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AIR FORCE TO 36A12-1C-2400-2-3

TECHNICAL MANUAL
FIELD MAINTENANCE MANUAL
FOR
MINE RESISTANT AMBUSH PROTECTED (MRAP)
M1224
(NSN 2355-01-553-4634) (EIC 1XF)
M1224A1
(NSN 2355-01-561-0281) (EIC 1XM)

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND AIR FORCE
19 NOVEMBER 2012

WARNING SUMMARY

EXPLANATION OF WARNING ICONS

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the technical manual.

FIRST AID

First aid is the emergency care given to the sick, injured, or wounded before being treated by medical personnel. First aid data can be found in FM 4-25.11. This manual contains procedures for all types of casualties and the measures described are for use by all service members. Service members may be able to save a life, prevent permanent disability, or reduce long periods of hospitalization by knowing WHAT to do, WHAT NOT to do, and WHEN to seek medical assistance.

WARNING SUMMARY – (Continued)

EXPLANATION OF GENERAL SAFETY ICONS



EAR PROTECTION – headphones over ears shows that noise level will harm ears.



ELECTRICAL – electrical wire to arm with electricity symbol running through body shows that shock hazard is present.



ELECTRICAL – electrical wire to hand with electricity symbol running through body shows that shock hazard is present.



FALLING PARTS – arrow bouncing off human shoulder and head shows that falling parts present a danger to life or limb.



FLYING PARTICLES – arrows bouncing off face shows that particles flying through air will harm face.



FLYING PARTICLES – arrows bouncing off face with face shield shows that particles flying through the air will harm face.



HEAVY OBJECT – human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS – foot with heavy object on top shows that heavy parts can crush and harm.



HEAVY PARTS – heavy object on human figure shows that heavy parts present a danger to life or limb.

WARNING SUMMARY – (Continued)



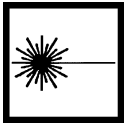
HEAVY PARTS – heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.



HELMET PROTECTION – arrow bouncing of head with helmet shows that falling parts present a danger.



HOT AREA – hand over object radiating heat shows that part is hot and can burn.



LASER LIGHT – laser light hazard symbol indicates extreme danger for eyes from laser beams and reflections.



MOVING PARTS – human figure with an arm caught between gears shows that the moving parts of the equipment present a danger to life or limb.



MOVING PARTS – hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.



MOVING PARTS – hand with fingers caught between rollers shows that the moving parts of the equipment present a danger to life or limb.



SHARP OBJECT – pointed object in hand shows that a sharp object presents a danger to life or limb.



SHARP OBJECT – pointed object in hand shows that a sharp object presents a danger to life or limb.

WARNING SUMMARY – (Continued)



SHARP OBJECT – pointed object in foot shows that a sharp object presents a danger to life or limb.



SLICK FLOOR – wavy line on floor with legs prone shows that slick floor presents a danger for falling.



EYE PROTECTION – person with goggles shows that the material will injure the eyes.

GENERAL WARNINGS

WARNING



Before performing any maintenance procedure, ensure vehicle is parked on level surface, engine is off, parking brake is applied, transmission is in NEUTRAL (N), and wheels are chocked. Wear eye protection and stay clear of rotating parts and hot surfaces. Make sure all electrical tools are grounded. Use extreme caution when working under vehicle. Use hydraulic jack to raise vehicle, and place jackstands under frame rails to support axle. Keep first-aid and fire-control equipment available during all operation and maintenance procedures. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

A/C

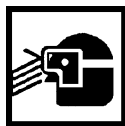


Do not install or remove air-conditioning testing or charging equipment while engine is running. Failure to comply may result in serious injury or death to personnel.

WARNING

AIR DRAIN VALVES

WARNING SUMMARY – (Continued)



Air drain valves are under pressure. Wear protective goggles and do not place face in front of air drain valves while draining air reservoirs. Open air drain valves slowly to release air pressure gradually. Failure to comply may result in serious injury or death to personnel.

WARNING

AIR LINES

Do not disconnect any air line or fitting until system pressure has been relieved. Hoses may whip and injure personnel, and air under pressure can penetrate skin. Failure to comply may result in serious injury or death to personnel.

Do not operate vehicle with air pressure system loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

BATTERIES



Wear protective eye goggles, face shield, and long sleeves when working on or near batteries. Batteries contain corrosive acid and can produce explosive gases. Batteries supply electrical current that can cause burns and electrical shock. Always check electrolyte level with engine off. Avoid leaning over or onto battery. Do not wear jewelry and do not smoke or have open flame or spark near battery. Do not allow tools to contact battery box or battery terminals. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Battery acid must not contact eyes, skin, or clothing. If battery acid contacts eyes or skin, flush area with large amounts of water for 15 minutes and seek immediate medical care. If swallowed, do not induce vomiting. Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention. Failure to comply may result in serious injury or death to personnel.

Disconnect battery ground cable or power source prior to working on electrical components. If electrical shock occurs, administer first aid and seek medical assistance immediately. Failure to comply may result in serious injury or death to personnel.

Ensure batteries are disconnected before removing ESC. Failure to comply may result in serious injury or death to personnel.

WARNING SUMMARY – (Continued)

WARNING

BRAKES (ALSO SEE HAZARDOUS MATERIALS WARNINGS)

Before working on air brake system or any auxiliary pressurized system, make sure air pressure has been drained from all reservoirs. Failure to comply may result in serious injury or death to personnel.

If springs are missing or damaged, replace with new spring hardware kit before installing new brake shoes. Replace brake shoes if there are any signs of overheating, if step on center wear tab of brake shoe lining is not visible, or if thickness on any part of brake shoe is ¼ in. (6 mm) or less. Drums must be turned or replaced if there were any signs of overheating on old brake shoes. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not allow grease or oil to contact brake linings. Linings can absorb grease and oil, causing early glazing and reduced braking action. Failure to comply may result in serious injury or death to personnel.

Before removing ABS Control Module, disconnect battery disconnect switch and disconnect batteries. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

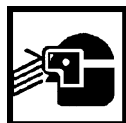
CAB DOOR WINCH STRAPS



Cab doors must be secured in the open position by using heavy duty winch straps to prevent accidental closure during vehicle maintenance. Failure to comply may result in serious injury or death to personnel.

WARNING

COMPRESSED AIR

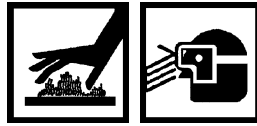


Do not use compressed air exceeding 30 psi (207 kPa) for cleaning purposes. Use only with effective chip-guarding and personal protective equipment, including goggles or face shield and gloves. Failure to comply could result in serious injury or death to personnel.

WARNING

COOLING SYSTEM/RADIATOR

WARNING SUMMARY – (Continued)



Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.

Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

WARNING

DMM (DIGITAL MULTIMETER)



Ensure power is off before cutting, soldering, or removing a circuit component to insert the Digital Multi-meter (DMM) for current measurements. Even small amounts of current can be dangerous. Failure to comply may result in serious injury to personnel.

When routing DMM leads, do not crimp leads, run leads too close to moving parts, or let leads touch hot engine surfaces. Failure to comply may result in serious injury to personnel.

WARNING

ELECTRICAL



Turn off ignition switch and main power switch before performing electrical system maintenance. Failure to comply may result in serious injury or death to personnel.

Disconnect negative ground cable from batteries before removing any electrical component. Failure to comply may result in serious injury or death to personnel.

Never attempt a voltage measurement with test probe lead in current jack (10A or 300mA). Failure to comply may result in serious injury to personnel.

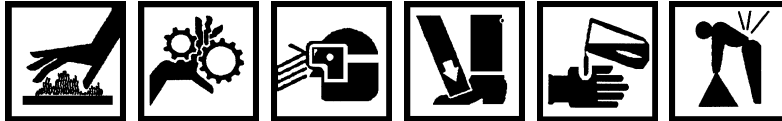
Shut engine down before performing voltage checks for injector solenoids. When engine is running, injector circuits have high voltage and amperage. Failure to comply may result in serious injury to personnel.

WARNING SUMMARY – (Continued)

Do not use a circuit breaker, fuse, or relay with higher amperage rating than listed for a particular application. Using higher amperage will overheat the electrical circuit, causing melted components and possible fire. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

ENGINE (ALSO SEE HAZARDOUS MATERIALS WARNINGS.)



Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistance of crewmember or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

Do not rotate diesel engine when priming with oil. This may cause engine to accidentally start. Failure to comply may result in serious injury or death to personnel.

Prior to performing work on crossmember, place wooden block between crossmember and front engine mount. Failure to comply may result in damage to equipment and serious injury to personnel.

WARNING

EMERGENCY HATCH



Emergency hatch door is extremely heavy. Use caution and keep arms, hands, and head clear of hatch when opening or closing. Ensure hatch door is properly secured in both the open or closed position. Do not operate vehicle with emergency roof hatch open. Failure to comply may result in serious injury or death to personnel.

Use lifting device capable of lifting 1000 lbs to lift emergency hatch from vehicle. Clear all nonessential personnel from area when lifting hatch from vehicle. Do not stand directly under hatch door while lowering to floor. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

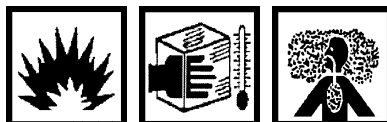
EXHAUST

WARNING SUMMARY – (Continued)

Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING**FAN BLADE**

Do not attempt to restrict fan blade rotation during engine operation. Improper use of application or modification of fan drive or fan can damage fan drive. Do not operate vehicle with malfunctioning or damaged fan drive or fan blades. Failure to comply may result in damage to equipment and serious injury to personnel.

WARNING**FSS (FIRE SUPPRESSION SYSTEM)**

Before installing FSS extinguisher, verify correct part number is being installed. Check for visible damage to the canister, such as dents, cracked plastic, chips, or scratches where hoses connect. If damage is visible anywhere, do not use; contact your supervisor. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Prior to servicing FSS, make sure FSS power is off, main power switch is off, unless otherwise instructed. If damage is visible, anywhere, do not use. Contact your supervisor. Failure to comply may result in discharging of system and serious injury or death to personnel.

Before handling extinguisher, make sure anti-recoil plug is installed in valve outlet port and mechanical lever lockpin is installed in lever lock holes. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Some fire suppression systems have a safety pin to install before disconnecting lines. Check to see if system uses a safety pin and install it before disconnecting lines. When disconnecting the extinguisher lines, use extreme caution. Do not disturb the pyrotechnic actuator and pressure switch; this will cause the extinguisher to discharge automatically. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING SUMMARY – (Continued)

Do not drop or strike FSS extinguisher. Extinguisher can discharge accidentally and chemical agent can escape through holes in side of ant-recoil plug. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not release extinguisher bottle band clamps unless anti-recoil plug is installed in valve outlet port and mechanical lever lockpin is installed in lever lock holes. Failure to comply may result in personal injury or death, or damage to equipment.

FSS extinguisher can move violently when discharging. Ensure extinguisher is properly secured during use. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Replace fire extinguisher immediately after use, even if only partly used. Failure to comply may result in serious injury or death to personnel.

Exposure to large quantities of dry chemical fire extinguisher in cab may result in temporary breathing difficulty during and immediately after discharge. If possible, discharge fire extinguisher from outside cab. Ventilate and wash cab thoroughly prior to reentry. If respiratory irritation or distress occurs, move victim to fresh air. Seek medical attention if irritation persists.

Chemical fire suppression agents are refrigerants and can freeze skin. Extinguisher will be extremely cold after discharging. Avoid contact with chemical agent and do not touch extinguisher after use. Failure to comply may result in serious personal injury.

WARNING

FUEL LINES/PUMP



Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not overtighten bolts for fuel pump or cross-thread connections on fuel lines. This will interfere with sealing and operation of fuel pump. If seal is not complete or lines leak due to cross-threads, fuel pump will not operate properly and vehicle may not run. Starting vehicle without fuel pressure in lines or pump may result in damage to equipment and serious injury or death to personnel.

WARNING

GUNNER HATCH



WARNING SUMMARY – (Continued)

Gunner hatch is extremely heavy. Use caution when opening and closing. Wear safety goggles when removing, installing, or working on interior of gunner hatch. Keep arms and hands clear of gunner hatch when closing. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Gunner sliding hatch can only be opened or closed when vehicle is stationary and on level surface. Do not attempt to open or close the hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Ensure gunner hatch is completely locked in open position before moving vehicle with gunner in position. Use extreme caution when standing in gunner hatch while vehicle is in motion. Gunner should be holding onto weapon or other support to maintain stability at all times. Failure to comply may result in serious injury or death to personnel.

WARNING HEATSHRINK TUBING



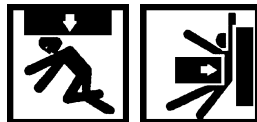
Never use open flame to apply heat to heatshrink tubing. Allow heatshrink tubing to cool before handling. Failure to comply may result in serious injury to personnel.

WARNING HEAVY LIFTING



Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING HOOD



Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

WARNING SUMMARY – (Continued)

WARNING

INSTRUMENT PANEL



The instrument panel is bulky and heavy and cannot be removed by one person. Before removing the side A-pillar mounting bolts, obtain assistance for remainder of removal. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

JACKS



Before lifting vehicle off ground, make sure it is parked on level surface. Set parking brake and chock wheels. Use hydraulic jack to lift vehicle. Do not use jack alone to support vehicle. Never work under or near a vehicle supported only by jack or lifting device. Use rated jackstands under frame rails to properly support vehicle. Do not support vehicle under front and rear axles. Use additional jackstands as necessary to support vehicle components during removal and installation procedures. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

LITTER



Keep personnel clear of litter-lift moving parts. Ensure litters and patients are properly secured and clear of rear door/ramp and all other obstacles during litter-lift movement. Failure to comply may result in serious injury or death to personnel.

Hold litter stub and connector plate up while removing or installing hex-head screws from bracket. If connector plate and stub fall and slide down stainless sliding rail, serious damage to parts may occur. Failure to comply may result in serious injury or death to personnel.

WARNING

PITMAN ARM

Pitman arm will be extremely tight. Do not pound on pitman arm or apply heat to pitman arm or sector shaft. Never weld pitman arm or sector shaft. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING SUMMARY – (Continued)

Proper installation of pitman is critical to vehicle safety. Install pitman arm after steering gear is mounted on vehicle so proper torque can be applied to pitman arm. Otherwise, pitman arm could loosen and cause an accident. If pitman arm is loose, replace pitman arm and sector shaft. Always use a new tab lock retainer. If tabs and notches do not line up, tighten beyond specified torque value until two tabs align. Never back off retainer to align retaining tabs. Failure to comply may result in damage to equipment and serious injury or death to personnel.

When installing new cotter pin, tighten nut until slot appears and insert cotter pin. Never back off nut to install cotter pin. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING

REAR CABIN DOOR/RAMP



Rear cabin door/ramp is heavy. Make sure door/ramp is secured so it will not move. Failure to comply may result in serious personal injury or death to personnel.

Ensure no one is behind vehicle when lowering rear door/ramp. Use extreme caution when using emergency rear door/ramp release, to ensure no one is struck by door as it falls open. Keep arms and legs clear of rear door/ramp when closing. Do not operate rear door/ramp when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.

Attach a lifting device and sling to rear door/ramp prior to removing mounting bolts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Rear door/ramp is heavy. Ensure lifting device and sling are in place prior to removing rear door/ramp mounting bolts. Failure to comply may result in serious injury or death to personnel.

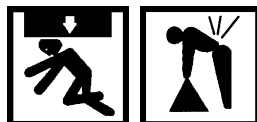
WARNING

RIFLES

Remove rifles from rifle racks being worked on. Ensure rifles are not loaded and store in safe manner. Failure to comply may result in serious injury or death to personnel.

WARNING

TOWING EYES



Do not remove both rear towing eyes at the same time, Entire rear frame crossmember assembly will fall. Replace one towing eye at a time. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING SUMMARY – (Continued)

WARNING

TRANSFER CASE



During normal vehicle operation, transfer case and oil cooler can become very hot. Allow transfer case and oil cooler to cool prior to servicing oil cooler. Wear safety goggles, work gloves, and protective clothing. Use extreme caution when opening drain valves and removing bolts. Failure to comply may result in serious injury to personnel.

WARNING

TRANSMISSION



Use care when working with hot transmission and fluid during maintenance procedures. Wear protective goggles, work gloves, and long sleeves to avoid injury. Avoid contact with hot transmission oil or sump when draining transmission oil. If transmission oil temperature is above 220°F (104°C), allow transmission oil to cool before removing dipstick. Failure to comply may result in serious injury or death to personnel.

WARNING

WHEELS/TIRES



Wheel and tire assemblies are heavy. Do not attempt to lift wheel and tire assemblies without assistance from crewmember. Wear safety goggles and work gloves. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Ensure vehicle is parked on hard, level surface before changing wheel and tire assembly. Soft or uneven ground may cause jack or jackstand to slip, resulting in damage to equipment and serious injury or death to personnel.

EXPLANATION OF HAZARDOUS MATERIALS ICONS

WARNING SUMMARY – (Continued)



BIOLOGICAL – abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.



CHEMICAL – drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



CRYOGENIC – hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.



EXPLOSION – rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.



FIRE – flame shows that a material may ignite and cause burns.



POISON – skull and crossbones shows that a material is poisonous or is a danger to life.



RADIATION – three circular wedges shows that the material emits radioactive energy and can injure human tissue.



VAPOR – human figure in a cloud shows that material vapors present a danger to life or health.

WARNING



ANTI-SEIZE COMPOUND

WARNING SUMMARY – (Continued)

Anti-seize compound is flammable and toxic. Container may explode from excessive heat. Vapors can cause headache, dizziness, unconsciousness, corneal injury, and respiratory tract irritation. Use only in well-ventilated area. Use approved respirator with dual organic vapor/mist and particulate cartridge. Wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and obtain immediate medical attention. If swallowed, do not induce vomiting; obtain immediate medical attention. Failure to comply may result in serious injury or death to personnel.

WARNING**ASBESTOS**

Brake dust contains asbestos, a known health hazard. Always wear safety goggles and an approved respirator during all brake service procedures. Wear respirator during removal of wheels through assembly. Handle all brake parts with care; brake dust covers all brake parts. Failure to comply may result in serious injury or death to personnel.

Never use compressed air or dry brushing to clean brake parts or assemblies. Use an industrial vacuum cleaner with a HEPA filter system to clean dust from brake drums, backing plates, and other brake parts. After vacuuming, remove any remaining dust with a rag soaked in water and wrung until nearly dry. Carefully clean parts in a well-ventilated or open-air area. During brake disassembly, carefully place all parts on the floor to avoid getting dust into the air. Do not use compressed air to clean clothing after working on brakes; use vacuum with HEPA filter system. Failure to comply may result in serious injury or death to personnel.

WARNING**CARBON MONOXIDE**

Carbon monoxide is a colorless, odorless, and dangerous gas that deprives the body of oxygen and causes suffocation. Use the following precautions to avoid carbon monoxide poisoning. Failure to comply may result in permanent brain damage or death to personnel.

- Do not idle engine for long periods of time.
- If necessary to run engine in confined area during vehicle service, use proper equipment to vent exhaust gasses outside work area.
- Do not operate personnel heater in enclosed area without adequate ventilation.
- Turn auxiliary diesel heater switch off before filling any fuel tank on vehicle.
- Do not sleep in vehicle with heater operating or engine idling.
- Notify Field Maintenance if exhaust fumes are detected in crew compartment while operating the vehicle.
- Be alert at all times for exhaust odors and symptoms of exposure to carbon monoxide, such as headaches, dizziness, loss of muscular control, apparent drowsiness, and coma. If symptoms are evident, move affected personnel to fresh air, keep them warm, do not permit physical exercise, administer artificial respiration (if necessary), and seek immediate medical attention.

WARNING

WARNING SUMMARY – (Continued)



CARC (CHEMICAL AGENT RESISTANT COATING)

Vehicles are finished with a chemical agent resistant coating (CARC). CARC contains isocyanates, which are highly irritating to skin and respiratory system. Breathing CARC vapor or dried paint dust can cause coughing, shortness of breath, burning sensation in throat and nose, watering of eyes, pain during respiration, and chest tightness. Skin contact with particulates can cause itching or redness of skin. Sensitivity to isocyanates may increase from repeated exposure. Use the following precautions to prevent injury from exposure. Failure to comply may result in serious injury to personnel.

- Never weld or cut CARC coated surfaces. Grinding or sanding CARC coated surfaces will create harmful dust.
- Personnel who have lung or breathing problems or who have had a reaction to isocyanates must not be in any area where CARC painting operations are performed or CARC dust particles are present.
- CARC painting operations must be performed only by qualified painters wearing protective gear and respirators and working in fully equipped facilities. All personnel in the area must wear high-efficiency air purifying respirators, protective goggles, gloves, and other protective clothing. Thoroughly wash all clothing before reuse.

WARNING



CLEANING SOLVENTS

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Wear goggles and protective clothing. Keep away from open flame and use in well-ventilated area. If adhesive, solvent, or sealing compound get on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury or death to personnel.

WARNING



CONNECTOR LUBRICANT

Connector lubricant is harmful to skin and eyes. If lubricant contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

WARNING



CORROSION PREVENTIVE COMPOUND

WARNING SUMMARY – (Continued)

Corrosion preventive compound is toxic. Use only in well-ventilated area. Use approved respirator with dual organic vapor/mist and particulate cartridge. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

WARNING



DIELECTRIC GREASE

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

WARNING



ETHER CANISTER

Ether canisters contain hazardous, combustible and flammable materials. Handle with care and dispose of in accordance with standard operating procedures. Use approved respirator with dual organic vapor/mist and particulate cartridge. Avoid contact with skin and eyes, and avoid breathing fumes. If swallowed, do not induce vomiting. Obtain immediate medical attention. Failure to comply may result in serious injury or death to personnel.

Ether canisters are pressurized, combustible and flammable. Keep away from flames and sparks. Do not incinerate or puncture canister. Do not expose to temperatures above 120°F (49°C). Do not store spare canister in vehicle cab. Failure to comply may result in serious injury or death to personnel.

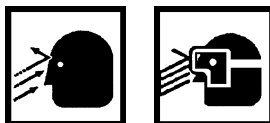
WARNING



ENGINE FLUIDS

Engine fluids (oil, fuel, and coolant) may flammable and may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

WARNING



WARNING SUMMARY – (Continued)

FIBERGLASS

Direct contact with fiberglass materials or exposure to airborne fiberglass dust may irritate skin, eyes, nose, and throat. Minimize exposure to fiberglass particles by wearing long sleeves and long pants, work gloves, hat, and face shield or safety goggles with side shields. Personnel who experience irritation or have a known sensitivity should wear an approved particulate respirator. After working with fiberglass materials, wash skin with soap and running water and change clothing before touching eyes. Failure to comply may result in injury to personnel.

WARNING



FUEL

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

WARNING



HYDRAULIC FLUID

Hydraulic fluid is flammable and harmful to skin and eyes. Wear work gloves and eye protection when handling fluids. Do not perform maintenance while smoking or near flame or sparks. If fluid contacts skin, wash affected area immediately. In case of eye contact, flush with water for 15 minutes and seek medical care immediately. Dispose of hydraulic fluid in accordance with standard operating procedures. Failure to comply may result in serious injury to personnel.

WARNING



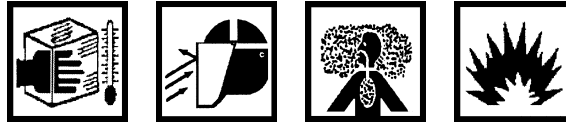
NBC (NUCLEAR, BIOLOGICAL, and CHEMICAL) SYSTEM

NBC system maintenance procedures require at least two personnel due to risk of medical emergency from possible exposure to NBC agents. Maintenance must be performed by properly trained, authorized personnel with proper safety equipment and protective clothing. Make sure batteries are disconnected and

WARNING SUMMARY – (Continued)

area is well ventilated. Do not smoke or allow open flame near vehicle. Never operate system with cover or panel removed. Failure to comply may result in serious injury or death to personnel.

WARNING



REFRIGERANT

Do not expose refrigerant containers, empty or full, to open flames or temperatures above 125°F (52°C). Do not discard empty containers where they may be subject to heat from a trash burner; containers may explode. Failure to comply may result in damage to equipment and serious injury or death to personnel.

The temperature of liquid refrigerant is -20°F (-29°C). Wear full face shield, protective rubberized gloves, and protective clothing when working with refrigerant. If refrigerant contacts skin, remove all contaminated clothing. Treat skin as though it were frostbitten or frozen and seek immediate medical attention. If refrigerant contacts eyes, do not rub them. Flush eyes with cold water for at least 15 minutes to gradually increase temperature above freezing point. Seek immediate medical attention. Failure to comply may result in serious injury or death to personnel.

Refrigerant becomes a poisonous gas in the presence of heat. Do not smoke or allow any type of flame in immediate area while servicing air conditioning system. Never weld, solder, steam clean, or use excessive heat on any part of the air conditioning system while charged/pressurized. Failure to comply may result in damage to equipment and serious injury or death to personnel.

R-134a refrigerant must not be mixed with air and then pressurized. When mixed with large quantities of air and pressurized, R-134a becomes combustible. Failure to comply may result in damage to equipment and environment, and serious injury or death to personnel.

Refrigerant evaporates very quickly and may displace oxygen surrounding work area, especially in a small or enclosed area. This can cause suffocation or brain damage. If leak occurs, avoid breathing refrigerant vapor and thoroughly ventilate area before continuing service. If personnel breathe refrigerant vapors, obtain immediate medical assistance. Failure to comply may result in serious injury or death to personnel.

Federal and state laws require that refrigerant be recovered and recycled. Refrigerant must be recovered from system with authorized recommended equipment before any work can be performed on unit. Always use approved recycling equipment to prevent accidental discharge. Failure to comply may result in damage to equipment and environment, and serious injury or death to personnel.

WARNING



HVAC SYSTEM

Do not check compressor oil level when HVAC system is charged with refrigerant. Never open the high side hand valve of the manifold gauge set while HVAC system is operating. If hot, high pressure refrigerant is forced through gauge to refrigerant supply cylinder, which could rupture. Do not disconnect HVAC lines from compressor. Release of refrigerant may cause damage to equipment or environment and serious injury or death to personnel.

Do not use parts other than those specified for the system being serviced. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Accidental or intentional introduction of liquid contaminants into the environment is a violation of state, federal, and military regulations. Store, install, and dispose of containers in accordance with standard operating procedures.

WARNING SUMMARY – (Continued)

Refer to Army POL (para. 1-8) for information concerning storage, use, and disposal of liquid contaminants. Failure to comply may result in damage to environment and serious injury or death to personnel.

WARNING



SILICONE GASKET MATERIAL

Silicone gasket material emits a small amount of acid vapor. Ensure work area is well ventilated. Read and carefully follow manufacturer's instructions before use. If silicone gasket material contacts eyes, follow manufacturer's emergency procedures. Seek medical assistance as soon as possible. Failure to comply may result in serious injury to personnel.

WARNING



SILICONE GREASE

Silicone grease is harmful to skin and eyes. If silicone grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

WARNING



THREAD SEALING COMPOUND

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

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Original 19 November 2012

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND AIR FORCE
WASHINGTON, D.C., 19 NOVEMBER 2012

TECHNICAL MANUAL
FIELD MAINTENANCE MANUAL
FOR
MINE RESISTANT AMBUSH PROTECTED (MRAP)

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M1224A1
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CHAPTER 5
TROUBLESHOOTING PROCEDURES
FOR
MINE RESISTANT AMBUSH PROTECTED (MRAP)

FIELD MAINTENANCE
HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Terminal Test Kit (WP 0795, Item 122)

WP 0731
WP 0769
WP 0770
WP 0774
WP 0775
WP 0777
WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0059
WP 0202
WP 0277
WP 0726
WP 0727
WP 0728
WP 0730

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Hood open and secured (TM 9-2355-106-10)
Engine coolant at or near ambient temperature (TM 9-2355-106-10)

Drawings Required

WP 0789, Figure 75
WP 0789, Figure 77

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****TROUBLESHOOTING PROCEDURE****WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Hoses, pipes, and valves containing engine coolant can be hot. Use caution when directed to feel parts for temperature conditions. Use gloves if necessary. Failure to comply may result in injury to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

On some vehicles, terminals R and S on connector J6/P6 are identified as terminals O and I respectively.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

1. Turn HVAC/LSS operator panel mode switch to VENT position (TM 9-2355-106-10).
2. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
3. Turn MAIN POWER switch ON (TM 9-2355-106-10).
4. Start engine (TM 9-2355-106-10).
5. Allow engine to idle for 20 minutes.

WARNING

Hoses, pipes, and valves containing engine coolant can be hot. Use caution when directed to feel parts for temperature conditions. Use gloves if necessary. Failure to comply may result in injury to personnel.

6. Feel temperature of inlet heater hose (Figure 1, Item 1) at HVAC/LSS box (Figure 1, Item 2).

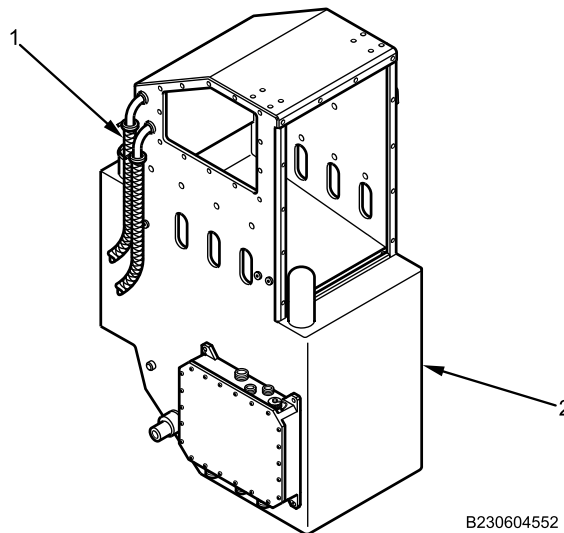


Figure 1. HVAC Box Heater Hose Connections.

CONDITION/INDICATION

Is inlet heater hose getting hot?

DECISION

NO Go to next step.
 YES Go to Step 10.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP****NOTE**

The system can not be properly tested unless ambient temperature is below 79.7°F (26.5°C).

7. Turn HVAC/LSS operator panel mode switch to HEAT position (TM 9-2355-106-10).
8. Turn HVAC/LSS operator panel temperature control switch to maximum heat (TM 9-2355-106-10).
9. Wait 2 minutes, then feel temperature of inlet heater hose (Figure 2, Item 1) at HVAC/LSS box (Figure 2, Item 2).

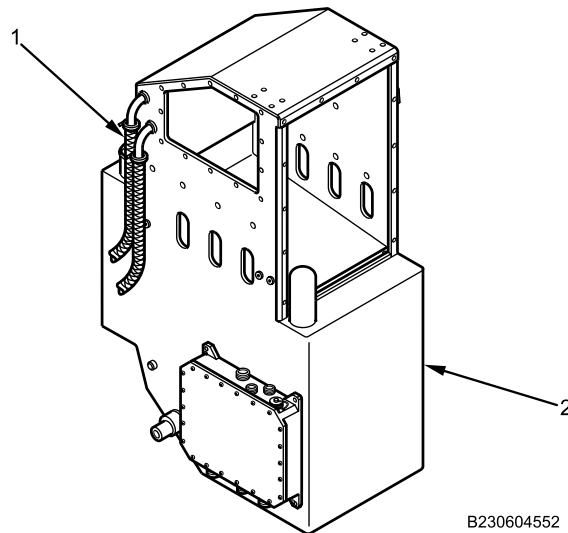


Figure 2. HVAC Box Heater Hose Connections.

CONDITION/INDICATION

Is inlet heater hose getting hot?

DECISION

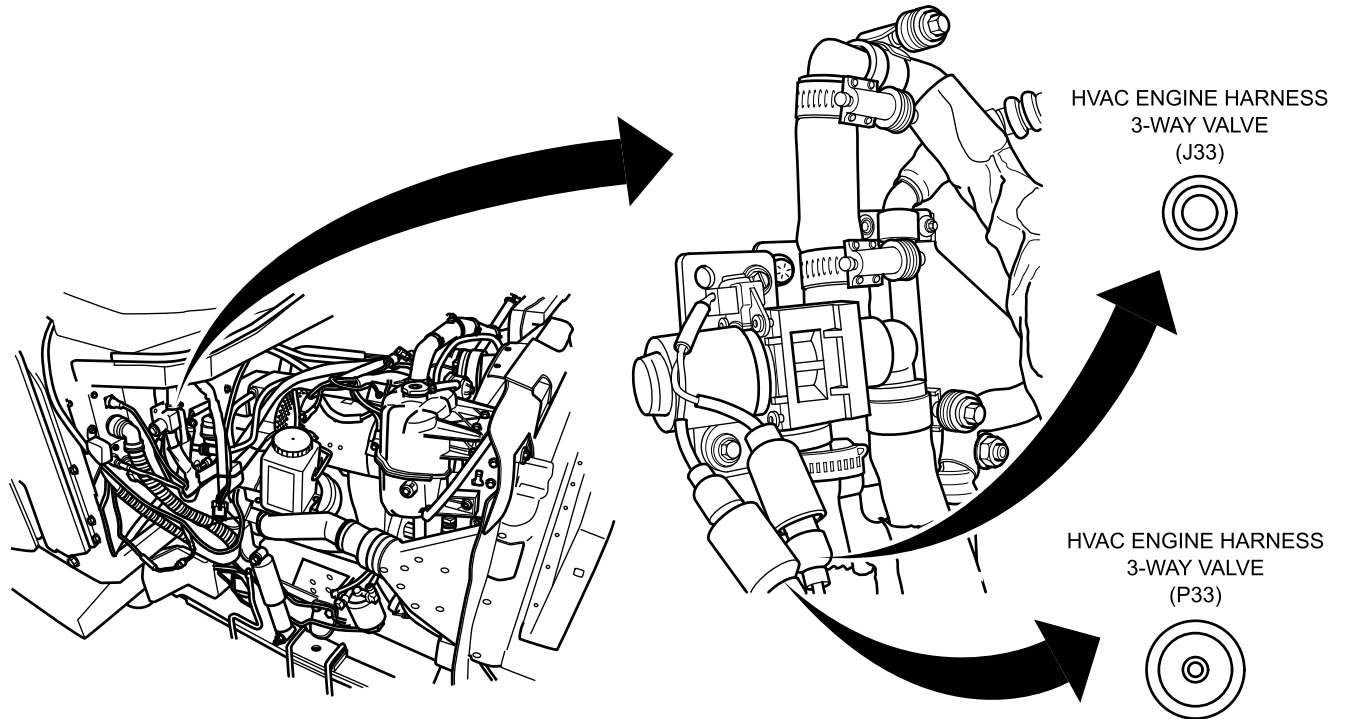
YES Return to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202).

NO Go to Step 21.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

10. Disconnect connectors P33 and J33. Refer to Figure 3.



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Figure 3. Right Side Engine Compartment at Firewall.

11. Measure DC voltage between connector J33 and P33 with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read 0V?

DECISION

YES Go to next step.

NO Go to Step 15.

STEP

12. Open exterior battery box armor door (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

13. With assistant, move heater hose (Figure 4, Item 2) attached to coolant tee (Figure 4, Item 1), in a front-to-back-to-front motion.

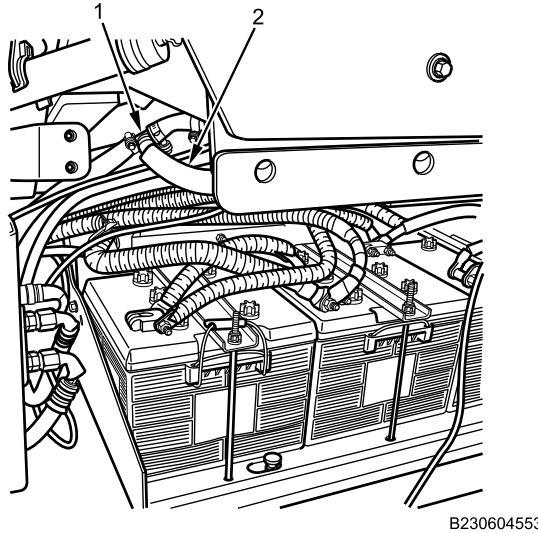


Figure 4. Heater Hoses Above Battery Box.

14. Visually inspect heater hoses (Figure 5, Item 3) to determine if hose being moved by maintainer is attached to left connection (Figure 5, Item 2) at 3-way valve (Figure 5, Item 1).

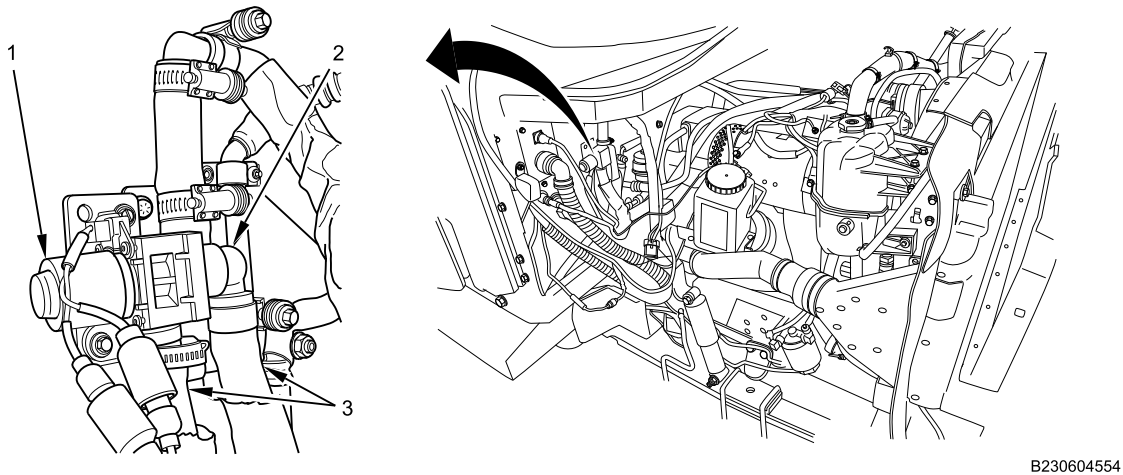


Figure 5. 3-Way Valve Heater Hose Connections at Firewall.

CONDITION/INDICATION

Is hose being moved by maintainer attached to left connection at 3-way valve?

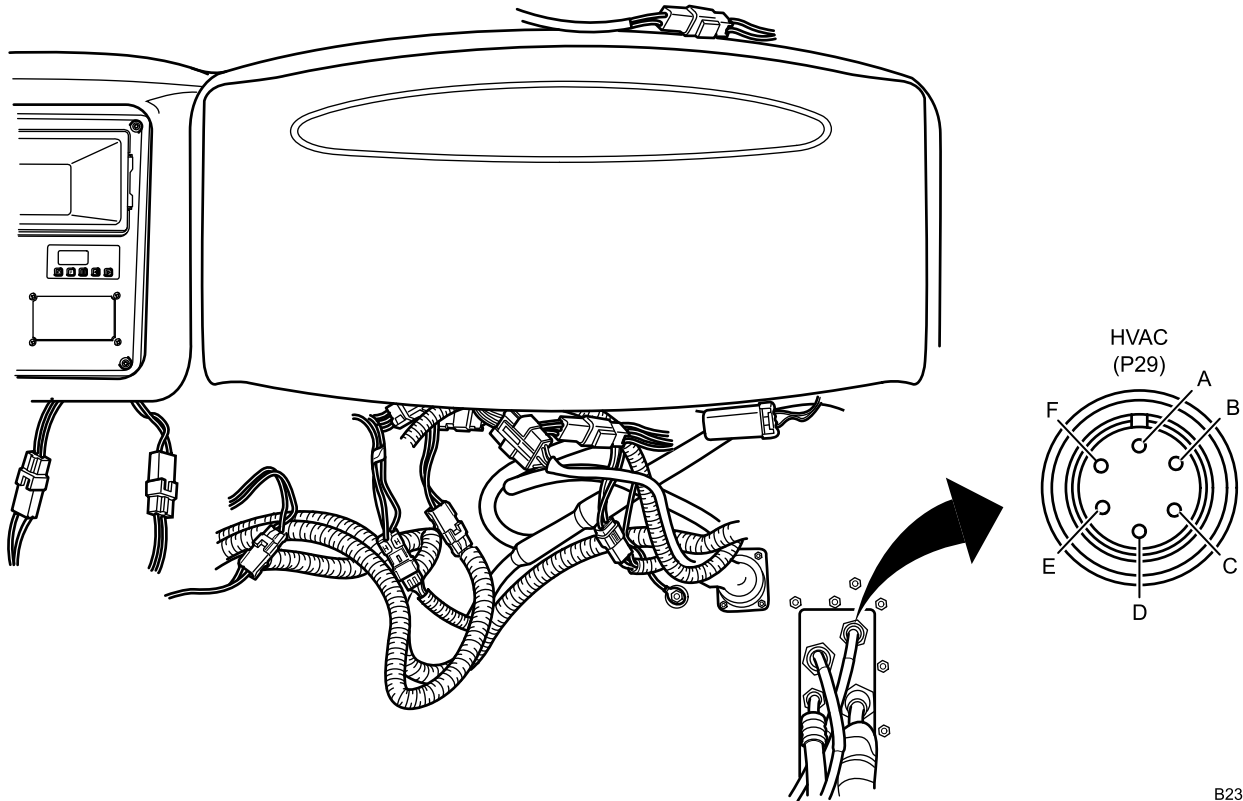
DECISION

YES Go to Step 81.
NO Go to Step 71.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

15. Disconnect connector P29. Refer to Figure 6.



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Figure 6. Right Front Cabin Area.

16. Measure DC voltage between connector P29 terminal A and ground with multimeter. Refer to Figure 6.

CONDITION/INDICATION

Does multimeter read 0V?

DECISION

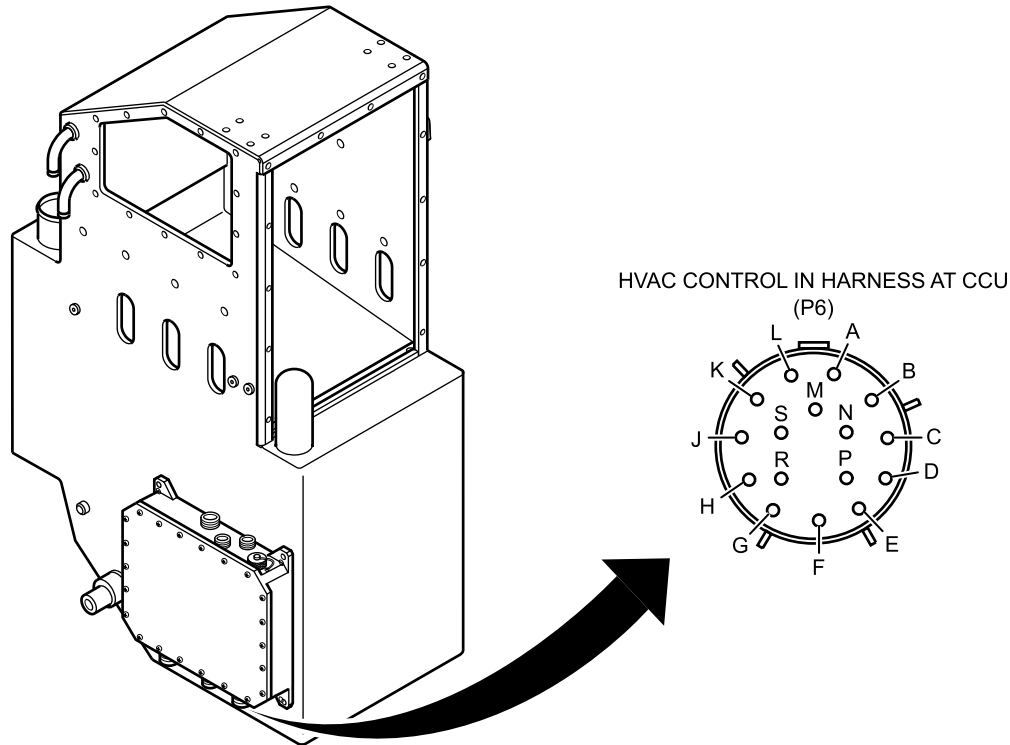
YES Go to Step 73.

NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

17. Turn ignition switch OFF (TM 9-2355-106-10).
18. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
19. Disconnect connector P6. Refer to Figure 7.



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Figure 7. HVAC Box Area.

20. Measure resistance between connector P6 terminal R (terminal O on some vehicles) and all other terminals on connector P6 with multimeter. Refer to Figure 7.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

YES Go to Step 72.
NO Go to Step 74.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

21. Turn ignition switch OFF (TM 9-2355-106-10).
22. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
23. Leave engine off for 30 minutes.
24. Check engine coolant level (TM 9-2355-106-10).

CONDITION/INDICATION

Is engine coolant level low?

DECISION

NO Go to next step.
YES Go to Step 75.

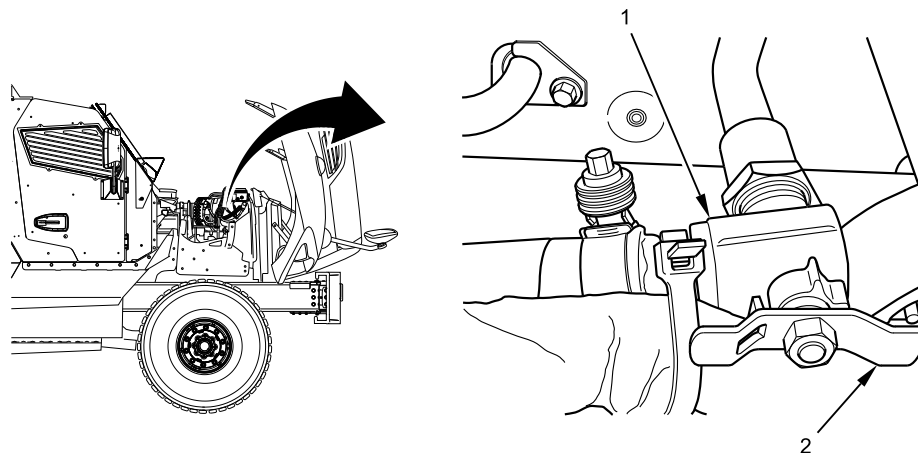
STEP

WARNING



Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

25. Ensure coolant outlet valve (Figure 8, Item 1) is open by turning handle (Figure 8, Item 2) counterclockwise.

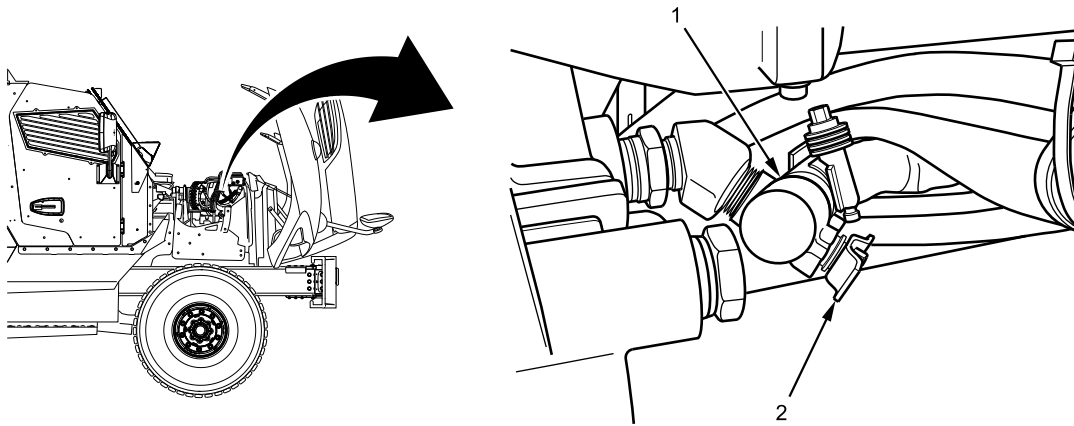


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Figure 8. Heater Coolant Engine Outlet Valve.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)**

26. Ensure coolant inlet valve (Figure 9, Item 1) is open by turning handle (Figure 9, Item 2) counterclockwise.



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Figure 9. Heater Coolant Engine Inlet Valve.

CONDITION/INDICATION

Was either coolant valve closed?

DECISION

NO Go to next step.

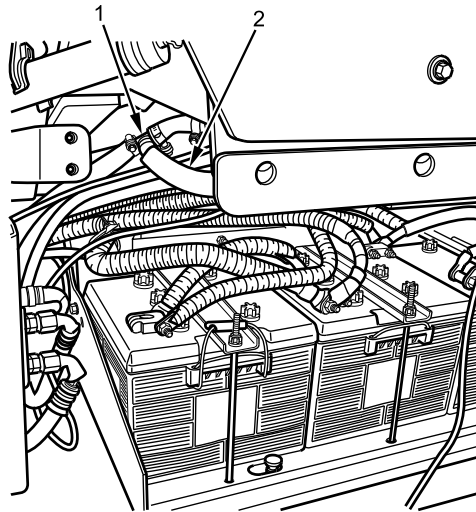
YES Return vehicle to service.

STEP

27. Open exterior battery box armor door (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

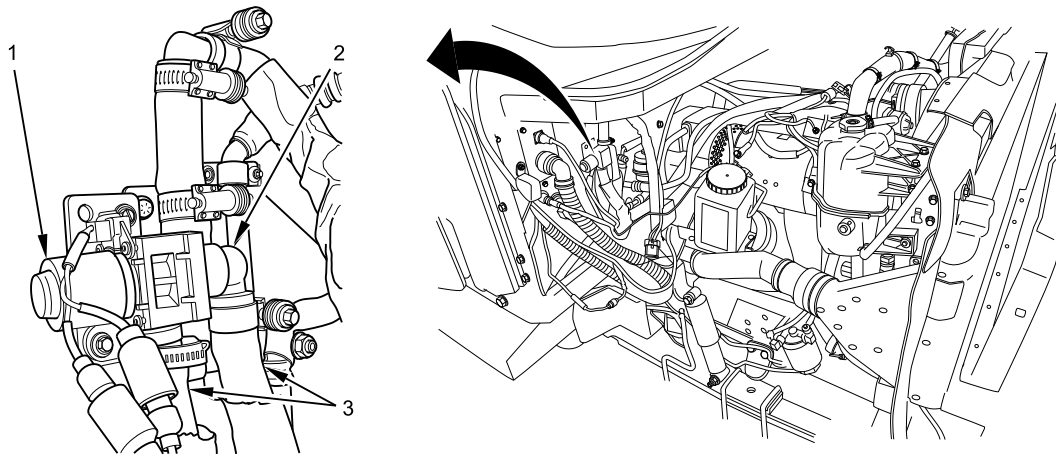
28. With assistant, move heater hose (Figure 10, Item 2) attached to coolant tee (Figure 10, Item 1) in a front-to-back-to-front motion.



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Figure 10. Heater Hose Above Battery Box.

29. Visually inspect heater hoses (Figure 11, Item 3) to determine if hose being moved by maintainer is attached to left connection (Figure 11, Item 2) at 3-way valve (Figure 11, Item 1).



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Figure 11. 3-Way Valve Heater Hose Connections.

CONDITION/INDICATION

Is hose being moved by maintainer attached to left connection at 3-way valve?

DECISION

YES Go to next step.
NO Go to Step 71.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

30. Remove 3-way valve outlet hose. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve Coolant Outlet Hose Removal and Installation (WP 0726).
31. Visually inspect 3-way valve outlet hose for restrictions.

CONDITION/INDICATION

Does 3-way valve outlet hose have a restriction?

DECISION

NO Go to next step.
YES Go to Step 76.

STEP

32. Remove 3-way valve inlet hose. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve Coolant Inlet Hose Removal and Installation (WP 0730).
33. Visually inspect 3-way valve inlet hose for restrictions.

CONDITION/INDICATION

Does 3-way valve inlet hose have a restriction?

DECISION

NO Go to next step.
YES Go to Step 77.

STEP

34. Remove fuel fired heater inlet hose. Refer to Heating Ventilating and Air Conditioning (HVAC) Fuel-Fired Heater Coolant Inlet Hose Removal and Installation (WP 0731).
35. Visually inspect fuel fired heater inlet hose for restrictions.

CONDITION/INDICATION

Does fuel fired heater inlet hose have a restriction?

DECISION

NO Go to next step.
YES Go to Step 78.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

36. Remove fuel fired heater outlet hose. Refer to Heating Ventilating and Air Conditioning (HVAC) Fuel-Fired Heater Coolant Outlet Hose Removal and Installation (WP 0726).
37. Visually inspect fuel fired heater outlet hose for restrictions.

CONDITION/INDICATION

Does fuel fired heater outlet hose have a restriction?

DECISION

NO Go to next step.
YES Go to Step 79.

STEP

38. Remove cabin heater hoses. Refer to Heating Ventilating and Air Conditioning (HVAC) Cabin Heater Hose Removal and Installation (WP 0728).
39. Visually inspect cabin heater hoses for restrictions.

CONDITION/INDICATION

Do cabin heater hoses have a restriction?

DECISION

NO Go to next step.
YES Go to Step 80.

STEP

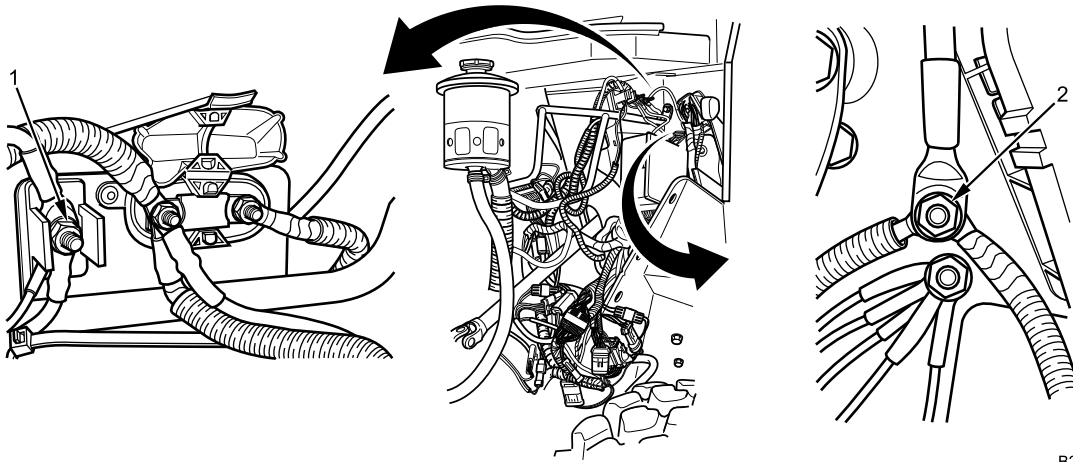
40. Remove 3-way valve. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve and Bracket Removal and Installation (WP 0727).

NOTE

It may be necessary to use an assistant to help hold jumper wires in place during the next four steps.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

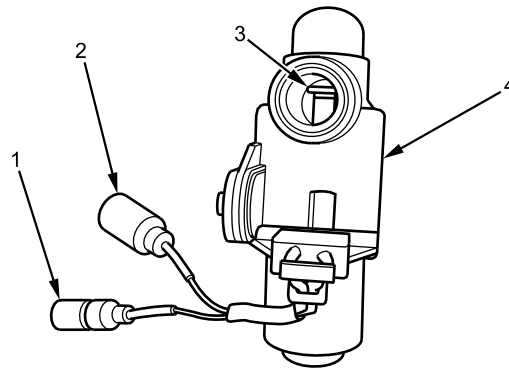
41. Connect jumper wire to ground distribution lug (Figure 12, Item 2).



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Figure 12. 24V Power Source at Left Side Engine Compartment Area.

42. Connect another jumper wire to power distribution junction block lug (Figure 12, Item 1).
 43. Connect other end of jumper wire that is connected to power distribution lug (Figure 12, Item 1) to connector P33 (BROWN wire on 3-way valve) (Figure 13, Item 2).



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Figure 13. 3-Way Valve Bench Test Connections.

NOTE

Ensure valve is held in position shown in illustration during the next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

44. While observing plunger (Figure 13, Item 3) in 3-way valve (Figure 13, Item 4), momentarily touch other end of jumper wire that is connected to ground distribution lug (Figure 12, Item 2) to connector J33 (RED wire on 3-way valve) (Figure 13, Item 1). Plunger should move about 1/4-inch. When jumper wire is removed from connector J33 (RED wire on 3-way valve), plunger should move back to the original position.

CONDITION/INDICATION

Does 3-way valve plunger move properly?

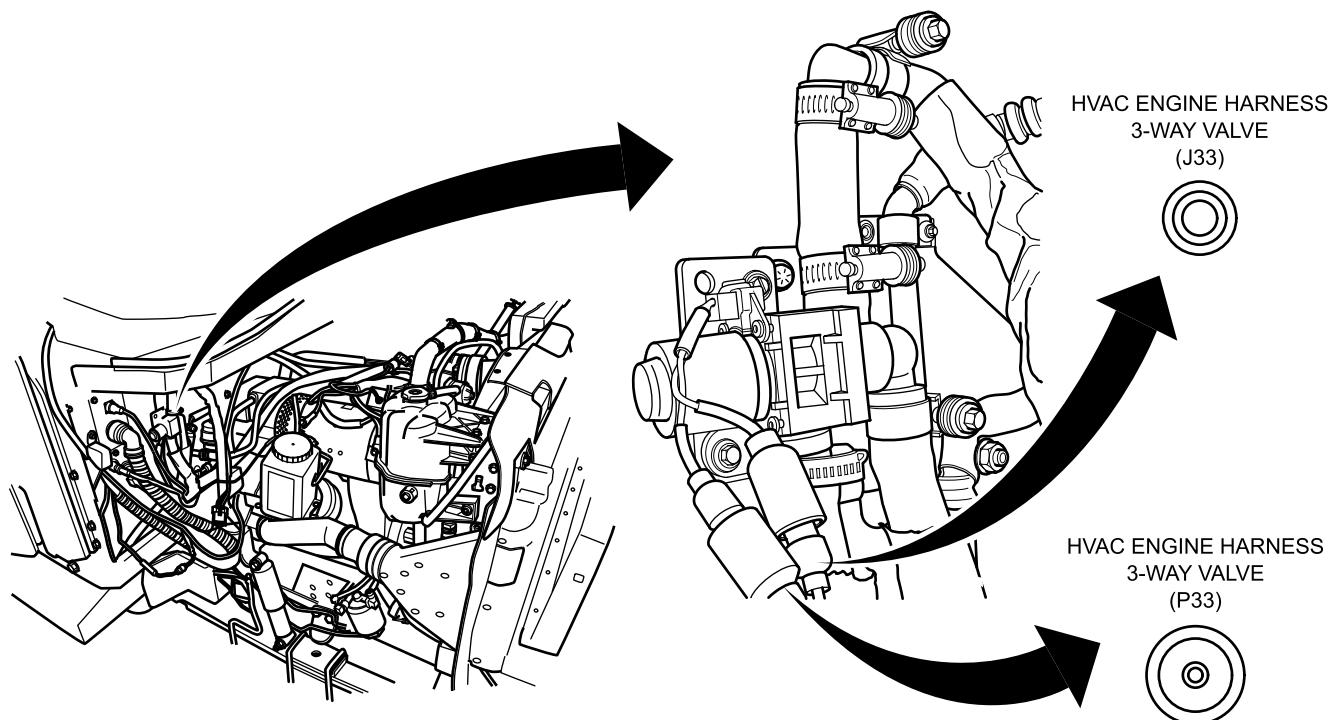
DECISION

YES Go to next step.

NO Go to Step 81.

STEP

45. Turn MAIN POWER switch ON (TM 9-2355-106-10).
 46. Turn ignition switch ON (TM-2355-106-10).
 47. Measure DC voltage between connector J33 (female terminal, engine harness side) and ground with multimeter. Refer to Figure 14.



B230604689

Figure 14. Right Side Engine Compartment at Firewall.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.

NO Go to Step 49.

STEP

48. Measure DC voltage between connector J33 (female terminal, engine harness side) and connector P33 (male terminal, engine harness side). Refer to Figure 14.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU (WP 0769).

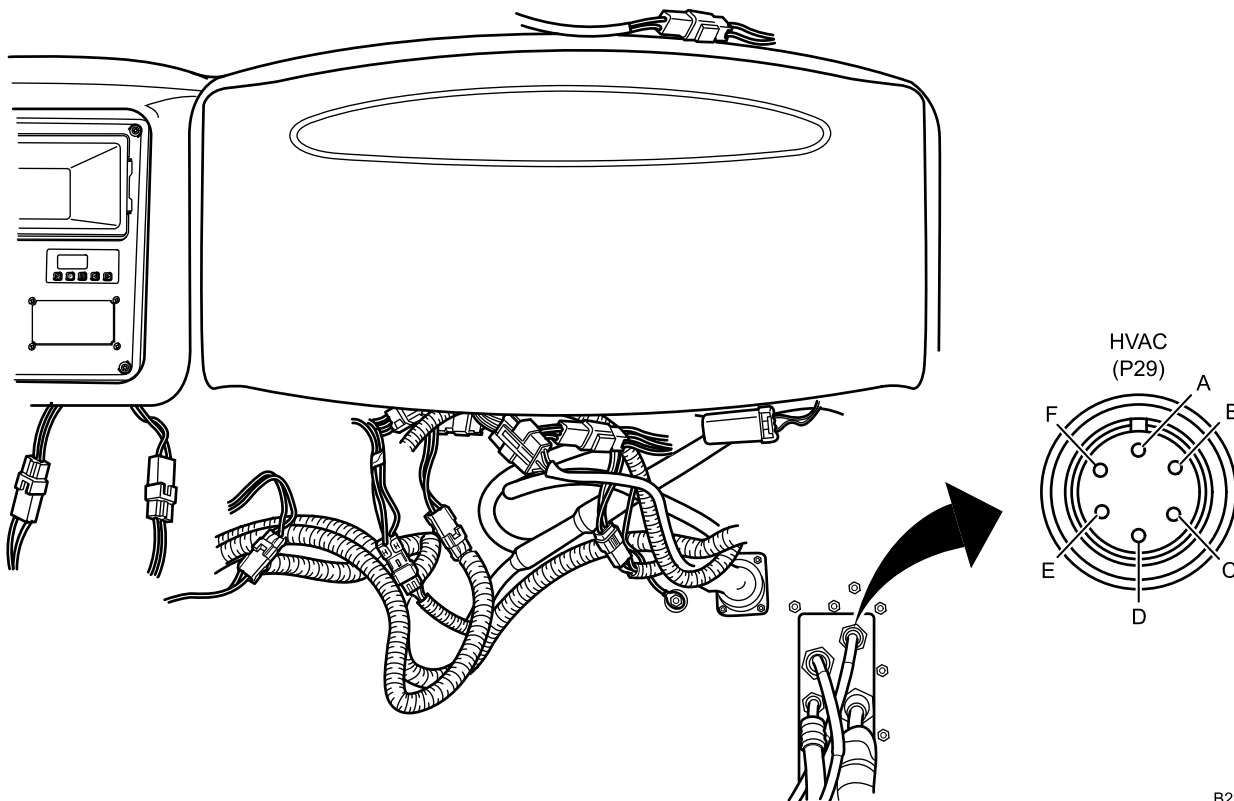
NO Go to Step 61.

STEP

49. Turn ignition switch OFF (TM 9-2355-106-10).

50. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

51. Disconnect connector P29. Refer to Figure 15.



B230604557

Figure 15. Right Front Cabin Area.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)**

52. Turn ignition switch ON (TM 9-2355-106-10).
53. Turn MAIN POWER switch ON (TM 9-2355-106-10).
54. Measure DC voltage between connector P29 terminal A and ground with multimeter. Refer to Figure 15.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

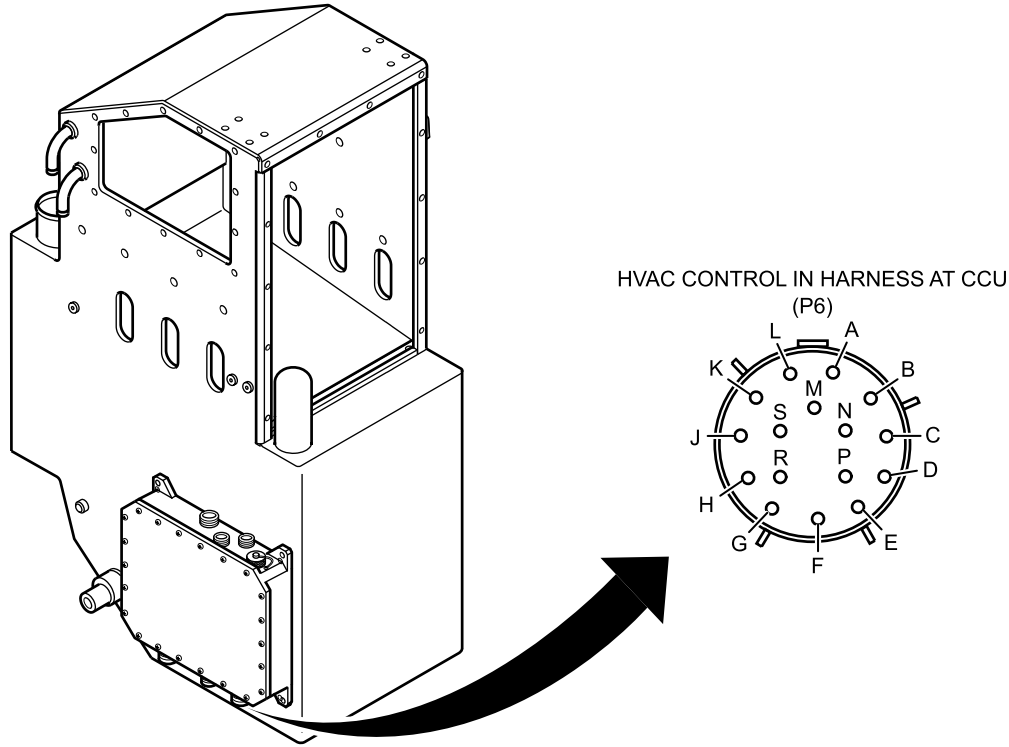
DECISION

NO Go to next step.
YES Go to Step 73.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

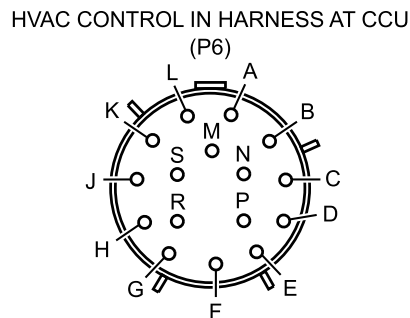
- 55. Turn ignition switch OFF (TM 9-2355-106-10).
- 56. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 57. Disconnect connector P6. Refer to Figure 16.



B230604556

Figure 16. HVAC Box Area.

- 58. Measure resistance between connector P6 terminal R (terminal O on some vehicles) and connector P29 terminal A with multimeter. Refer to Figure 17. Refer to Figure 18.



B230603934

Figure 17. Connector P6.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Got to next step.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)**

NO Go to Step 74.

STEP

59. Measure resistance between connector P6 terminal R (terminal O on some vehicles) and ground with multimeter. Refer to Figure 17.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

NO Go to Step 74.

YES Go to next step.

STEP

60. Measure resistance between connector P6 terminal R (terminal O on some vehicles) and all other terminals on connector P6 with multimeter. Refer to Figure 17.

CONDITION/INDICATION

Does multimeter read OL for each terminal?

DECISION

NO Go to Step 74.

YES Go to Step 72.

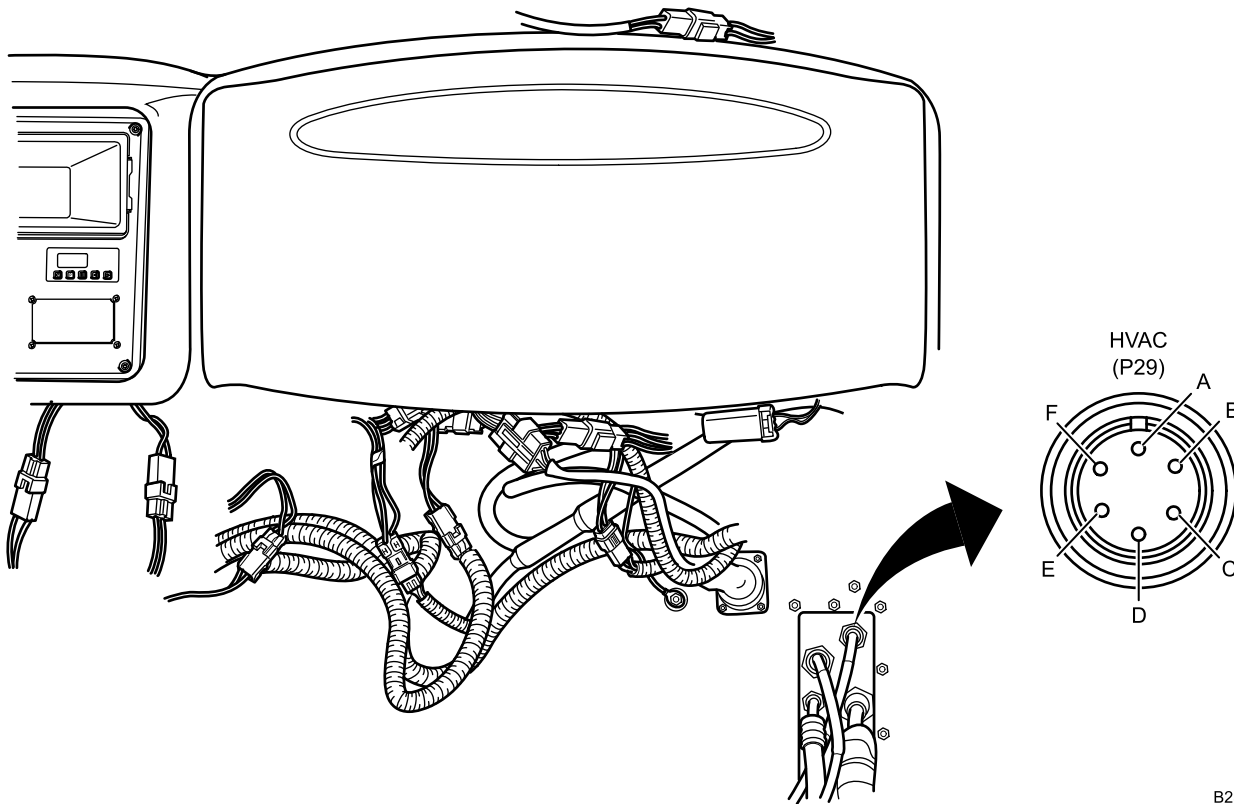
STEP

61. Turn ignition switch OFF (TM 9-2355-106-10).

62. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)

63. Disconnect connector P29. Refer to Figure 18.



B230604557

Figure 18. Right Front Cabin Area.

64. Turn MAIN POWER switch ON (TM 9-2355-106-10).
65. Turn ignition switch ON (TM 9-2355-106-10).
66. Measure DC voltage between connector P29 terminals A and F with multimeter. Refer to Figure 18.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

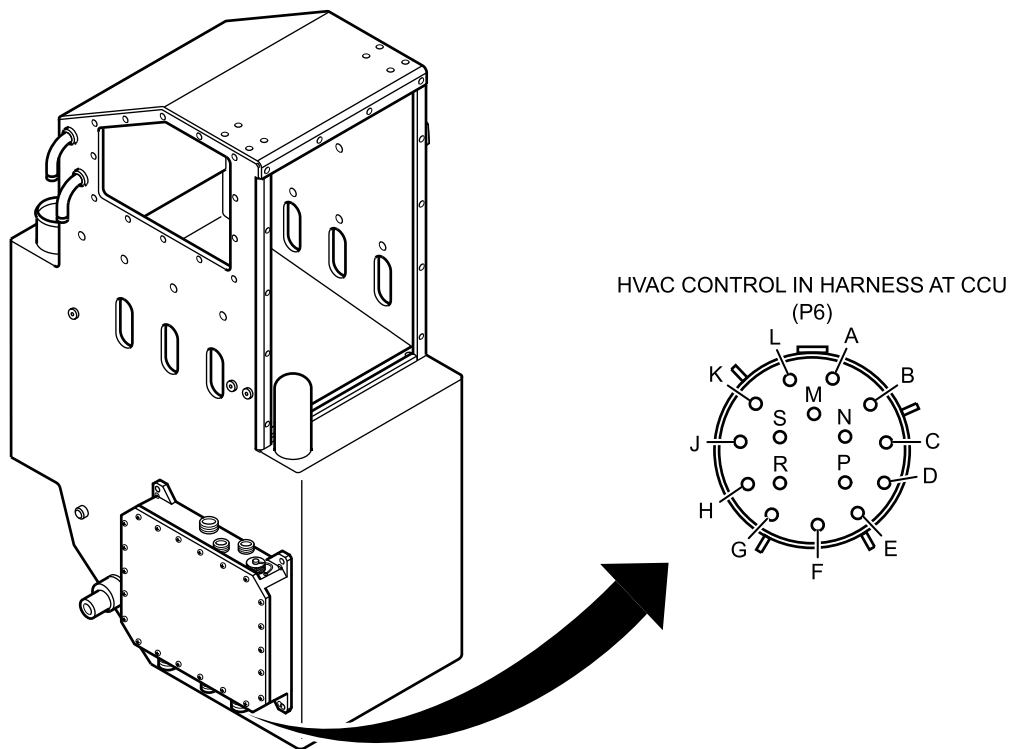
DECISION

- YES Go to Step 73.
- NO Go to next step.

STEP

67. Turn ignition switch OFF (TM 9-2355-106-10).
68. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
69. Disconnect connector P6. Refer to Figure 19.

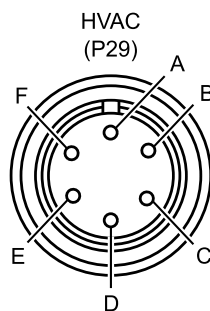
HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604556

Figure 19. HVAC Box Area.

70. Measure resistance between connector P6 terminal H and connector P29 terminal F with multimeter. Refer to Figure 19 and Figure 20.



B230603946

Figure 20. Connector P29.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU (WP 0769).

NO Go to Step 74.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 71. Hoses at bottom of 3-way valve are reversed.

ACTION

Install hoses correctly. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve Coolant Outlet Hose Removal and Installation (WP 0726), and Heating Ventilating and Air Conditioning (HVAC) Fuel-Fired Heater Coolant Inlet Hose Removal and Installation (WP 0731).

END OF TEST**MALFUNCTION**

- 72. CCU is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 73. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Engine Wiring Harness Removal and Installation (WP 0774). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 74. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control In Wiring Harness Removal and Installation (WP 0775). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 75. Engine coolant level is low.

ACTION

Fill engine coolant to proper level. Refer to Cooling System Drain and Fill Procedure (WP 0277). Return vehicle to service.

END OF TEST

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 76. Hose is faulty.

ACTION

Replace hose. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve Coolant Outlet Hose Removal and Installation (WP 0726). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 77. Hose is faulty.

ACTION

Replace hose. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve Coolant Inlet Hose Removal and Installation (WP 0730). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 78. Hose is faulty.

ACTION

Replace hose. Refer to Heating Ventilating and Air Conditioning (HVAC) Fuel-Fired Heater Coolant Inlet Hose Removal and Installation (WP 0731). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 79. Hose is faulty.

ACTION

Replace hose. Refer to Heating Ventilating and Air Conditioning (HVAC) Fuel-Fired Heater Coolant Outlet Hose Removal and Installation (WP 0726). Return vehicle to service.

END OF TEST

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) 3-WAY VALVE TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 80. Hose is faulty.

ACTION

Replace hose. Refer to Heating Ventilating and Air Conditioning (HVAC) Cabin Heater Hose Removal and Installation (WP 0728). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 81. 3-way valve is faulty.

ACTION

Replace 3-way valve. Refer to Heating Ventilating and Air Conditioning (HVAC) 3-Way Valve and Bracket Removal and Installation (WP 0727). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
**HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING
PROCEDURE**

INITIAL SETUP:**Test Equipment**

Harness, relay breakout (WP 0795, Item 51)

WP 0774

WP 0775

WP 0782

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Terminal Test Kit (WP 0795, Item 122)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0202

WP 0333

WP 0335

WP 0353

WP 0769

Drawings Required

Schematic (WP 0789, Figure 75)

Schematic (WP 0789, Figure 77)

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

TROUBLESHOOTING PROCEDURE

STEP

WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

1. Turn HVAC/LSS operator panel mode switch to COOL position (TM 9-2355-106-10).
2. Turn MAIN POWER switch ON (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).

CONDITION/INDICATION

Does engine speed increase to 1,300 rpm (\pm 800 rpm) within 10 seconds after turning LSS switch ON?

DECISION

YES Go to next step.
NO Go to Step 6.

STEP

5. Apply service brakes (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

CONDITION/INDICATION

Does engine speed immediately decrease?

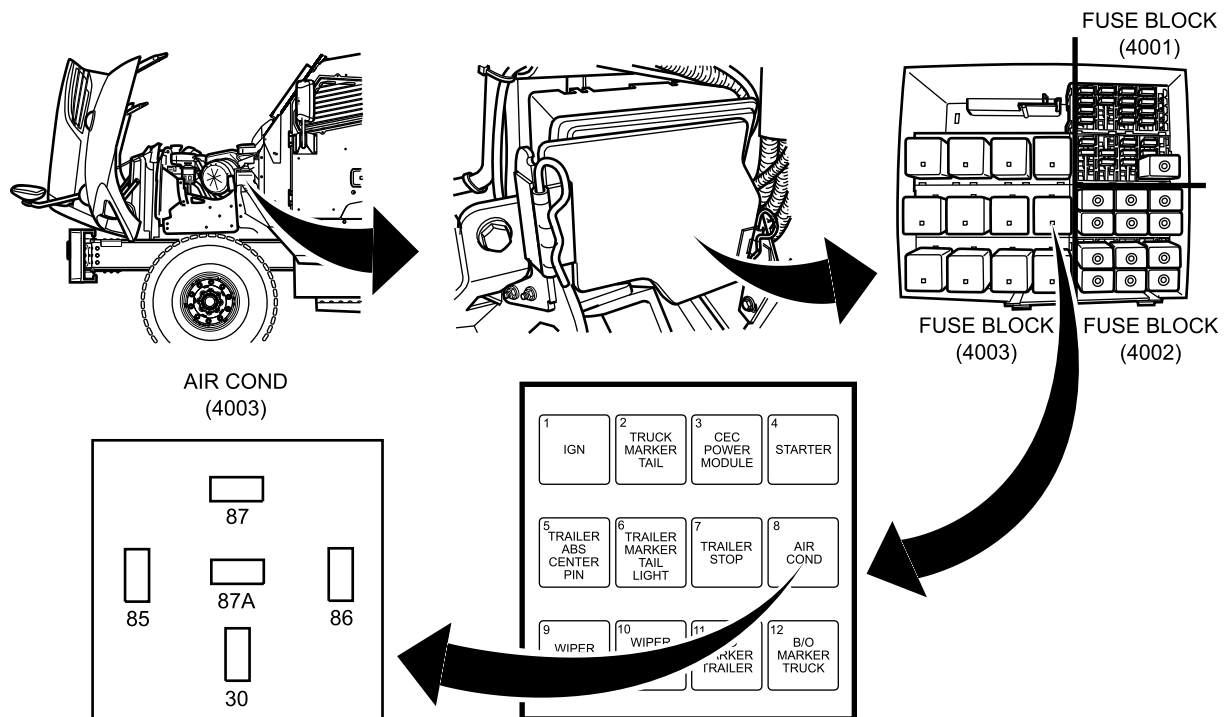
DECISION

YES Return to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202).

NO Go to Step 39.

STEP

6. Turn ignition switch OFF (TM 9-2355-106-10).
7. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
8. Remove AIR COND relay from underhood Power Distribution Center (PDC). Refer to Power Distribution Center (PDC) Fuse and Relay Removal and Installation (WP 0333). Refer to Figure 1.

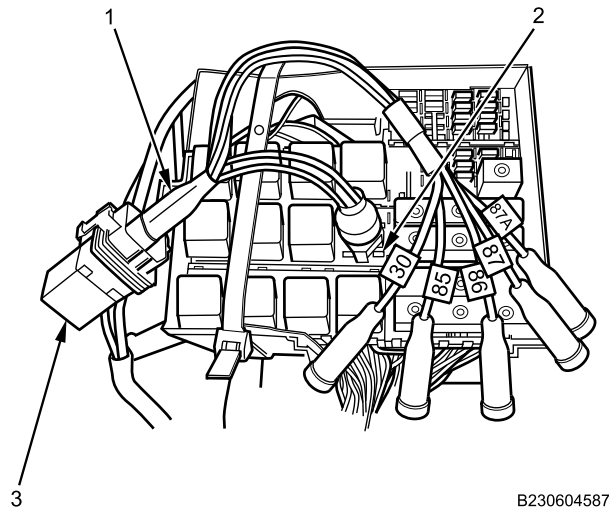


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Figure 1. Right Side Instrument Panel Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

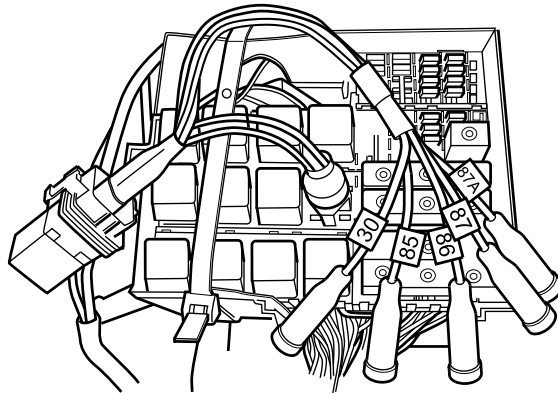
9. Install relay breakout harness (Figure 2, Item 1) on AIR COND relay socket (Figure 2, Item 2), and install AIR COND relay (Figure 2, Item 3) on relay breakout harness.



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Figure 2. AIR COND Relay Breakout Harness.

10. Turn MAIN POWER switch ON (TM 9-2355-106-10).
 11. Turn ignition switch ON (TM 9-2355-106-10).
 12. Measure DC voltage between breakout harness terminal 85 and ground with multimeter. Refer to Figure 3.



B230604586

Figure 3. AIR COND Relay Breakout Harness.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
 NO Go to Step 21.

STEP

13. Start engine (TM 9-2355-106-10).
 14. Connect a jumper wire between relay breakout harness terminals 30 and 87. Refer to Figure 3.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING
PROCEDURE - (CONTINUED)****CONDITION/INDICATION**

Does engine speed increase to 1,300 rpm (\pm 800 rpm) within 10 seconds after connecting jumper wire?

DECISION

YES Go to Step 64.
NO Go to next step.

STEP

15. Remove jumper wire from relay breakout harness.
16. Measure DC voltage between relay breakout harness terminal 30 and ground with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read more than 8.5V?

DECISION

YES Go to Step 62.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

- 17. Turn ignition switch OFF (TM 9-2355-106-10).
- 18. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 19. Disconnect connector 4004. Refer to Figure 4.

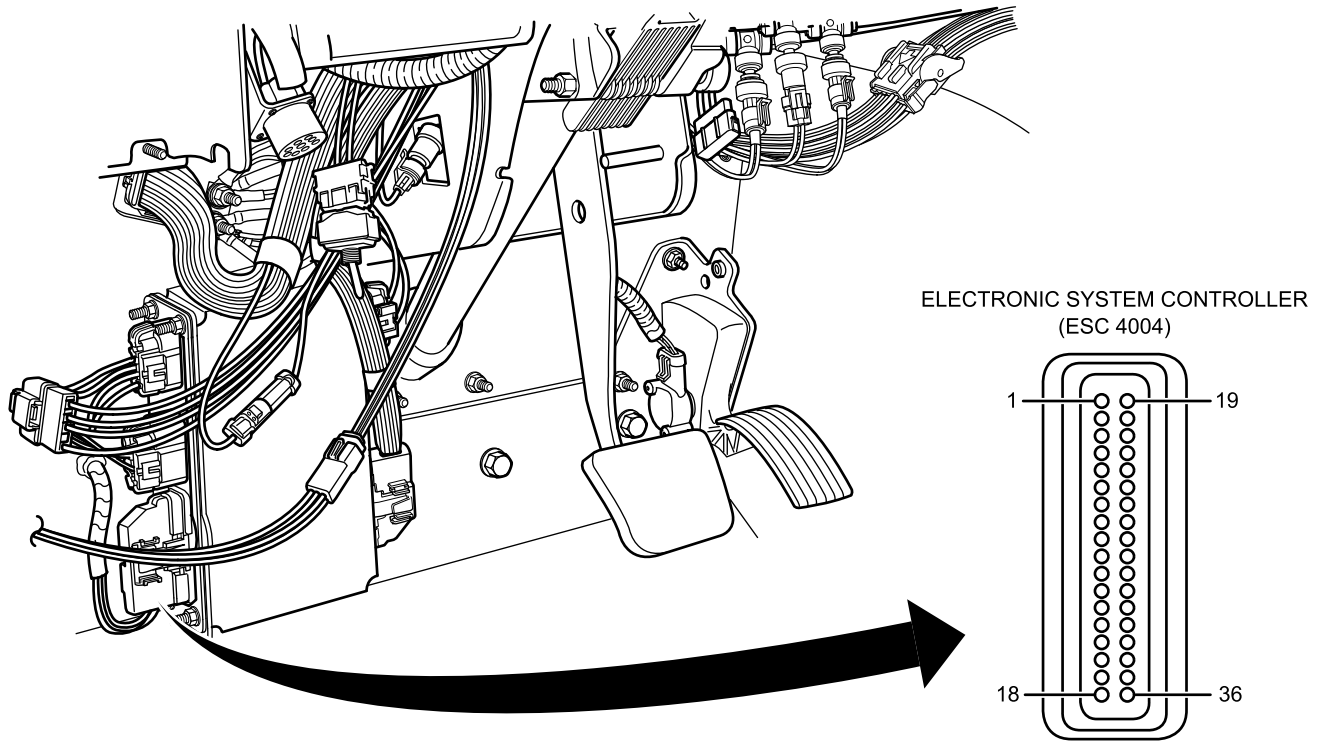
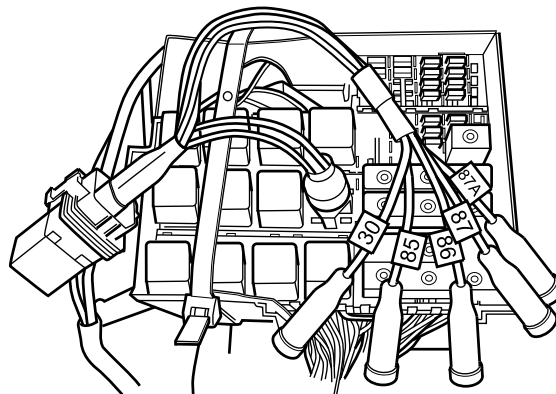


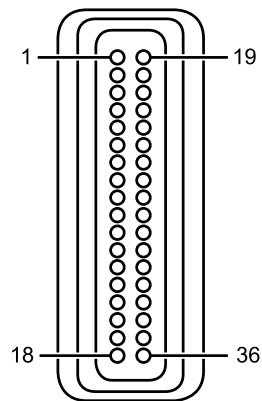
Figure 4. Left Front Cabin Area.

- 20. Measure resistance between relay breakout harness terminal 30 and connector 4004 terminal 3 with multimeter. Refer to Figure 5. Refer to Figure 6.



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Figure 5. AIR COND Relay Breakout Harness.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING
PROCEDURE - (CONTINUED)**ELECTRONIC SYSTEM CONTROLLER
(ESC 4004)

B230603830

Figure 6. Connector 4004.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISIONYES Go to Step 60.NO Go to Step 62.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

21. Turn ignition switch OFF (TM 9-2355-106-10).
22. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
23. Disconnect connector 4019. Refer to Figure 7.

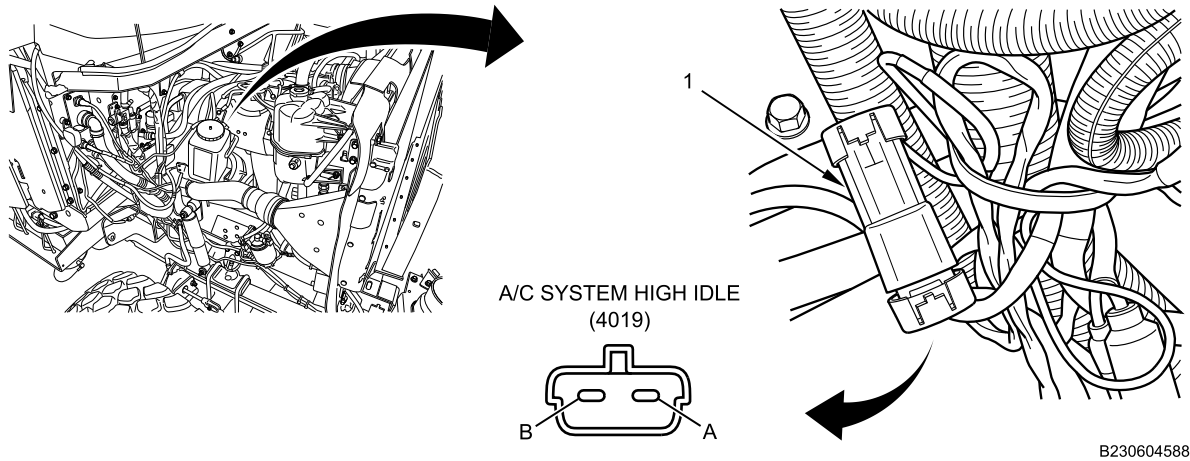


Figure 7. Right Side Engine Compartment Area.

24. Turn ignition switch ON (TM 9-2355-106-10).
25. Turn MAIN POWER switch ON (TM 9-2355-106-10).
26. Measure DC voltage between connector 4019 terminal A and ground with multimeter. Refer to Figure 7.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

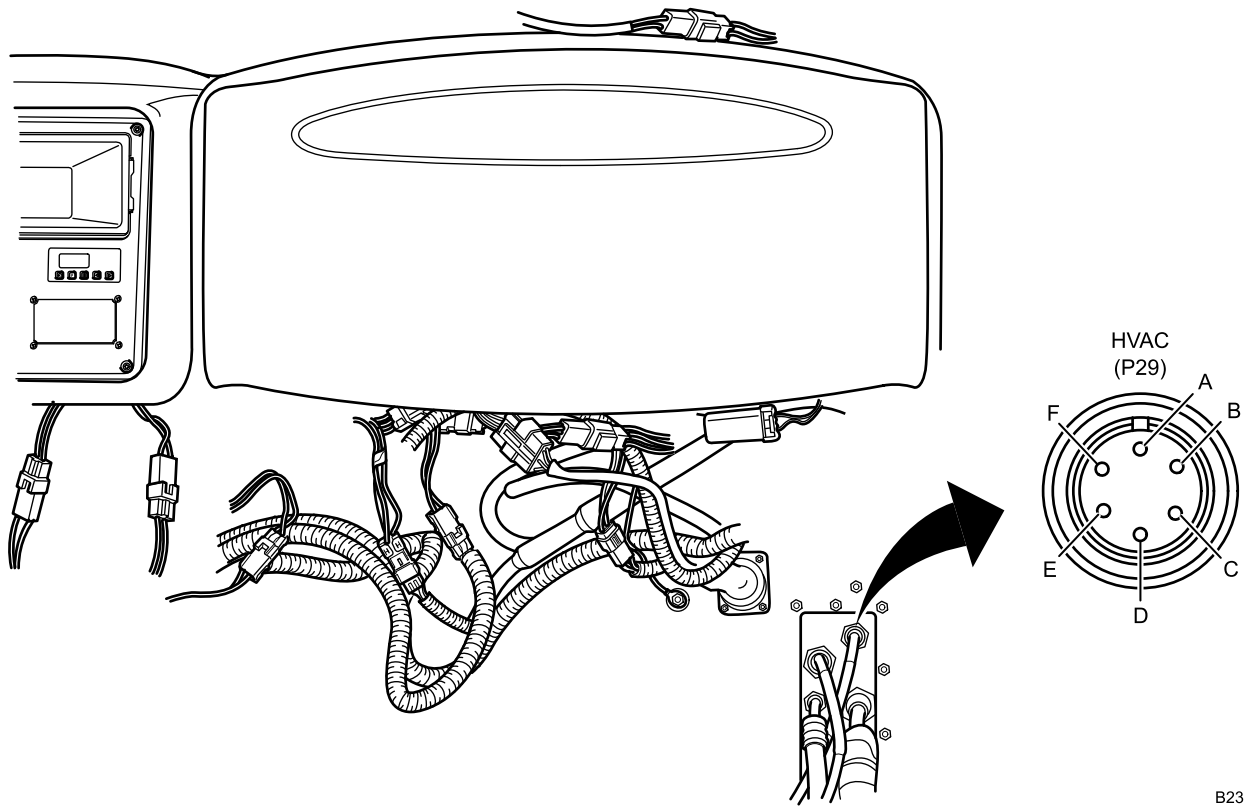
DECISION

YES Go to Step 62.
NO Go to next step.

STEP

27. Turn ignition switch OFF (TM 9-2355-106-10).
28. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
29. Disconnect connector P29. Refer to Figure 8.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)



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Figure 8. Right Front Cabin Area.

30. Turn ignition switch ON (TM 9-2355-106-10).
31. Turn MAIN POWER switch ON (TM 9-2355-106-10).
32. Measure DC voltage between connector P29 terminal C and ground with multimeter. Refer to Figure 8.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to Step 61.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

33. Turn ignition switch OFF (TM 9-2355-106-10).
34. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
35. Disconnect connector P6. Refer to Figure 9.

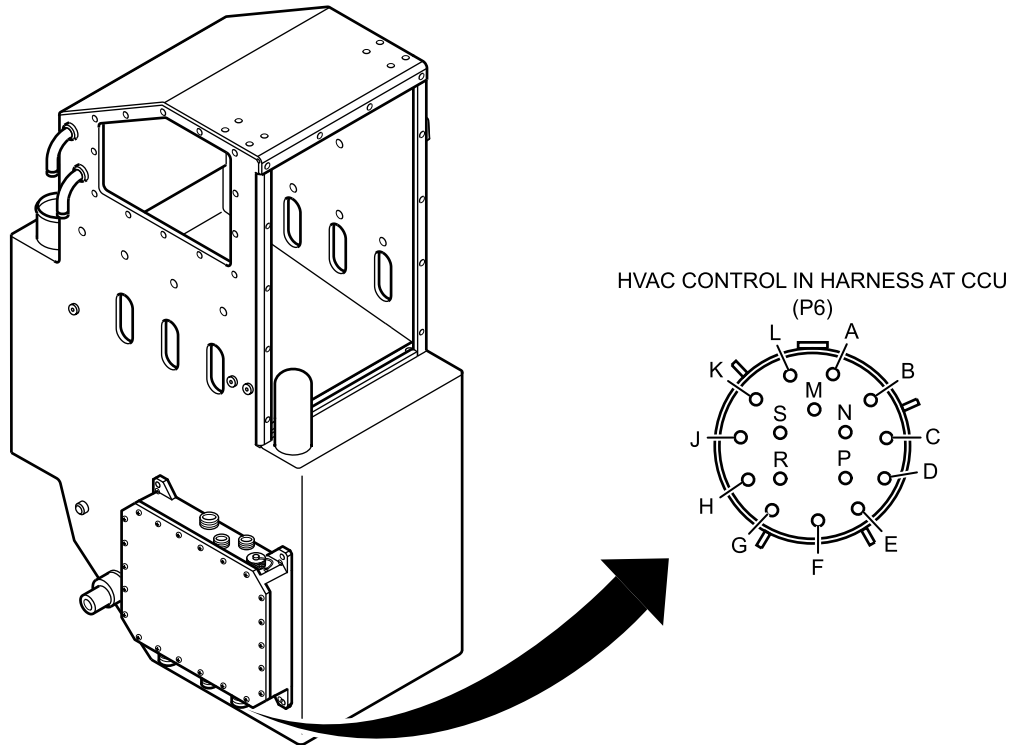


Figure 9. HVAC Box Area.

B230604556

36. Measure resistance between connector P6 terminal A and connector P29 terminal C with multimeter. Refer to Figure 9 and Figure 8.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
 NO Go to Step 63.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

37. Measure resistance between connector P6 terminal A and ground with multimeter. Refer to Figure 9.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

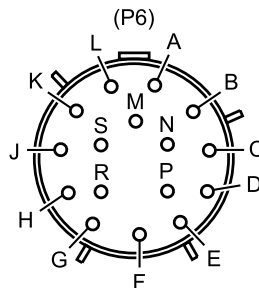
YES Go to next step.

NO Go to Step 63.

STEP

38. Measure resistance between connector P6 terminal A and all other terminals on connector P6 with multimeter. Refer to Figure 10.

HVAC CONTROL IN HARNESS AT CCU



B230603934

Figure 10. Connector P6.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

YES Go to Step 59.

NO Go to Step 63.

STEP

39. Turn LSS switch OFF (TM 9-2355-106-10).

CONDITION/INDICATION

Does engine speed decrease?

DECISION

YES Go to Step 52.

NO Go to next step.

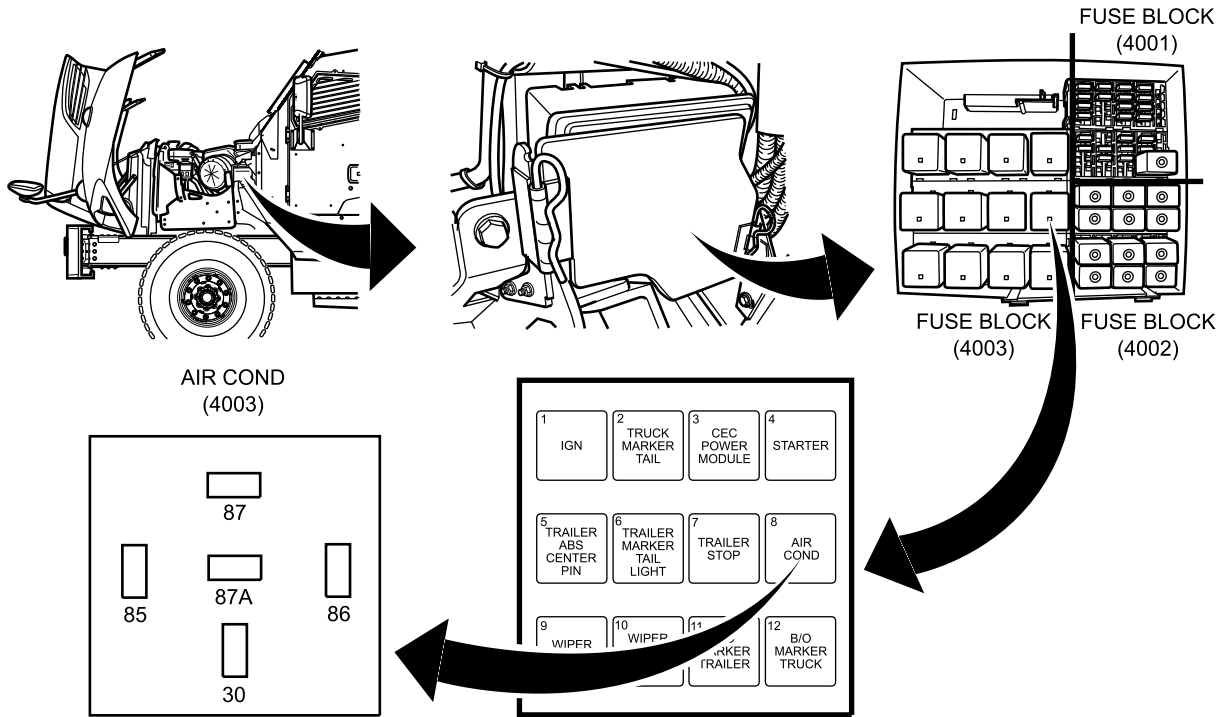
HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

NOTE

Keep engine running during next step.

- 40. Remove AIR COND relay from PDC. Refer to Power Distribution Center (PDC) Fuse and Relay Removal and Installation (WP 0333). Refer to Figure 11.



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Figure 11. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does engine idle speed decrease?

DECISION

YES Go to next step.
 NO Go to Step 47.

STEP

- 41. Turn ignition switch OFF (TM 9-2355-106-10).
- 42. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 43. Install relay breakout harness (Figure 12, Item 1) on AIR COND relay socket (Figure 12, Item 2) , and install AIR COND relay (Figure 12, Item 3) on relay breakout harness.

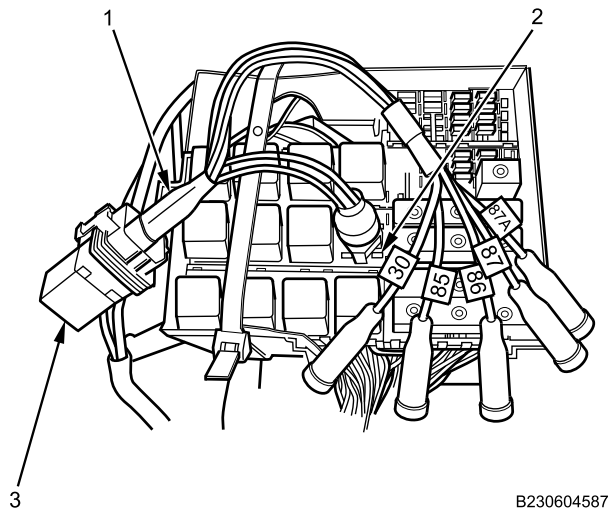
**HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING
PROCEDURE - (CONTINUED)**

Figure 12. AIR COND Relay Breakout Harness Installation.

44. Turn ignition switch ON (TM 9-2355-106-10).
45. Turn MAIN POWER switch ON (TM 9-2355-106-10).
46. Measure DC voltage between relay breakout harness terminal 85 and ground with multimeter. Refer to Figure 12.

CONDITION/INDICATION

Does multimeter read 0V?

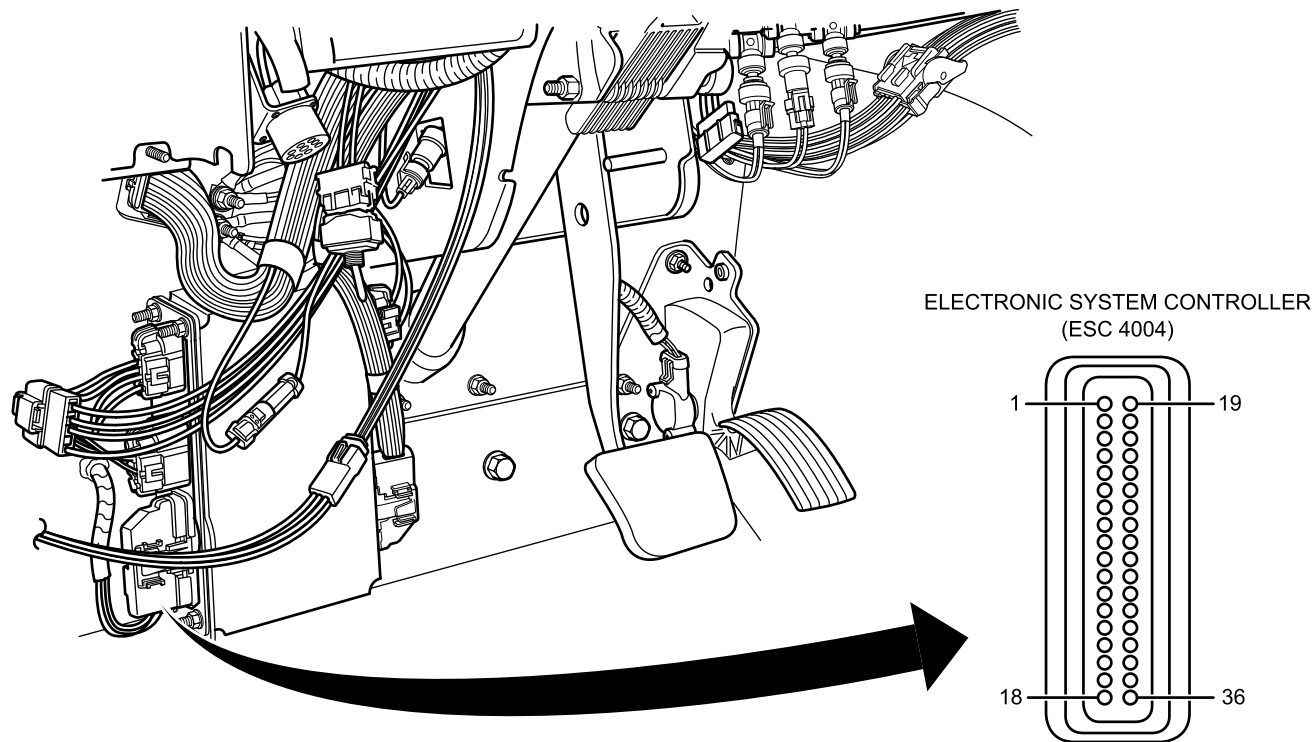
DECISION

- YES Go to Step 64.
NO Start engine (TM 9-2355-106-10) and go to Step 52.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

- 47. Turn ignition switch OFF (TM 9-2355-106-10).
- 48. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 49. Disconnect connector 4004. Refer to Figure 13.



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Figure 13. Left Front Cabin Area.

- 50. Measure resistance between connector 4004 terminal 3 and ground with multimeter. Refer to Figure 13.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

- YES Go to next step.
- NO Go to Step 62.

STEP

- 51. Measure resistance between connector 4004 terminal 3 and all other terminals on connector 4004. Refer to Figure 13.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

- YES Go to Step 60.
- NO Go to Step 61.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

52. Ensure LSS switch is ON (TM 9-2355-106-10).
53. Release parking brake (TM 9-2355-106-10).
54. Disconnect connector 4019. Refer to Figure 14.

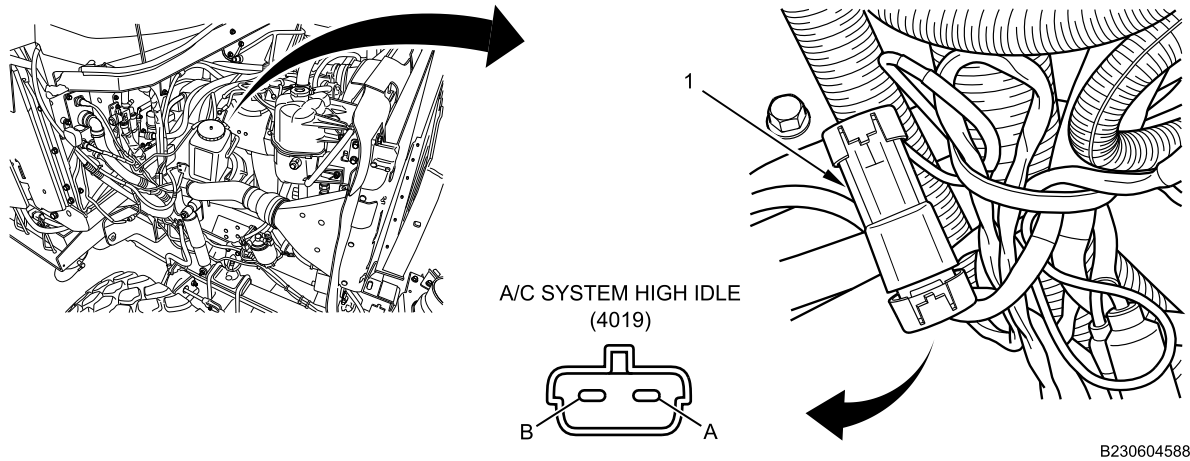


Figure 14. Right Side Engine Compartment Area.

CONDITION/INDICATION

Does engine speed decrease?

DECISION

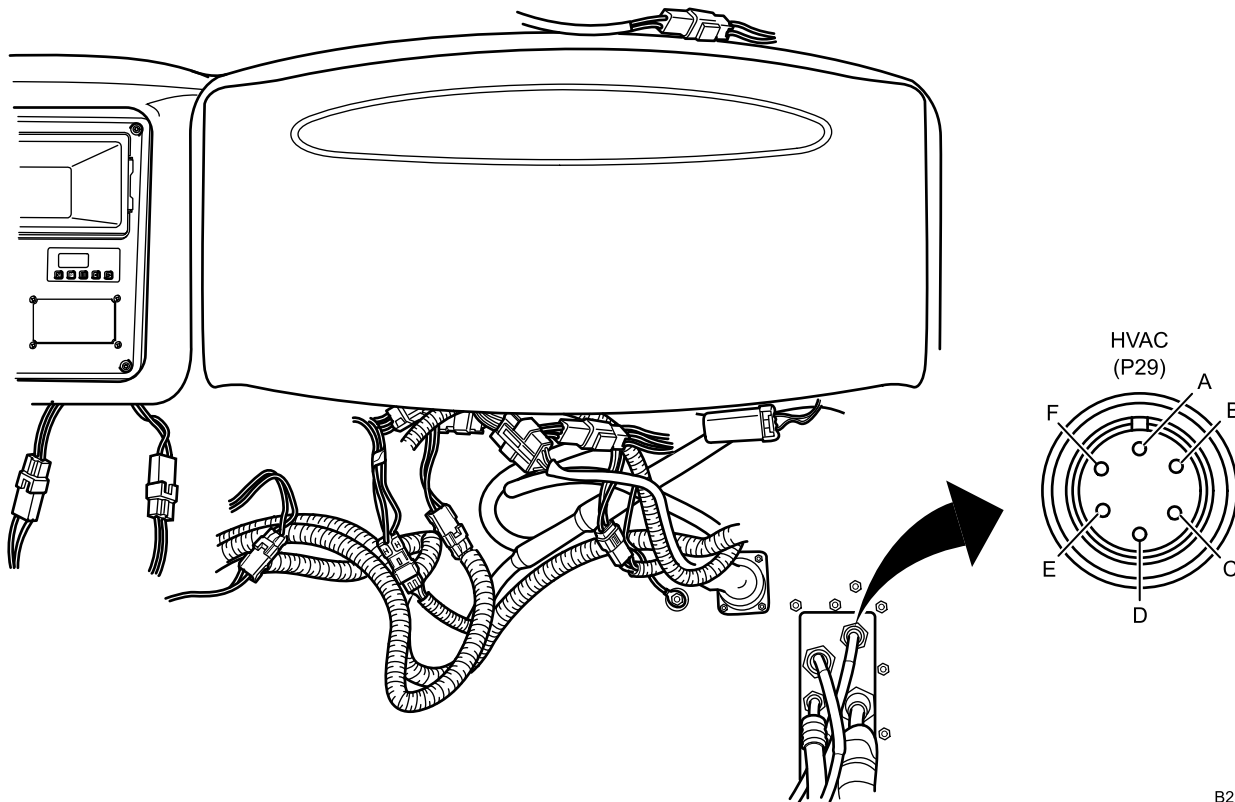
YES Go to next step.
NO Go to Step 62.

STEP

55. Connect connector 4019. Refer to Figure 14.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)

56. Disconnect connector P29. Refer to Figure 15.



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Figure 15. Right Front Cabin Area.

CONDITION/INDICATION

Does engine speed decrease?

DECISION

YES Go to next step.

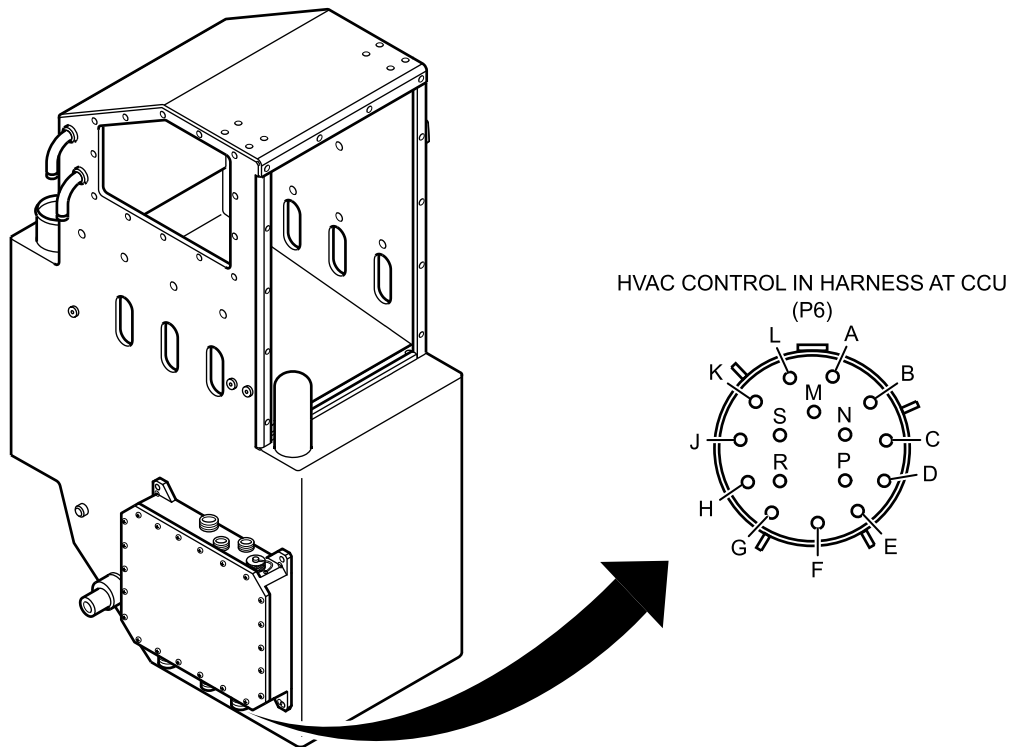
NO Go to Step 61.

STEP

57. Connect connector P29. Refer to Figure 15.

58. Disconnect connector P6. Refer to Figure 16.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604556

Figure 16. HVAC Box Area.

CONDITION/INDICATION

Does engine speed decrease?

DECISION

YES Go to Step 60.

NO Go to Step 63.

MALFUNCTION

- 59. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST

MALFUNCTION

- 60. Electronic System Controller (ESC) is faulty.

ACTION

Replace ESC. Refer to Electronic System Controller (ESC) Removal and Installation (WP 0353). Return vehicle to service.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) HIGH IDLE CIRCUIT TROUBLESHOOTING
PROCEDURE - (CONTINUED)****END OF TEST****MALFUNCTION**

- 61. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Engine Wiring Harness Removal and Installation (WP 0774). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 62. Harness is faulty.

ACTION

Replace harness. Refer to Power Distribution Center (PDC) Harness Removal and Installation (WP 0335). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 63. Harness is faulty.

ACTION

Replace Harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control In Wiring Harness Removal and Installation (WP 0775). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 64. Relay is faulty.

ACTION

Replace AIR COND relay. Refer to Power Distribution Center (PDC) Fuse and Relay Removal and Installation (WP 0333). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Refrigeration Ordnance Service Tool Kit
(WP 0795, Item 85)

WP 0768

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine shut off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
HVAC/LSS upper panel removed (WP 0767)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0202
WP 0769
WP 0767
WP 0780

Drawings Required

Schematic (WP 0789, Figure 75)

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

TROUBLESHOOTING PROCEDURE**WARNING**

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

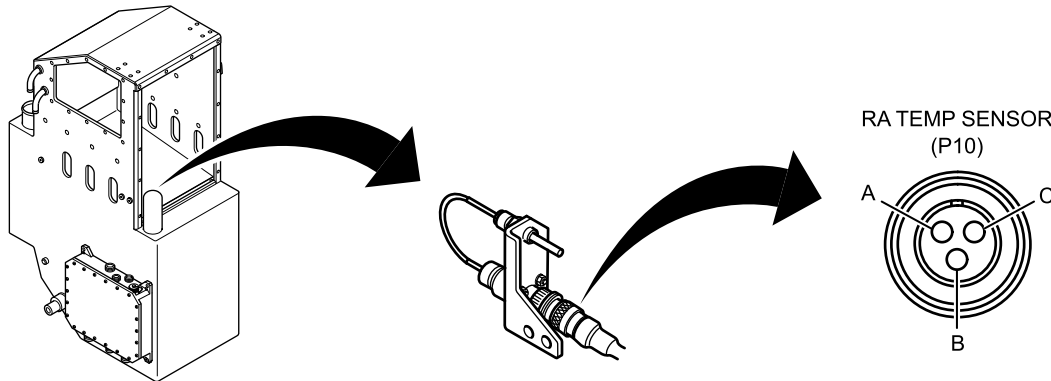
NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

1. Disconnect connector P10. Refer to Figure 1.



B230604601

Figure 1. HVAC Box Interior Area.

2. Turn mode control knob on HVAC/LSS control panel to COOL position (TM 9-2355-106-10).
3. Turn temperature control knob on HVAC/LSS control panel to coldest position (TM 9-2355-106-10).
4. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
5. Turn MAIN POWER switch ON (TM 9-2355-106-10).
6. Turn ignition switch ON (TM 9-2355-106-10).
7. Measure DC voltage between connector P10 terminal A and ground with multimeter. Refer to Figure 1.

CONDITION/INDICATION

Does multimeter read more than 4.5V?

DECISION

YES Go to next step.
NO Go to Step 14.

STEP

8. Measure DC voltage between connector P10 terminals A and B with multimeter. Refer to Figure 1.

CONDITION/INDICATION

Does multimeter read more than 4.5V?

DECISION

YES Go to next step.
NO Go to Step 20.

STEP

9. Measure and note ambient air temperature inside vehicle.
10. Turn ignition switch OFF (TM 9-2355-106-10).
11. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
12. Measure resistance between connector J10 terminals A and B with multimeter. Refer to Figure 2.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)

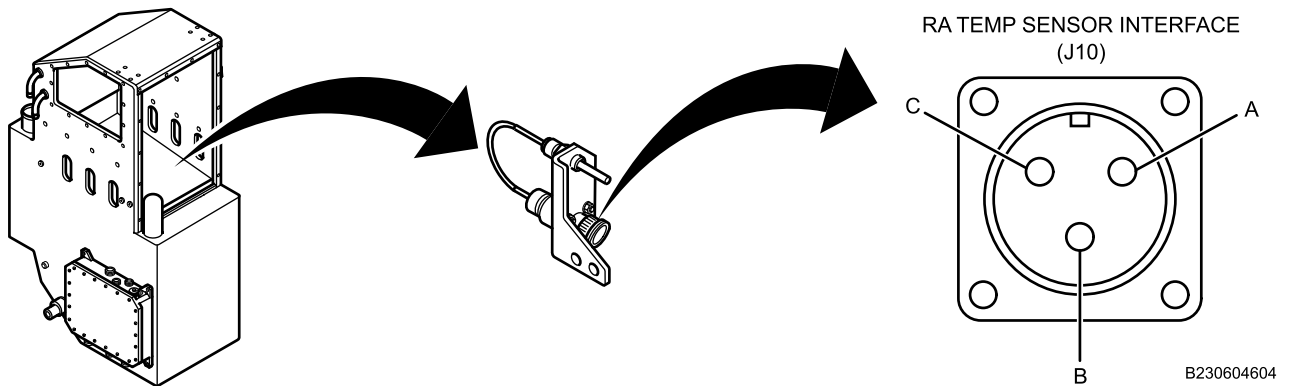


Figure 2. HVAC Box Interior Area.

13. Compare multimeter reading and ambient air temperature with Table 1, Temperature vs Resistance.

Table 1. Temperature vs Resistance.

Temperature	Resistance
50°F (10°C)	19.9k ohms
59°F (15°C)	15.71k ohms
68°F (20°C)	12.49k ohms
77°F (25°C)	10k ohms
86°F (30°C)	8.05k ohms
95°F (35°C)	6.53k ohms
104°F (40°C)	5.32k ohms
113°F (45°C)	4.37k ohms
122°F (50°C)	3.6k ohms
131°F (55°C)	2.98k ohms

CONDITION/INDICATION

Does ambient air temperature agree with multimeter reading in Table 1, Temperature vs Resistance?

DECISION

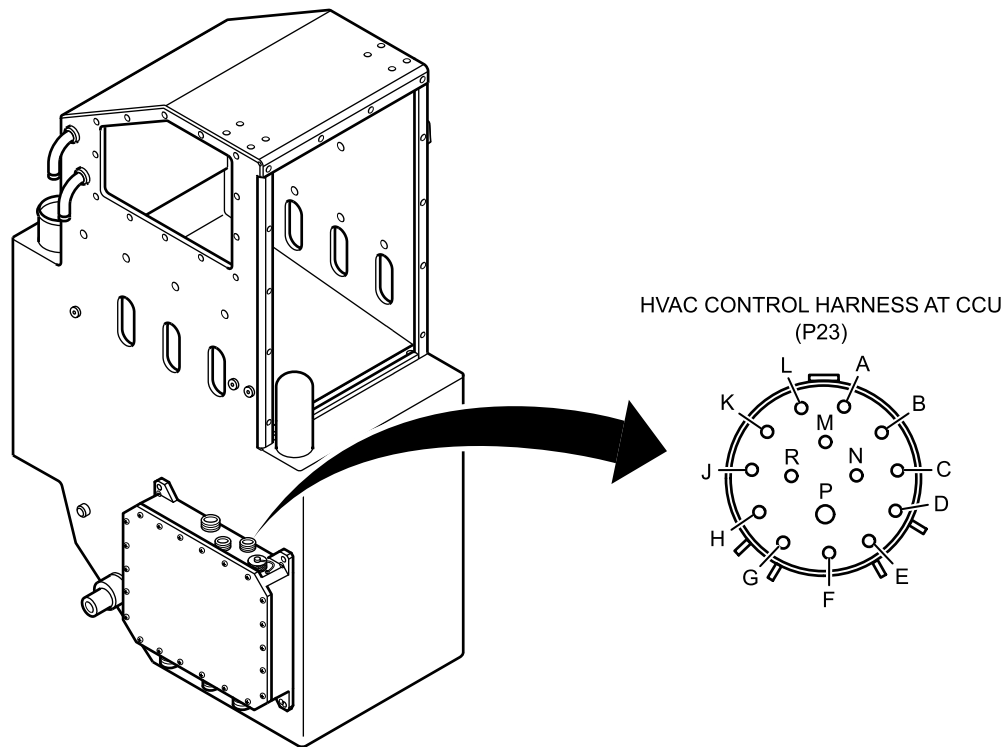
YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU (WP 0769).

NO Go to Step 25.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

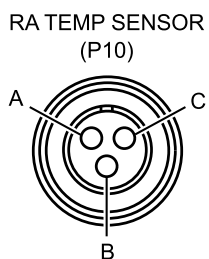
14. Turn ignition switch OFF (TM 9-2355-106-10).
15. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
16. Disconnect connector P23. Refer to Figure 3.



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Figure 3. HVAC Box Exterior Area.

17. Measure resistance between connector P23 terminal H and connector P10 terminal A with multimeter. Refer to Figure 3 and Figure 4.



B230603941

Figure 4. Connector P10.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

- YES Go to next step.
- NO Go to Step 26.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)**STEP**

18. Measure resistance between connector P23 terminal H and ground with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to next step.

NO Go to Step 26.

STEP

19. Measure resistance between connector P23 terminal H and all other terminals on connector P23 with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

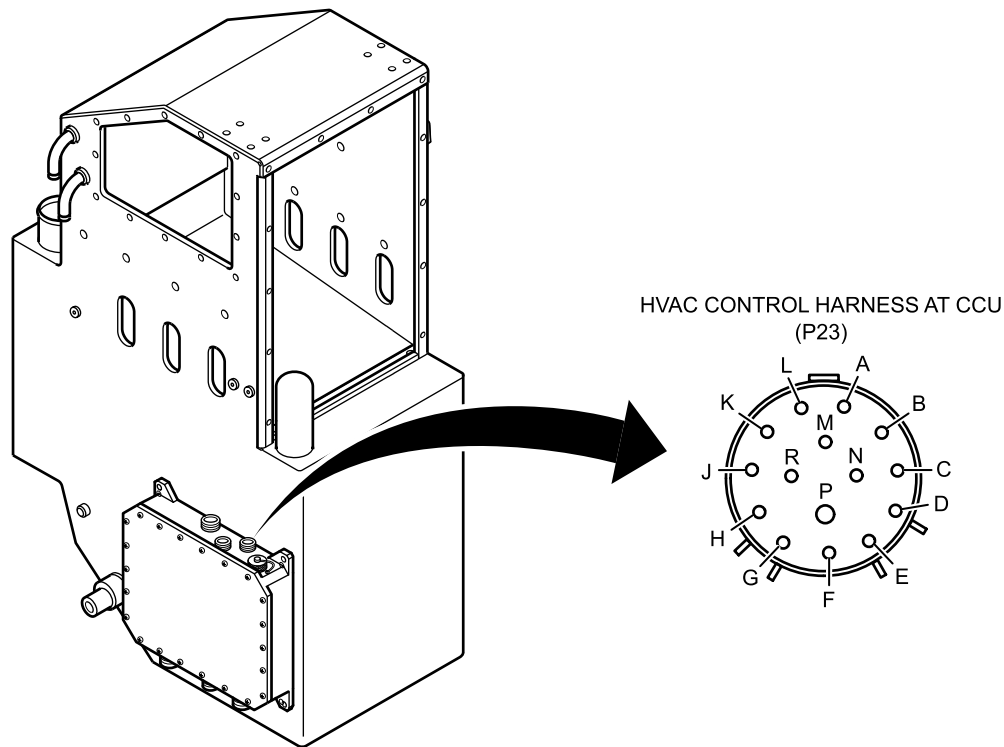
YES Go to Step 24.

NO Go to Step 26.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

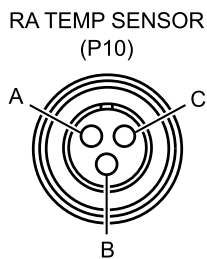
- 20. Turn ignition switch OFF (TM 9-2355-106-10).
- 21. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 22. Disconnect connector P23. Refer to Figure 5.



B230604602

Figure 5. HVAC Box Exterior Area.

- 23. Measure resistance between connector P23 terminal G and connector P10 terminal B with multimeter. Refer to Figure 5 and Figure 6.



B230603941

Figure 6. Connector P10.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

- YES Go to Step 24.
- NO Go to Step 26.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) RECYCLED AIR (RA) TEMPERATURE SENSOR TROUBLESHOOTING PROCEDURE - (CONTINUED)**MALFUNCTION**

- 24. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 25. RA temperature sensor is faulty.

ACTION

Replace sensor. Refer to Heating Ventilating and Air Conditioning (HVAC) Recirculated Air (RA) Temperature Sensor Removal and Installation (WP 0768). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 26. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Control Wiring Harness Removal and Installation (WP 0780). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
HEATING VENTILATING AND AIR CONDITIONING (HVAC) FREEZE SWITCH TROUBLESHOOTING PROCEDURE

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Terminal Test Kit (WP 0795, Item 122)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0202
WP 0759
WP 0769
WP 0767
WP 0780
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
HVAC/LSS upper panel removed (WP 0767)
Evaporator temperature above 42.8°F ($\pm 3.6^\circ\text{F}$) (6°C [$\pm 2^\circ\text{C}$]).

Drawings Required

Schematic (WP 0789, Figure 75)

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

TROUBLESHOOTING PROCEDURE**STEP****WARNING**

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

CAUTION

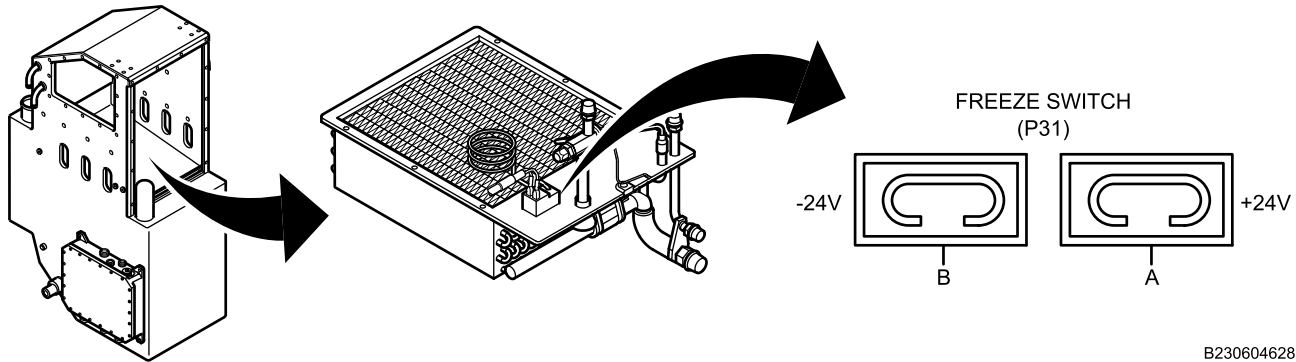
Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) FREEZE SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

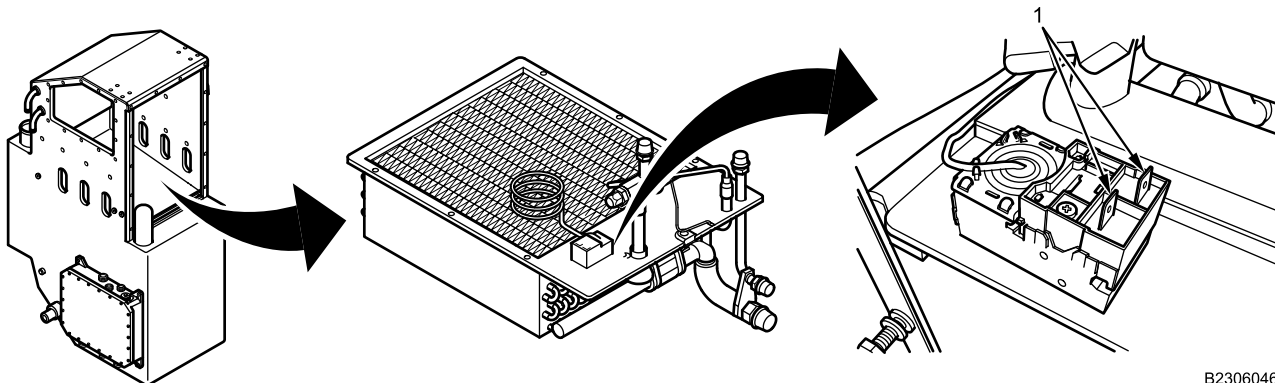
1. Disconnect connector P31 terminals A and B. Refer to Figure 1.



B230604628

Figure 1. HVAC Box Interior Area.

2. Measure resistance between freeze switch terminals (Figure 2, Item 1) with multimeter.



B230604629

Figure 2. HVAC Freeze Switch Terminals Location.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 19.

STEP

3. Turn mode control knob on HVAC/LSS control panel to COOL position (TM 9-2355-106-10).
4. Turn temperature control knob on HVAC/LSS control panel to coldest position (TM 9-2355-106-10).
5. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
6. Turn MAIN POWER switch ON (TM 9-2355-106-10).
7. Turn ignition switch ON (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) FREEZE SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

NOTE

Connector P31 terminals A and B are not marked and have no identifying characteristics. The RED multimeter lead may be connected to either terminal during the next test. Multimeter may read a negative value when taking voltage measurement. Ignore the polarity reading for this test.

8. Measure DC voltage between connector P31 terminals A and B with multimeter. Refer to Figure 1.

CONDITION/INDICATION

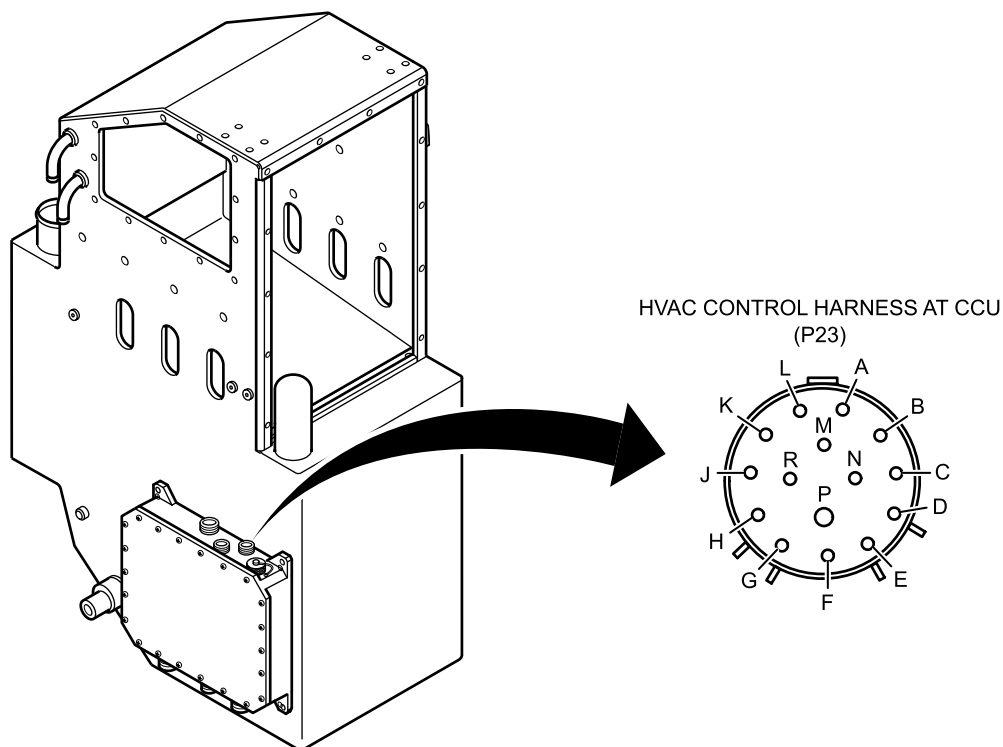
Does multimeter read more than 22.5V?

DECISION

YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769).
NO Go to next step.

STEP

9. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
10. Ignition switch OFF (TM 9-2355-106-10).
11. Disconnect connector P23. Refer to Figure 3.



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Figure 3. HVAC Box Exterior Area.

12. Connect jumper wire between connector P23 terminals A and B. Refer to Figure 3.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) FREEZE SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

13. Measure resistance between connector P31 terminals A and B with multimeter. Refer to Figure 4.

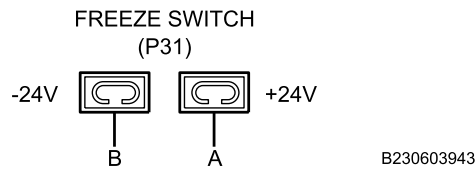


Figure 4. Connector P31.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.

NO Go to Step 18.

STEP

14. Measure resistance between connector P31 terminal A and ground with multimeter. Refer to Figure 4.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to next step.

NO Go to Step 18.

STEP

15. Remove jumper wire from connector P23. Refer to Figure 3.

16. Measure resistance between connector P23 terminal A and all other terminals on connector P23 with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read OL for each terminal?

DECISION

YES Go to Step 17.

NO Go to Step 18.

MALFUNCTION

- 17. Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST

MALFUNCTION

- 18. Harness is faulty.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) FREEZE SWITCH TROUBLESHOOTING
PROCEDURE - (CONTINUED)****ACTION**

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Control Wiring Harness Removal and Installation (WP 0780). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 19. Freeze switch is faulty.

ACTION

Replace freeze switch. Refer to Heating Ventilating and Air Conditioning (HVAC) Main Evaporator Assembly Removal and Installation (WP 0759). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE**HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH
TROUBLESHOOTING PROCEDURE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Terminal Test Kit (WP 0795, Item 122)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0202
WP 0707
WP 0771
WP 0769
WP 0774
WP 0775
WP 0780

Drawings Required

Schematic (WP 0789, Figure 77)
Schematic (WP 0789, Figure 76)

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

TROUBLESHOOTING PROCEDURE

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH
TROUBLESHOOTING PROCEDURE - (CONTINUED)****STEP****WARNING**

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

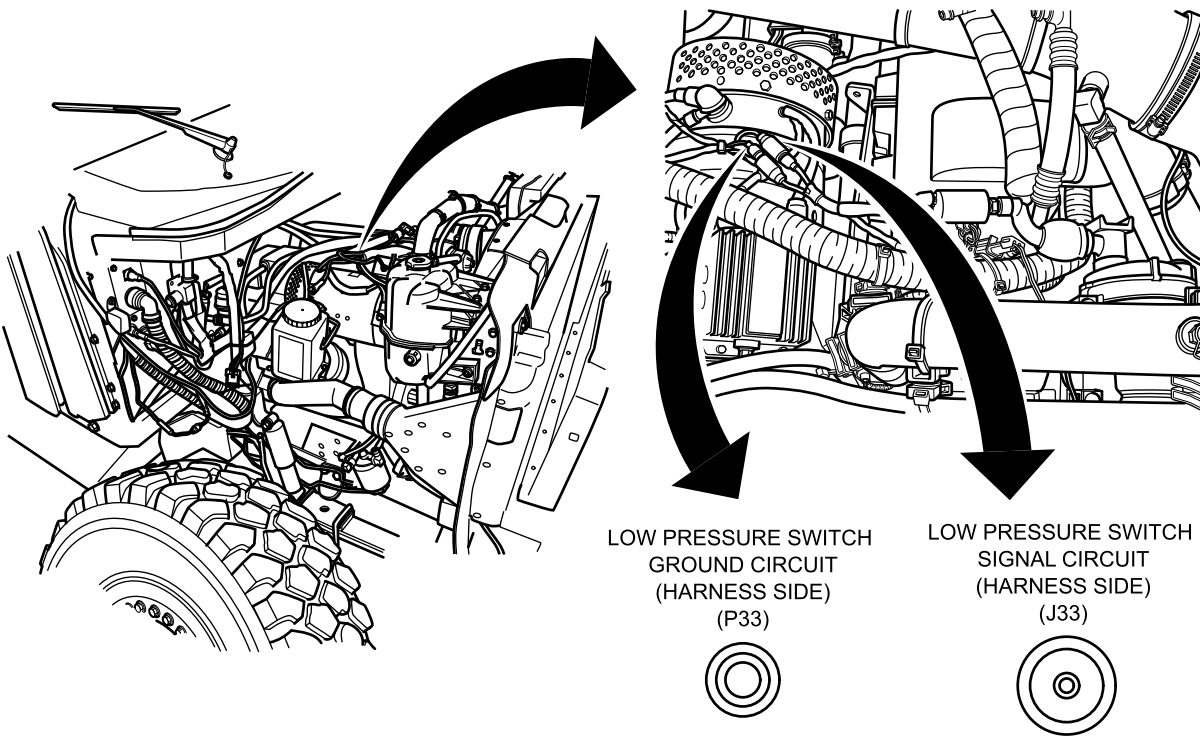
NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

On some vehicles, terminals R and S on connector J6/P6 are identified as terminals O and I respectively.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

1. Disconnect connectors P33 and J33. Refer to Figure 1.

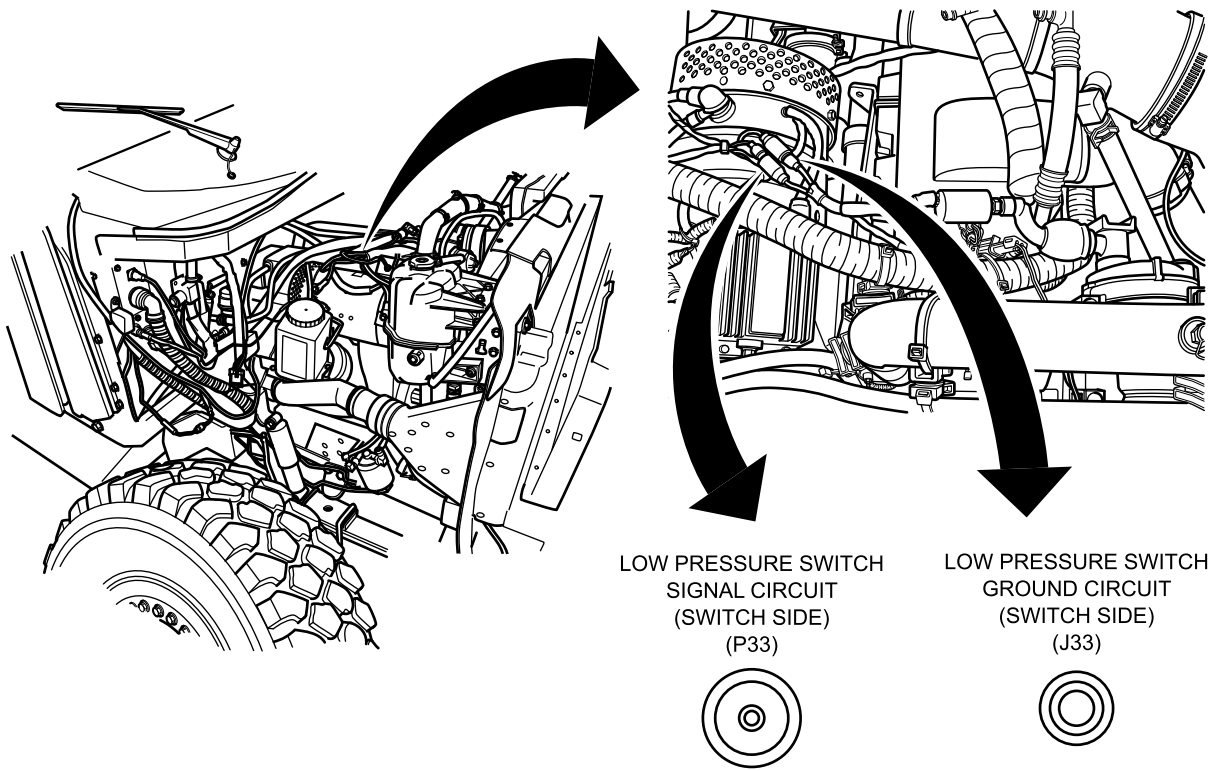


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Figure 1. Low Pressure Switch Harness Connectors Location.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

2. Measure resistance between connectors J33 and P33 (switch side) with multimeter. Refer to Figure 2.



B230604640

Figure 2. Low Pressure Switch Connector Interfaces Location.

CONDITION/INDICATION

Does multimeter read OL?

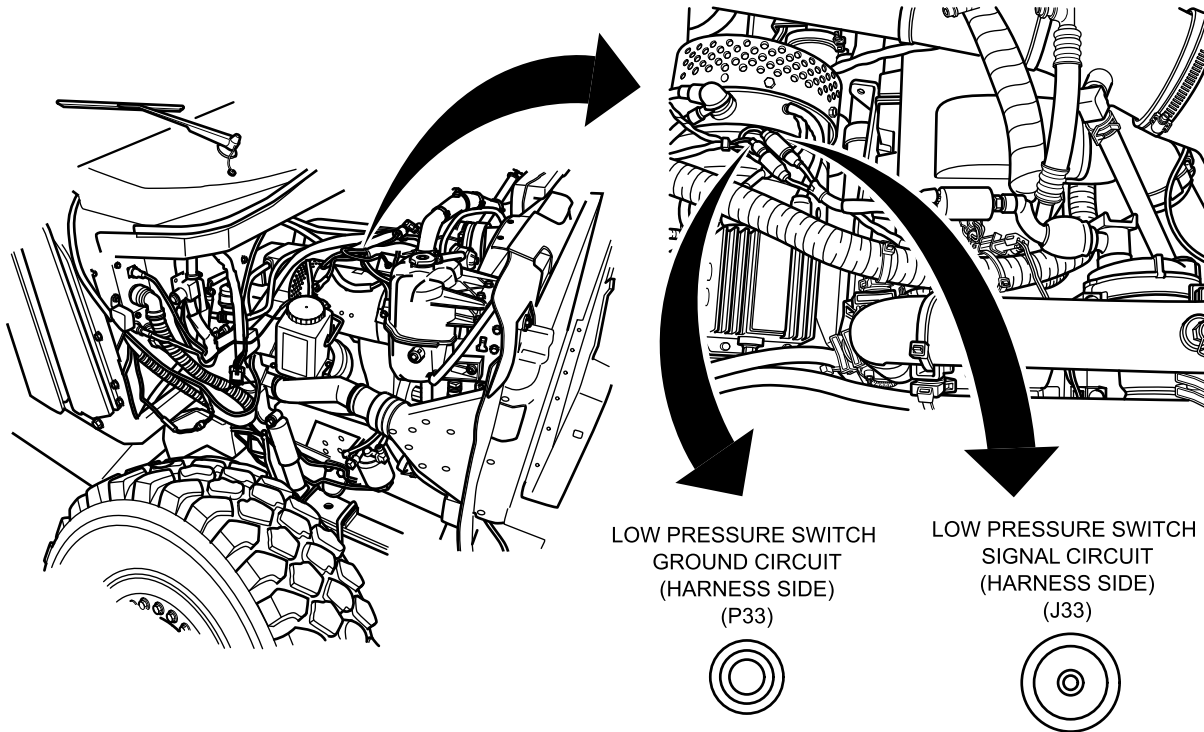
DECISION

YES Go to next step.
NO Go to Step 23.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

3. Measure resistance between connector P33 (harness side) and ground with multimeter. Refer to Figure 3.



B230604639

Figure 3. Low Pressure Switch Harness Connectors Location.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

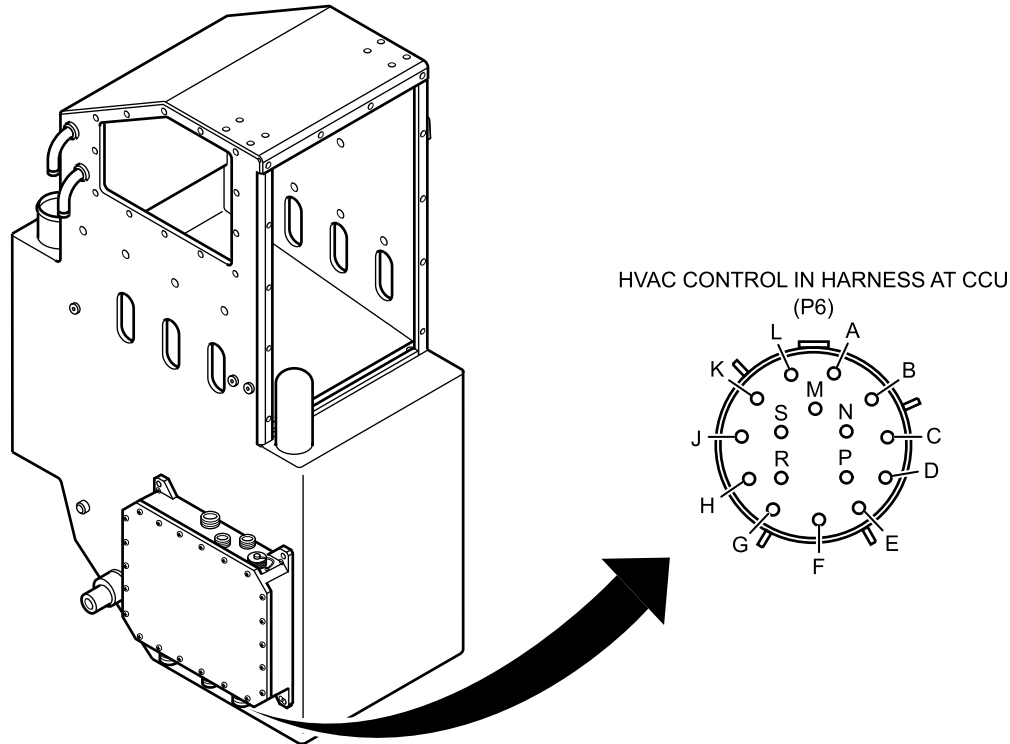
YES Go to next step.

NO Go to Step 12.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

4. Disconnect connector P6. Refer to Figure 4.

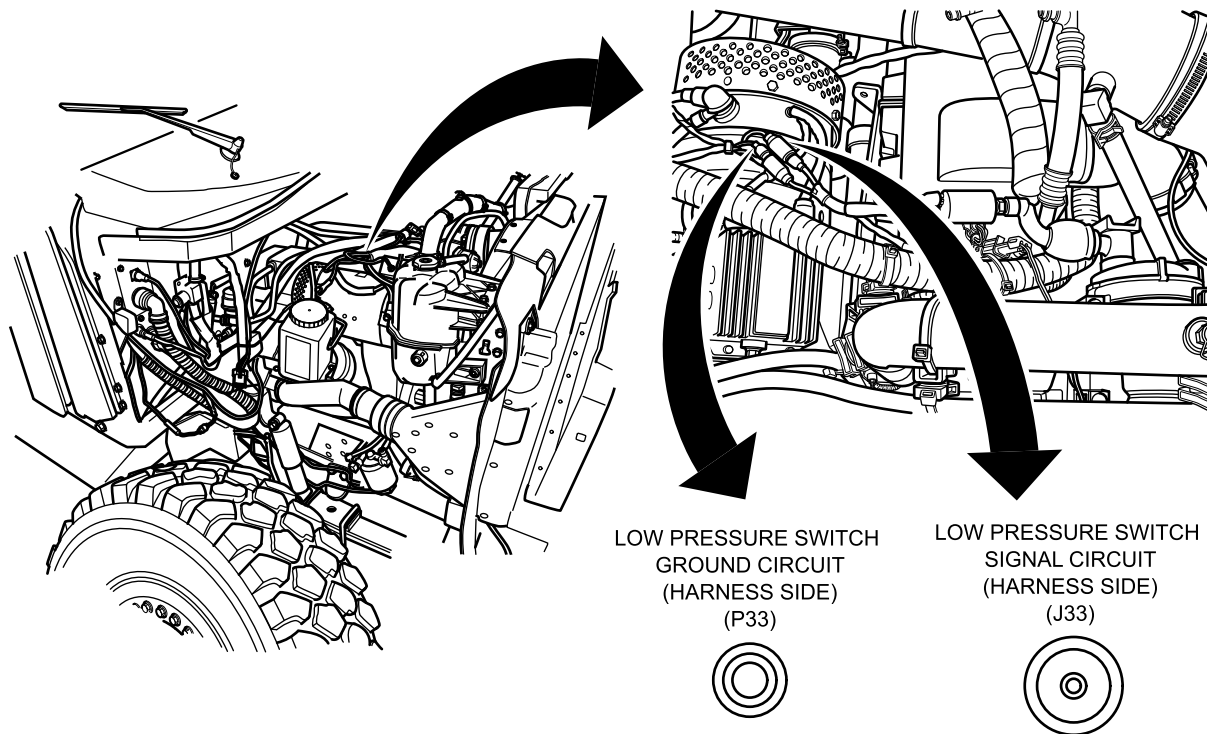


B230604556

Figure 4. HVAC Box Area.

5. Connect a jumper wire between connector P6 terminals B and C. Refer to Figure 4.
6. Measure resistance between harness connectors P33 and J33 with multimeter. Refer to Figure 5.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604639

Figure 5. Low Pressure Switch Harness Connectors Location.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 16.

STEP

7. Measure resistance between harness connector J33 and ground. Refer to Figure 5.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

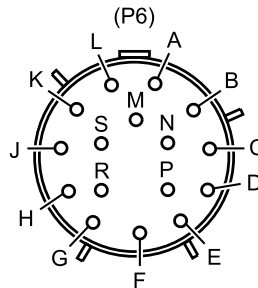
YES Go to next step.
NO Go to Step 18.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

8. Remove jumper wire from connector P6. Refer to Figure 6.

HVAC CONTROL IN HARNESS AT CCU



B230603934

Figure 6. Connector P6.

9. Measure resistance between connector P6 terminal C and all other terminals on connector P6. Refer to Figure 6.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

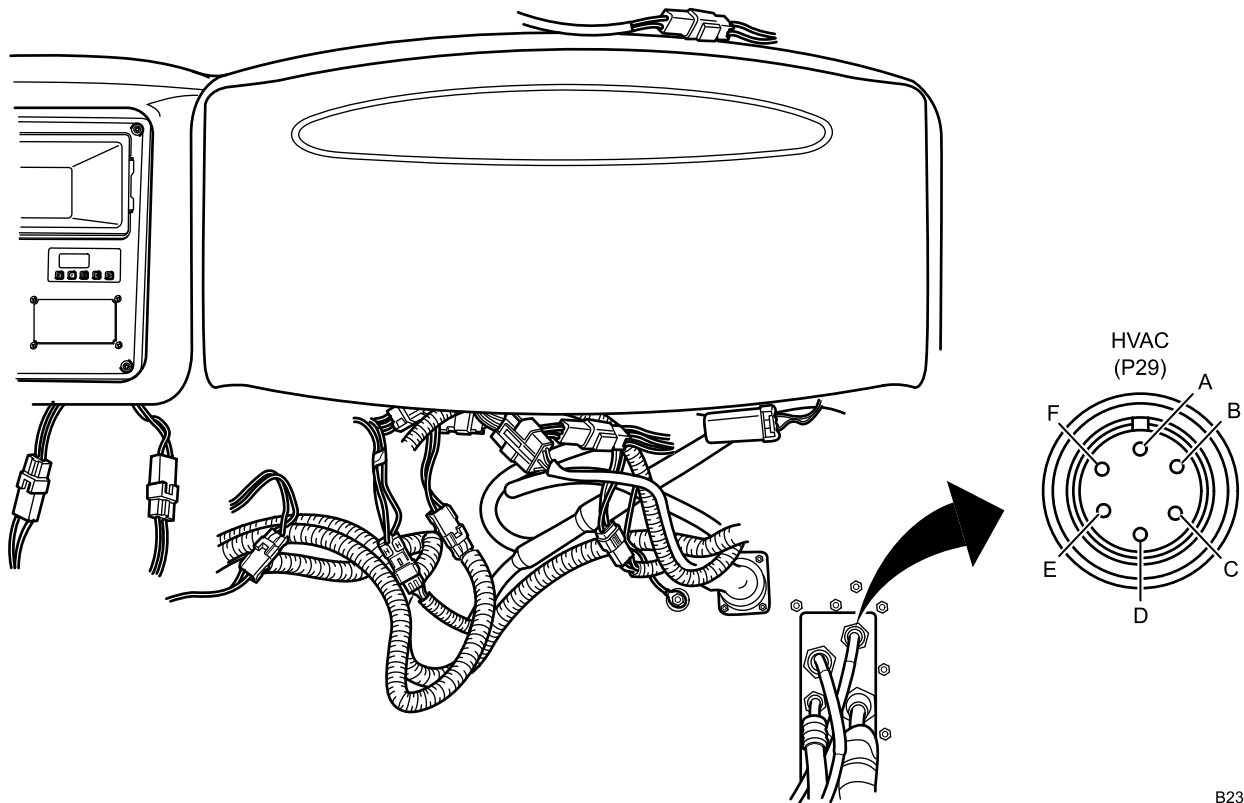
DECISION

YES Return to operational checkout procedure. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769).
NO Go to next step.

STEP

10. Disconnect connector P29. Refer to Figure 7.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604557

Figure 7. Right Front Cabin Area.

11. Measure resistance between connector P6 terminal C and all other terminals on connector P6. Refer to Figure 6.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

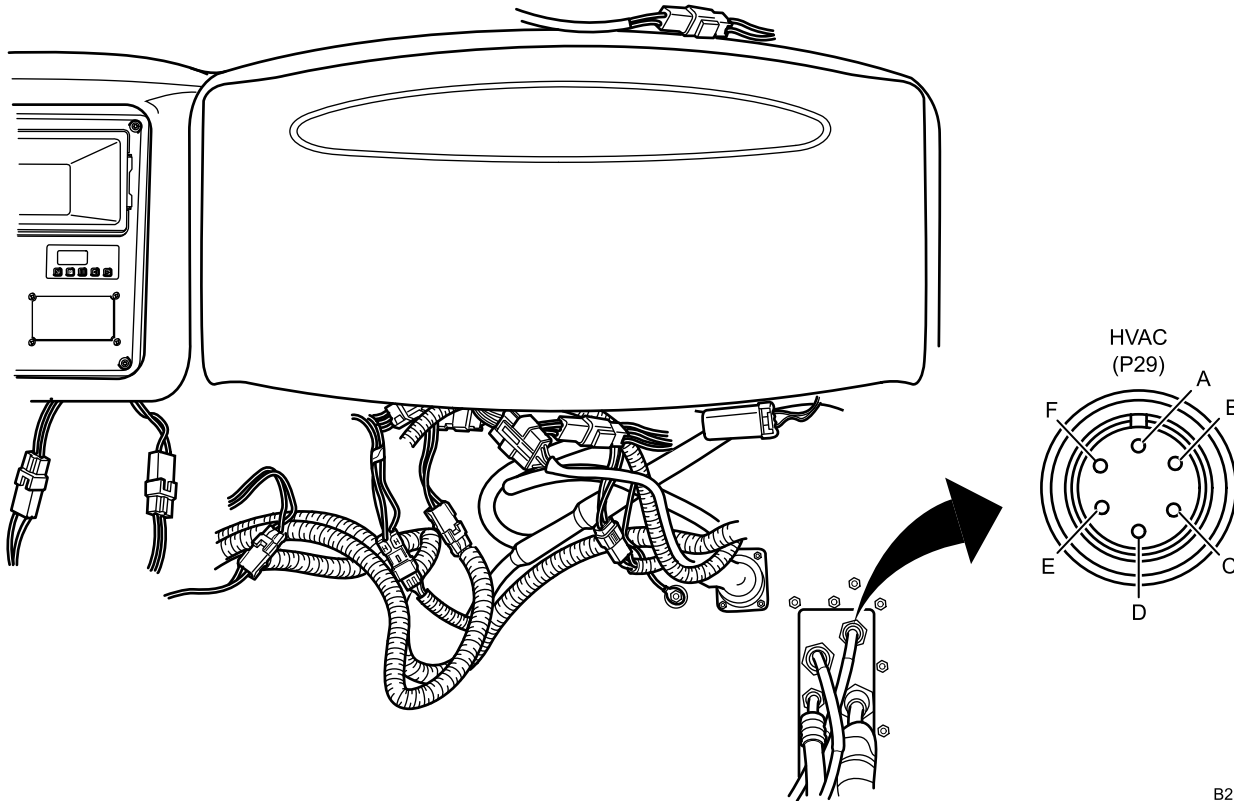
DECISION

YES Go to Step 22.
NO Go to Step 21.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

12. Disconnect connector P29. Refer to Figure 8.



B230604557

Figure 8. Right Front Cabin Area.

13. Measure resistance between connector P29 terminal D and ground with multimeter. Refer to Figure 8.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

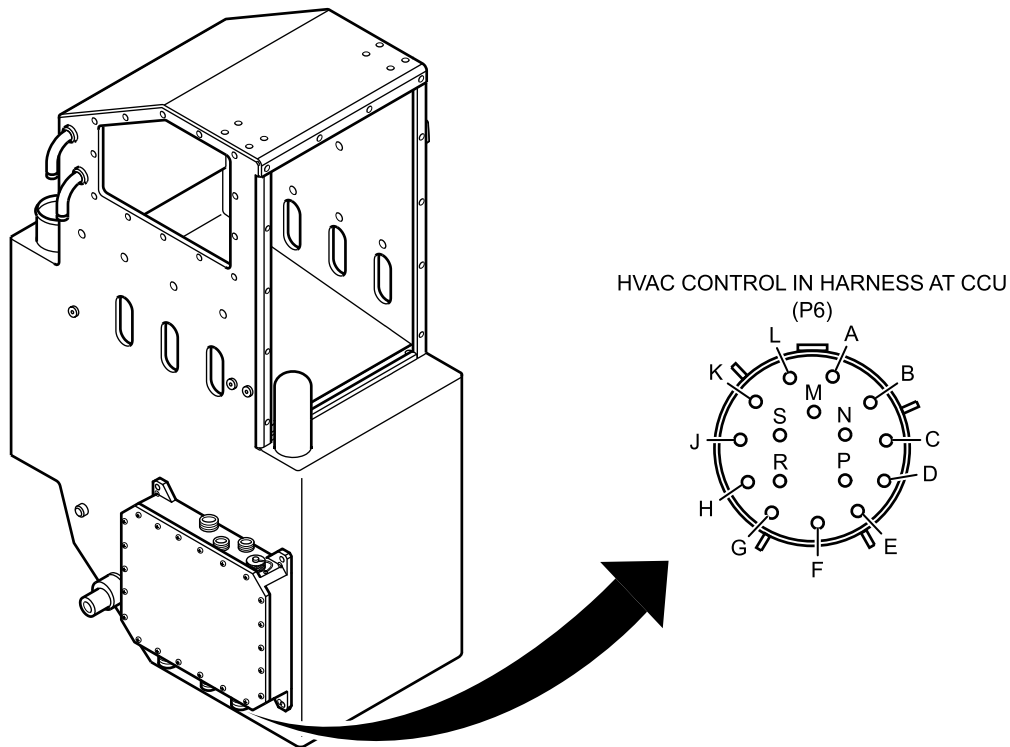
YES Go to Step 22.

NO Go to next step.

STEP

14. Disconnect connector P6. Refer to Figure 9.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604556

Figure 9. HVAC Box Area.

15. Measure resistance between connector P6 terminal B and connector P29 terminal D with multimeter. Refer to Figure 9 and Figure 8.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to Step 20.
NO Go to Step 21.

STEP

16. Disconnect connector P29. Refer to Figure 8.
17. Measure resistance between connector P29 terminals E and D with multimeter. Refer to Figure 8.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

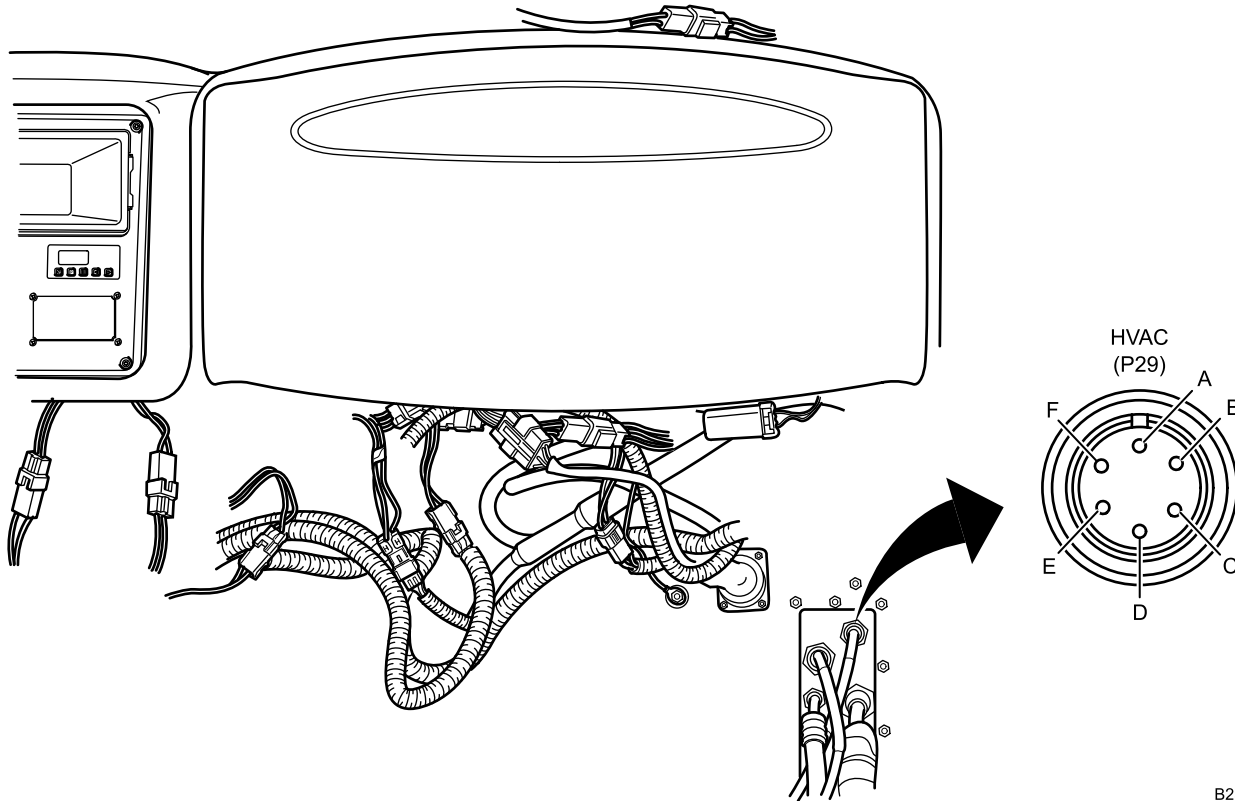
DECISION

YES Go to Step 22.
NO Go to Step 21.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

18. Disconnect connector P29. Refer to Figure 10.



B230604557

Figure 10. Right Front Cabin Area.

19. Measure resistance between connector P29 terminal E and ground with multimeter. Refer to Figure 10.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to Step 22.
 NO Go to Step 21.

MALFUNCTION

- 20. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST

MALFUNCTION

- 21. Harness is faulty.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) LOW PRESSURE CUTOUT SWITCH
TROUBLESHOOTING PROCEDURE - (CONTINUED)****ACTION**

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control In Wiring Harness Removal and Installation (WP 0775). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 22. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Engine Wiring Harness Removal and Installation (WP 0774). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 23. Switch is faulty.

ACTION

Replace switch. Refer to Heating Ventilating and Air Conditioning (HVAC) Low Pressure Switch Removal and Installation (WP 0771). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE**HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING
PROCEDURE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Terminal Test Kit (WP 0795, Item 122)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
HVAC/LSS upper panel removed (WP 0767)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0202
WP 0707
WP 0758
WP 0769
WP 0767
WP 0780

Drawings Required

Schematic (WP 0789, Figure 75)

Before Beginning This Troubleshooting Procedure

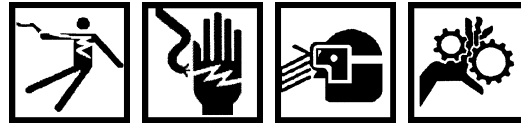
Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

TROUBLESHOOTING PROCEDURE

STEP

WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Recirculated Air (RA) blower cage rotates at a high rate of speed. Keep hands and fingers away from rotating cage. Failure to comply may result in damage to equipment and serious injury to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

1. Disconnect connector P12. Refer to Figure 1.

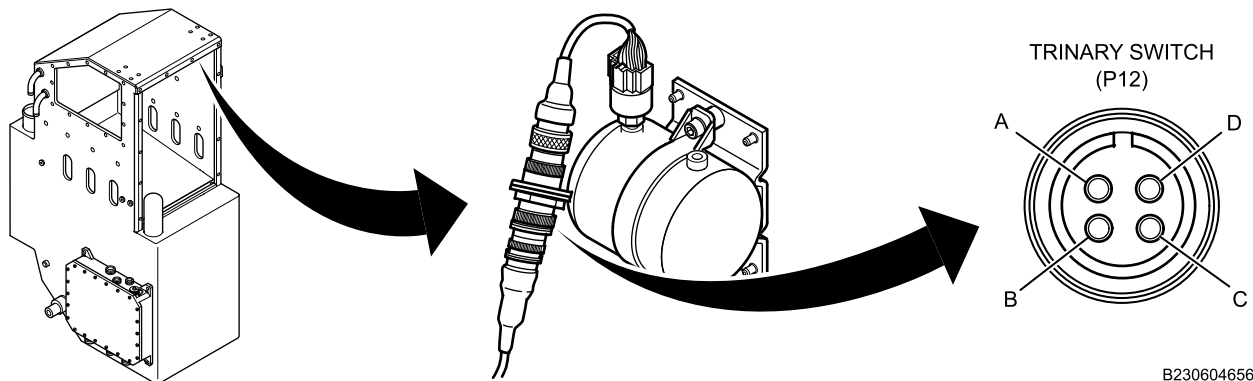
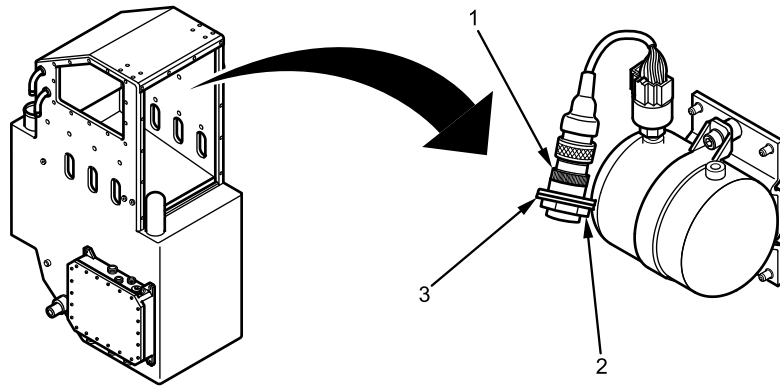


Figure 1. HVAC Box Interior Area.

2. Remove nut (Figure 2, Item 2) from connector J12 (Figure 2, Item 1).

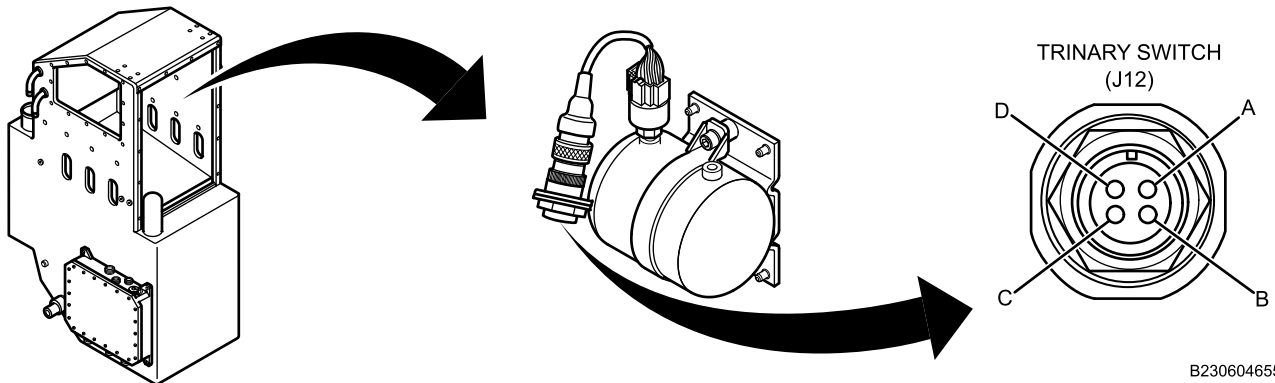
HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230611666

Figure 2. HVAC Box Interior Area.

3. Remove connector J12 (Figure 2, Item 1) from bracket (Figure 2, Item 3).
4. Measure resistance between connector J12 terminals A and B with multimeter. Refer to Figure 3.



B230604655

Figure 3. HVAC Box Interior Area.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.

NO Go to Step 49.

STEP

5. Measure resistance between connector J12 terminals C and D with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read OL?

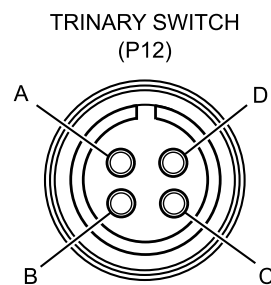
HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

DECISION

YES Go to next step.
NO Go to Step 49.

STEP

6. Turn mode control knob on HVAC/LSS control panel to COOL position (TM 9-2355-106-10).
7. Turn temperature control knob on HVAC/LSS control panel to coldest position (TM 9-2355-106-10).
8. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
9. Turn MAIN POWER switch ON (TM 9-2355-106-10).
10. Ignition switch ON (TM 9-2355-106-10).
11. Measure DC voltage between connector P12 terminal C and ground with multimeter. Refer to Figure 4.



B230603942

Figure 4. Connector P12.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 41.

STEP

12. Measure DC voltage between connector P12 terminal A and ground with multimeter. Refer to Figure 4.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 35.

STEP

13. Determine if complaint is for all condenser fans not operating correctly, or A/C compressor not operating properly.

CONDITION/INDICATION

Is complaint for all condenser fans not operating properly?

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

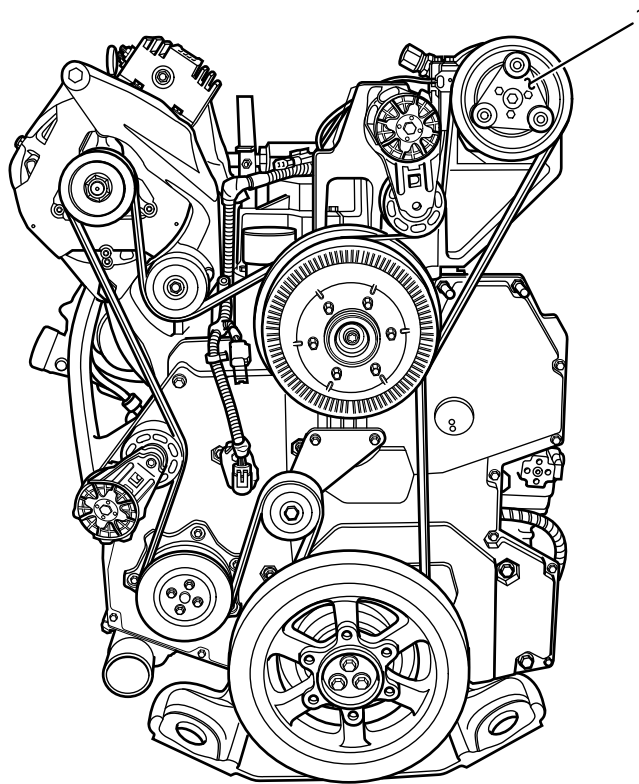
DECISION

YES Go to Step 24.
NO Go to next step.

STEP

14. Turn ignition switch OFF (TM 9-2355-106-10).
15. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
16. Connect a jumper wire between connector P12 terminals A and B. Refer to Figure 4.
17. Turn MAIN POWER switch ON (TM 9-2355-106-10).
18. Start engine (TM 9-2355-106-10).

CONDITION/INDICATION



B239103791

Figure 5. A/C Compressor Clutch Location.

Is A/C compressor clutch (Figure 5, Item 1) spinning?

DECISION

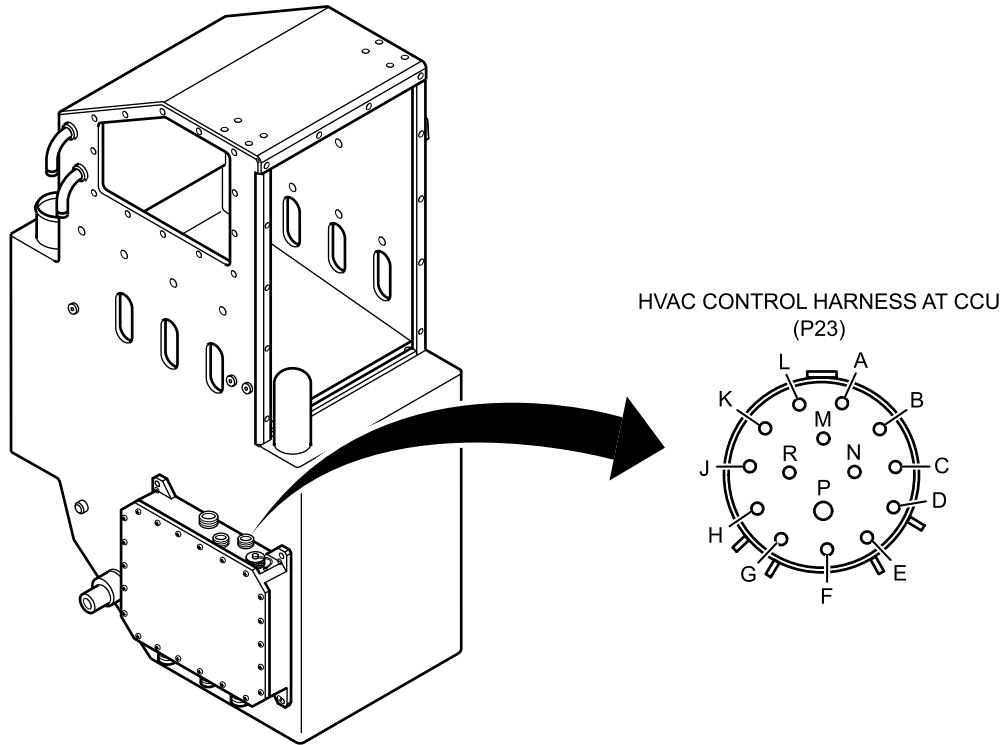
YES Go to Step 49.
NO Go to next step.

STEP

19. Turn ignition switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

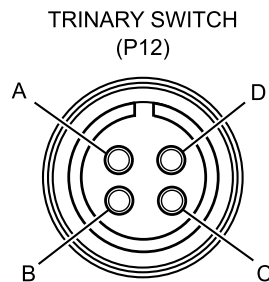
- 20. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 21. Disconnect connector P23. Refer to Figure 6.



B230604602

Figure 6. HVAC Box Exterior.

- 22. Measure resistance between connector P23 terminal E and connector P12 terminal B with multimeter. Refer to Figure 6 and Figure 7.



B230603942

Figure 7. Connector P12.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

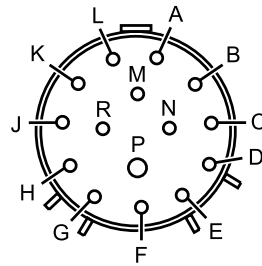
YES Go to next step.
 NO Go to Step 48.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

23. Measure resistance between connector P23 terminal E and all other terminals on connector P23 with multimeter. Refer to Figure 8.

HVAC CONTROL HARNESS AT CCU
(P23)



B230603932

Figure 8. Connector P23.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

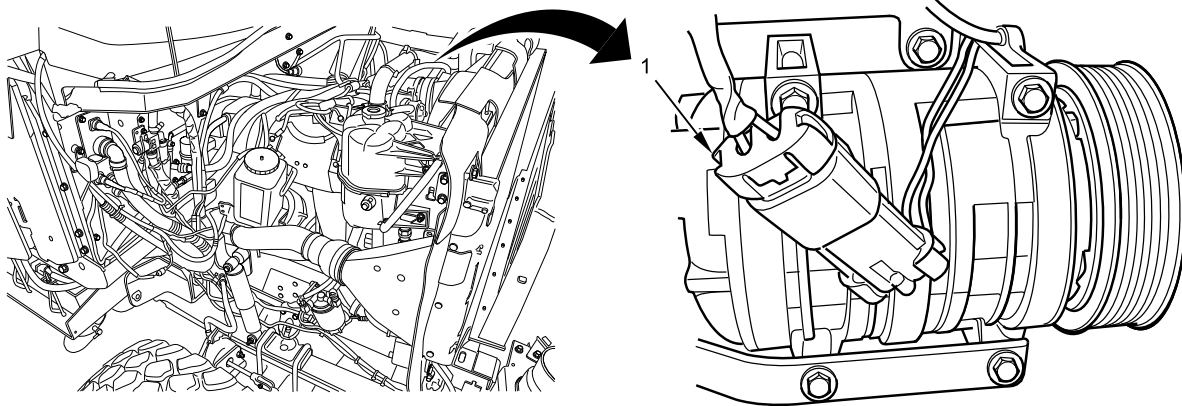
DECISION

YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769).
NO Go to Step 48.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

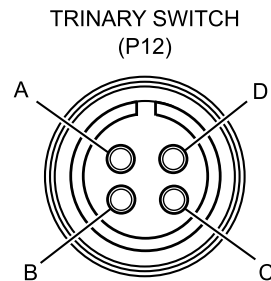
24. Turn ignition switch OFF (TM 9-2355-106-10).
25. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
26. Disconnect connector P36 (Figure 9, Item 1).



B235203902

Figure 9. A/C Compressor Connector Location.

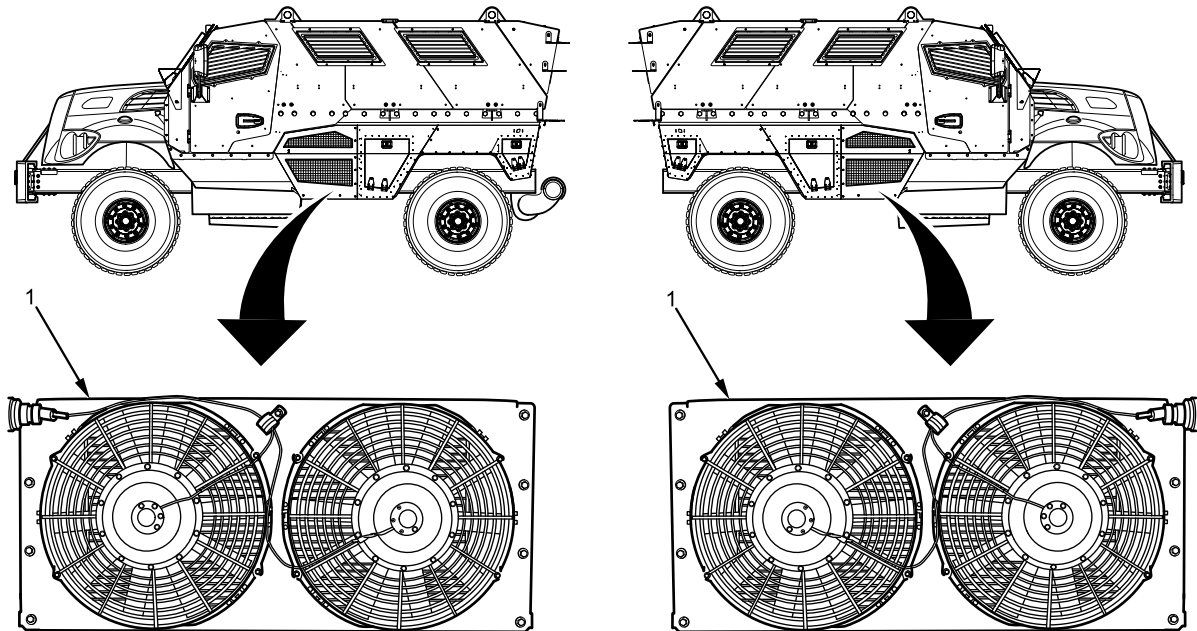
27. Connect a jumper wire between connector P12 terminals C and D. Refer to Figure 10.



B230603942

Figure 10. Connector P12.

28. Turn MAIN POWER switch ON (TM 9-2355-106-10).
29. Start engine (TM 9-2355-106-10).

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING
PROCEDURE - (CONTINUED)****CONDITION/INDICATION**

B239103790

Figure 11. A/C Condenser Fans Location.

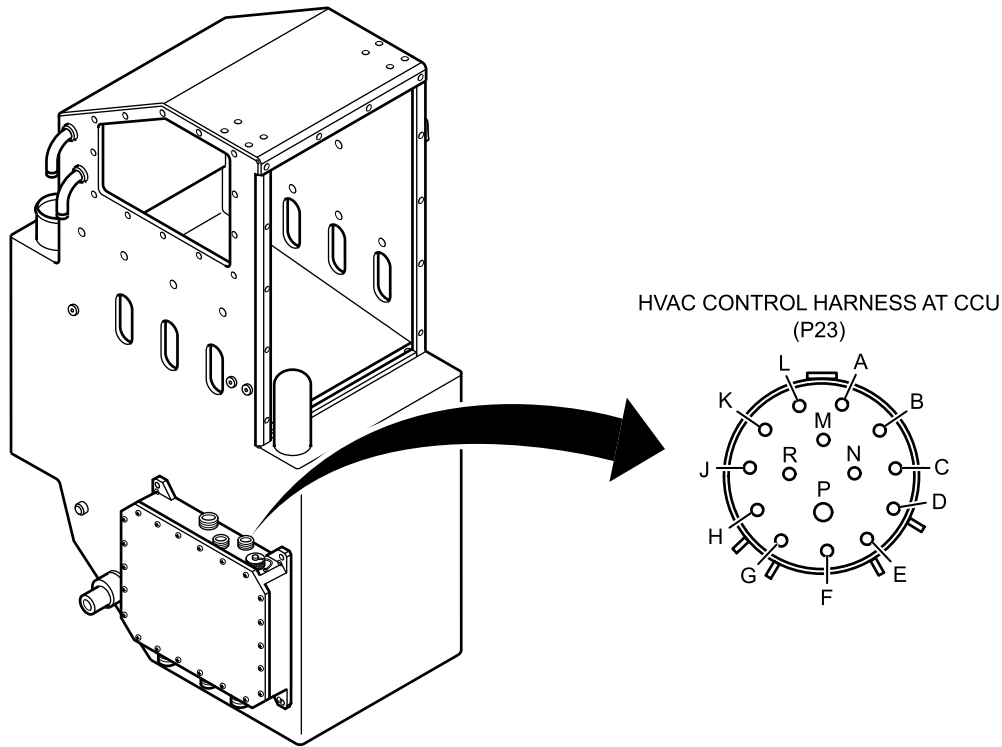
Do condenser fans turn on? Refer to Figure 11.

DECISIONYES Go to Step 49.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

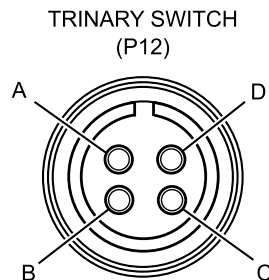
- 30. Turn ignition switch OFF (TM 9-2355-106-10).
- 31. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 32. Disconnect connector P23. Refer to Figure 12.



B230604602

Figure 12. HVAC Box Exterior.

- 33. Measure resistance between connector P23 terminal C and connector P12 terminal D with multimeter. Refer to Figure 12 and Figure 13.



B230603942

Figure 13. Connector P12.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
 NO Go to Step 48.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

34. Measure resistance between connector P23 terminal C and all other terminals on connector P23 with multimeter. Refer to Figure 12.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

YES Return to HVAC/LSS Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace CCU (WP 0769).
NO Go to Step 48.

STEP

35. Turn ignition switch OFF (TM 9-2355-106-10).
36. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
37. Disconnect connector P23. Refer to Figure 12.
38. Measure resistance between connector P23 terminal F and connector P12 terminal A. Refer to Figure 12 and Figure 13.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 48.

STEP

39. Measure resistance between connector P23 terminal F and ground. Refer to Figure 12.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to next step.
NO Go to Step 48.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

40. Measure resistance between connector P23 terminal F and all other terminals on connector P23. Refer to Figure 14.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

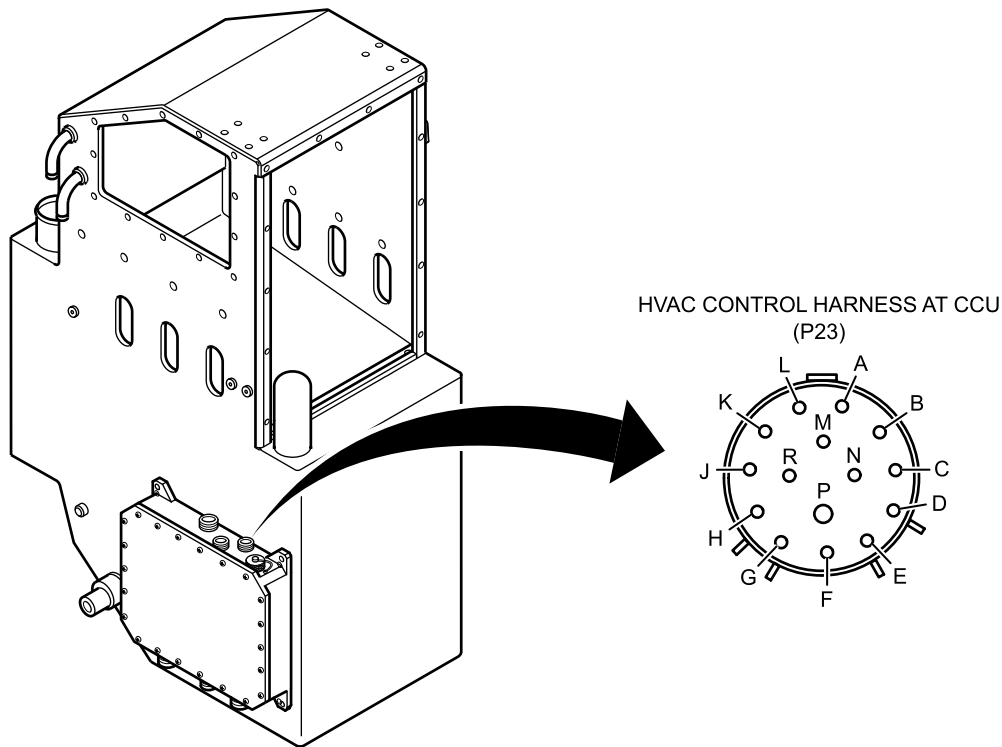
DECISION

YES Step 47.

NO Go to Step 48.

STEP

- 41. Turn ignition switch OFF (TM 9-2355-106-10).
- 42. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
- 43. Disconnect connector P23. Refer to Figure 14.

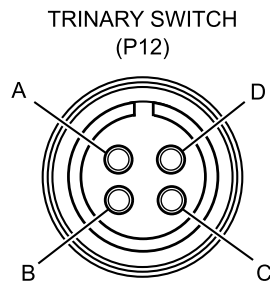


B230604602

Figure 14. HVAC Box Exterior.

44. Measure resistance between connector P23 terminal D and connector P12 terminal C. Refer to Figure 14 and Figure 15.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230603942

Figure 15. Connector P12.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 48.

STEP

45. Measure resistance between connector P23 terminal D and ground. Refer to Figure 14.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to next step.
NO Go to Step 48.

STEP

46. Measure resistance between connector P23 terminal D and all other terminals on connector P23. Refer to Figure 14.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

YES Step 47.
NO Go to Step 48.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) TRINARY SWITCH TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 47. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 48. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Control Wiring Harness Removal and Installation (WP 0780). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 49. Trinary switch is faulty.

ACTION

Replace switch. Refer to Heating Ventilating and Air Conditioning (HVAC) Receiver/Drier Removal and Installation (WP 0758). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
**HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING
PROCEDURE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0202
WP 0708
WP 0769
WP 0775
WP 0776
WP 0780
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

Drawings Required

Schematic (WP 0789, Figure 77)
Schematic (WP 0789, Figure 76)

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

TROUBLESHOOTING PROCEDURE**STEP****WARNING**

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)

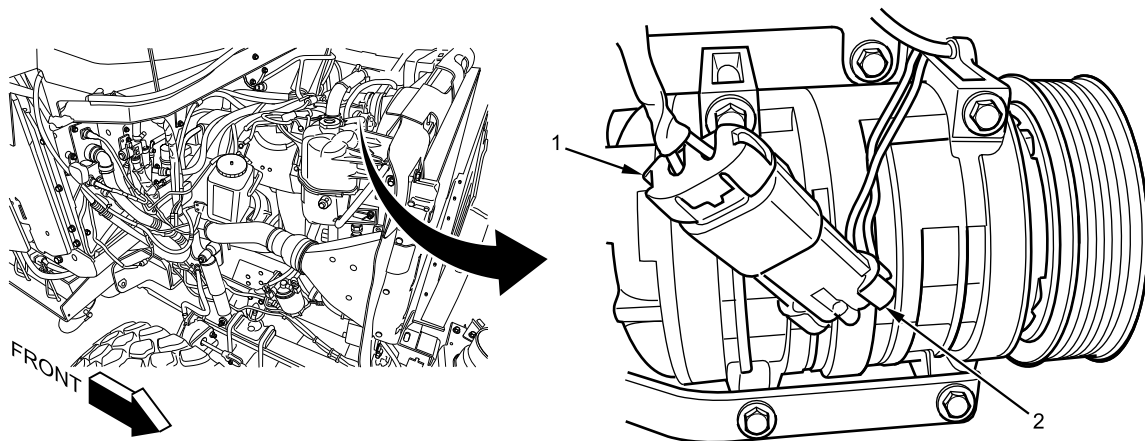
CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

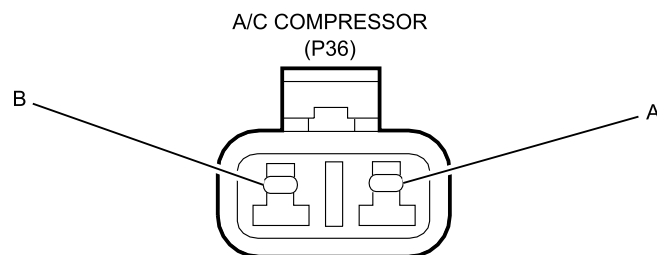
1. Disconnect connector P36 (Figure 1, Item 1) from connector J36 (Figure 1, Item 2).



B235211668

Figure 1. Engine Compartment Area.

2. Turn HVAC/LSS operator panel mode switch to DRY position (TM 9-2355-106-10).
3. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
4. Turn MAIN POWER switch ON (TM 9-2355-106-10).
5. Ignition switch ON (TM 9-2355-106-10).
6. Measure DC voltage between connector P36 terminal B and ground with multimeter. Refer to Figure 2.



B230604654

Figure 2. Connector P36.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING
PROCEDURE - (CONTINUED)****CONDITION/INDICATION**

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.

NO Go to Step 8.

STEP

7. Measure DC voltage between connector P36 terminals A and B with multimeter. Refer to Figure 2.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to Step 33.

NO Go to Step 20.

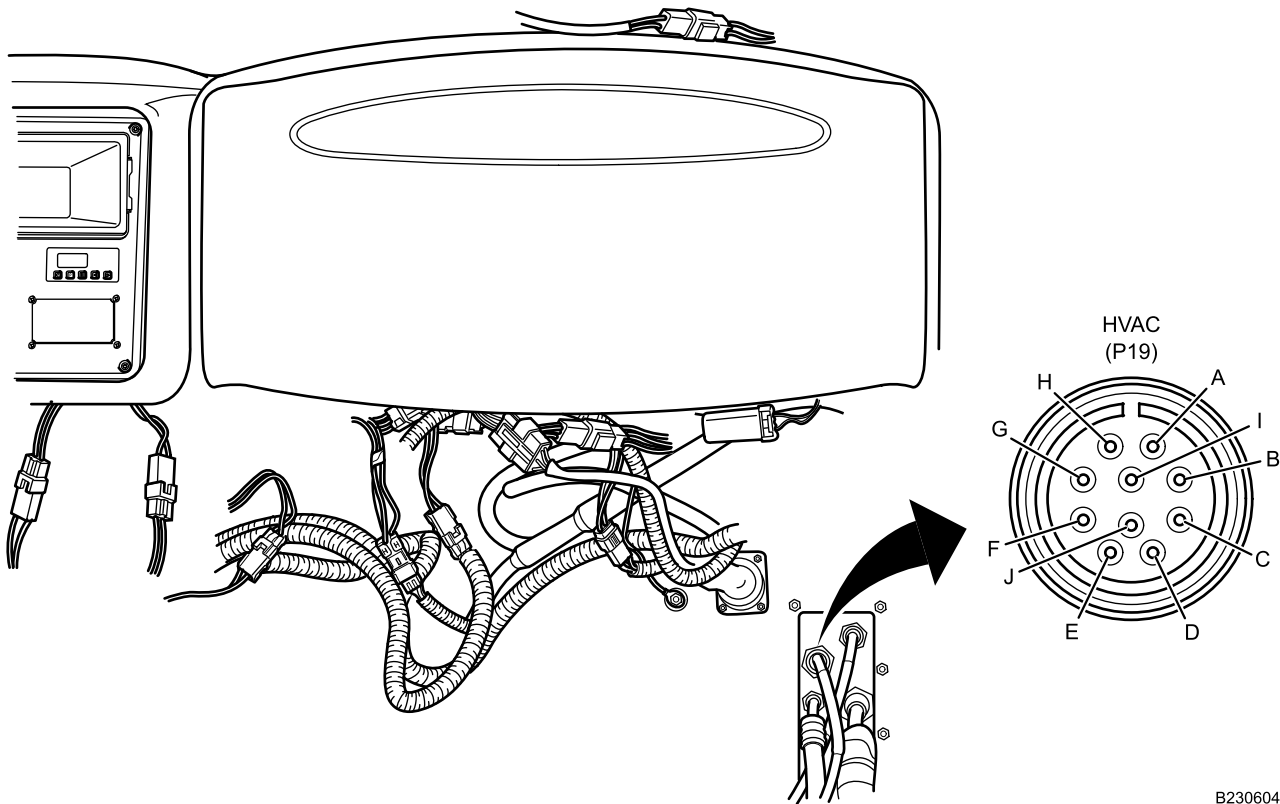
STEP

8. Turn ignition switch OFF (TM 9-2355-106-10).

9. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)

10. Disconnect connector P19. Refer to Figure 3.



B230604671

Figure 3. Right Front Cabin Area.

11. Turn MAIN POWER switch ON (TM 9-2355-106-10).
12. Turn ignition switch ON (TM 9-2355-106-10).
13. Measure DC voltage between connector P19 terminal A and ground with multimeter. Refer to Figure 3.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

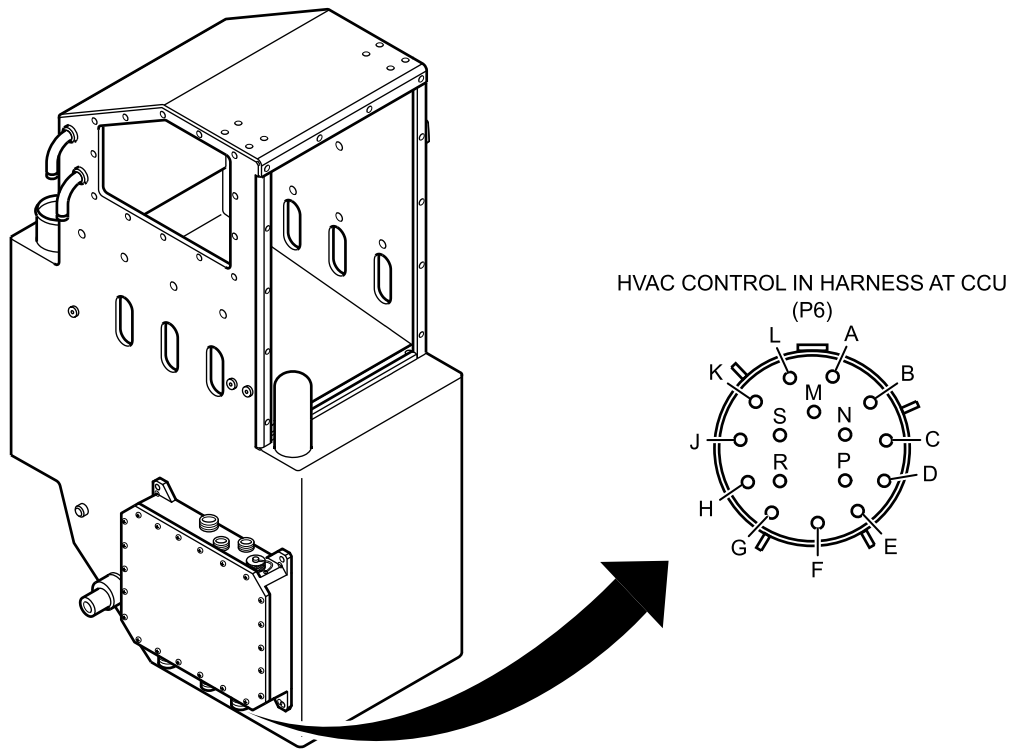
DECISION

- YES Go to Step 37.
NO Go to next step.

STEP

14. Turn LSS switch OFF (TM 9-2355-106-10).
15. Turn ignition switch OFF (TM 9-2355-106-10).
16. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
17. Disconnect connector P6. Refer to Figure 4.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604556

Figure 4. HVAC Box Exterior Area.

18. Measure resistance between connector P6 terminal D and ground with multimeter. Refer to Figure 4.

CONDITION/INDICATION

Does multimeter read OL?

DECISION

YES Go to next step.
NO Go to Step 35.

STEP

19. Measure resistance between connector P6 terminal D and all other terminals on P6 with multimeter. Refer to Figure 4.

CONDITION/INDICATION

Does multimeter read OL for all terminals?

DECISION

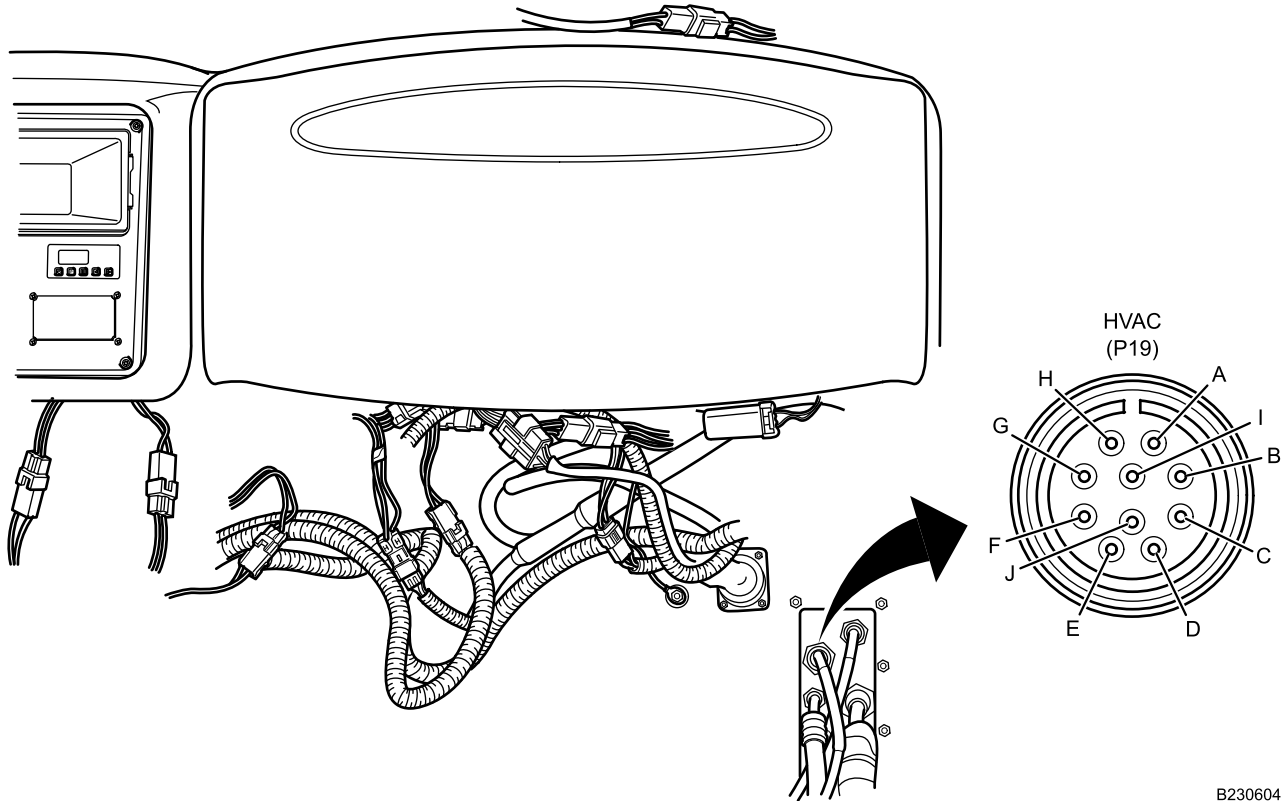
YES Go to Step 34.
NO Go to Step 35.

STEP

20. Turn LSS switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)

21. Turn ignition switch OFF (TM 9-2355-106-10).
22. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
23. Disconnect connector P19. Refer to Figure 5.



B230604671

Figure 5. Right Front Cabin Area.

24. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
25. Turn MAIN POWER switch ON (TM 9-2355-106-10).
26. Turn ignition switch ON (TM 9-2355-106-10).
27. Measure DC voltage between connector P19 terminals A and J with multimeter. Refer to Figure 5.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

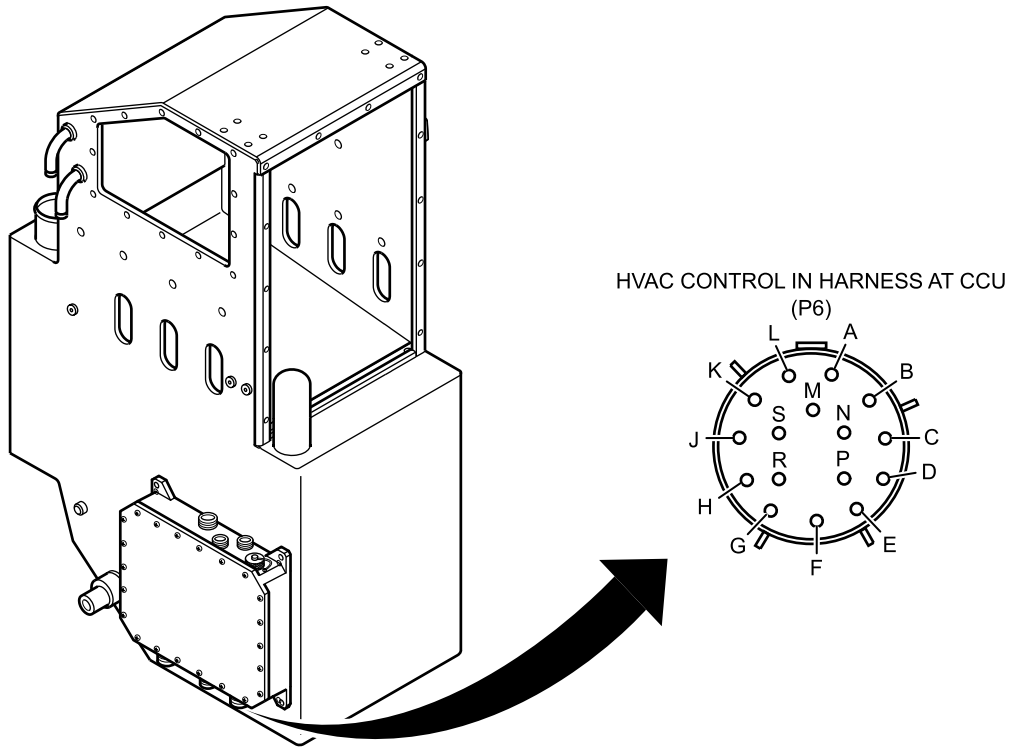
DECISION

YES Go to Step 37.
NO Go to next step.

STEP

28. Turn LSS switch OFF (TM 9-2355-106-10).
29. Turn ignition switch OFF (TM 9-2355-106-10).
30. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
31. Disconnect connector P6. Refer to Figure 6.

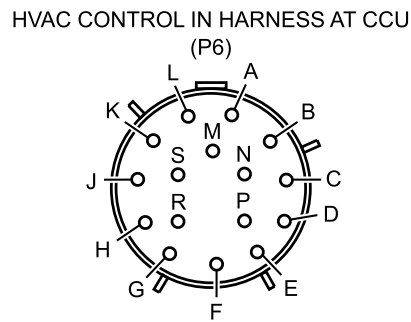
HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604556

Figure 6. Connector P6.

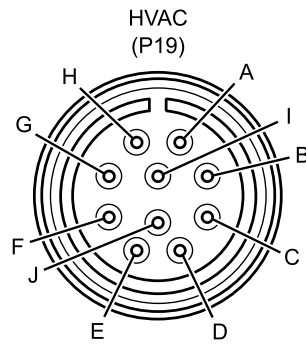
32. Measure resistance between connector P6 terminal J and connector P19 terminal J with multimeter. Refer to Figure 7 and Figure 8.



B230603934

Figure 7. Connector P6.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230603944

Figure 8. Connector P19.

CONDITION/INDICATION

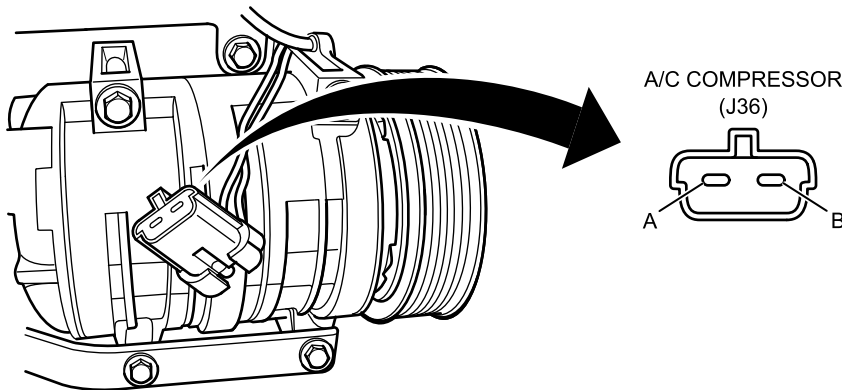
Does multimeter read less than 5 ohms?

DECISION

YES Go to Step 34.
NO Go to Step 35.

STEP

33. Measure resistance between connector J36 terminals A and B with multimeter. Refer to Figure 9.



B235211669

Figure 9. Connector J36 (Compressor Side).

CONDITION/INDICATION

Does multimeter read between 14 and 16 ohms?

DECISION

NO Go to Step 36.
YES Return to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202). If the other systems test good and problem persists, replace Climate Control Unit (CCU) (WP 0769).

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) COMPRESSOR CONTROL TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 34. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 35. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control In Wiring Harness Removal and Installation (WP 0775). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 36. A/C compressor is faulty.

ACTION

Replace A/C compressor. Refer to Heating Ventilating and Air Conditioning (HVAC) Compressor Removal and Installation (WP 0708). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 37. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control 2 Wiring Harness Removal and Installation (WP 0776). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Terminal Test Kit (WP 0795, Item 122)

WP 0772
WP 0773
WP 0775
WP 0776
WP 0782

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0059
WP 0202
WP 0317
WP 0332
WP 0319
WP 0672
WP 0707
WP 0724
WP 0769
WP 0767

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
HVAC/LSS upper panel removed (WP 0767)

Drawings Required

Schematic (WP 0789, Figure 76)
Schematic (WP 0789, Figure 77)

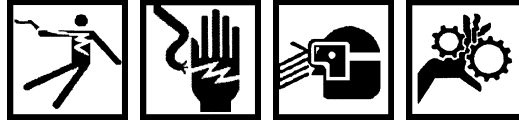
Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

TROUBLESHOOTING PROCEDURE

WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

RA blower cage rotates at a high rate of speed. Keep hands and fingers away from rotating cage. Failure to comply may result in damage to equipment and serious injury to personnel.

CAUTION

Use light contact when probing connector terminals. Do not force test probe into connector terminal. Failure to comply may result in damage to connector terminal.

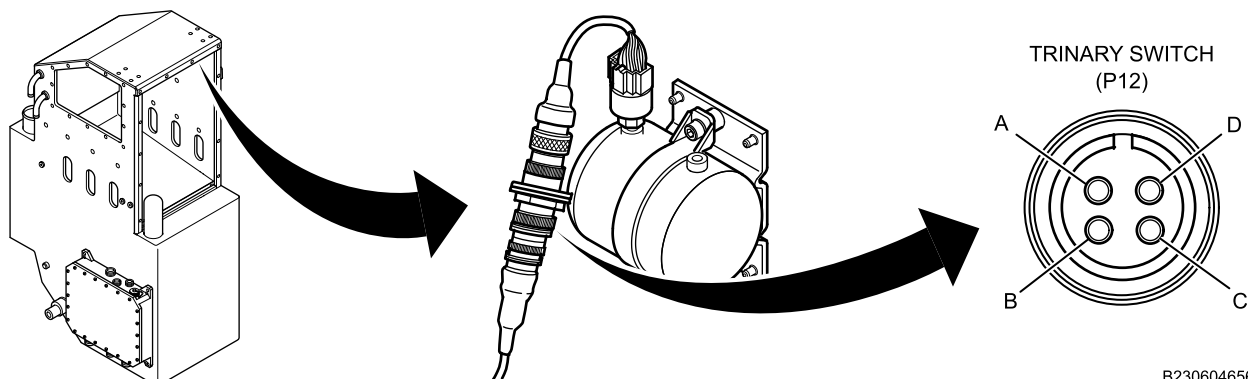
NOTE

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

On some vehicles, terminals R and S on connector J6/P6 are identified as terminals O and I respectively.

STEP

1. Disconnect connector P12. Refer to Figure 1.

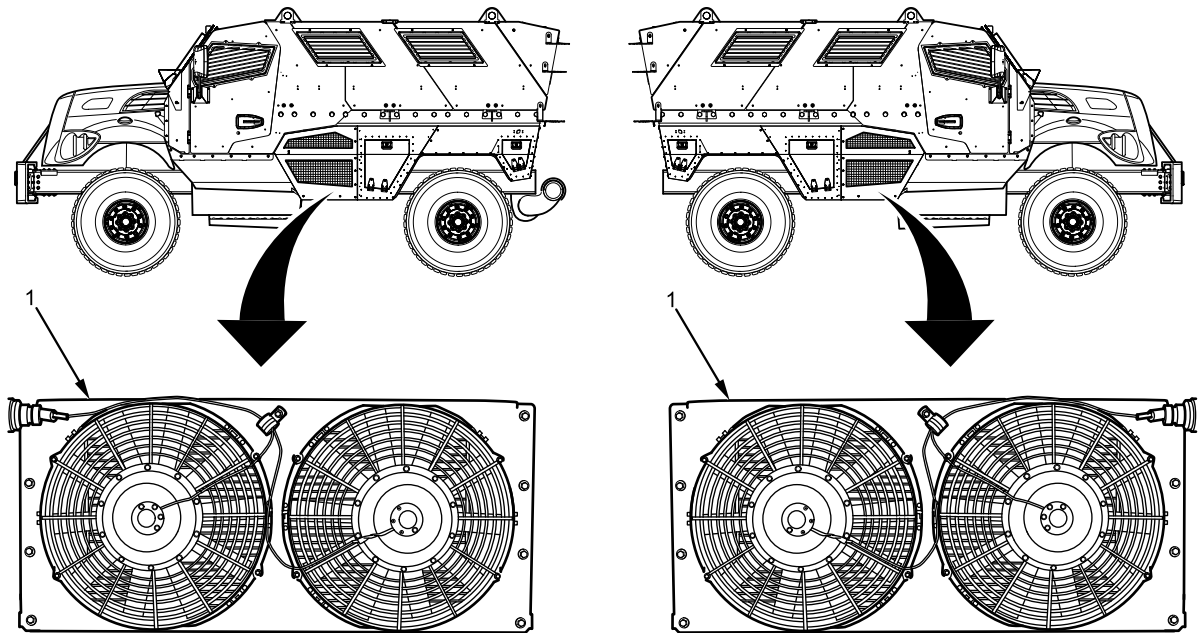


B230604656

Figure 1. HVAC Box Interior Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

2. Connect a jumper wire between connector P12 terminals C and D. Refer to Figure 1.
3. Turn HVAC/LSS operator panel LSS switch ON (TM 9-2355-106-10).
4. Turn MAIN POWER switch ON (TM 9-2355-106-10).
5. Turn ignition switch ON (TM 9-2355-106-10).
6. Observe left side and right side condenser fans (Figure 2, Item 1) operation.



B239103790

Figure 2. A/C Condenser Fans Location.

CONDITION/INDICATION

Are all four condenser fans not working?

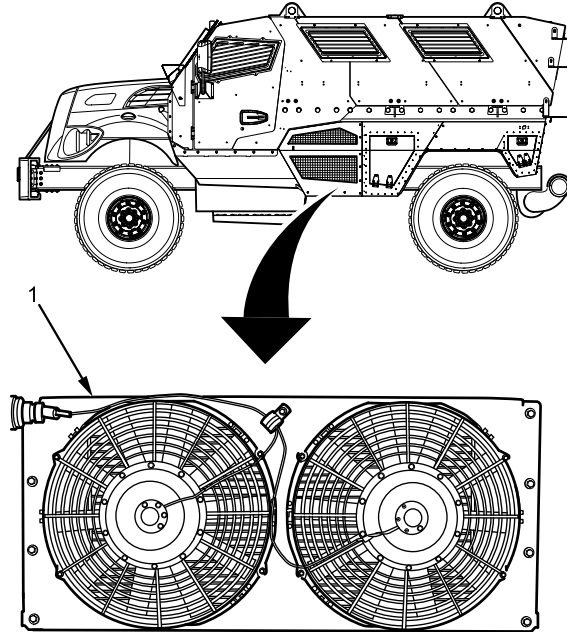
DECISION

YES Go to Step 10.

NO Go to next step.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

7. Observe left side condenser fans operation. Refer to Figure 3.



B230604880

Figure 3. Left Side A/C Condenser Fans Location.

CONDITION/INDICATION

Are one or more left side condenser fans not working?

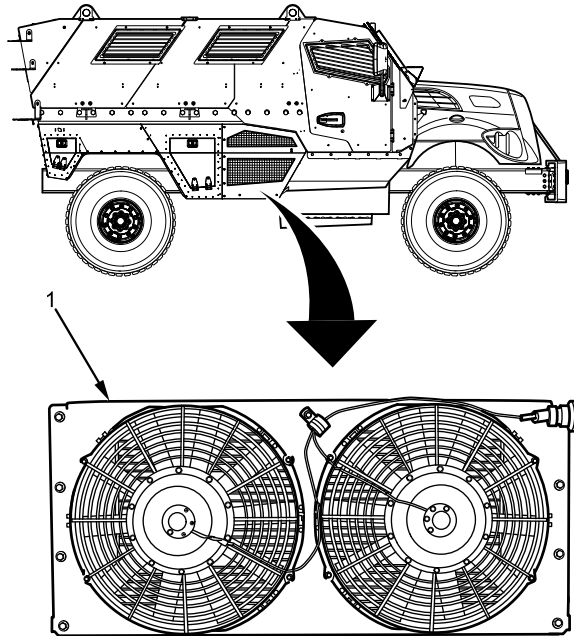
DECISION

YES Go to Step 9.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

8. Observe right side condenser fans operation. Refer to Figure 4.



B230604881

Figure 4. Right Side A/C Condenser Fans Location.

CONDITION/INDICATION

Does only one right side fan not work?

DECISION

YES Go to Step 114.

NO Go to Step 28.

STEP

9. Observe left side condenser fans operation. Refer to Figure 3.

CONDITION/INDICATION

Does only one left side fan not work?

DECISION

YES Go to Step 114.

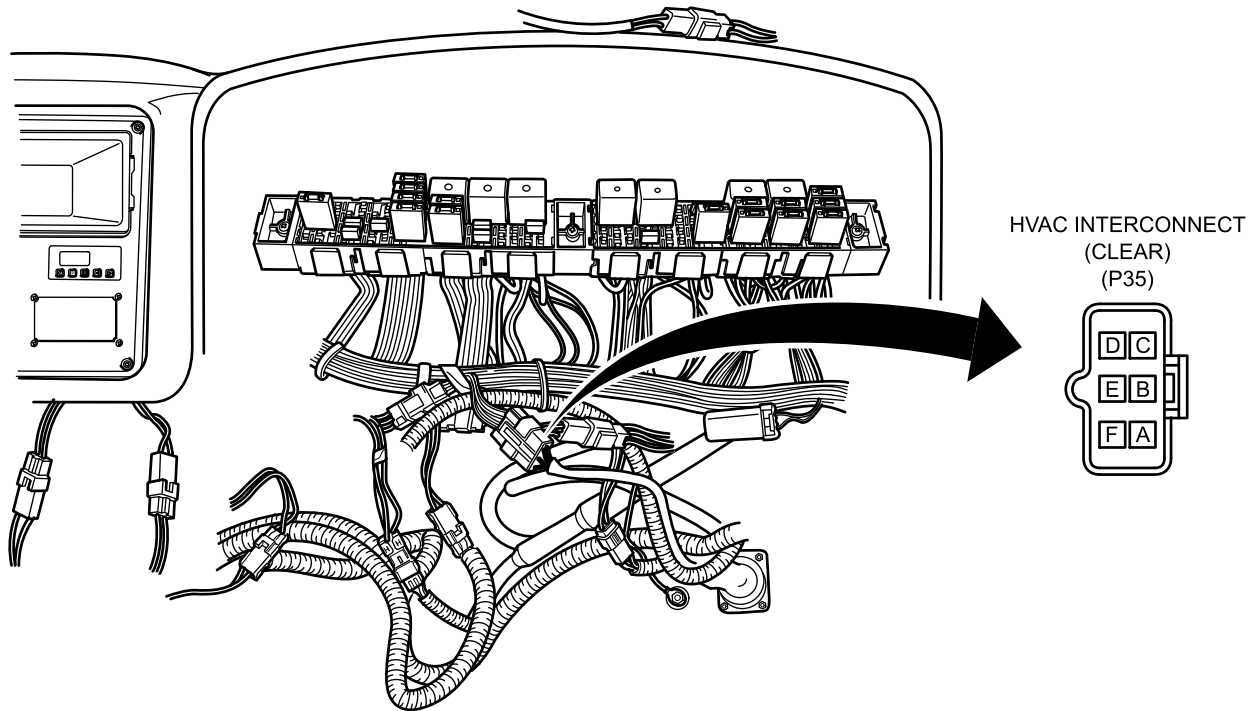
NO Go to Step 71.

STEP

10. Turn ignition switch OFF (TM 9-2355-106-10).
 11. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

12. Remove instrument panel right side closeout fuse access panel. Refer to Instrument Panel (IP) Right Side Closeout Removal and Installation (WP 0580).
13. Disconnect connector P35. Refer to Figure 5.



B230604882

Figure 5. Right Side Instrument Panel Area.

14. Turn MAIN POWER switch ON (TM 9-2355-106-10).
15. Turn ignition switch ON (TM 9-2355-106-10).
16. Measure DC voltage between connector P35 terminal A and ground with multimeter. Refer to Figure 5.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 18.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

17. Measure DC voltage between connector P35 terminals A and B with multimeter. Refer to Figure 5.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

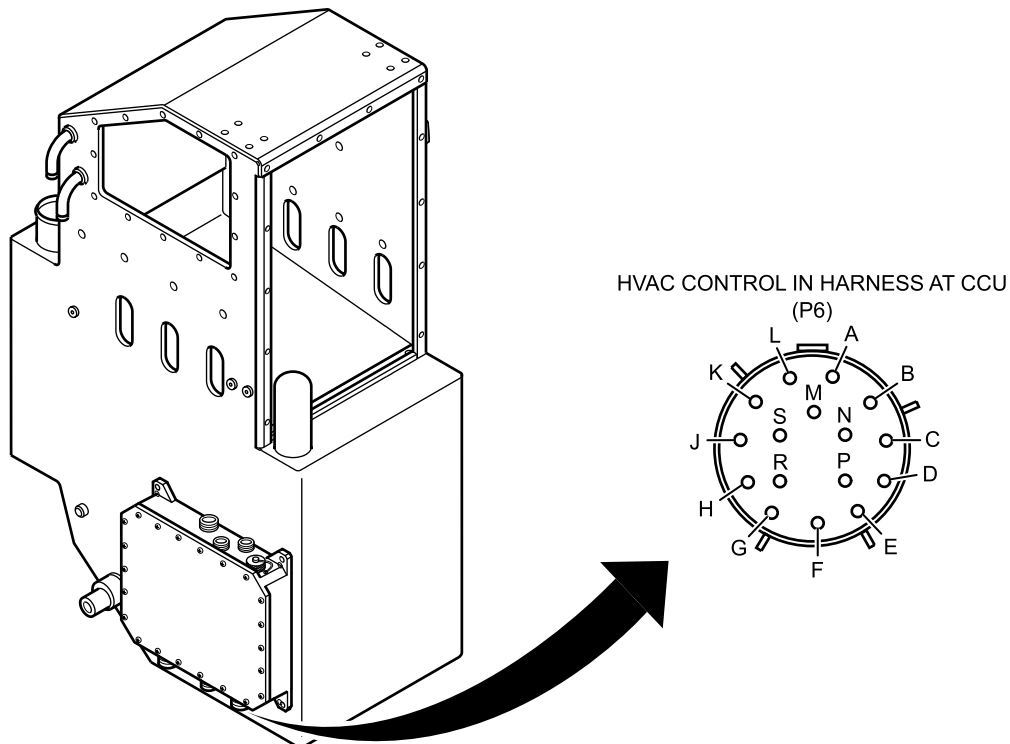
DECISION

YES Go to Step 118.

NO Go to Step 24.

STEP

18. Turn ignition switch OFF (TM 9-2355-106-10).
19. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
20. Disconnect connector P6. Refer to Figure 6.



B230604556

Figure 6. HVAC Box Exterior Area.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****NOTE**

On some vehicles, terminal S on connector J6/P6 is identified as terminal I.

21. Connect jumper wire between connector P6 terminals N and S. Refer to Figure 6.
22. Measure resistance between connector P35 terminals A and B with multimeter. Refer to Figure 5.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 117.

STEP

23. Measure resistance between connector P35 terminal A and ground with multimeter. Refer to Figure 5.

CONDITION/INDICATION

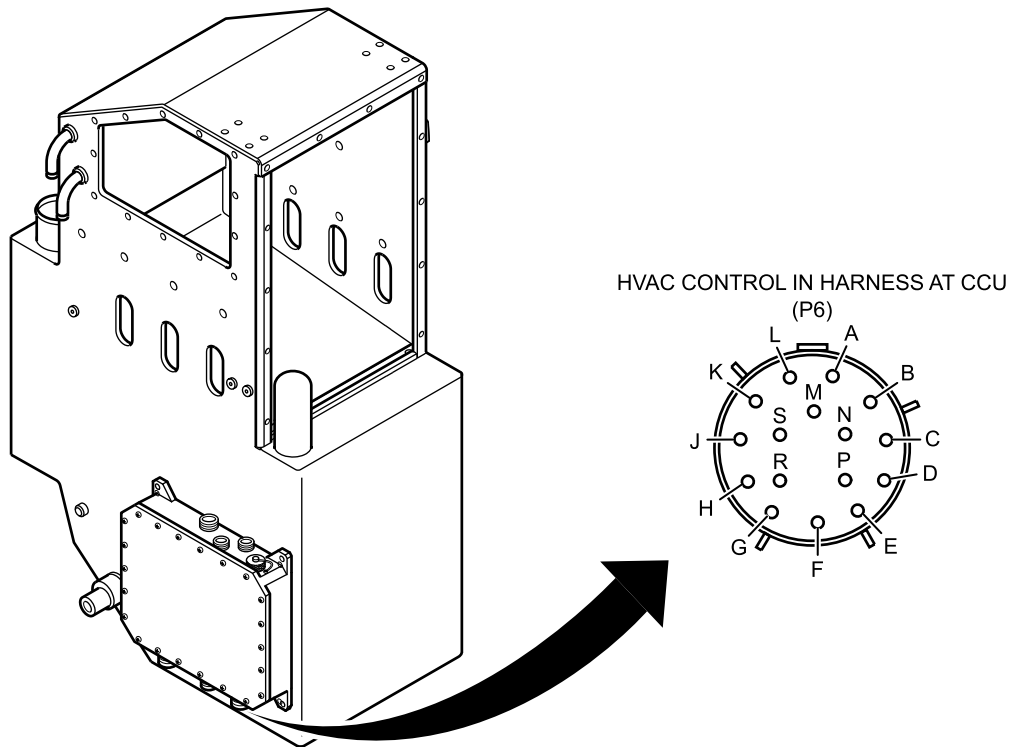
Does multimeter read OL?

DECISION

YES Go to Step 112.
NO Go to Step 117.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

24. Turn ignition switch OFF (TM 9-2355-106-10).
25. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
26. Disconnect connector P6. Refer to Figure 7.



B230604556

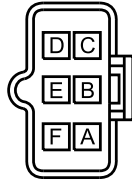
Figure 7. HVAC Box Exterior Area.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****NOTE**

On some vehicles, terminal S on connector J6/P6 is identified as terminal I.

27. Measure resistance between connector P35 terminal B and connector P6 terminal S with multimeter. Refer to Figure 8 and Figure 7.

HVAC INTERCONNECT
(CLEAR)
(P35)



B230604205

Figure 8. Connector P35.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to Step 112.

NO Go to Step 117.

STEP

28. Turn ignition switch OFF (TM 9-2355-106-10).
29. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

30. Remove right side condenser fans relay 1019. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0332). Refer to Figure 9.

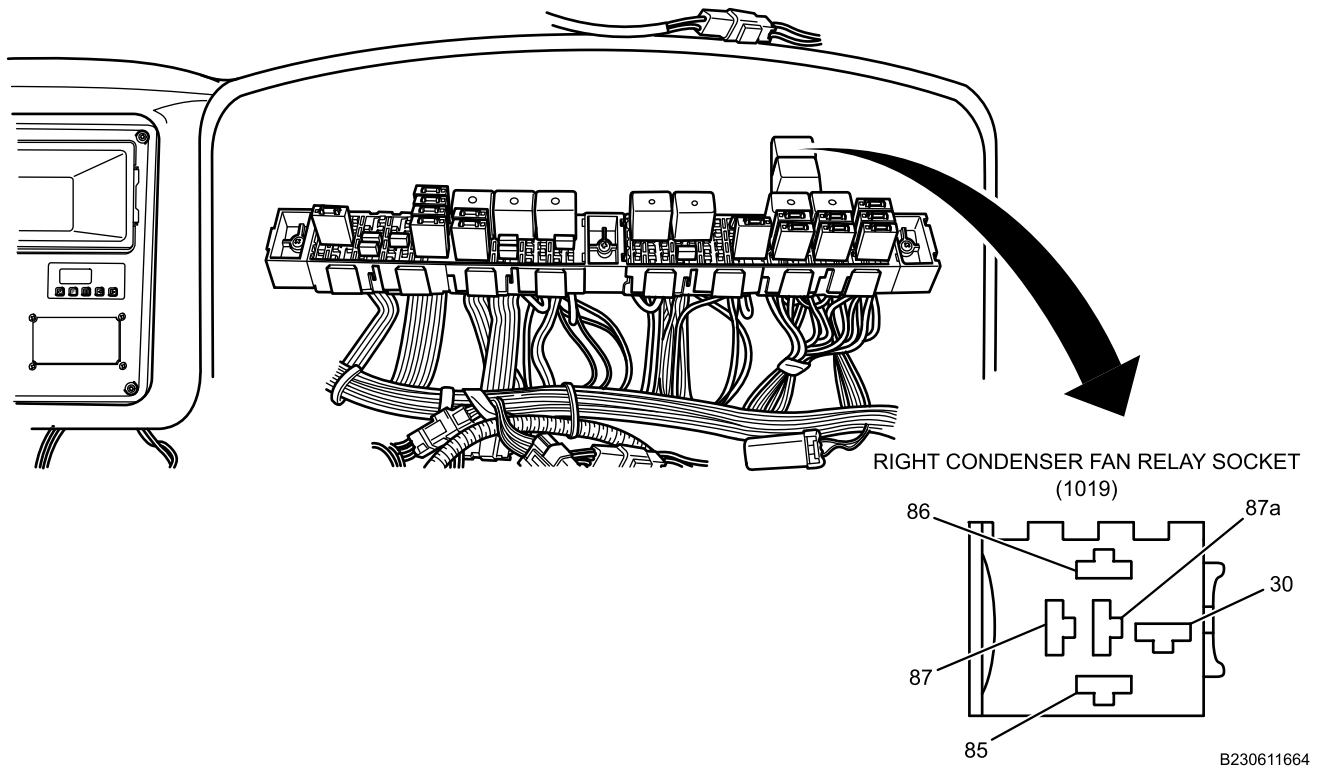


Figure 9. Right Side Instrument Panel Area.

31. Turn MAIN POWER switch ON (TM 9-2355-106-10).
32. Turn ignition switch ON (TM 9-2355-106-10).
33. Measure DC voltage between relay socket 1019 terminals 85 and 86. Refer to Figure 9.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 118.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

34. Measure DC voltage between relay socket 1019 terminal 30 and ground. Refer to Figure 9.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.

NO Go to Step 54.

STEP

35. Connect a jumper wire between relay socket 1019 terminals 30 and 87. Refer to Figure 9.

CONDITION/INDICATION

Do right side condenser fans turn on?

DECISION

YES Go to Step 115.

NO Go to next step.

STEP

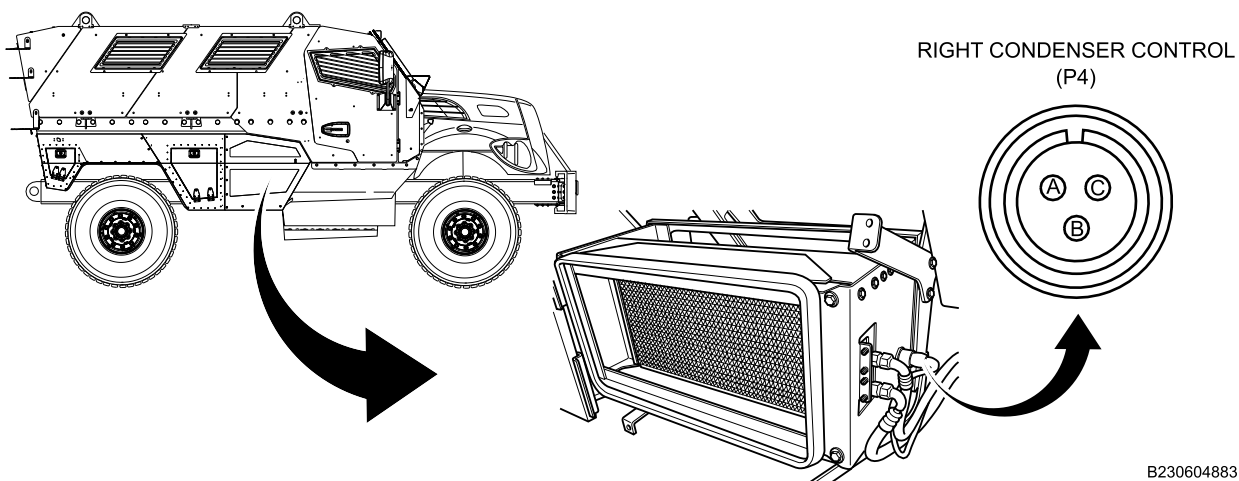
36. Turn ignition switch OFF (TM 9-2355-106-10).

37. Turn MAIN POWER switch OFF (TM 9-2355-106-10).

38. Remove jumper wire from relay socket 1019.

39. Remove right side Air Conditioning (A/C) condenser panel. Refer to Air Conditioning (A/C) Condenser Panel Removal and Installation (WP 0672).

40. Disconnect connector P4. Refer to Figure 10.



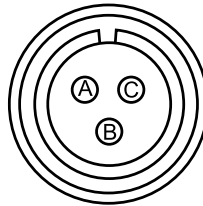
B230604883

Figure 10. Right Side Condenser Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

41. Connect a jumper wire between connector P4 terminals A and B. Refer to Figure 11.

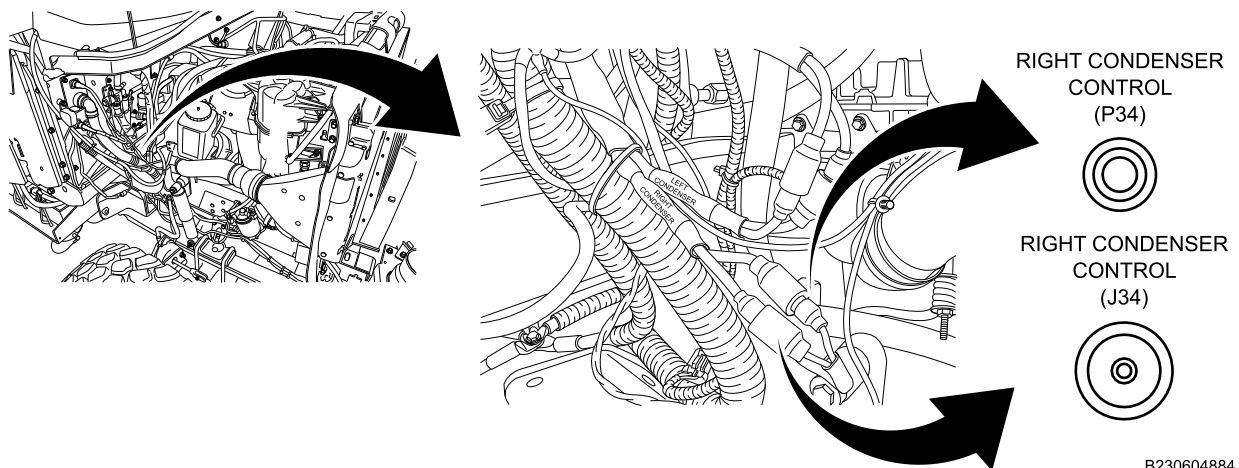
RIGHT CONDENSER CONTROL
(P4)



B230604413

Figure 11. Connector P4.

42. Remove right side engine armor. Refer to Right Side Engine Armor Plate Removal and Installation (WP 0599).
43. Disconnect connectors P34 and J34. Refer to Figure 12.



B230604884

Figure 12. Right Side Engine Compartment Area.

44. Measure resistance between connectors P34 and J34 (condenser fans side) with multimeter. Refer to Figure 12.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

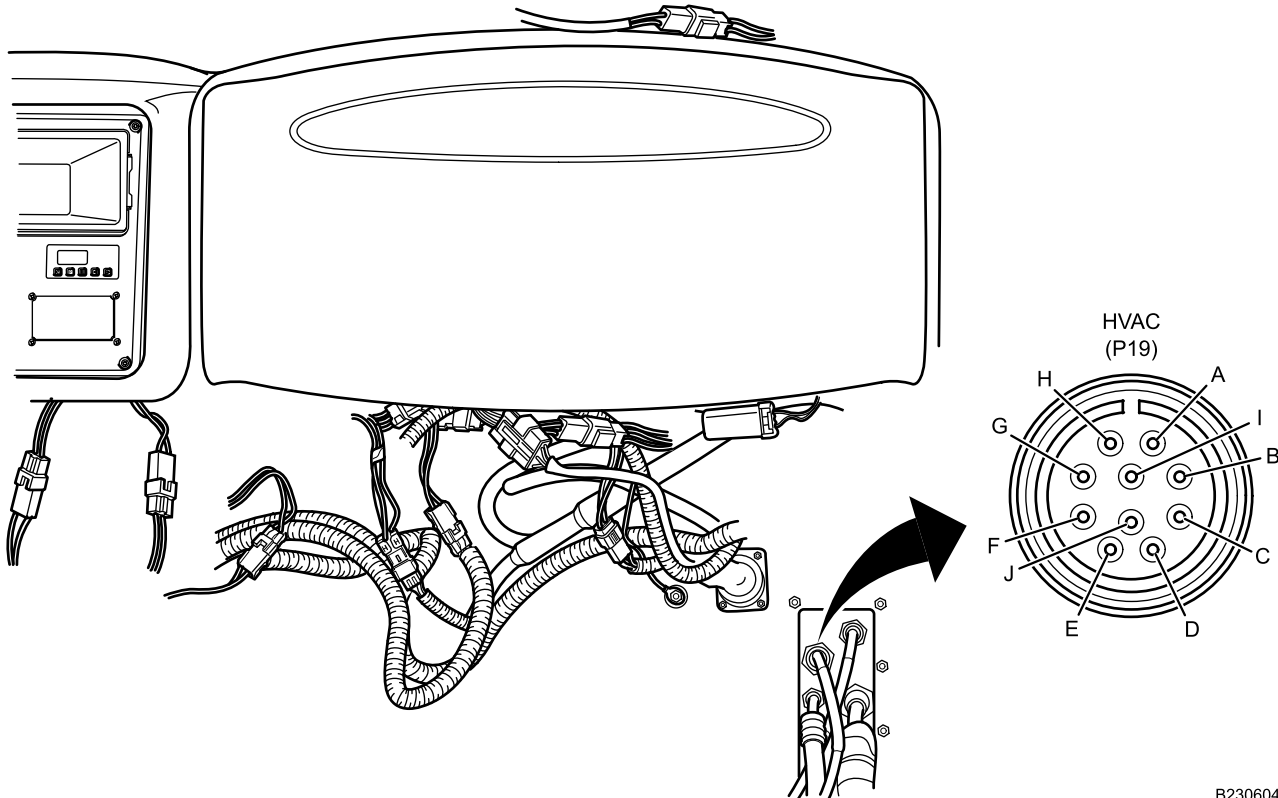
DECISION

YES Go to next step.
NO Go to Step 120.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

45. Connect connectors P34 and J34. Refer to Figure 12.
46. Disconnect connector P19. Refer to Figure 13.



B230604671

Figure 13. Right Side Instrument Panel Area.

47. Measure resistance between connector P19 terminals I and D, terminals I and F, and terminals I and E. Refer to Figure 13.

CONDITION/INDICATION

Does multimeter read less than 5 ohms for each measurement?

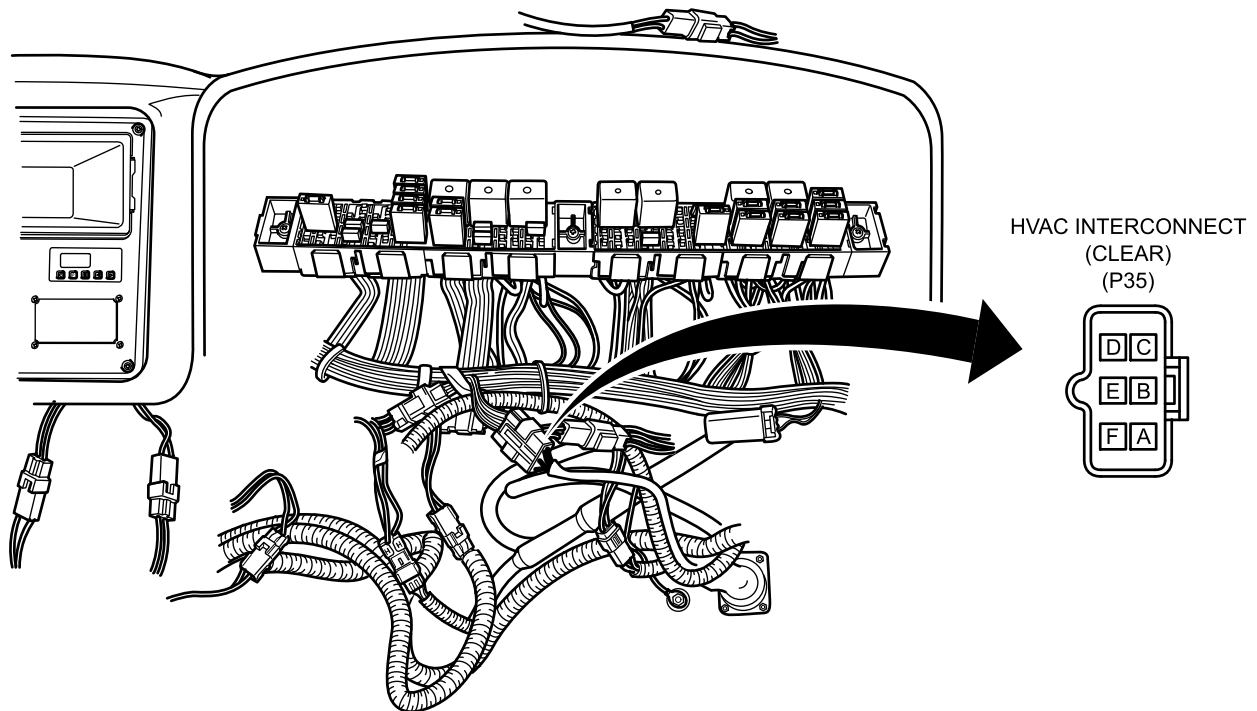
DECISION

YES Go to next step.
NO Go to Step 116.

STEP

48. Connect connector P19. Refer to Figure 13.
49. Remove instrument panel right side closeout fuse access panel. Refer to Instrument Panel (IP) Right Side Closeout Removal and Installation (WP 0580).
50. Disconnect connector P35. Refer to Figure 14.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604882

Figure 14. Right Side Instrument Panel Area.

51. Measure resistance between connector P35 terminals D and F with multimeter. Refer to Figure 14.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.

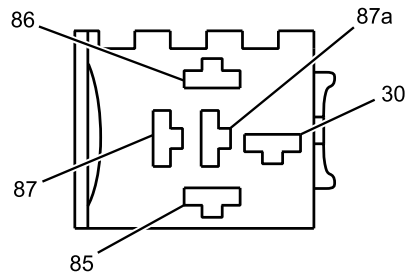
NO Go to Step 117.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

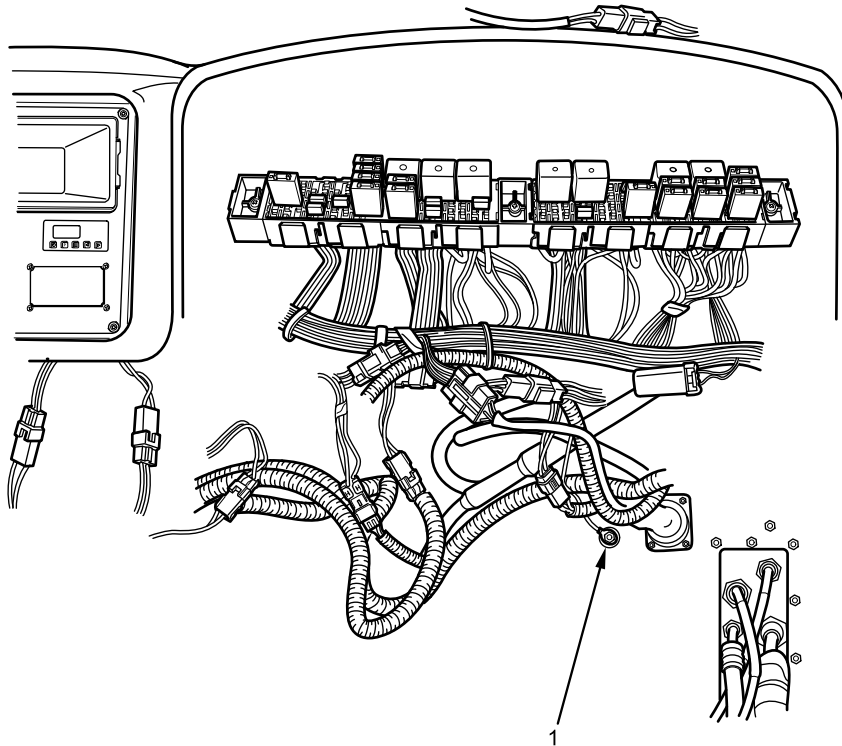
- 52. Connect connector P35. Refer to Figure 14.
- 53. Measure resistance between relay socket 1019 terminal 87 and ground stud 1055 (Figure 16, Item 1) with multimeter. Refer to Figure 15.

RIGHT CONDENSER FAN RELAY SOCKET
(1019)



B230603865

Figure 15. Relay Socket 1019.



B230604887

Figure 16. Right Side Instrument Panel Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

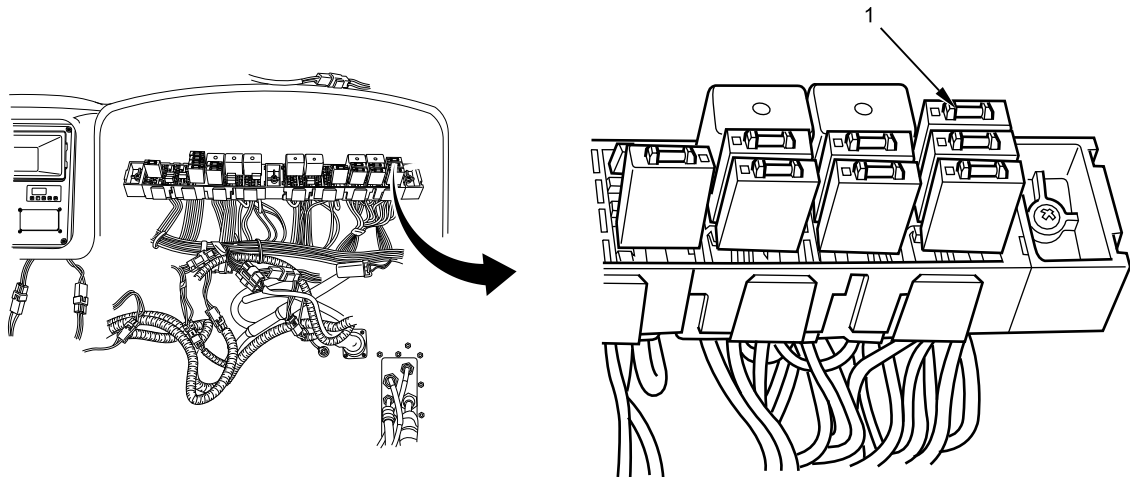
DECISION

YES Go to Step 114.

NO Go to Step 118.

STEP

54. Remove instrument panel right side closeout fuse access panel. Refer to Instrument Panel (IP) Right Side Closeout Removal and Installation (WP 0580).
55. Compare circuit breaker F45 reset button (Figure 17, Item 1) with other circuit breaker reset buttons in IP circuit breaker, fuse, and relay center.



B230604885

Figure 17. Circuit Breaker F45 Reset Button.

CONDITION/INDICATION

Is circuit breaker F45 reset button popped up?

DECISION

YES Go to next step.

NO Go to Step 66.

STEP

56. Push reset button on circuit breaker F45 (Figure 17, Item 1).

CONDITION/INDICATION

Does reset button pop back up?

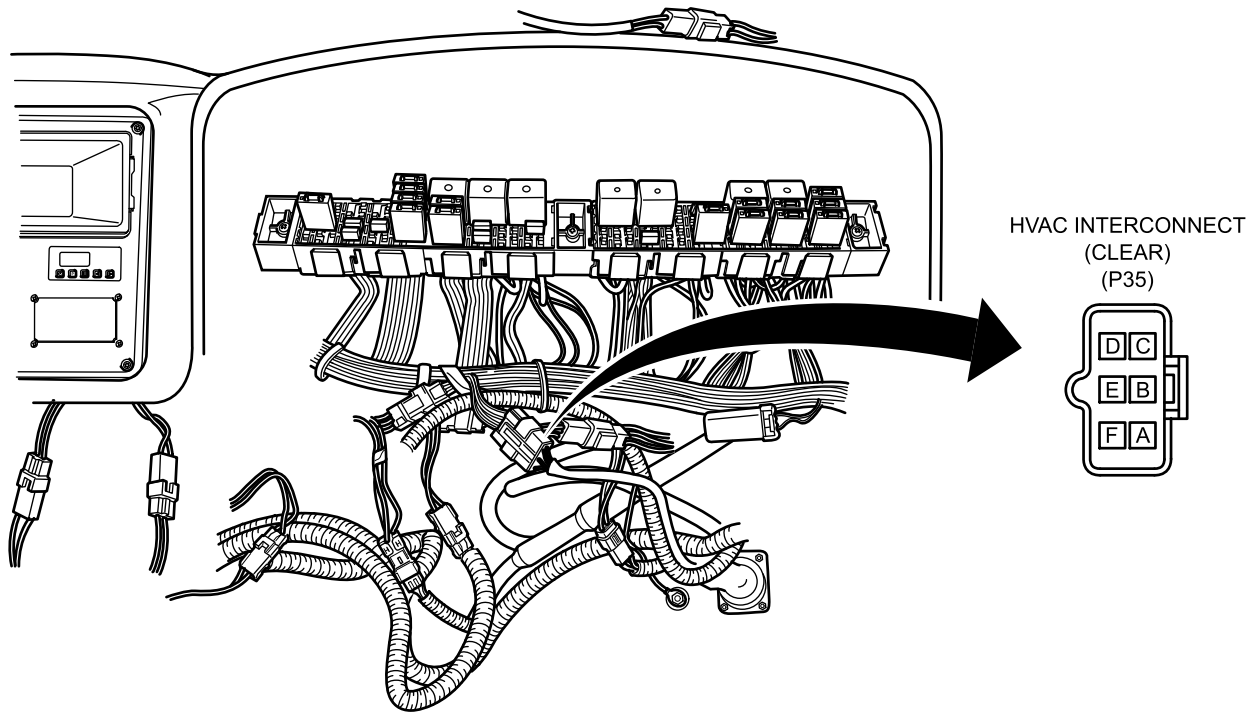
DECISION

YES Go to Step 118.

NO Go to next step.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

57. Disconnect connector P35. Refer to Figure 18.



B230604882

Figure 18. Right Side Instrument Panel Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

58. Install relay 1019. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0332). Refer to Figure 19.

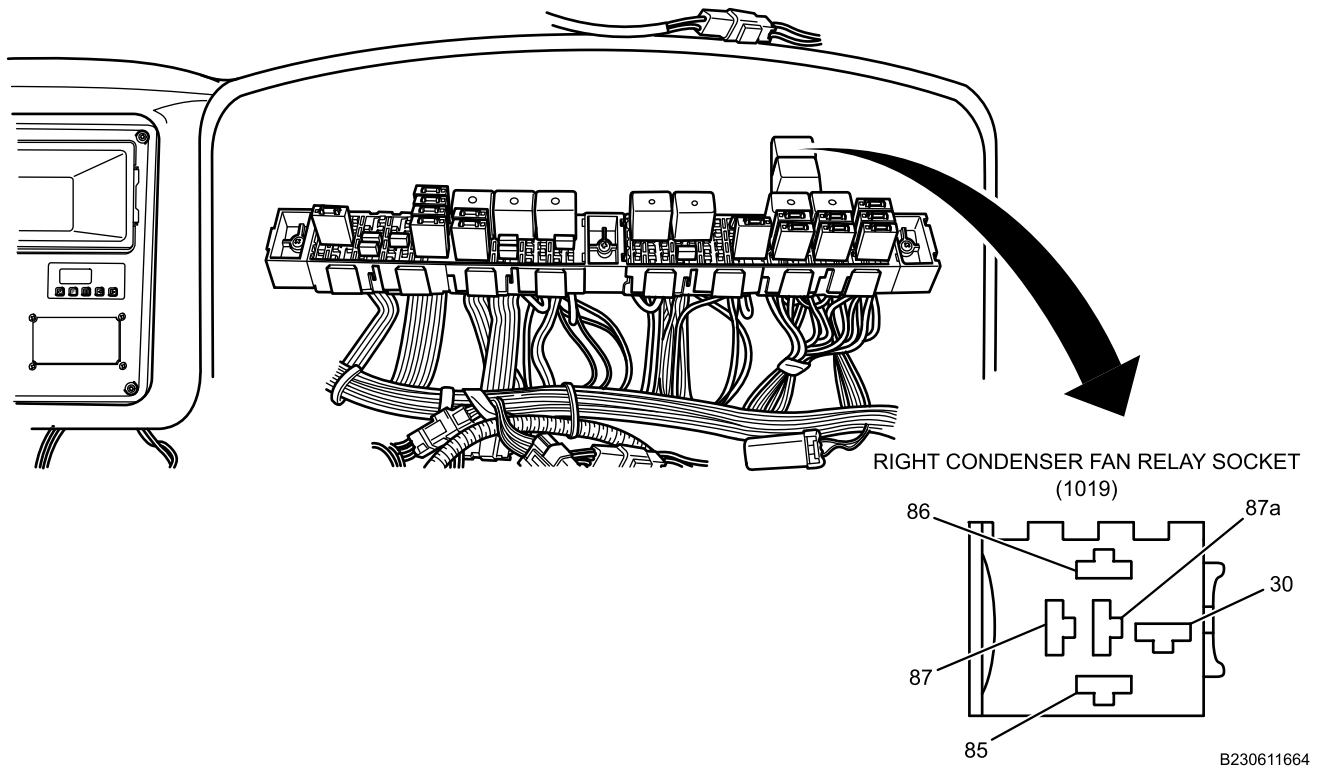


Figure 19. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F45 pop back up?

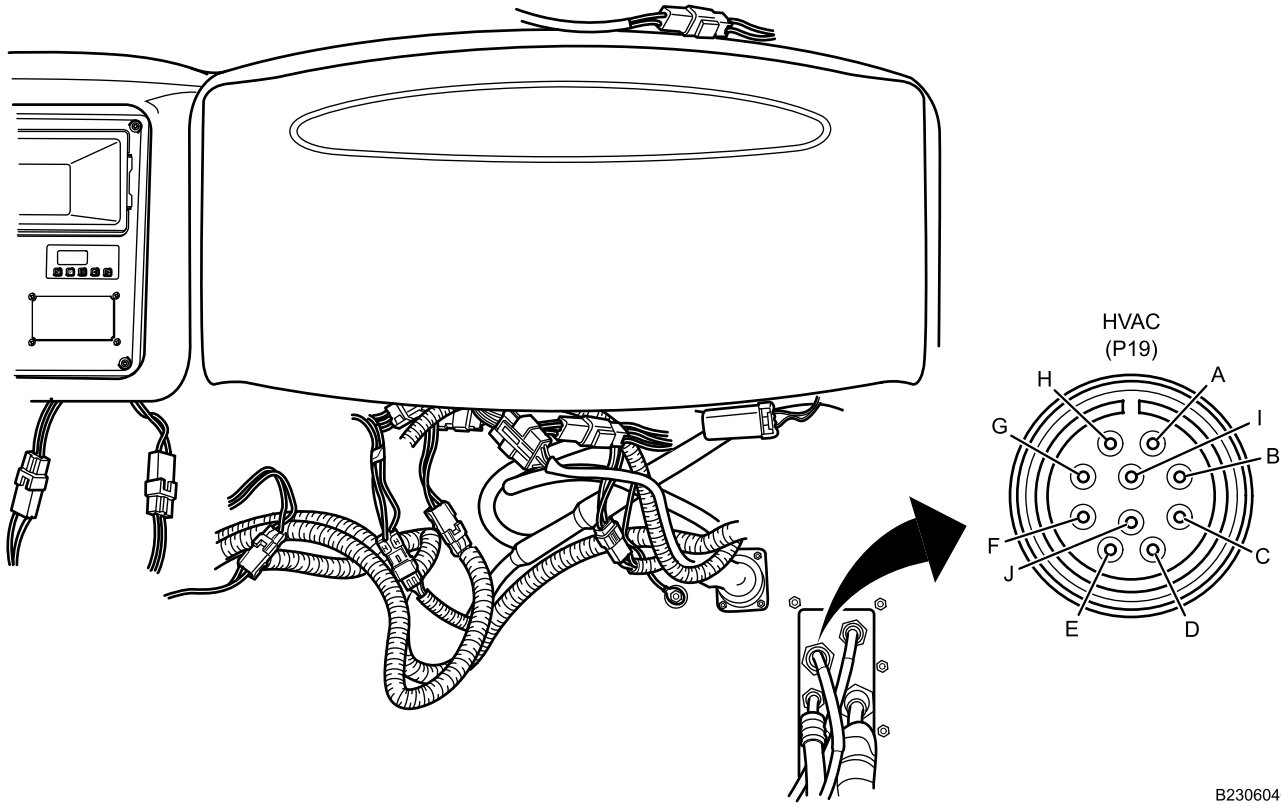
DECISION

YES Go to Step 118.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

59. Disconnect connector P19. Refer to Figure 20.

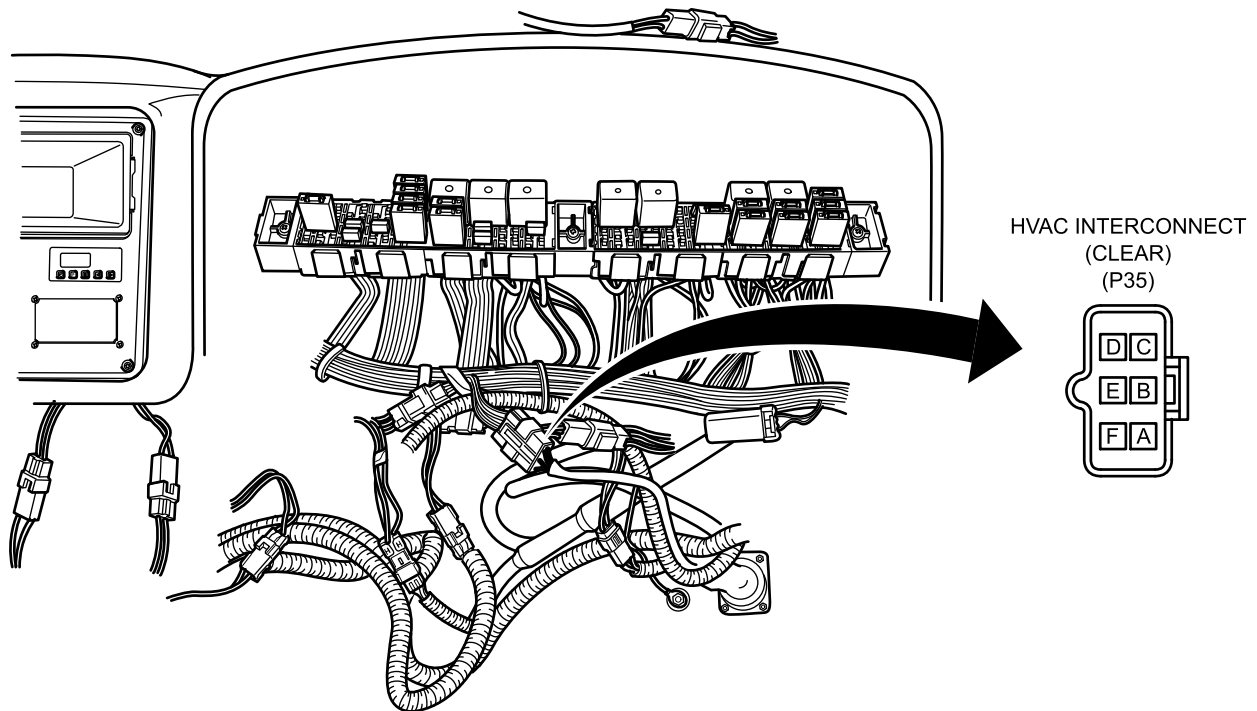


B230604671

Figure 20. Right Side Instrument Panel Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

60. Connect connector P35. Refer to Figure 21.



B230604882

Figure 21. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F45 pop back up?

DECISION

YES Go to Step 117.

NO Go to next step.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

61. Remove right side engine armor. Refer to Right Side Engine Armor Plate Removal and Installation (WP 0599).
62. Disconnect connectors P34 and J34. Refer to Figure 22.

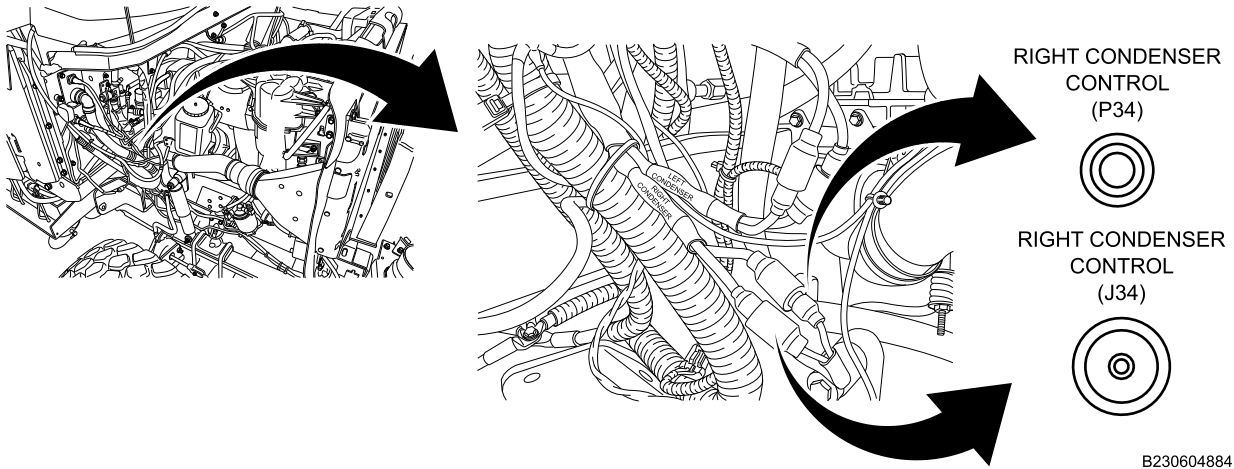
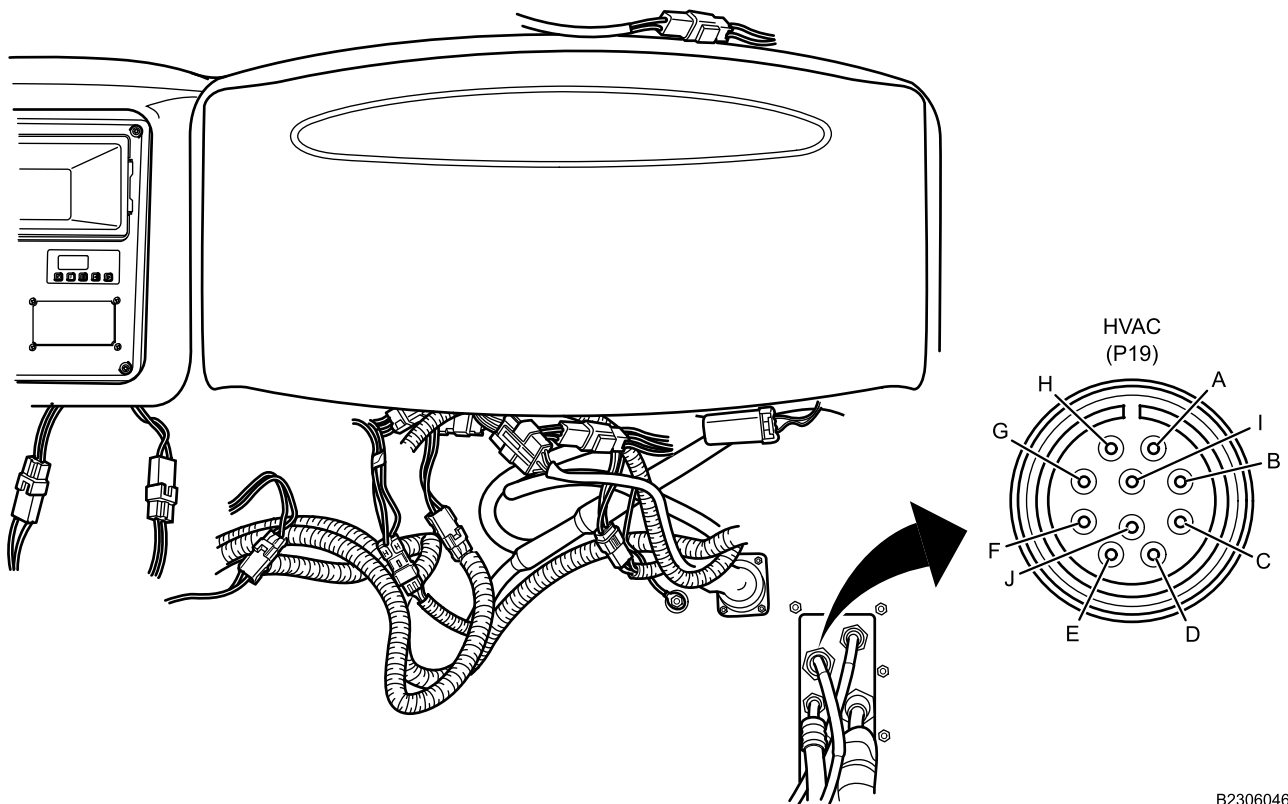


Figure 22. Right Side Engine Compartment Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

63. Connect connector P19. Refer to Figure 23.



B230604671

Figure 23. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F45 pop back up?

DECISION

YES Go to Step 116.

NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

64. Disconnect connector P4. Refer to Figure 24.

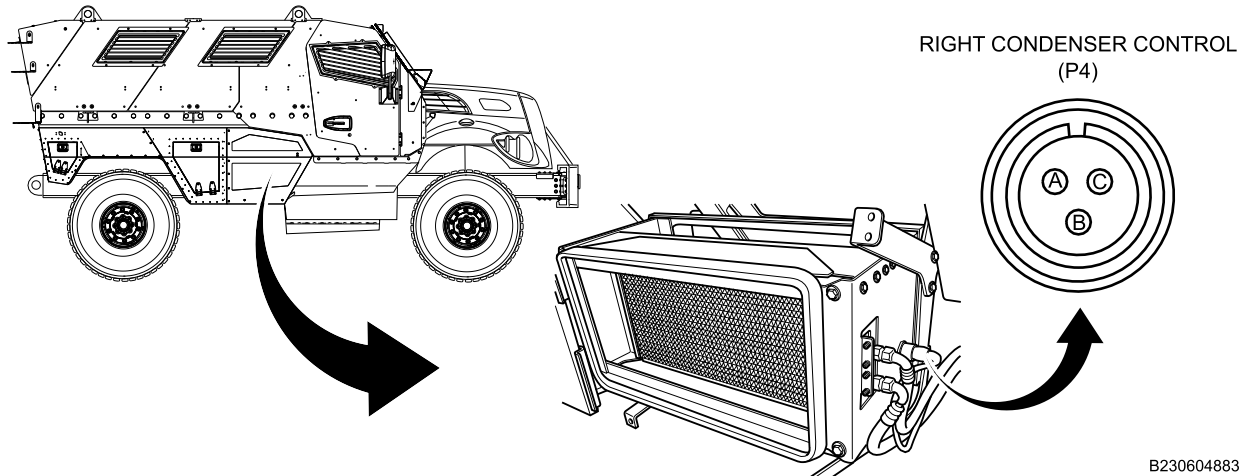


Figure 24. Right Side Condenser Fans Area.

65. Connect connectors P34 and J34. Refer to Figure 25.

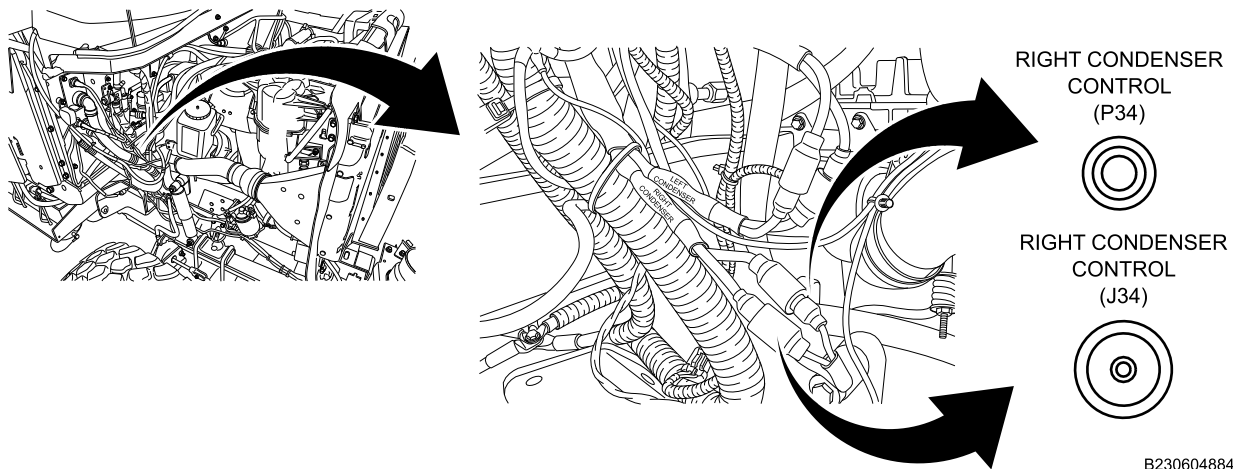


Figure 25. Right Side Engine Compartment Area.

CONDITION/INDICATION

Does reset button on circuit breaker F45 pop back up?

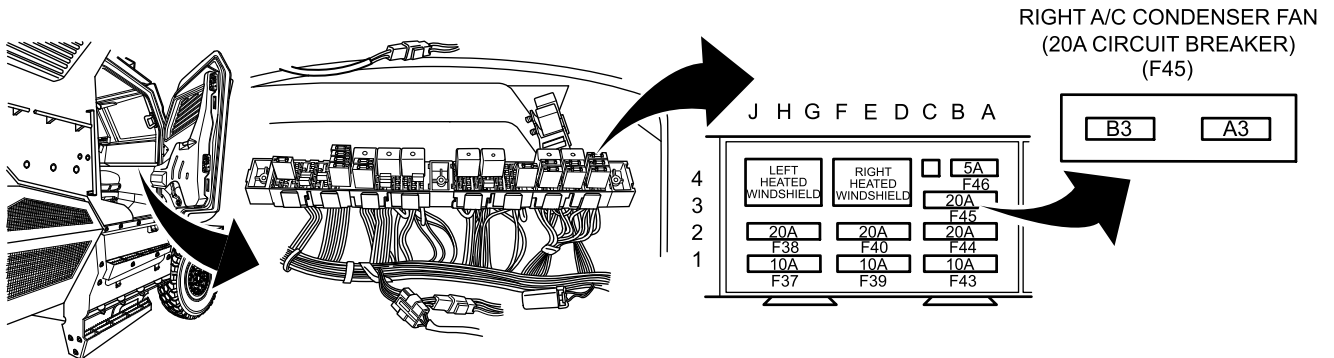
DECISION

YES Go to Step 120.
 NO Go to Step 114.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

66. Remove circuit breaker F45. Refer to Instrument Panel Circuit Breaker, Fuse, and Relay Removal and Installation (WP 0317). Refer to Figure 26.

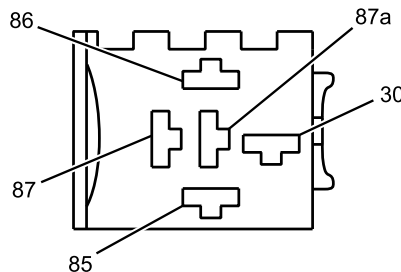


B230605528

Figure 26. Right Instrument Panel Area.

67. Measure resistance between circuit breaker socket F45 terminal B3 and relay socket 1019 terminal 30 with multimeter. Refer to Figure 26 and Figure 27.

RIGHT CONDENSER FAN RELAY SOCKET (1019)



B230603865

Figure 27. Relay Socket 1019.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.
NO Go to Step 118.

STEP

- 68. Turn MAIN POWER switch ON (TM 9-2355-106-10).
- 69. Turn ignition switch ON (TM 9-2355-106-10).
- 70. Measure DC voltage between circuit breaker socket F45 terminal A3 and ground with multimeter. Refer to Figure 26.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to Step 113.

NO Refer to Power Distribution Troubleshooting Procedure (WP 0059).

STEP

71. Turn ignition switch OFF (TM 9-2355-106-10).
72. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
73. Remove left side condenser fans relay 1018. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0332). Refer to Figure 28.

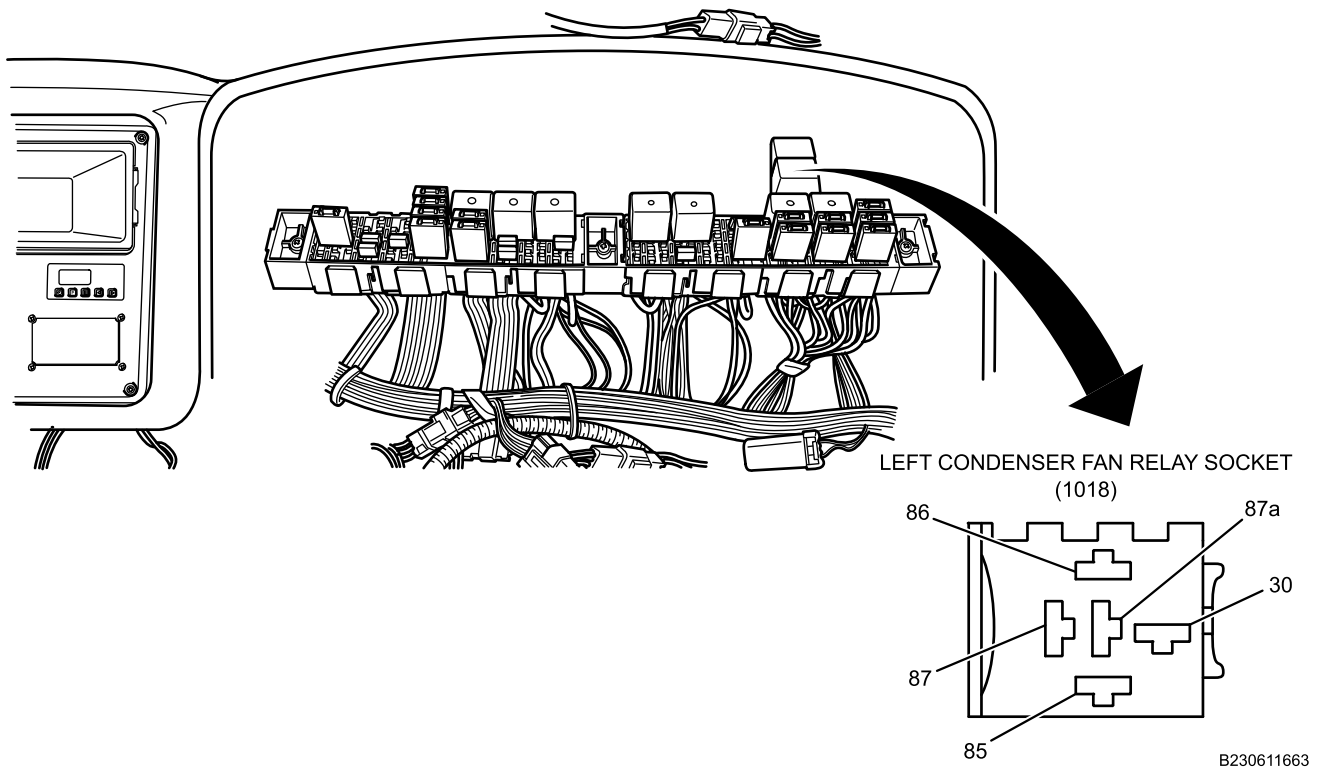
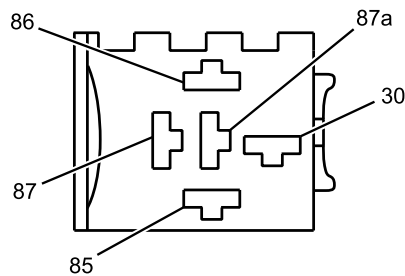


Figure 28. Right Side Instrument Panel Area.

74. Turn MAIN POWER switch ON (TM 9-2355-106-10).
75. Turn ignition switch ON (TM 9-2355-106-10).
76. Measure DC voltage between relay socket 1018 terminals 85 and 86. Refer to Figure 29.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

LEFT CONDENSER FAN RELAY SOCKET
(1018)



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Figure 29. Relay Socket 1018.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 118.

STEP

77. Measure DC voltage between relay socket 1018 terminal 30 and ground. Refer to Figure 29.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to next step.
NO Go to Step 95.

STEP

78. Connect a jumper wire between relay socket 1018 terminals 30 and 87. Refer to Figure 29.

CONDITION/INDICATION

Do left side condenser fans turn on?

DECISION

YES Go to Step 115.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

79. Turn ignition switch OFF (TM 9-2355-106-10).
80. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
81. Remove jumper wire from relay socket 1018.
82. Disconnect connector P3. Refer to Figure 30.

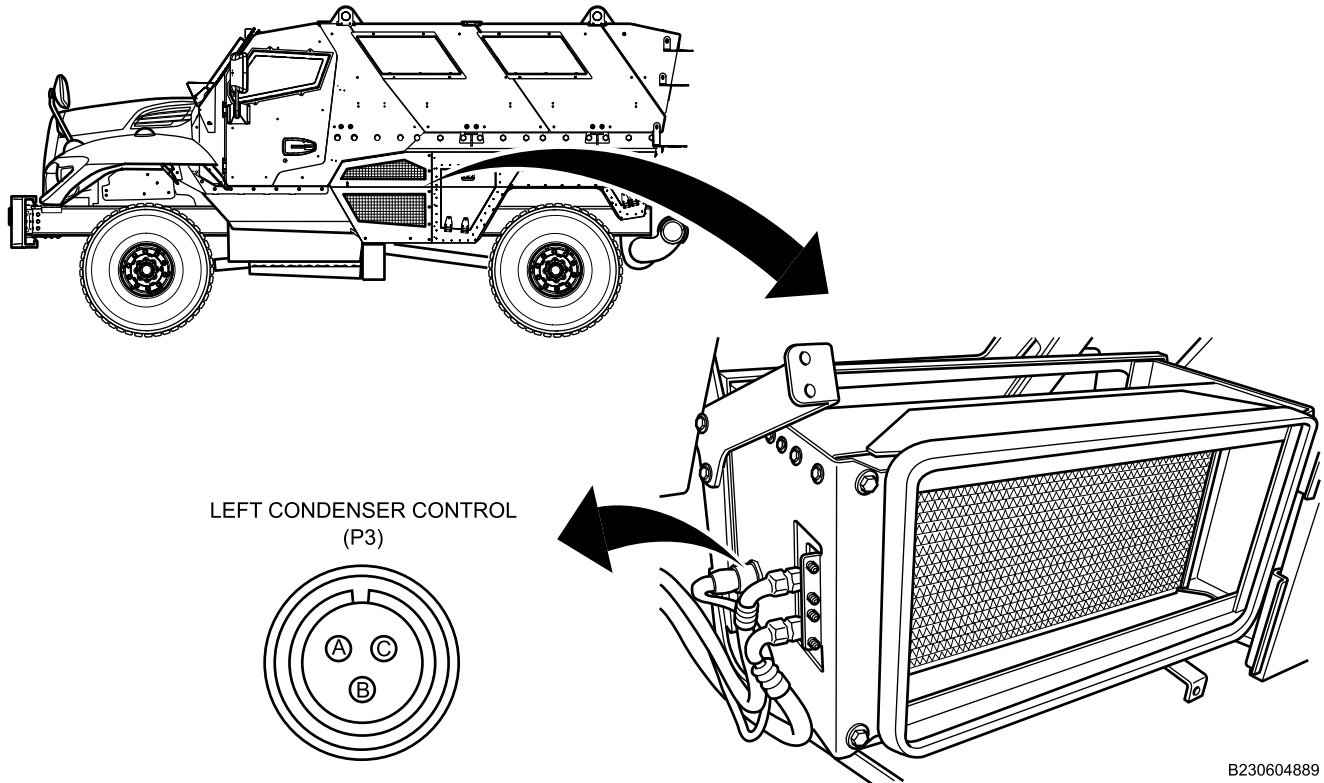
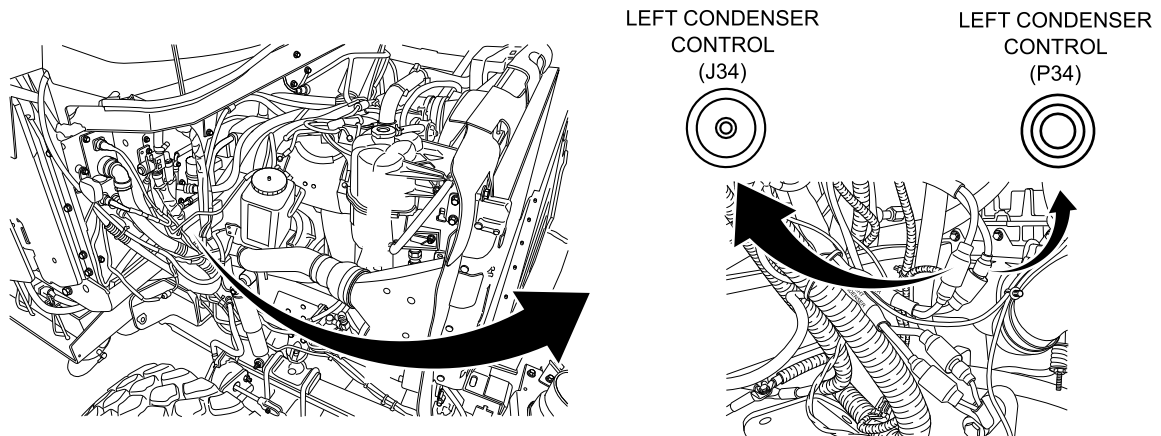


Figure 30. Left Side Condenser Fans Area.

83. Connect jumper wire between connector P3 terminals A and B. Refer to Figure 30.
84. Remove right side engine armor. Refer to Right Side Engine Armor Plate Removal and Installation (WP 0599).
85. Disconnect connectors P34 and J34. Refer to Figure 31.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)



B230604890

Figure 31. Right Side Engine Compartment Area.

86. Measure resistance between connectors P34 and J34 (condenser fans side) with multimeter. Refer to Figure 31.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

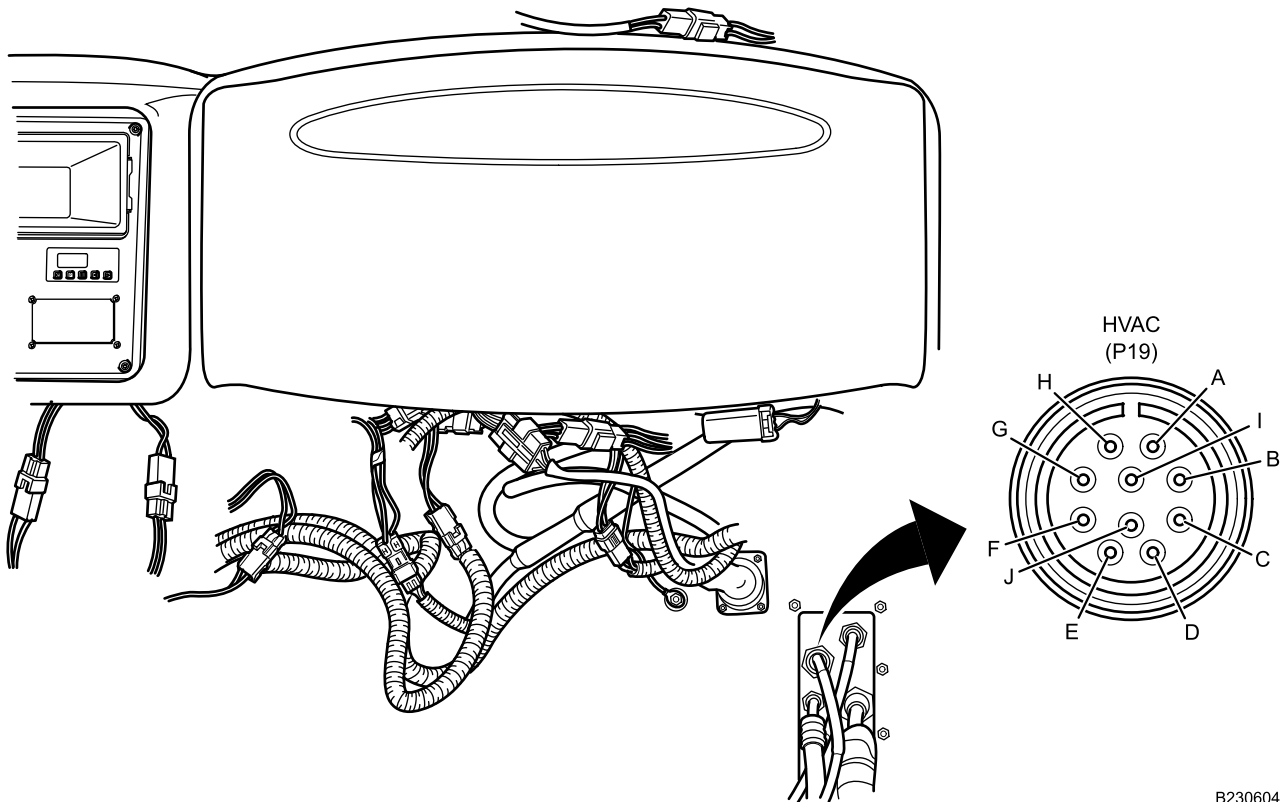
YES Go to next step.
NO Go to Step 119.

STEP

87. Connect connectors P34 and J34. Refer to Figure 31.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

88. Disconnect connector P19. Refer to Figure 32.



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Figure 32. Right Side Instrument Panel Area.

89. Measure resistance between connector P19 terminals B and H, terminals B and C, and terminals B and G. Refer to Figure 32.

CONDITION/INDICATION

Does multimeter read less than 5 ohms for each measurement?

DECISION

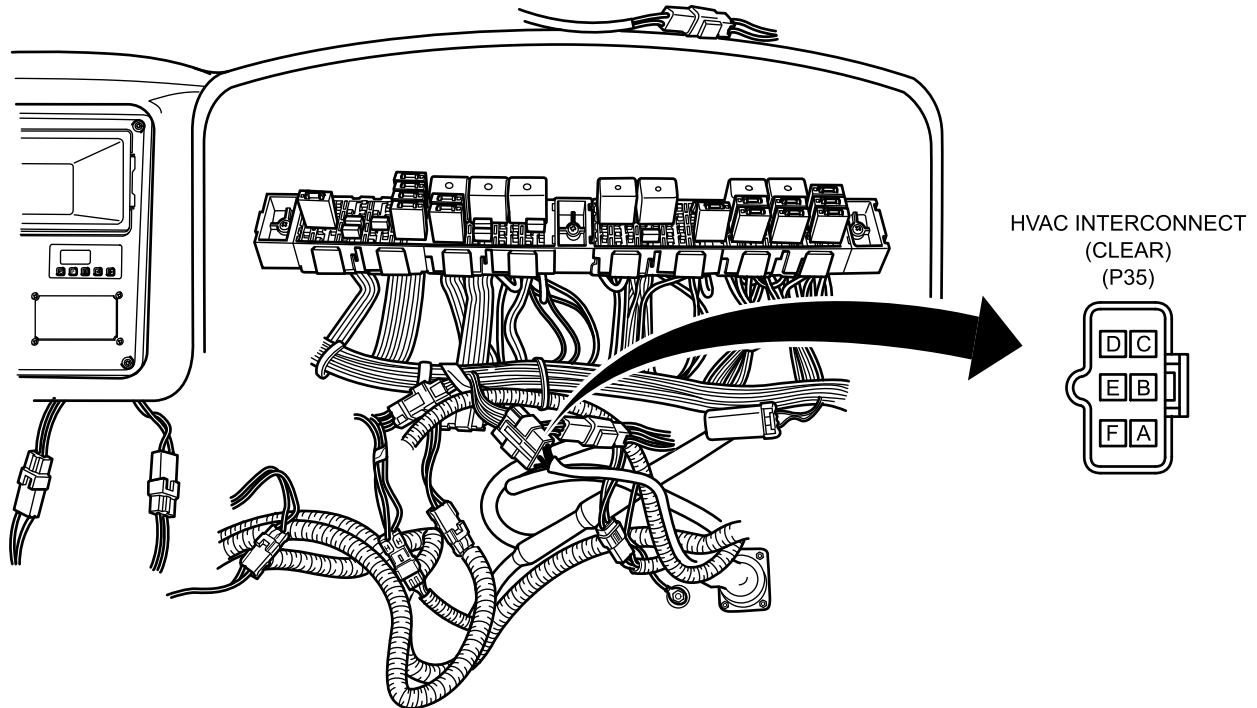
YES Go to next step.

NO Go to Step 116.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

90. Connect connector P19. Refer to Figure 32.
 91. Disconnect connector P35. Refer to Figure 33.



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Figure 33. Right Side Instrument Panel Area.

92. Measure resistance between connector P35 terminals C and E with multimeter. Refer to Figure 33.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

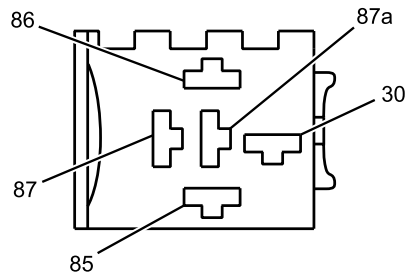
YES Go to next step.
 NO Go to Step 117.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

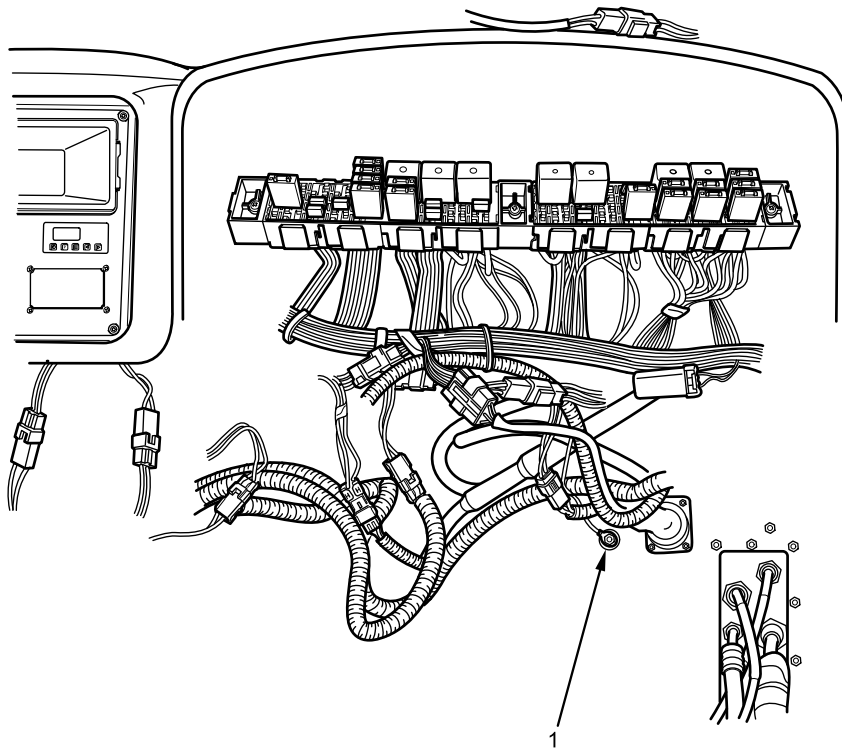
- 93. Connect connector P35. Refer to Figure 33.
- 94. Measure resistance between relay socket 1018 terminal 87 and ground stud 1055 (Figure 35, Item 1) with multimeter. Refer to Figure 34.

LEFT CONDENSER FAN RELAY SOCKET
(1018)



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Figure 34. Relay Socket 1018.



B230604887

Figure 35. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

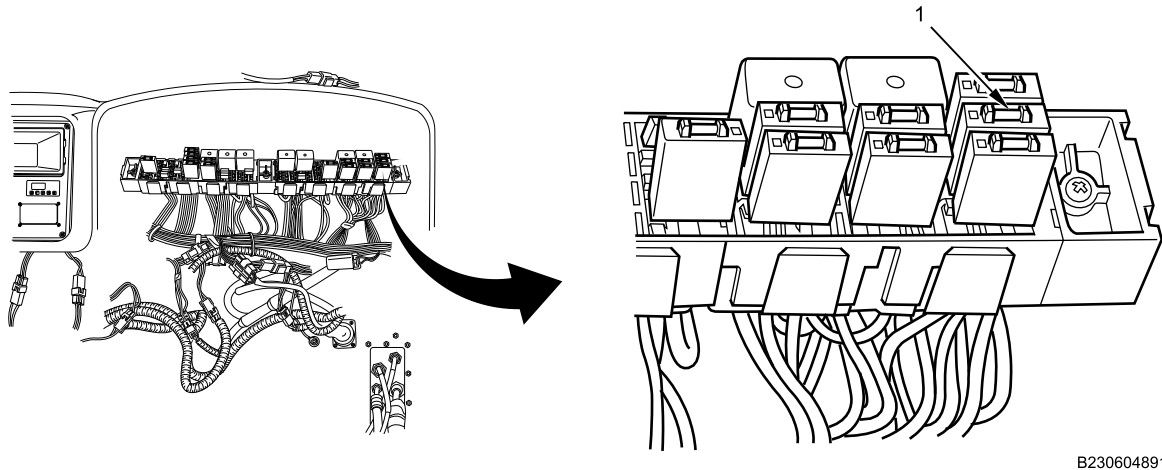
DECISION

- YES Go to Step 114.
- NO Go to Step 118.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

95. Remove right side instrument panel closeout. Refer to Instrument Panel Right Side Closeout Removal and Installation (WP 0317).
96. Compare circuit breaker F44 reset button (Figure 36, Item 1) with other circuit breaker reset buttons in IP circuit breaker, fuse, and relay center.



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Figure 36. Circuit Breaker F44 Reset Button.

CONDITION/INDICATION

Is circuit breaker F44 reset button popped up?

DECISION

YES Go to next step.
NO Go to Step 107.

STEP

97. Push reset button on circuit breaker F44 (Figure 36, Item 1).

CONDITION/INDICATION

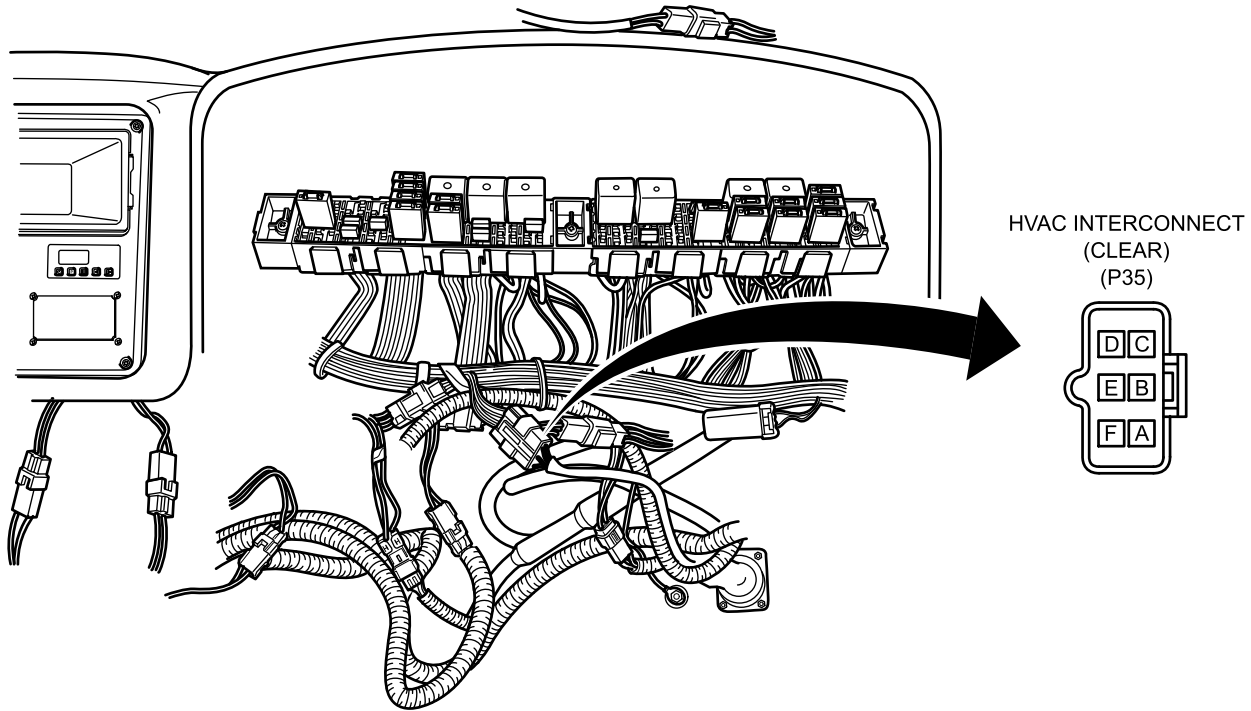
Does reset button pop back up?

DECISION

YES Go to Step 118.
NO Go to next step.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****STEP**

98. Disconnect connector P35. Refer to Figure 37.



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Figure 37. Right Side Instrument Panel Area.

99. Install relay 1018. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0332). Refer to Figure 38.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

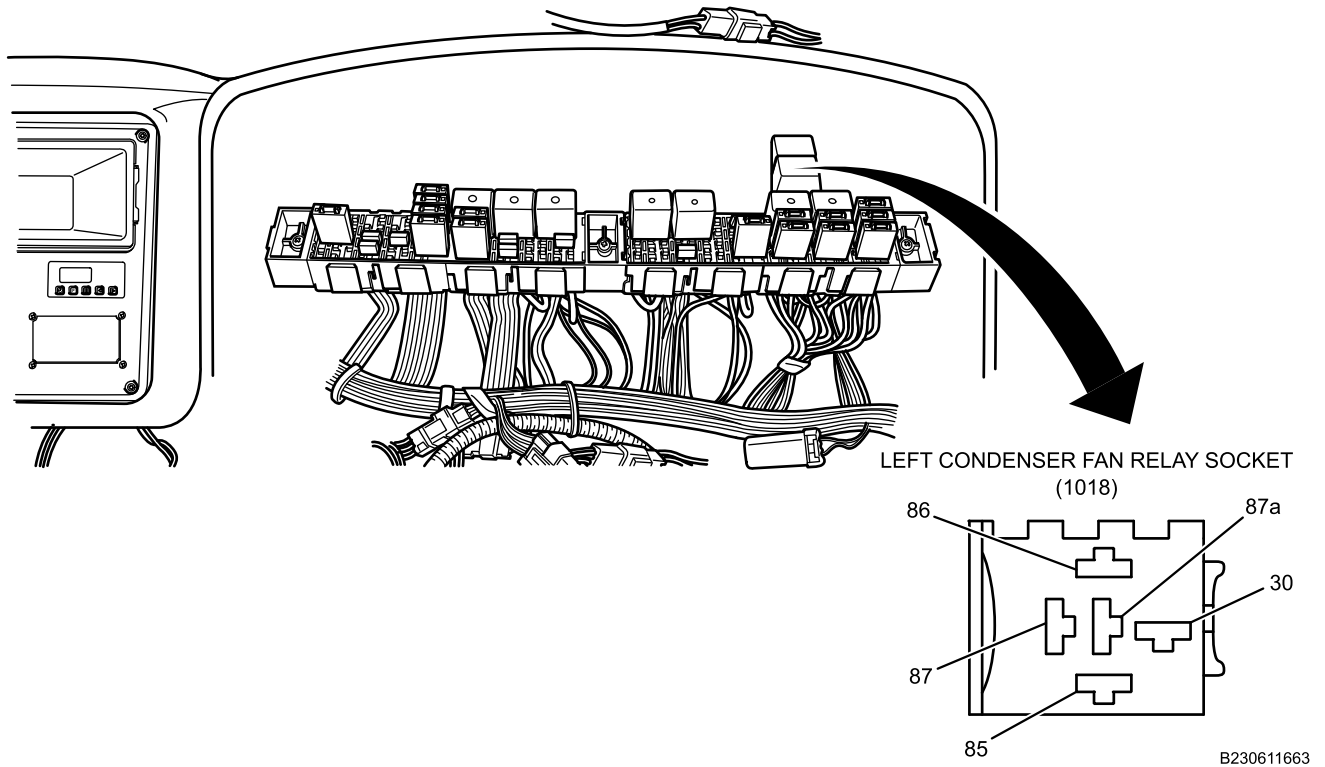


Figure 38. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F44 pop back up?

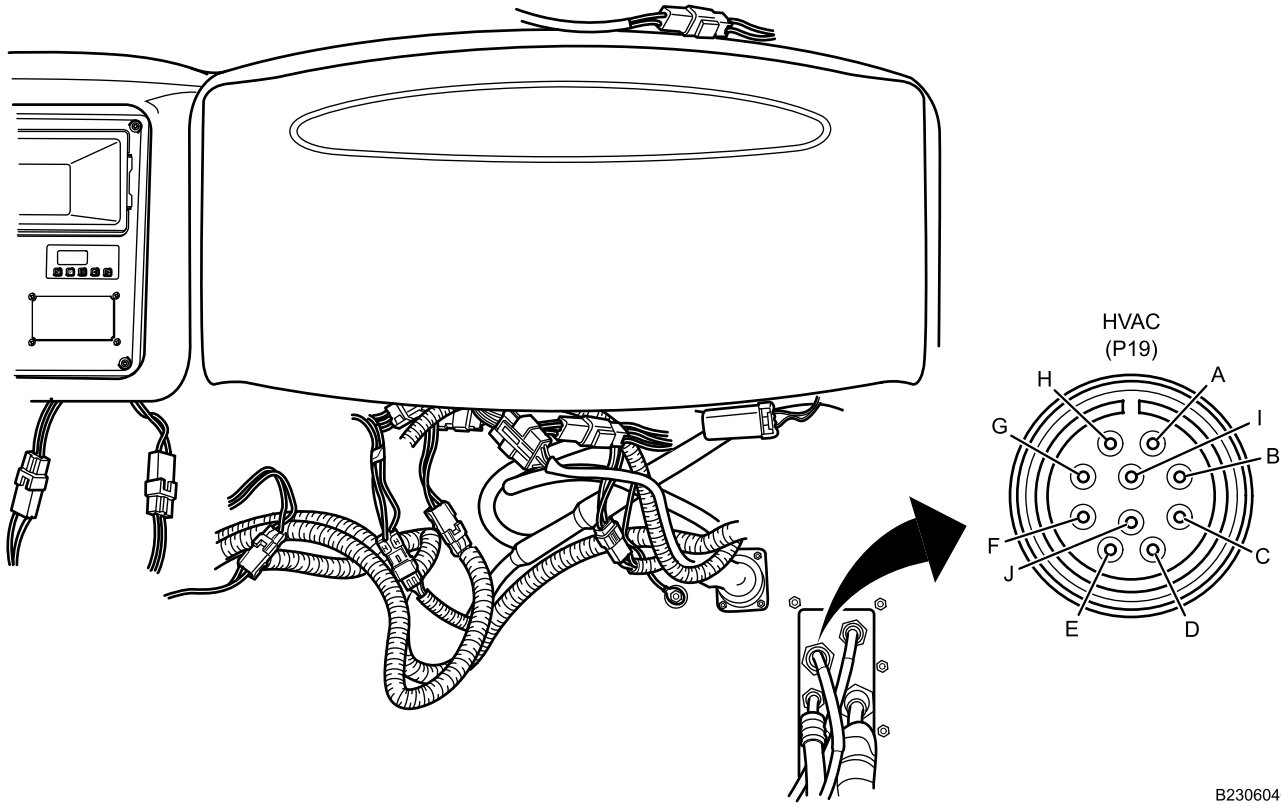
DECISION

YES Go to Step 118.
 NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

100. Disconnect connector P19. Refer to Figure 39.

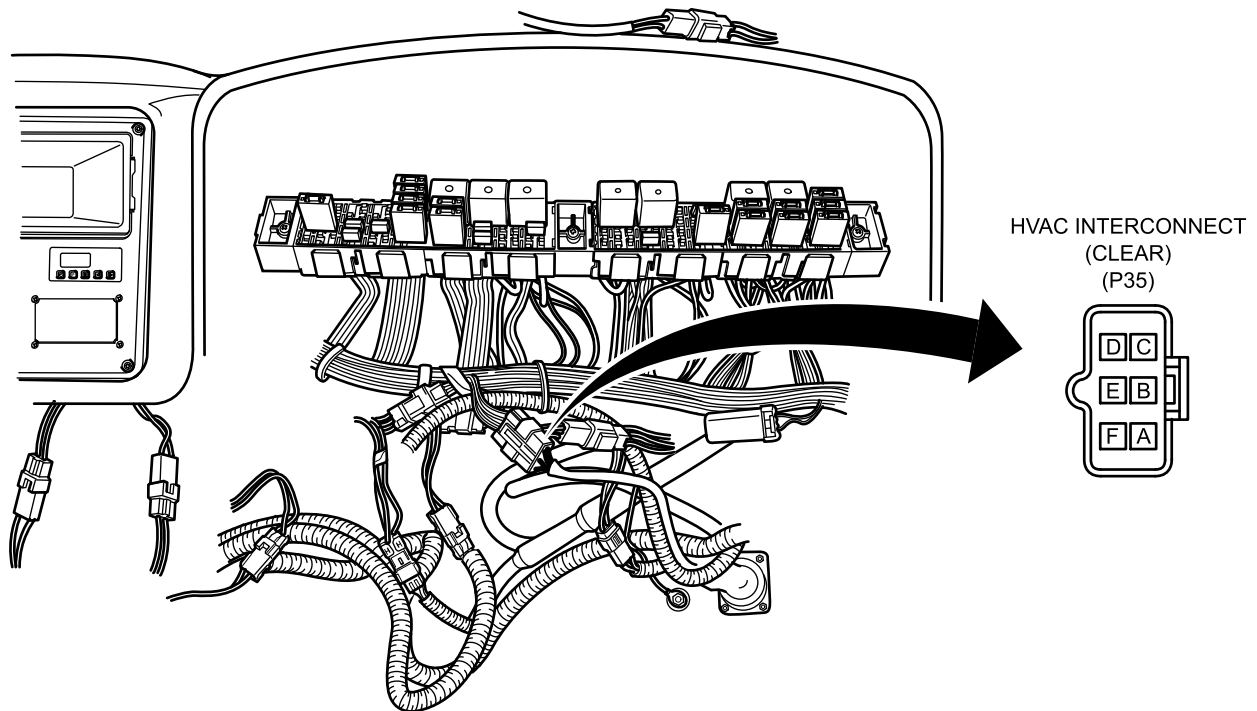


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Figure 39. Right Side Instrument Panel Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

101. Connect connector P35. Refer to Figure 40.



B230604882

Figure 40. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F44 pop back up?

DECISION

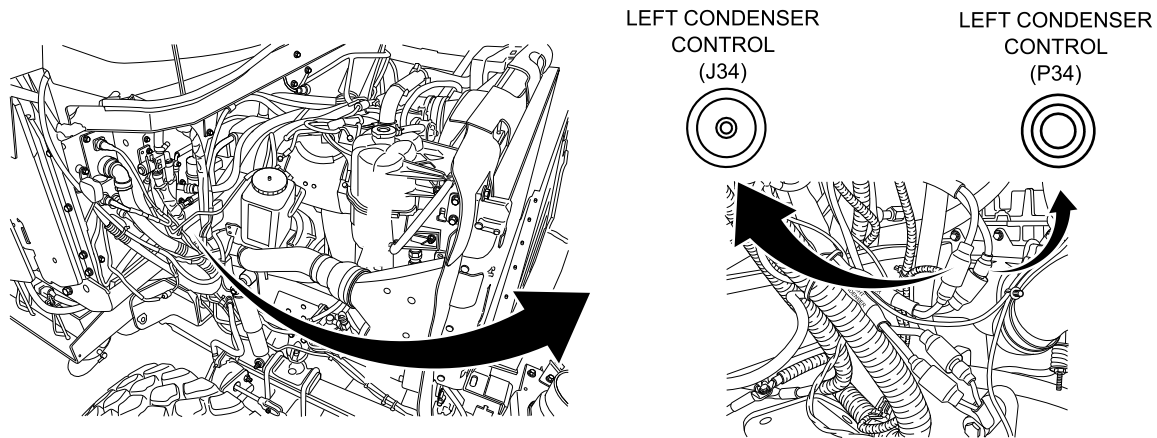
YES Go to Step 117.

NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

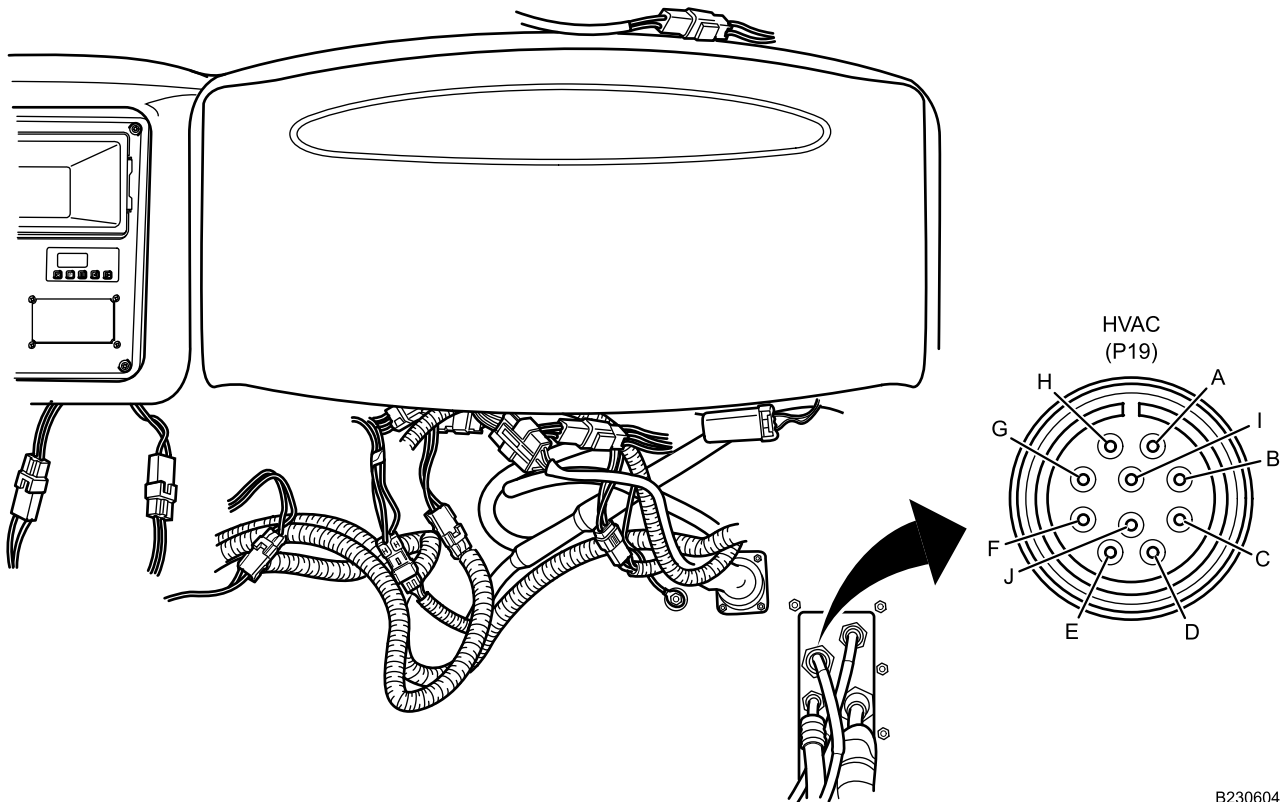
- 102.Remove right side engine armor. Refer to Right Side Engine Armor Plate Removal and Installation (WP 0599).
- 103.Disconnect connectors P34 and J34. Refer to Figure 41.



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Figure 41. Left Side Engine Compartment Area.

- 104.Connect connector P19. Refer to Figure 42.



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Figure 42. Right Side Instrument Panel Area.

CONDITION/INDICATION

Does reset button on circuit breaker F44 pop back up?

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****DECISION**

YES Go to Step 116.

NO Go to next step.

STEP

105. Disconnect connector P3. Refer to Figure 43.

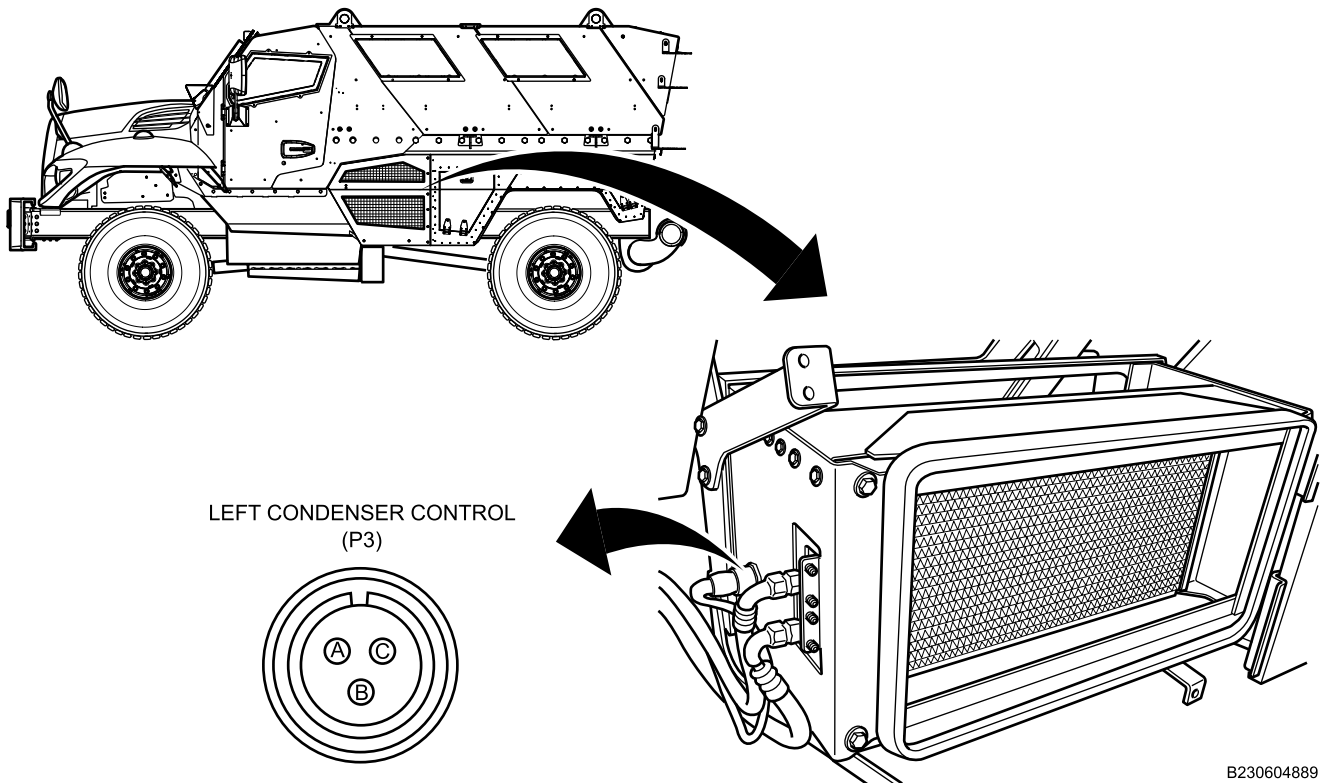
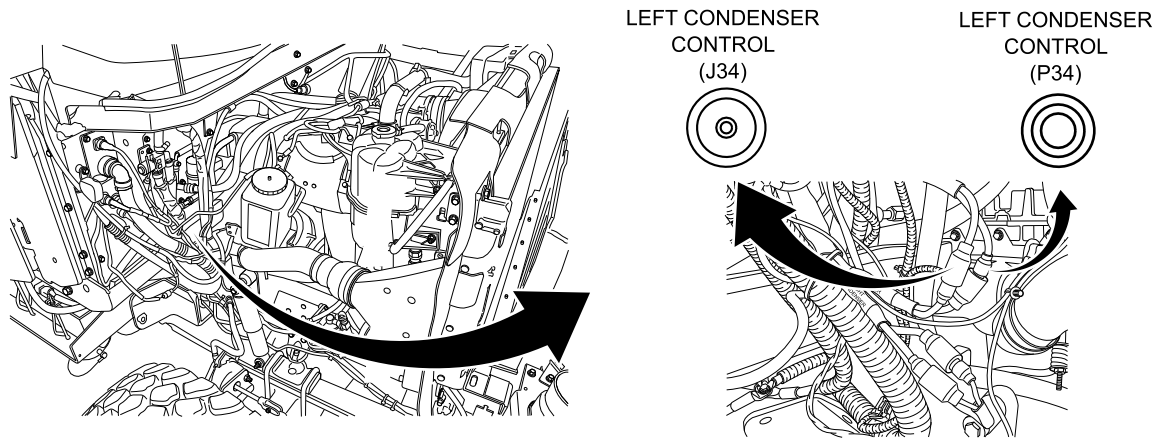


Figure 43. Left Side Condenser Fans Area.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

106. Connect connectors P34 and J34. Refer to Figure 44.



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Figure 44. Left Side Engine Compartment Area.

CONDITION/INDICATION

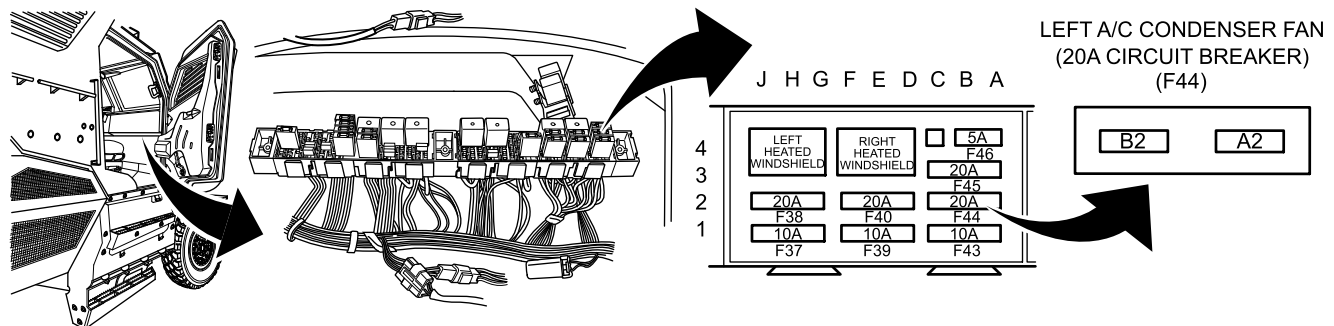
Does reset button on circuit breaker F44 pop back up?

DECISION

YES Go to Step 119.
NO Go to Step 114.

STEP

107. Remove circuit breaker F44. Refer to Instrument Panel Circuit Breaker, Fuse, and Relay Removal and Installation (WP 0317). Refer to Figure 45.



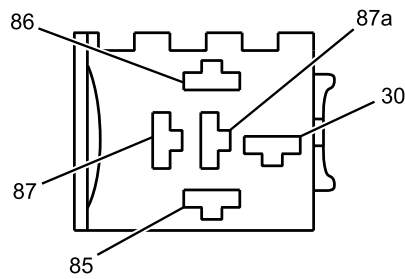
B230605527

Figure 45. Right Instrument Panel Area.

108. Measure resistance between circuit breaker F44 terminal B2 and relay socket 1018 terminal 30 with multimeter. Refer to Figure 45 and Figure 46.

HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING PROCEDURE - (CONTINUED)

LEFT CONDENSER FAN RELAY SOCKET
(1018)



B230603864

Figure 46. Relay Socket 1018.

CONDITION/INDICATION

Does multimeter read less than 5 ohms?

DECISION

YES Go to next step.

NO Go to Step 118.

STEP

109. Turn MAIN POWER switch ON (TM 9-2355-106-10).

110. Turn ignition switch ON (TM 9-2355-106-10).

111. Measure DC voltage between circuit breaker F44 terminal A2 and ground with multimeter. Refer to Figure 45.

CONDITION/INDICATION

Does multimeter read more than 22.5V?

DECISION

YES Go to Step 113.

NO Refer to Power Distribution Troubleshooting Procedure (WP 0059).

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****MALFUNCTION**

- 112. Climate Control Unit (CCU) is faulty.

ACTION

Replace CCU. Refer to Climate Control Unit (CCU) Box Removal and Installation (WP 0769). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 113. Circuit breaker is faulty.

ACTION

Replace circuit breaker. Refer to Instrument Panel Circuit Breaker, Fuse, and Relay Removal and Installation (WP 0317). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 114. Fan assembly is faulty.

ACTION

Replace fans. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0724). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 115. Relay is faulty.

ACTION

Replace relay. Refer to Air Conditioner (A/C) Condenser Fan Motor Relay Removal and Installation (WP 0332). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 116. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control 2 Wiring Harness Removal and Installation (WP 0776). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 117. Harness is faulty.

**HEATING VENTILATING AND AIR CONDITIONING (HVAC) CONDENSER FANS TROUBLESHOOTING
PROCEDURE - (CONTINUED)****ACTION**

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Control In Wiring Harness Removal and Installation (WP 0775). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 118. Harness is faulty.

ACTION

Replace harness. Refer to Instrument Panel Harness Removal and Installation (WP 0319). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 119. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Left Condenser Control Wiring Harness Removal and Installation (WP 0772). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 120. Harness is faulty.

ACTION

Replace harness. Refer to Heating Ventilating and Air Conditioning (HVAC) Right Condenser Control Wiring Harness Removal and Installation (WP 0773). Return vehicle to service.

END OF TEST**END OF WORK PACKAGE**

FIELD MAINTENANCE
**HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN
PRESSURE TROUBLESHOOTING PROCEDURE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0636

WP 0585

WP 0720

WP 0757

Personnel Required

Maintainer - (2)

WP 0762

WP 0764

References

TM 9-2355-106-10

WP 0778

TM 9-2355-106-23P

WP 0582

WP 0202

WP 0782

WP 0607

Equipment Condition

WP 0614

Parking brake set (TM 9-2355-106-10)

WP 0590

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

WP 0592

Engine off (TM 9-2355-106-10)

WP 0593

MAIN POWER switch off (TM 9-2355-106-10)

WP 0595

Wheels chocked (TM 9-2355-106-10)

WP 0639

Before Beginning This Troubleshooting Procedure

Successful diagnosis of the HVAC system depends on performing the various procedures in the correct sequence. Failure to comply will lead to misdiagnosis. Perform Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Operational Checkout Procedure (WP 0202) before performing the tests in this troubleshooting procedure.

TROUBLESHOOTING PROCEDURE**STEP****NOTE**

Personnel must read and understand the Troubleshooting Procedures Overview in How to Use This Manual before performing any troubleshooting procedures.

1. Turn MAIN POWER switch ON (TM 9-2355-106-10).
2. Start engine (TM 9-2355-106-10).
3. Turn LSS switch on HVAC/LSS control panel to ON position (TM 9-2355-106-10).
4. Close all doors and hatches to seal cabin (TM 9-2355-106-10).
5. Observe minihelic gauge and note reading (TM 9-2355-106-10).

CONDITION/INDICATION

Does minihelic gauge read less than 0.8 inch Water Column (W.C.) (200 pascal)?

DECISION

YES Go to next step.

NO Go to Step 35.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

6. Remove Nuclear, Biological, and Chemical (NBC) filter. Refer to Nuclear, Biological, and Chemical (NBC) Filter Removal and Installation (WP 0762).
7. Visually inspect NBC filter (Figure 1, Item 1), housing tube (Figure 1, Item 2), filter cover (Figure 1, Item 4), and filter cover tube (Figure 1, Item 3) for signs of clogging or debris that could cause a restriction.

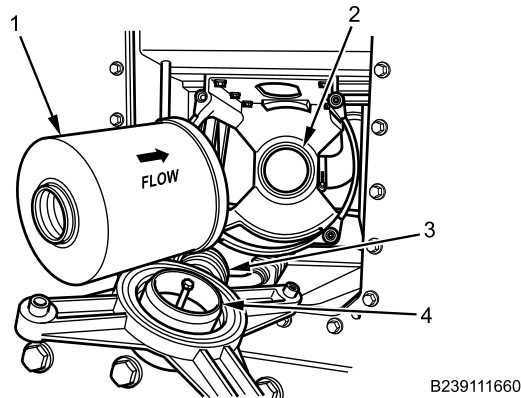


Figure 1. NBC Filter.

CONDITION/INDICATION

Was a restriction found?

DECISION

YES Go to Step 36.
NO Go to next step.

STEP

8. Remove NBC particle separator. Refer to Nuclear, Biological, and Chemical (NBC) Particle Separator Filter Removal and Installation (WP 0764).
9. Visually inspect particle separator filter (Figure 2, Item 1) and hoses (Figure 2, Item 2 and 3) for signs of clogging or debris that could cause a restriction.

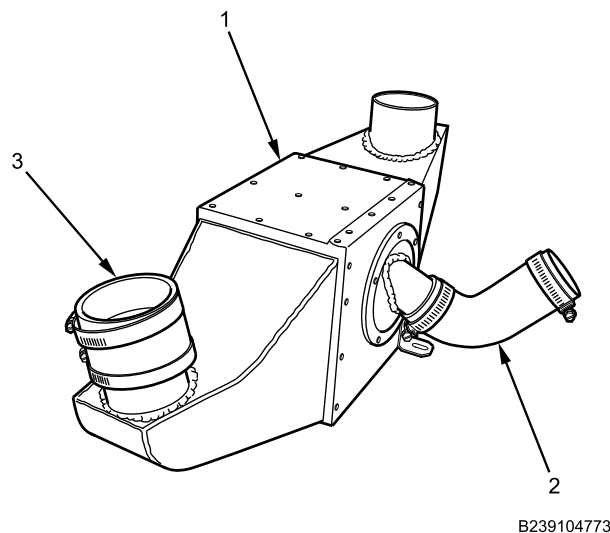


Figure 2. NBC Particle Separator Filter.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)**CONDITION/INDICATION**

Was a restriction found?

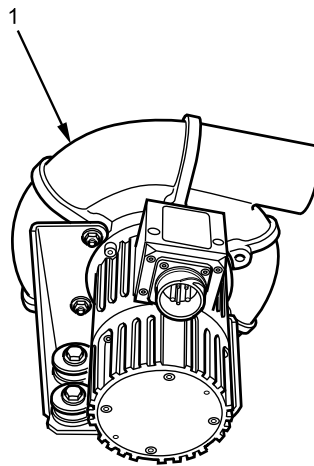
DECISION

YES Go to Step 37.

NO Go to next step.

STEP

10. Remove Fresh Air (FA) blower. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Main Blower Motor and Support Removal and Installation (WP 0765).
11. Visually inspect FA blower (Figure 3, Item 1) for signs of clogging or debris that could cause a restriction.



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Figure 3. FA Blower.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)**CONDITION/INDICATION**

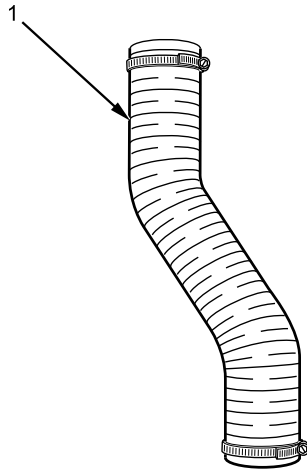
Was a restriction found?

DECISION

YES Go to Step 38
NO Go to next step.

STEP

12. Remove HVAC fresh air inlet tube. Refer to Heating Ventilating and Air Conditioning (HVAC) Fresh Air Inlet Tube Removal and Installation (WP 0720).
13. Visually inspect fresh air inlet tube (Figure 4, Item 1) for restrictions or debris that could cause a restriction.



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Figure 4. Fresh Air Inlet Tube.

CONDITION/INDICATION

Was a restriction found?

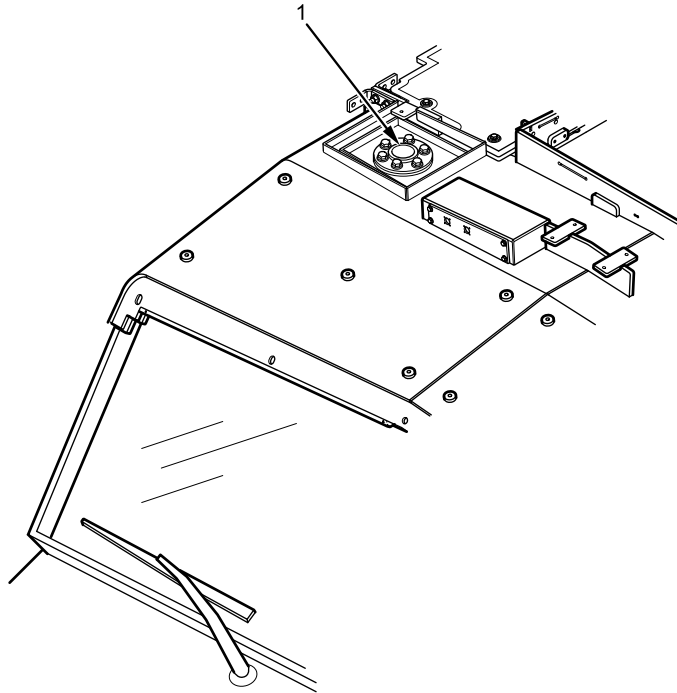
DECISION

YES Go to Step 39.
NO Go to next step.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

14. Remove roof armor front spoiler. Refer to Roof Armor Front Spoiler Removal and Installation (WP 0585).
15. Inspect area near fresh air inlet (Figure 5, Item 1) for restrictions.



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Figure 5. Fresh Air Inlet on Roof.

CONDITION/INDICATION

Was a restriction found?

DECISION

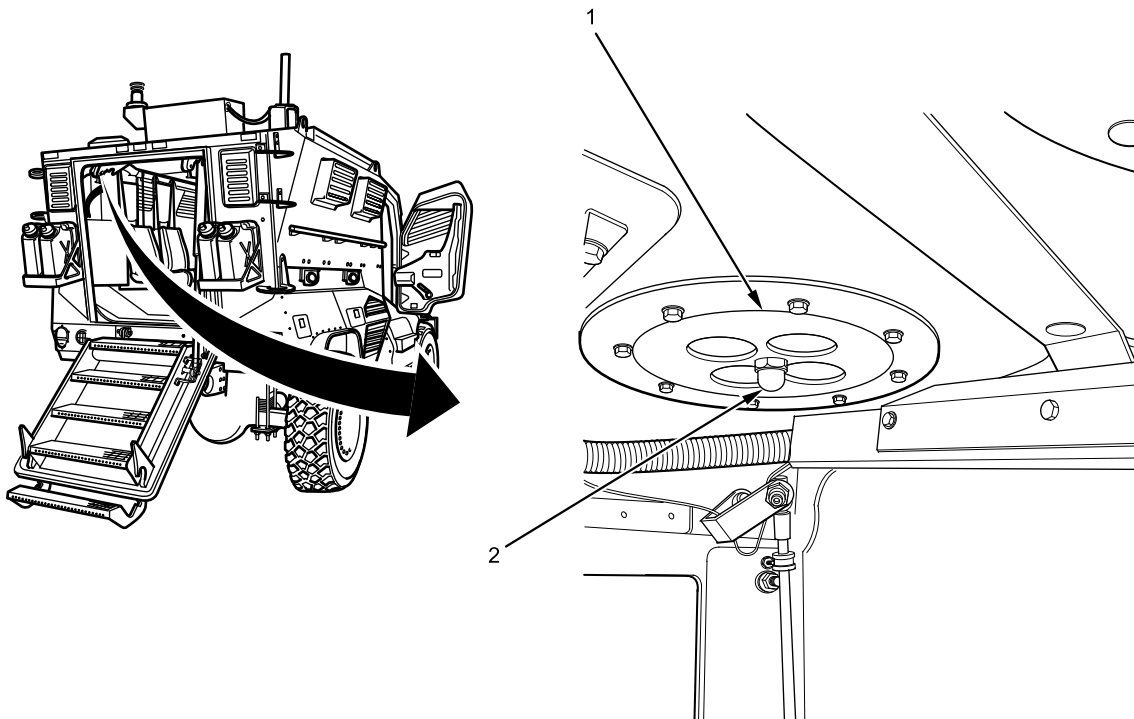
YES Go to Step 40.
NO Go to next step.

STEP

16. Install all previously removed equipment:
 - Install roof armor front spoiler. Refer to Roof Armor Front Spoiler Removal and Installation (WP 0585).
 - Install HVAC fresh air inlet tube. Refer to Heating Ventilating and Air Conditioning (HVAC) Fresh Air Inlet Tube Removal and Installation (WP 0720).
 - Install FA blower. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Main Blower Motor and Support Removal and Installation (WP 0778).
 - NBC particle separator. Refer to Nuclear, Biological, and Chemical (NBC) Particle Separator Filter Removal and Installation (WP 0764).
 - Install NBC filter. Refer to Nuclear, Biological, and Chemical (NBC) Filter Removal and Installation (WP 0762).

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

17. Turn MAIN POWER switch ON (TM 9-2355-106-10).
18. Start engine (TM 9-2355-106-10).
19. Turn LSS switch on HVAC/LSS control panel to ON position (TM 9-2355-106-10).
20. With two maintainers inside vehicle, close all doors and hatches to seal cabin (TM 9-2355-106-10).
21. With maintainer assistance, hold nut (Figure 6, Item 2) on overpressure pressure relief valve (Figure 6, Item 1) in down position to keep overpressure relief valve closed while observing minihelic gauge (TM 9-2355-106-10).



B230604778

Figure 6. Overpressure Relief Valve.

CONDITION/INDICATION

Does cabin pressure increase while overpressure relief valve is held closed?

DECISION

YES Go to Step 41.
NO Go to next step.

STEP

22. Turn LSS switch OFF (TM 9-2355-106-10).
23. Turn ignition switch OFF (TM 9-2355-106-10).
24. Turn MAIN POWER switch OFF (TM 9-2355-106-10).
25. Open and secure left front cabin door (TM 9-2355-106-10).

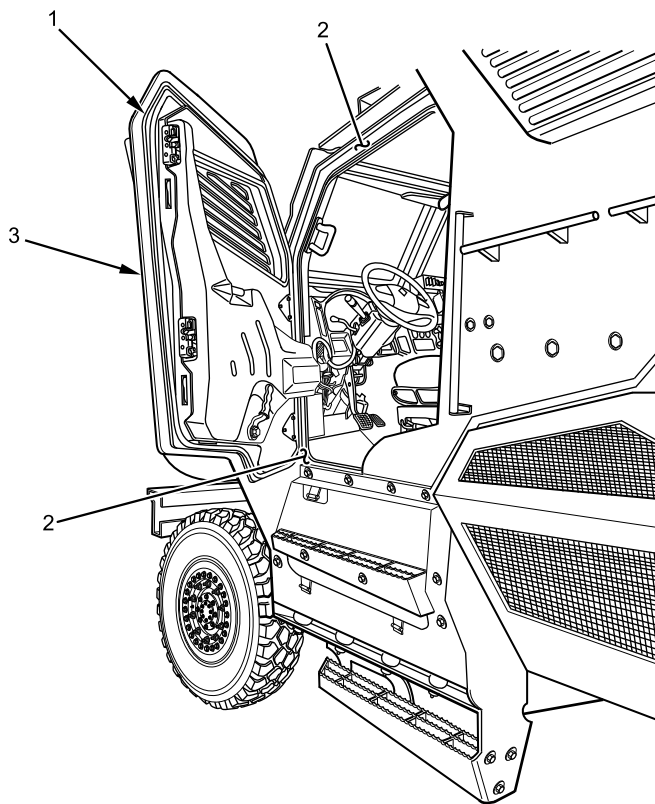
HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

NOTE

The HVAC system is capable of supplying enough air volume to overcome small cabin air leaks. The intent of the following door and hatch seal inspections is to discover the major source of an air leak. Do not perform repairs on items that can not cause major air leaks.

26. Perform the following inspections:

- a. Visually inspect door seal (Figure 7, Item 1) for damage.
- b. Visually and physically ensure door seal (Figure 7, Item 1) is secured to door (Figure 7, Item 3) and does not easily pull away from door in any location. Entire seal should be installed securely to door.
- c. Visually ensure door seal (Figure 7, Item 1) makes full contact with door opening (Figure 7, Item 2) when door is closed.



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Figure 7. Left Front Cabin Door Seal. Right Front Cabin Door Seal Similar.

27. Repeat inspection for right front cabin door seal.

CONDITION/INDICATION

Are both door seals properly secured to door, making full contact with door opening when door is closed, and free of damage?

DECISION

YES Go to next step.
NO Go to Step 43.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)**STEP**

28. Open rear door/ramp (TM 9-2355-106-10).
29. Perform the following inspections:
 - a. Visually inspect door/ramp seal (Figure 8, Item 1) for damage.
 - b. Visually and physically ensure door/ramp seal (Figure 8, Item 1) is secured to door/ramp opening (Figure 8, Item 2).

NOTE

Door/ramp seal (Figure 8, Item 1) is installed on a protrusion on door/ramp opening (Figure 8, Item 2). Ensure protrusion is not bent over flat against door/ramp opening. Protrusion should stand perpendicular to door/ramp opening.

- c. Visually ensure door/ramp seal (Figure 8, Item 1) makes full contact with door/ramp (Figure 8, Item 3) when door/ramp is closed.

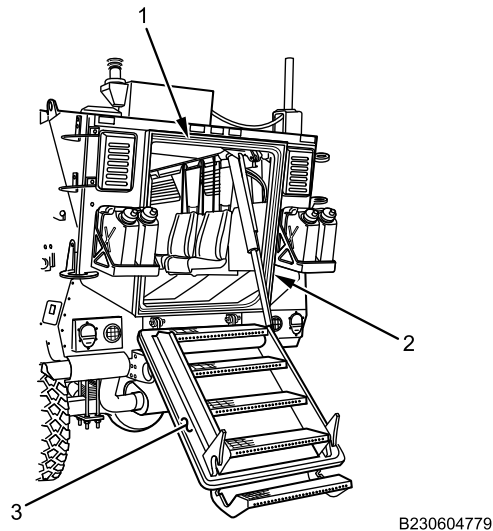


Figure 8. Rear Door/Ramp Seal.

CONDITION/INDICATION

Is seal properly secured to door/ramp opening, making full contact with door/ramp when closed, and free of damage?

DECISION

YES Go to next step.
NO Go to Step 44.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

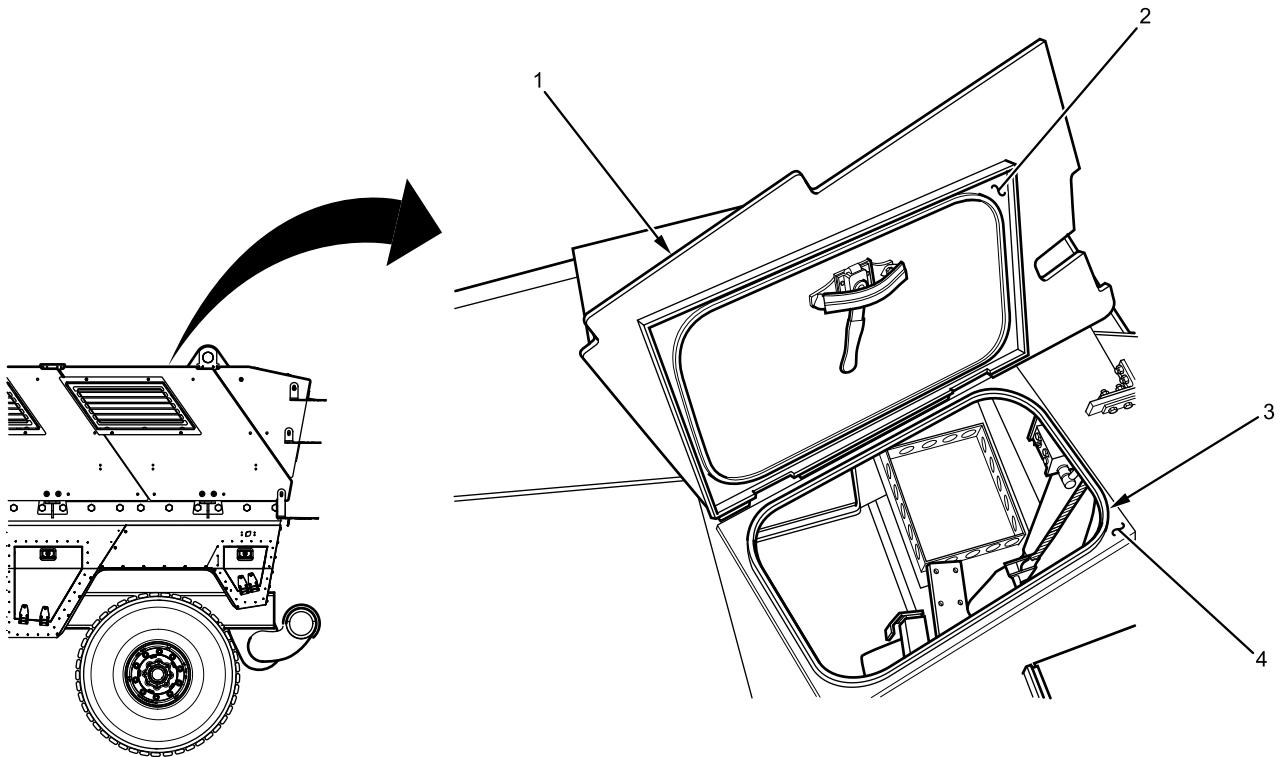
STEP

30. Open and secure emergency escape hatch (TM 9-2355-106-10).
31. Perform the following inspections:
 - a. Visually inspect hatch seal (Figure 9, Item 3) for damage.
 - b. Visually and physically ensure hatch seal (Figure 9, Item 3) is secured to hatch opening (Figure 9, Item 4).

NOTE

Hatch seal is installed on a protrusion on hatch opening (Figure 9, Item 4). Ensure protrusion is not bent away from hatch channel (Figure 9, Item 2) when closed.

- c. Visually ensure hatch seal (Figure 9, Item 3) makes full contact within channel (Figure 9, Item 2) on hatch (Figure 9, Item 1) when hatch is closed.



B230604780

Figure 9. Emergency Escape Hatch.

CONDITION/INDICATION

Is seal properly secured to hatch opening, making full contact with hatch when closed, and free of damage?

DECISION

YES Go to next step.
NO Go to Step 45.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)

STEP

32. Open and secure sliding gunner hatch (TM 9-2355-106-10).
33. Perform the following inspections:
 - a. Visually inspect hatch seal (Figure 10, Item 2) for damage.
 - b. Visually and physically ensure hatch seal (Figure 10, Item 2) is secured to hatch opening (Figure 10, Item 3).

NOTE

Hatch seal (Figure 10, Item 2) is installed on a protrusion on hatch opening (Figure 10, Item 3). Visually ensure protrusion is not bent away from hatch (Figure 10, Item 1) when closed.

- c. Visually ensure hatch seal (Figure 10, Item 2) makes full contact with hatch (Figure 10, Item 1) when hatch is closed.

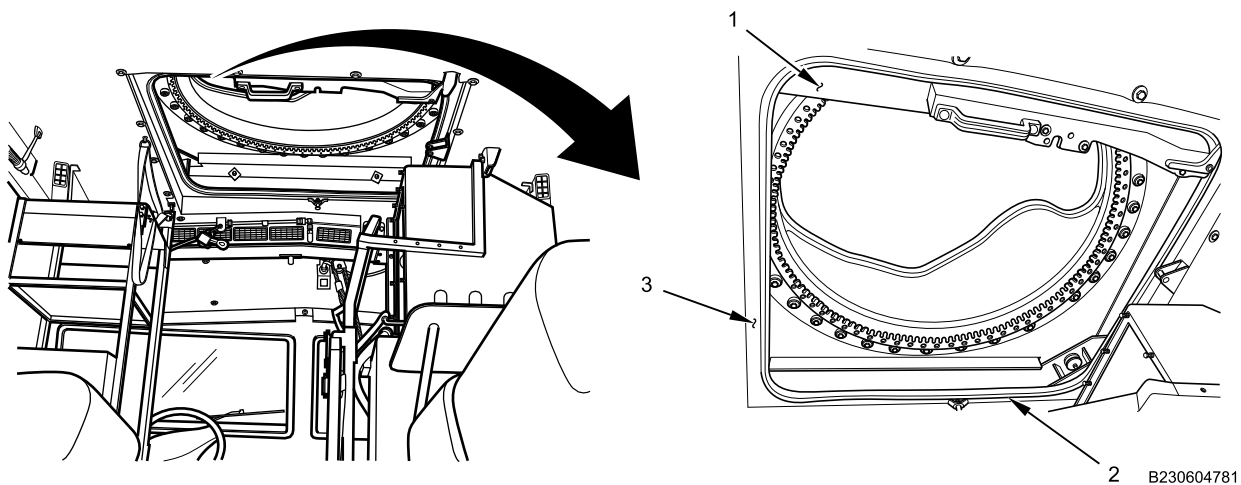


Figure 10. Sliding Gunner Hatch.

CONDITION/INDICATION

Is seal properly secured to hatch opening, making full contact with hatch when closed, and free of damage?

DECISION

YES Go to next step.
NO Go to Step 46.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)**STEP**

34. Visually inspect entire vehicle for battle damage that could result in a cabin pressure air leak.

CONDITION/INDICATION

Was battle damage, causing an air leak found?

DECISION

YES Go to Step 47.

NO Go to Step 42.

STEP

35. Open left front cabin door (TM 9-2355-106-10).

CONDITION/INDICATION

Does minihelic gauge read more than 0.0 inch Water Column (W.C.) (700 pascal)? (TM 9-2355-106-10).

DECISION

YES Go to Step 42.

NO Go to Step 41.

MALFUNCTION

- 36. Restriction found.

ACTION

If possible, remove restriction. If restriction can not be removed, replace NBC filter. Refer to Nuclear, Biological, and Chemical (NBC) Filter Removal and Installation (WP 0762).

END OF TEST**MALFUNCTION**

- 37. Restriction found.

ACTION

If possible, remove restriction. If restriction can not be removed, replace NBC particle separator. Refer to Nuclear, Biological, and Chemical (NBC) Particle Separator Filter Removal and Installation (WP 0764). Return vehicle to service.

END OF TEST

**HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN
PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)****MALFUNCTION**

- 38. Restriction found.

ACTION

If possible, remove restriction. If restriction can not be removed, replace FA blower. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Main Blower Motor and Support Removal and Installation (WP 0778). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 39. Restriction found.

ACTION

If possible, remove restriction. If restriction can not be removed, replace fresh air inlet tube. refer to Heating Ventilating and Air Conditioning (HVAC) Fresh Air Inlet Tube Removal and Installation (WP 0720). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 40. Restriction found.

ACTION

Remove restriction from fresh air inlet. Return vehicle to service.

END OF TEST**MALFUNCTION**

- 41. Overpressure relief valve is faulty.

ACTION

Replace overpressure relief valve. Refer to Heating Ventilating and Air Conditioning (HVAC)/Life Support System (LSS) Overpressure Relief Valve Removal and Installation (WP 0757). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 42. Gage is faulty.

ACTION

Replace gauge. Refer to Nuclear, Chemical, and Biological (NBC) Gauge Removal and Installation (WP 0582). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 43. Door is not sealing properly.

HEATING VENTILATING AND AIR CONDITIONING (HVAC)/LIFE SUPPORT SYSTEM (LSS) CABIN PRESSURE TROUBLESHOOTING PROCEDURE - (CONTINUED)**ACTION**

Replace seal. Refer to Cabin Door Seal Removal and Installation (WP 0614). If door requires alignment, or replacement to ensure seal makes full contact with door opening, refer to (WP 0607). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 44. Door/ramp is not sealing properly.

ACTION

Replace seal. Refer to Rear Door/Ramp Seal Removal and Installation (WP 0636). If door/ramp requires alignment, or replacement to ensure seal makes full contact with door/ramp opening, refer to (WP 0639). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 45. Hatch is not sealing properly.

ACTION

Replace seal. Refer to Cabin Emergency Hatch Seal Removal and Installation (WP 0595). If hatch requires alignment, or replacement to ensure seal makes full contact with hatch opening, refer to (WP 0593). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 46. Hatch is not sealing properly.

ACTION

Replace seal. Refer to Weapon (Sliding) Hatch (Gunner Hatch) Seal Removal and Installation (WP 0592). If hatch requires alignment, or replacement to ensure seal makes full contact with hatch opening, refer to (WP 0590). Return vehicle to service.

END OF TEST**MALFUNCTION**

- 47. Battle damage found.

ACTION

Notify Sustainment Maintenance.

END OF TEST**END OF WORK PACKAGE**

CHAPTER 6
MAINTENANCE INSTRUCTIONS
FOR
MINE RESISTANT AMBUSH PROTECTED (MRAP)

FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

OVERVIEW

To ensure the vehicle is ready for operation at all times, it must be inspected on a regular basis so items to be serviced may be found before they result in serious damage, equipment failure, or injury to personnel. The PMCS table in the following work package contains systematic inspections and services to maintain the vehicle in mission-ready condition.

GENERAL SERVICE AND INSPECTION PROCEDURES

Always perform PMCS in the same order. If a component does not pass PMCS inspection, troubleshoot it with the instructions in this manual or notify your supervisor. If a problem is found that is beyond your echelon of repair, report the problem to your supervisor.

Inspect the vehicle for the following items:

- Cleanliness – Dirt, grease, oil, and debris get in the way and may cover up a serious problem.
- Nuts and Screws – Check for obvious looseness, missing parts, and bent or broken conditions. Look for chipped paint, bare metal, or rust around screw heads. If you find a screw or nut is loose, tighten it.
- Welds – Look for loose or chipped paint, rust, or gaps where parts are welded together.
- Electrical Wires and Connectors – Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good shape.
- Fluid Lines, Fittings and Air Lines – Look for wear, damage, or leaks, and make sure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can also identify a leak. If a leak comes from a loose fitting or connector, tighten it. Start vehicle, let air tanks fill, shut off engine, and listen for air leaks.
- Damage – Damage is defined as any condition that affects safety or would render the vehicle unserviceable for mission requirements.
- MRAP vehicles (M1224 and M1224A1) are not enrolled in the Army Oil Analysis Program (AOAP). HARDTIME INTERVALS APPLY.
- Collection and Disposal of Fluids – Retain or dispose of all fluids in accordance with local or unit Standard Operating Procedures (SOP).
- Fluid Leakage – It is necessary for you to know how fluid leakage affects the status of the M1224 and M1224A1 MRAP vehicle. Following are types/classes of leakage you need to know to be able to determine the status of the M1224 and M1224A1 MRAP vehicle. Learn these leakage definitions and remember - when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor. Fuel leaks should be immediately reported to your supervisor.

1. Class I: Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
 2. Class II: Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
 3. Class III: Leakage of fluid great enough to form drops that fall from the item being checked/inspected.
- Corrosion Control – Corrosion control maintenance is a requirement of the vehicle. While performing the PMCS, look for rust, paint peeling, blistering, or damage that can cause corrosion. Inspect the entire vehicle as well as the specific areas mentioned in the PMCS. Use Table 1 to aid in visual detection of corrosion. Also look for and always be aware of missing or damaged corrosion preventive compounds. Report problem areas as soon as possible. Having problem areas corrected as soon as possible will maximize the life of the vehicle.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION - (CONTINUED)**Table 1. Visual Detection of Corrosion.**

METAL/COMPONENT	CORROSION
Steel	Powdery, Reddish-Brown Film
Aluminum	Powdery, White Film
Brass	Green Film
Electrical Connection	Green Film

NOTE

Some PMCS checks may not be readily accessible due to armor plating and will require visual inspection instead of hands-on.

EXPLANATION OF PMCS TABLE

The following columns appear left to right in the PMCS table:

ITEM NO: Provides logical order for PMCS performance and is used as a source number for DA Form 2404 or DA Form 5988-E, on which your PMCS results will be recorded.

INTERVAL: Indicates when check or service is to be performed.

Annual – Every 12 months or 12,000 miles (19,308 kilometers), whichever occurs first. Perform all semi-annual inspections, in addition to annual inspections, at time of annual inspection.

ITEM TO BE CHECKED/SERVICED: Lists the system, common name, or location of the item to be inspected.

PROCEDURE: Provides instructions for servicing, inspection, replacement, or equipment and, in some cases, having an item repaired at a higher level. If a defect is found, repair, fill, remove, or adjust as needed.

EQUIPMENT NOT READY/AVAILABLE IF: Provides information for deadlining a vehicle when checks or services reveal a defect or deficiency of a component(s) of the vehicle.

END OF WORK PACKAGE

FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Jackstand, 10-ton, 19–28.5-inches (WP 0795, Item 62)
Wrench, torque, 90-600 lb-ft, 3/4-inch drive (WP 0795, Item 144)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive (WP 0795, Item 141)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive (WP 0795, Item 143)

Gloves (WP 0794, Item 18)
Gloves (WP 0794, Item 19)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

Equipment Condition

Right front cabin riot guard removed (WP 0632)
Exterior body armor right front panel removed (WP 0633)
Belly armor removed (WP 0606)
Left side engine armor removed (WP 0597)
Right side engine armor removed (WP 0599)
Fuel tank armor removed (WP 0605)
Transfer case armor removed (WP 0462)
Rear door hydraulic pump cover removed (WP 0690)

Materials/Parts

Compound (WP 0794, Item 13)
Face shield, industrial (WP 0794, Item 16)
Goggles, industrial (WP 0794, Item 20)
Rag (WP 0794, Item 39)

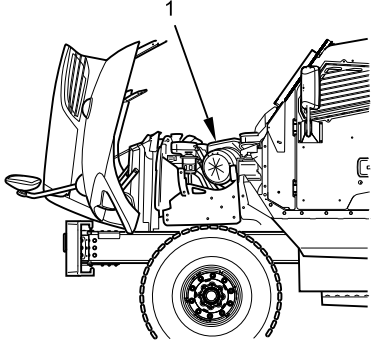
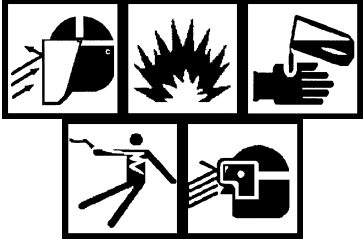
Table 1. Unit Preventive Maintenance Checks And Services.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Annual	Road Test	Drive vehicle at least 5 miles (8 km) over varied terrain, both on and off road. This will provide ample time to check reported malfunctions and to locate unreported malfunctions. Lubrication intervals of every 1,000 miles (1,600 km) or monthly, and 3,000 miles (4,800 km) or quarterly, will be performed with maintenance or, when practical, lubrication services will be made to coincide with annual preventive maintenance services. For this purpose, a 10 percent tolerance (variation) in specified lubrication point mileage is permissible.	
2	Annual	Road Test	<ol style="list-style-type: none"> 1. Reach a desired speed and lightly apply brake pedal with steady force. Vehicle should slow down immediately and stop smoothly, without side pull or chatter. 2. After stopping vehicle, and with transmission selector in D (DRIVE), release brake pedal. All wheel brakes should release immediately and without difficulty. 	Vehicle pulls to one side or the other. Brake chatter. Brakes do not release immediately.
3	Annual	Road Test	<ol style="list-style-type: none"> 1. Check engine throughout range of operating speeds listening for any unusual noises. Be alert for excessive vibration, and smell of oil, fuel or exhaust. 	Engine knocks, shakes, or smokes excessively.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			2. Check engine instruments for proper range, refer to (WP 0070) and (TM 9-2355-106-10).	
4	Annual	Road Test	1. Check transmission oil temperature gauge. Normal range is 120°-250°F (49°-104°C). Refer to (TM 9-2355-106-10). 2. Check for response to shifting and smoothness of operation in all speed ranges.	Oil temperature exceeds 300°F (149°C), or does not move.
5	Annual	Road Test	Shift transfer case selector switch between XFER LOW and XFER HIGH positions to ensure proper operations. Observe for smoothness of engagements. Refer to (TM 9-2355-106-10).	Transfer case does not shift properly.
6	Annual	Road Test	Observe how vehicle responds to road shock, driving at least 5 miles (8 km) over varied terrain, both on and off road. If vehicle has excessive bouncing, swaying from side-to-side, or one side sits lower than the other side, these are indication of a malfunction.	Handling is unstable.
7	Annual	Brakes	<p style="text-align: center;">WARNING</p> <p>Do not allow grease or oil to contact brake linings. Linings can absorb grease and oil, causing early glazing and reduced braking action. Failure to comply may result in serious injury or death to personnel.</p> 1. Check brake pedal for free travel. Adjust brake pedal if required (WP 0038). 2. Inspect condition of brake calipers and linings. 3. Inspect condition of brake disk, and check for cracks scouring and brittle areas. 4. Inspect condition of braking system pneumatic lines and reservoirs, and check for loose fittings and leaks.	Travel exceeds ½ in. Vehicle pulls to one side or the other. Grooves or uneven wear is evident. Cracked or broken linings. Brake disks are broken, cracked or chipped. Any air leak is detected.

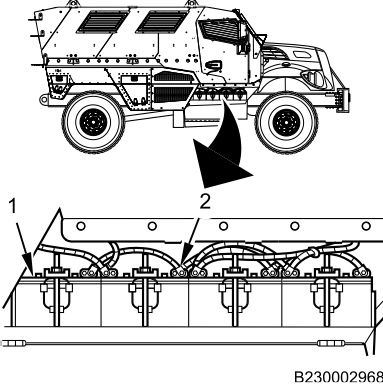
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Annual	Air Filter	<p>1. Inspect filter element (Figure 1, Item 1) for tears and presence of dirt and oil.</p>  <p style="text-align: right; font-size: small;">B230002952</p> <p style="text-align: center;">Figure 1. Air Filter.</p> <p>2. If dirt is present, clean filter element.</p>	Air filter has holes, cracks, damaged seal, oil, breaks, or is crushed or has structural integrity issues.
9	Annual	Batteries	<p style="text-align: center;">WARNING</p>  <p>Wear protective eye goggles, face shield, and long sleeves when working on or near batteries. Batteries contain corrosive acid and can produce explosive gases. Batteries supply electrical current that can cause burns and electrical shock. Always check electrolyte level with engine off. Avoid leaning over or onto battery. Do not wear jewelry and do not smoke or have open flame or spark near battery. Do not allow tools to contact battery box or battery terminals. Failure to comply may result in damage to equipment and serious injury or death to personnel.</p>	

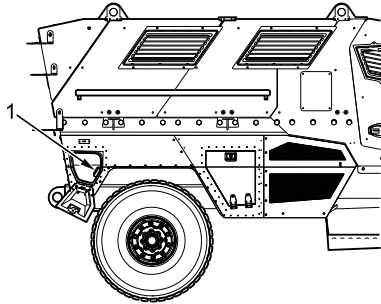
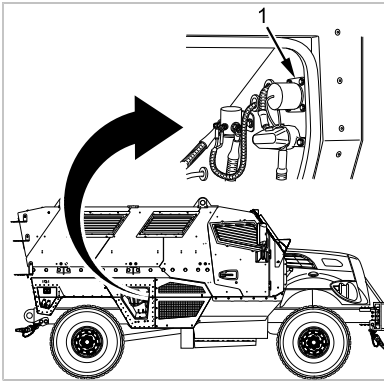
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>Battery acid must not contact eyes, skin, or clothing. If battery acid contacts eyes or skin, flush area with large amounts of water for 15 minutes and seek immediate medical care. If swallowed, do not induce vomiting. Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention. Failure to comply may result in serious injury or death to personnel.</p> <p>Turn MAIN POWER switch off prior to performing maintenance on battery or electrical system. Always remove negative battery terminals first. When reconnecting, always connect negative terminals last to avoid arcing or sparks that could cause an explosion. Do not allow tools to contact battery box or other battery terminals when removing or installing terminals. Failure to comply may result in damage to equipment and serious injury or death to personnel.</p> <p>Disconnect battery ground cable or power source prior to working on electrical components. If electrical shock occurs, administer first aid and seek medical assistance immediately. Failure to comply may result in serious injury or death to personnel.</p> <p>Ensure batteries are disconnected before removing ESC. Failure to comply may result in serious injury or death to personnel.</p> <ol style="list-style-type: none"> 1. Clean and inspect batteries (Figure 2, Item 1). Replace if required. 2. Inspect battery box for security of mounting and completeness of assembly. 	<p>Unserviceable batteries.</p>

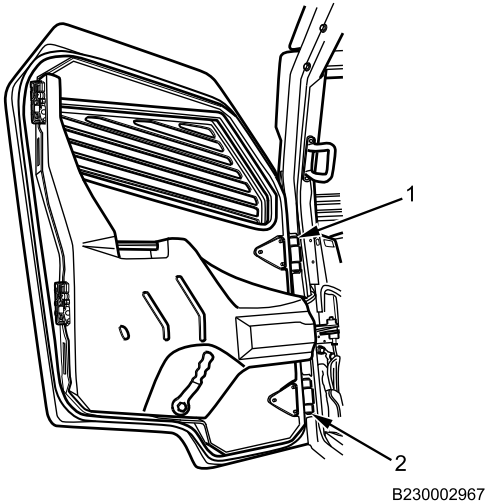
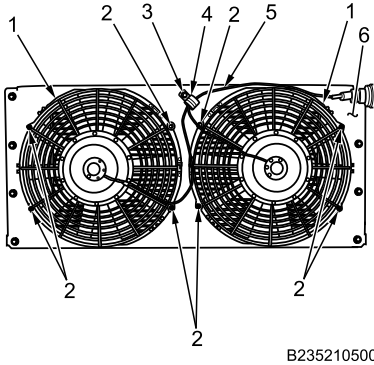
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>3. Inspect battery cables and terminals (Figure 2, Item 2) for frays, splits, and security. Repair/replace battery cables or terminals as necessary.</p>  <p style="text-align: center;">B230002968</p> <p style="text-align: center;">Figure 2. Batteries.</p> <p>4. Lightly coat battery terminals and slave receptacle contacts with grease.</p> <p>5. Perform battery power operational checkout procedure. Refer to (WP 0032).</p>	<p>Frayed, split, or loose cables.</p>
10	Annual	Body	<p>1. Wash vehicle to remove any mud, dirt, or debris from body.</p> <p>2. Inspect for loose rivets, cracks, loose or missing bolts, and general body damage.</p> <p>3. Inspect body armor for gaps between panels, cracks, security, and broken or missing bolts.</p>	<p>Body excessively damaged.</p> <p>Panels severely damaged, cracked, or corroded.</p> <p>Body and armor panel mounting bolts loose, broken, or missing.</p> <p>Gaps between armor panels.</p>
11	Annual	110V Outlet	<p>1. Inspect 110V outlet (Figure 3, Item 1) and wiring for corrosion, frays, splits, damage, and security of mounting.</p>	<p>110V outlet or wiring is damaged or corroded.</p>


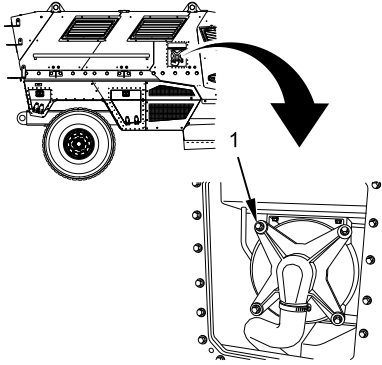
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. Visually inspect GFCI button. If button is depressed, refer to (WP 0119).</p>  <p style="text-align: right;">B230002954</p> <p style="text-align: center;">Figure 3. 110V Outlet.</p>	<p>GFCI button depressed.</p>
12	Annual	NATO Jump Start Connector	<p>1. Inspect NATO jump start connector (Figure 4, Item 1) and wiring for corrosion, frays, splits, damage, and security of mounting.</p>  <p style="text-align: right;">B230003586</p> <p style="text-align: center;">Figure 4. NATO Jump Start Connector.</p> <p>2. Clean NATO jump start connector and coat connector contacts with dielectric grease. Apply corrosion preventive compound to terminals.</p>	<p>NATO jump start connector or wiring is damaged or corroded.</p> <p>Terminals corroded.</p>
13	Annual	Cab Components	<p>1. Open cab door.</p>	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. Lubricate door hinges (Figure 5, Item 1 and 2) every 1,000 miles (1,600 km) or monthly, whichever occurs first.</p>  <p style="text-align: right;">B230002967</p> <p style="text-align: center;">Figure 5. Door Hinges.</p> <p>3. Operate combat locks.</p>	<p>Combat locks do not operate.</p>
14	Annual	Heating Ventilation and Air Conditioning (HVAC)/Life Support System (LSS) Filtration System	<p>1. Inspect HVAC/LSS system wiring for frayed, corroded, or pinched wires (Figure 6, Item 5), damaged wire retainers (Figure 6, Item 4), and loose wire retainer bolts (Figure 6, Item 3).</p>  <p style="text-align: right;">B235210500</p> <p style="text-align: center;">Figure 6. Condenser Fans.</p>	<p>Broken or frayed wires.</p>



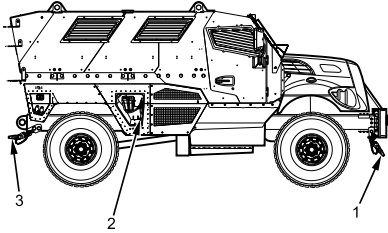
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			2. Inspect condensers (Figure 6, Item 6) for damage, missing bolts, corrosion, and insecure mounting.	Condensers or fans leaking, or excessively damaged, or corroded.
15	Annual	Nuclear, Biological, and Chemical (NBC) Filter	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  </div> <p>NBC system maintenance procedures require at least two personnel due to risk of medical emergency from possible exposure to NBC agents. Maintenance must be performed by properly trained, authorized personnel with proper safety equipment and protective clothing. Make sure batteries are disconnected and area is well ventilated. Do not smoke or allow open flame near vehicle. Never operate system with cover or panel removed. Failure to comply may result in serious injury or death to personnel.</p> <p>Inspect NBC filter module (Figure 7, Item 1) for security of mounting, damaged parts, and loose or missing mounting bolts.</p> <div style="text-align: center;">  <p style="text-align: center;">B230003587</p> </div> <p style="text-align: center;">Figure 7. NBC Filter.</p>	Damaged or missing parts. Evident damage.
16	Annual	Weapon Station Turret	1. Inspect turret ring (Figure 8, Item 2) for bent or broken teeth. Make sure turret rotates freely.	Ring teeth are broken or bent. Turret does not rotate freely.


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. Inspect turret brake (if equipped) for cracked mounting bracket welds, and missing or broken mounting bolts.</p> <p>3. Inspect turret wiring for frayed, broken, corroded, or pinched wires.</p> <p>4. Inspect turret mounting (Figure 8, Item 1) for loose, missing, or damaged parts.</p> <div style="text-align: center;"> <p>B233410497</p> </div> <p>Figure 8. Weapon Station Turret.</p> <p>5. Ensure brushes are present and are not curled upward.</p> <p>6. Inspect turret brake for cracked mounting bracket welds.</p> <p>7. Inspect for damaged or bent stop ring notches</p>	<p>Turret brake is misaligned or mounting bracket welds are cracked.</p> <p>Lock does not engage and release properly.</p> <p>Turret wiring is frayed, broken, or corroded.</p> <p>Brushes are missing or curled upward more than 0.25 in. (6.4 mm).</p> <p>Stop ring notches will not stop at required position.</p>

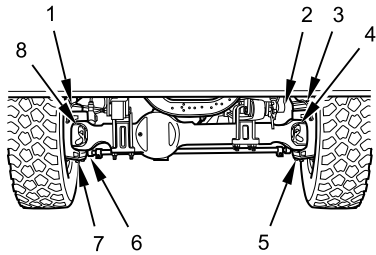
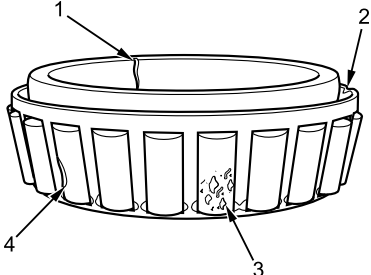
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
17	Annual	Front Winch	<p style="text-align: center;">WARNING</p> <div style="display: flex; justify-content: center; gap: 20px;">   </div> <p>Wear heavy, leather-palmed work gloves when handling cable. Never let moving cable slide through hands, even when wearing gloves. Cable can become frayed or contain broken wires. A broken wire could cut through gloves and injure hands. Failure to comply can result in serious injury to personnel.</p> <ol style="list-style-type: none"> 1. Inspect winch for security of mounting, loose or missing mounting bolts, and broken or missing parts. 2. Unwind entire cable, lubricate with lithium grease, and inspect for kinks, frays, and wear. 	<p>Broken, missing or loose mounting bolts.</p> <p>Kinked, frayed, or worn cable.</p>
18	Annual	Compressed Air Systems	<p style="text-align: center;">NOTE</p> <p>Inspection of emergency and service air lines and fittings will be performed for entire vehicle. Tighten, repair, and/or replace components of these compressed air systems as required.</p> <ol style="list-style-type: none"> 1. Inspect front and rear service couplings (Figure 9, Item 1 and 3) and emergency air coupling (Figure 9, Item 2) for serviceability and seals. <div style="text-align: center;">  <p style="font-size: small;">B230002969</p> </div> <p>Figure 9. Compressed Air Couplers.</p> <ol style="list-style-type: none"> 2. Inspect air lines and fittings for security of mounting, tightness of connections, and damage that could cause air leaks. 	<p>Any air leak.</p>

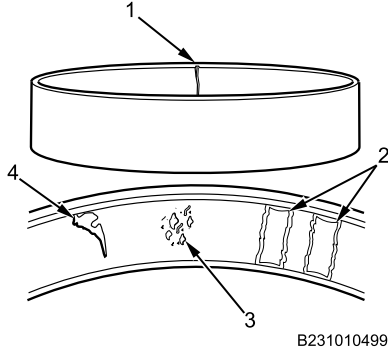
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
19	Annual	Frame and Crossmembers	<p style="text-align: center;">NOTE</p> <p>Inspection of crossmembers, bolts, and rivets will be performed over complete vehicle. Tighten, repair, and/or replace components of frame as required.</p> <p>Inspect crossmembers and frames for breaks, missing bolts, and obstructions to other components.</p>	<p>Any missing bolts.</p> <p>Any breaks of frame or crossmembers.</p>
20	Annual	Front Wheels, Hubs, and Drums	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  </div> <p>Before lifting vehicle off ground, make sure it is parked on level surface. Set parking brake and chock wheels. Use hydraulic jack to lift vehicle. Jackstands and hydraulic jack must be used on a stable surface capable of supporting the combined weight of the vehicle being lifted and the lifting equipment. Do not use jack alone to support vehicle. Never work under or near a vehicle supported only by jack or lifting device. Use rated jackstands under frame rails to properly support vehicle. Do not support vehicle under front and rear axles. Use additional jackstands as necessary to support vehicle components during removal and installation procedures. Failure to comply may result in damage to equipment and serious injury or death to personnel.</p> <p style="text-align: center;">NOTE</p> <p>Similar left and right side components are inspected in same manner and will be serviced simultaneously.</p> <p>When documenting discrepancies for similar left and right side components, indicate which side is affected.</p>	

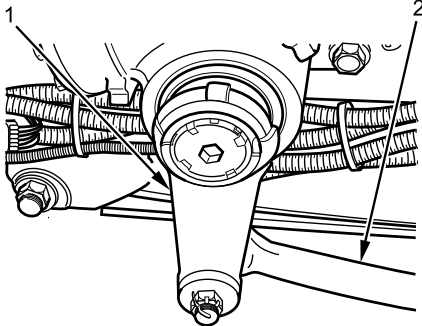
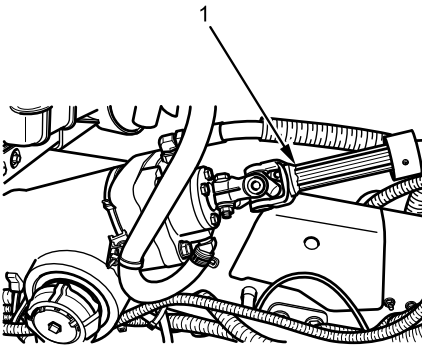
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>1. Inspect axle drive yokes (Figure 10, Item 4 and 8) for oil leaks.</p>  <p style="text-align: center;">B230002966</p> <p>Figure 10. Front Axle Components.</p> <p>2. Inspect wheel bearing cone center for cracks (Figure 11, Item 1), cage damage (Figure 11, Item 2), pitting (Figure 11, Item 3) or spalling (Figure 11, Item 4). Replace bearing if damage is found.</p>  <p style="text-align: center;">B231010498</p> <p>Figure 11. Bearing Cone Damage.</p> <p>3. Inspect bearing cup for cracks (Figure 12, Item 1), etching (Figure 12, Item 2), pitting (Figure 12, Item 3) or spalling (Figure 12, Item 4). Replace bearing if damage is found.</p>	<p>Any Class III leak.</p> <p>Cracked, spalling, worn, or etching of</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p style="text-align: center;">Figure 12. Bearing Cup Damage.</p> <ol style="list-style-type: none"> 4. Clean, inspect, and lubricate axle shaft and universal joints. 5. Inspect wheels for cracks, bends, and impact damage. 6. Inspect drums for cracks, severe heat checking, heat spotting, scoring, pitting. 	<p>bearing cone or cup.</p> <p>Cracks, heat checking, heat spotting, scoring, pitting of drums.</p>
21	Annual	Steering System	<ol style="list-style-type: none"> 1. Lubricate grease fittings every 2,700-3,300 miles (4,345-5310 km) or 3 months, whichever occurs first. When practical, lubrication services will be made to coincide with semi-annual preventive maintenance service. 2. Inspect steering knuckles (Figure 10, Item 5 and 7), steering gear, tie rod assembly (Figure 10, Item 6), steering arms (Figure 10, Item 1 and 3), drag link, (Figure 13, Item 2) pitman arm (Figure 13, Item 1), and lower steering gear shaft (Figure 14, Item 1) for breaks, cracks, rust, wear, and signs of damage and/or unserviceable condition. Refer to (WP 0476), (WP 0477), (WP 0531), (WP 0537), and (WP 0539). 	<p>Evident damage.</p> <p>Cracked or excessively worn tie rod, or broken power steering cylinder, gear</p>

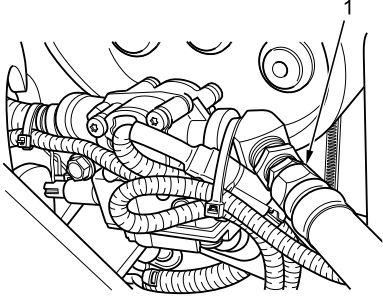
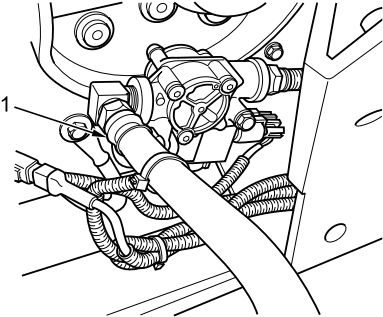
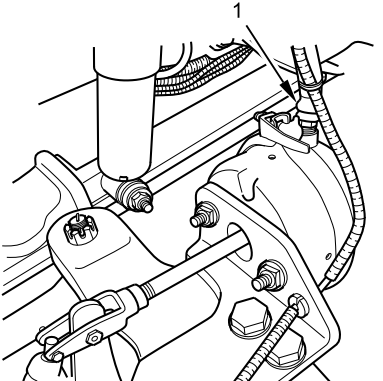
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p style="text-align: center;">B231403589</p> <p style="text-align: center;">Figure 13. Pitman Arm and Drag Link.</p>  <p style="text-align: center;">B230603588</p> <p style="text-align: center;">Figure 14. Steering Shaft.</p> <ol style="list-style-type: none"> 3. If steering knuckles, steering arms, or steering gear are broken, cracked, worn, or have other signs of an unserviceable condition, repair/replace as needed. 4. Lubricate with GAA or lithium grease at steering knuckle grease fittings, tie rod assembly grease fittings, steering shaft grease fittings, drag link grease fittings, and front left and right slack adjuster grease fittings. 5. Inspect steering stops for presence and security. If any stop is missing or has broken welds, replace or repair. 6. Inspect steering gear while steering wheel is rotated. Refer to Steering Gear Removal and Installation (WP 0537). 	<p>shaft, or drag link.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>7. Check for free play between steering knuckles and tie rod ends, drag link (Figure 13, Item 2) and pitman arm (Figure 13, Item 1) to drag link. If free play is present, torque attaching nuts to specification: stud size 3/4 inch – 85-105 lb-ft (116-143 N•m); stud size 7/8 inch – 120-160 lb-ft (163-218 N•m). Continue to tighten to align slot in locknut with cotter pin hole. Do not loosen nut to install cotter pin. Refer to Steering Knuckle and King Pin Removal and Installation (WP 0477) and Tie Rod Removal and Installation (WP 0531).</p> <p>8. Inspect hydraulic hoses and fittings behind armor and cylinder for loose connections, cracks, splits, or damage that could cause hydraulic leaks. Tighten hydraulic lines and fittings connections. Replace any hydraulic lines and fittings that have cracks, splits, or damage that could cause hydraulic leaks Refer to Power Steering Pump Removal and Installation (WP 0539).</p> <p>9. Inspect power steering pump for security of mounting and for leaks and signs of damage. Tighten loose mounting hardware. Refer to Power Steering Pump Removal and Installation (WP 0539).</p> <p>10. Inspect steering gear for security of mounting and signs of leaks. Refer to Steering Gear Removal and Installation (WP 0537).</p> <p>11. Tighten steering gear mounting locknuts securely. Refer to Torque Limits (WP 0537).</p>	<p>Excessive steering play.</p> <p>Cracked, split, or damaged hydraulic lines/fittings.</p>
22	Annual	Air Lines and Brake Chambers	<p>1. Inspect front service brake air lines and fittings (Figure 15, Item 1), (Figure 16, Item 1), and (Figure 17, Item 1) for loose connections, cracks, splits, or damage that could cause potential air leaks. Tighten loose air lines and fittings connections, and replace any air line or fitting that has cracks, splits, or damage that could cause potential air leaks (WP 0514).</p>	Any air leaks.

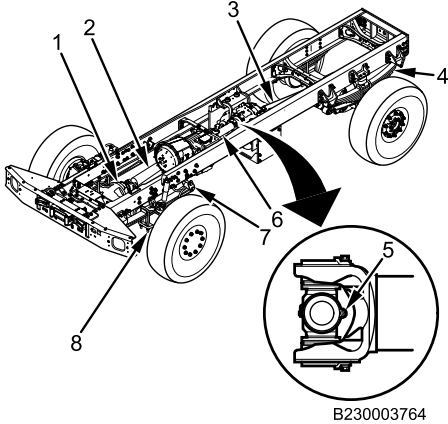
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. Inspect front service brake chambers (Figure 17, Item 3) for condition and security of mounting. Replace any service brake chamber that is damaged, defective, or inoperative (WP 0514).</p>  <p style="text-align: right;">B231204863</p> <p>Figure 15. Air Line Right Side.</p>  <p style="text-align: right;">B231204862</p> <p>Figure 16. Air Line Left Side.</p>  <p style="text-align: right;">B231204861</p> <p>Figure 17. Front Air Chamber.</p>	<p>Damaged or defective chambers.</p>

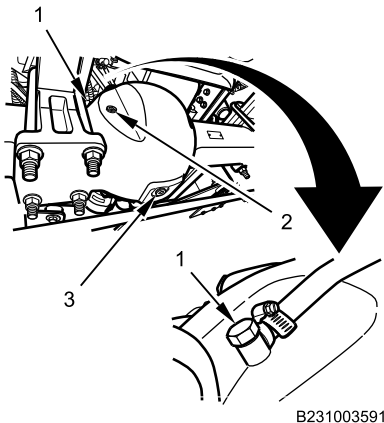
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
23	Annual	Springs, Propeller Shaft, Universal and Slip Joints, and Axle	<p style="text-align: center;">CAUTION</p> <p>Wipe fittings clean before servicing to prevent damage to shackle pins and bushings.</p> <p>Breathers and axle around breathers must be wiped clean before servicing to prevent damage to axle from contamination.</p> <p style="text-align: center;">NOTE</p> <p>Lubrication of universal and slip joints will be performed while performing other inspection tasks in the same area. Tighten, repair, and/or replace components of universal, slip joints, and propeller shafts when damaged or worn, as required. If maintenance is required at a higher level, records should reflect closest point of reference to ensure proper identification of components requiring service.</p> <ol style="list-style-type: none"> 1. Inspect axle (Figure 18, Item 1) for security of mounting on springs. Torque spring U-bolt nuts (Figure 18, Item 8) to 260-300 lb-ft (353-407 N•m). 2. Inspect springs (Figure 18, Item 4) and shackles (Figure 18, Item 7) for cracks, breaks, and security of mounting. Torque spring shackle mounting nuts to 325-400 lb-ft (441-543 N•m). 3. Lubricate spring U-bolts and shackles with GAA every 3,000 miles (4,800 km) or 6 months, whichever occurs first. 4. Inspect front spring bolts and bushing at both ends of shackle. 	Evident damage.

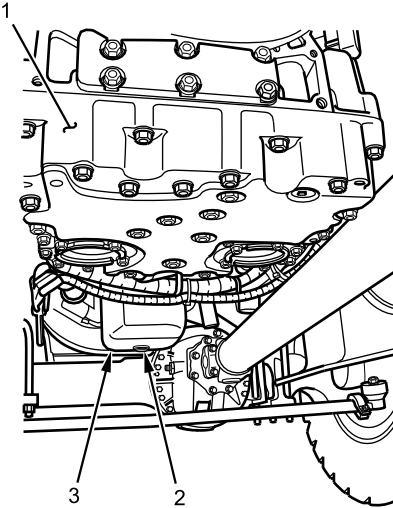
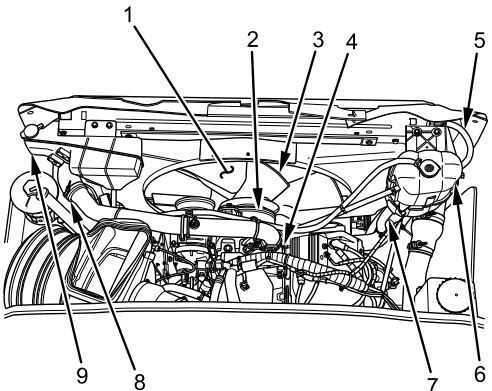
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>5. Lubricate universal (Figure 18, Item 5) and slip joints on propeller shafts with GAA (Figure 18, Item 2, 3, and 6) adapter every 3,000 miles (4,800 km) or 3 months, whichever occurs first.</p>  <p style="text-align: center;">B230003764</p> <p style="text-align: center;">Figure 18. Chassis Inspection and Lubrication Points.</p> <p>6. Inspect universal and slip joints on transfer case-to-front axle propeller shaft for damage or worn components. Replace worn components.</p> <p>7. Remove and clean axle breathers (Figure 19, Item 1) every 1,000 miles (1,600 km) or monthly, whichever comes first.</p> <p>8. Remove differential fill plug (Figure 19, Item 2) and check oil level in differential every 1,000 miles (1,600 km) or monthly, whichever occurs first. Fill if necessary. Level should be within ½ in. (12.7 mm) from hole of fill plug when oil is cold, and to hole of fill plug when hot.</p> <p>9. Inspect differential drain plug (Figure 19, Item 3) and fill plug for tightness and signs of leakage. Torque drain plug 35-50 lb-ft (48-67 N•m) and fill plug 35-50 lb-ft (48-67 N•m).</p>	<p>Any breather missing.</p> <p>Any axle plug missing.</p> <p>Any Class III leak.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p>Figure 19. Front Axle Plugs.</p>	
24	Annual	Underside of Engine and Transmission	<ol style="list-style-type: none"> <li>1. Inspect underside of engine for fuel, coolant, and oil leaks. <li>2. Inspect engine oil pan (Figure 20, Item 3) and drain plug (Figure 20, Item 2) for leaks. If oil pan is loose or if leaks are present, torque oil pan screws to 24 lb-ft (32 N•m). If drain plug is loose or if leaks are present, torque drain plug 50 lb-ft (68 N•m). <li>3. Inspect transmission (Figure 20, Item 1) body for cracks or loose bolts that could cause leaks. If damaged, replace bolts. 	Any Class I fuel leak or Class III oil/coolant leak.

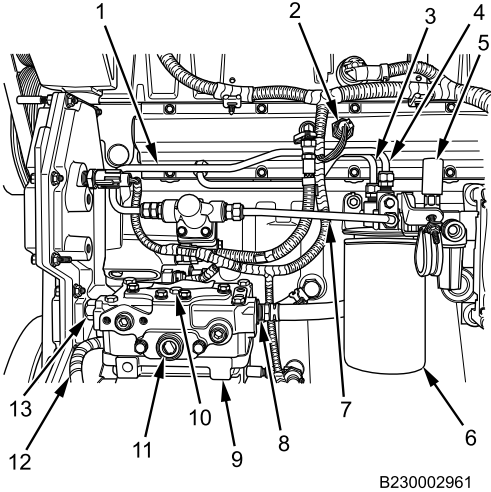
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p>B230002955</p> <p>Figure 20. Engine and Transmission Pans.</p>	
25	Annual	Cooling System	<p>1. Inspect coolant lines, hoses (Figure 21, Item 8), and fittings for loose connections, cracks, frays, wear, and damage that could cause leaks. Tighten loose connections. Replace any oil line, hose, or fitting that is cracked, frayed, worn, or damaged and could cause leaks.</p>  <p>B230002962</p> <p>Figure 21. Cooling System.</p> <p>2. Inspect radiator core (Figure 21, Item 1) for clogged or bent fins, leaks, and protruding debris. Clean clogged core and remove debris.</p>	<p>Cooling system leaking.</p> <p>Hoses/Lines cracked, frayed, or damaged.</p> <p>Radiator air-flow obstructed.</p>

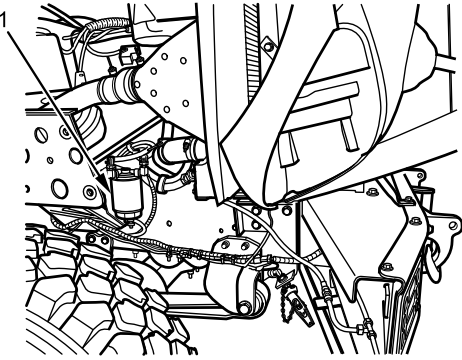
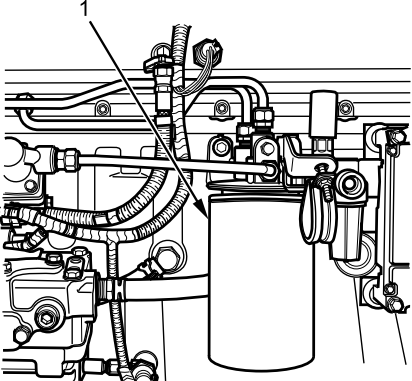
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<ol style="list-style-type: none"> 3. Inspect water pump pulley (Figure 21, Item 2) and fan (Figure 21, Item 3) for play. 4. Inspect fan blade for security, breaks, and damage that could cause an out-of-balance condition. 5. Inspect surge tank (Figure 21, Item 9), deaeration tank (Figure 21, Item 6), water manifold, thermostat housing, radiator, engine oil cooler, and hoses (Figure 21, Item 5 and 7) for leaks, general condition, and security of mounting. 6. Inspect coolant temperature sensor (Figure 21, Item 4) for security of mounting and leaks. Inspect sending unit wiring for frays, splits, breaks, and worn or missing insulation. 	<p>Water pump pulley or fan have play.</p> <p>Fan blades bent, broke, or damaged.</p> <p>Coolant temperature sensor wiring frayed, split, or broken.</p>
26	Annual	Air Compressor	<ol style="list-style-type: none"> 1. Check compressor (Figure 22, Item 9) for security of mounting and leaks. 2. Check condition and security of cooling lines (Figure 22, Item 8 and 13) to air compressor. Tighten cooling lines, if loose. Replace cooling lines if split, cracked, or damaged in such a manner as to cause leaks. 3. Check condition of compressor oil line (Figure 22, Item 12) and fittings. Tighten fittings and oil line if loose. Replace oil line if split, cracked, or damaged in such a manner as to cause leaks. 4. Check condition and security of input tube (Figure 22, Item 10) and hoses, output air line (Figure 22, Item 11), and governor control air line. Tighten output and governor control air lines, if loose. Replace input tube or hoses if split, cracked, collapsed, distorted, or damaged in such a manner as to prevent a tight seal or restrict incoming air. 	<p>Evident damage.</p> <p>Class III leak.</p> <p>Insecure mounting.</p>

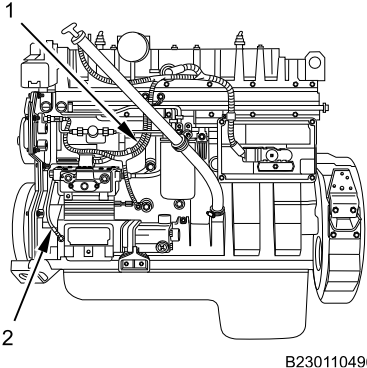
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p style="text-align: center;">Figure 22. Left Side of Engine.</p>	
27	Annual	Engine Fuel System	<ol style="list-style-type: none"> 1. Inspect fuel lines (Figure 22, Item 1 and 7) for tightness of connections. 2. Inspect fuel injector lines (Figure 22, Item 4), injector pump lines (Figure 22, Item 4), and filter (Figure 22, Item 3), and manifold line and screws for leaks and damage. Tighten fuel injector lines, injector pump lines, and manifold line and screws if leaking, and replace if damaged. 3. Inspect injector line hold-down bolts for security of mounting. Tighten bolts if loose. 4. Check fuel priming pump (Figure 22, Item 5) or fuel priming/transfer pump for security of mounting and proper operation. 5. Visually inspect fuel Injection Control Pressure (ICP) sensor (Figure 22, Item 2) and wiring for loose connections, frays, splits, and missing insulation. Repair or replace missing wiring and wiring that has frayed, split, or missing insulation. Tighten loose connections. 	

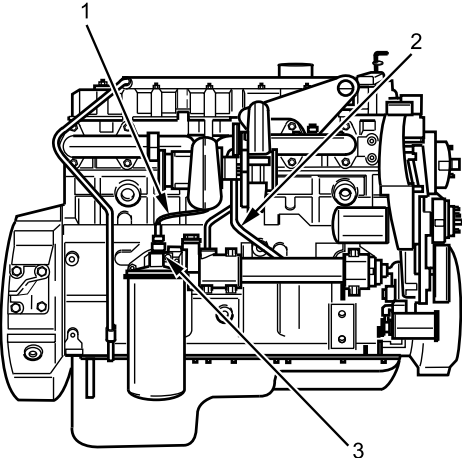
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>6. Inspect fuel/water separator (Figure 23, Item 1) mounting and housing for dents, cracks, and damage to inlet, outlet, and bleeder fittings that could cause leaks. Replace if fuel/water separator is damaged.</p>  <p style="text-align: right;">B230003760</p> <p style="text-align: center;">Figure 23. Fuel/Water Separator.</p> <p>7. Replace fuel/water separator filter. 8. Replace fuel filter (Figure 24, Item 1).</p>  <p style="text-align: right;">B230303598</p> <p style="text-align: center;">Figure 24. Fuel Filter.</p>	<p>Any fuel leaks. Excessive damage present.</p>

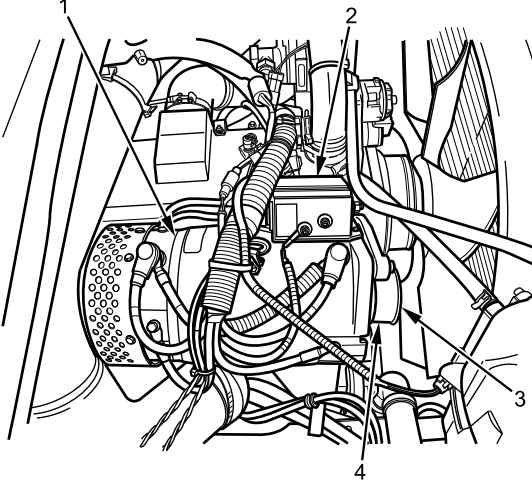
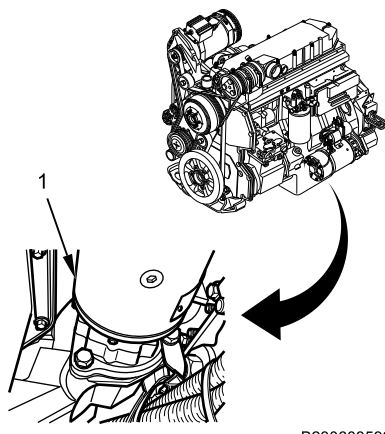
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
28	Annual	Engine Lubrication System and Oil Lines	<p>1. Inspect engine oil lines (Figure 25, Item 1 and 2), and fittings for loose connections, cracks, frays, wear, and damage that could cause leaks. Tighten loose connections, and replace any oil lines, and fittings that are cracked, frayed, worn, or damaged and could cause leaks. Refer to (WP 0250), and (WP 0527).</p>  <p style="text-align: center;">B230110496</p> <p style="text-align: center;">Figure 25. Engine Oil Lines.</p> <p>2. Inspect turbocharger oil lines (Figure 26, Item 1 and 2) and fittings for loose connections and damage that could cause leaks. Tighten loose connections, and replace any oil lines, and fittings that are cracked, frayed, worn, or damaged and could cause leaks. Refer to (WP 0262)</p> <p>3. Inspect vehicle for security of oil filter head (Figure 26, Item 3). Ensure spin-on oil filter is tight. If spin-on oil filter is loose, hand-tighten first, and then tighten an additional $\frac{3}{4}$ turn with a wrench.</p>	<p>Metal particles found in oil sample.</p> <p>Any Class III leak.</p>


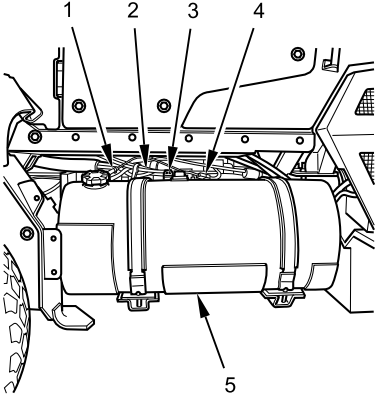
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p style="text-align: right; margin-right: 50px;">B230110495</p> <p style="text-align: center;">Figure 26. Turbo Oil Lines.</p> <ol style="list-style-type: none"> 4. Check engine oil and dipstick for metal particles. Notify supervisor if metal particles are found. 5. Change oil and filter (every 6 months or 6000 miles, whichever occurs first). 6. Inspect valve cover(s) and gasket(s) for evidence of leaks. 	
29	Annual	Engine Compartment Electrical Wiring	Inspect all engine compartment wiring for frays, splits, missing or damaged insulation, and poor connections. Repair or replace affected wiring.	Evident damage.

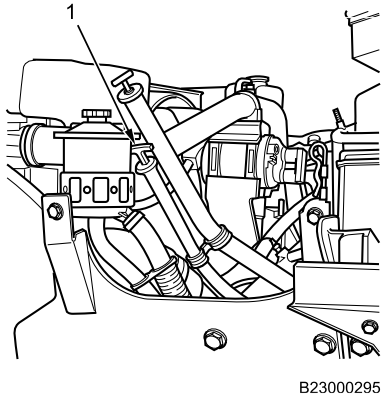
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
30	Annual	Charging System	 <p style="text-align: right;">B230604866</p> <p>Figure 27. Alternator and Voltage Regulator.</p> <p>Inspect alternator (Figure 27, Item 1) and voltage regulator (Figure 27, Item 2) for security, frayed or broken wiring and belt (Figure 27, Item 4), damaged pulley (Figure 27, Item 3), and missing/broken bolts.</p>	<p>Alternator pulley damaged.</p> <p>Wiring frayed or broken.</p> <p>Mounting bolts broken or missing.</p>
31	Annual	Starter Motor	<ol style="list-style-type: none"> 1. Inspect starter motor (Figure 28, Item 1) for secure mounting. 2. Inspect for frayed, broken, or corroded starter electrical cables.  <p style="text-align: right;">B230603593</p> <p>Figure 28. Starter Motor.</p>	<p>Starter assembly is cracked, broken, or missing bolts.</p> <p>Electrical cables are frayed, broken, or corroded.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
32	Annual	Fuel Lines and Tank	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  </div> <p>Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.</p> <ol style="list-style-type: none"> 1. Inspect fuel tank (Figure 29, Item 5) for dents, cracks, and broken welds that could cause leaks. 2. Visually inspect vent tube (Figure 29, Item 1), fuel hoses (Figure 29, Item 2), and fittings (Figure 29, Item 3) on fuel tank for loose connections, cracks, and splits. Replace fuel tank tubes and hoses that are cracked or split. Tighten loose fuel tank tubes and hose connections. 3. Inspect fuel tank electrical connector (Figure 29, Item 4) and wires for chafing, cracks, or corrosion. <div style="text-align: center;">  <p style="text-align: right; font-size: small;">B230002960</p> </div> <p style="text-align: center;">Figure 29. Fuel Tank.</p>	<p>Evident damage.</p> <p>Any Class III leak.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
33	Annual	Transmission and Transfer Case	<p style="text-align: center;">CAUTION</p> <p>Do not remove transmission dipstick before cleaning dirt away from access plate, filler tube, and dipstick. Dirt may enter and damage transmission.</p> <p>Do not overfill transmission. Failure to comply will result in internal transmission component damage.</p> <p>Change transmission oil when contamination by fuel, water, or other foreign material is evident. Failure to comply will result in internal transmission component damage.</p> <p>1. Inspect transmission dipstick (Figure 30, Item 1) and oil.</p> <div style="text-align: center;">  <p style="text-align: right; font-size: small;">B230002959</p> </div> <p style="text-align: center;">Figure 30. Transmission Dipstick.</p> <p>a. Check for evidence of metal particles. Notify your supervisor if metal particles are found.</p> <p>b. Check for evidence of dilution by coolant. If oil is diluted by coolant, notify your supervisor.</p> <p>c. Check oil level in transmission at normal operating temperature. If oil levels are excessive, drain excess. If oil is needed, add oil as required. Refer to (TM 9-2355-106-10).</p>	<p>Evident damage.</p> <p>Oil or contamination is noted.</p> <p>Any Class III leak.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

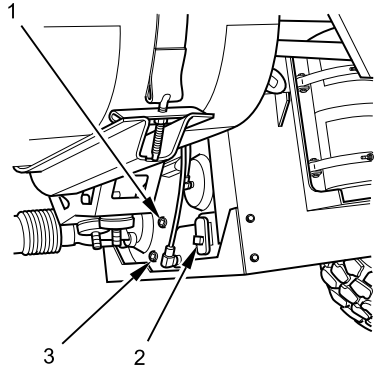
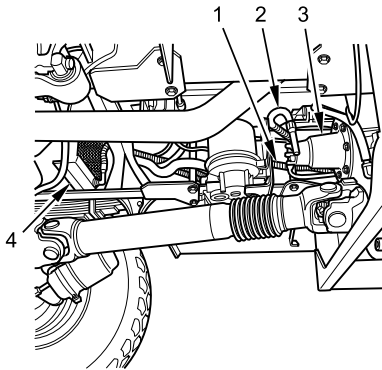
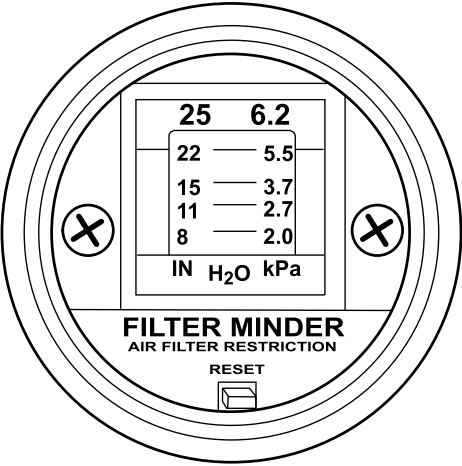
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. After road test, inspect transmission oil lines, hoses and fittings for loose connections, cracks, frays, wear, and damage that could cause leaks. Tighten loose connections. Replace any oil line, hose, or fitting that is cracked, frayed, worn, or damaged and could cause leaks.</p> <p>3. Inspect transmission oil sending unit for security and signs of leaks, and inspect wiring for frays, splits, breaks, and missing insulation. Tighten oil level sending unit if loose or leaking. Replace if necessary. Repair or replace wiring that is missing or has frayed, split, or missing insulation. Tighten loose connections. Refer to (WP 0420).</p> <p>4. Inspect for leaks, security of mounting, and signs of damage or unserviceable condition.</p> <p>5. Remove transfer case fill plug and check oil level in transfer case every 3,000 miles (4,800 km) or 3 months, whichever comes first. Fill as necessary. Level should be within ½ in. (12.7 mm) from fill hole when oil is cold, or to fill hole when oil is hot.</p> <p>6. Inspect transfer case drain plug (Figure 31, Item 3) and fill plug (Figure 31, Item 2) for tightness and signs of leakage. Torque fill plug and drain plug to 35-50 ft-lb (47-68 N•m).</p>  <p style="text-align: right;">B230003594</p>	<p>Loose, damaged, or missing connectors.</p> <p>Insecure mounting.</p>

Figure 31. Transfer Case Plugs.

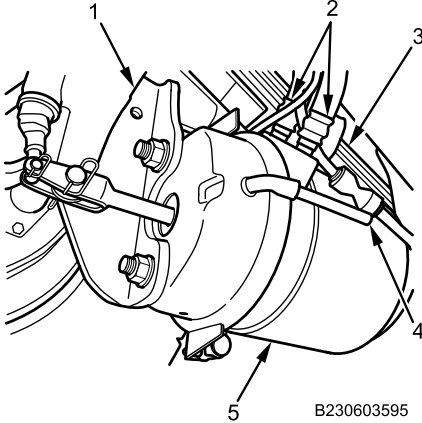
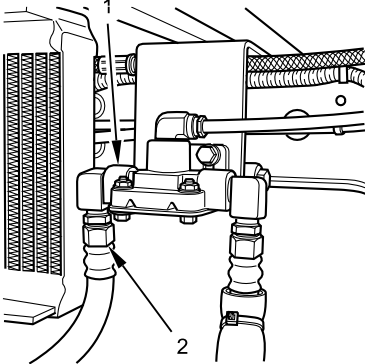
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>7. Inspect transfer case for leaks. Notify your supervisor if leaks are detected.</p> <p>8. Inspect for leaks and visible damage to drain and fill plugs. Tighten loose fittings and replace worn or damaged plugs.</p> <p>9. Inspect oil and air lines and fittings on transfer case for loose connections, cracks, frays, wear, and damage that could cause leaks. Inspect all mounting fasteners for tightness. Tighten loose connections. Replace any oil or air line, hose, or fitting that is cracked, frayed, worn, or damaged and could cause leaks.</p> <p>10. Inspect hydraulic pump (Figure 32, Item 3) for security of mounting, leaks, and sign of damage that could cause leaks. Tighten hydraulic pump mounting.</p> <p>11. Inspect hydraulic lines (Figure 32, Item 1 and 2) and fittings for loose connections, cracks, frays, wear, and damage that could cause leaks. Tighten loose connections. Replace any oil line, hose, or fitting that is cracked, frayed, worn, or damaged and could cause leaks.</p> <p>12. Check transfer oil cooler (Figure 32, Item 4) for damage and leaks.</p>  <p style="text-align: center;">B230002958</p> <p style="text-align: center;">Figure 32. Transfer Case Cooling Components.</p>	<p>Insecure hydraulic pump.</p>
34	Annual	Air Intake Tubes	<p>1. Inspect vent lines for serviceability and security of connections.</p>	

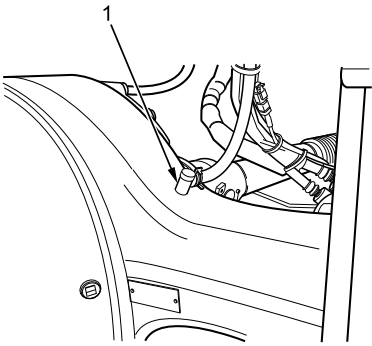
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>2. Inspect air intake piping and air cleaner assembly for condition and security of mountings.</p> <p>3. Test air cleaner indicator (figure 33) for proper operation.</p>  <p style="text-align: right;">B230612317</p> <p style="text-align: center;">Figure 33. Air Cleaner Indicator</p>	<p>Loose piping or mounting.</p> <p>Indicator inoperable.</p>
35	Annual	Rear Wheels and Hubs, and Suspension	<p style="text-align: center;">NOTE</p> <p>Similar left and right side components are inspected in same manner and will be serviced simultaneously.</p> <ol style="list-style-type: none"> 1. Clean, inspect, and lubricate inner and outer rear wheel bearings with GO-75 or GO-85w/140. 2. Inspect service, and service/spring brake air lines (Figure 34, Item 2), vent tubes (Figure 35, Item 3 and 4), and fittings for loose connections, cracks, splits, or damage that could cause air leaks. Tighten loose air lines and fittings and replace any air line or fitting that has cracks, splits, or damage that could cause air leaks. Refer to Rear Brake Air Chamber Removal and Installation (WP 0516). 	<p>Evident damage.</p> <p>Any Class III leak.</p>

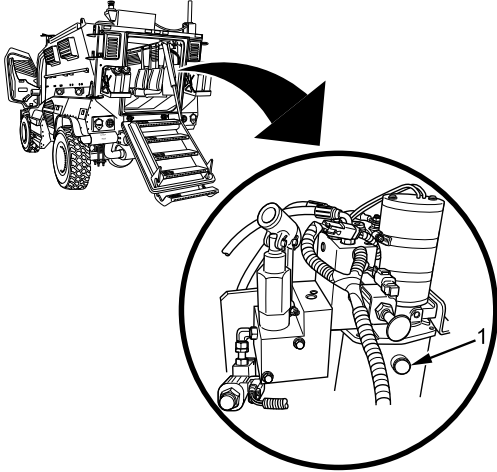
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			 <p style="text-align: right;">B230603595</p> <p>Figure 34. Rear Air Chamber.</p>  <p style="text-align: right;">B231202433</p> <p>Figure 35. Air Valve.</p> <p>3. Check brake shoe-to-drum adjustment and condition of brake shoes. Manually adjust brakes or notify your supervisor of inoperative adjusters. Replace brake shoes if worn beyond chamfer on linings. Refer to Brake Adjustment Procedures (WP 0484).</p> <p>4. Inspect service brake chambers (Figure 34, Item 5) for condition and security of mounting (Figure 34, Item 1). Replace service brake chambers and/or component parts if condition could impair operation of brakes.</p>	

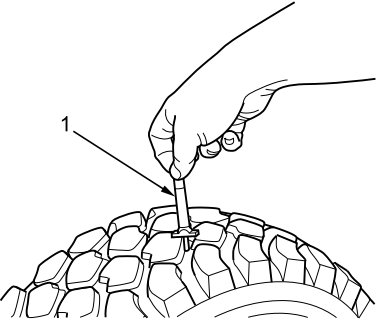
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>5. Inspect rear valves (Figure 35, Item 1) for condition and security of mounting, and inspect air lines and fittings for loose connections. Replace rear valves and/or component parts if condition could impair operation of ABS system.</p> <p>6. Tighten loose air lines and fittings. Inspect air lines and fittings for loose connections, cracks, splits, or damage that could cause air leaks. Tighten loose air lines and fittings.</p> <p>7. Visually inspect leaf springs for cracks, breaks, and security of mounting. Replace leaf springs, if cracked or broken. Secure mounting, if loose.</p> <p>8. Torque nuts on spring U-bolts to 370-400 lb-ft (502-542 N•m).</p> <p style="text-align: center;">CAUTION</p> <p>Clean breathers and axle around breathers (Figure 36, Item 1) before servicing to prevent damage to axle from contamination.</p> <p>9. Inspect differential seals for leaks.</p> <div style="text-align: center;">  <p>B231103599</p> </div> <p style="text-align: center;">Figure 36. Rear Axle Breather.</p>	<p>Any air leak.</p>
36	Annual	Towing Pintle Hook	<p>1. Lubricate towing pintle hook with GAA every 3,000 miles (4,800 km) or 3 months, whichever occurs first.</p>	<p>Evident damage.</p>

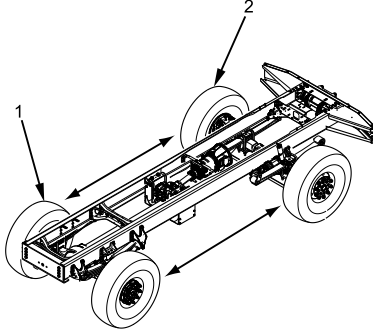
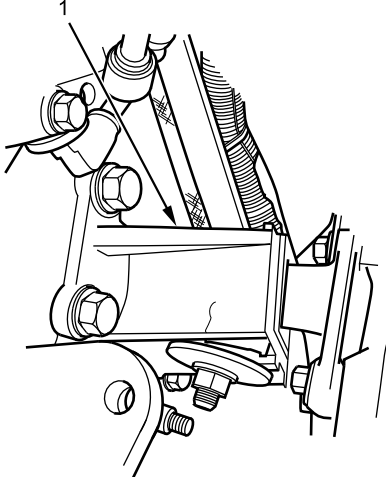
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			2. Inspect pintle and bracket for cracks, breaks, wear, and play of more than 0.003-0.017 in. (0.07-0.43 mm).	
37	Annual	Gladhands and Air Lines	1. Inspect emergency and service gladhands and air lines for serviceability and tightness of seal. Replace or service gladhands, air lines or dummy coupling(s) that are broken, bent or cracked, or have seals that leak. 2. Inspect emergency and service air lines and fittings for security of mounting, tightness of connections, and damage that could cause air leaks.	Any air leak.
38	Annual	Trailer Receptacle and Wiring	Inspect trailer receptacle and wiring for damage. Repair receptacle if damaged. Replace wiring if inoperable.	Wiring inoperative.
39	Annual	Vehicle Lights	Inspect front, rear, side, and marker lights for proper operation. Replace any defective lights.	Lights inoperative.
40	Annual	Hydraulic Ramp Oil Tank Level	Unscrew cap (Figure 37, Item 1) and visually check fluid level. Fill as needed. Check tank for damage and leaks.  <p style="text-align: right; font-size: small;">B230002965</p>	Evident damage. Any Class III leak. Missing or damaged fill cap.
41	Annual	Final Road Test	After all services and inspections have been completed, perform a short road test to ensure all corrections have been implemented. Correct any defects or malfunctions that occur during this test.	Any defects or malfunctions that occur during this test.
42	Annual	Front End	1. Check front end alignment with toe-in gauge. Refer to (WP 0472).	

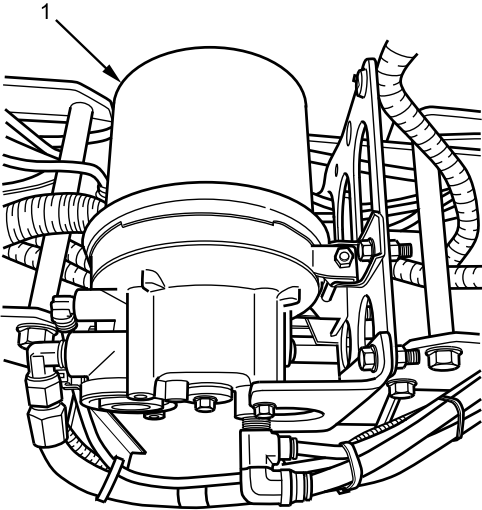
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			2. Inspect shock absorbers and mounting brackets for looseness, wear, cracks, serviceability, and leaks. Replace leaking shock absorbers if more than a Class I leak is detected. Refer to (WP 0472).	Evident damage.
43	Annual	Tires	1. Check each tire, using tire depth gauge (Figure 38, Item 1). Tread depth should be at least 1/8 in. (3 mm) or as indicated on tire depth gauge. <div style="text-align: center;">  <p>B231304879</p> <p>Figure 38. Tread Depth Gauge.</p> </div> 2. Inspect tires for cuts, gouges, cracks, or other damage. 3. Check tires for proper inflation. 4. Inspect for broken, missing, or damaged tire valves. 5. Inspect for loose, broken, or missing wheel studs and nuts. Assembly must be replaced if three or more consecutive wheel nuts are missing	Any tire has wear or damage that allows ply or belt material to be exposed through tread or sidewall. Any tire has tread or sidewall separation. Any tire does not hold proper air pressure. One or more wheel studs or nuts loose, missing, or broken. Three or more consecutive wheel nuts are missing.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			<p>6. Rotate rear tires (Figure 39, Item 1) to front and front tires (Figure 39, Item 2) to rear.</p>  <p style="text-align: center;">B231312316</p> <p style="text-align: center;">Figure 39. Tire Rotation.</p>	
44	Annual	Engine Compartment and Cabin	<ol style="list-style-type: none"> 1. Inspect front and rear cabin mounting brackets (Figure 40, Item 1) for security, wear, cracks, splits, broken welds, and missing bolts. 2. Replace front cabin mounting brackets if worn, cracked, split, or welds are broken.  <p style="text-align: center;">B230103596</p> <p style="text-align: center;">Figure 40. Mounting Brackets.</p>	Broken mounts, brackets, or welds.
45	Annual	Front and Rear Suspension	<ol style="list-style-type: none"> 1. Inspect axle housings for cracks, broken welds, breaks, or bends. Refer to (WP 0472). 2. Replace housings if welds are broken. 	Cracked housing.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
46	Annual	Air Dryer System	<ol style="list-style-type: none"> 1. Inspect air dryer (Figure 41, Item 1) and two purge valves, and check valve for security of mounting and signs of damage that could cause leaks. 2. Replace filter in air dryer. Air dryer will whistle when filter needs to be replaced. 3. Inspect all tubes and fittings for damage or cracks that could cause leaks.  <p style="text-align: right; font-size: small;">B231203597</p> <p style="text-align: center;">Figure 41. Air Dryer.</p>	Evident damage.
47	Annual	Fire Suppression System (FSS)	<ol style="list-style-type: none"> 1. Confirm that four FSS cylinders are securely mounted to vehicle (WP 0745), (WP 0750), (WP 0743), and (WP 0747). 2. Ensure pressure gauge and dash mounted indicators are in operable range (WP 0002). 3. Inspect all brackets for each cylinder to ensure that all bolts, nuts, and fasteners are tight (WP 0745), (WP 0750), (WP 0743), and (WP 0747). 4. Inspect all extinguisher nozzles (WP 0745), (WP 0750), (WP 0743), and (WP 0747). 5. Inspect all cabin and engine protection sensors (WP 0741), (WP 0742), (WP 0744), (WP 0748), and (WP 0749). 	Evident damage. Faulty reading.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) - (CONTINUED)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			6. Perform FSS operational system check. Refer to (WP 0191).	
48	Annual	Seat Mounts/ Restraints	Check and inspect all seat mounts and restraints. Ensure that seat mounts and restraints are firmly engaged and tight.	Damaged seat mount or restraint.

Table 1. Mandatory Replacement Parts.

ITEM NO.	PART NUMBER (CAGEC)	NSN	NOMENCLATURE	Qty
1	1817674C1 (338X5)	2910-01-411-8424	Strainer, fuel	1
2	1618386C93 (338X5)	4930-01-555-4840	Filter	1
3	65612 (6853)	4120-01-555-5461	Cartridge, desiccant	1
4	1822588C1 (338X5)	2910-01-444-8795	Filter	1

END OF WORK PACKAGE

CHAPTER 7
MAINTENANCE INSTRUCTIONS
FOR
MINE RESISTANT AMBUSH PROTECTED (MRAP)

FIELD MAINTENANCE
SERVICE UPON RECEIPT

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

DA PAM 750-8

SF 361

WP 0002

WP 0215

WP 0216

WP 0782

References

TM 9-2355-106-10

TM 9-2355-106-23P

SERVICE UPON RECEIPT OF MATERIAL

When new, used, or reconditioned material is first received, refer to TM 9-2355-106-10 and perform the following steps to determine if the material has been properly prepared for service.

1. Inspect all assemblies, subassemblies, and accessories to be sure they are properly assembled and in proper working order WP 0002.
2. Secure, clean, lubricate, or adjust equipment as indicated in the Preventative Maintenance Checks and Services (PMCS). Refer to WP 0216.
3. Check all Basic Issue Items (BII) to ensure every item is present, in good condition, and properly mounted or stowed.

Checking Unpacked Equipment

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions, see DA PAM 750-8).

Check to see whether the equipment has been modified.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE ASSEMBLY REMOVAL

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Lifting device (WP 0795, Item 67)
 Jack, transmission (WP 0795, Item 61)
 Wrench, combination, standard length, 12-pt, 1-1/8
 inch, chrome (WP 0795, Item 137)
 Wrench, torque, 50-250 lb-ft, 1/2-inch drive
 (WP 0795, Item 143)
 Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Faceshield, industrial (WP 0794, Item 16)
 Goggles, industrial (WP 0794, Item 20)
 Gloves (WP 0794, Item 18)
 Gloves (WP 0794, Item 19)

Personnel Required

Maintainer - (3)

References

TM 9-2355-106-10
 TM 9-2355-106-23P
 WP 0786
 WP 0782

Equipment Condition

Parking brake set (TM-9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Air tanks drained (TM 9-2355-106-10)
 Power steering fluid reservoir drained (WP 0543)
 Transmission drained (WP 0457)
 Right side engine armor plate removed (WP 0599)
 Air cleaner assembly removed (WP 0257)
 Heating Ventilating and Air Conditioning (HVAC)
 system evacuated and discharged (WP 0707)
 Armor grille support and bracket removed (WP 0568)
 Radiator pipes/hoses removed (WP 0285)
 Starter motor removed (WP 0292)
 Exhaust brake removed (WP 0246)
 Air compressor governor removed (WP 0525)
 Ether start valve and bracket removed (WP 0272)
 Oil gauge tube removed (WP 0230)
 Front frame crossmember removed (WP 0547)
 A/C compressor belt removed (WP 0244)
 Engine baffle removed (WP 0651)

ENGINE ASSEMBLY REMOVAL - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistant or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not operate vehicle with air system pressure loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Let air pressure build in both tanks to 100 psi (689 kPa) before releasing the parking brake. Low air pressure may affect vehicle braking capability. Failure to comply may result in injury or death to personnel.

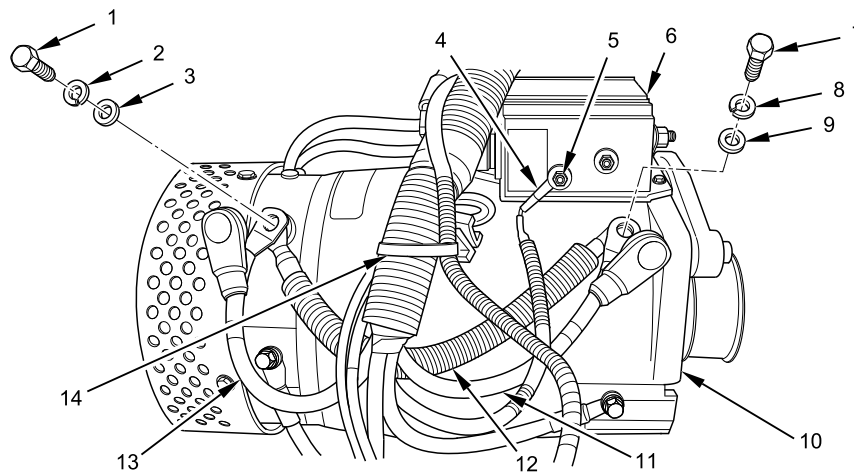
ENGINE ASSEMBLY REMOVAL - (CONTINUED)

REMOVAL

NOTE

- Label all wires prior to removal to aid in installation.
- Note location of cable lock straps prior to removal to aid in installation.

1. Remove two bolts (Figure 1, Item 1 and 6), lockwashers (Figure 1, Item 2 and 8), flat washers (Figure 1, Item 5 and 9), two positive cables (Figure 1, Item 11, and 13), and jumper cable (Figure 1, Item 12) from alternator (Figure 1, Item 10). Discard lockwashers.



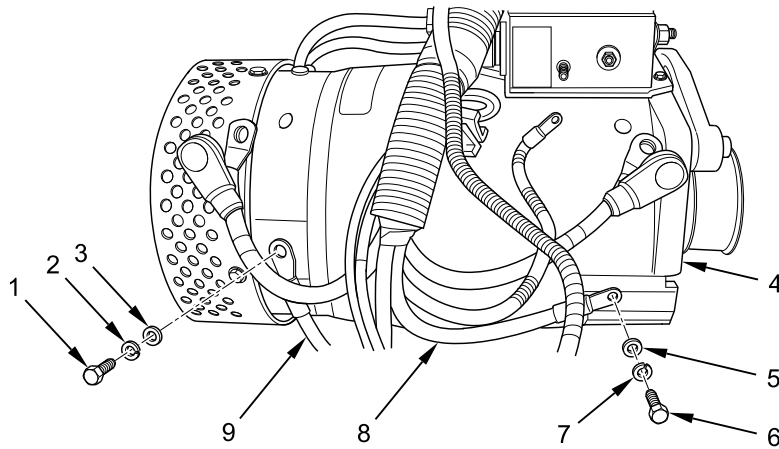
B230110443

Figure 1. Alternator Positive Cable Removal.

2. Remove and discard cable lock straps (Figure 1, Item 14) as necessary.
3. Remove nut (Figure 1, Item 5) and 24V ignition wire (Figure 1, Item 4) from voltage regulator (Figure 1, Item 6).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

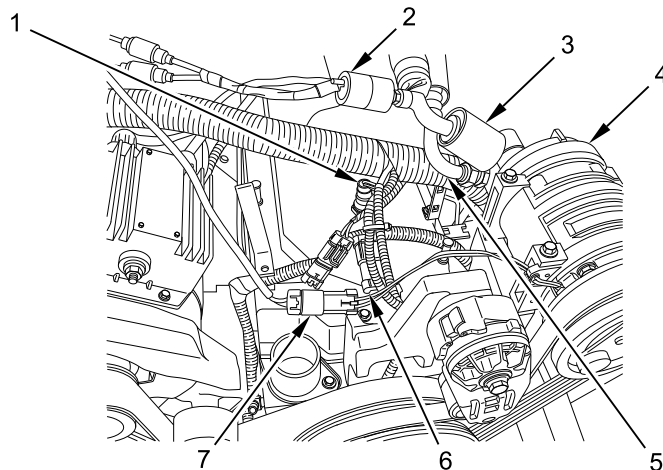
4. Remove two bolts (Figure 2, Item 1 and 6), lockwashers (Figure 2, Item 2 and 7), flat washers (Figure 2, Item 3 and 5), and two negative cables (Figure 2, Item 8 and 9) from alternator (Figure 2, Item 4). Discard lockwashers.



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Figure 2. Alternator Negative Cable Removal.

5. Disconnect A/C pressure switch (Figure 3, Item 2).

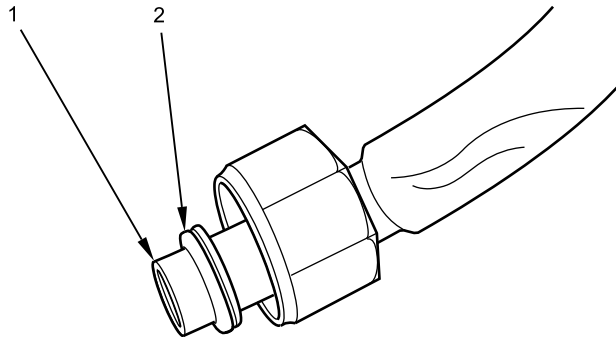


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Figure 3. Engine Harness and A/C Pressure Hoses.

6. Disconnect manifold absolute pressure (MAP) sensor harness connector (Figure 3, Item 1).
 7. Disconnect camshaft position (CMP) sensor jumper harness connector (Figure 3, Item 6).
 8. Disconnect A/C compressor clutch harness connector (Figure 3, Item 7).
 9. Remove HVAC low-pressure hose (Figure 3, Item 3) from HVAC compressor (Figure 3, Item 4).
 10. Remove HVAC high-pressure hose (Figure 3, Item 5) from HVAC compressor (Figure 3, Item 4).
 11. Remove and discard O-rings (Figure 4, Item 2) from end of each HVAC compressor hose (Figure 4, Item 1).

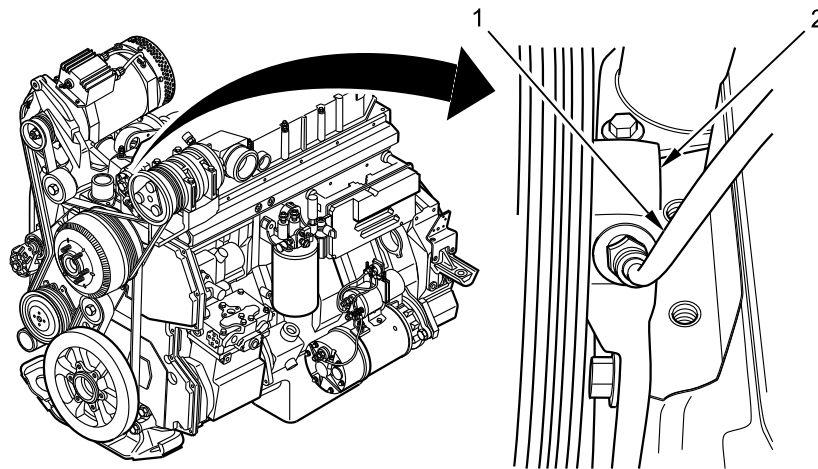
ENGINE ASSEMBLY REMOVAL - (CONTINUED)



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Figure 4. O-Rings.

12. Disconnect air hose (Figure 5, Item 1) from fan clutch (Figure 5, Item 2).



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Figure 5. Fan Drive Air Line.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

NOTE

Engine wiring harness is located on rear valve cover.

13. Remove bolt (Figure 6, Item 1) and insulated engine wiring harness retainer (Figure 6, Item 2) from valve cover (Figure 6, Item 4). Position wiring harness (Figure 6, Item 3) aside.

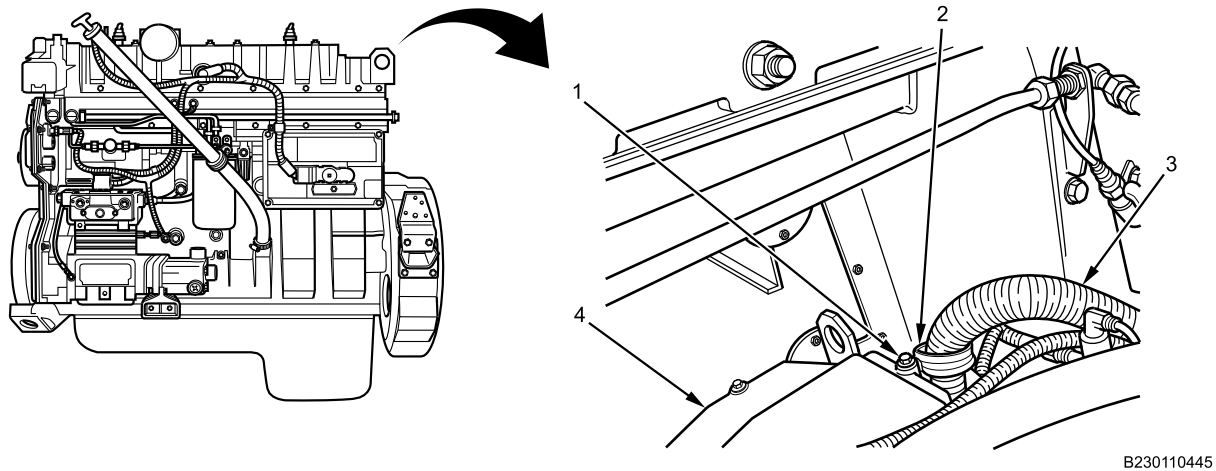


Figure 6. Insulated Engine Wiring Harness Retainer.

14. Remove screw (Figure 7, Item 4) and cover (Figure 7, Item 3) from engine wiring harness connector (Figure 7, Item 5).

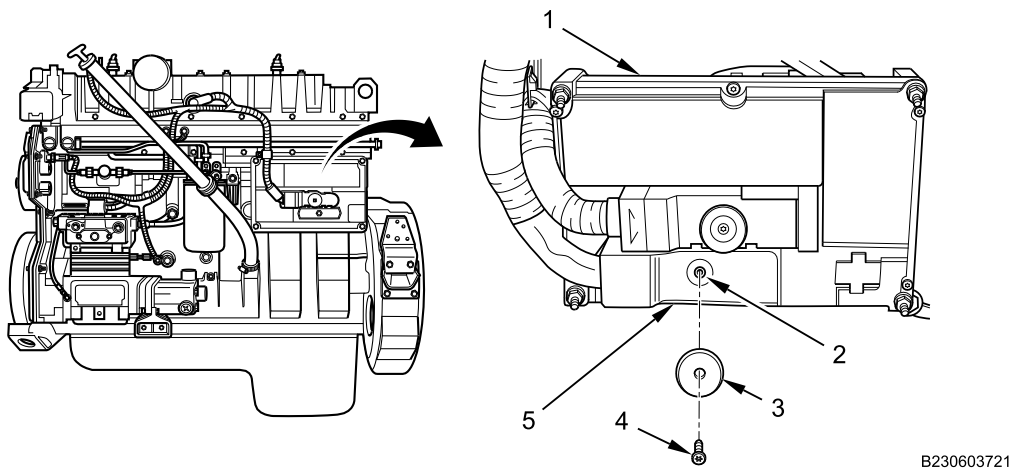


Figure 7. Engine Control Module (ECM).

15. Remove retaining bolt (Figure 7, Item 2) from engine wiring harness connector (Figure 7, Item 5) and ECM (Figure 7, Item 1).
16. Disconnect engine wiring harness connector (Figure 7, Item 5) from ECM (Figure 7, Item 1).
17. Remove nut (Figure 8, Item 1), lockwasher (Figure 8, Item 6), engine wiring harness ground cable (Figure 8, Item 7), and engine wiring harness ground cables (Figure 8, Item 2, 3, 4, and 8) from engine block ground stud (Figure 8, Item 5). Discard lockwasher.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

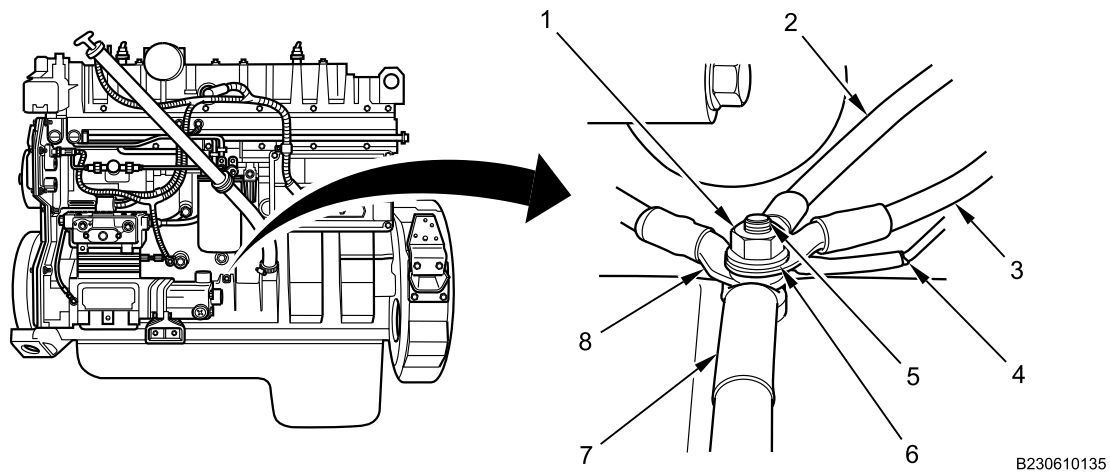


Figure 8. Engine Block Ground Stud.

18. Remove nut (Figure 9, Item 5), bolt, (Figure 9, Item 6) and retainer (Figure 9, Item 1) from transmission dipstick tube (Figure 9, Item 2), and position tube aside.

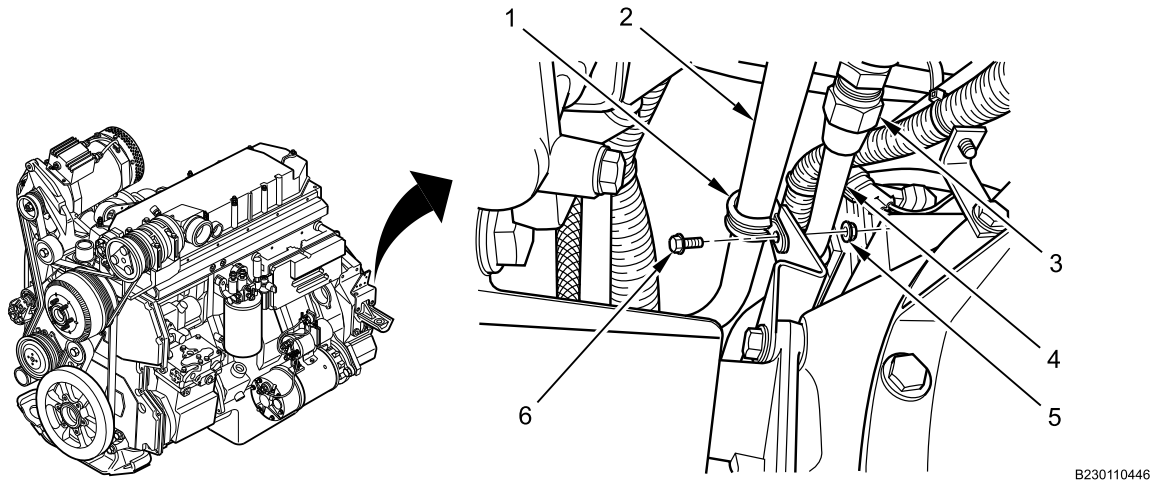
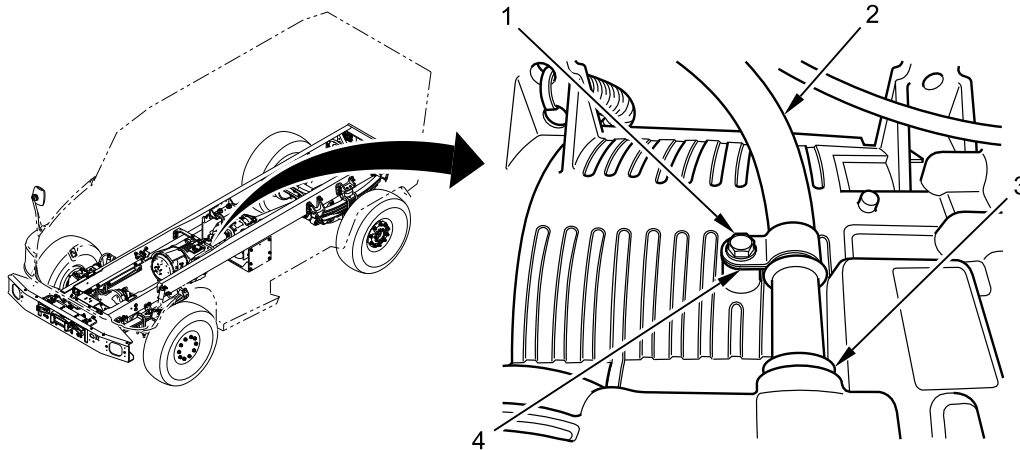


Figure 9. Transmission Dipstick Tube and Air Line.

19. Remove air line (Figure 9, Item 4) from air line fitting (Figure 9, Item 3).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

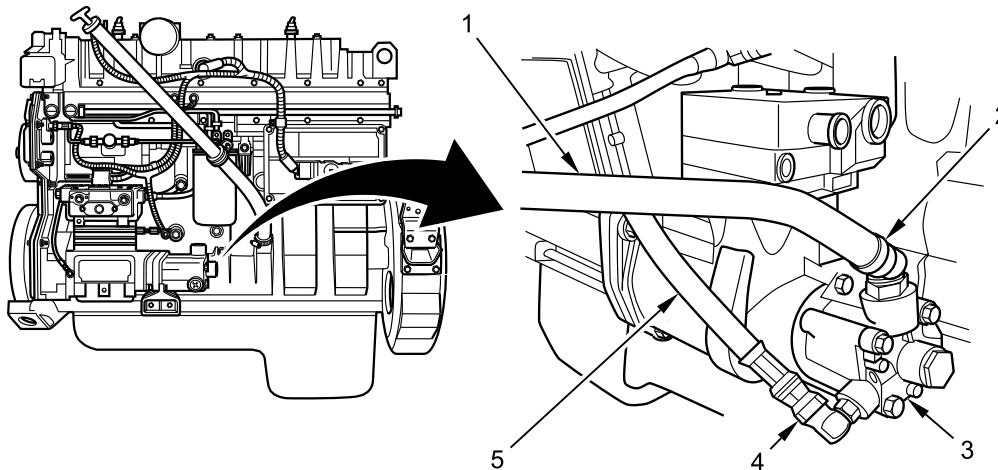
20. Remove bolt (Figure 10, Item 1) and lower mounting bracket (Figure 10, Item 4) from transmission dipstick tube (Figure 10, Item 2), and pull transmission dipstick tube up and out of transmission. Remove and discard transmission dipstick tube seal (Figure 10, Item 3).



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Figure 10. Lower Mounting Bracket on Transmission Dipstick Tube.

21. Remove clamp (Figure 11, Item 2) and inlet hose (Figure 11, Item 1) from power steering pump (Figure 11, Item 3).

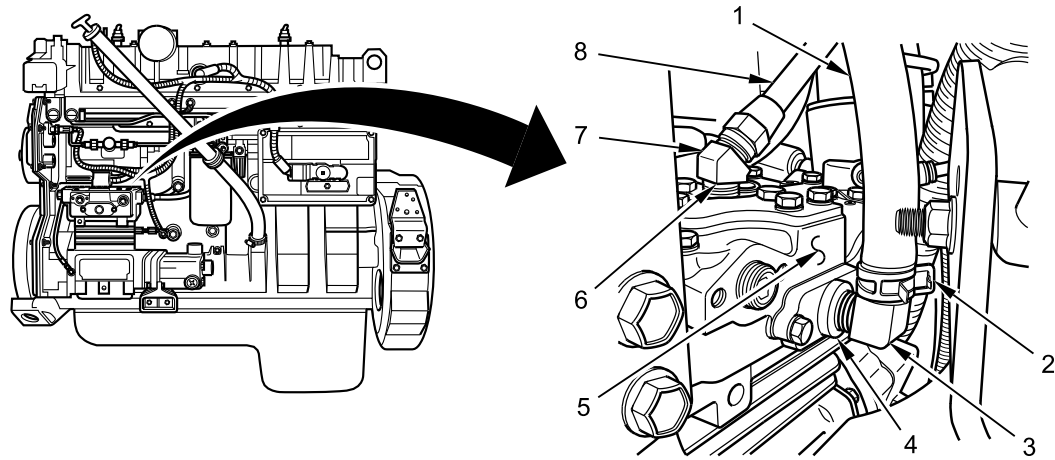


B230110448

Figure 11. Power Steering Hoses.

22. Remove pressure hose (Figure 11, Item 5) from power steering pump (Figure 11, Item 3) at elbow fitting (Figure 11, Item 4).
23. Remove air compressor supply air line clamp (Figure 12, Item 2) and air compressor supply air line (Figure 12, Item 1) from angle fitting (Figure 12, Item 3) on air compressor air inlet port (Figure 12, Item 4).

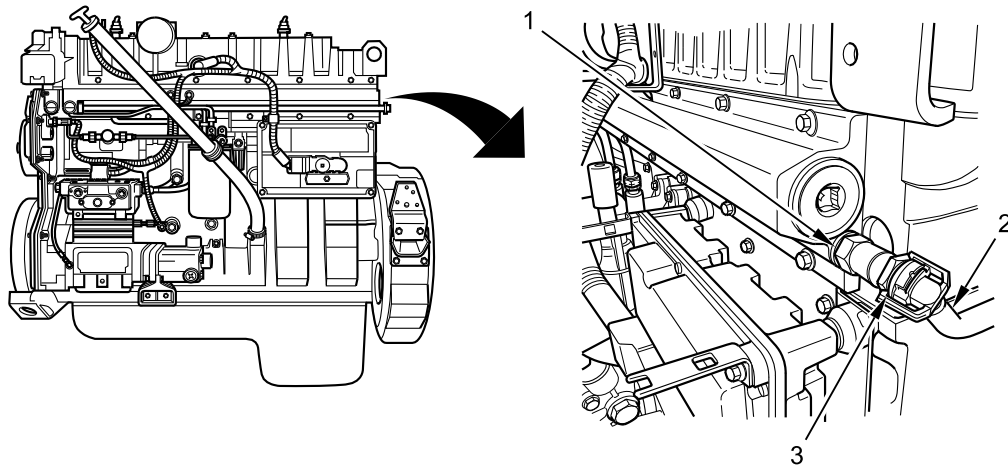
ENGINE ASSEMBLY REMOVAL - (CONTINUED)



B230110449

Figure 12. Air Compressor Connection.

24. Disconnect pipe fitting (Figure 12, Item 7) on air compressor delivery air line pipe (Figure 12, Item 8) from angle fitting (Figure 12, Item 6) on air compressor (Figure 12, Item 5). Remove air line pipe.
25. Position drain pan under fuel primer regulator (Figure 13, Item 1).



B230112171

Figure 13. Supply Manifold.

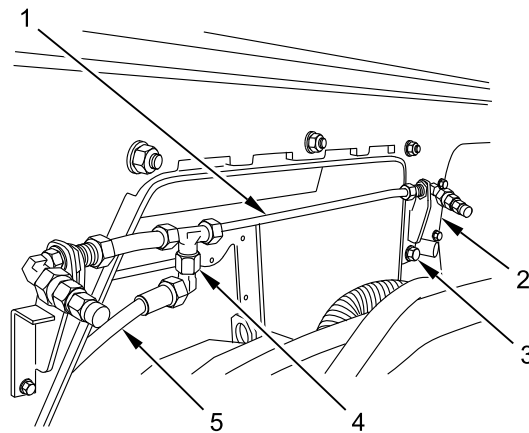
26. Press WHITE connector clip (Figure 13, Item 3) in and pull connector and fuel line (Figure 13, Item 2) off fuel primer regulator (Figure 13, Item 1). Position fuel line aside.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

NOTE

Left side shown, right side similar.

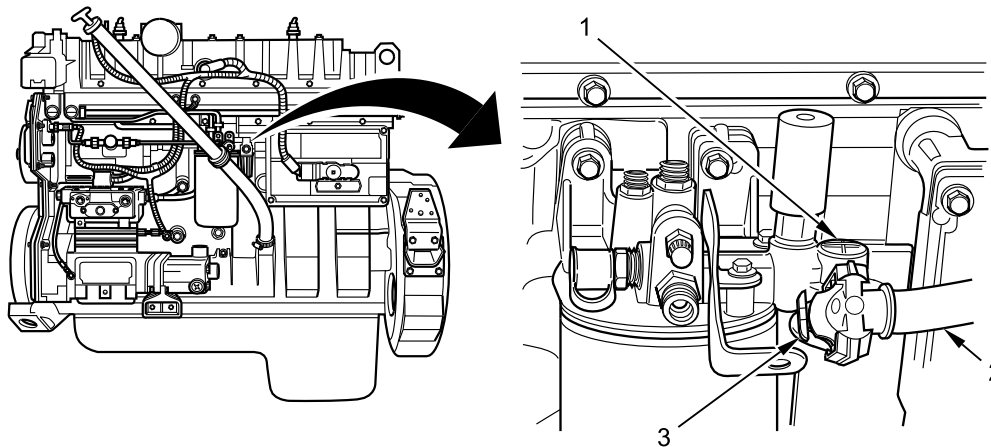
27. Loosen FSS fitting nut (Figure 14, Item 4) and remove FSS hose (Figure 14, Item 5) from fitting. Position FSS hose aside.



B230110450

Figure 14. Fire Suppression System (FSS) Engine Compartment Assembly and Brackets.

28. With assistant positioned inside cabin, remove two nuts and bolts (Figure 14, Item 3) from FSS mounting brackets (Figure 14, Item 2) on bulkhead. Remove FSS assembly (Figure 14, Item 1).
29. Position drain pan under fuel filter assembly (Figure 15, Item 1).



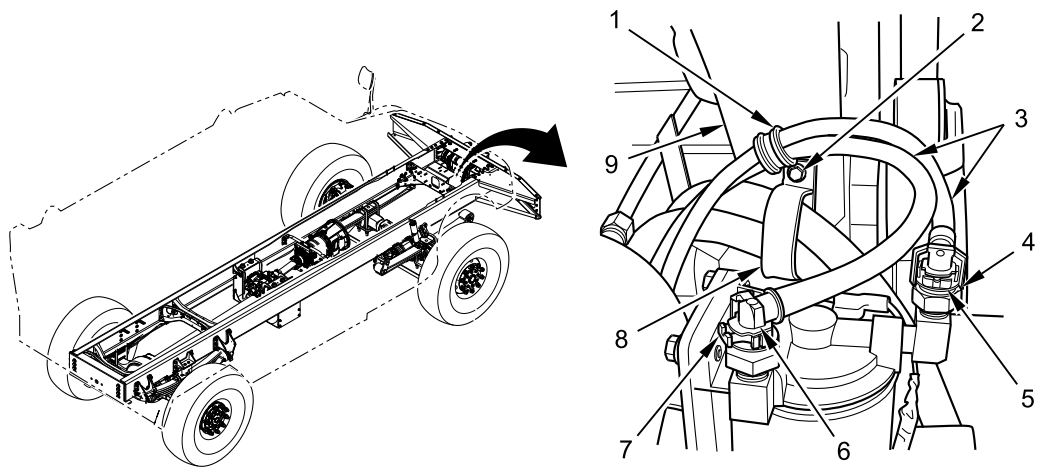
B230112172

Figure 15. Fuel Filter Assembly.

30. Press WHITE connector clip (Figure 15, Item 3) in and pull connector and fuel line (Figure 15, Item 2) off fuel filter assembly (Figure 15, Item 1). Disconnect fuel line and position aside.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

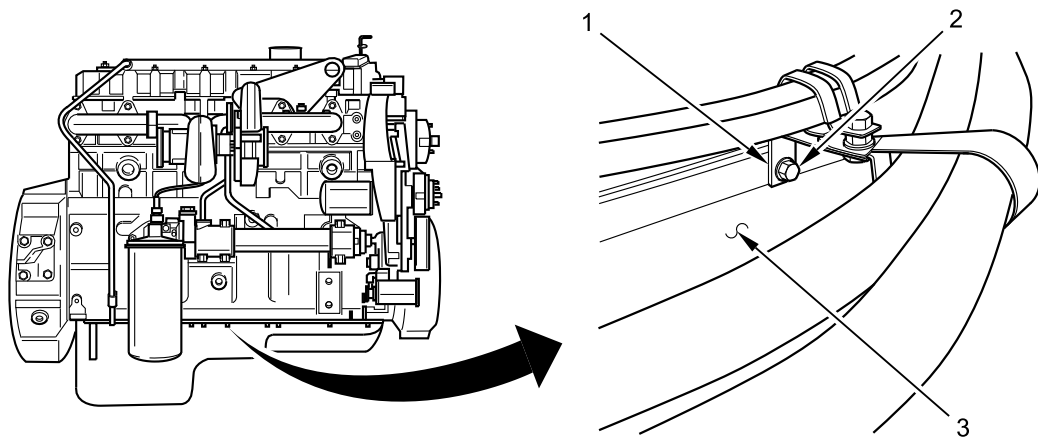
31. Press WHITE connector clips (Figure 16, Item 5 and 7) in and pull up on fuel line connectors (Figure 16, Item 4 and 6) to remove fuel lines (Figure 16, Item 3). Position fuel lines aside.



B230112173

Figure 16. Transmission Cooler Lines and Fuel Lines Bracket.

32. Remove bolt (Figure 16, Item 2) from fuel line insulated retainer (Figure 16, Item 1) and transmission cooler line retainer (Figure 16, Item 8) on A/C compressor bracket (Figure 16, Item 9). Remove retainers from lines.
33. Remove oil pan bolt (Figure 17, Item 2) securing fuel lines and transmission oil cooler lines bracket (Figure 17, Item 1) to oil pan (Figure 17, Item 3). Position lines and bracket aside.

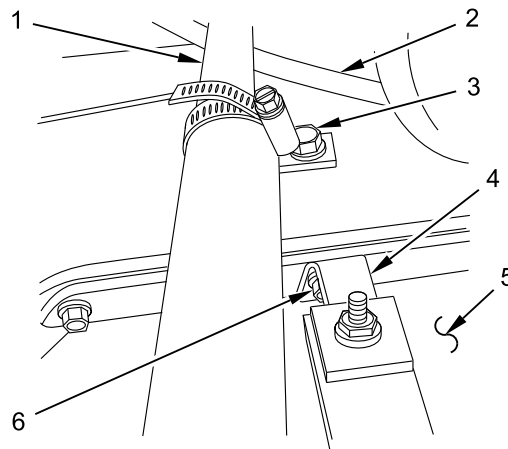


B230112174

Figure 17. Transmission Oil Cooler Line Bracket on Oil Pan.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

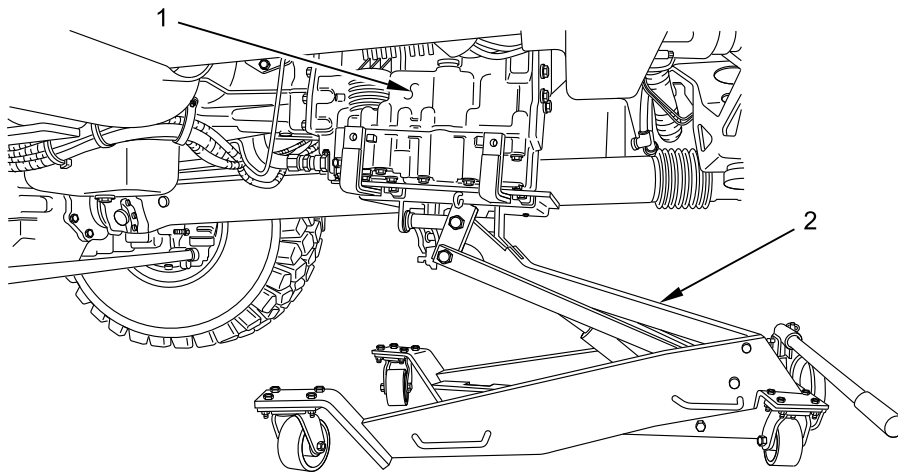
34. Remove bolt (Figure 18, Item 3) securing draft tube (Figure 18, Item 1) to engine.



B230112175

Figure 18. Draft Tube and Transmission Oil Cooler Lines Bracket.

35. Remove oil pan bolt securing transmission oil cooler lines bracket (Figure 18, Item 4) to oil pan (Figure 18, Item 5). Position bracket and lines aside.
36. Position fuel line (Figure 18, Item 2) out from under draft tube (Figure 18, Item 1).
37. Position transmission jack (Figure 19, Item 2) under transmission (Figure 19, Item 1).



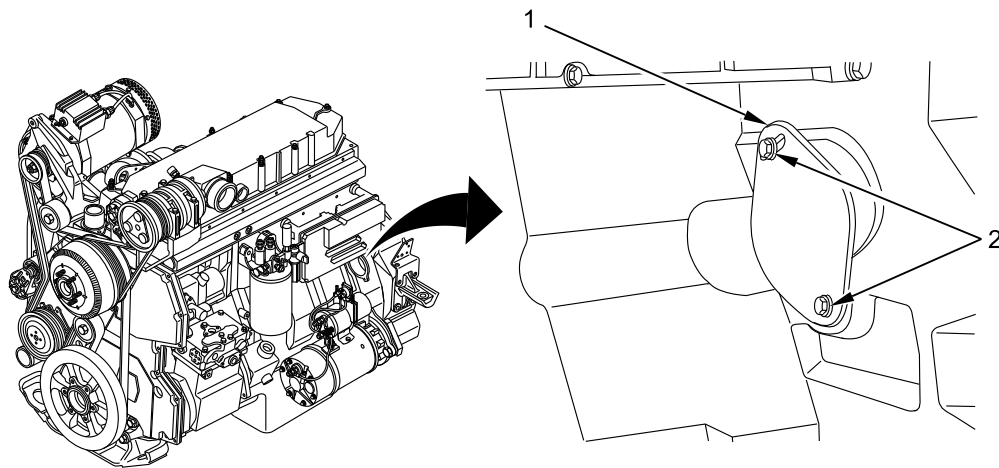
B230112178

Figure 19. Transmission and Transmission Jack.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)**WARNING**

Keep hands and clothing clear of moving parts in the engine compartment. Rotating parts can cause severe injury to personnel. Ensure that all guards are in place and do not wear loose clothing when conducting maintenance. Always check to ensure that the area is clear of personnel and obstructions before starting the engine. Failure to comply may result in injury to personnel.

38. Remove two bolts (Figure 20, Item 2) and access cover (Figure 20, Item 1) from engine.

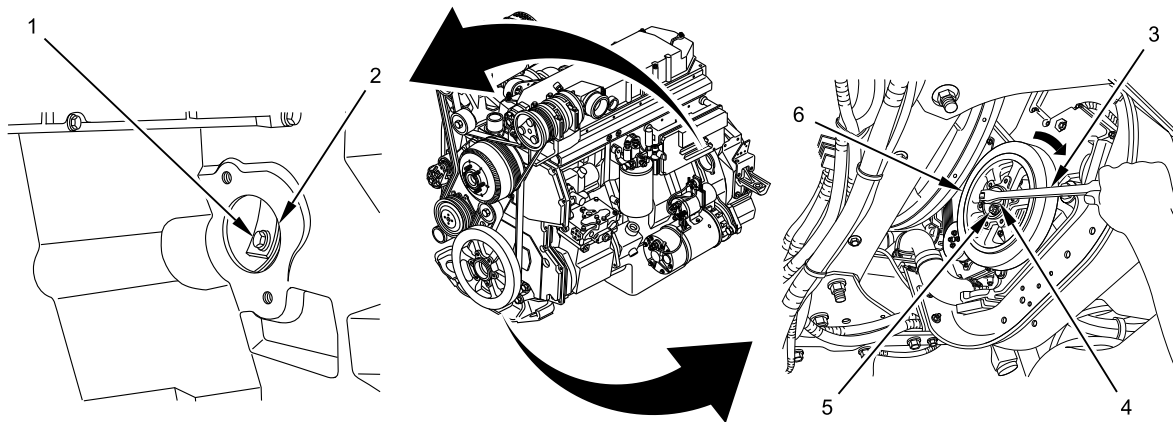


B230112176

Figure 20. Access Cover.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

39. Remove six torque converter-to-flywheel bolts, using the following steps:
- Using 1/2-in. breaker bar (Figure 21, Item 3) and 12-point socket (Figure 21, Item 4) on crankshaft damper bolt (Figure 21, Item 5), rotate crankshaft damper (Figure 21, Item 6) clockwise until converter-to-flywheel bolt (Figure 21, Item 1) is visible through access hole (Figure 21, Item 2), and remove converter-to-flywheel bolt.
 - Repeat step a until all six converter-to-flywheel bolts (Figure 21, Item 5) have been removed.



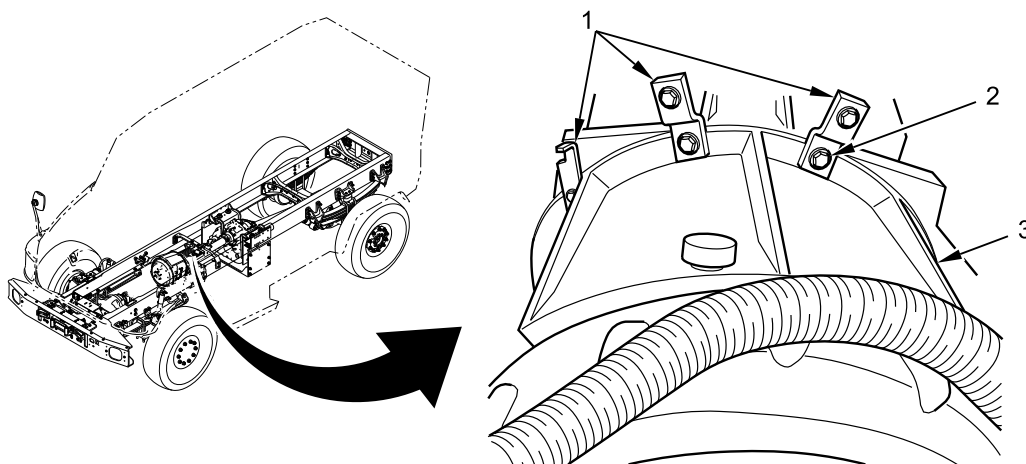
B230112177

Figure 21. Converter Bolts.

NOTE

Note position of upper bolts securing air hose and wire harness brackets to aid in installation.

40. Remove 12 bolts (Figure 22, Item 2) and air hose and wiring harness brackets (Figure 22, Item 1) from transmission flywheel housing (Figure 22, Item 3).



B230112179

Figure 22. Transmission Flywheel Housing Bolts.

- Remove and discard cable lock straps securing wiring harness to top of transmission.
- Remove five bolts (Figure 23, Item 4) securing transmission mounting bracket (Figure 23, Item 3) to transmission (Figure 23, Item 6).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

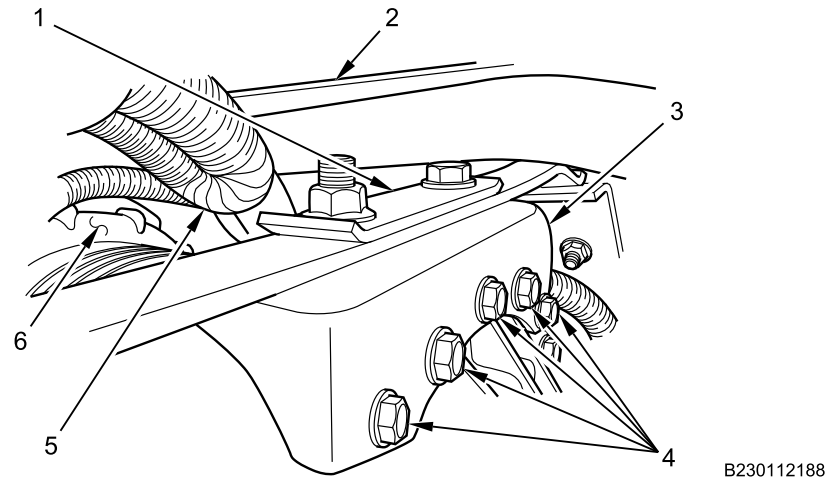


Figure 23. Transmission Mount.

43. Position wiring harnesses (Figure 23, Item 5 and 6) aside, and remove mounting bracket (Figure 23, Item 3) and hanger (Figure 23, Item 1) from frame (Figure 23, Item 2).
44. Attach lifting chain (Figure 24, Item 4) to front and rear engine lifting eyelets (Figure 24, Item 2 and 3).

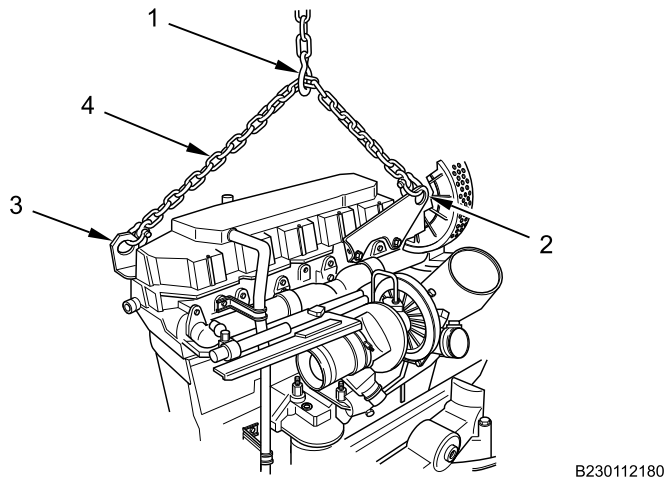


Figure 24. Engine Lifting Eyelets.

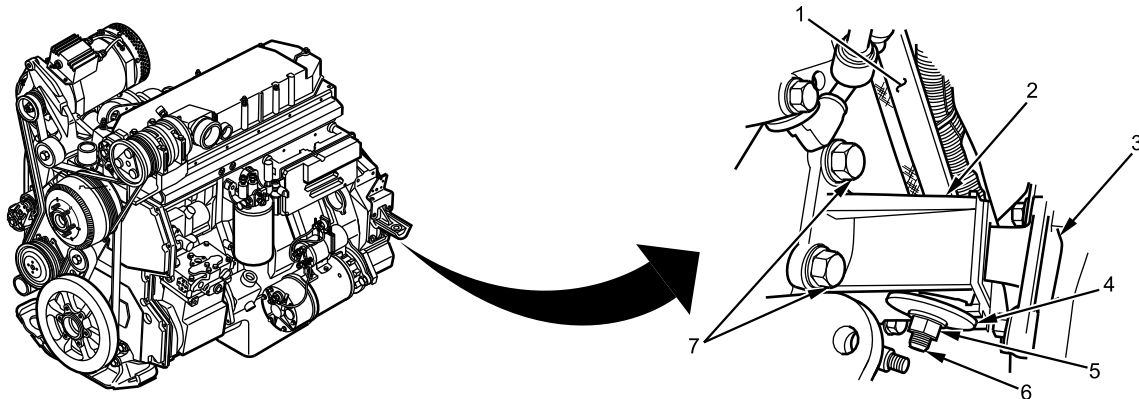
45. Attach lifting device (Figure 24, Item 1) to lifting chain (Figure 24, Item 4).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

NOTE

- Retain tension on lifting device while removing and installing rear engine mount.
- Left side shown; right side similar.

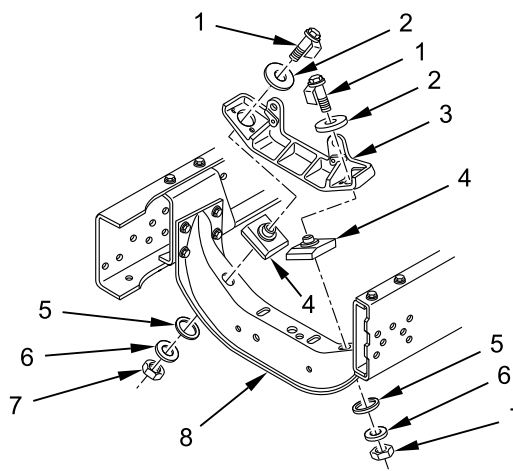
46. Remove nut (Figure 25, Item 5), washer (Figure 25, Item 4), and bolt (Figure 25, Item 6) from rear engine mount (Figure 25, Item 2) and engine mounting bracket (Figure 25, Item 3).



B230110421

Figure 25. Rear Engine Mount.

47. Remove four nuts, bolts (Figure 25, Item 7) and rear engine mount (Figure 25, Item 2) from frame rail (Figure 25, Item 1).
48. Remove two locknuts (Figure 26, Item 7) and flat washers (Figure 26, Item 6) from bottom of front crossmember (Figure 26, Item 8). Discard locknuts.



B230103390

Figure 26. Front Crossmember Engine Mounts.

49. Remove two bolts (Figure 26, Item 1) and insulators (Figure 26, Item 2) from top of front engine mount bracket (Figure 26, Item 3).
50. Remove two engine mount insulators (Figure 26, Item 4) and O-rings (Figure 26, Item 5) between crossmember (Figure 26, Item 8) and front engine mount bracket (Figure 26, Item 3). Discard O-rings.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)**CAUTION**

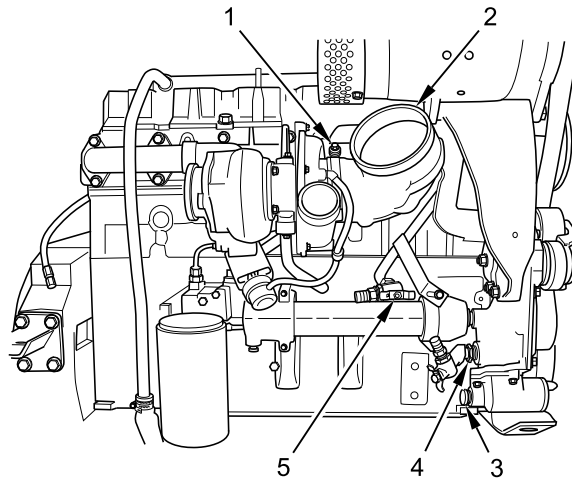
To prevent damage during engine removal, position assistants on left and right sides of engine compartment to monitor all hoses, lines, and wiring harnesses for interference.

51. With assistants and lifting device, remove engine from vehicle.

END OF TASK**DISASSEMBLY****NOTE**

- Note all valve and fitting locations and orientation before removal to aid in installation.
- Install engine on suitable stand prior to disassembly.

1. Loosen turbocharger hose clamp (Figure 27, Item 1) and remove turbocharger hose (Figure 27, Item 2) and clamp.



B230103517

Figure 27. Turbocharger Hose.

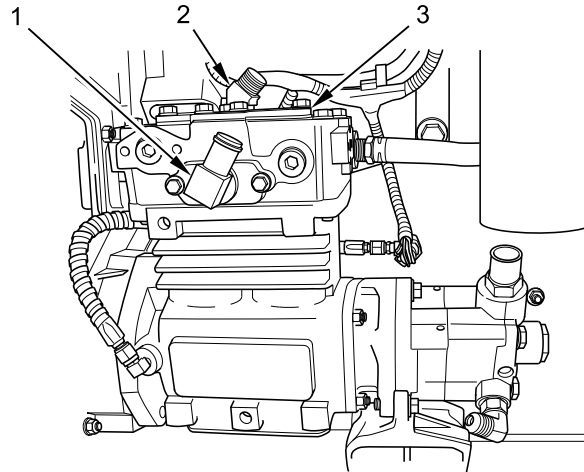
2. Remove inlet hose valve assembly (Figure 27, Item 5).
3. Remove fuel fired heater outlet valve assembly (Figure 27, Item 4).
4. Remove coolant port plug (Figure 27, Item 3).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

NOTE

Note location and orientation of fittings before removal to aid in installation.

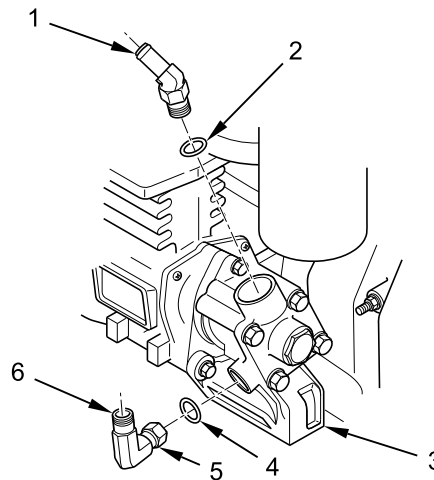
5. Remove elbow fitting (Figure 28, Item 2) from top of air compressor (Figure 28, Item 3).



B230112181

Figure 28. Air Compressor Fittings.

6. Remove elbow fitting (Figure 28, Item 1) from side of air compressor (Figure 28, Item 3).
7. Remove inlet fitting (Figure 29, Item 1) and O-ring (Figure 29, Item 2) from power steering pump (Figure 29, Item 3). Discard O-ring.



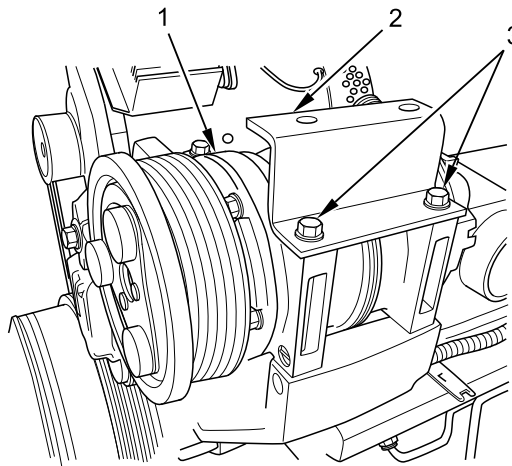
B230112182

Figure 29. Power Steering Pump Fittings.

8. Loosen jam nut (Figure 29, Item 5) and remove outlet fitting (Figure 29, Item 6) with O-ring (Figure 29, Item 4) from power steering pump (Figure 29, Item 3). Discard O-ring.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

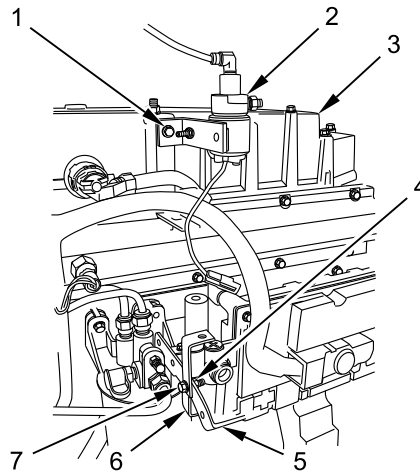
9. Remove two bolts (Figure 30, Item 3) and bracket (Figure 30, Item 2) from A/C compressor (Figure 30, Item 1).



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Figure 30. A/C Compressor Bracket.

10. Remove bolt (Figure 31, Item 1) and exhaust brake assembly (Figure 31, Item 2) from valve cover (Figure 31, Item 3).



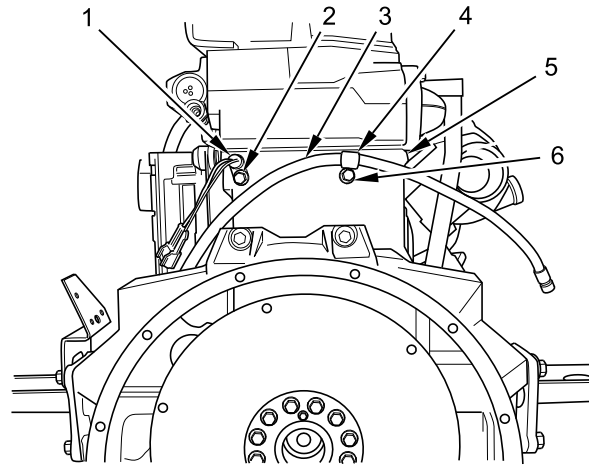
B230112186

Figure 31. Exhaust Brake Solenoid and Fuel Filter Assembly Bracket.

11. Remove bolt (Figure 31, Item 7), nut (Figure 31, Item 4), and bracket (Figure 31, Item 6) from fuel filter assembly bracket (Figure 31, Item 5).

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

12. Remove bolt (Figure 32, Item 6) and insulated retainer (Figure 32, Item 4) securing exhaust brake hose (Figure 32, Item 3) to engine (Figure 32, Item 5).



B230103513

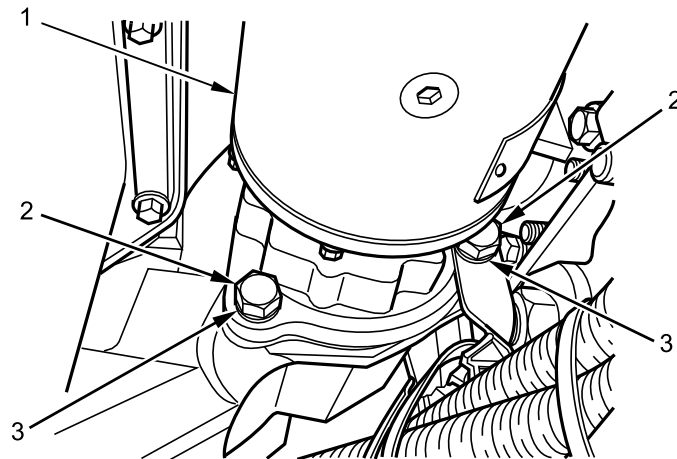
Figure 32. Exhaust Brake Hose and Ether Start Thermostatic Switch.

13. Remove bolt (Figure 32, Item 2) and ether start thermostatic switch (Figure 32, Item 1) from engine (Figure 32, Item 5).

NOTE

If new engine is being installed, perform the following three steps to remove starter before performing engine installation.

14. Position suitable support under starter (Figure 33, Item 1).



B230112184

Figure 33. Starter Bolts.

ENGINE ASSEMBLY REMOVAL - (CONTINUED)

15. With assistant, remove three bolts (Figure 33, Item 2) and lockwashers (Figure 33, Item 3) from starter (Figure 33, Item 1). One bolt is at top of starter. Discard lockwashers.
16. Remove starter (Figure 33, Item 1) from engine.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE ASSEMBLY INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Lifting device (WP 0795, Item 67)
Jack, transmission (WP 0795, Item 61)
Wrench, combination, standard length, 12-pt, 1-1/8
inch, chrome (WP 0795, Item 137)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Faceshield, industrial (WP 0794, Item 16)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 18)
Gloves (WP 0794, Item 19)
Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Sealing compound (WP 0794, Item 42)
Cable lock strap - (18) (WP 0796, Item 124)
O-ring (WP 0796, Item 37)
O-ring (WP 0796, Item 34)
O-ring (WP 0796, Item 166)
O-ring (WP 0796, Item 165)
O-ring - (2) (WP 0796, Item 164)
Seal (WP 0796, Item 52)
Wire tags (WP 0794, Item 33)
Lockwasher - (2) (WP 0796, Item 10)
Lockwasher - (2) (WP 0796, Item 9)
Lockwasher - (3) (WP 0796, Item 178)
Lockwasher (WP 0796, Item 14)
Locknut - (2) (WP 0796, Item 125)

Personnel Required

Maintainer - (3)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM-9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Air tanks drained (TM 9-2355-106-10)
Power steering fluid reservoir drained (WP 0543)
Transmission drained (WP 0457)
Right side engine armor plate removed (WP 0599)
Air cleaner assembly removed (WP 0257)
Heating Ventilating and Air Conditioning (HVAC)
system evacuated and discharged (WP 0707)
Armor grille support and bracket removed (WP 0568)
Radiator pipes/hoses removed (WP 0285)
Starter motor removed (WP 0292)
Exhaust brake removed (WP 0246)
Air compressor governor removed (WP 0525)
Ether start valve and bracket removed (WP 0272)
Oil gauge tube removed (WP 0230)
Front frame crossmember removed (WP 0547)
A/C compressor belt removed (WP 0244)
Engine baffle removed (WP 0651)
Engine assembly removed (WP 0218)

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistant or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not operate vehicle with air system pressure loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Let air pressure build in both tanks to 100 psi (689 kPa) before releasing the parking brake. Low air pressure may affect vehicle braking capability. Failure to comply may result in injury or death to personnel.

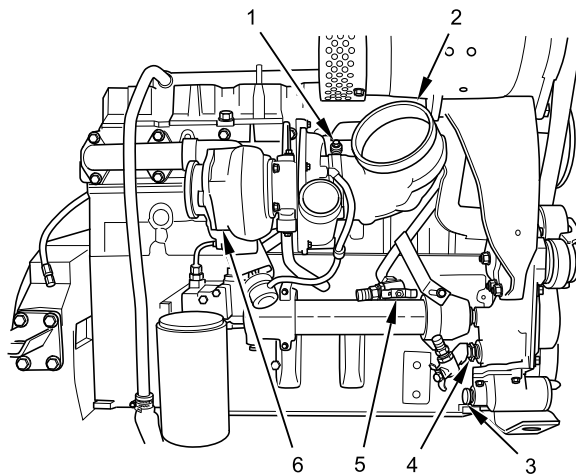
ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

ASSEMBLY

WARNING

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Install turbocharger hose (Figure 1, Item 2) and clamp (Figure 1, Item 1) on turbocharger (Figure 1, Item 6). Tighten clamp securely.

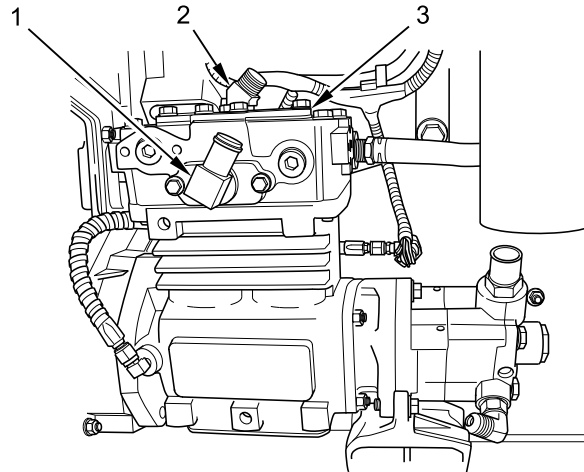


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Figure 1. Turbocharger Hose.

2. Apply thread sealing compound on inlet hose valve fitting threads.
3. Install inlet hose valve assembly (Figure 1, Item 5) in location and orientation noted during removal. Tighten valve and fitting securely.
4. Apply thread sealing compound on outlet hose valve fitting threads.
5. Install fuel fired heater outlet valve assembly (Figure 1, Item 4) in location and orientation noted during removal. Tighten valve and fittings securely.
6. Apply thread sealing compound on coolant port plug threads.
7. Install coolant port plug (Figure 1, Item 3) on engine. Tighten plug securely.
8. Apply thread sealing compound on elbow fitting threads.

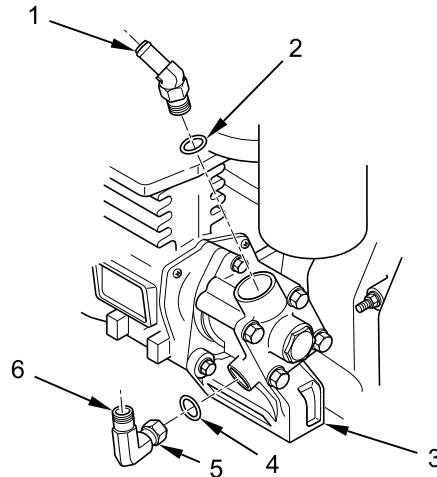
ENGINE ASSEMBLY INSTALLATION - (CONTINUED)



B230112181

Figure 2. Air Compressor Fittings.

9. Install elbow fitting (Figure 2, Item 2) on top of air compressor (Figure 2, Item 3) in location and orientation noted during removal. Tighten fitting securely.
10. Install elbow fitting (Figure 2, Item 1) on side of air compressor (Figure 2, Item 3) in location and orientation noted during removal. Tighten fitting securely.
11. Install inlet fitting (Figure 3, Item 1) with new O-ring (Figure 3, Item 2) on power steering pump (Figure 3, Item 3). Tighten fitting securely.



B230112182

Figure 3. Power Steering Pump Fittings.

12. Install outlet fitting (Figure 3, Item 6) with new O-ring (Figure 3, Item 4) on power steering pump (Figure 3, Item 3). Tighten fitting and jam nut (Figure 3, Item 5) securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

13. Install bracket (Figure 4, Item 2) on A/C compressor (Figure 4, Item 1) with two bolts (Figure 4, Item 3). Tighten bolts securely.

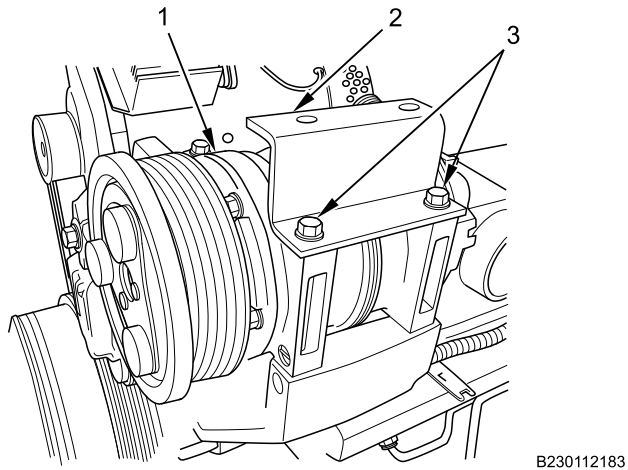


Figure 4. A/C Compressor Bracket.

14. Install exhaust brake assembly (Figure 5, Item 2) on valve cover (Figure 5, Item 3) with bolt (Figure 5, Item 1). Tighten bolt securely.

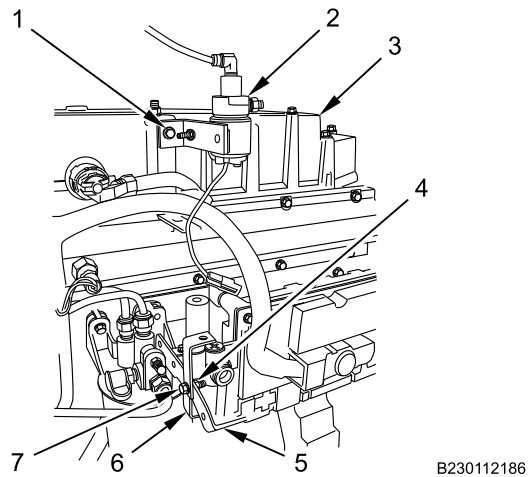
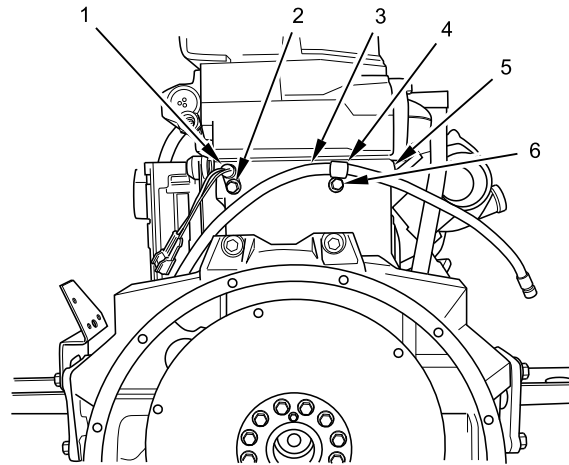


Figure 5. Exhaust Brake Solenoid and Fuel Filter Assembly Bracket.

15. Install bracket (Figure 5, Item 6) on fuel filter assembly bracket (Figure 5, Item 5) with bolt (Figure 5, Item 7) and nut (Figure 5, Item 4). Tighten bolt securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

16. Install exhaust brake hose (Figure 6, Item 3) and insulated retainer (Figure 6, Item 4) on engine (Figure 6, Item 5) with bolt (Figure 6, Item 6). Tighten bolt securely.



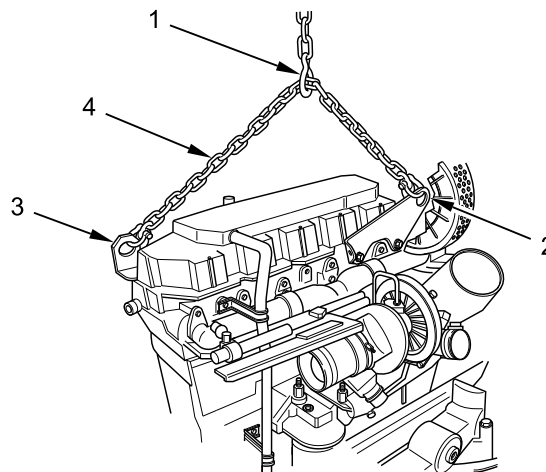
B230103513

Figure 6. Exhaust Brake Hose and Ether Start Thermostatic Switch.

17. Install ether start thermostatic switch (Figure 6, Item 1) on engine (Figure 6, Item 5) with bolt (Figure 6, Item 2). Tighten bolt securely.

END OF TASK**INSTALLATION**

1. Attach lifting chain (Figure 7, Item 4) to front and rear engine lifting eyelets (Figure 7, Item 2 and 3).



B230112180

Figure 7. Engine Eyelets.

2. Attach lifting device (Figure 7, Item 1) to lifting chain (Figure 7, Item 4).

CAUTION

To prevent damage during engine installation, position assistants on left and right sides of engine compartment to monitor all hoses, lines, and wiring harnesses for interference.

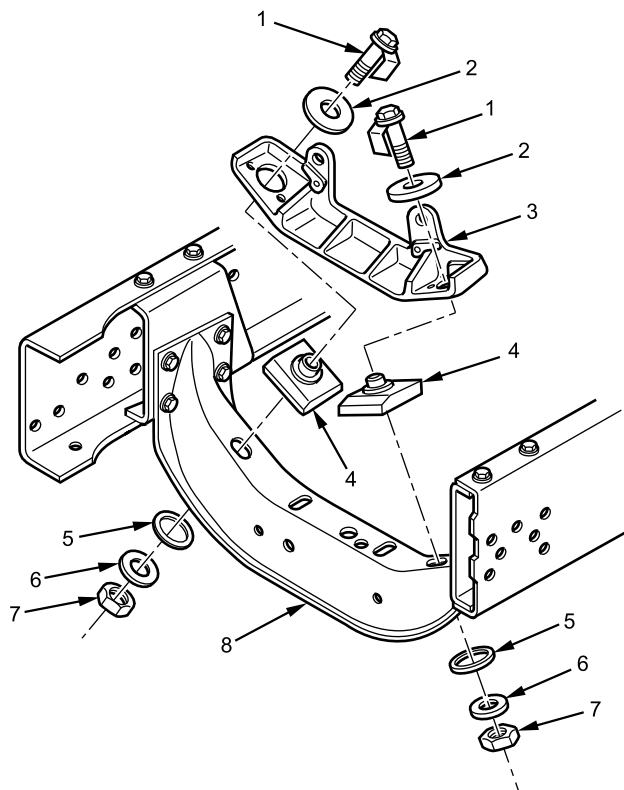
ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

3. With assistants and lifting device (Figure 7, Item 1), install engine into vehicle.

NOTE

Retain tension on chain while installing front and rear engine mounts. Chain will support engine during engine mount installation.

4. Install two engine mount insulators (Figure 8, Item 4) and new O-rings (Figure 8, Item 5) between crossmember (Figure 8, Item 8) and front engine mount bracket (Figure 8, Item 3).



B230103390

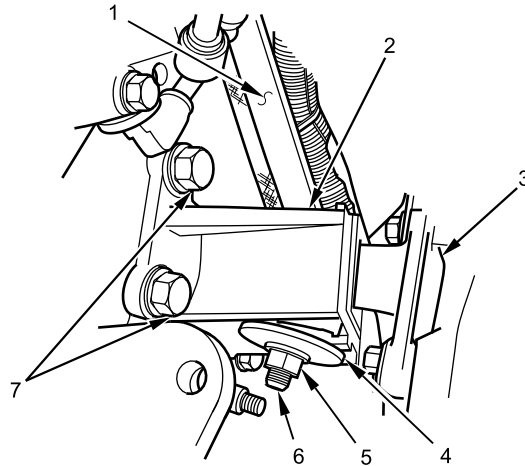
Figure 8. Front Crossmember Engine Mounts.

5. Install two bolts (Figure 8, Item 1) and insulators (Figure 8, Item 2) into top of front engine mount bracket (Figure 8, Item 3). Tighten bolts securely.
6. Install two flat washers (Figure 8, Item 6) and new locknuts (Figure 8, Item 7) on bolts (Figure 8, Item 1). Tighten nuts securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)**NOTE**

Perform next step for left and right sides. Left side shown; right side similar.

7. Install rear engine mount (Figure 9, Item 2) on frame rail (Figure 9, Item 1) with four bolts (Figure 9, Item 7) and nuts. Tighten securely.



B230102634

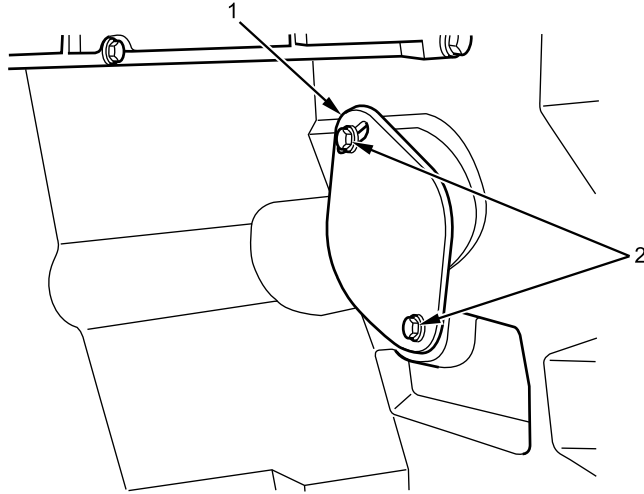
Figure 9. Rear Engine Mount.

8. Loosely install engine mounting bracket (Figure 9, Item 3) on rear engine mount (Figure 9, Item 2) with bolt (Figure 9, Item 6), washer (Figure 9, Item 4), and nut (Figure 9, Item 5).
9. Remove tension on lifting device and tighten bolt (Figure 9, Item 6) and nut (Figure 9, Item 5) securely.
10. Remove lifting device from engine.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)**NOTE**

Perform following step only if installing new engine.

11. Remove two bolts (Figure 10, Item 2) and access cover (Figure 10, Item 1).



B230702594

Figure 10. Access Cover.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)**WARNING**

Keep fingers away from torque converter access hole while aligning transmission to engine. Failure to comply may result in serious injury to personnel.

CAUTION

Do not push or pry on punch. Otherwise, damage to threads in torque converter bolt holes can occur.

12. With assistant, align transmission to engine, and insert punch (Figure 11, Item 1) through flexplate bolt holes and torque converter boltholes to maintain alignment.

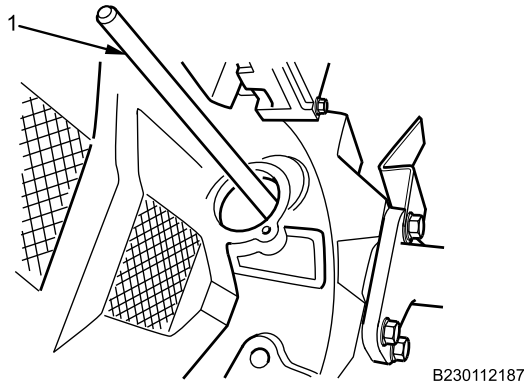


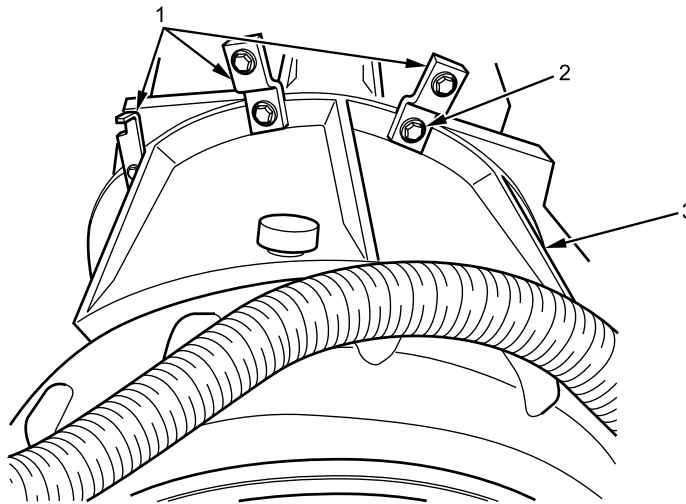
Figure 11. Punch Installation.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

WARNING

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

13. Apply corrosion preventive compound on threads of 12 engine-to-transmission bolts.



B230702632

Figure 12. Flywheel Housing Bolts.

14. Install 12 bolts (Figure 12, Item 2) on transmission flywheel housing (Figure 12, Item 3) with air hose and wiring harness brackets (Figure 12, Item 1), as noted in removal. Torque all bolts to 38-45 lb-ft (51-61 N•m).

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

15. Remove punch (Figure 13, Item 1) from flexplate and torque converter boltholes.

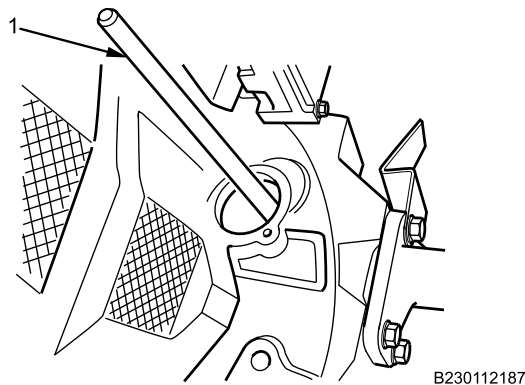


Figure 13. Punch Removal.

16. Install six torque converter-to-flywheel bolts, using the following steps:
- Install converter-to-flywheel bolt (Figure 14, Item 1) and torque to 46-54 lb-ft (63-73 N•m).
 - Using 1/2-in. breaker bar (Figure 14, Item 3) and 12-point socket (Figure 14, Item 4) on crankshaft damper bolt (Figure 14, Item 5), rotate crankshaft damper (Figure 14, Item 6) clockwise until next converter-to-flywheel bolt hole is visible through access hole (Figure 14, Item 2).
 - Install converter-to-flywheel bolt (Figure 14, Item 1) and torque to 46-54 lb-ft (63-73 N•m).
 - Repeat steps b and c until remaining converter-to-flywheel bolts (Figure 14, Item 1) have been installed.

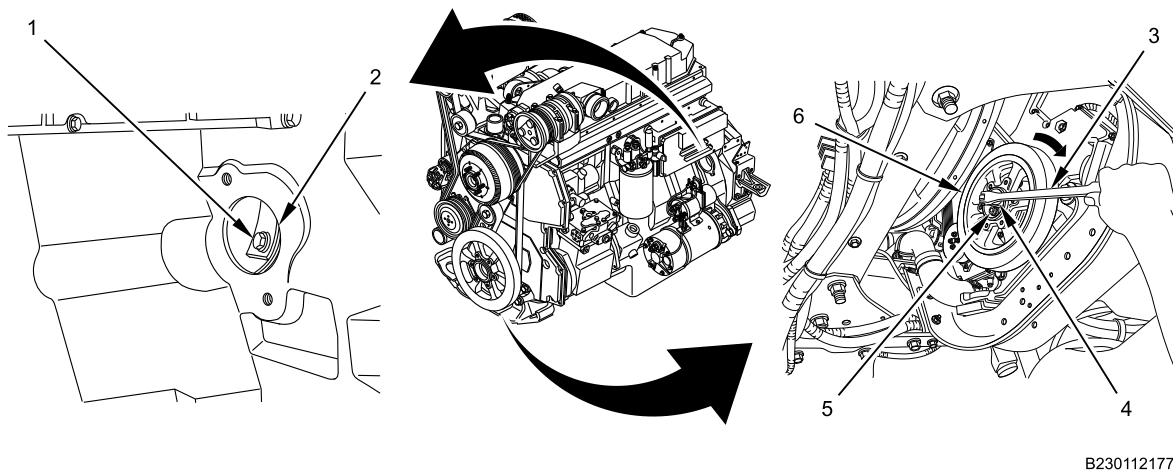
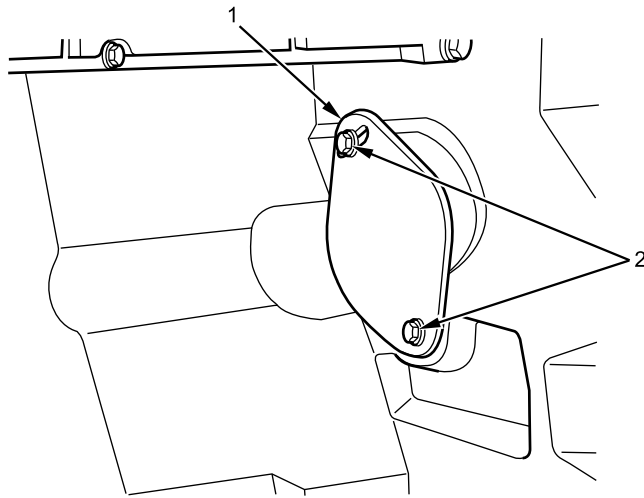


Figure 14. Converter Bolts.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

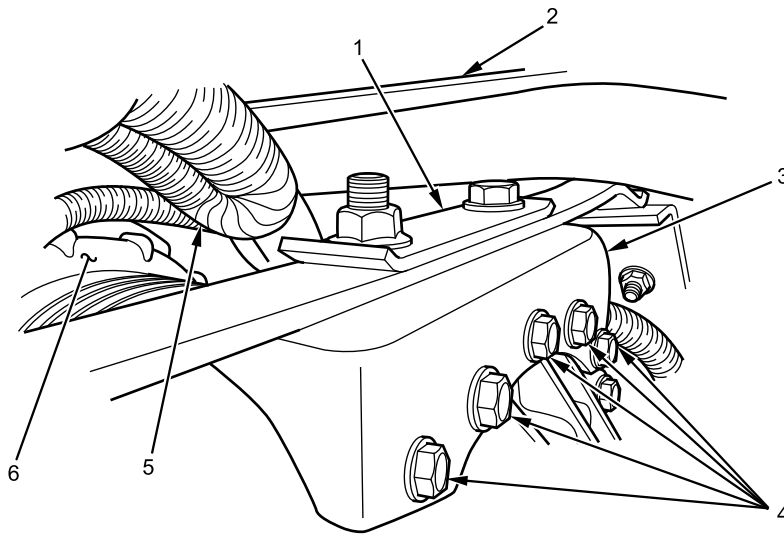
17. Install access cover (Figure 15, Item 1) with two bolts (Figure 15, Item 2). Tighten bolts securely.



B230702594

Figure 15. Access Cover.

18. Slide mounting bracket (Figure 16, Item 3) and hanger (Figure 16, Item 1) onto frame (Figure 16, Item 2).



B230112188

Figure 16. Transmission Mount.

19. Align transmission (Figure 16, Item 6) to mounting bracket (Figure 16, Item 3). Install transmission mounting bracket (Figure 16, Item 3) on transmission (Figure 16, Item 6) with five bolts (Figure 16, Item 4). Tighten bolts securely.
20. Secure wiring harness (Figure 16, Item 5) on top of transmission (Figure 16, Item 6) with new cable lock straps.
21. Remove transmission jack from under transmission (Figure 16, Item 6).

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

22. Position fuel line (Figure 17, Item 2) under draft tube (Figure 17, Item 1), and install bolt (Figure 17, Item 3) securing draft tube (Figure 17, Item 1) on engine. Tighten bolt securely.

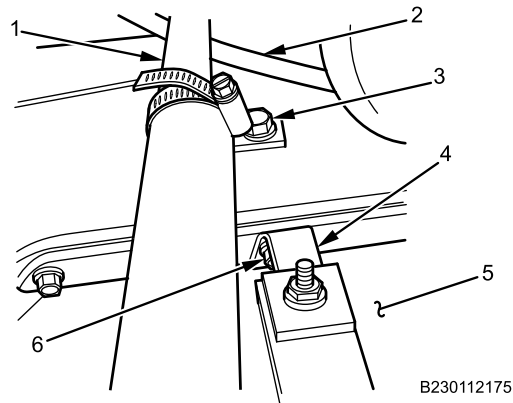


Figure 17. Draft Tube and Transmission Oil Cooler Lines Bracket.

NOTE

If a new engine is being installed, oil pan bolt used in following step must first be removed from new engine.

23. Install transmission oil cooler line bracket (Figure 17, Item 4) on oil pan (Figure 17, Item 5) with bolt (Figure 17, Item 6). Tighten bolt securely.

NOTE

If a new engine is being installed, oil pan bolt used in following step must first be removed from new engine.

24. Position fuel lines and transmission oil cooler lines bracket (Figure 18, Item 1) and secure on oil pan (Figure 18, Item 3) with bolt (Figure 18, Item 2). Tighten bolt securely.

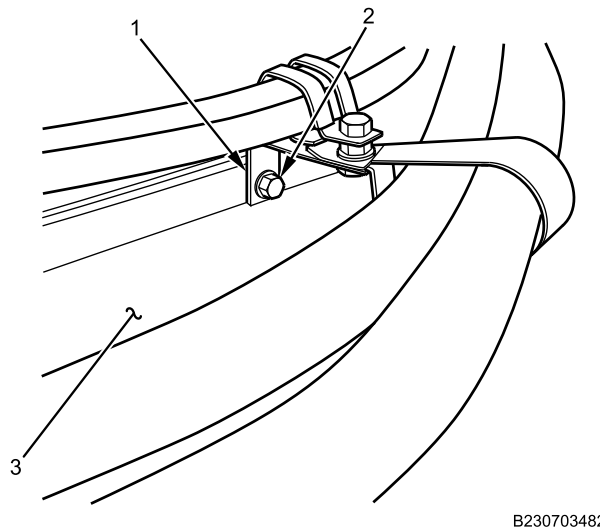
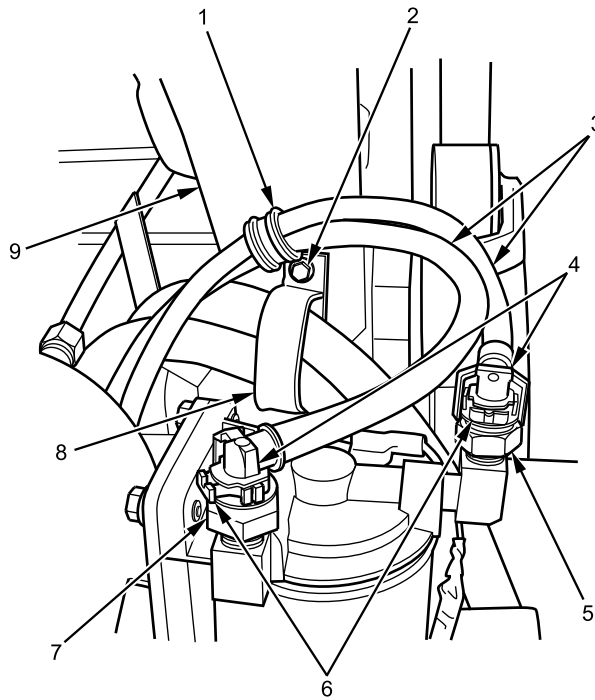


Figure 18. Transmission Oil Cooler and Fuel Line Bracket on Oil Pan.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

25. Position retainers (Figure 19, Item 1 and 8) on lines.



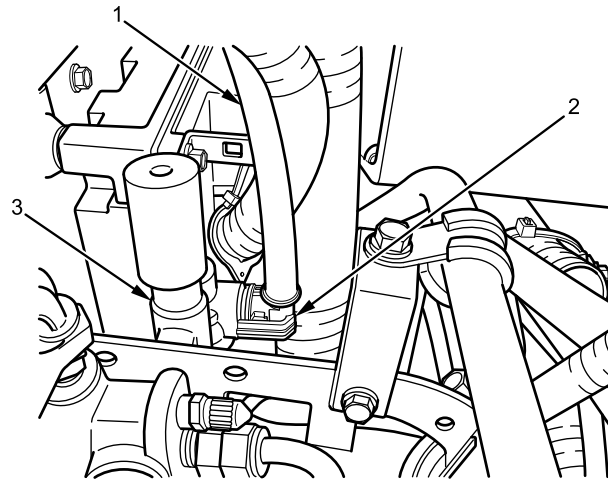
B230112189

Figure 19. Transmission Cooler Lines and Fuel Lines Retainer.

26. Install fuel line insulated retainer (Figure 19, Item 1) and transmission cooler line retainer (Figure 19, Item 8) on alternator bracket (Figure 19, Item 9) with bolt (Figure 19, Item 2). Tighten bolt securely.
27. Install fuel lines (Figure 19, Item 3) on fittings (Figure 19, Item 5 and 7) by pressing WHITE connector clips (Figure 19, Item 6) in and pushing down on fuel line connectors (Figure 19, Item 4). Ensure fuel line connections are secure.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

28. Install fuel line (Figure 20, Item 1) on fuel header assembly (Figure 20, Item 3) by pushing fuel line fitting (Figure 20, Item 2) on fuel header assembly until it clicks.



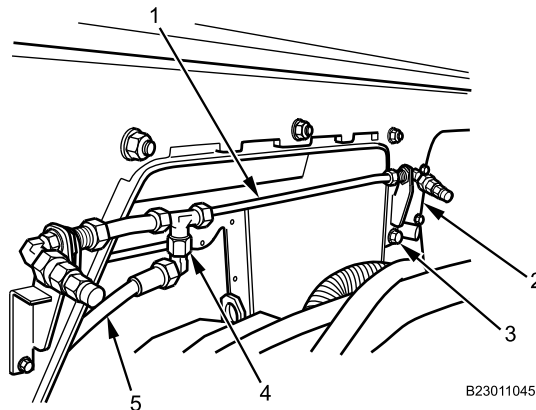
B230305706

Figure 20. Fuel Line Installation.

NOTE

Left side shown, right side similar.

29. With assistant, install FSS assembly (Figure 21, Item 1) and mounting brackets (Figure 21, Item 2) with two nuts and bolts (Figure 21, Item 3). Tighten bolts securely.



B230110450

Figure 21. FSS Engine Compartment Pipes and Bracket.

30. Install FSS hose (Figure 21, Item 5) and tighten fitting nut (Figure 21, Item 4) securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

31. Install fuel line (Figure 22, Item 2) on fuel primer regulator (Figure 22, Item 1) by pressing WHITE connector clip (Figure 22, Item 4) in while pushing fuel line connector (Figure 22, Item 3) on fitting (Figure 22, Item 5). Ensure fuel line connection is secure.

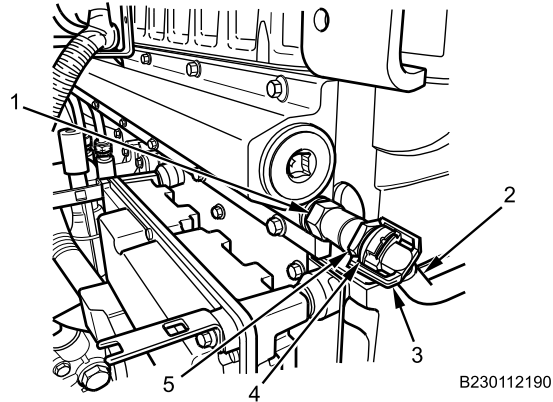


Figure 22. Supply Manifold.

WARNING

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

32. Apply thread sealing compound on angle fitting threads.

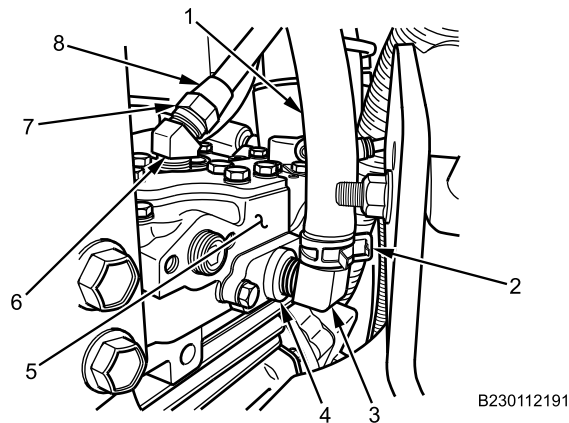


Figure 23. Air Compressor Connection.

33. Connect air compressor delivery air line pipe (Figure 23, Item 8) to angle fitting (Figure 23, Item 6) on air compressor (Figure 23, Item 5) with nut (Figure 23, Item 7). Tighten fitting nut securely.
34. Connect air compressor supply air line (Figure 23, Item 1) to angle fitting (Figure 23, Item 3) on air compressor air inlet port (Figure 23, Item 4) with hose clamp (Figure 23, Item 2).

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

35. Install inlet hose (Figure 24, Item 1) on power steering pump (Figure 24, Item 3) with spring clamp (Figure 24, Item 2).

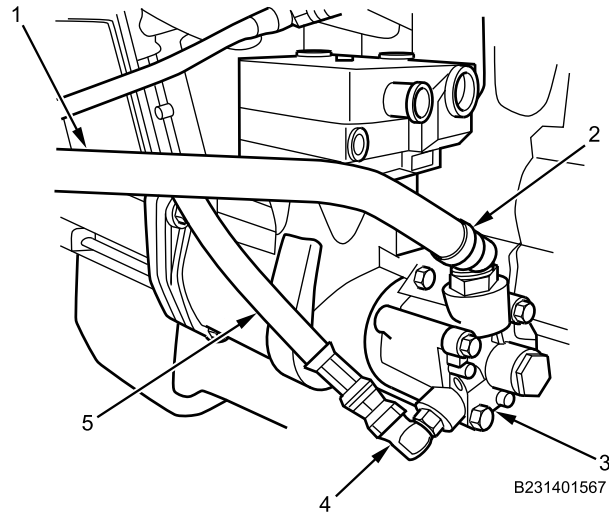


Figure 24. Power Steering Pump.

36. Install pressure hose (Figure 24, Item 5) on power steering pump (Figure 24, Item 3) at elbow fitting (Figure 24, Item 4). Tighten hose securely.
37. Install new seal (Figure 25, Item 3) on transmission dipstick tube (Figure 25, Item 2).

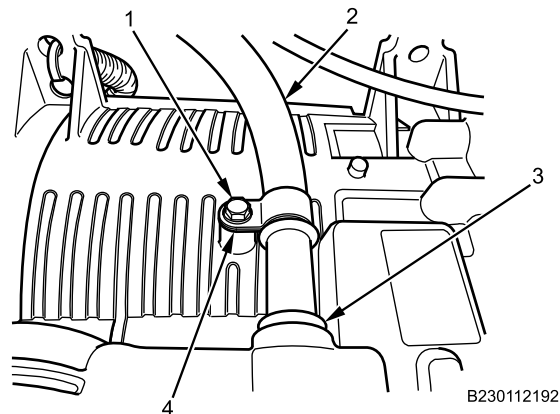
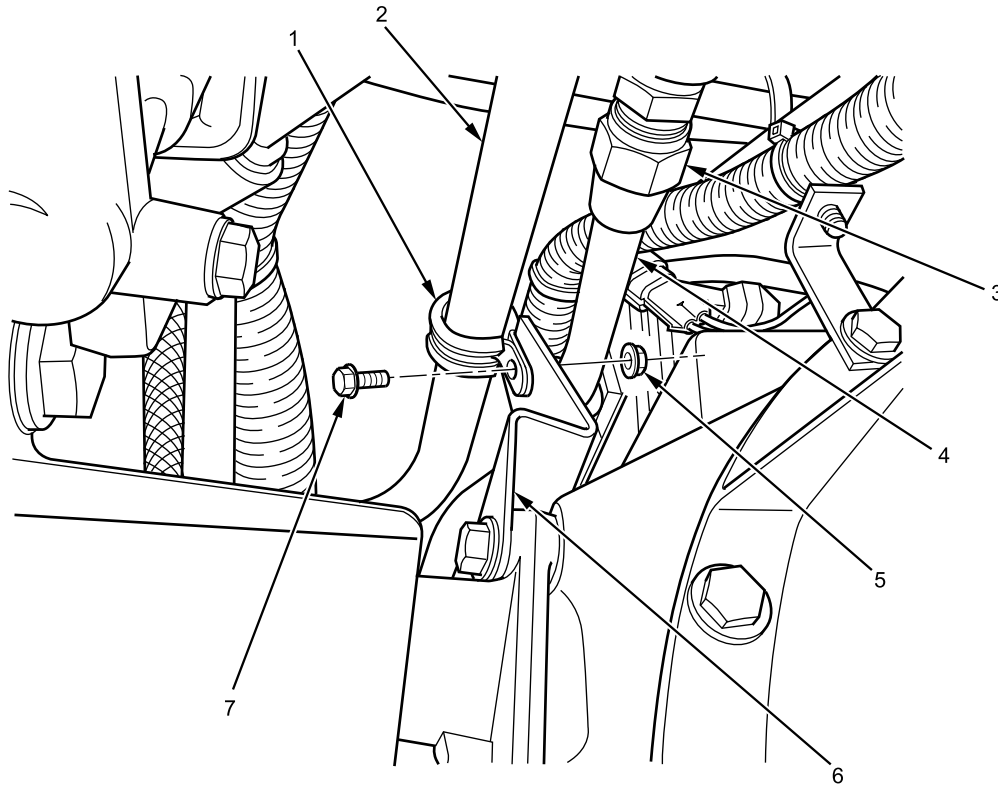


Figure 25. Lower Mounting Bracket on Transmission Dipstick Tube.

38. Install transmission dipstick tube (Figure 25, Item 2) with lower mounting bracket (Figure 25, Item 3) and bolt (Figure 25, Item 1). Tighten bolt securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

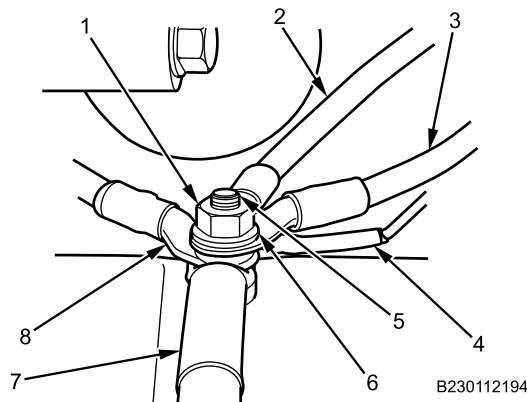
39. Install transmission dipstick tube (Figure 26, Item 2) and air line retainer (Figure 26, Item 1) on bracket (Figure 26, Item 6) with nut (Figure 26, Item 5) and bolt (Figure 26, Item 7). Tighten bolt securely.



B230112193

Figure 26. Transmission Dipstick Tube and Air Line Retainer.

40. Install air line (Figure 26, Item 4) on fitting (Figure 26, Item 3) and tighten securely.
 41. Install engine wiring harness ground cable (Figure 27, Item 7) and engine wiring harness ground cables (Figure 27, Item 2, 3, 4, and 8) on engine block ground stud (Figure 27, Item 5).



B230112194

Figure 27. Engine Ground Stud.

42. Install new lockwasher (Figure 27, Item 6) and nut (Figure 27, Item 1). Tighten nut securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

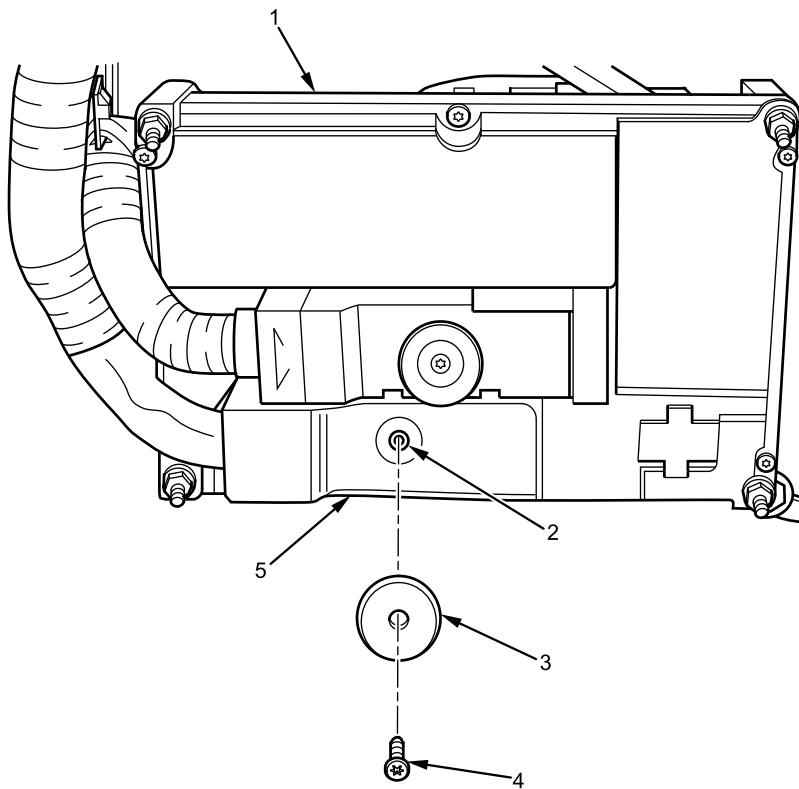
WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

- If a new engine was installed, remove protective cover on ECM connection.
- Apply dielectric grease on ECM electrical contacts before installation.

43. Connect engine wiring harness connector (Figure 28, Item 5) to ECM (Figure 28, Item 1) with bolt (Figure 28, Item 2). Torque bolt to 50 lb-in (6 N•m).



B230112195

Figure 28. ECM.

44. Install cover (Figure 28, Item 3) on engine wiring harness connector (Figure 28, Item 5) with screw (Figure 28, Item 4). Tighten screw securely.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

45. Connect air hose (Figure 29, Item 1) to fan clutch (Figure 29, Item 2).

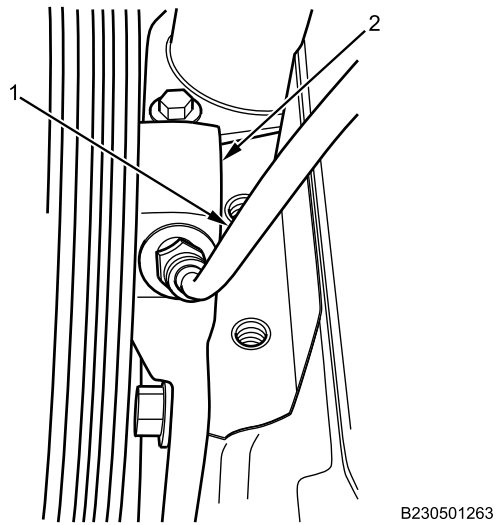
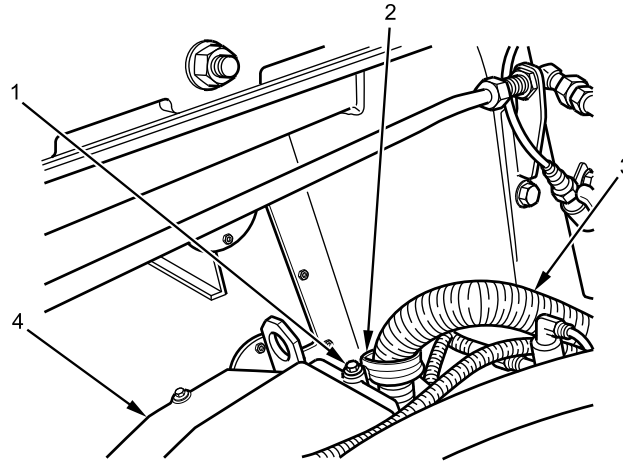


Figure 29. Fan Drive Air Line.

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

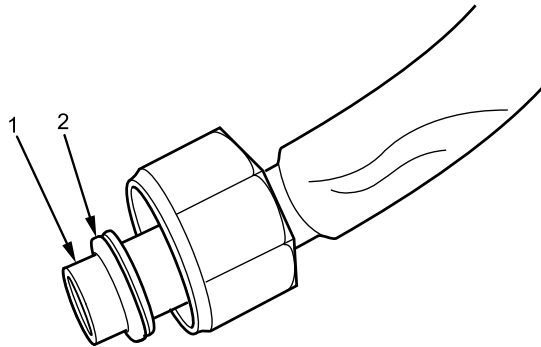
46. Install insulated engine wiring harness retainer (Figure 30, Item 2) and harness (Figure 30, Item 3) on valve cover (Figure 30, Item 4) with bolt (Figure 30, Item 1). Tighten bolt securely.



B230603476

Figure 30. Insulated Engine Wiring Harness Retainer.

47. Install new O-ring (Figure 31, Item 2) on end of each HVAC compressor hose (Figure 31, Item 1).

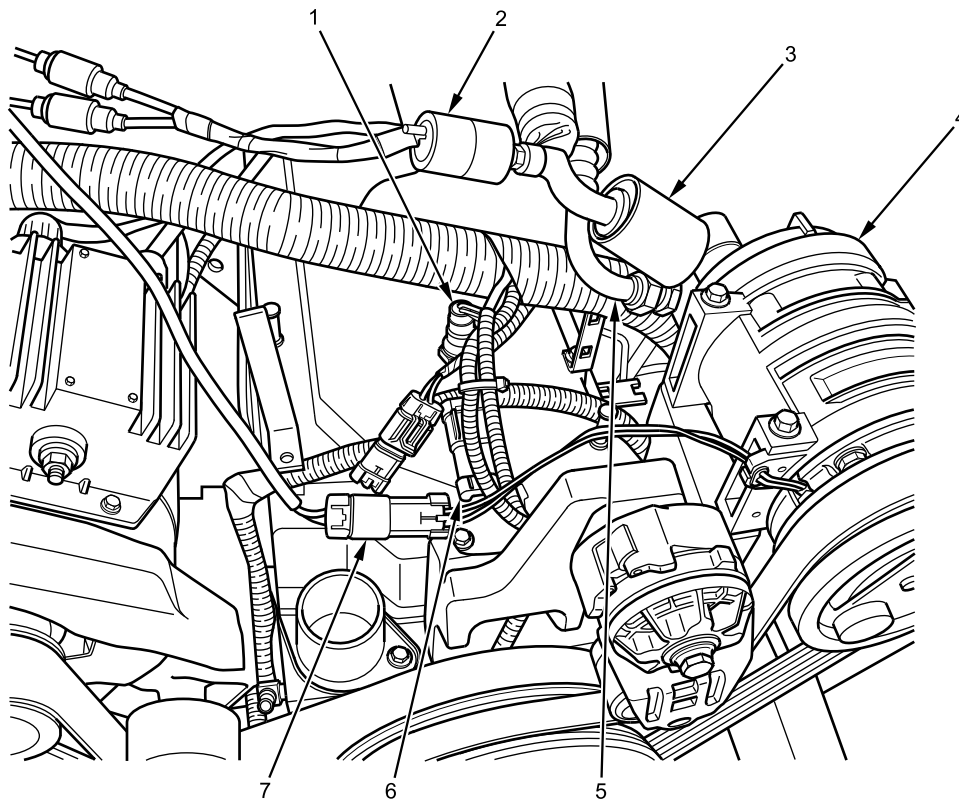


B235203067

Figure 31. O-Rings.

48. Install HVAC high-pressure hose (Figure 32, Item 5) on HVAC compressor (Figure 32, Item 4).

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)



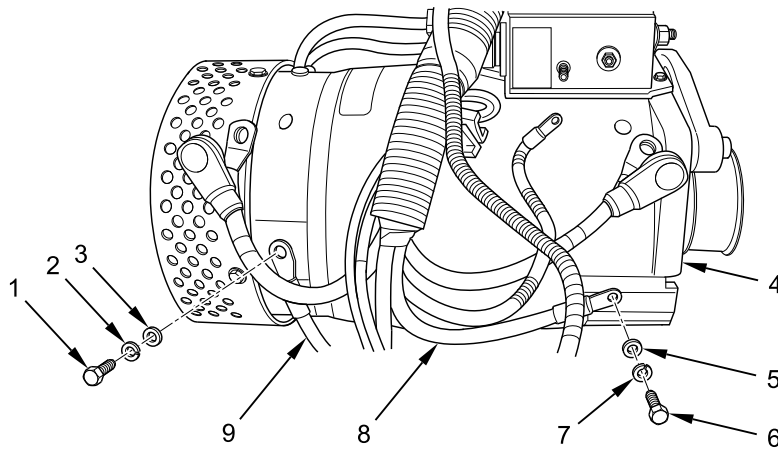
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Figure 32. Engine Harness and A/C Pressure Hoses.

49. Install HVAC low-pressure hose (Figure 32, Item 3) on HVAC compressor (Figure 32, Item 4).
50. Connect A/C compressor clutch harness connector (Figure 32, Item 7).
51. Connect CMP sensor jumper harness connector (Figure 32, Item 6).
52. Connect MAP sensor harness connector (Figure 32, Item 1).
53. Connect A/C pressure switch (Figure 32, Item 2).

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)

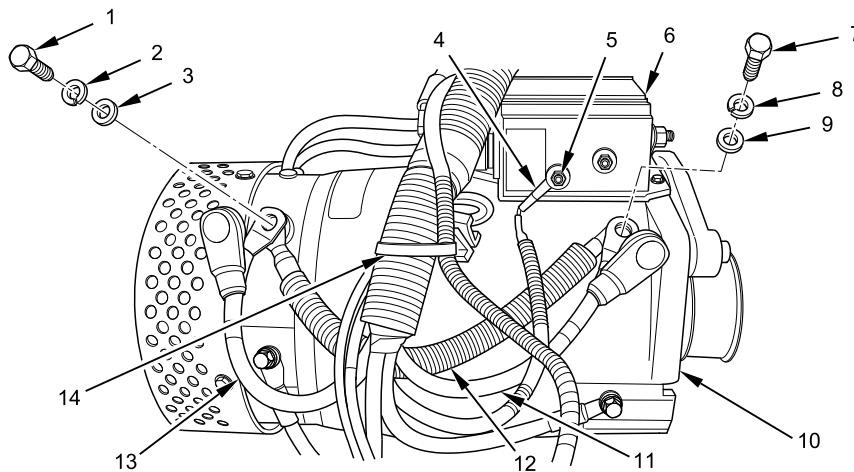
54. Install two negative cables (Figure 33, Item 8 and 9) on alternator (Figure 33, Item 4) with two flat washers (Figure 33, Item 3 and 5), two new lockwashers (Figure 33, Item 2 and 7), and bolts (Figure 33, Item 1 and 6).



B230112196

Figure 33. Alternator Negative Cable Installation.

55. Install two positive cables (Figure 34, Item 11 and 12) and jumper cable (Figure 34, Item 11) on alternator (Figure 34, Item 10) with two flat washers (Figure 34, Item 3 and 8), two new lockwashers (Figure 34, Item 2 and 7), and two bolts (Figure 34, Item 1 and 6). Tighten bolts securely.



B230110443

Figure 34. Alternator Positive Cable Installation.

56. Install 24V ignition wire (Figure 34, Item 4) on voltage regulator (Figure 34, Item 6) with nut (Figure 34, Item 5). Tighten nut securely.
57. Install new cable lock straps (Figure 34, Item 13) as necessary, and tighten securely.
58. Remove drain pan.

END OF TASK

ENGINE ASSEMBLY INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install engine baffle (WP 0457).
2. Install A/C compressor belt (WP 0244).
3. Install front frame crossmember (WP 0547).
4. Install oil gauge tube (WP 0230).
5. Install ether start valve and bracket (WP 0272).
6. Install air compressor governor (WP 0525).
7. Install exhaust brake (WP 0246).
8. Install starter motor (WP 0292).
9. Install radiator pipes/hoses (WP 0285).
10. Install armor grille support and bracket (WP 0568).
11. Install air cleaner assembly (WP 0257).
12. Fill transmission (WP 0457).
13. Fill power steering fluid reservoir (WP 0543).
14. Prime fuel system (WP 0255).
15. Turn MAIN POWER switch on (TM 9-2355-106-10).
16. Start engine and allow engine to reach normal operating temperature (TM 9-2355-106-10).
17. Check for leaks (TM 9-2355-106-10).
18. Turn engine off (TM 9-2355-106-10).
19. Turn MAIN POWER switch off (TM 9-2355-106-10).
20. Service HVAC system (WP 0707).
21. Install right side engine armor plate (WP 0599).
22. Turn MAIN POWER switch on (TM 9-2355-106-10).
23. Start engine and allow air brake system pressure to build to normal range (TM 9-2355-106-10).
24. Remove wheel chocks (TM 9-2355-106-10).
25. Drive vehicle to verify engine operation (TM 9-2355-106-10).
26. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
27. Set parking brake (TM 9-2355-106-10).
28. Turn engine off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FRONT ENGINE MOUNT REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Lifting device (WP 0795, Item 67)
Lifting sling (WP 0795, Item 68)

Materials/Parts

O-ring - (2) (WP 0796, Item 164)
Locknut - (2) (WP 0796, Item 125)

Personnel Required

Maintainer - (2)

References

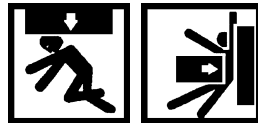
TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Radiator removed (WP 0278)
Crankshaft damper removed (WP 0223)

WARNING


Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Lifting device must have a lifting capacity greater than weight of engine and transmission to prevent damage to equipment and injury to personnel.

Do not raise engine with floor jacks. Improper placement of floor jacks may cause injury or death to personnel and damage to equipment.

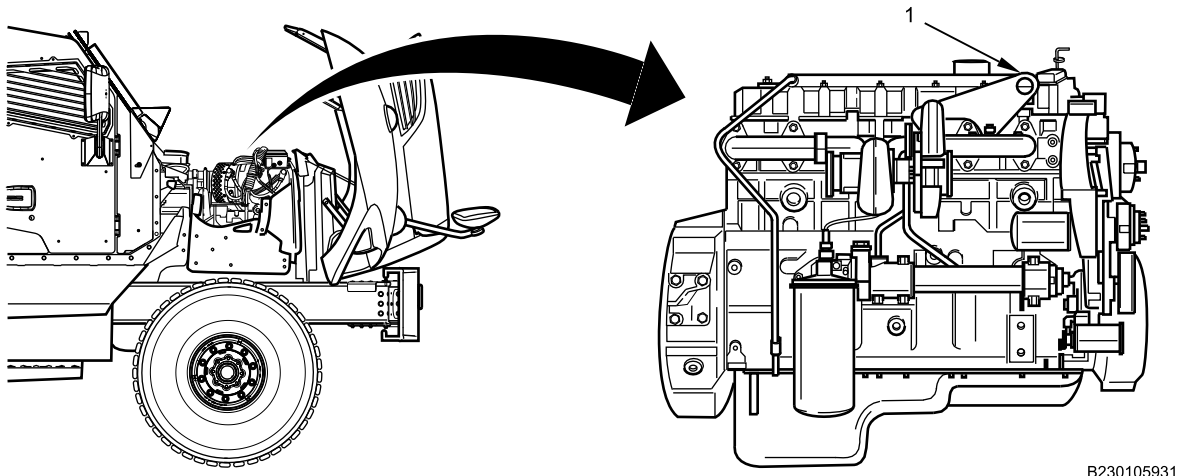
Do not place fingers between front engine mount and front crossmember. Failure to comply may result in serious injury to personnel.

NOTE

Assistant will help with lifting operations.

FRONT ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)

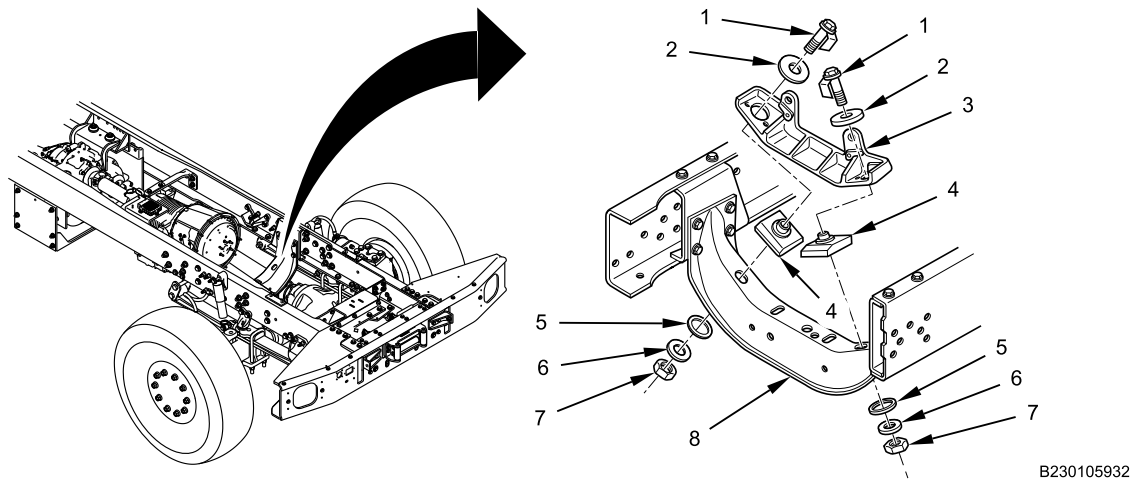
REMOVAL



B230105931

Figure 1. Front Lifting Eye.

1. Attach lifting device to engine front lifting eye (Figure 1, Item 1).



B230105932

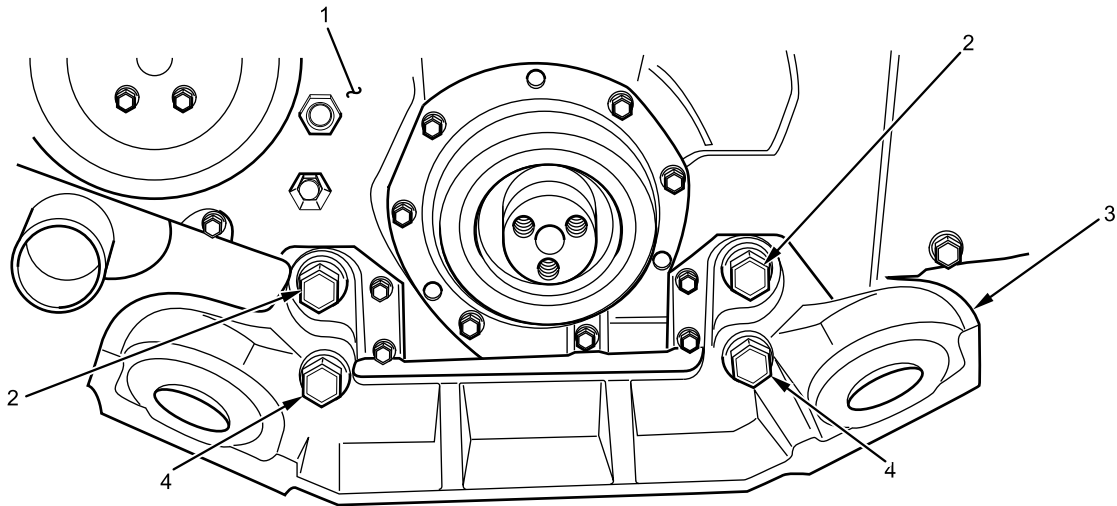
Figure 2. Front Crossmember.

2. Remove two locknuts (Figure 2, Item 7) and flat washers (Figure 2, Item 6) from bottom of front crossmember (Figure 2, Item 8). Discard locknuts.
3. Raise front of engine so that front engine mount bracket (Figure 2, Item 3) is separated from front crossmember (Figure 2, Item 8).
4. Remove two bolts (Figure 2, Item 1) and insulators (Figure 2, Item 2) from top of front engine mount bracket (Figure 2, Item 3).
5. Remove two engine mount insulators (Figure 2, Item 4) and O-rings (Figure 2, Item 5) between crossmember (Figure 2, Item 8) and front engine mount bracket (Figure 2, Item 3). Discard O-rings.
6. Remove two upper bolts (Figure 3, Item 2) from engine block (Figure 3, Item 1).
7. Remove two lower bolts (Figure 3, Item 4) from engine block (Figure 3, Item 1) and front engine mount bracket (Figure 3, Item 3). Remove front engine mount bracket.

END OF TASK

FRONT ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Do not place fingers between front engine mount bracket and front crossmember. Failure to comply may result in serious injury to personnel.



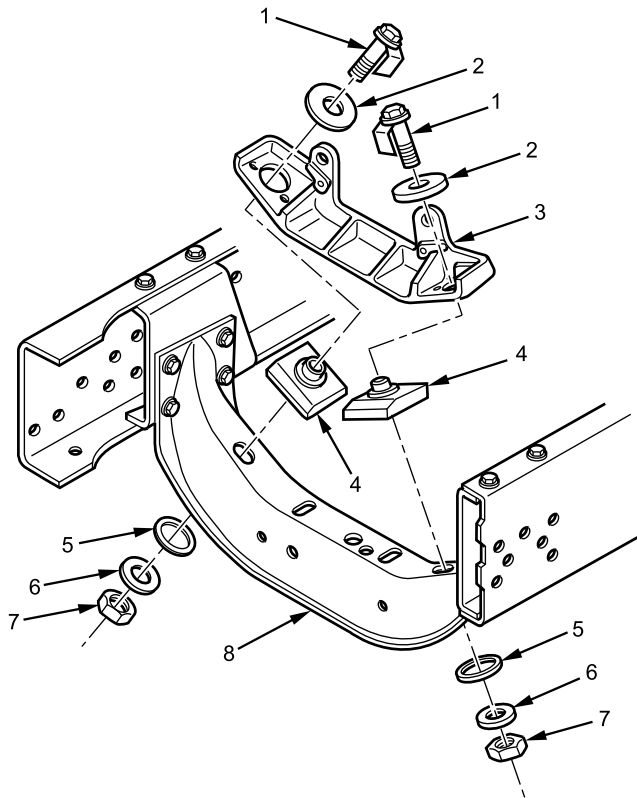
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Figure 3. Front Engine Mount Bracket.

1. Align bolt holes of front engine mount bracket (Figure 3, Item 3) to engine block (Figure 3, Item 1) and secure with two upper mounting bolts (Figure 3, Item 2) and two lower mounting bolts (Figure 3, Item 4). Tighten bolts to 284 lb-ft (385 N•m).

FRONT ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)

2. Place two engine mount insulators (Figure 4, Item 4) on crossmember (Figure 4, Item 8).



B230103390

Figure 4. Front Crossmember.

3. Insert two bolts (Figure 4, Item 1) and insulators (Figure 4, Item 2) into bolt holes located in front engine mount bracket (Figure 4, Item 3).
4. Lower engine and align bolts (Figure 4, Item 1) with bolt holes in crossmember (Figure 4, Item 8).
5. Install two new O-rings (Figure 4, Item 5), flat washers (Figure 4, Item 6), and nuts (Figure 4, Item 7) and tighten securely.
6. Remove lifting device from lifting eye.

END OF TASK

FRONT ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install crankshaft damper (WP 0223).
2. Install radiator (WP 0278).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine and run to operating temperature (TM 9-2355-106-10).
5. Check for proper engine operation.
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

REAR ENGINE MOUNT REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (WP 0795, Item 37)
 Lifting device (WP 0795, Item 67)
 Sling, nylon (WP 0795, Item 91)

TM 9-2355-106-23P
 WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
 Gloves (WP 0794, Item 18)
 Goggles, industrial (WP 0794, Item 20)
 Face shield, industrial (WP 0794, Item 16)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)
 Belly armor removed (WP 0606)

References

TM 9-2355-106-10

WARNING



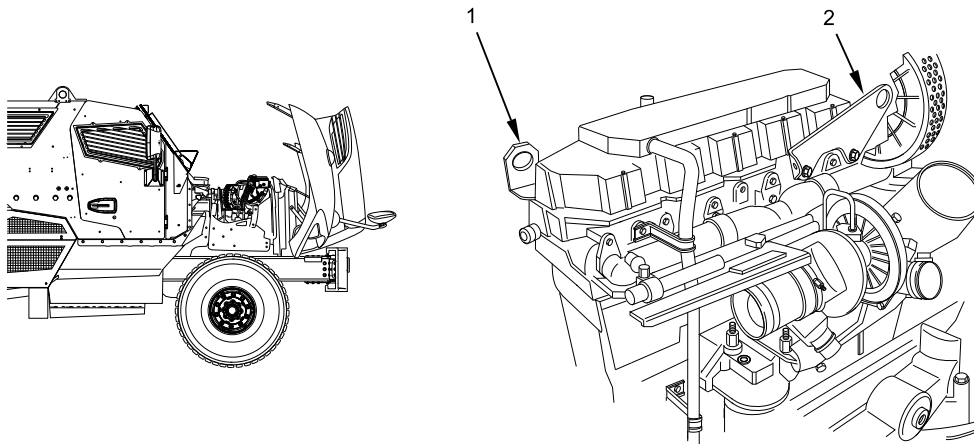
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistant or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

REAR ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. If removing right rear engine mount, remove battery box (WP 0418).
2. Attach lifting sling to engine rear lifting eyelet (Figure 1, Item 1) and front lifting eyelet (Figure 1, Item 2).



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Figure 1. Engine Lifting Eyelets.

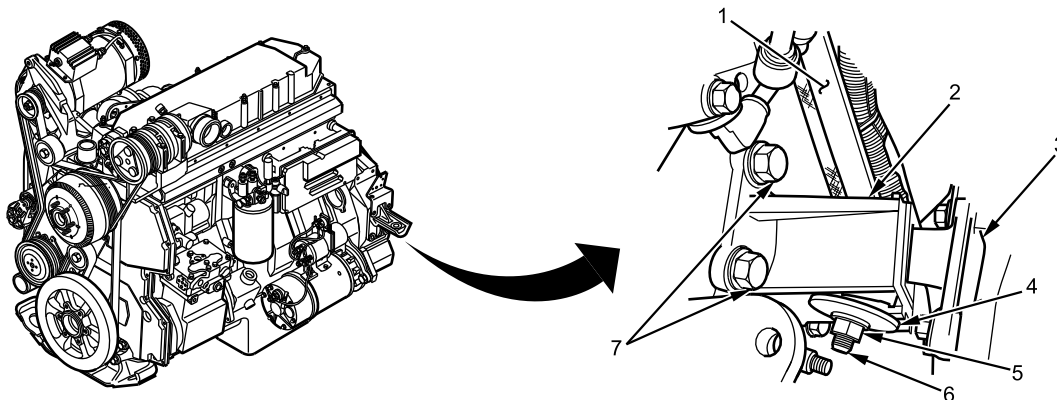
3. Attach lifting device to lifting sling.

NOTE

Retain tension on lifting sling while removing and installing rear engine mount.

Left side shown; right side similar.

4. Remove nut (Figure 2, Item 5), washer (Figure 2, Item 4), and bolt (Figure 2, Item 6) from rear engine mount (Figure 2, Item 2) and engine mounting bracket (Figure 2, Item 3).



B230110421

Figure 2. Rear Engine Mount.

5. Remove four nuts, bolts (Figure 2, Item 7) and rear engine mount (Figure 2, Item 2) from frame rail (Figure 2, Item 1).

END OF TASK

REAR ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound on all rear engine mount bolts threads.

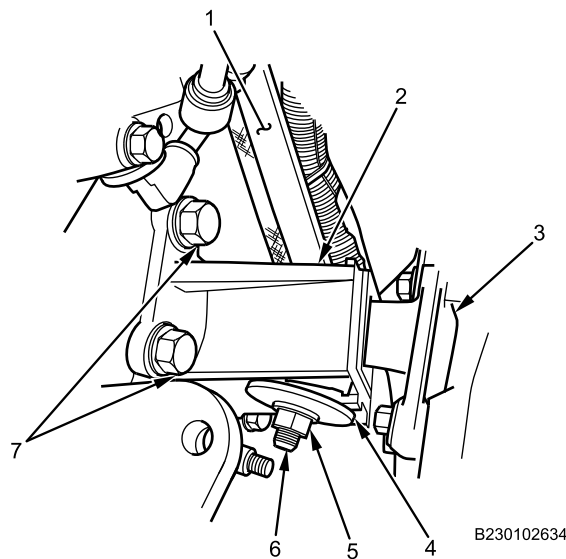


Figure 3. Rear Engine Mount.

2. Install rear engine mount (Figure 9, Item 2) on frame rail (Figure 9, Item 1) with four bolts (Figure 9, Item 7), and nuts. Tighten and secure.
3. Loosely install engine mounting bracket (Figure 9, Item 3) on rear engine mount (Figure 9, Item 2) with bolt (Figure 9, Item 6), washer (Figure 9, Item 4), and nut (Figure 9, Item 5).
4. Remove tension on lifting device and tighten bolt (Figure 9, Item 6) and nut (Figure 9, Item 5) securely.
5. Remove lifting device and lifting sling from vehicle.

END OF TASK

REAR ENGINE MOUNT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install battery box (WP 0418).
2. Install belly armor (WP 0606).
3. Close engine hood (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Lifting sling (WP 0795, Item 68)
 Pan, drain, 5-gal. capacity (WP 0795, Item 75)
 Gauge, feeler, standard, 0.003-0.018-inch, 25 pieces
 (WP 0795, Item 36)
 Straightedge (WP 0795, Item 114)
 Lifting device (WP 0795, Item 67)
 Wrench, torque, 50-250 lb-ft, 1/2-inch drive
 (WP 0795, Item 143)
 Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
 drive (WP 0795, Item 145)
 Kit, head pressure test (WP 0795, Item 26)
 Brush, wire, scratch (WP 0795, Item 22)

Materials/Parts

Antifreeze (WP 0794, Item 5)
 Degreaser (WP 0794, Item 10)
 Lubricating oil (WP 0794, Item 27)
 Rags (WP 0794, Item 39)
 Wire tags (WP 0794, Item 49)
 Gloves (WP 0794, Item 19)
 Goggles, industrial (WP 0794, Item 20)
 Plug (WP 0794, Item 37)
 Bolt - (6) (WP 0796, Item 79)
 Bolt - (20) (WP 0796, Item 80)
 Gasket (WP 0796, Item 89)

Personnel Required

Maintainer - (2)

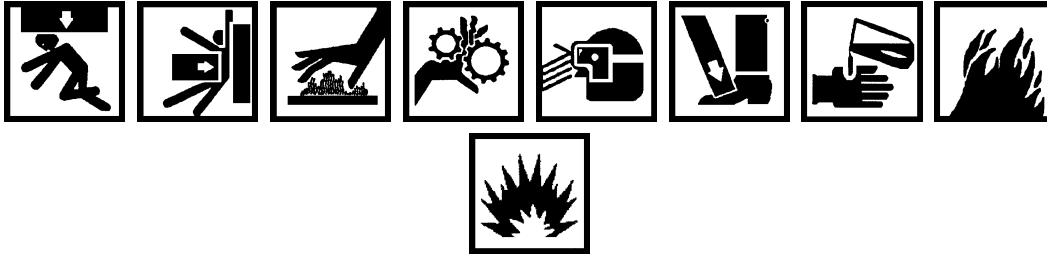
References

TM 9-2355-106-10
 TM 9-2355-106-23P
 WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)
 Cooling fan drive assembly removed (WP 0287)
 Fire Suppression System (FSS) engine compartment
 dispersion cross-tube removed (WP 0751)
 Injection Control Pressure (ICP) sensor removed
 (WP 0391)
 Engine Coolant Temperature (ECT) sensor removed
 (WP 0388)
 Camshaft Position (CMP) sensor removed
 (WP 0393)
 Exhaust manifold removed (WP 0239)
 Fuel injectors removed (WP 0249)
 Fuel injector wire harness removed (WP 0331)
 Heating Ventilating and Air Conditioning (HVAC)
 compressor removed (WP 0708)
 Oil/fuel manifold removed (WP 0250)

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistant or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use proper lifting device for weight of item. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

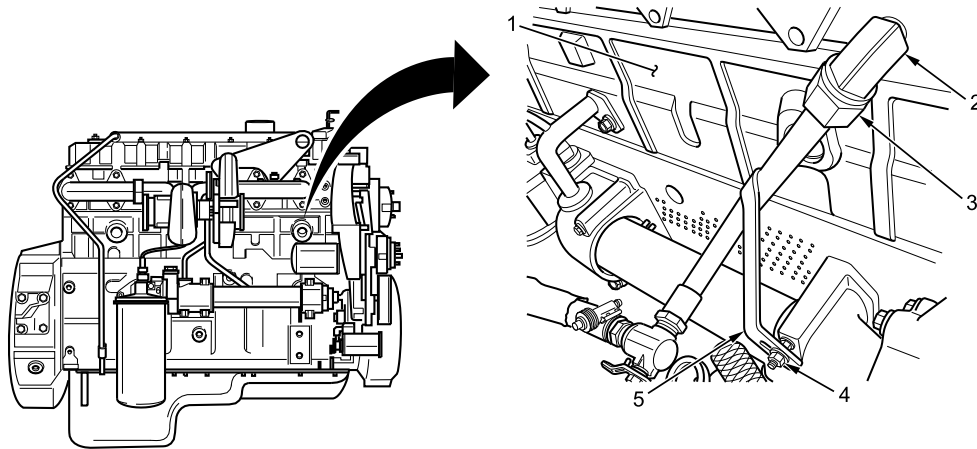
Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

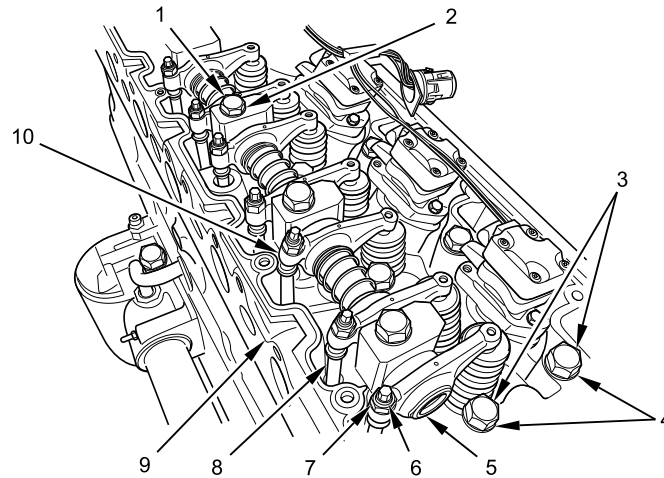
B230103422

Figure 1. Coolant Line Disconnected.

1. Position drain pan under coolant line (Figure 1, Item 3).
2. Disconnect coolant line (Figure 1, Item 3) from angle fitting (Figure 1, Item 2) on cylinder head (Figure 1, Item 1).
3. Remove angle fitting (Figure 1, Item 2) from cylinder head (Figure 1, Item 1).
4. Remove nut (Figure 1, Item 4) from coolant line bracket (Figure 1, Item 5).

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

5. Loosen 12 locknuts (Figure 2, Item 7) and adjusting screws (Figure 2, Item 6) on rocker arms (Figure 2, Item 10) two full turns.



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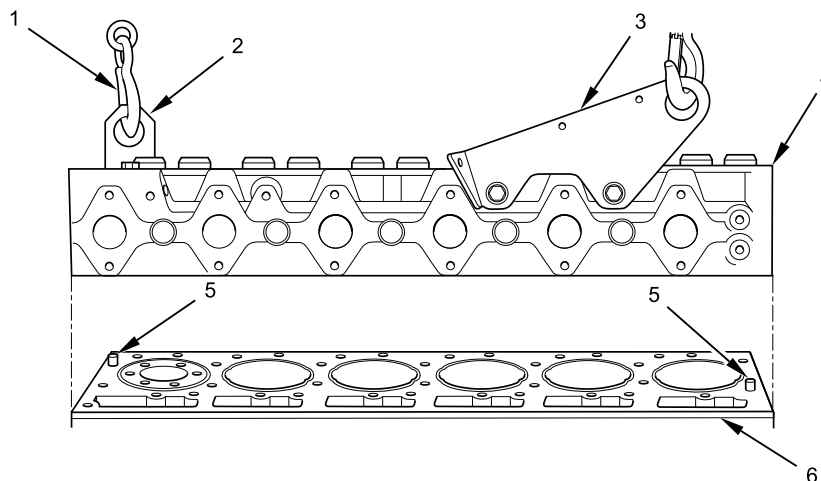
Figure 2. Cylinder Head Components Removal.

6. Remove six long bolts (Figure 2, Item 1), washers (Figure 2, Item 2), and rocker arm assembly (Figure 2, Item 5) from cylinder head (Figure 2, Item 9). Discard bolts.

NOTE

Number pushrods to ensure proper installation.

7. Remove 12 pushrods (Figure 2, Item 8) from cylinder head (Figure 2, Item 9).
8. Remove 20 short bolts (Figure 2, Item 3) and washers (Figure 2, Item 4) from cylinder head (Figure 2, Item 9). Discard bolts.
9. Attach lifting chains and hooks (Figure 3, Item 1) to cylinder head rear lifting eyelet (Figure 3, Item 2) and front lifting eyelet (Figure 3, Item 3).



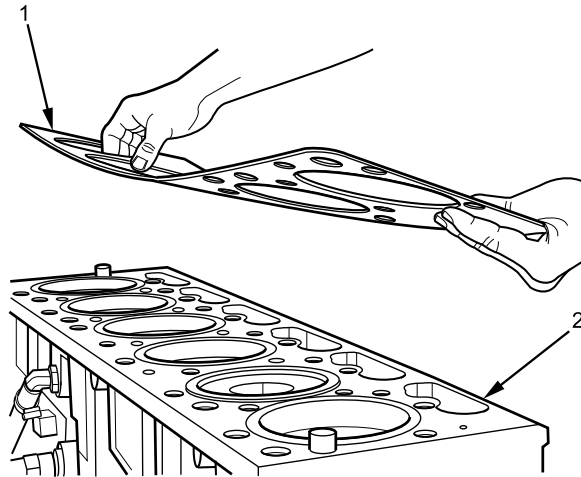
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Figure 3. Cylinder Head Removal.

10. Attach lifting device to chain.
11. With lifting device and assistant, remove cylinder head (Figure 3, Item 4) from engine block (Figure 3, Item 6).

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

12. Remove lifting device and chains.
13. Remove dowel rings (Figure 3, Item 5).
14. Remove cylinder head gasket (Figure 4, Item 1) from engine block (Figure 4, Item 2).



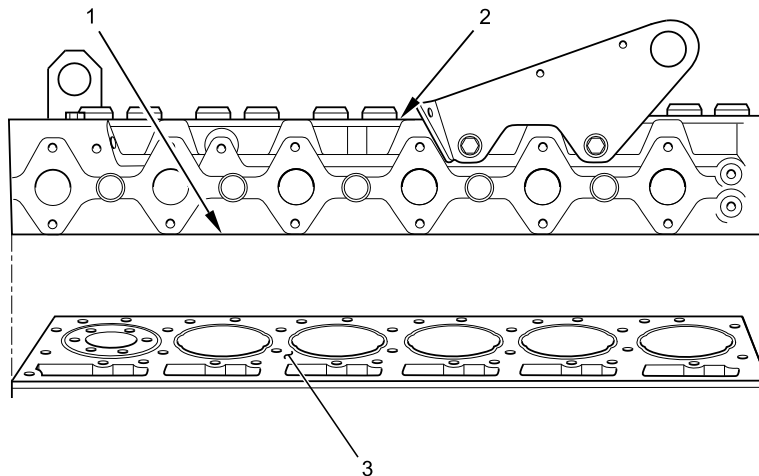
P230100985

Figure 4. Cylinder Head Gasket Removal.

15. Remove drain pan.

END OF TASK**CLEANING**

1. Using wire brush and degreaser, clean any cylinder head gasket residue from cylinder head gasket mating surfaces (Figure 5, Item 1 and 3) on cylinder head (Figure 5, Item 2) and engine block (Figure 5, Item 3).



B230110436

Figure 5. Cylinder Head Gasket Cleaning.

END OF TASK

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**NONDESTRUCTIVE TESTING INSPECTION (NDTI)**

- Using straight edge (Figure 6, Item 1) and feeler gauge (Figure 6, Item 3), measure cylinder head lower deck (Figure 6, Item 2) for warping in several locations. Ensure cylinder head warpage is not in excess of 0.004 in. (0.10 mm) per every 9 in. (229 mm). If cylinder head warpage exceeds specifications, replace cylinder head.

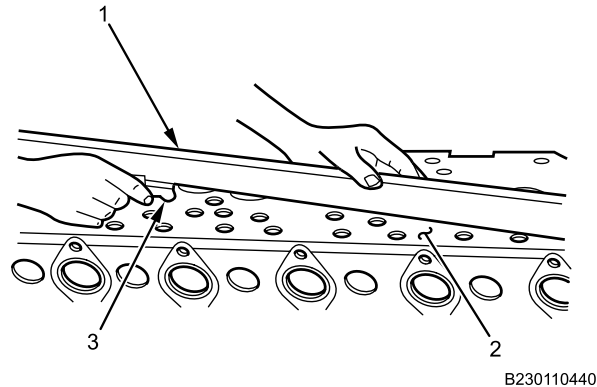


Figure 6. Cylinder Head Flatness Measurement.

NOTE

Cylinder head pressure test will reveal cracks in coolant passages.

- Using 24 mounting bolts and nuts (Figure 7, Item 2) from head pressure test kit, attach pressure plate assembly (Figure 7, Item 1) to cylinder head gasket surface (Figure 7, Item 3).

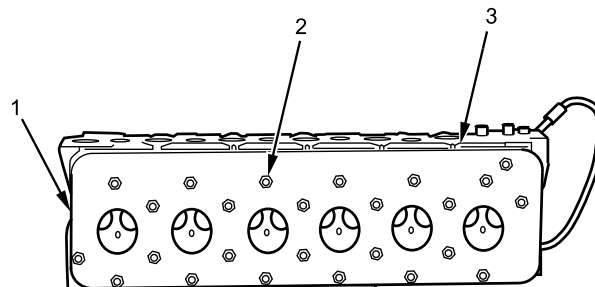
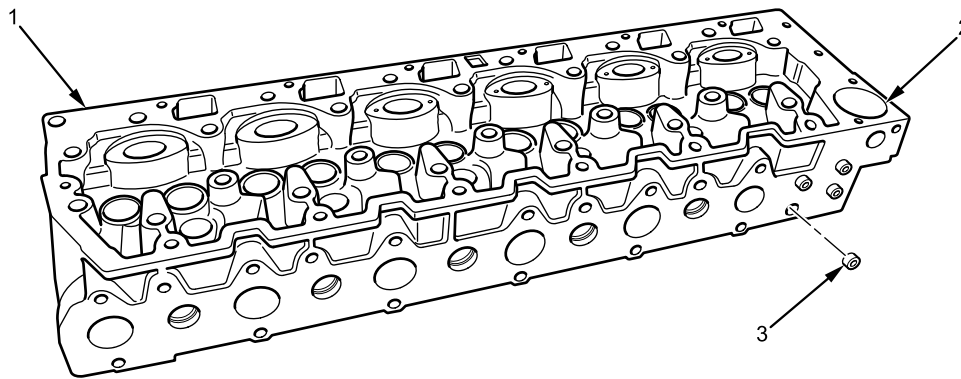


Figure 7. Cylinder Head Pressure Test.

- Install pipe plug (Figure 8, Item 3) in cylinder head (Figure 8, Item 1).

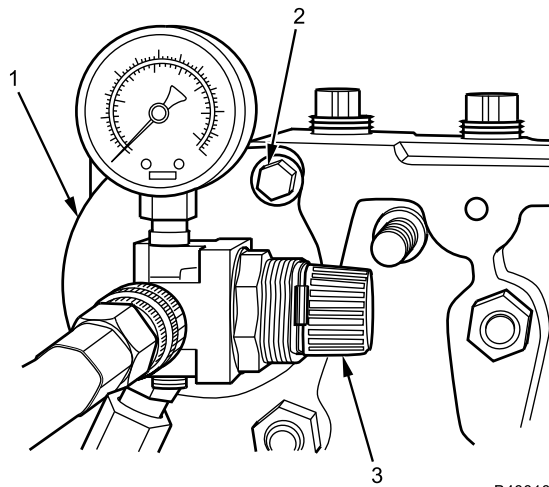
CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)



B230110442

Figure 8. Pipe Plug.

4. Fill cylinder head with hot water through thermostat opening (Figure 8, Item 2).
5. Attach thermostat opening pressure test adapter and water supply housing pressure test adapter (Figure 9, Item 1) to thermostat opening in cylinder head with existing fasteners (Figure 9, Item 2).



B400100271

Figure 9. Test Adapter.

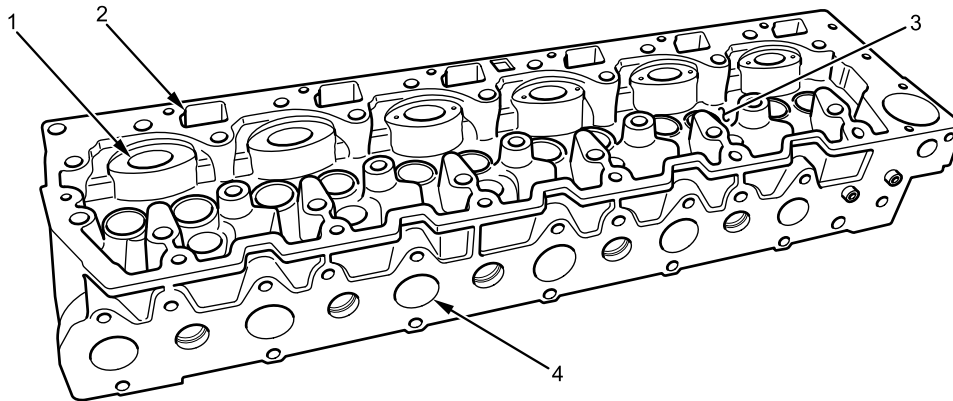
6. Install air regulator (Figure 9, Item 3) on thermostat test adapter.
7. Attach hose fitting to air regulator (Figure 9, Item 3), and apply 18 to 20 psi (124 to 138 kPa) air pressure.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

If water leaks or cracks are observed at any port or on upper and lower deck, cylinder head must be replaced.

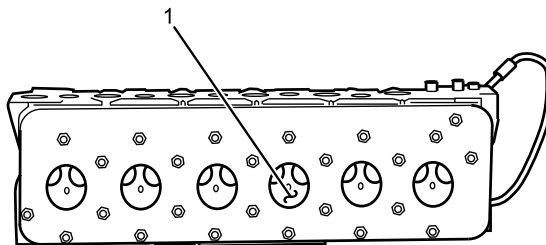
8. Inspect for water leaks or visible cracks around six intake ports (Figure 10, Item 2) and six exhaust ports (Figure 10, Item 4).



B230110437

Figure 10. Cylinder Head Upper Deck Inspection.

9. Inspect for water leaks or visible cracks around six injector bores (Figure 10, Item 1) and on upper cylinder head deck (Figure 10, Item 3).
10. Inspect for water leaks or visible cracks on lower cylinder head deck (Figure 11, Item 1).



B230110438

Figure 11. Cylinder Head Lower Deck Inspection.

11. Remove hose fitting from air regulator (Figure 12, Item 3), and release air pressure from cylinder head.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

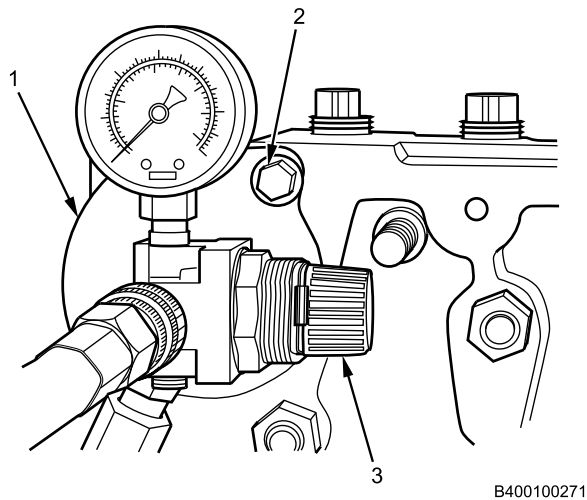


Figure 12. Test Adapter.

12. Remove fasteners (Figure 12, Item 2), and thermostat opening pressure test adapter and water supply housing pressure test adapter (Figure 12, Item 1) from thermostat opening in cylinder head.
13. Place drain pan below cylinder head (Figure 13, Item 1) and remove pipe plug (Figure 13, Item 2). Allow water to drain from cylinder head.

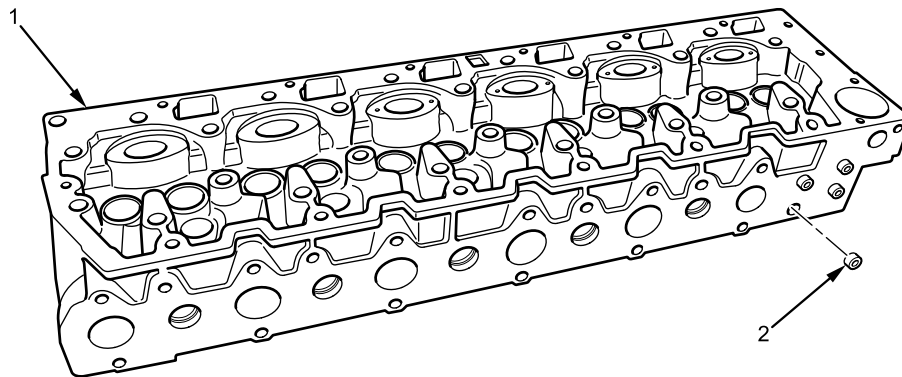
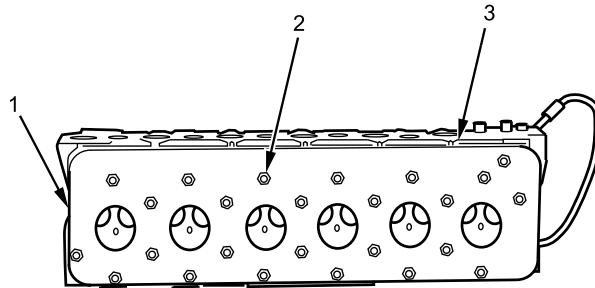


Figure 13. Drain Cylinder Head.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

14. Remove 24 mounting bolts and nuts (Figure 14, Item 2), and pressure plate assembly (Figure 14, Item 1) from cylinder head gasket surface (Figure 14, Item 3).



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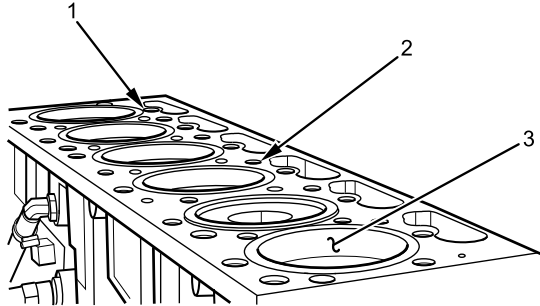
Figure 14. Cylinder Head Pressure Test Kit.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Replace engine if there are any visible cracks around bolt holes, coolant ports, or cylinder sleeves.

Use thread insert to repair any threaded holes with damaged threads.

15. Inspect 26 bolt holes (Figure 15, Item 1) for damaged threads or cracks.



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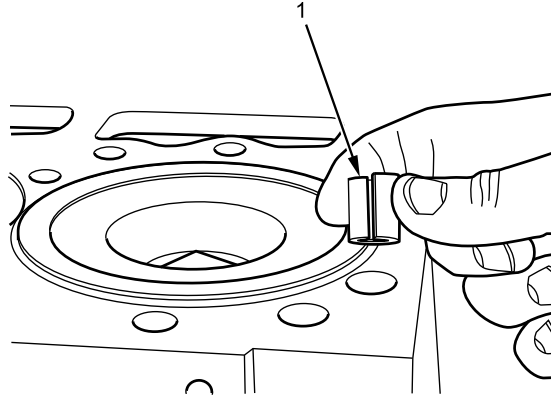
Figure 15. Engine Block Inspection.

16. Inspect 12 coolant ports (Figure 15, Item 2) for cracks.
17. Inspect six cylinder sleeves (Figure 15, Item 3) for cracks.

END OF TASK

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

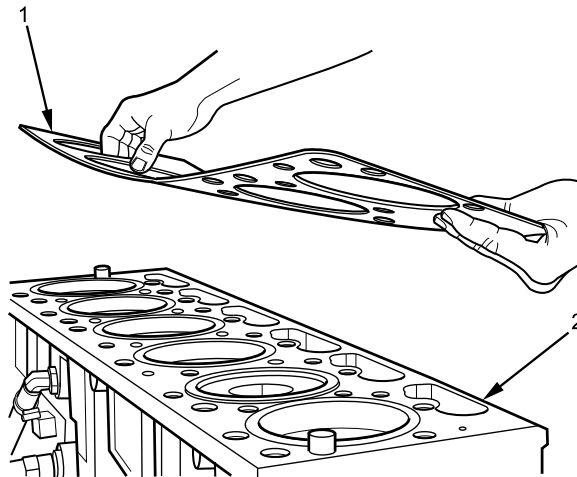
1. Install two dowel rings (Figure 16, Item 1), one on each end of block deck surface. Dowel holes are recessed into deck surface.



B400100309

Figure 16. Cylinder Head Dowel Rings.

2. Install new cylinder head gasket (Figure 17, Item 1) on engine block (Figure 17, Item 2).

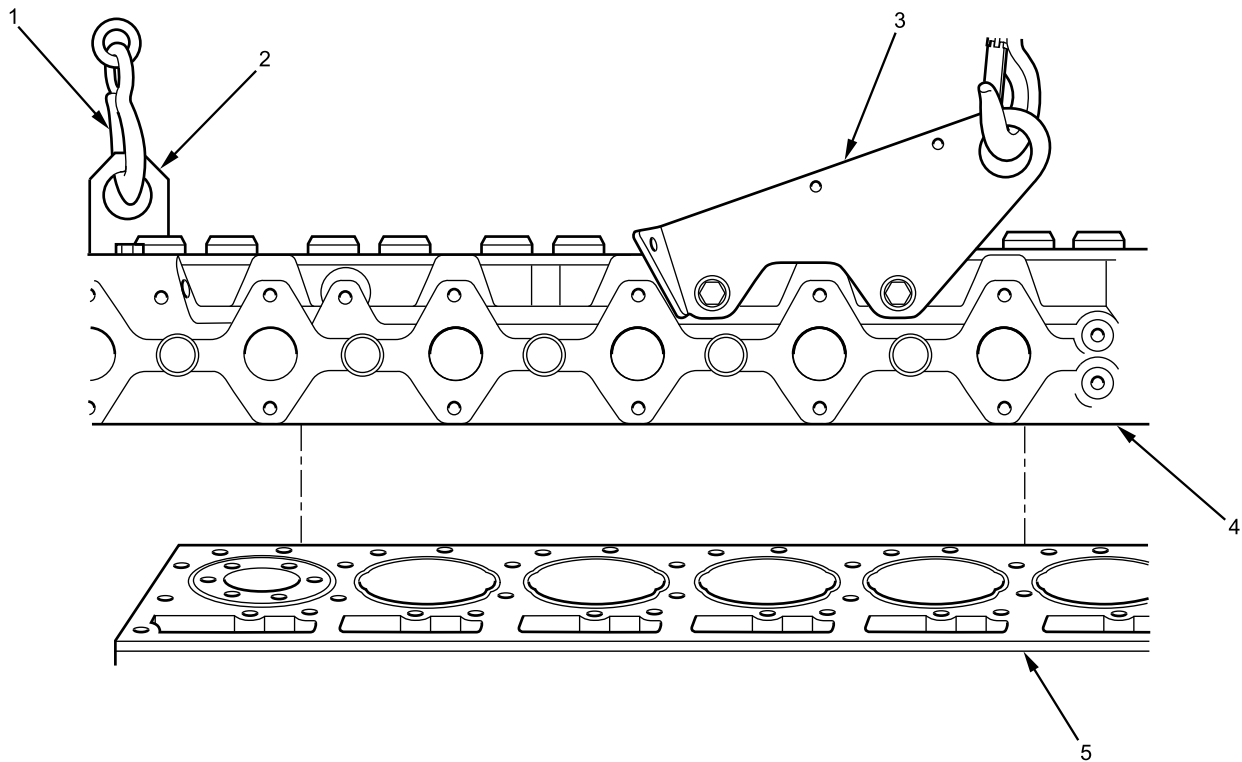


P230100985

Figure 17. Cylinder Head Gasket Installation.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

3. Attach lifting chains and hooks (Figure 18, Item 1) to cylinder head rear lifting eyelet (Figure 18, Item 2) and front lifting eyelet (Figure 18, Item 3).

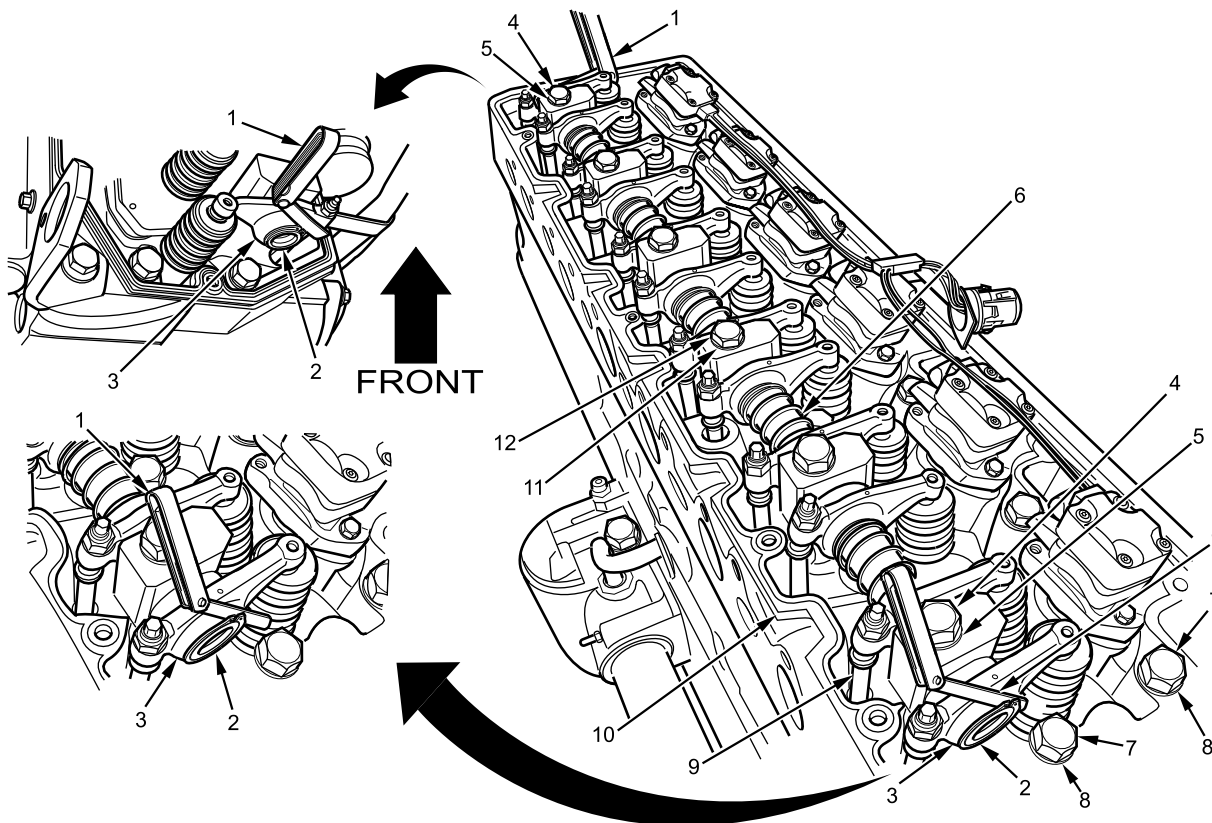


B230102675

Figure 18. Cylinder Head Installation.

4. Attach lifting device to chain.
5. With lifting device and assistant, install cylinder head (Figure 18, Item 4) on engine block (Figure 18, Item 5).
6. Remove lifting device and chains.
7. Apply light coat of clean engine oil on all cylinder head bolt threads and washers.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)



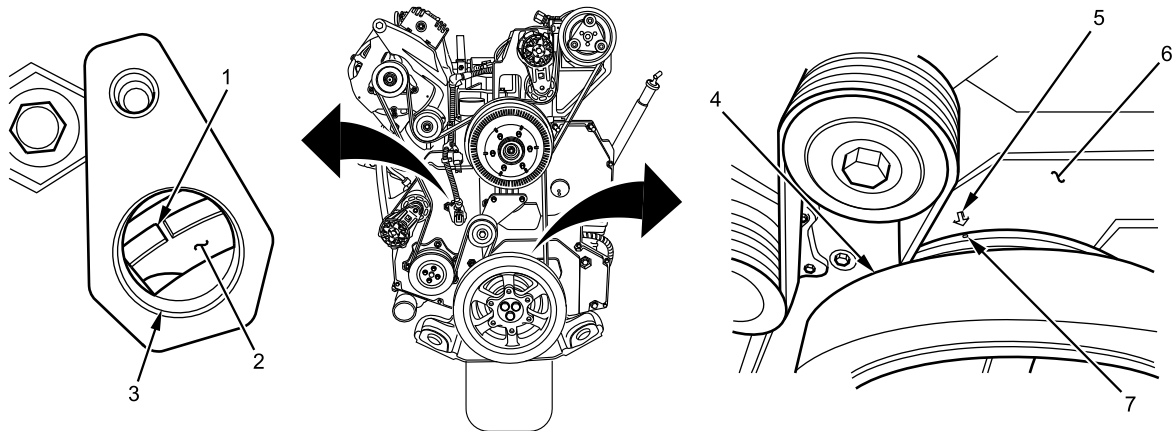
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Figure 19. Cylinder Head Components Installation.

8. Attach cylinder head (Figure 19, Item 10) on engine with 20 new short bolts (Figure 19, Item 7) and washers (Figure 19, Item 8). Do not tighten.
9. Install 12 pushrods (Figure 19, Item 9) into cylinder head (Figure 19, Item 10) in same location as removed.
10. Install rocker arm assembly (Figure 19, Item 6) on cylinder head (Figure 19, Item 10) with four new long bolts (Figure 19, Item 12) and washers (Figure 19, Item 11), leaving out two end bolts (Figure 19, Item 4) and washers (Figure 19, Item 5). Do not tighten.
11. Insert two 0.005-inch (0.013-mm) feeler gauges (Figure 19, Item 1) in front and back of rocker arm assembly (Figure 19, Item 6) between snapping (Figure 19, Item 2) and rocker arm (Figure 19, Item 3).
12. Install two new end bolts (Figure 19, Item 4) and washers (Figure 19, Item 5) into rocker arm assembly (Figure 19, Item 6). Do not tighten.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

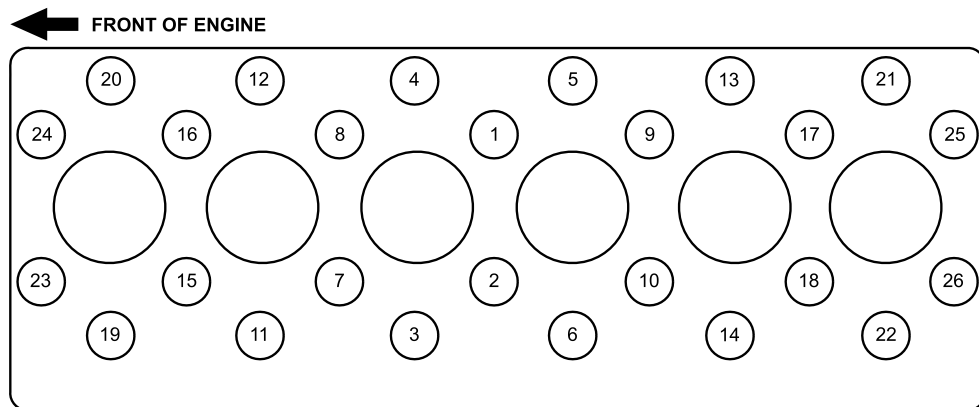
13. Position number one piston at Top Dead Center (TDC) in compression stroke by rotating engine crankshaft damper (Figure 20, Item 4) clockwise until thin vane (Figure 20, Item 1) on timing disk plate (Figure 20, Item 2) is visible through CMP sensor mounting hole (Figure 20, Item 3), and TDC mark (Figure 20, Item 7) on engine crankshaft damper (Figure 20, Item 4) is aligned with TDC mark (Figure 20, Item 5) on front cover (Figure 20, Item 6).



005553

Figure 20. Engine Timing Mark Alignment.

14. Rotate engine crankshaft damper (Figure 20, Item 4) clockwise until TDC mark (Figure 20, Item 7) on engine crankshaft damper is 2-1/4 in. (57 mm) past TDC mark (Figure 20, Item 5) on front cover (Figure 20, Item 6).
15. In 1/4-turn increments, tighten cylinder head bolts in sequence shown (Figure 21) to 100 lb-ft (136 N•m).



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Figure 21. Cylinder Head Bolt Tightening Sequence.

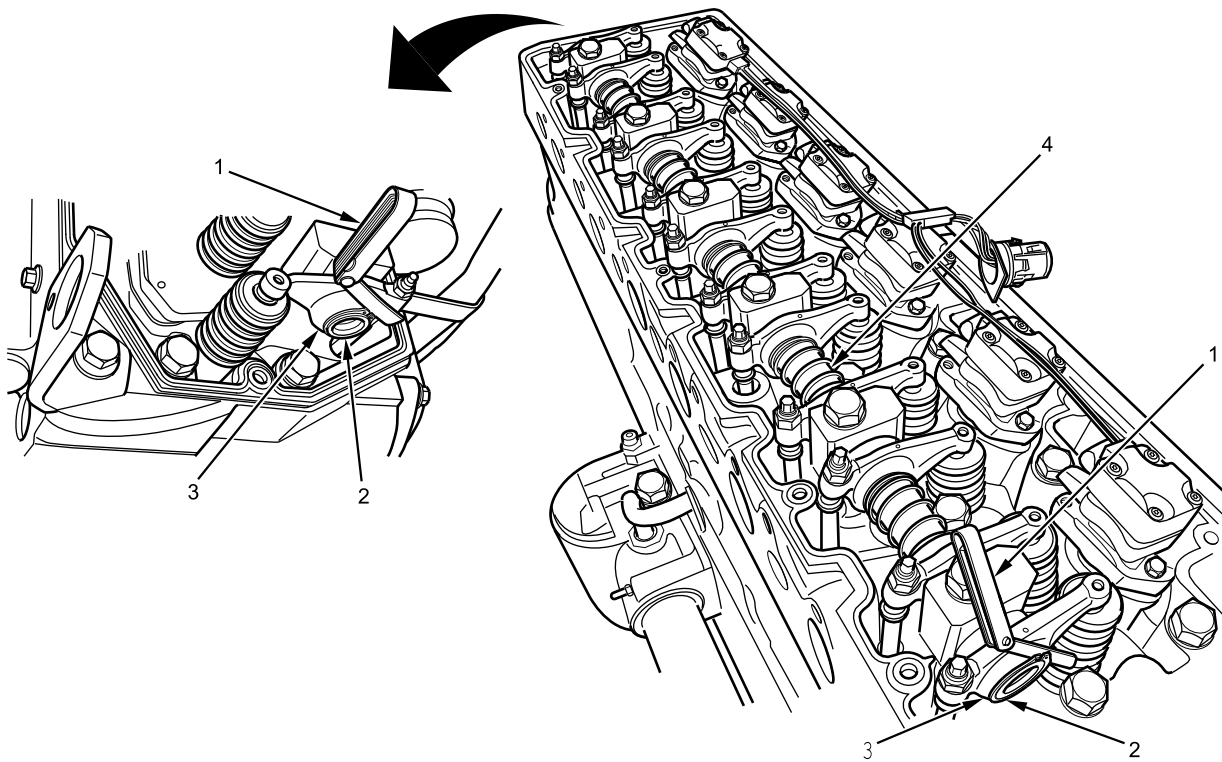
16. In 1/4-turn increments, retighten cylinder head bolts in sequence shown (Figure 21) to 130 lb-ft (176 N•m).

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Mark cylinder head bolts and cylinder head to show bolt tightening starting point. Mark cylinder head surface again, 90 degrees clockwise from current cylinder head bolt position. This will help track which bolts have been tightened during the next step.

17. Retighten cylinder head bolts 1/4 turn in sequence shown (Figure 21).
18. Remove two 0.005-inch (0.013-mm) feeler gauges (Figure 22, Item 1) from between snaprings (Figure 22, Item 2) and rocker levers (Figure 22, Item 3).



B230110420

Figure 22. Rocker Arm Assembly.

19. Rotate rocker levers (Figure 22, Item 3) at each end of rocker arm assembly (Figure 22, Item 4) by hand to verify they are not binding or locked.

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

20. Install angle fitting (Figure 23, Item 2) on cylinder head (Figure 23, Item 1). Tighten securely.

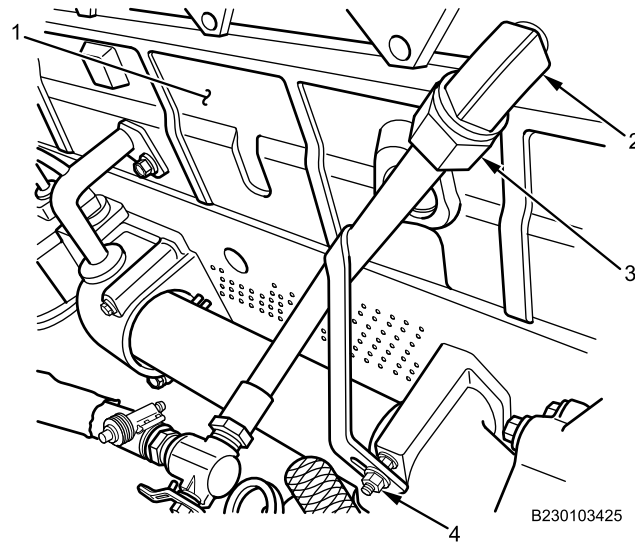


Figure 23. Coolant Line Connected.

21. Connect coolant line (Figure 23, Item 3) onto angle fitting (Figure 23, Item 2) on cylinder head (Figure 23, Item 1). Tighten securely.
22. Install nut (Figure 23, Item 4) securing coolant line bracket and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Perform engine valve adjustment (WP 0229).
2. Install oil/fuel manifold (WP 0250).
3. Install HVAC compressor (WP 0708).
4. Install fuel injector wire harness (WP 0331).
5. Install fuel injectors (WP 0249).
6. Install exhaust manifold (WP 0239).
7. Install CMP sensor (WP 0393).
8. Install ECT sensor (WP 0388).
9. Install ICP sensor (WP 0391).
10. Install FSS engine compartment dispersion cross-tube (WP 0751).
11. Install cooling fan drive assembly (WP 0287).
12. Drain and fill engine oil (WP 0233).
13. Service HVAC system (WP 0707).
14. Turn MAIN POWER switch on.
15. Prime fuel system (WP 0255).
16. Start engine and verify operation (TM 9-2355-106-10).
17. Turn engine off and check for oil leaks.
18. Close engine hood (TM 9-2355-106-10).

CYLINDER HEAD AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

19. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Heater, damper (WP 0795, Item 55)
Meter (WP 0795, Item 72)
Installer, crankshaft front wear sleeve and oil seal
(WP 0795, Item 57)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)
Master puller set (WP 0795, Item 78)
Gloves, thermal (WP 0795, Item 39)

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)
Rag (WP 0794, Item 39)
Bolt - (3) (WP 0794, Item 7)

Kit, oil seal front (WP 0796, Item 93)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Radiator fan removed (WP 0282)
Serpentine belt removed (WP 0240)

WARNING

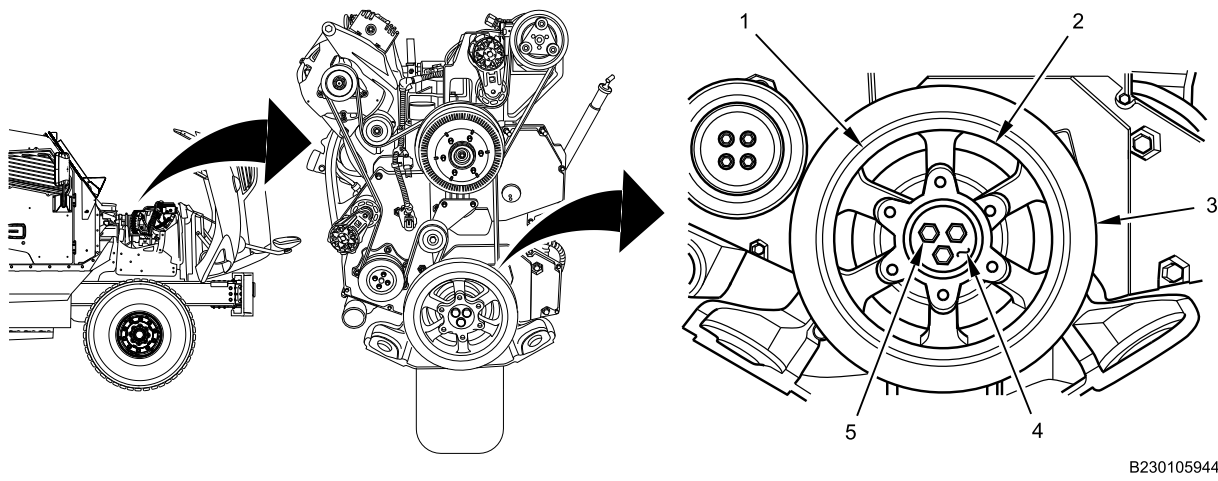


Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

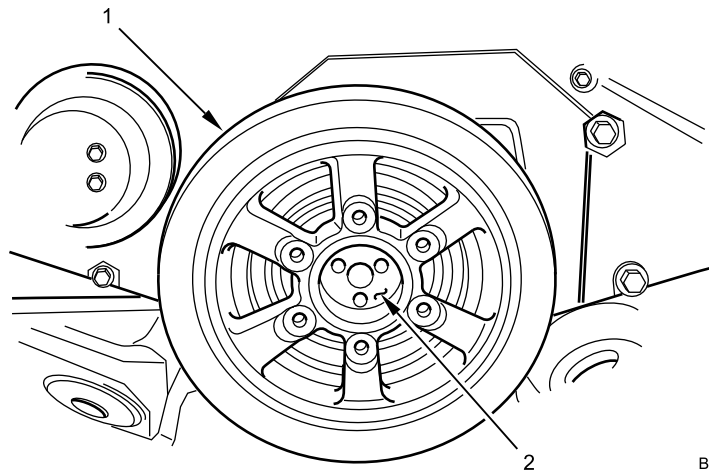
REMOVAL



B230105944

Figure 1. Crankshaft Damper and Bolts.

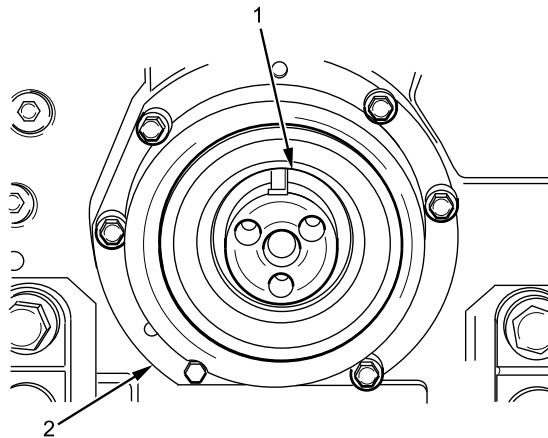
1. Inspect for damage on rubber insulator (Figure 1, Item 1) or any play between hub (Figure 1, Item 2) and outer rim (Figure 1, Item 3). Replace crankshaft damper (Figure 1, Item 3) as necessary.
2. Remove three bolts (Figure 1, Item 5) and crankshaft damper plate (Figure 1, Item 4) from crankshaft damper (Figure 1, Item 3).



B230100085

Figure 2. Crankshaft Damper (Plate Removed).

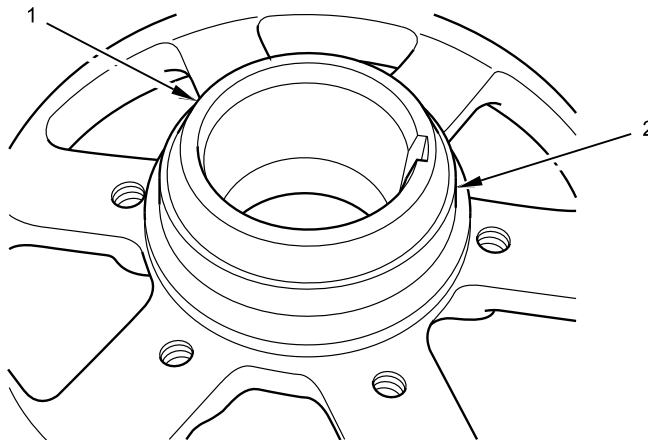
3. Remove crankshaft damper (Figure 2, Item 1) from engine crankshaft (Figure 2, Item 2) using gear and pulley puller.

CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230100097

Figure 3. Front Seal Removal.

4. Using a suitable pry bar, remove front seal (Figure 3, Item 1) from oil pump assembly (Figure 3, Item 2). Discard seal (Figure 3, Item 1).



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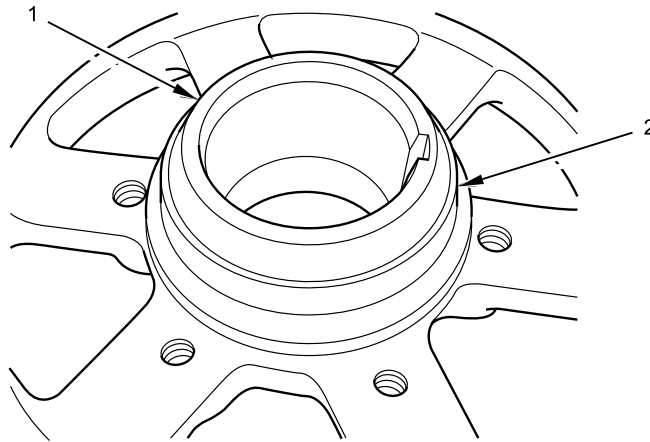
Figure 4. Crankshaft Damper Wear Sleeve.

5. Remove wear sleeve (Figure 4, Item 2) from crankshaft damper (Figure 4, Item 1). Discard wear sleeve (Figure 4, Item 2).

END OF TASK

CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION



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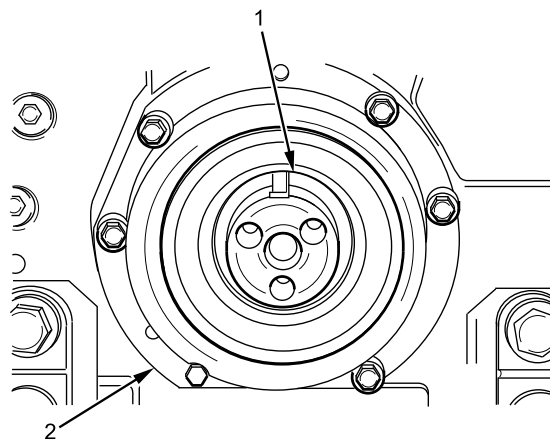
Figure 5. Crankshaft Damper Wear Sleeve.

1. Press new wear sleeve (Figure 5, Item 2) onto crankshaft damper (Figure 5, Item 1) using crankshaft front wear sleeve and oil seal installer.
2. Using crankshaft front wear sleeve and oil seal installer, install new front seal (Figure 6, Item 1) into oil pump assembly (Figure 6, Item 2).

WARNING



Crankshaft damper will become extremely hot. Use thermal protection gloves when handling damper. Failure to comply may result in personal injury.



B230100097

Figure 6. Front Seal.

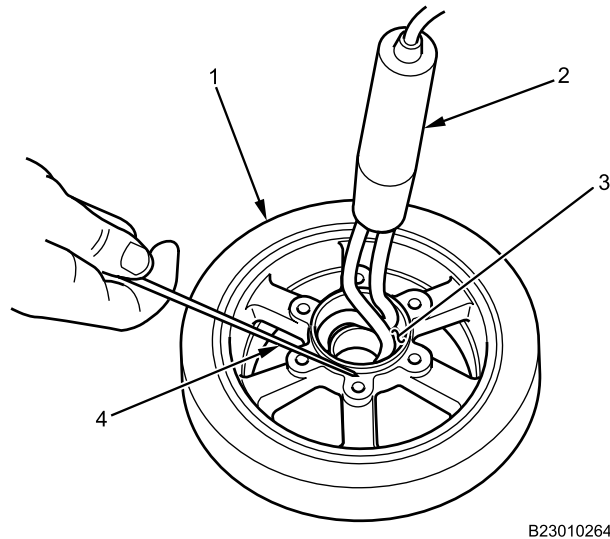
CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)


Figure 7. Damper Heater.

3. Insert damper heater (Figure 7, Item 2) into center of crankshaft damper (Figure 7, Item 3) and apply heat.
4. Position temperature probe (Figure 7, Item 4) on crankshaft damper (Figure 7, Item 1) center section. When temperature reaches 300 degrees Fahrenheit, remove damper heater (Figure 7, Item 2).

NOTE

When installing crankshaft damper, make sure keyway in damper is aligned with key on crankshaft.

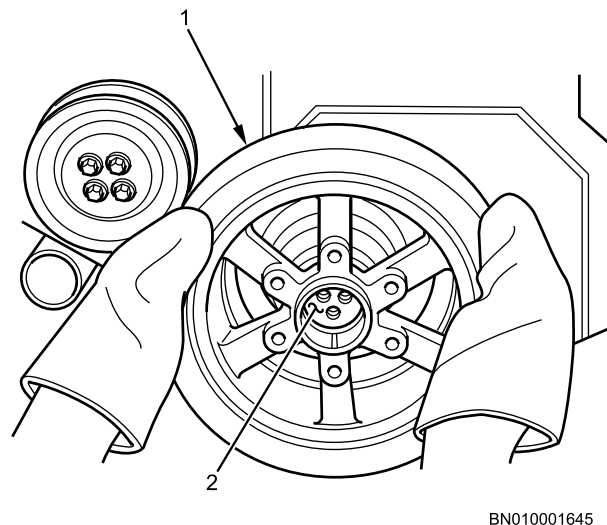


Figure 8. Crankshaft Damper Installation.

5. Using thermal gloves, install crankshaft damper (Figure 8, Item 1) onto crankshaft (Figure 8, Item 2) as quickly and as far back as possible.

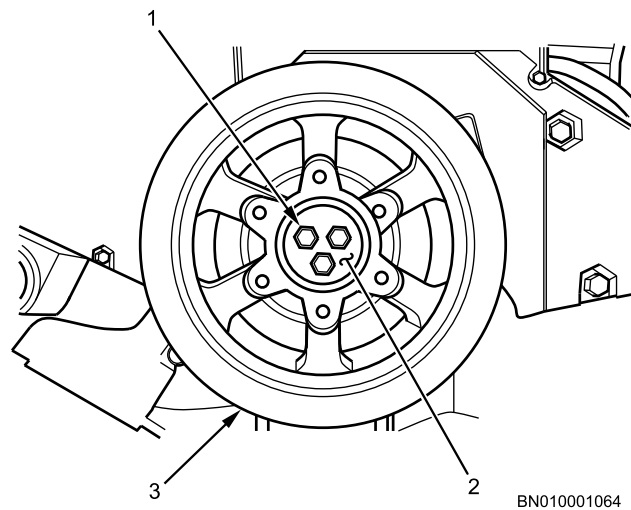
CRANKSHAFT DAMPER AND FRONT SEAL ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 9. Crankshaft Damper.

6. Install damper plate (Figure 9, Item 2) on crankshaft damper (Figure 9, Item 3).
7. Loosely install three installation bolts (Figure 9, Item 1).
8. Tighten bolts (Figure 9, Item 1) sequentially in small increments to maintain even pressure on damper plate (Figure 9, Item 2) until damper is seated on crankshaft
9. Remove installation bolts (Figure 9, Item 1).
10. Install damper bolts. Tighten to 100 lb-ft (136 Nm).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Install radiator fan (WP 0282).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine and verify proper operation (TM 9-2355-106-10).
5. Turn engine off and check for oil leaks (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

REAR CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Installer, rear main seal (WP 0795, Item 58)
Set, slide hammer (WP 0795, Item 90)
Drill, hand, VSR, electric 3/8-inch (WP 0795, Item 29)
Bit, drill, standard, cobalt, jobber length, 3/16-inch (WP 0795, Item 18)
Wear sleeve remover (WP 0795, Item 129)

Materials/Parts

Rags (WP 0794, Item 39)
Seal (WP 0796, Item 58)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

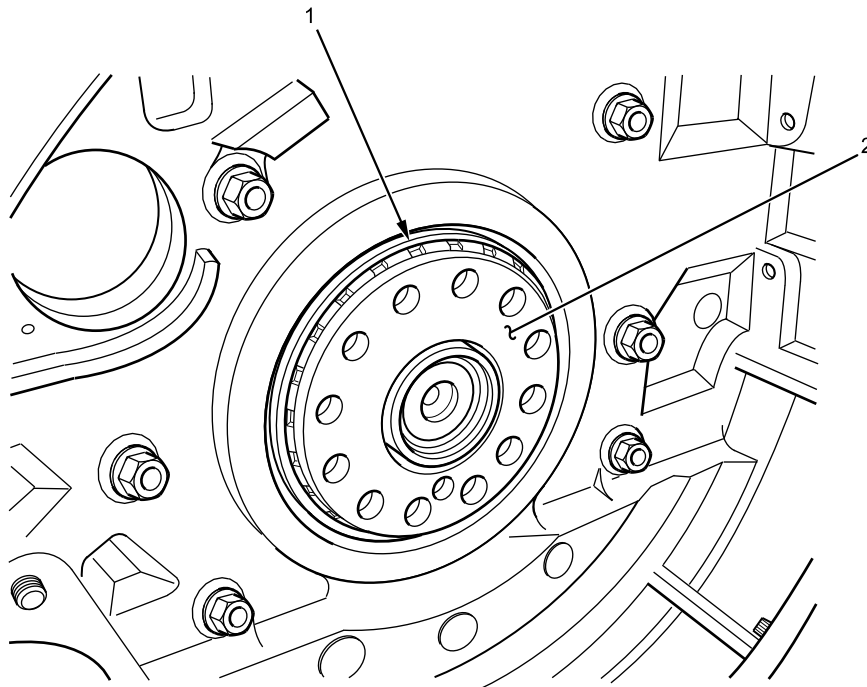
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Transmission assembly removed (WP 0454)
Flexplate removed (WP 0225)

REMOVAL

CAUTION

When removing rear oil seal and retainer, be careful not to scratch housing or crankshaft.

1. Remove oil seal retainer (Figure 1, Item 1) from crankshaft (Figure 1, Item 2) and discard.



B230102695

Figure 1. Rear Oil Seal Retainer Removal.

REAR CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Removal holes drilled in rear oil seal may increase depending on the size of screw tip.

2. Drill three 1/8-inch (3.175-mm) holes evenly spaced and centered in rear oil seal (Figure 2, Item 1).

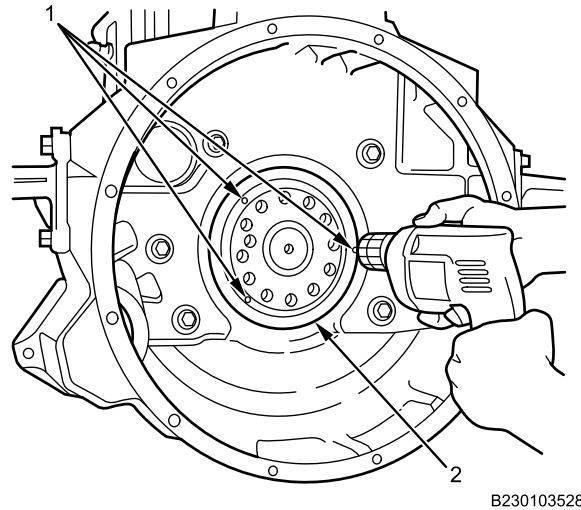


Figure 2. Rear Oil Seal.

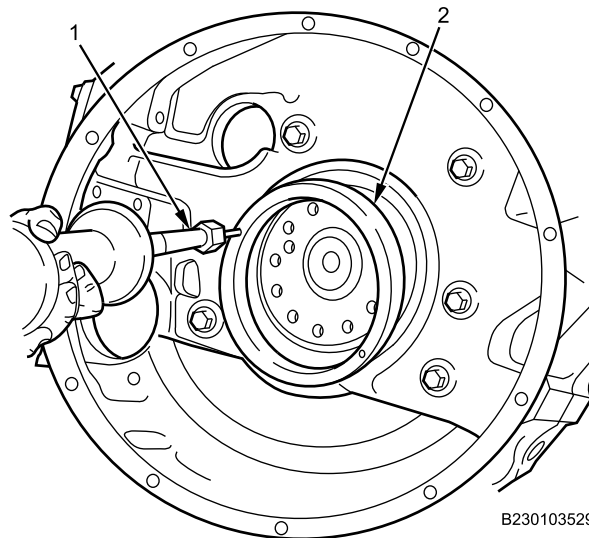
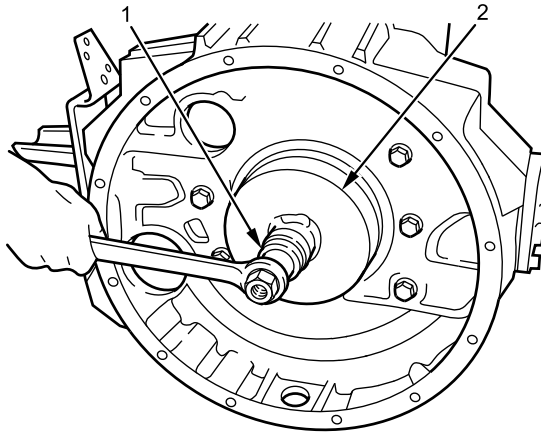


Figure 3. Rear Oil Seal.

3. Using slide hammer with screw tip (Figure 3, Item 1), remove rear oil seal (Figure 3, Item 2) from crankshaft and discard.

REAR CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION - (CONTINUED)

B230103532

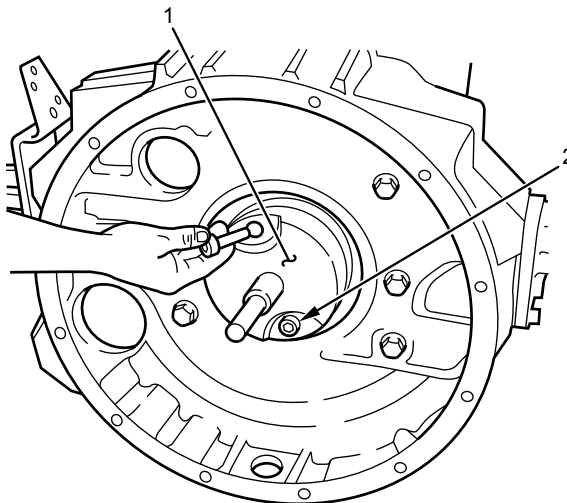
Figure 4. Wear Sleeve Removal.

4. Using wear sleeve puller (Figure 4, Item 1), remove seal wear sleeve from crankshaft (Figure 4, Item 2) and discard.

END OF TASK**INSTALLATION****NOTE**

When installing rear oil seal and retainer, be careful not to scratch housing and crankshaft.

1. Install rear seal installer base (Figure 5, Item 1) on crankshaft and tighten two bolts (Figure 5, Item 2).

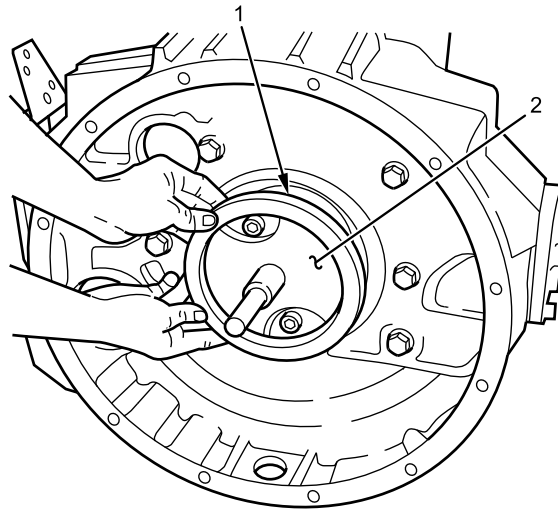


B230103530

Figure 5. Rear Oil Seal Installer Base.

REAR CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION - (CONTINUED)

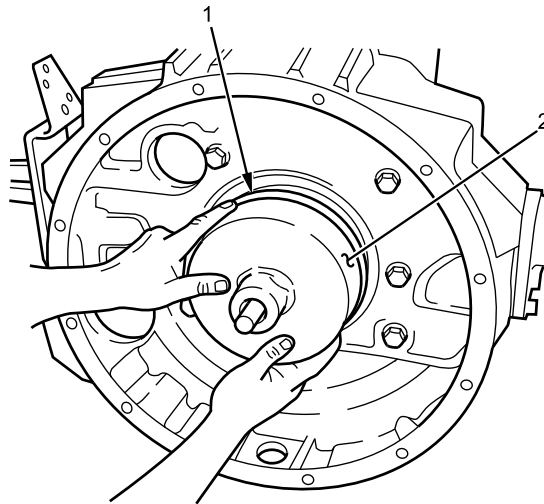
2. Install new seal assembly (Figure 6, Item 1) on rear seal installer base (Figure 6, Item 2).



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Figure 6. Rear Oil Seal Installation on Base.

3. Install rear seal installer (Figure 7, Item 2) against steel face of rear oil seal (Figure 7, Item 1).



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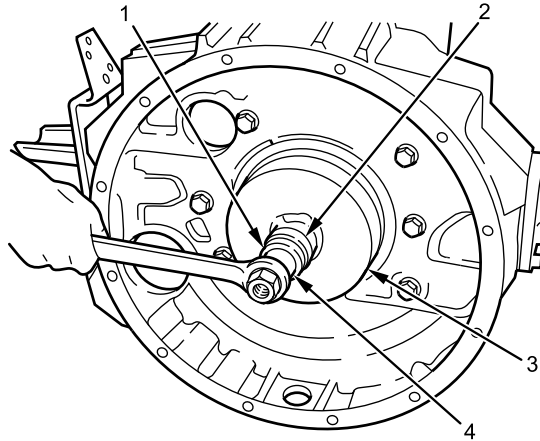
Figure 7. Rear Seal Installer on Base.

4. Using rear seal installer (Figure 7, Item 2), push rear oil seal (Figure 7, Item 1) into flywheel housing by hand until resistance is felt.

REAR CRANKSHAFT OIL SEAL REMOVAL AND INSTALLATION - (CONTINUED)**CAUTION**

Do not use air tools to tighten rear seal installer nut. Failure to comply can result in engine damage.

5. Install bearing (Figure 8, Item 2), washer (Figure 8, Item 1), and forcing nut (Figure 8, Item 4) on installer shaft.



B230103538

Figure 8. Rear Oil Seal Installation.

6. Tighten forcing nut (Figure 8, Item 4) until rear oil seal installer (Figure 8, Item 3) bottoms out.
7. Remove rear oil seal installer from crankshaft.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install flexplate (WP 0225).
2. Install transmission assembly (WP 0454).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine and verify operation (TM 9-2355-106-10).
5. Turn engine off and check for oil leaks (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FLEX PLATE REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)
Guide stud set (WP 0795, Item 42)

Materials/Parts

Rags (WP 0794, Item 51)

Personnel Required

Maintainer - (2)

References

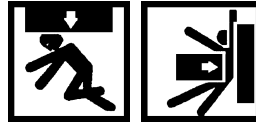
TM 9-2355-106-10

TM 2355-106-23P

WP 0782

Equipment Condition

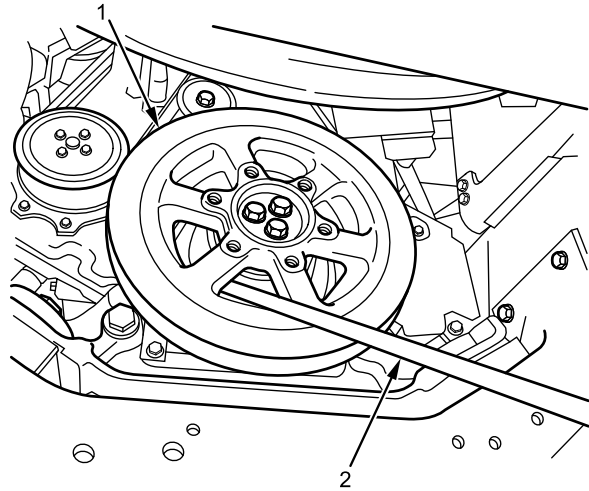
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Transmission assembly removed (WP 0454)

REMOVAL**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

FLEX PLATE REMOVAL AND INSTALLATION - (CONTINUED)

1. With assistant, hold crankshaft vibration damper (Figure 1, Item 1) with pry bar (Figure 1, Item 2) during removal of flexplate mounting bolts.



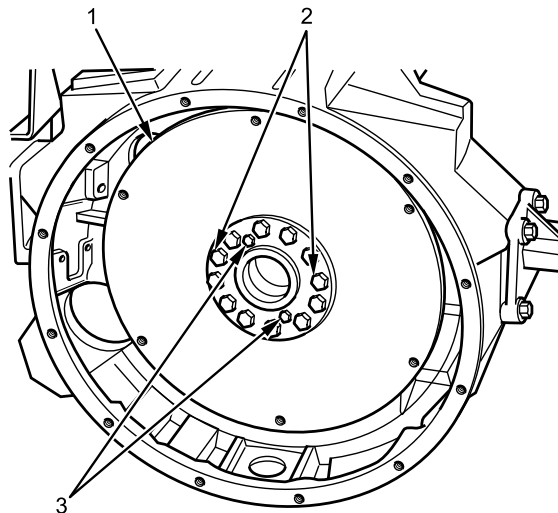
B230103297

Figure 1. Crankshaft Vibration Damper.

CAUTION

To avoid possible engine and transmission damage, remove flexplate assembly as a complete unit. Do not remove flexplate assembly bolts (Figure 2, Item 3).

2. Remove two mounting bolts (Figure 2, Item 2) from flexplate assembly (Figure 2, Item 1).



B230102772

Figure 2. Flexplate Bolts Removal.

3. Install two guide studs (Figure 3, Item 4) into flexplate assembly (Figure 3, Item 1).

FLEX PLATE REMOVAL AND INSTALLATION - (CONTINUED)

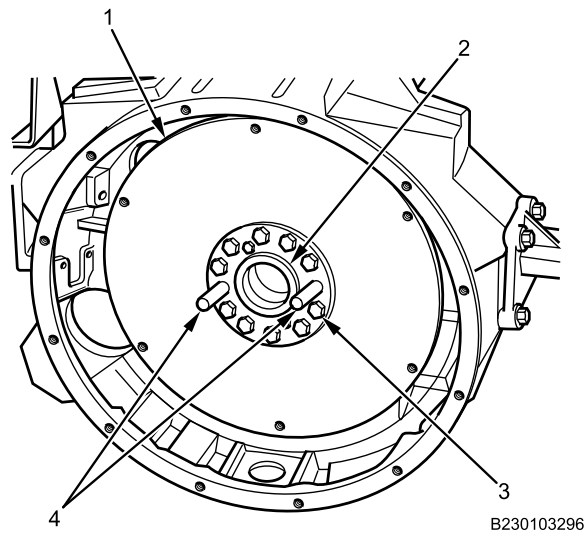


Figure 3. Guide Studs Installation.

4. Remove remaining 10 mounting bolts (Figure 3, Item 3) and flexplate assembly (Figure 3, Item 1) from crankshaft (Figure 3, Item 2).

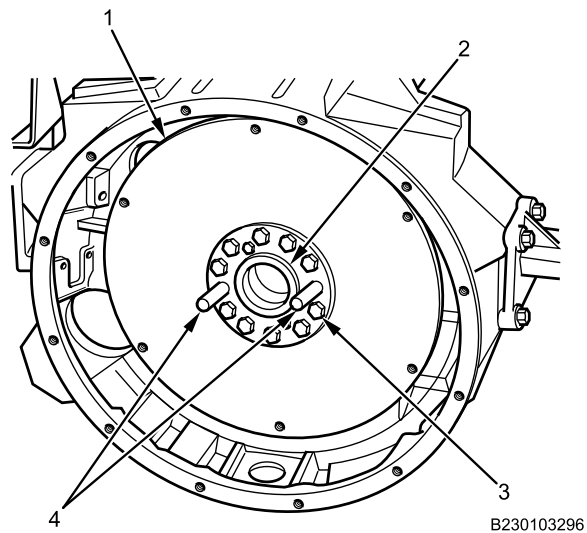
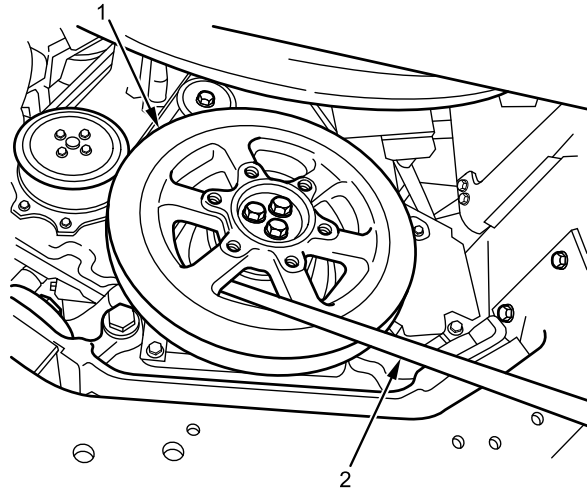
END OF TASK**INSTALLATION**

Figure 4. Flexplate Installation.

1. Install flexplate assembly (Figure 4, Item 1) on crankshaft (Figure 4, Item 2) with 10 mounting bolts (Figure 4, Item 3). Do not tighten.
2. Remove guide studs (Figure 4, Item 4) from crankshaft (Figure 4, Item 2).

FLEX PLATE REMOVAL AND INSTALLATION - (CONTINUED)

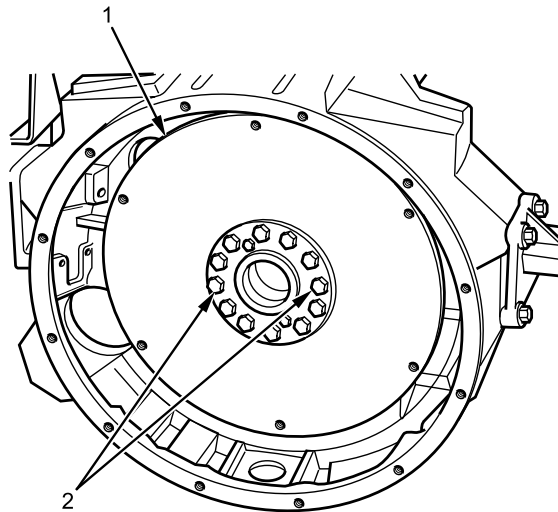
3. With assistant, hold crankshaft vibration damper (Figure 5, Item 1) with pry bar (Figure 5, Item 2) during installation of flexplate mounting bolts.



B230103297

Figure 5. Crankshaft Vibration Damper.

4. Install remaining two mounting bolts (Figure 6, Item 2) on flexplate (Figure 6, Item 1). Tighten all mounting bolts to 100 lb-ft (136 N•m).



B230102773

Figure 6. Flexplate Bolts Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install transmission assembly (WP 0454).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).

FLEX PLATE REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

STARTER RING GEAR REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 141)

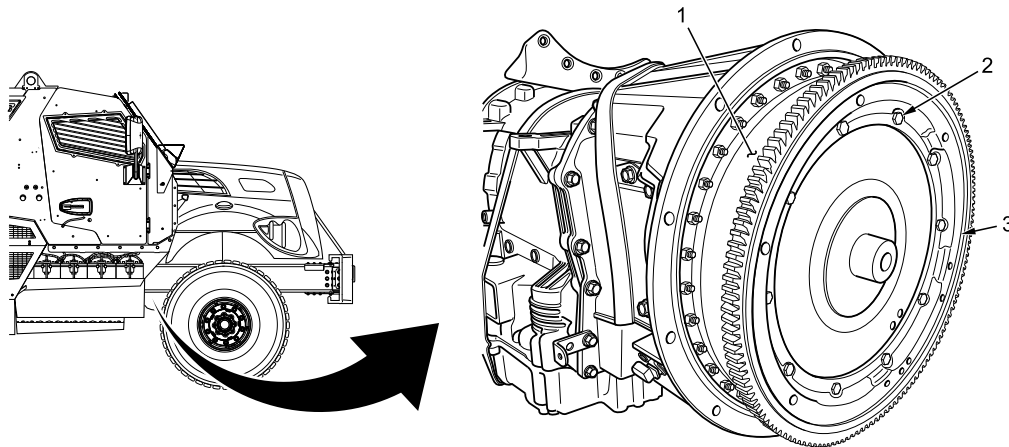
References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Transmission removed (WP 0454)

REMOVAL



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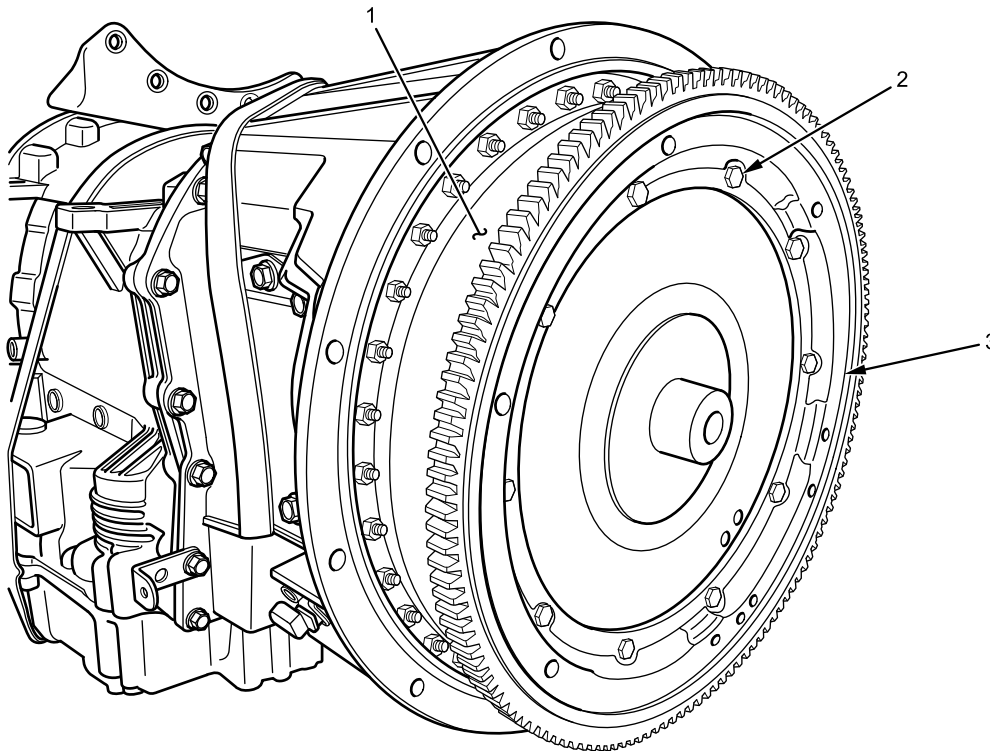
Figure 1. Starter Ring Gear.

CAUTION

When removing starter ring gear, do not pull torque converter out of transmission.

1. Remove 10 bolts (Figure 1, Item 2) from starter ring gear (Figure 1, Item 3).
2. Remove starter ring gear (Figure 1, Item 3) from torque converter (Figure 1, Item 1).

END OF TASK

STARTER RING GEAR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

B230703229

Figure 2. Starter Ring Gear.

1. Position ring gear (Figure 2, Item 3) on front of torque converter (Figure 2, Item 1) and align bolt holes in starter ring gear and torque converter.
2. Install starter ring gear (Figure 2, Item 3) on torque converter (Figure 2, Item 1) with ten bolts (Figure 2, Item 2). Tighten bolts to 21-35 lb-ft (28-47 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install transmission assembly (WP 0454).
2. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FRONT ENGINE COVER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Adapter, socket wrench, 3/8-inch drive female -
 1/2-inch male (WP 0795, Item 2)
 Wrench, torque, click, ratcheting, 3/8-inch drive,
 15-75 lb-ft (WP 0795, Item 145)
 Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
 Face shield, industrial (WP 0794, Item 16)
 Compound (WP 0794, Item 13)
 Compound (WP 0794, Item 43)
 Rag (WP 0794, Item 39)
 Lubricating oil (WP 0794, Item 22 or
 WP 0794, Item 23)
 O-ring - (2) (WP 0796, Item 67)
 Seal (WP 0796, Item 66)
 Gasket (WP 0796, Item 62)
 Gasket (WP 0796, Item 69)
 Gasket (WP 0796, Item 98)
 Gloves (WP 0794, Item 18)
 Gloves (WP 0794, Item 19)

Personnel Required

Maintainer - (2)

References

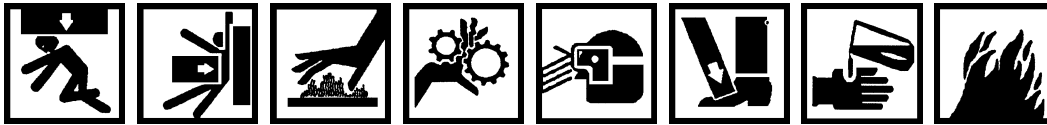
TM 9-2355-106-10
 TM 9-2355-106-23P
 WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Batteries disconnected (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)
 Alternator bracket removed (WP 0289)
 Cooling fan drive assembly removed (WP 0287)
 Camshaft position sensor removed (WP 0393)
 Engine water pump assembly removed (WP 0286)
 Front oil pump assembly removed (WP 0238)
 Serpentine belt idler pulley removed (WP 0241)
 Front motor mount removed (WP 0220)

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

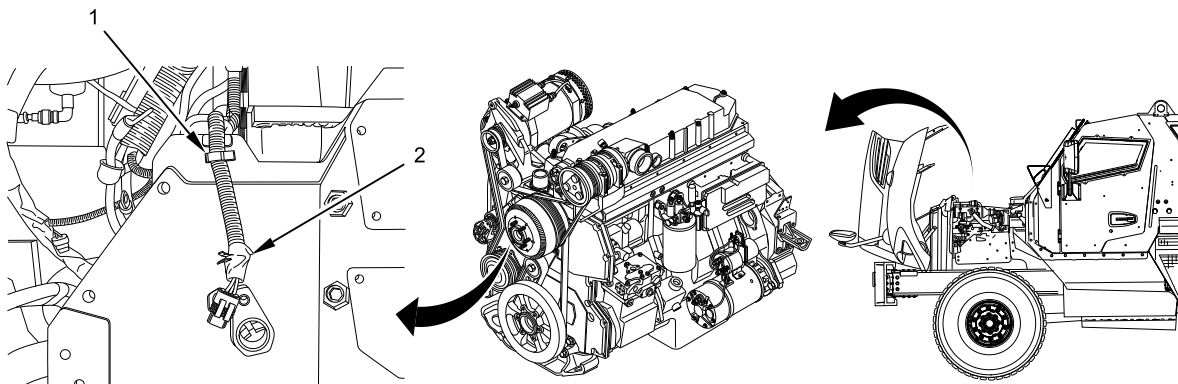
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistant or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

Engine fluids (oil, fuel, and coolant) may flammable and may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

REMOVAL

1. Remove camshaft position sensor harness (Figure 1, Item 2) from retainer (Figure 1, Item 1).



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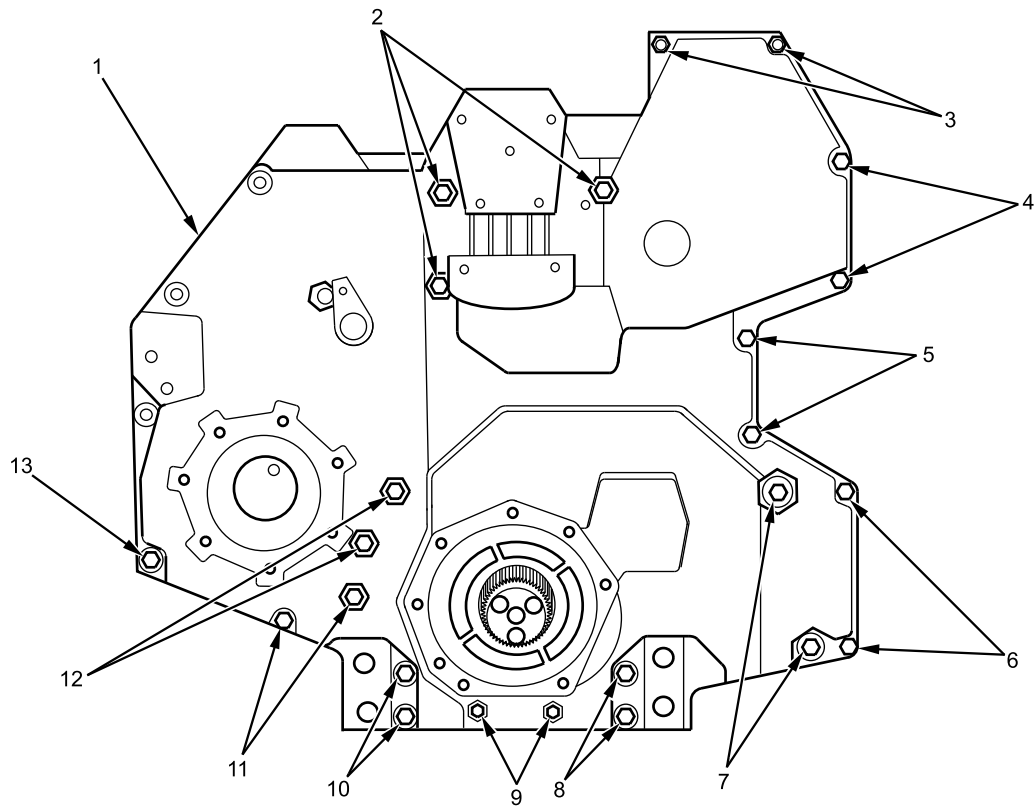
Figure 1. Camshaft Position Sensor Harness.

NOTE

Front engine cover has different lengths and types of bolts. Note the location of the different bolts to aid in installation.

2. Position drain pan under front engine cover (Figure 2, Item 1).

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)



B230102748

Figure 2. Front Engine Cover Removal.

3. Remove four nuts and two bolts (Figure 2, Item 3) from front engine cover (Figure 2, Item 1).
4. Remove six nuts and bolts (Figure 2, Item 4, 5, and 6) from front engine cover (Figure 2, Item 1).
5. Remove two air compressor bolts (Figure 2, Item 7) from front engine cover (Figure 2, Item 1).
6. With assistant, remove 14 bolts (Figure 2, Item 2, 8, 9, 10, 11, 12, and 13) and front engine cover (Figure 2, Item 1) from engine.

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove two O-rings (Figure 3, Item 1 and 3) from engine (Figure 3, Item 2) and discard.

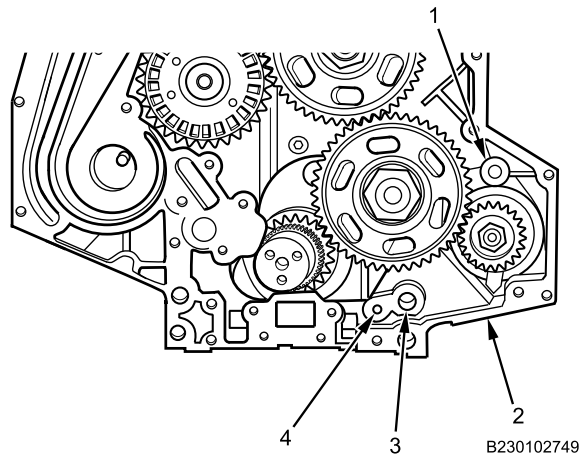


Figure 3. O-Rings and Seal Removal.

8. Remove seal (Figure 3, Item 4) from engine (Figure 3, Item 2) and discard.
 9. Remove three-piece gasket (Figure 4, Item 1) from front engine cover (Figure 4, Item 2) and discard.

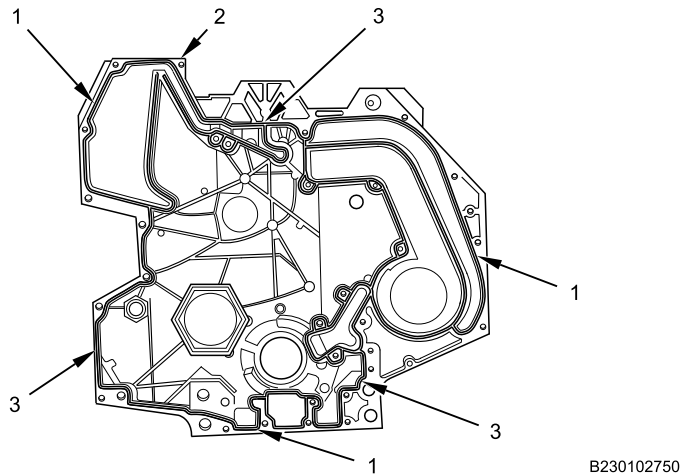
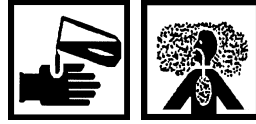


Figure 4. Gasket Removal.

10. Scrape sealing compound residue from gasket seam areas (Figure 4, Item 3) on front engine cover (Figure 4, Item 2) and engine.

END OF TASK

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Silicone gasket material emits a small amount of acid vapor. Ensure work area is well ventilated. Read and carefully follow manufacturer's instructions before use. If silicone gasket material contacts eyes, follow manufacturer's emergency procedures. Seek medical assistance as soon as possible. Failure to comply may result in serious injury to personnel.

1. Install new three-piece gasket (Figure 5, Item 1) on front engine cover (Figure 5, Item 2).

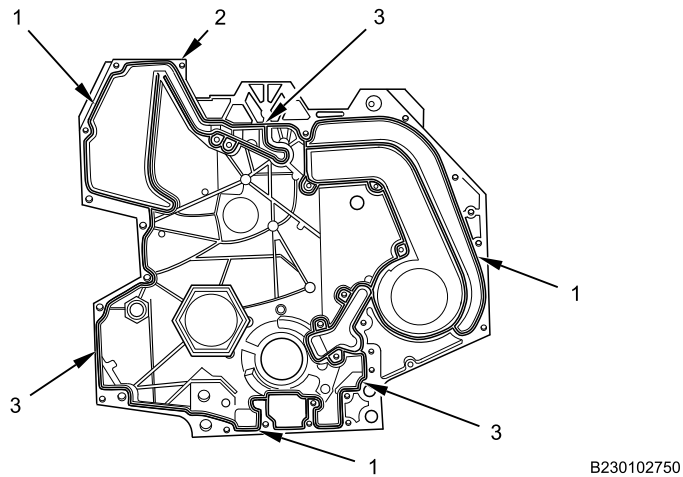


Figure 5. Gasket Installation.

2. Apply sealing compound to gasket seam areas (Figure 5, Item 3) to join together three-piece gasket (Figure 5, Item 1).

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)

3. Install two new O-rings (Figure 6, Item 1 and 3) on engine (Figure 6, Item 2).

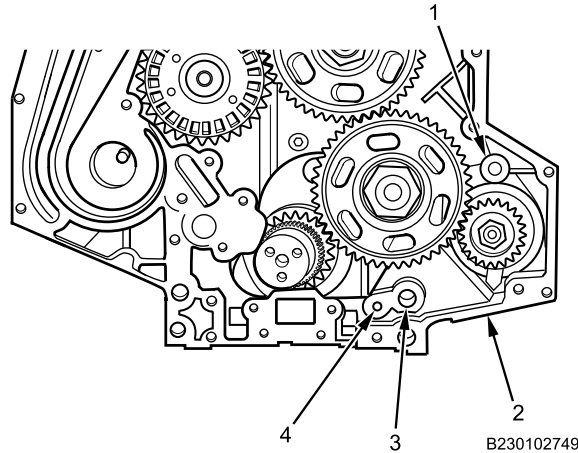


Figure 6. O-Rings and Seal Installation.

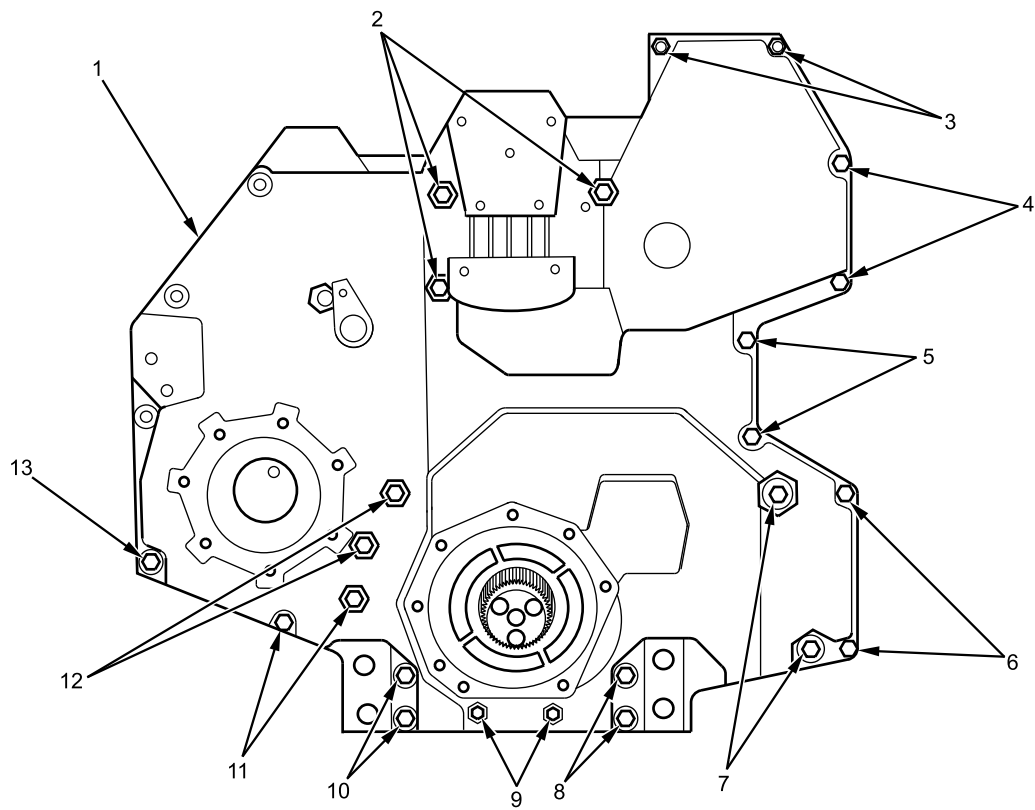
4. Install new seal (Figure 6, Item 4) on engine (Figure 6, Item 2).

WARNING

Corrosion preventive compound is toxic. Use only in well-ventilated area. Use approved respirator with dual organic vapor/mist and particulate cartridge. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

5. Apply corrosion preventive compound on all front engine cover bolt threads.

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)



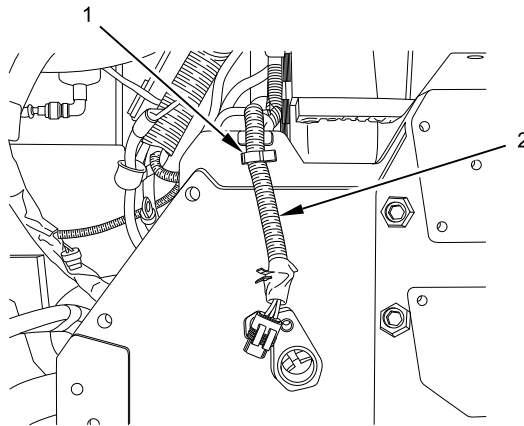
B230102748

Figure 7. Front Engine Cover Installation.

6. With assistant, install front engine cover (Figure 7, Item 1) on engine with 14 bolts (Figure 7, Item 2, 8, 9, 10, 11, 12, and 13). Do not tighten.
7. Install six bolts and nuts (Figure 7, Item 4, 5, and 6) on front engine cover (Figure 7, Item 1). Do not tighten.
8. Install two bolts (Figure 7, Item 3) and four nuts on front engine cover (Figure 7, Item 1). Torque all front engine cover bolts to 16 lb-ft (22 N•m).
9. Install two air compressor bolts (Figure 7, Item 7) on front engine cover (Figure 7, Item 1) and torque to 46 lb-ft (62 N•m).

FRONT ENGINE COVER REMOVAL AND INSTALLATION - (CONTINUED)

10. Install camshaft position sensor harness (Figure 8, Item 2) on retainer (Figure 8, Item 1).



B230103391

Figure 8. Camshaft Position Sensor Harness.

11. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install front motor mount (WP 0220).
2. Install serpentine belt idler pulley (WP 0241).
3. Install front oil pump assembly (WP 0238).
4. Install engine water pump assembly (WP 0286).
5. Install camshaft position sensor (WP 0393).
6. Install cooling fan drive assembly (WP 0287).
7. Install alternator bracket (WP 0289).
8. Connect batteries (TM 9-2355-106-10).
9. Turn MAIN POWER switch on (TM 9-2355-106-10).
10. Start engine and verify operation (TM 9-2355-106-10).
11. Check for coolant and engine oil leaks (TM 9-2355-106-10).
12. Turn engine off (TM 9-2355-106-10).
13. Turn MAIN POWER switch off (TM 9-2355-106-10).
14. Close engine hood (TM 9-2355-106-10).
15. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

VALVE COVER AND GASKET REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, dial, 300 lb-in., 3/8-inch drive
(WP 0795, Item 147)
Adapter, socket wrench drive, 1/2 inch male - 3/8
inch (WP 0795, Item 2)

TM 9-2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM-9-2355-106-10)
Transmission set in NEUTRAL (N)
(TM-9-2355-106-10)
Engine off (TM-9-2355-106-10)
MAIN POWER switch off (TM-9-2355-106-10)
Wheels chocked (TM-9-2355-106-10)
Engine hood open and secured (TM-9-2355-106-10)
Engine oil breather hose removed (WP 0231)
Charge Air Cooler (CAC) hoses removed (WP 0264)
Manifold Absolute Pressure (MAP) sensor removed
(WP 0390)
Air Conditioning (A/C) belt removed (WP 0244)

Materials/Parts

Gloves (WP 0794, Item 19)
Goggles, industrial (WP 0794, Item 18)
Degreaser (WP 0794, Item 10)
Rags (WP 0794, Item 39)
Wire tags (WP 0794, Item 49)
Gasket (WP 0796, Item 68)
O-ring (WP 0796, Item 78)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

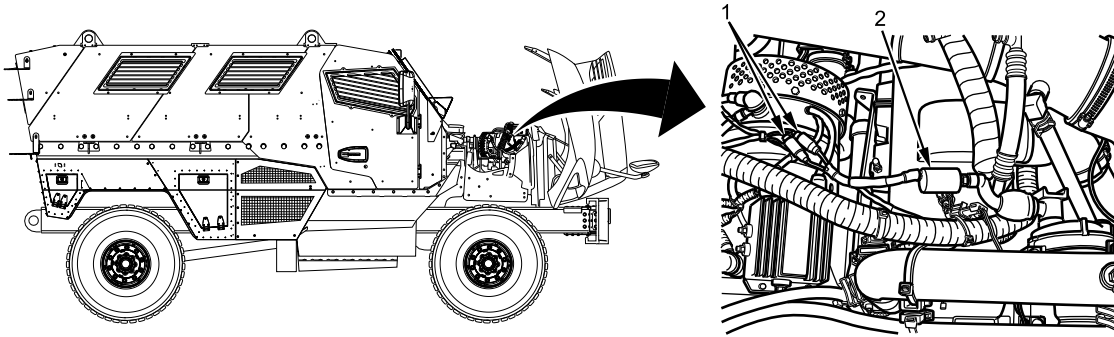
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

NOTE

Note harness routing and connector locations prior to removal to aid in installation.

VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect two connectors (Figure 1, Item 1) from A/C high-pressure switch (Figure 1, Item 2).



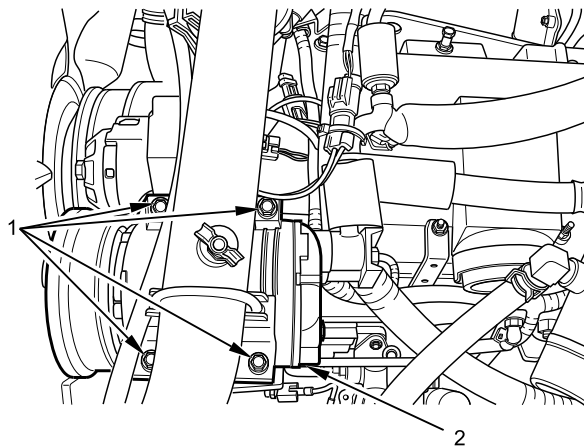
B230105124

Figure 1. A/C High-Pressure Switch Connectors.

CAUTION

A/C compressor lines are not removed. Use care while repositioning A/C compressor or damage to A/C lines may result.

2. Remove four bolts (Figure 2, Item 1) from A/C compressor (Figure 2, Item 2) and position compressor to right side of engine.



B230610422

Figure 2. A/C Compressor.

3. Remove air line (Figure 3, Item 2) from fan drive assembly (Figure 3, Item 3).

VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

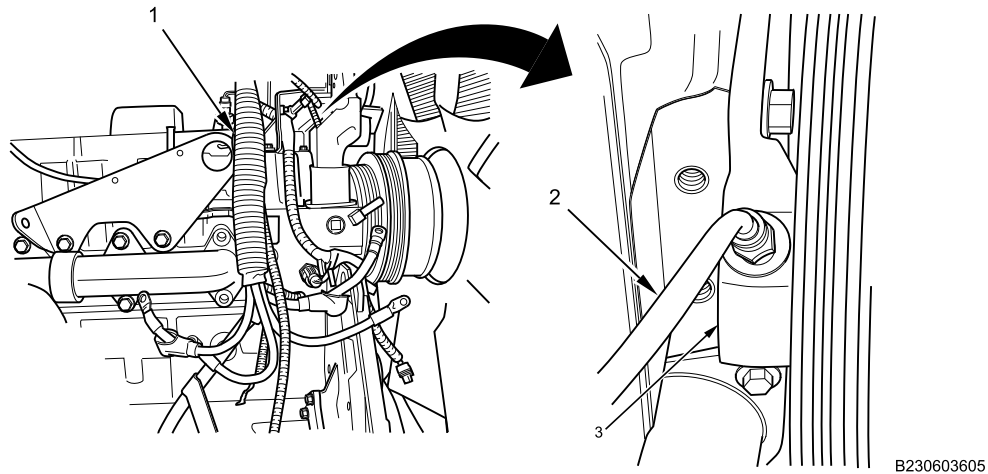


Figure 3. Engine Wiring Harness and Fan Drive Assembly Air Line. (Alternator Removed for Clarity).

4. Reposition engine wiring harness (Figure 3, Item 1) to left side of engine.

NOTE

Note harness bracket and valve cover stud bolt locations prior to removal to aid in installation.

5. Remove two nuts (Figure 4, Item 4) and two harness brackets (Figure 4, Item 3) from valve cover (Figure 4, Item 1). Position harness brackets aside.

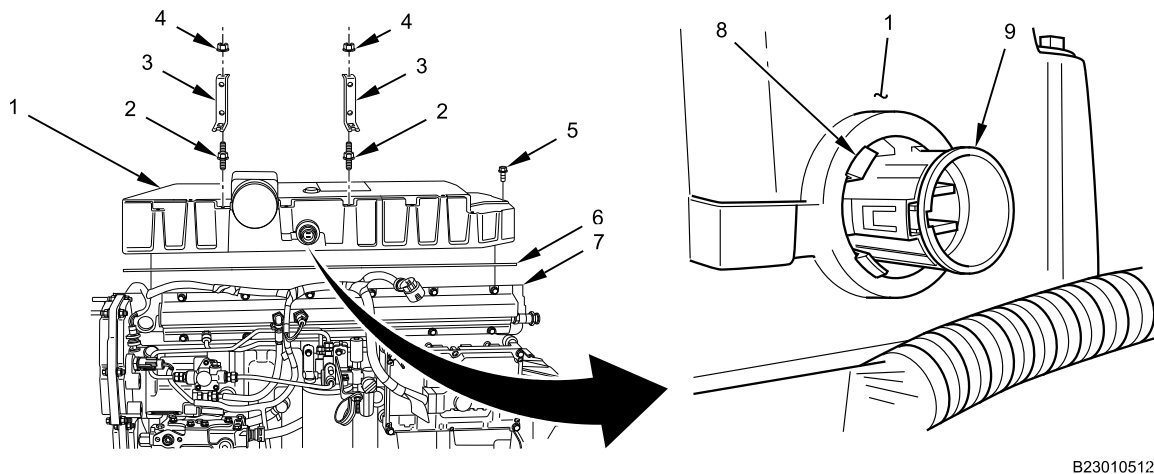


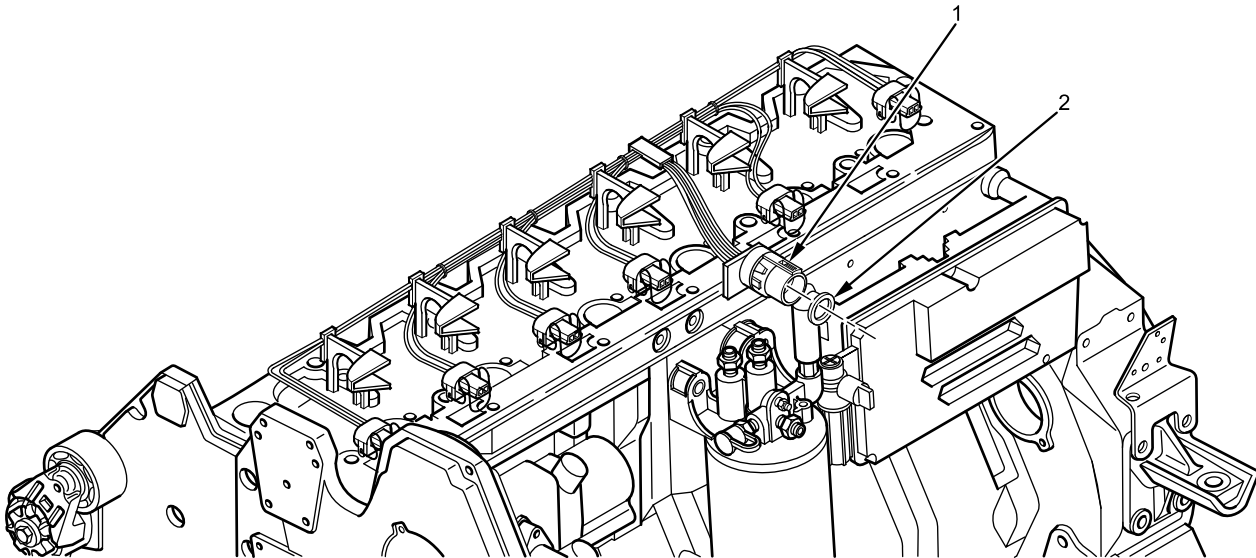
Figure 4. Engine Valve Cover.

6. Remove 7 bolts (Figure 4, Item 5) and 6 stud bolts (Figure 4, Item 2) from valve cover (Figure 4, Item 1).
7. Raise valve cover (Figure 4, Item 1) from cylinder head (Figure 4, Item 7).
8. Pinch injector harness connector tabs (Figure 4, Item 8) together and push injector harness connector (Figure 4, Item 9) through valve cover (Figure 4, Item 1).
9. Remove valve cover (Figure 4, Item 1) and gasket (Figure 4, Item 6) from cylinder head (Figure 4, Item 7). Discard gasket.

VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Wear goggles and protective clothing. Keep away from open flame and use in well-ventilated area. If adhesive, solvent, or sealing compound get on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury or death to personnel.

10. Clean cylinder head and valve cover mating surfaces with degreaser.
11. Remove O-ring (Figure 5, Item 2) from injector harness connector (Figure 5, Item 1). Discard O-ring.



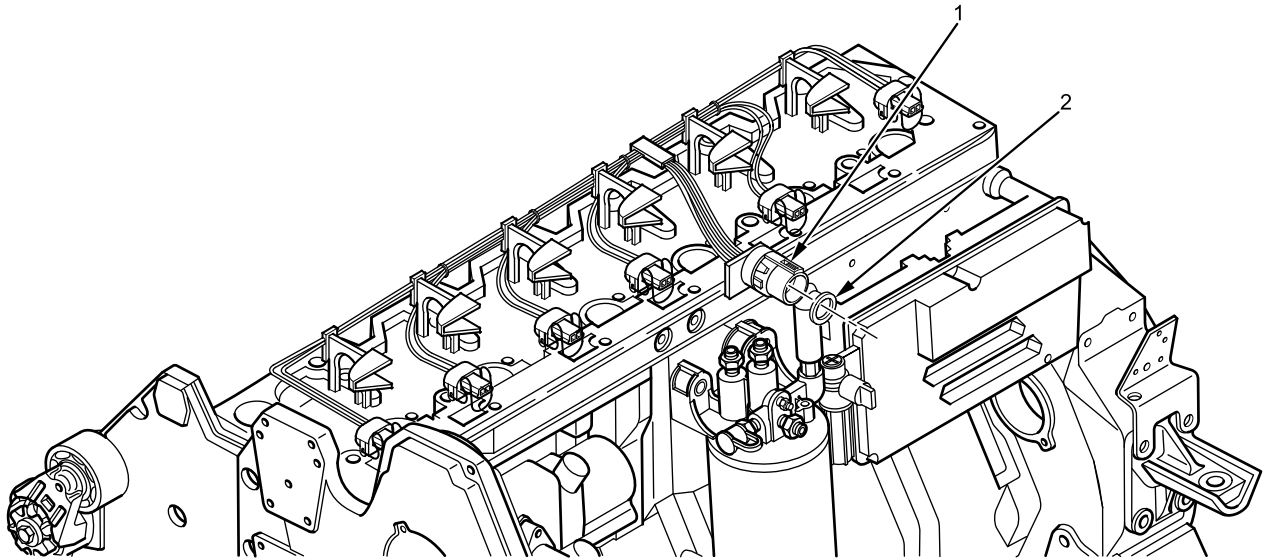
B230610423

Figure 5. Injector Harness Connector.

END OF TASK**INSTALLATION**

1. Position new O-ring (Figure 6, Item 2) on injector harness connector (Figure 6, Item 1).

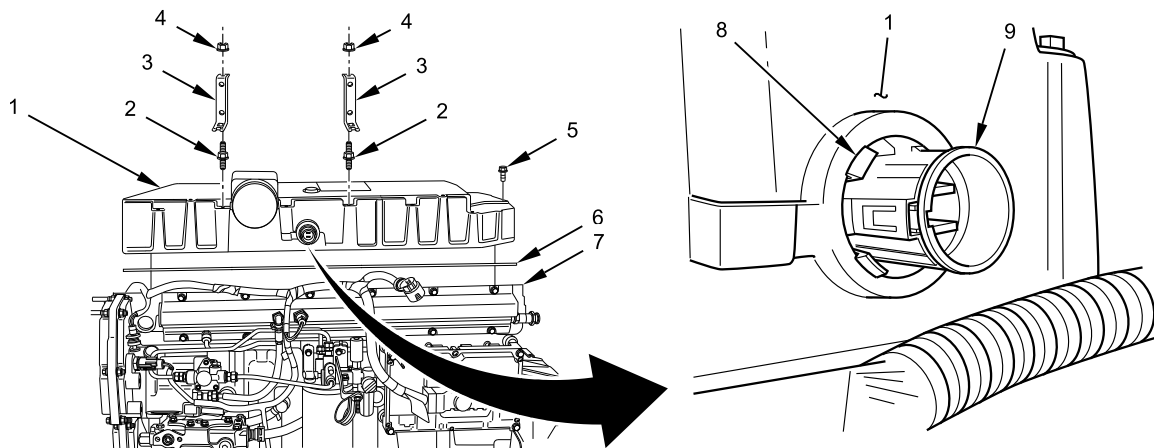
VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)



B230610423

Figure 6. Injector Harness Connector.

2. Align new gasket (Figure 7, Item 6) on cylinder head (Figure 7, Item 7).

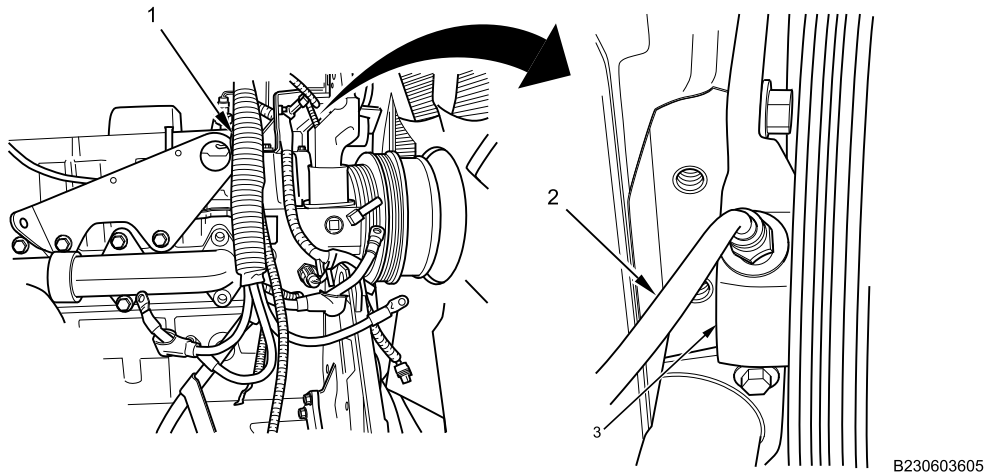


B230105125

Figure 7. Engine Valve Cover.

3. Install injector harness connector (Figure 7, Item 9) with O-ring on valve cover (Figure 7, Item 1) until connector retaining tabs (Figure 7, Item 8) are secured into position.
4. Install valve cover (Figure 7, Item 1) on cylinder head (Figure 7, Item 7) with 7 bolts (Figure 7, Item 5) and 6 stud bolts (Figure 7, Item 2) as noted in removal. Torque bolts and stud bolts to 156 lb-in (17 N•m).
5. Install two harness brackets (Figure 7, Item 3) on stud bolts (Figure 7, Item 2) with nuts (Figure 7, Item 4) as noted in removal. Torque nuts to 156 lb-in (17 N•m).
6. Install air line (Figure 8, Item 2) on fan drive assembly (Figure 8, Item 3). Tighten air line securely.

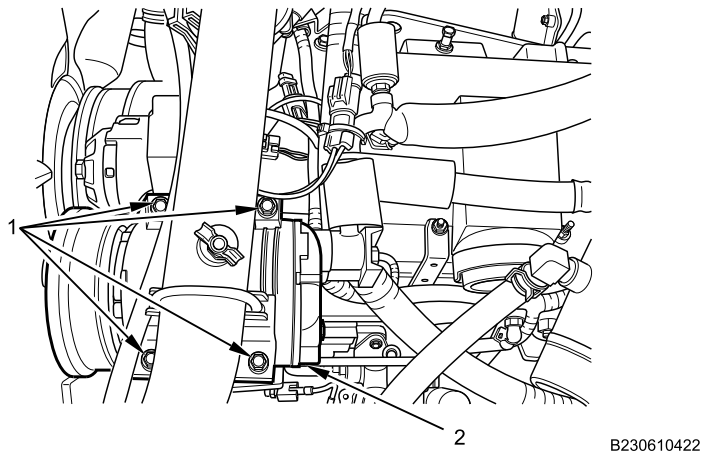
VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)



B230603605

Figure 8. Engine Wiring Harness and Fan Drive Assembly Air Line. (Alternator Removed for Clarity).

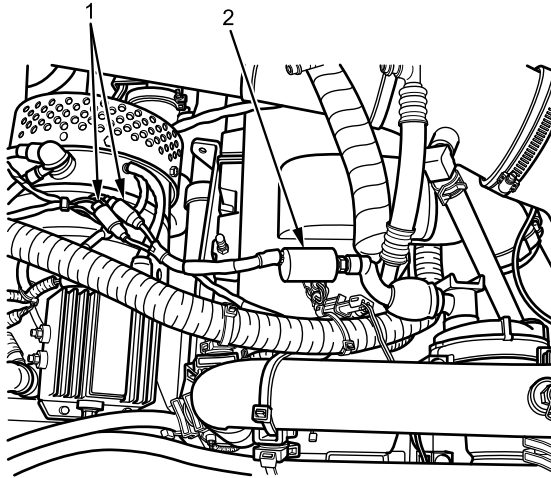
7. Install A/C compressor (Figure 9, Item 2) on bracket with four bolts (Figure 9, Item 1). Tighten bolts securely.



B230610422

Figure 9. A/C Compressor.

8. Connect two connectors (Figure 10, Item 1) on A/C high-pressure switch (Figure 10, Item 2).

VALVE COVER AND GASKET REMOVAL AND INSTALLATION - (CONTINUED)

B235203603

Figure 10. A/C High-Pressure Switch Connectors.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install A/C belt (WP 0244).
2. Install MAP sensor (WP 0390).
3. Install CAC hoses (WP 0264).
4. Install engine oil breather hose (WP 0231).
5. Turn MAIN POWER switch on (TM-9-2355-106-10).
6. Start engine and verify proper operation (TM-9-2355-106-10).
7. Turn engine off (TM-9-2355-106-10).
8. Turn MAIN POWER switch off (TM-9-2355-106-10).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM-9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE VALVE ADJUSTMENT

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 40-200 lb-in., 3/8-inch drive
(WP 0795, Item 142)

Materials/Parts

Gloves (WP 0794, Item 19)
Goggles, industrial (WP 0794, Item 20)

References

TM 9-2355-106-10

TM 2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Valve cover and gasket removed (WP 0228)

VALVE ADJUSTMENT PROCEDURE**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

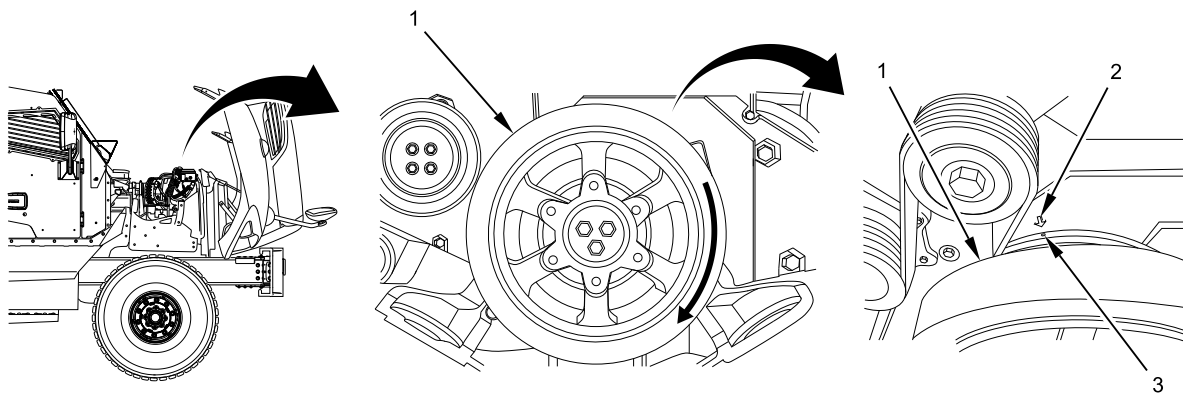
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ENGINE VALVE ADJUSTMENT - (CONTINUED)

NOTE

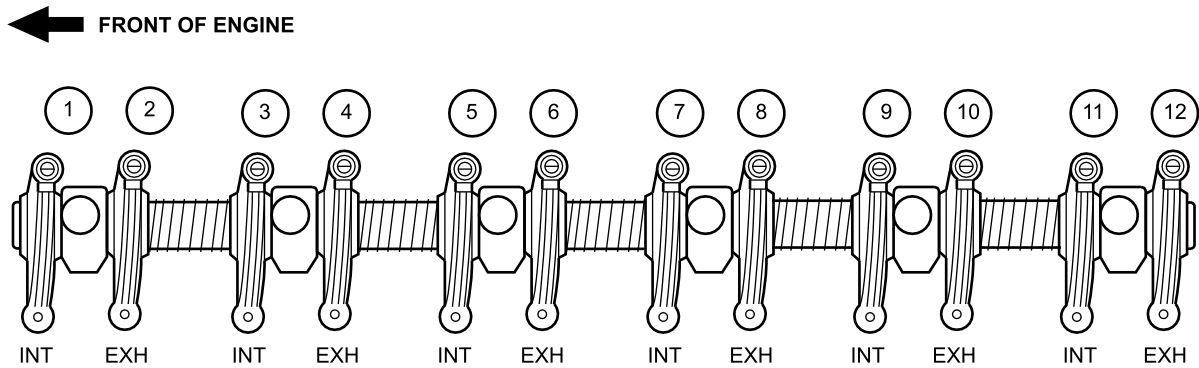
Piston number one is located at front of engine.

1. Position piston number one at TDC in compression stroke, using the following steps:
 - a. Rotate engine crankshaft damper (Figure 1, Item 1) clockwise while watching for upward movement in rocker arm #1 (Figure 2, Item 1).
 - b. Continue turning crankshaft damper (Figure 1, Item 1) until rocker arm #1 (Figure 2, Item 1) upward movement stops.
 - c. Continue turning engine crankshaft damper (Figure 1, Item 1) to align crankshaft damper notch (Figure 1, Item 3) with front cover timing mark (Figure 1, Item 2).



B230104975

Figure 1. Crankshaft Timing Marks.



B230103732

Figure 2. Engine Valve Sequence.

ENGINE VALVE ADJUSTMENT - (CONTINUED)

2. With piston number one at TDC, adjust clearance for valves 1, 2, 3, 6, 7, and 10 as follows:
 - a. Loosen locknut (Figure 3, Item 4) and adjusting screw (Figure 3, Item 3) two full turns.
 - b. Insert 0.025-inch (0.64-mm) feeler gauge between rocker arm (Figure 3, Item 1) and valve stem tip (Figure 3, Item 2).
 - c. Turn adjusting screw (Figure 3, Item 3) until there is light drag on feeler gauge.
 - d. Tighten locknut (Figure 3, Item 4) while holding adjusting screw (Figure 3, Item 3) until resistance is felt on locknut.
 - e. Torque locknut (Figure 3, Item 4) to 144 in-lb. (16 N•m).
 - f. Using 0.025-inch (0.64-mm) feeler gauge, check clearance between rocker arm (Figure 3, Item 1) and valve stem tip (Figure 3, Item 2).
 - g. Repeat steps a through f if clearance between rocker arm and valve stem tip is not correct.

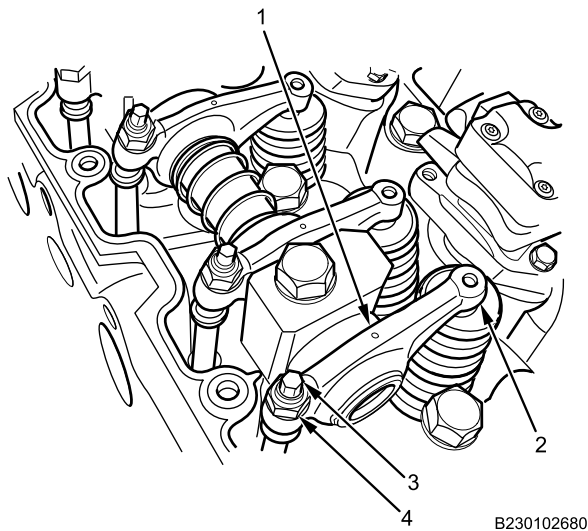


Figure 3. Engine Valve Adjustment.

ENGINE VALVE ADJUSTMENT - (CONTINUED)

NOTE

Piston number six is located at rear of engine.

3. Position piston number six at TDC in the compression stroke using the following steps:
 - a. Rotate engine crankshaft damper (Figure 4, Item 1) clockwise while watching for upward movement in rocker arm #11 (Figure 2, Item 11).
 - b. Continue turning crankshaft damper (Figure 4, Item 1) until rocker arm #11 (Figure 2, Item 11) upward movement stops.
 - c. Continue turning engine crankshaft damper (Figure 4, Item 1) to align crankshaft damper notch (Figure 4, Item 3) with front cover timing mark (Figure 4, Item 2).

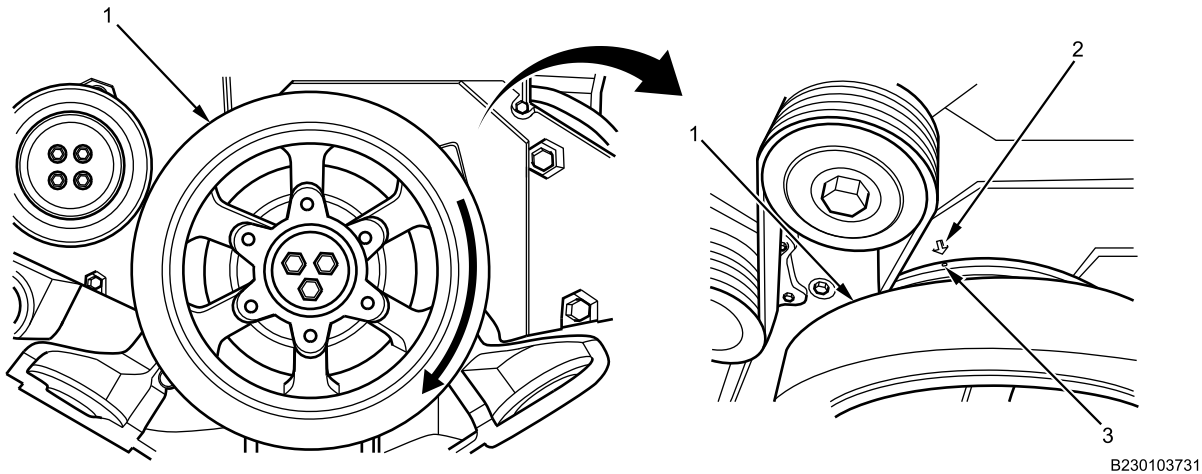


Figure 4. Crankshaft Timing Marks.

4. With piston number six at TDC, adjust clearance for valves 4, 5, 8, 9, 11, and 12 as follows:
 - a. Loosen locknut (Figure 5, Item 4) and adjusting screw (Figure 5, Item 3) two full turns.
 - b. Insert 0.025-inch (0.64-mm) feeler gauge between rocker arm (Figure 5, Item 1) and valve stem tip (Figure 5, Item 2).
 - c. Turn adjusting screw (Figure 5, Item 3) until there is light drag on feeler gauge.
 - d. Tighten locknut (Figure 5, Item 4) while holding adjusting screw (Figure 5, Item 3) until resistance is felt on locknut.
 - e. Torque locknut (Figure 5, Item 4) to 144 in-lb. (16 N•m).
 - f. Using 0.025-inch (0.64-mm) feeler gauge, check clearance between rocker arm (Figure 5, Item 1) and valve stem tip (Figure 5, Item 2).
 - g. Repeat steps a through f if clearance between rocker arm and valve stem tip is not correct.

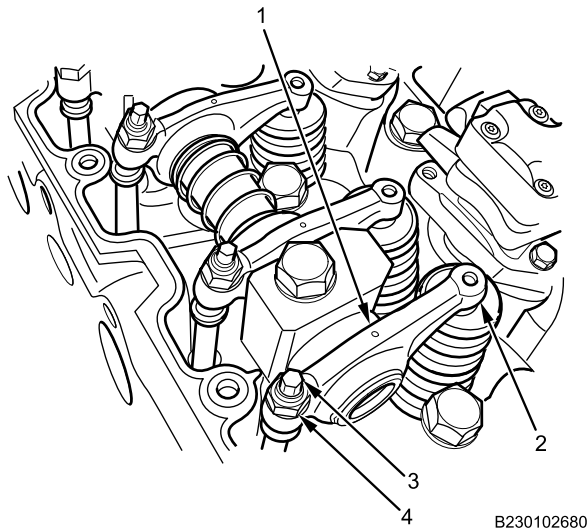
ENGINE VALVE ADJUSTMENT - (CONTINUED)

Figure 5. Engine Valve Adjustment.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install valve cover and gasket (WP 0228).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Close engine hood (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**OIL GAUGE TUBE REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Cable lock strap - (4) (WP 0796, Item 124)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM 9-2355-106-10)
Belly armor removed (WP 0606)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

OIL GAUGE TUBE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove oil level gauge (Figure 1, Item 1) from engine oil gauge tube (Figure 1, Item 2).

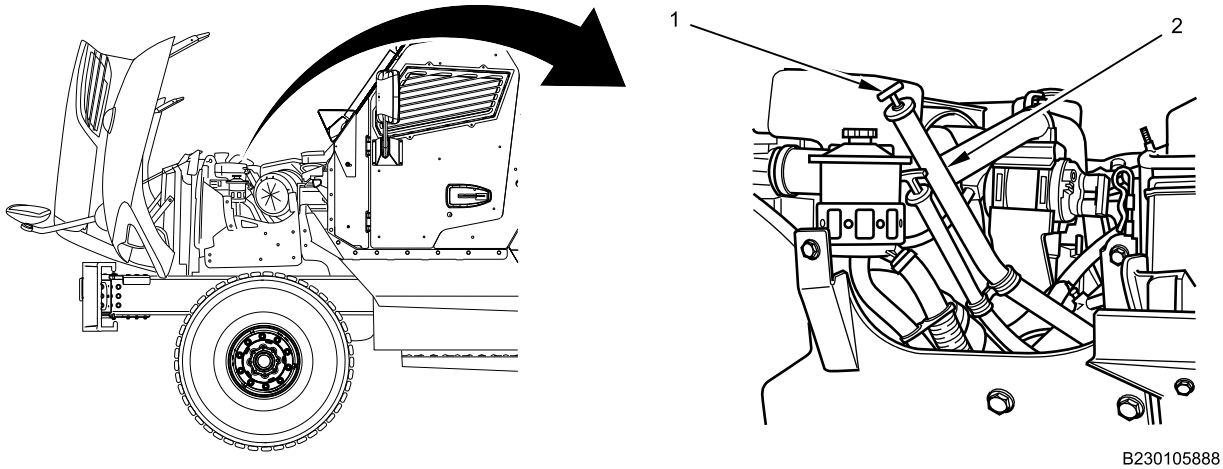


Figure 1. Engine Oil Level Gauge.

2. Remove bolt (Figure 2, Item 4) from retainers (Figure 2, Item 2 and 3), and separate transmission dipstick tube (Figure 2, Item 5) and engine oil gauge tube (Figure 2, Item 1).

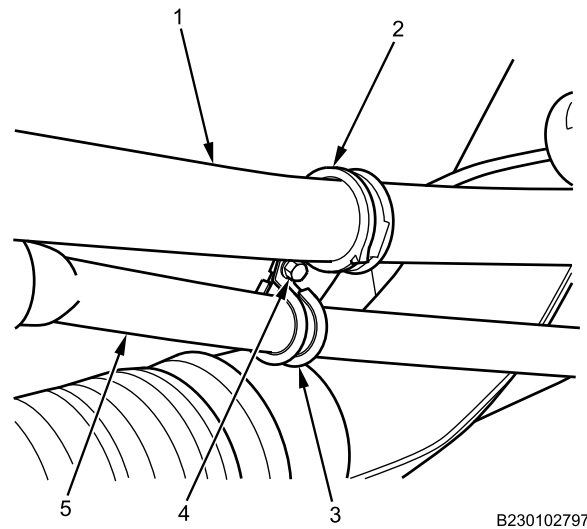


Figure 2. Oil Gauge Tube and Transmission Dipstick Retainer.

3. Cut cable lock straps (Figure 3, Item 1, 2, and 7) securing harness to oil gauge tube (Figure 3, Item 6). Discard cable lock straps (Figure 3, Item 1, 2, and 7).

OIL GAUGE TUBE REMOVAL AND INSTALLATION - (CONTINUED)

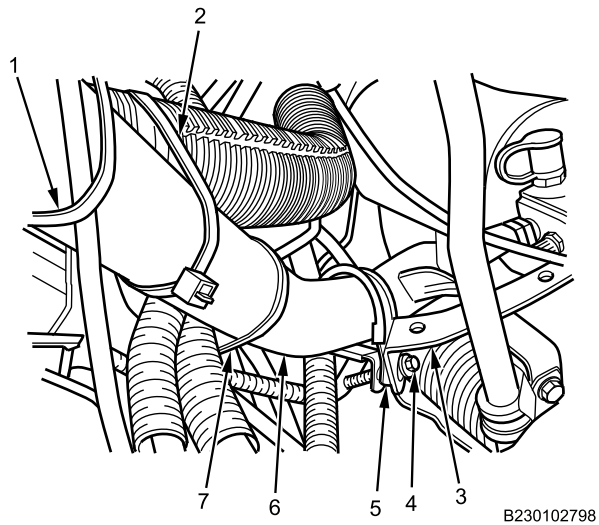


Figure 3. Center Retainer.

4. Remove bolt (Figure 3, Item 4) securing retainer (Figure 3, Item 5) to bracket (Figure 3, Item 3).
5. Cut and discard cable lock strap (Figure 4, Item 2).

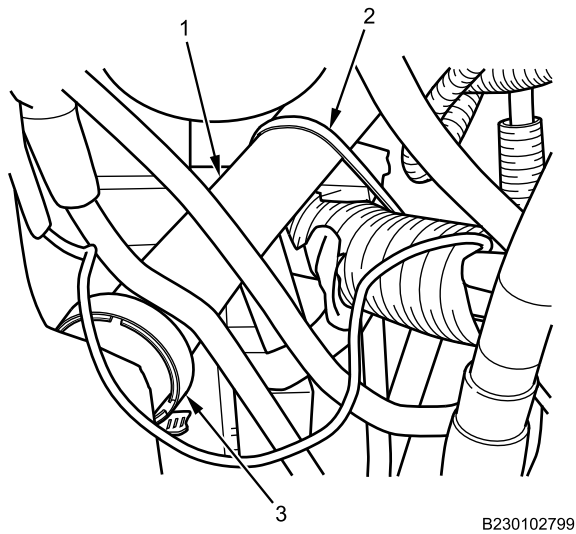


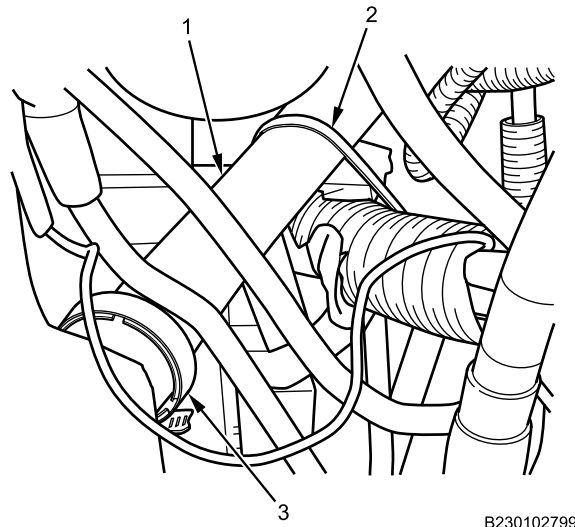
Figure 4. Lower Retainer.

6. Loosen clamp (Figure 4, Item 3) and pull oil gauge tube (Figure 4, Item 1) and seal out of engine block.

END OF TASK

OIL GAUGE TUBE REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

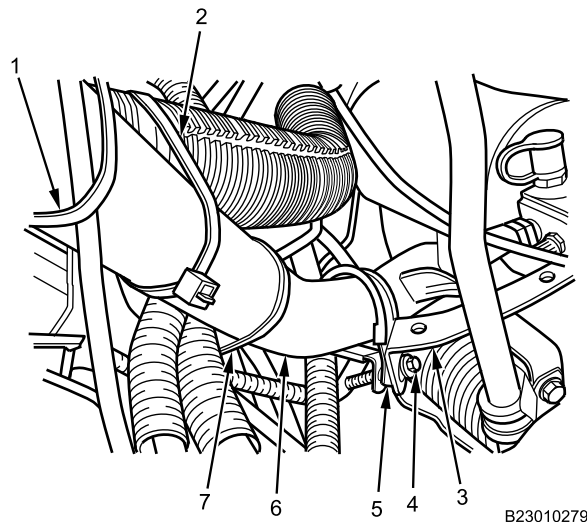
1. Install oil gauge tube seal onto oil gauge tube (Figure 5, Item 1).



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Figure 5. Lower Retainer.

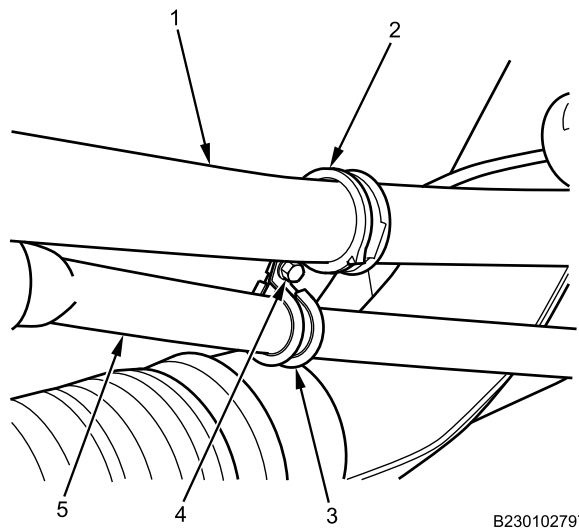
2. Push oil gauge tube (Figure 5, Item 1) into engine block.
3. Tighten clamp (Figure 5, Item 3) securely.
4. Install new cable lock strap (Figure 5, Item 2) securing harness to oil gauge tube (Figure 5, Item 1).
5. Position retainer (Figure 6, Item 5) on bracket (Figure 6, Item 3).



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Figure 6. Center Retainer.

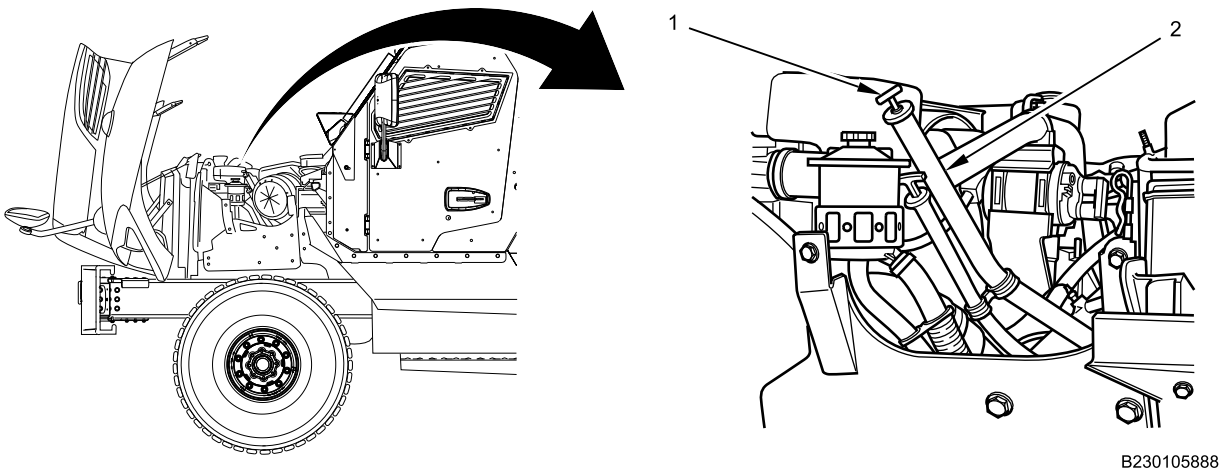
6. Install bolt (Figure 6, Item 4) securing retainer (Figure 6, Item 5) to bracket (Figure 6, Item 3).
7. Install new cable lock straps (Figure 6, Item 1, 2, and 7) securing harness to oil gauge tube (Figure 6, Item 6).
8. Position transmission dipstick tube (Figure 7, Item 5) and oil gauge tube (Figure 7, Item 1) next to each other and align retainers (Figure 7, Item 2 and 3). Insert bolt (Figure 7, Item 4) and tighten securely.

OIL GAUGE TUBE REMOVAL AND INSTALLATION - (CONTINUED)

B230102797

Figure 7. Oil Gauge Tube and Transmission Dipstick Retainer.

9. Install oil level gauge (Figure 8, Item 1) into oil gauge tube (Figure 8, Item 2).



B230105888

Figure 8. Engine Oil Level Gauge.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install belly armor (WP 0606).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL BREATHER TUBE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (WP 0795, Item 37)

Materials/Parts

O-ring (WP 0796, Item 99)

Lubricating oil, engine (WP 0794, Item 27)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood opened and secured (TM 9-2355-106-10)

Right engine armor plate removed (WP 0599)

Right engine armor plate bracket removed (WP 0600)

Turbocharger intake tube removed (WP 0256)

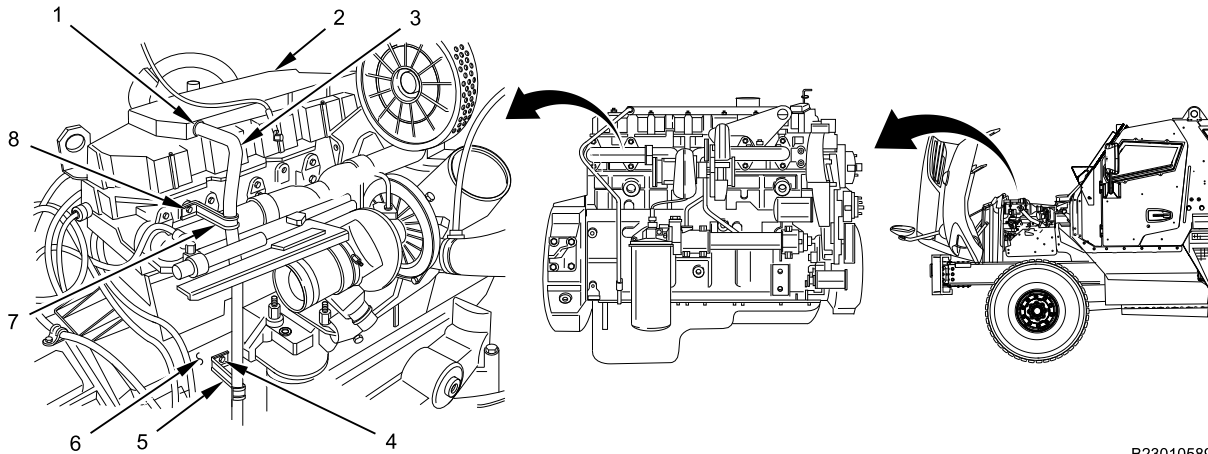
WARNING


Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

ENGINE OIL BREATHER TUBE REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove two screws (Figure 1, Item 4 and 8) from two mounting brackets (Figure 1, Item 5 and 7) securing breather tube to engine (Figure 1, Item 6).



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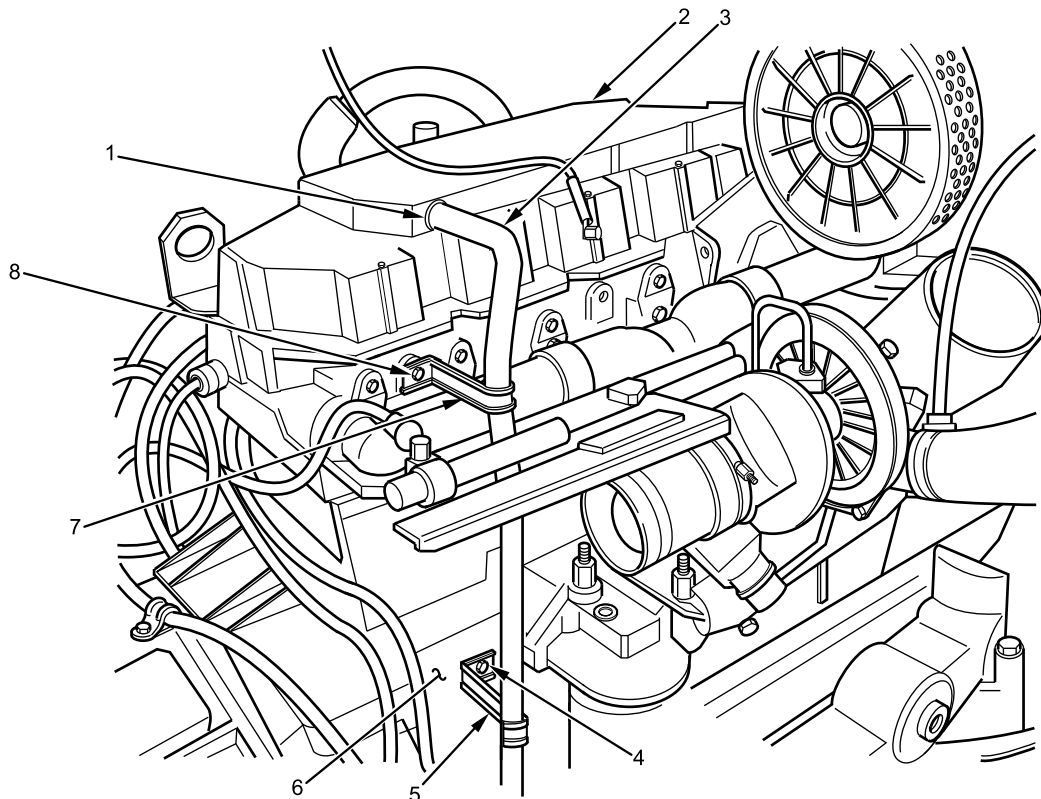
Figure 1. Engine Oil Breather Tube.

2. Pull engine oil breather tube (Figure 1, Item 3) and O-ring (Figure 1, Item 1) from engine rocker cover (Figure 1, Item 2). Discard oil breather tube O-ring.

END OF TASK**INSTALLATION****NOTE**

Coat O-ring with engine oil prior to installation.

1. Position new O-ring (Figure 2, Item 1) on top of engine oil breather tube (Figure 2, Item 3).
2. Push top end of engine oil breather tube (Figure 2, Item 3) into engine rocker cover (Figure 2, Item 2).
3. Position upper and lower mounting brackets (Figure 2, Item 5 and 7) on engine block (Figure 2, Item 6) and secure with two screws (Figure 2, Item 4 and 8).

ENGINE OIL BREATHER TUBE REMOVAL AND INSTALLATION - (CONTINUED)

B230100011

Figure 2. Engine Oil Breather Tube.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install turbocharger intake tube (WP 0256).
2. Check engine oil; add as needed (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine and check for leaks (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Check engine oil; add as needed (TM 9-2355-106-10).
7. Install right engine armor plate bracket (WP 0600).
8. Install right engine armor plate (WP 0599).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL FILTER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Filter strap wrench (WP 0795, Item 139)
Pan, drain, 5-gal. capacity (WP 0795, Item 107)
Funnel, flexible spout, 1 qt. capacity (WP 0795, Item 35)

Materials/Parts

Rags (WP 0794, Item 39)
Oil filter (WP 0796, Item 161)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Belly armor removed (WP 0606)
Front prop shaft removed (WP 0468)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Oil filter will contain oil when removed from engine header. Use extreme care when lowering from engine. Prior to starting engine, clean oil spills from belly armor. Spilled engine oil may ignite, causing damage to equipment and serious injury or death to personnel.

ENGINE OIL FILTER REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Position drain pan or rags under oil filter prior to removal.

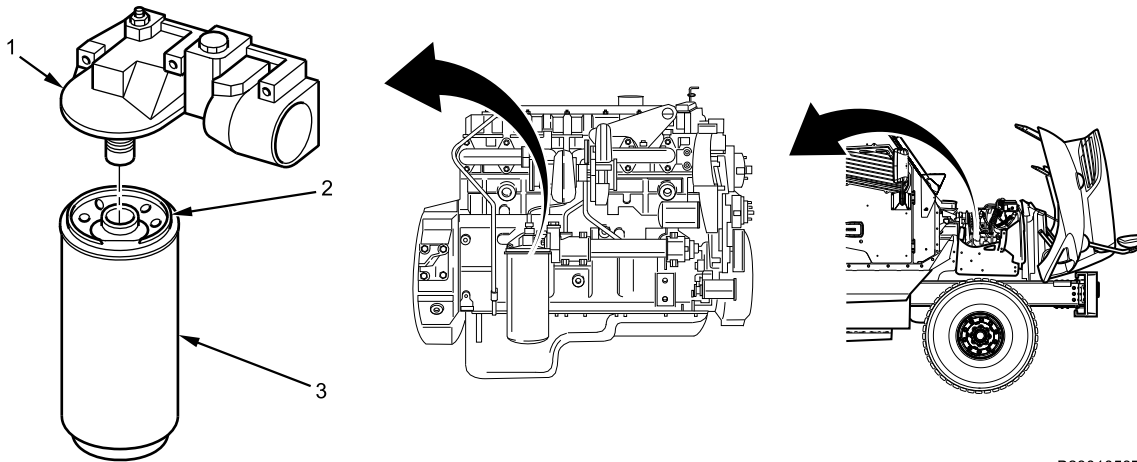


Figure 1. Engine Oil Filter.

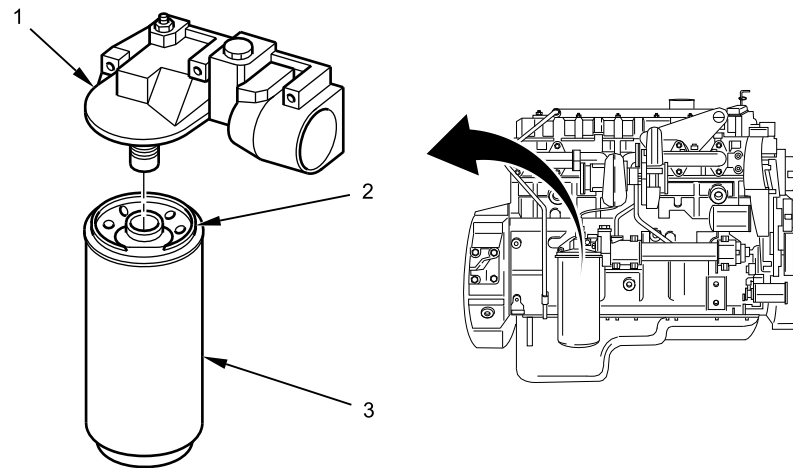
1. Remove and discard oil filter (Figure 1, Item 3) from oil filter header (Figure 1, Item 1). Make sure all oil filter gasket material (Figure 1, Item 2) is removed from engine oil header.

END OF TASK**INSTALLATION****CAUTION**

Do not overtighten oil filter, or damage will result.

NOTE

Coat oil filter gasket with engine oil prior to installation.

ENGINE OIL FILTER REMOVAL AND INSTALLATION - (CONTINUED)

B100000199

Figure 2. Engine Oil Filter.

1. Attach new oil filter (Figure 2, Item 3) to oil filter header (Figure 2, Item 1).
2. Spin oil filter (Figure 2, Item 3) onto header (Figure 2, Item 1) until oil filter gasket (Figure 2, Item 2) contacts header. Using an oil filter wrench, tighten filter an additional $\frac{3}{4}$ turn.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and run to operating temperature (TM 9-2355-106-10).
3. Check engine for leaks (TM 9-2355-106-10).
4. Check oil level; add as needed (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Install belly armor (WP 0606).
8. Install front prop shaft (WP 0468)
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ENGINE OIL DRAIN/FILL PROCEDURE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Belly armor removed WP 0606

Materials/Parts

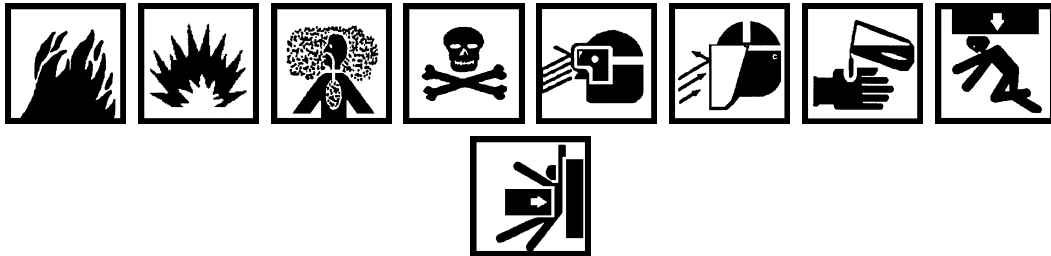
Rags (WP 0794, Item 39)
Lubricating oil (WP 0794, Item 27)
Gasket (WP 0796, Item 86)

References

TM 9-2355-106-10

REMOVAL

WARNING



Follow all standard operating procedures for use, storage, and disposal of hazardous materials. Failure to comply may result in injury to personnel and damage to the environment.

Accidental or intentional introduction of liquid contaminants into the environment is a violation of state, federal, and military regulations. Store, install, and dispose of containers in accordance with standard operating procedures. Refer to Army Petroleum, Oil, and Lubricants (POL) (para. 1-8) for information concerning storage, use, and disposal of liquid contaminants. Failure to comply may result in damage to environment and serious injury or death to personnel.

Clean spilled oil prior to starting vehicle. Spilled engine oil may ignite, causing damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ENGINE OIL DRAIN/FILL PROCEDURE - (CONTINUED)

1. Position drain pan on floor under oil pan (Figure 1, Item 1).

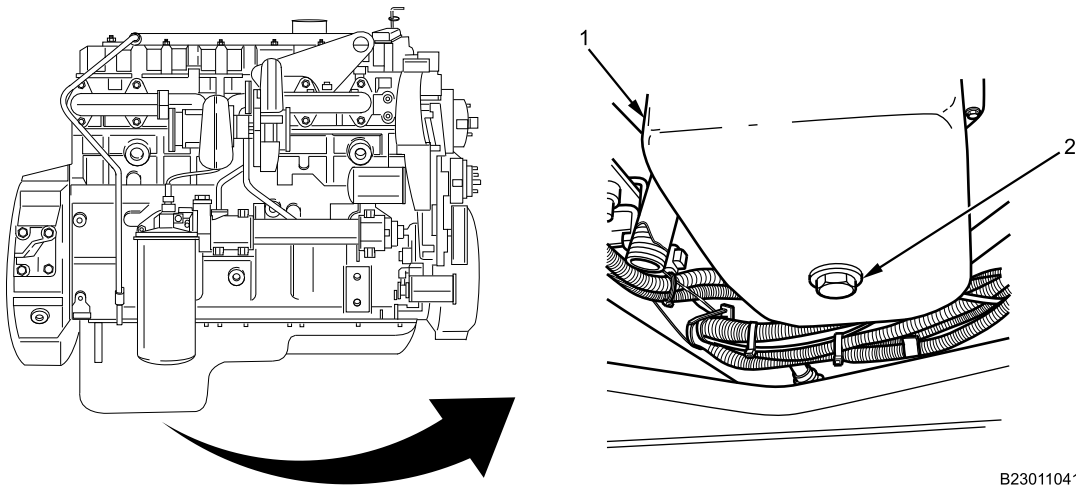


Figure 1. Engine Oil Drain Plug.

2. Remove oil drain plug and drain plug gasket (Figure 1, Item 2) from oil pan (Figure 1, Item 1). Discard drain plug gasket.

END OF TASK**INSTALLATION****CAUTION**

Do not fill engine oil level above operating range located on dipstick. Failure to comply may result in damage to engine.

1. Install drain plug and new drain plug gasket (Figure 1, Item 2) into oil pan (Figure 1, Item 1). Torque drain plug to 50 lb-ft (68 N•m).
2. Remove engine oil dipstick (Figure 2, Item 1) from engine oil fill tube (Figure 2, Item 2).

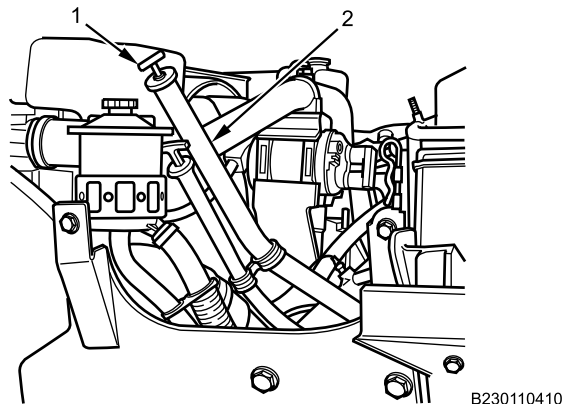
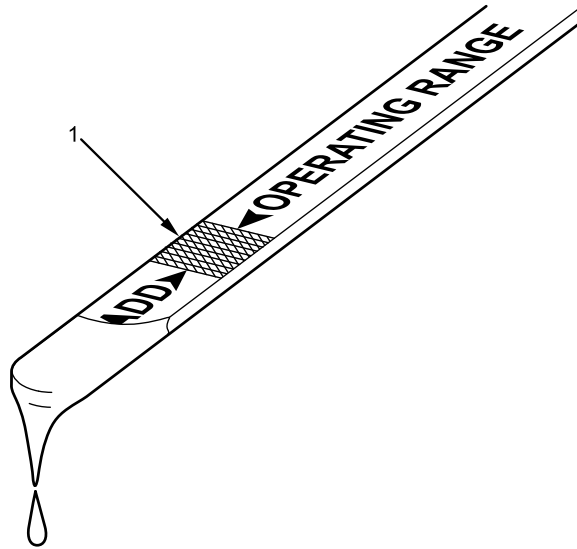


Figure 2. Engine Oil Dipstick.

3. Add oil through engine oil fill tube (Figure 2, Item 2). Refer to (WP 0783) for capacity.
4. Insert dipstick (Figure 2, Item 1) into oil fill tube (Figure 2, Item 2) and secure into position.

ENGINE OIL DRAIN/FILL PROCEDURE - (CONTINUED)

5. Remove engine oil dipstick (Figure 2, Item 1) from engine oil fill tube (Figure 2, Item 2). Inspect oil level on dipstick. Oil level should be within operating range (Figure 3, Item 1) shown on dipstick.



B230100008

Figure 3. Dipstick Parameters.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and run for 5 minutes (TM 9-2355-106-10).
3. Turn engine off (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Check oil level; add if necessary (TM 9-2355-106-10).
6. Install belly armor (WP 0606).
7. Close engine hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL COOLER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Hammer, hand, soft face, dead blow, 10 oz
(WP 0795, Item 44)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
drive (WP 0795, Item 145)
Crowfoot attachment, flare nut, 3/8-inch drive, 10mm
(WP 0795, Item 30)
Socket, regular, 3/8-inch drive, 6 pt, 10mm
(WP 0795, Item 56)
Adapter, socket, wrench drive, 3/8-inch female -
1/2-inch male (WP 0795, Item 2)

Materials/Parts

Sealing compound (WP 0794, Item 44)
Faceshield, industrial (WP 0794, Item 16)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)
Rags (WP 0794, Item 39)
Lubricant (WP 0794, Item 32)
Cleaner (WP 0794, Item 9)
O-ring - (4) (WP 0796, Item 71)
O-ring - (2) (WP 0796, Item 76)
O-ring - (2) (WP 0796, Item 77)

O-ring (WP 0796, Item 59)
Gasket (WP 0796, Item 57)
Seal, plain (WP 0796, Item 90)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Right side Fire Suppression System (FSS) bracket
removed (WP 0748)
Right side engine armor removed (WP 0599)
Engine oil drained (WP 0233)
Charge air cooler hose removed (WP 0264)
Turbocharger removed (WP 0261)
Alternator and bracket removed (WP 0289)
Oil filter removed (WP 0232)

WARNING

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

CAUTION

In the event of engine bearing failure, replace oil cooler bundle. Small bearing debris may become lodged in oil cooler bundle, resulting in damage to engine.

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove coolant supply tube bolt (Figure 1, Item 3) and retaining plate (Figure 1, Item 2) from engine block (Figure 1, Item 6).

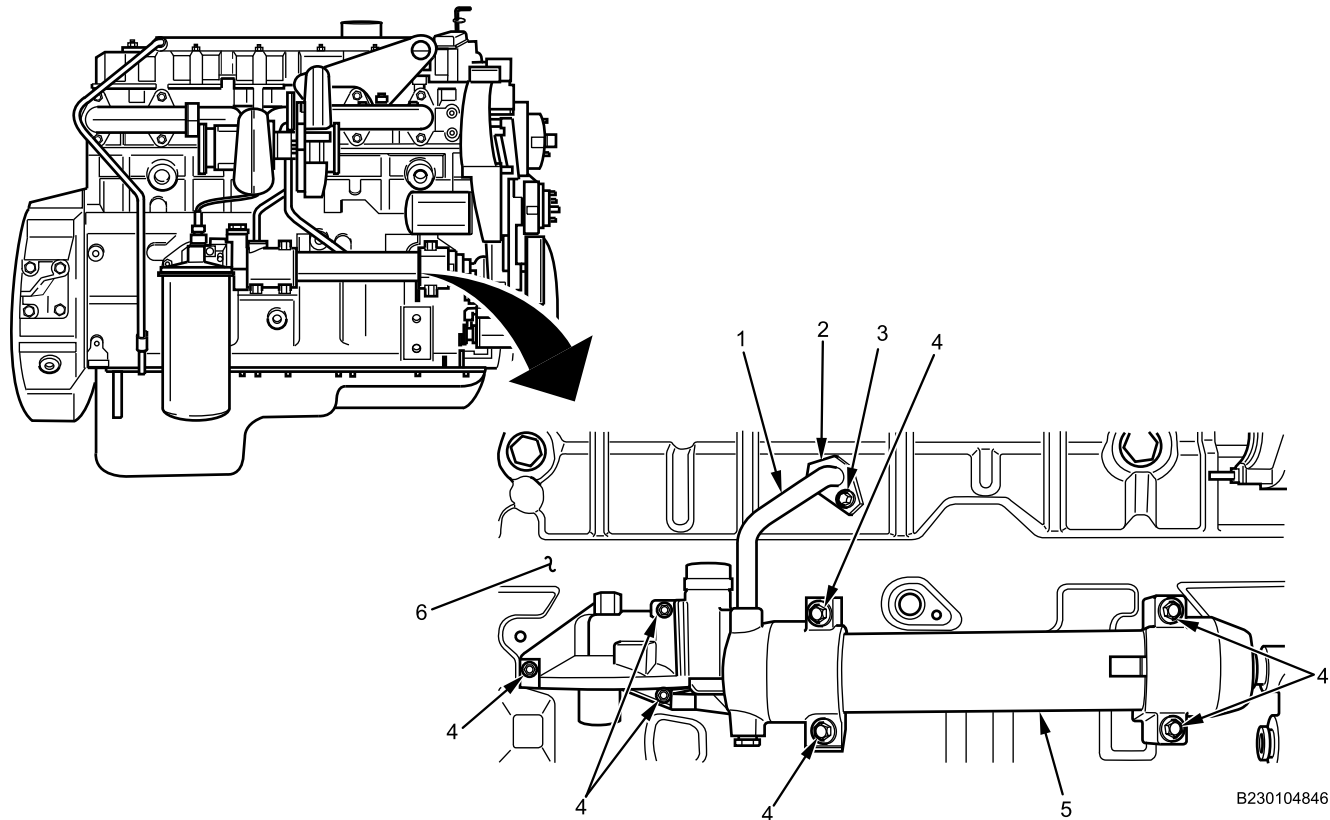


Figure 1. Engine Oil Cooler.

2. Remove seven mounting bolts (Figure 1, Item 4), engine oil cooler (Figure 1, Item 5), and coolant supply tube (Figure 1, Item 1) from engine block (Figure 1, Item 6).

END OF TASK**DISASSEMBLY****CAUTION**

Use a non-metallic hammer to disassemble oil cooler headers from oil cooler. Failure to comply may result in damage to components.

1. Using a non-metallic hammer, hold oil cooler (Figure 2, Item 6) and strike oil cooler filter header (Figure 2, Item 14) to remove header from oil cooler assembly.

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)

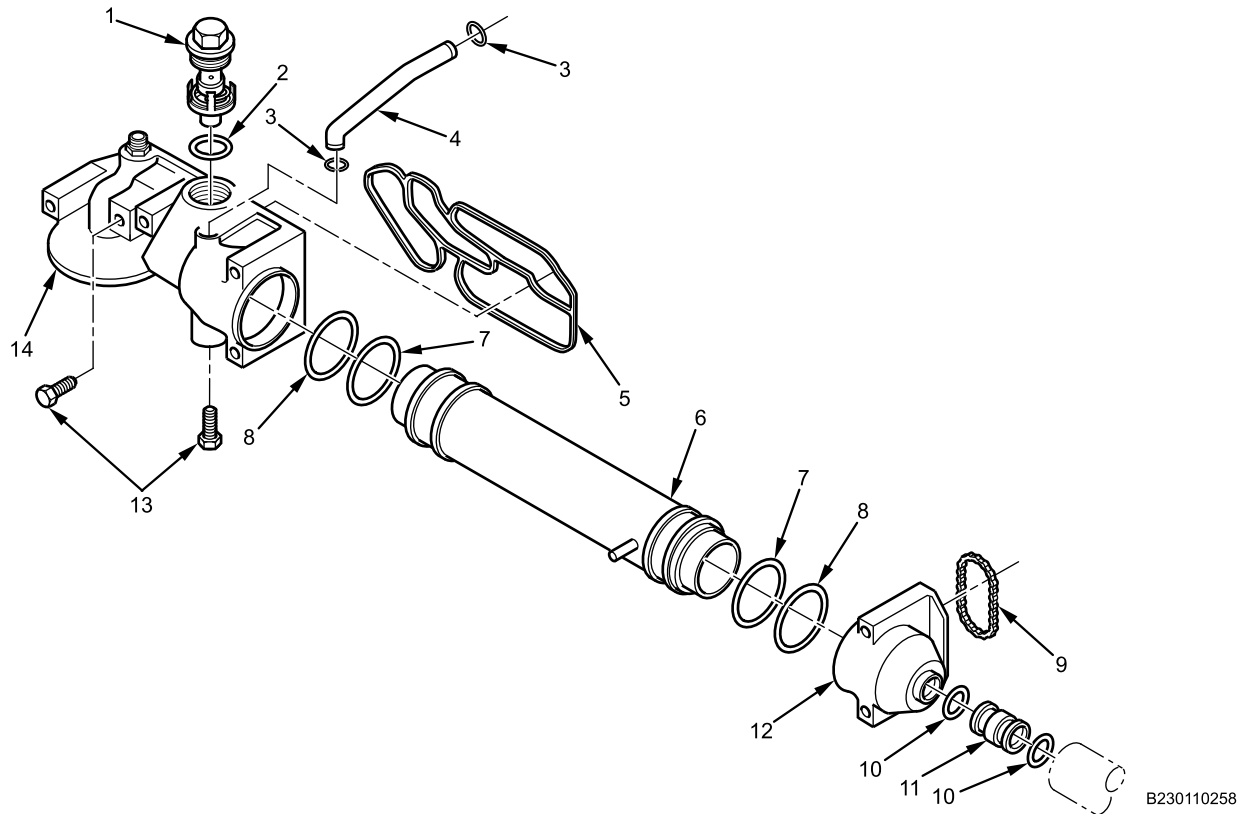


Figure 2. Oil Cooler and Filter Header Disassembly.

2. Using a non-metallic hammer, hold oil cooler (Figure 2, Item 6) and strike front oil cooler header (Figure 2, Item 12) to remove from oil cooler assembly.
3. Remove two O-rings (Figure 2, Item 7 and 8) from oil cooler assembly (Figure 2, Item 6). Discard O-rings.
4. Remove oil temperature control valve (Figure 2, Item 1) and O-ring (Figure 2, Item 2) from oil cooler filter header (Figure 2, Item 14). Discard O-ring.
5. Remove oil cooler water inlet tube (Figure 2, Item 4) and two O-rings (Figure 2, Item 3) from oil cooler filter header (Figure 2, Item 14). Discard O-rings.
6. Remove pipe plugs (Figure 2, Item 13) from oil cooler filter header (Figure 2, Item 14).
7. Remove gasket (Figure 2, Item 5) from rear of oil cooler filter header (Figure 2, Item 14). Discard gasket.
8. Remove tube (Figure 2, Item 11) from front oil cooler header (Figure 2, Item 12), and remove two O-rings (Figure 2, Item 10) from tube. Discard O-rings.
9. Remove plain seal (Figure 2, Item 9) from front oil cooler header (Figure 2, Item 12). Discard seal.

END OF TASK

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)**CLEANING****WARNING**

Do not use compressed air exceeding 30 psi (207 kPa) for cleaning purposes. Use only with effective chip-guarding and personal protective equipment, including goggles or face shield and gloves. Failure to comply could result in serious injury or death to personnel.

CAUTION

Do not use a caustic solution on engine or related components. Failure to comply could result in damage to equipment.

1. Wash grease and oil from oil cooler parts using non-caustic solution.
2. Use compressed air to dry oil cooler parts.

END OF TASK**INSPECTION-ACCEPTANCE AND REJECTION CRITERIA**

1. Inspect oil cooler for blocked tubes and corrosion where tubes are assembled to headers. Replace oil cooler tube, if required.
2. Inspect header for blocked orifices or damaged threads at oil filter threaded insert.
3. Remove any debris that may be blocking oil flow passages.
4. Inspect cooler and engine block mating surfaces for damage and flatness with a straight edge. Replace if damaged.

END OF TASK**ASSEMBLY****NOTE**

Lubricate oil cooler tube, gaskets, O-rings, and headers prior to assembling oil cooler and filter assembly.

1. Place new O-ring (Figure 3, Item 2) on oil temperature control valve (Figure 3, Item 1). Place temperature control valve into oil cooler filter header (Figure 3, Item 14) and torque to 25 lb ft (34 N•m).

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)

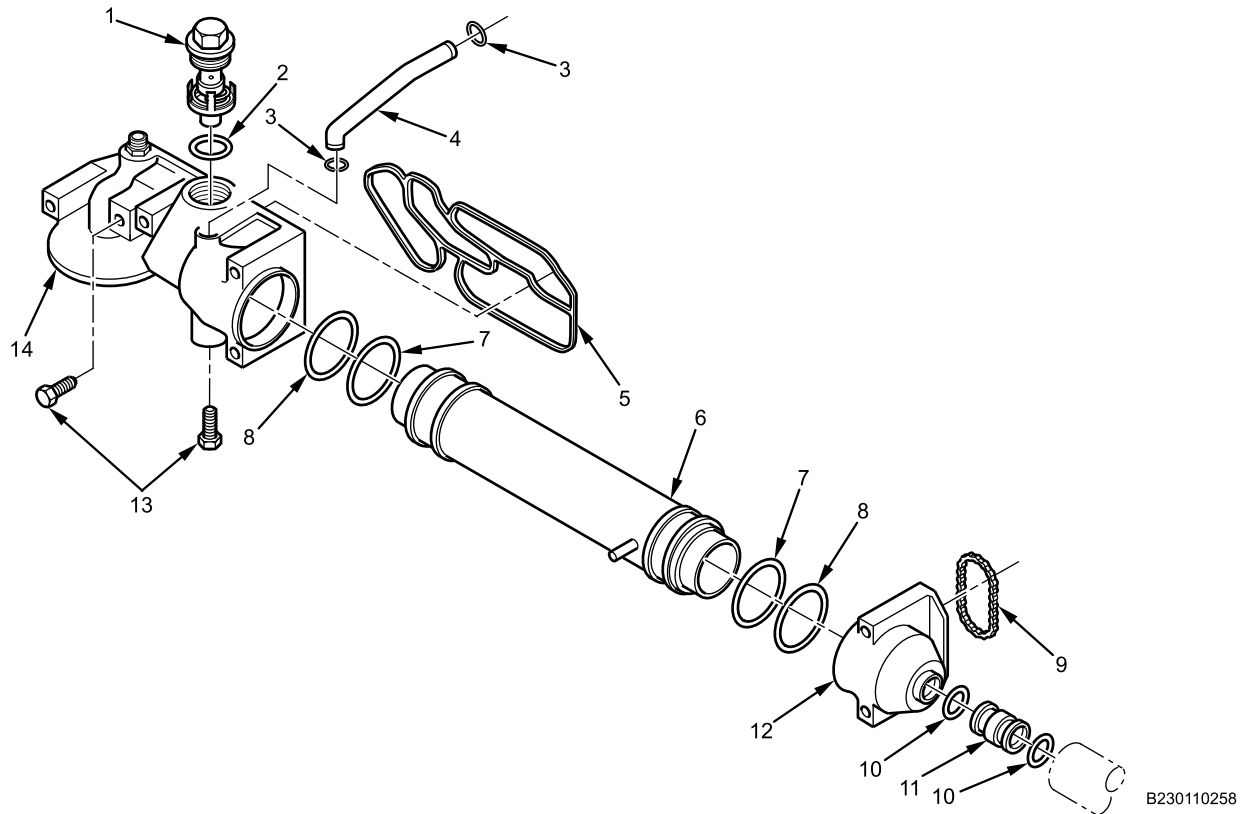


Figure 3. Oil Cooler and Filter Header Assembly.

WARNING

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

2. Apply thread sealing compound to pipe plugs (Figure 3, Item 13) and install into oil cooler filter header (Figure 3, Item 14). Tighten securely.
3. Install two new O-rings (Figure 3, Item 10) on tube (Figure 3, Item 11).
4. Push tube (Figure 3, Item 11) into front oil cooler header (Figure 3, Item 12).
5. Install two new O-rings (Figure 3, Item 7 and 8) on both ends of oil cooler tube (Figure 3, Item 6).

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)

6. Ensure locator pin (Figure 4, Item 3) on oil cooler (Figure 4, Item 4) aligns in slot (Figure 4, Item 2) on oil filter header (Figure 4, Item 1) and front oil cooler header (Figure 3, Item 12).

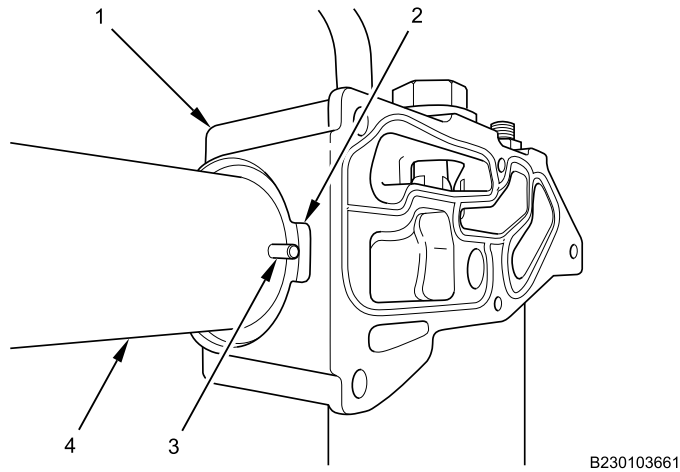


Figure 4. Oil Cooler Locator Pin (Oil Filter Header Shown, Front Oil Cooler Header Similar).

7. Install oil cooler filter header (Figure 5, Item 1) and front oil cooler header (Figure 5, Item 3) onto oil cooler tube (Figure 5, Item 2). Press down on oil cooler filter header (Figure 5, Item 1) until both front oil cooler header (Figure 5, Item 3) and oil cooler filter header (Figure 5, Item 1) are seated on oil cooler tube cooler filter header (Figure 5, Item 2).

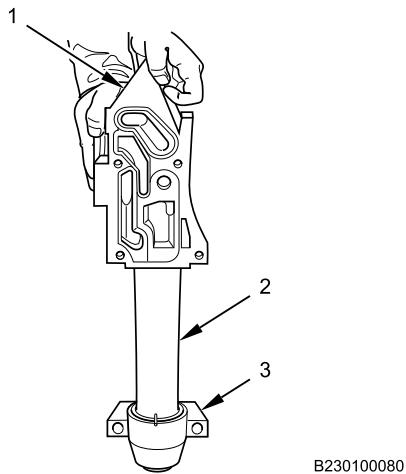


Figure 5. Assemble Oil Cooler.

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)

8. Install two new O-rings (Figure 6, Item 3) on oil cooler water inlet tube (Figure 6, Item 4).

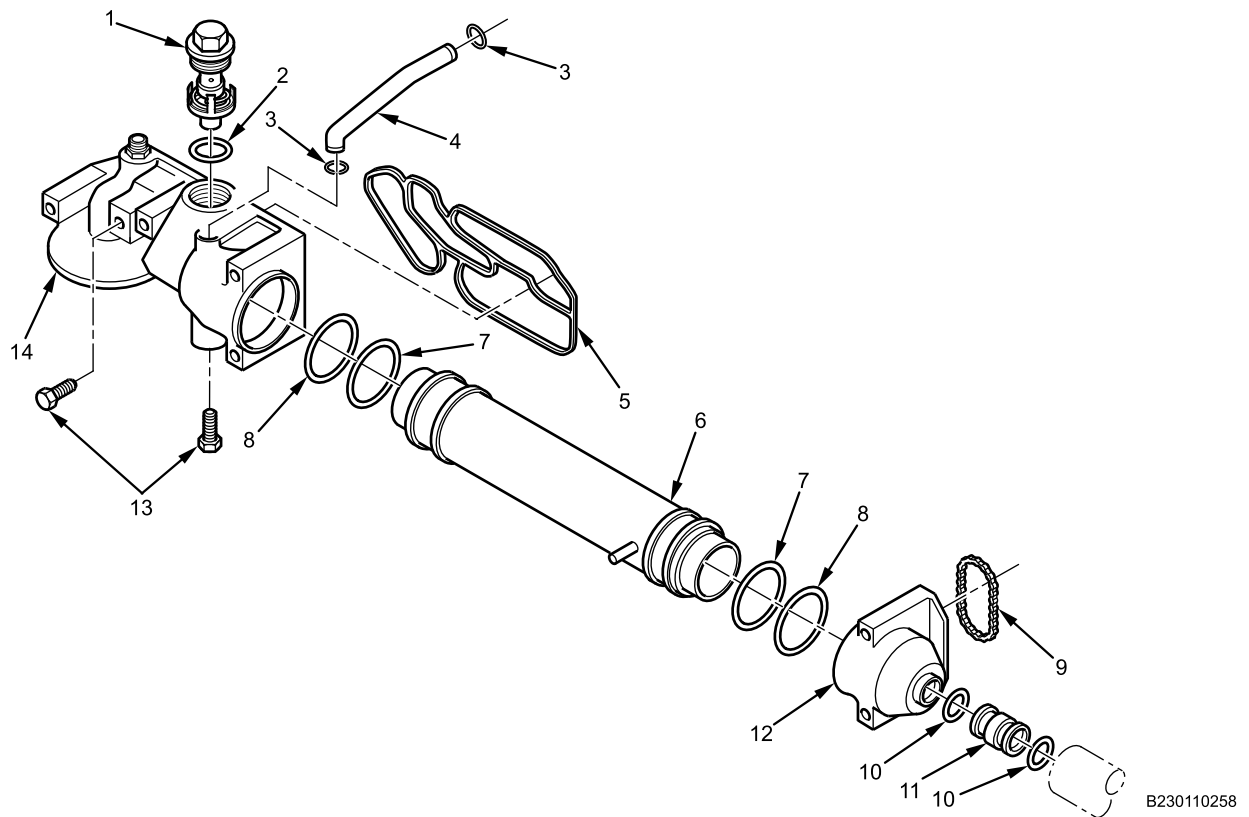


Figure 6. Oil Cooler and Filter Header Assembly.

9. Press oil cooler water inlet tube (Figure 6, Item 4) into oil cooler filter header (Figure 6, Item 14) until seated.
10. Install new gasket (Figure 6, Item 5) to oil cooler filter header (Figure 6, Item 14) by pressing into groove on rear of header.
11. Install new plain seal (Figure 6, Item 9) to front oil cooler header (Figure 6, Item 12) by pressing into groove on rear of header.

END OF TASK

ENGINE OIL COOLER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Align bolt holes in assembled oil cooler (Figure 7, Item 5) and engine block (Figure 7, Item 6) and secure with seven bolts (Figure 7, Item 4). Torque bolts to 19 lb-ft (26 N•m).

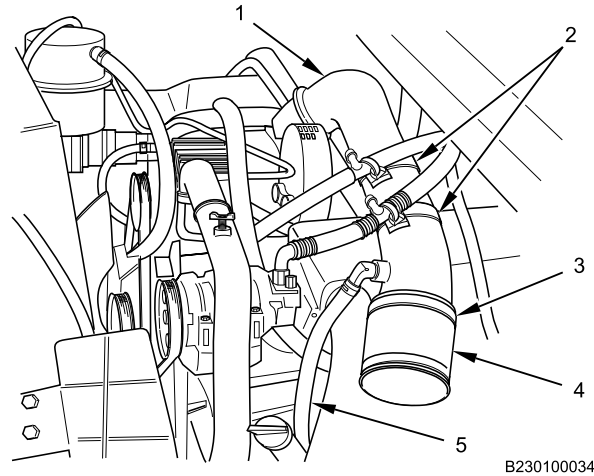


Figure 7. Assembled Engine Oil Cooler.

2. Align coolant supply tube (Figure 7, Item 1) and retaining plate (Figure 7, Item 2) with engine block (Figure 7, Item 6) and secure with bolt (Figure 7, Item 3).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install oil filter (WP 0232).
2. Install alternator bracket and alternator (WP 0289).
3. Install turbocharger (WP 0261).
4. Install charge air cooler hose (WP 0264).
5. Fill engine oil (WP 0233).
6. Turn MAIN POWER switch on (TM 9-2355-106-10).
7. Start engine, check for leaks (TM 9-2355-106-10).
8. Turn engine off, check engine oil level (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).
10. Install right side engine armor (WP 0599).
11. Install right side FSS bracket (WP 0748).
12. Close engine hood (TM 9-2355-106-10).
13. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL COOLER PRESSURE REGULATOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

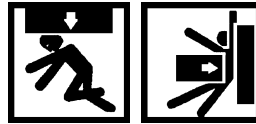
O-ring (WP 0796, Item 99)
Lubricating oil (WP 0794, Item 27)
Wire (WP 0794, Item 57)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Engine oil cooler removed (WP 0234)

References

TM 9-2355-106-10

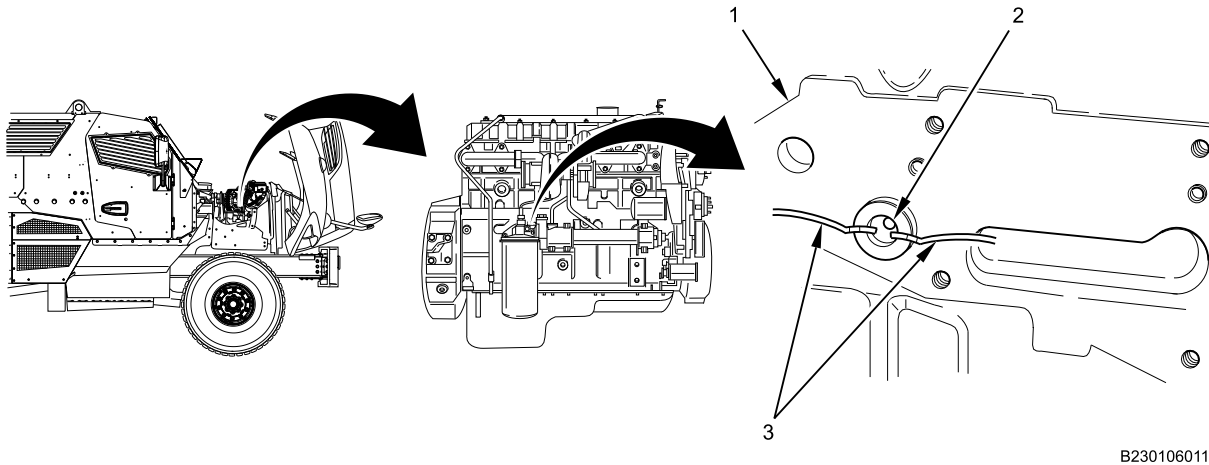
WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ENGINE OIL COOLER PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

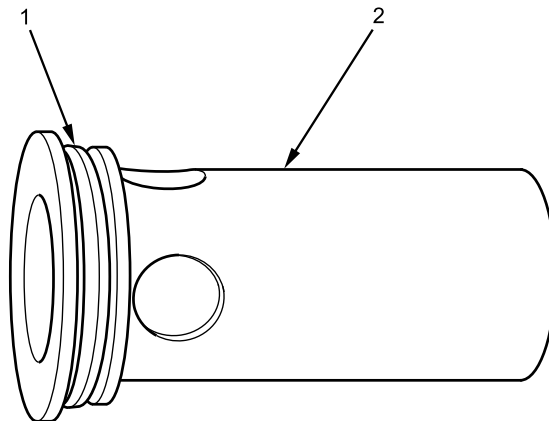
1. Press oil cooler pressure regulator valve plunger (Figure 1, Item 2).



B230106011

Figure 1. Engine Oil Cooler Pressure Regulator.

2. Insert two lengths of mechanics wire (Figure 1, Item 3) through oil cooler pressure regulator valve.
3. Release oil cooler pressure regulator valve plunger (Figure 1, Item 2), trapping mechanics wire (Figure 1, Item 3) in regulator valve.
4. Pull mechanics wire (Figure 1, Item 3), removing oil cooler pressure regulator valve (Figure 1, Item 2) from crankcase (Figure 1, Item 1). Remove mechanics wire from oil cooler pressure regulator.
5. Remove and discard O-ring (Figure 2, Item 1) from engine oil cooler pressure regulator (Figure 2, Item 2).



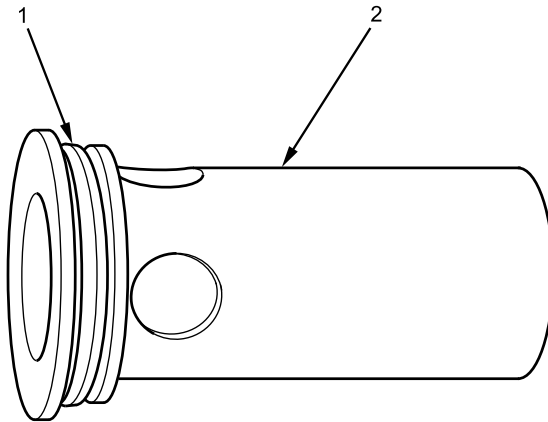
B230105904

Figure 2. Oil Cooler Pressure Regulator O-Ring Removal.

END OF TASK

ENGINE OIL COOLER PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

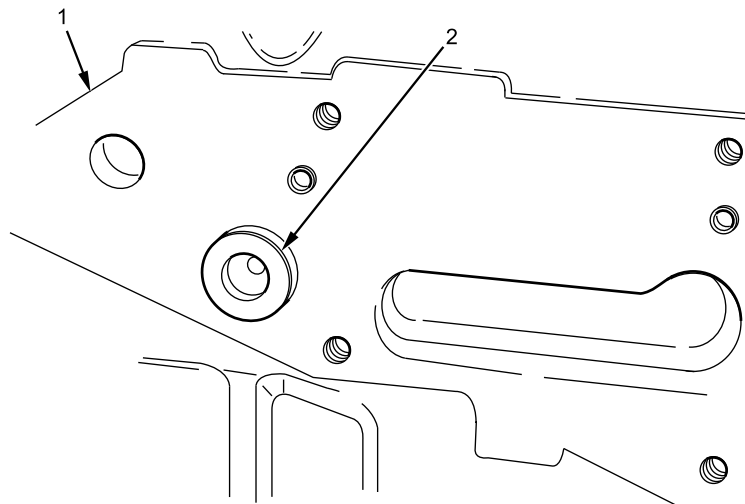
1. Lubricate new O-ring with clean engine oil.



B230105904

Figure 3. Oil Cooler Pressure Regulator O-Ring Installation.

2. Install new O-ring (Figure 3, Item 1) on engine oil cooler pressure regulator (Figure 3, Item 2).
3. Press engine oil cooler pressure regulator valve (Figure 4, Item 2) into crankcase (Figure 4, Item 1).



B230102561

Figure 4. Engine Oil Cooler Pressure Regulator.

END OF TASK

ENGINE OIL COOLER PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install engine oil cooler (WP 0234).
2. Turn on MAIN POWER switch (TM 9-2355-106-10).
3. Start engine, check engine oil pressure, verify operation (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Check engine oil level (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ENGINE OIL PAN REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 141)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Adhesive (WP 0794, Item 3)
Rags (WP 0794, Item 39)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 18)
Gasket (WP 0796, Item 88)

Personnel Required

Maintainer (2)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine shut off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Belly armor removed (WP 0606)
Engine oil drained (WP 0233)

REMOVAL

WARNING

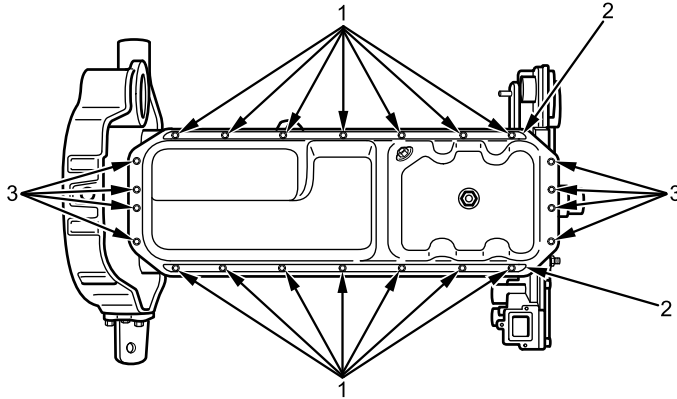


Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ENGINE OIL PAN REMOVAL AND INSTALLATION - (CONTINUED)

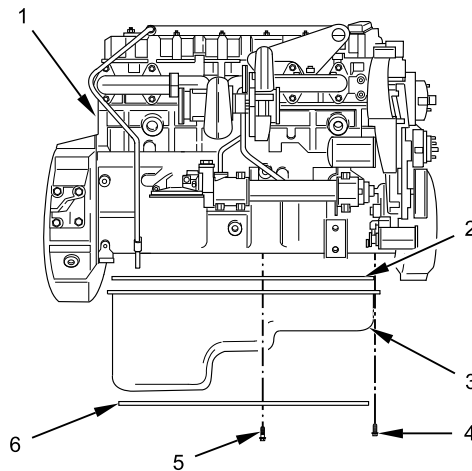
1. Prior to removal, identify location of 14 long bolts (Figure 1, Item 1) securing two mounting bars (Figure 1, Item 2), and eight short bolts (Figure 1, Item 3), at ends of oil pan.



B230110405

Figure 1. Oil Pan Bolt Locations.

2. Place drain pan under oil pan (Figure 2, Item 3).



B230100012

Figure 2. Engine Oil Pan.

3. Remove 14 long bolts (Figure 2, Item 5) securing oil pan mounting bars (Figure 2, Item 6) and oil pan (Figure 2, Item 3) to engine block (Figure 2, Item 1).
4. Remove mounting bars (Figure 2, Item 6) from around perimeter of oil pan.
5. With assistant, support oil pan (Figure 2, Item 3) while removing eight short bolts (Figure 2, Item 4) from front and rear of oil pan.
6. Lower oil pan.

ENGINE OIL PAN REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

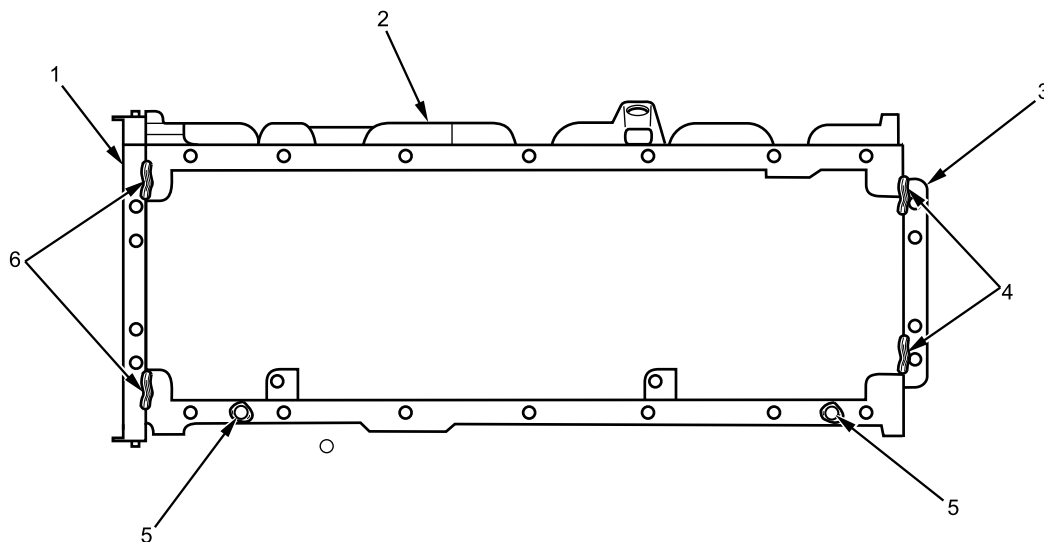
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Wear goggles and protective clothing. Keep away from open flame and use in well-ventilated area. If adhesive, solvent, or sealing compound get on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury or death to personnel.

7. Make sure all oil pan gasket material (Figure 2, Item 2) is removed from around edges of oil pan (Figure 2, Item 3) and engine block (Figure 2, Item 1).
8. Remove drain pan.

END OF TASK**INSTALLATION****NOTE**

Do not apply RTV sealant more than 5 minutes prior to installing oil pan.

1. Apply 1/4-in. (6-mm) bead of RTV sealant (Figure 3, Item 6) where engine block (Figure 3, Item 2) contacts rear half of front cover assembly (Figure 3, Item 1).



B230100014

Figure 3. Bottom View of Engine Block.

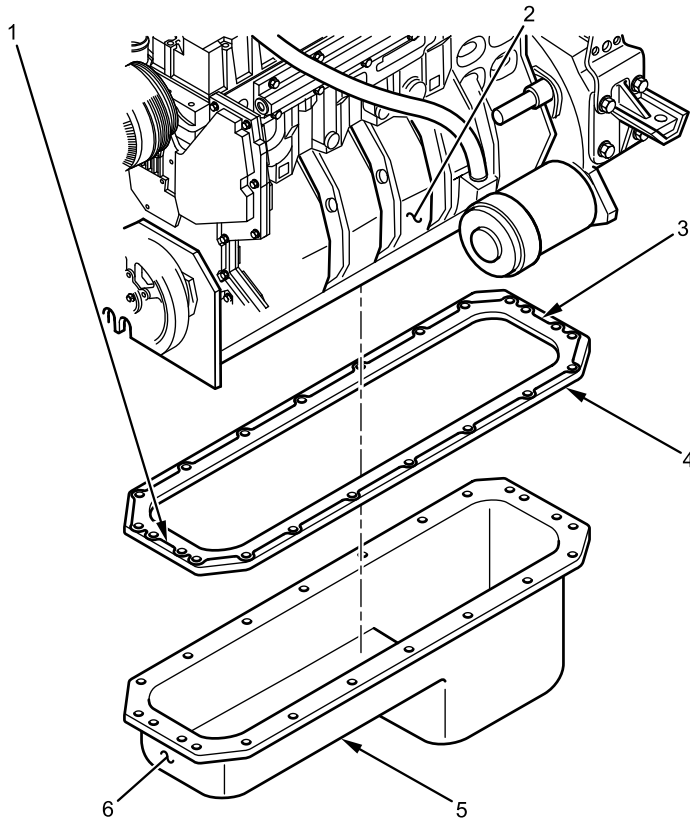
2. Apply 1/4-in. (6-mm) bead of RTV sealant (Figure 3, Item 4) where engine block (Figure 3, Item 2) contacts rear oil seal carrier (Figure 3, Item 3).
3. Apply 1/4-in. (6-mm) bead of RTV sealant around cup plug crankcase orientation holes (Figure 3, Item 5).

ENGINE OIL PAN REMOVAL AND INSTALLATION - (CONTINUED)

CAUTION

Ensure bolt holes on new pan gasket align with bolt holes on oil pan prior to installation.

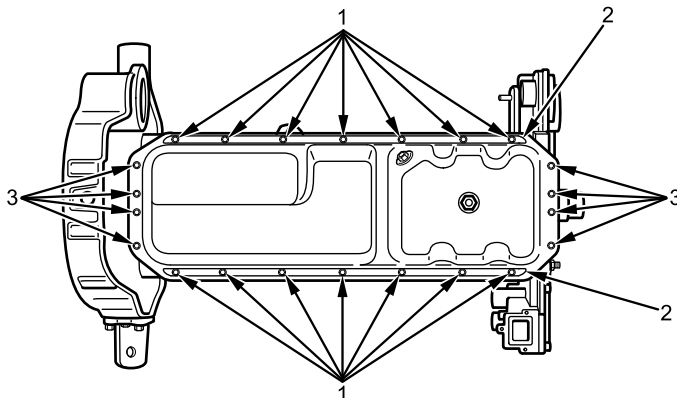
4. Position oil pan gasket (Figure 4, Item 4) to oil pan (Figure 4, Item 5) with seal bead (Figure 4, Item 3) facing engine block (Figure 4, Item 2) and edge marked FRONT (Figure 4, Item 1) oriented toward front side (Figure 4, Item 6) of oil pan.



B230110407

Figure 4. Engine Oil Pan Installation.

5. With assistant, lift oil pan into position.
6. Align oil pan bolt holes with bolt holes on engine block, and loosely install eight short bolts (Figure 5, Item 3) at front and rear of oil pan.



B230110405

Figure 5. Oil Pan Bolt Locations.

ENGINE OIL PAN REMOVAL AND INSTALLATION - (CONTINUED)

7. Position two mounting bars (Figure 5, Item 2) on each side of oil pan.
8. Align bolt holes of mounting bars (Figure 5, Item 2) with oil pan bolt holes. Secure oil pan and mounting bars to engine block with 14 long mounting bolts (Figure 5, Item 1). Torque all bolts to 24 lb-ft (33 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Fill engine oil (WP 0233).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Turn engine off and check for oil leaks under vehicle (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Install belly armor (WP 0606).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ENGINE OIL PICKUP TUBE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
drive (WP 0795, Item 145)

Materials/Parts

Degreaser (WP 0794, Item 10)
Gasket (WP 0796, Item 55)
Gloves (WP 0794, Item 18)
Gloves (WP 0794, Item 19)
Goggles, industrial (WP 0794, Item 20)
Rags (WP 0794, Item 39)

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Engine oil pan removed (WP 0236)
Crankshaft damper removed (WP 0223)

References

TM 9-2355-106-10

WARNING

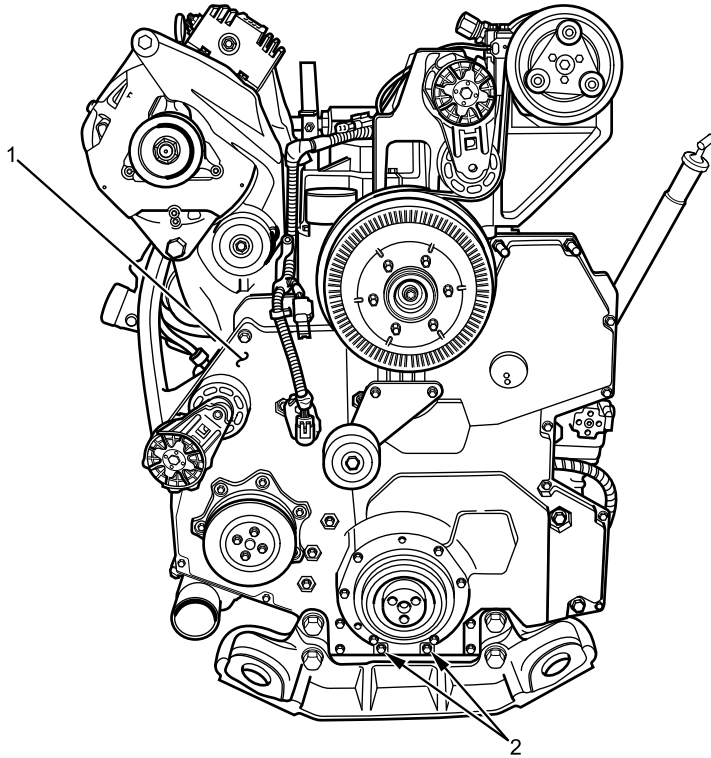


Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ENGINE OIL PICKUP TUBE REMOVAL AND INSTALLATION - (CONTINUED)

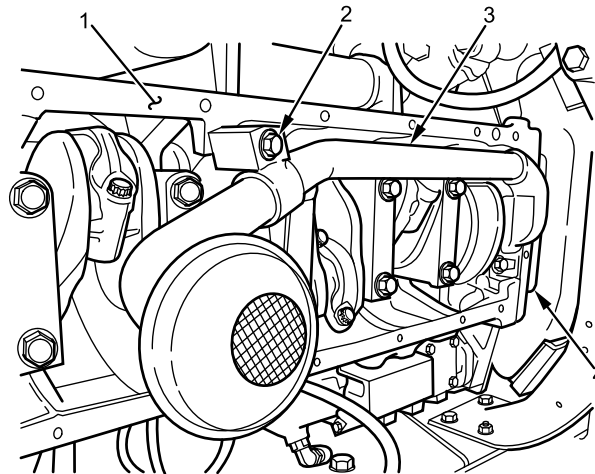
REMOVAL



B230110406

Figure 1. Engine Front Cover.

1. Remove two bolts (Figure 1, Item 2) from engine front cover (Figure 1, Item 1).



B230103672

Figure 2. Engine Oil Pickup Tube.

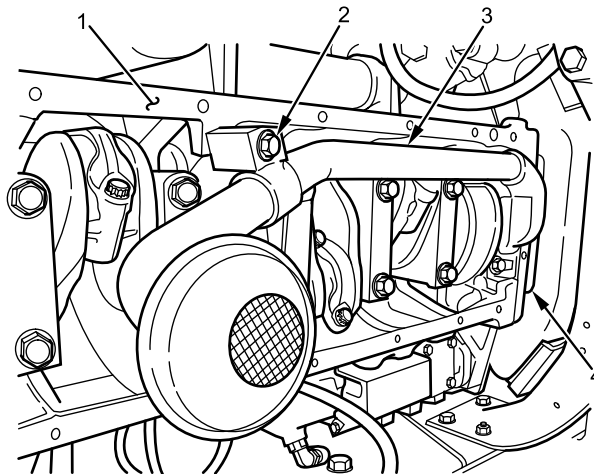
2. Remove engine oil pickup tube bolt (Figure 2, Item 2).
3. Remove engine oil pickup tube (Figure 2, Item 3) and gasket from engine (Figure 2, Item 1). Discard gasket.

END OF TASK

ENGINE OIL PICKUP TUBE REMOVAL AND INSTALLATION - (CONTINUED)**CLEANING****WARNING**

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Wear goggles and protective clothing. Keep away from open flame and use in well-ventilated area. If adhesive, solvent, or sealing compound get on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury or death to personnel.

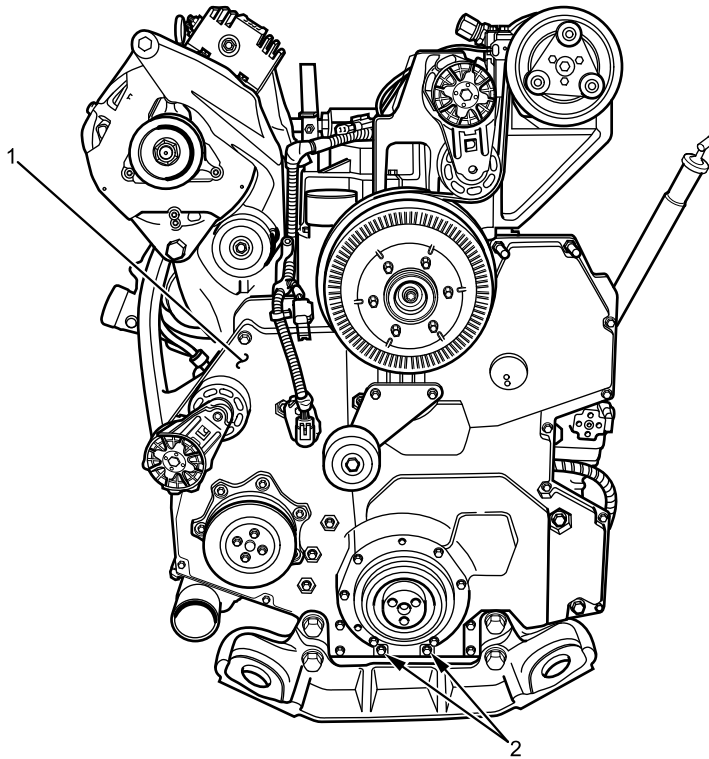
1. Using degreaser, remove gasket residue from engine oil pickup tube (Figure 2, Item 3) and engine front cover (Figure 2, Item 4).

END OF TASK**INSTALLATION**

B230103672

Figure 3. Engine Oil Pickup Tube.

1. Position engine oil pickup tube (Figure 3, Item 3) to engine block (Figure 3, Item 1) and loosely install bolt (Figure 3, Item 2).
2. Position new engine oil pickup tube gasket between oil pickup tube (Figure 3, Item 3) and engine front cover (Figure 3, Item 4).
3. Align holes in engine oil pickup tube (Figure 3, Item 3) and gasket with two holes in engine front cover (Figure 3, Item 4).

ENGINE OIL PICKUP TUBE REMOVAL AND INSTALLATION - (CONTINUED)

B230110406

Figure 4. Engine Front Cover.

4. Install two bolts (Figure 4, Item 2) through engine front cover (Figure 4, Item 1) into engine oil pickup tube and torque to 16 lb-ft (22 N•m).
5. Torque engine oil pickup tube bolt (Figure 3, Item 2) to 24 lb-ft (33 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install oil pan (WP 0236).
2. Install crankshaft damper (WP 0223).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine, check for leaks (TM 9-2355-106-10).
5. Turn engine off, check engine oil level (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Close engine hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Rags (WP 0794, Item 39)
Lubricating oil (WP 0794, Item 27)
Seal - (2) (WP 0796, Item 70)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Engine oil drained (WP 0233)
Radiator fan and fan shroud removed (WP 0282)
Serpentine belt removed (WP 0240)
Crankshaft damper removed (WP 0223)

WARNING



Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

FRONT OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove six bolts (Figure 1, Item 2) from oil pump housing (Figure 1, Item 1) and remove housing from engine (Figure 1, Item 3).

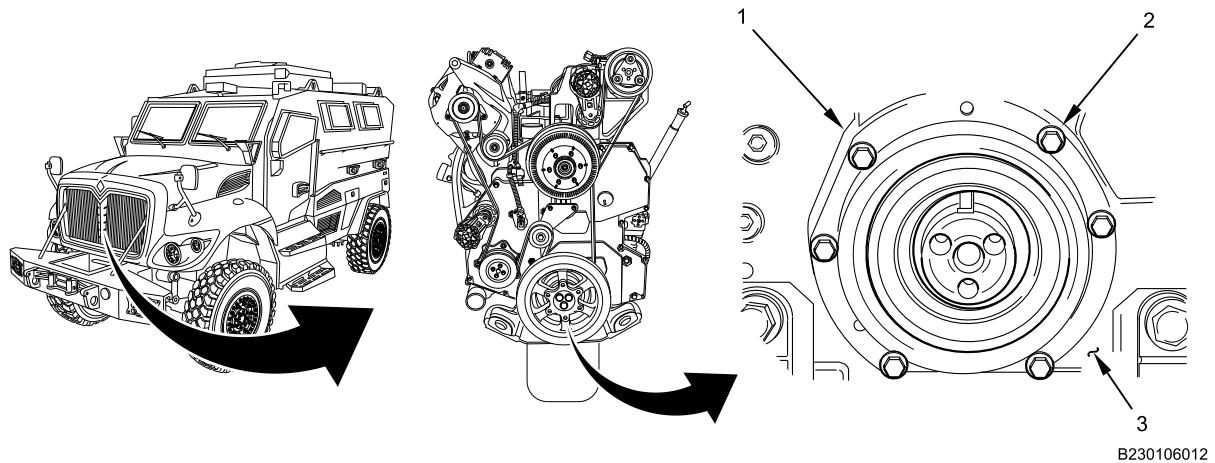


Figure 1. Oil Pump Removal.

2. Remove and discard seal (Figure 2, Item 1) from oil pump housing (Figure 2, Item 2).

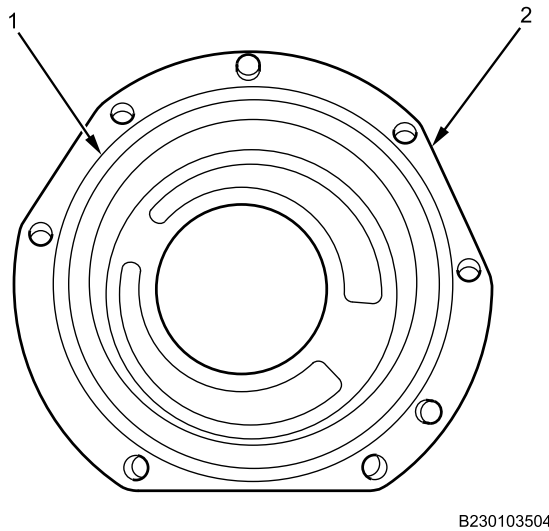


Figure 2. Oil Pump Housing.

3. Remove crankshaft key (Figure 3, Item 1), shim (Figure 3, Item 2), and outer rotor (Figure 3, Item 4) from crankshaft (Figure 3, Item 6).

FRONT OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

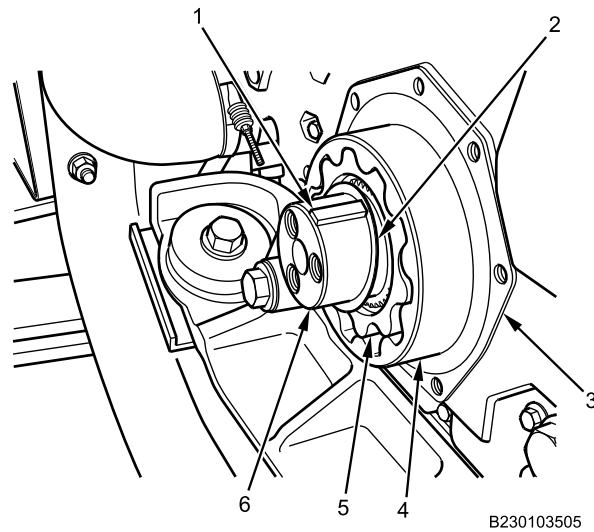


Figure 3. Crankshaft Front.

4. Remove inner rotor (Figure 3, Item 5) from crankshaft (Figure 3, Item 6).
5. Remove mounting plate (Figure 3, Item 3) and inner seal. Discard seal.

END OF TASK**INSTALLATION**

1. Install new mounting plate inner seal (Figure 4, Item 1) in groove on engine front cover (Figure 4, Item 2).

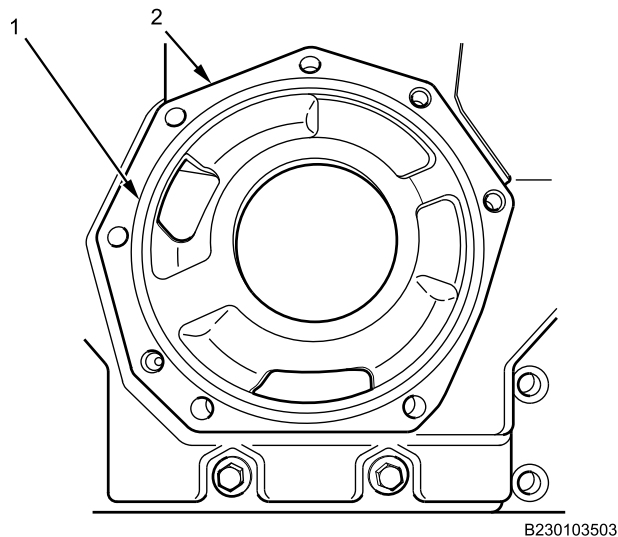


Figure 4. Front Cover.

FRONT OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

2. Install engine oil pump mounting plate (Figure 5, Item 3) on engine.

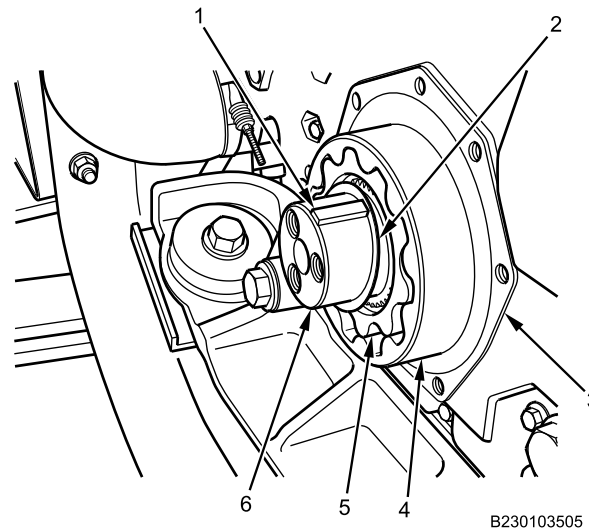


Figure 5. Crankshaft Front.

3. Install inner rotor (Figure 5, Item 5), outer rotor (Figure 5, Item 4), and shim (Figure 5, Item 2) on crankshaft (Figure 5, Item 6).
4. Install crankshaft key (Figure 5, Item 1) on crankshaft (Figure 5, Item 6).
5. Install new seal (Figure 6, Item 1) in groove on housing (Figure 6, Item 2).

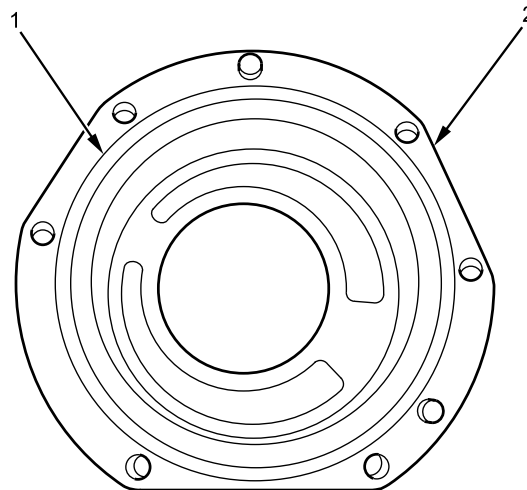


Figure 6. Oil Pump Housing.

6. Install oil pump housing (Figure 7, Item 1) on engine (Figure 7, Item 3) with six bolts (Figure 7, Item 2). Tighten securely.

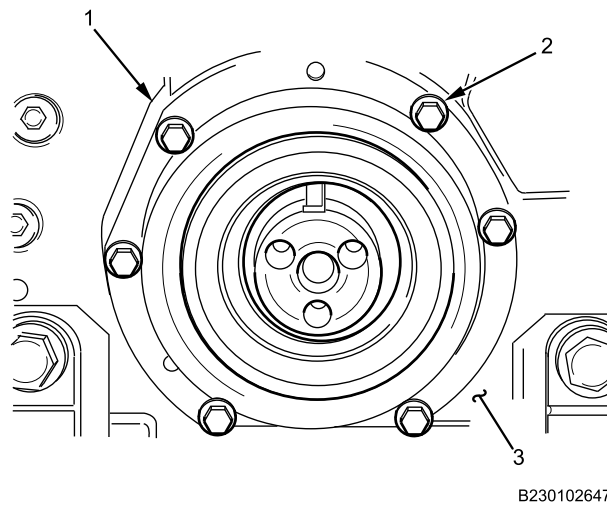
FRONT OIL PUMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 7. Oil Pump Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install crankshaft damper (WP 0223).
2. Fill engine oil (WP 0233).
3. Install serpentine belt (WP 0240).
4. Install radiator fan and fan shroud (WP 0282).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Start engine and verify operation (TM 9-2355-106-10).
7. Turn engine off and check for oil leaks (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

EXHAUST MANIFOLD REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 141)

Materials/Parts

Degreaser (WP 0794, Item 14)
Rags (WP 0794, Item 39)
Exhaust manifold gasket (WP 0796, Item 85)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Right side tire Fire Suppression System (FSS) bracket removed (WP 0748)
Right side engine armor removed (WP 0599)
Serpentine belt removed (WP 0240)
Alternator bracket removed (WP 0290)
Engine oil breather tube removed (WP 0231)
Turbocharger removed (WP 0261)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

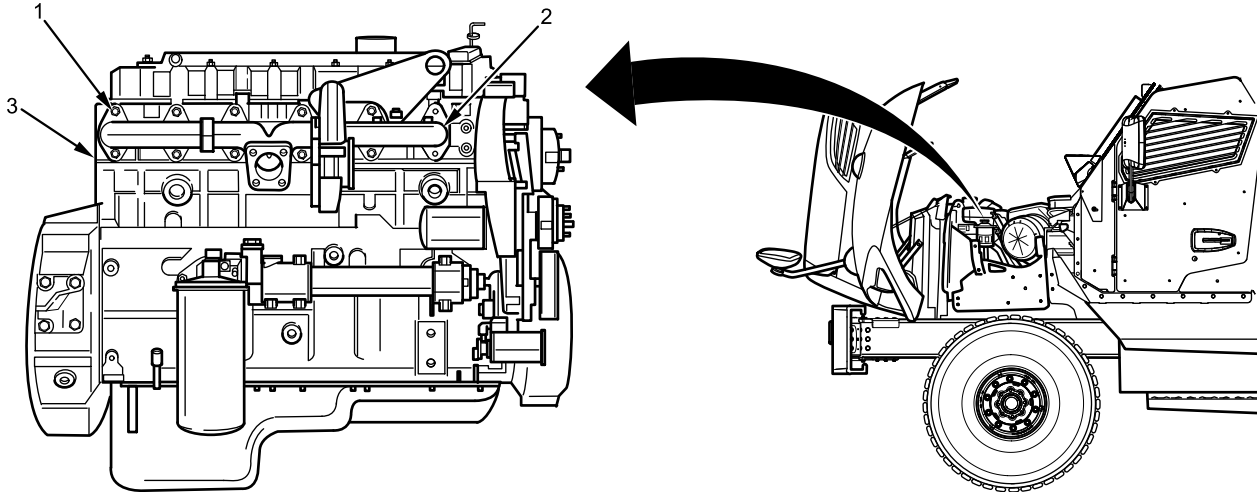
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

NOTE

Remove exhaust manifold as one complete unit.

EXHAUST MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove 10 mounting bolts (Figure 1, Item 1) and exhaust manifold assembly (Figure 1, Item 2) from cylinder head (Figure 1, Item 3).



B230105894

Figure 1. Exhaust Manifold.

2. Remove and discard exhaust manifold gasket.

END OF TASK**CLEANING****WARNING**

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Wear goggles and protective clothing. Keep away from open flame and use in well-ventilated area. If adhesive, solvent, or sealing compound get on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury or death to personnel.

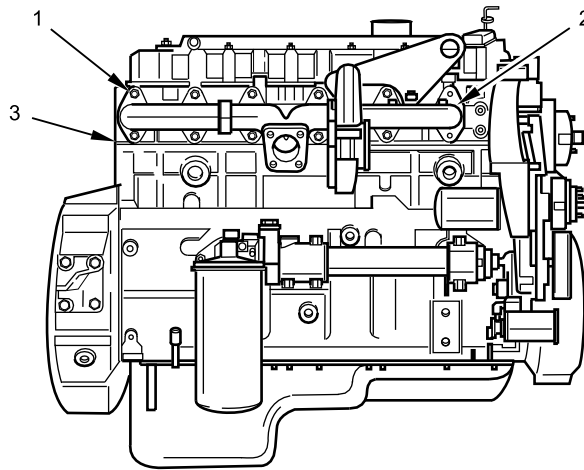
1. Using rags and cleaning solvent, clean old gasket residue off engine block.

END OF TASK

EXHAUST MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****NOTE**

Ensure exhaust manifold gasket is aligned to exhaust manifold prior to tightening bolts.

1. Align exhaust manifold gasket to the cylinder head (Figure 2, Item 3).



B230105893

Figure 2. Exhaust Manifold.

2. Position exhaust manifold assembly (Figure 2, Item 2) to cylinder head (Figure 2, Item 3) and secure with 10 bolts (Figure 2, Item 1). Torque bolts to 60 lb-ft (81 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install turbocharger (WP 0261).
2. Install engine oil breather tube (WP 0231).
3. Install alternator bracket (WP 0289).
4. Install serpentine belt (WP 0240).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Start engine and verify operation (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install right side engine armor (WP 0599).
9. Install right side tire FSS bracket (WP 0748).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**SERPENTINE BELT REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

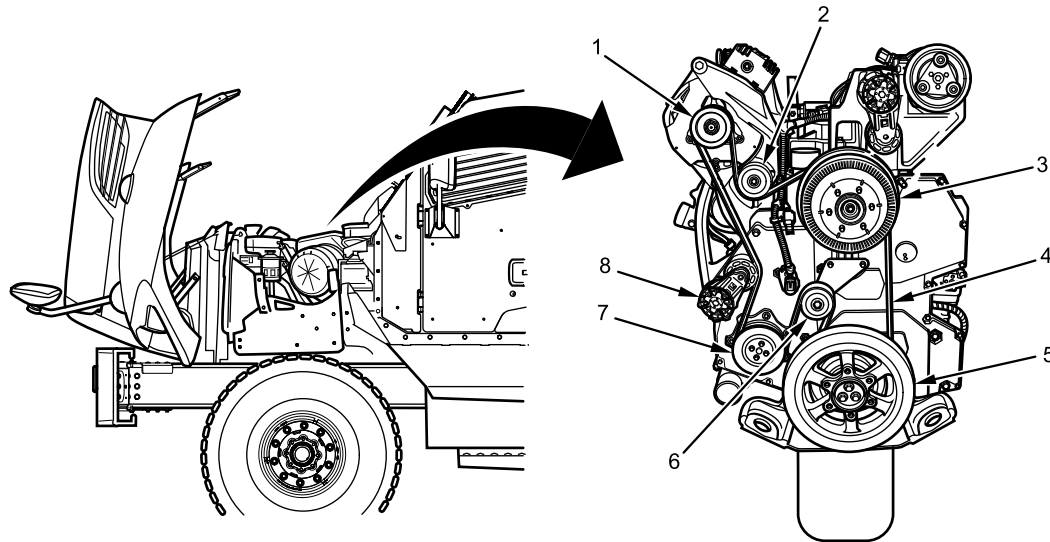
Air conditioning (A/C) belt removed (WP 0244)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

SERPENTINE BELT REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

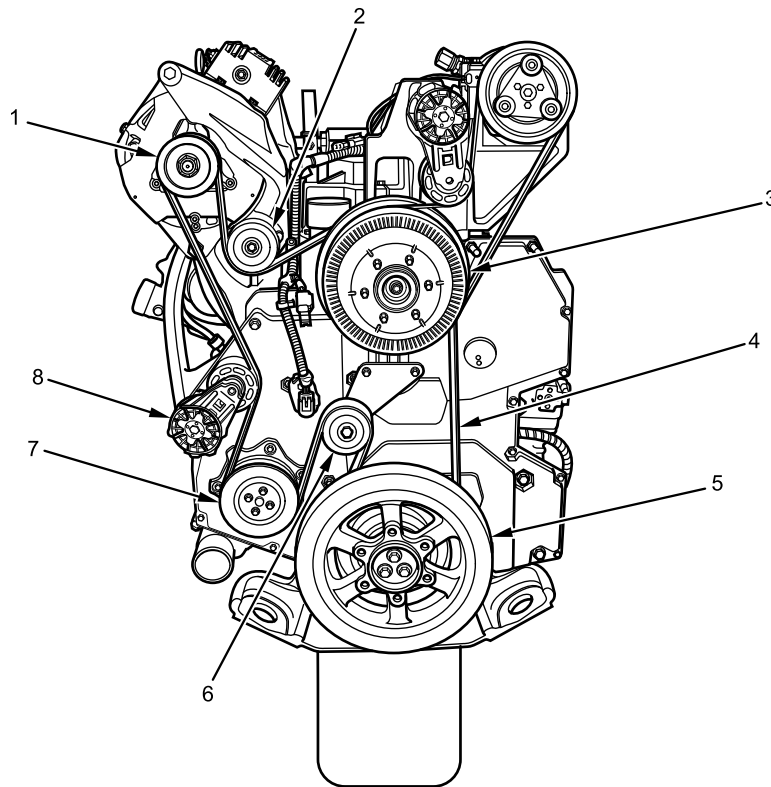
B230105929

Figure 1. Serpentine Belt.

1. Place 1/2-in. breaker bar into square hole of serpentine belt tensioner (Figure 1, Item 8). Pull breaker bar counterclockwise.
2. Remove serpentine belt (Figure 1, Item 4) from around serpentine belt tensioner (Figure 1, Item 8). Release pressure on serpentine belt tensioner.
3. Remove serpentine belt (Figure 1, Item 4) from around alternator pulley (Figure 1, Item 1), idler pulley (Figure 1, Item 2), fan clutch pulley (Figure 1, Item 3), crankshaft pulley (Figure 1, Item 5), idler pulley (Figure 1, Item 6), and water pump pulley (Figure 1, Item 7).
4. Pull serpentine belt (Figure 1, Item 4) over cooling fan and remove from engine compartment.

END OF TASK**INSTALLATION**

1. Position serpentine belt (Figure 2, Item 4) over fan hub.

SERPENTINE BELT REMOVAL AND INSTALLATION - (CONTINUED)

B230105928

Figure 2. Serpentine Belt.

2. Route serpentine belt (Figure 2, Item 4) around crankshaft pulley (Figure 2, Item 5), idler pulley (Figure 2, Item 6), water pump pulley (Figure 2, Item 7), alternator pulley (Figure 2, Item 1), idler pulley (Figure 2, Item 2), and fan clutch pulley (Figure 2, Item 3).
3. Place 1/2-in. breaker bar into square hole located in serpentine belt tensioner (Figure 2, Item 8). Pull breaker bar counterclockwise.
4. Position serpentine belt (Figure 2, Item 4) around serpentine belt tensioner (Figure 2, Item 8). Make sure serpentine belt is aligned with all pulleys and release serpentine belt tensioner.

END OF TASK

SERPENTINE BELT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install A/C belt (WP 0244).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Close engine hood (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**SERPENTINE BELT IDLER PULLEY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Puller set, mechanical (WP 0795, Item 78)

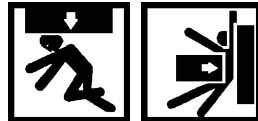
References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

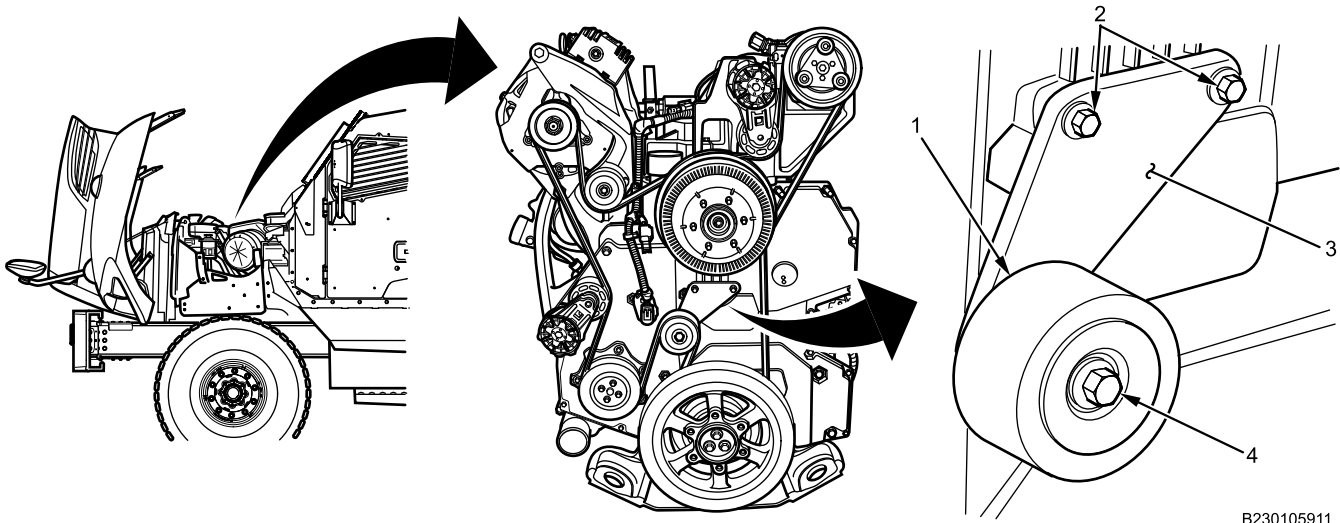
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Serpentine belt removed (WP 0240)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

SERPENTINE BELT IDLER PULLEY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

B230105911

Figure 1. Serpentine Belt Idler Pulley.

1. Remove two bolts (Figure 1, Item 2) from idler pulley bracket (Figure 1, Item 3).
2. Remove pulley and bracket (Figure 1, Item 3) from engine.

END OF TASK**DISASSEMBLY**

1. Remove bolt (Figure 1, Item 4) securing pulley (Figure 1, Item 1) to bracket (Figure 1, Item 3).
2. Remove pulley (Figure 1, Item 1) from bracket (Figure 1, Item 3) using puller.

END OF TASK**ASSEMBLY**

1. Position pulley (Figure 1, Item 1) to bracket (Figure 1, Item 3).
2. Install bolt (Figure 1, Item 4) and tighten securely.

END OF TASK

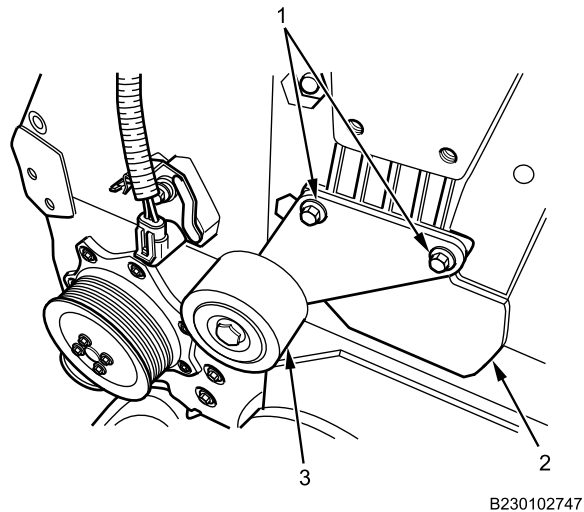
SERPENTINE BELT IDLER PULLEY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

Figure 2. Serpentine Belt Idler Pulley.

1. Install idler pulley assembly (Figure 2, Item 3) onto engine (Figure 2, Item 2) with two bolts (Figure 2, Item 1), and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

SERPENTINE BELT TENSIONER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

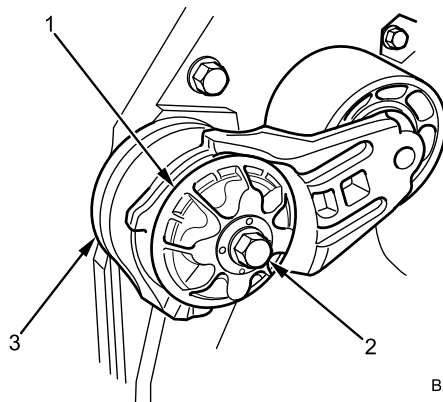
Serpentine belt removed (WP 0240)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

REMOVAL

B230110404

Figure 1. Serpentine Belt Tensioner.

1. Remove bolt (Figure 1, Item 2) securing tensioner (Figure 1, Item 1) to front cover.
2. Remove tensioner (Figure 1, Item 1) and adapter plate (Figure 1, Item 3) from front cover.

END OF TASK

SERPENTINE BELT TENSIONER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Align adapter plate pin (Figure 2, Item 4) with hole (Figure 2, Item 3) in front cover (Figure 2, Item 2), and position adapter plate (Figure 2, Item 1) to front cover.

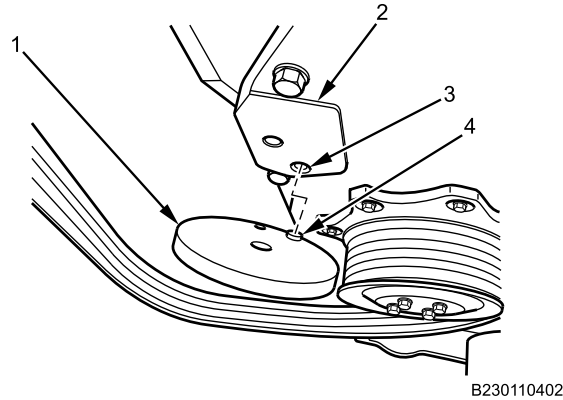


Figure 2. Adapter Plate Alignment.

2. Align serpentine belt tensioner pin (Figure 3, Item 4) with hole (Figure 3, Item 5) in serpentine belt adapter plate (Figure 3, Item 1), and position serpentine belt tensioner (Figure 3, Item 2) to adapter plate.

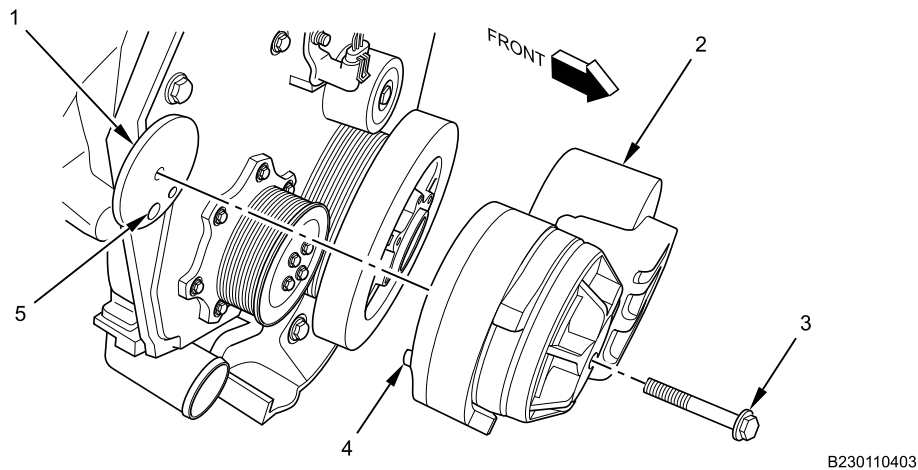


Figure 3. Serpentine Belt Tensioner Installation.

3. Install bolt (Figure 3, Item 3) and torque to 37 lb-ft (50 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**SERPENTINE BELT UPPER IDLER PULLEY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

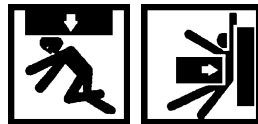
Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Serpentine belt removed (WP 0240)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

REMOVAL**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

SERPENTINE BELT UPPER IDLER PULLEY REMOVAL AND INSTALLATION - (CONTINUED)

1. Remove bolt (Figure 1, Item 2) securing pulley (Figure 1, Item 1) to bracket.

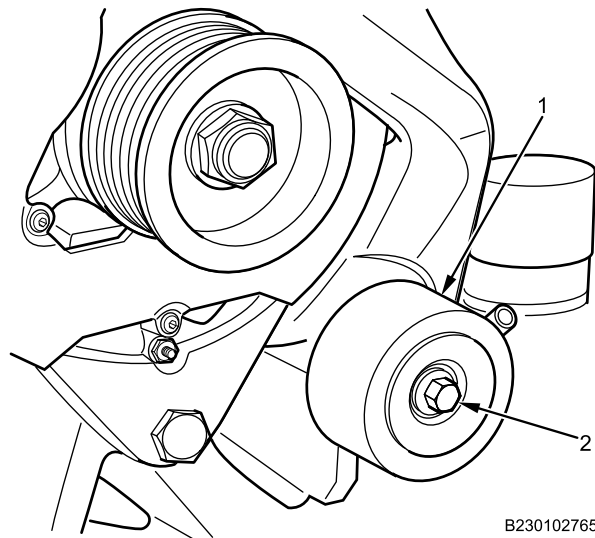


Figure 1. Serpentine Belt Upper Idler Pulley.

2. Remove pulley (Figure 1, Item 1) from bracket.

END OF TASK**INSTALLATION**

1. Position pulley (Figure 2, Item 1) to bracket.

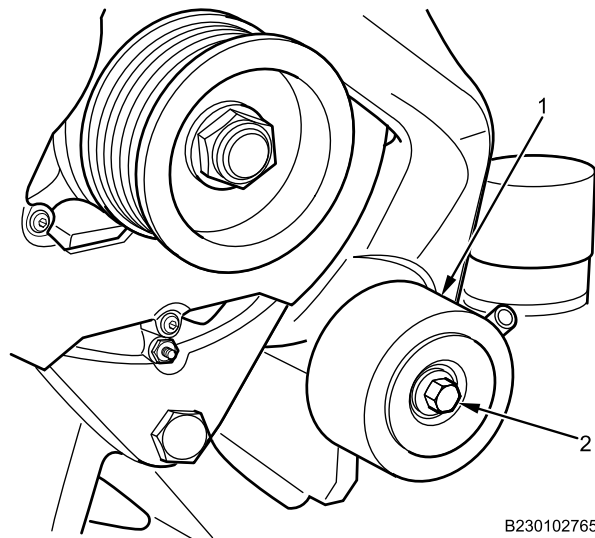


Figure 2. Serpentine Belt Upper Idler Pulley.

2. Install bolt (Figure 2, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).

SERPENTINE BELT UPPER IDLER PULLEY REMOVAL AND INSTALLATION - (CONTINUED)

2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AIR CONDITIONER (A/C) BELT REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Breaker bar, 1/2-inch drive, 18-inch OAL, chrome
(WP 0795, Item 12)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

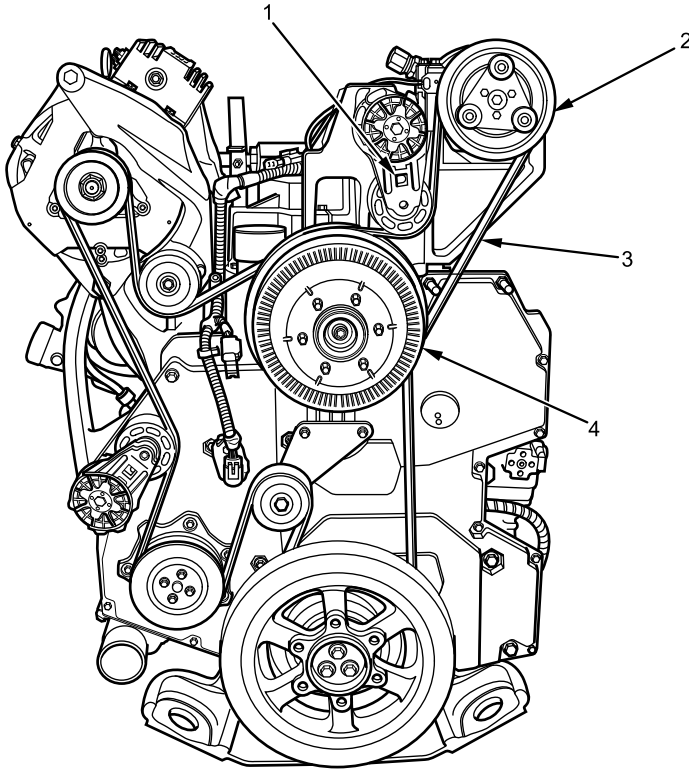
Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Ensure hands are clear of belt before releasing belt tensioner. Failure to comply may result in serious injury to personnel.

AIR CONDITIONER (A/C) BELT REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

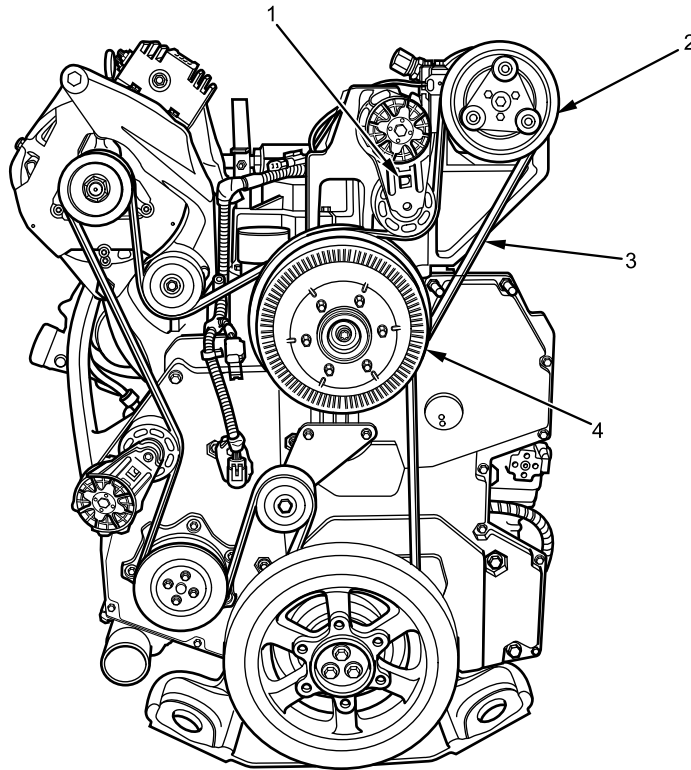
B230100010

Figure 1. A/C Belt.

1. Place 1/2-in. breaker bar into square hole of belt tensioner (Figure 1, Item 1). Rotate tensioner clockwise with breaker bar as viewed in figure 1 to release tension on belt.
2. Remove A/C belt (Figure 1, Item 3) from around A/C pulley (Figure 1, Item 2) and fan clutch pulley (Figure 1, Item 4).

END OF TASK**INSTALLATION****NOTE**

The ribs of the A/C belt must face fan clutch ribs.

AIR CONDITIONER (A/C) BELT REMOVAL AND INSTALLATION - (CONTINUED)

B230100010

Figure 2. A/C Belt Configuration.

1. Place A/C belt (Figure 2, Item 3) around fan clutch pulley (Figure 2, Item 4).
2. Place 1/2-in. breaker bar into square hole in belt tensioner (Figure 2, Item 1). Rotate tensioner clockwise with breaker bar as viewed in figure 2 to release tension on belt tensioner.
3. Place A/C belt (Figure 2, Item 3) around A/C pulley (Figure 2, Item 2). Align ribs of belt with ribs of pulley. Release tension on belt tensioner pulley.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and verify operation (TM 9-2355-106-10).
3. Turn engine off (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Close engine hood (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

AIR CONDITIONING (A/C) BELT TENSIONER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

A/C belt removed (WP 0244)

Equipment Condition

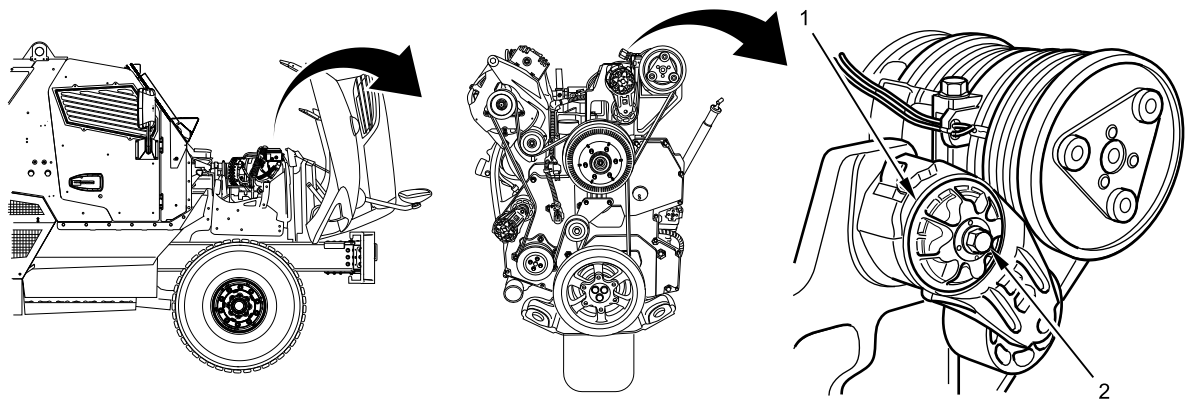
Parking brake set (TM 9-2355-106-10)

WARNING



Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

REMOVAL



B230106086

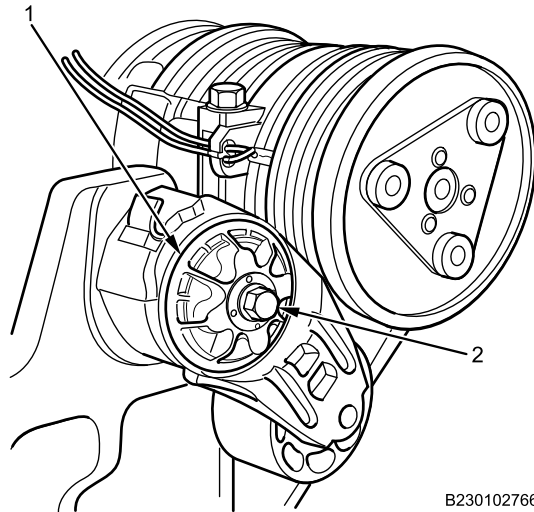
Figure 1. A/C Belt Tensioner.

1. Remove bolt (Figure 1, Item 2) securing tensioner (Figure 1, Item 1) to bracket.
2. Remove tensioner (Figure 1, Item 1) from bracket.

END OF TASK

AIR CONDITIONING (A/C) BELT TENSIONER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Position A/C belt tensioner (Figure 2, Item 1) to bracket.



B230102766

Figure 2. A/C Belt Tensioner.

2. Install bolt (Figure 2, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install A/C belt (WP 0244).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**EXHAUST BRAKE REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Gloves (WP 0794, Item 19)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM-9-2355-106-10)
Belly armor removed (WP 0606)
Front propeller shaft removed (WP 0468)
Air intake tube removed (WP 0256)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not remove hot exhaust system from vehicle. Bolts can stretch, crack, and break when hot. Allow exhaust system to cool before loosening bolts on C-clamps. Failure to comply may result in damage to equipment and injury or death to personnel.

EXHAUST BRAKE REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Loosen pipe clamp nut (Figure 1, Item 2) from pipe clamp (Figure 1, Item 4) between exhaust brake (Figure 1, Item 3) and turbocharger pipe (Figure 1, Item 1), and remove pipe clamp.

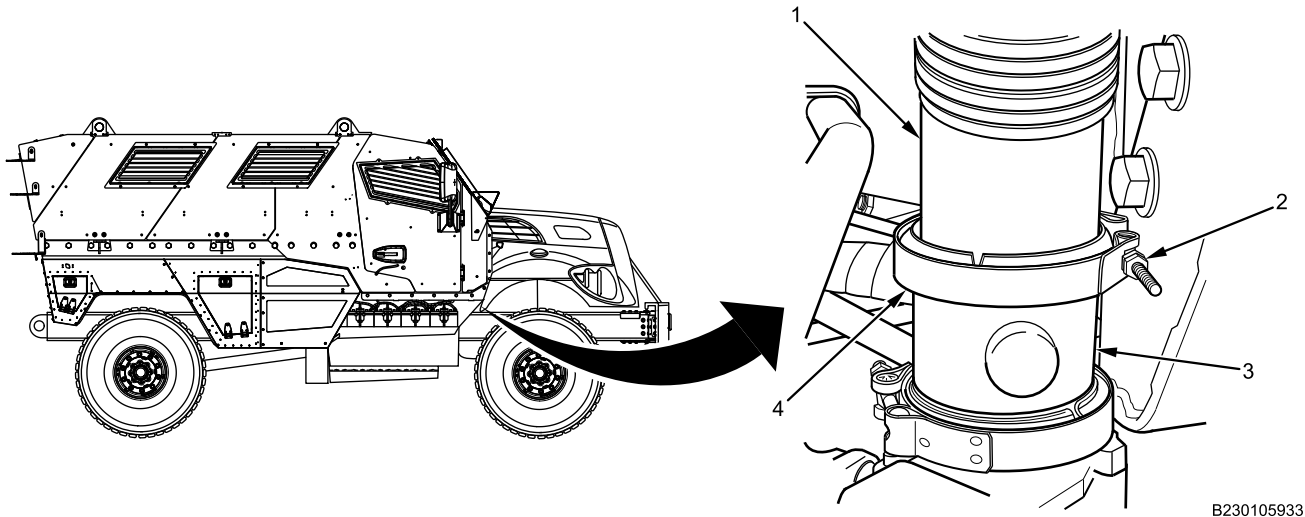


Figure 1. Exhaust Brake and Turbocharger Pipe Connection.

2. Remove exhaust brake supply air line connection (Figure 2, Item 2) from exhaust brake air line angle fitting (Figure 2, Item 1).

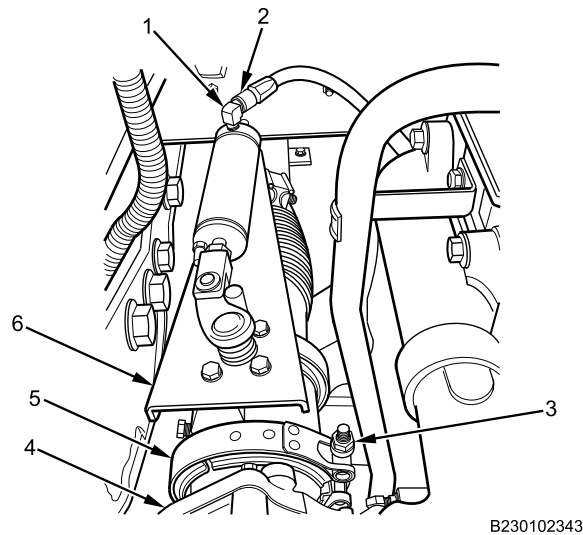


Figure 2. Exhaust Brake and Supply Air Line Connection.

3. Loosen pipe clamp nut (Figure 2, Item 3) from pipe clamp (Figure 2, Item 5) between exhaust brake (Figure 2, Item 6) and turbocharger (Figure 2, Item 4), and remove pipe clamp and exhaust brake.
4. Loosen pipe clamp bolts (Figure 3, Item 4) from pipe clamp (Figure 3, Item 2) between front intermediate exhaust pipe (Figure 3, Item 3) and turbocharger pipe (Figure 3, Item 1). Remove turbocharger pipe and clamp.

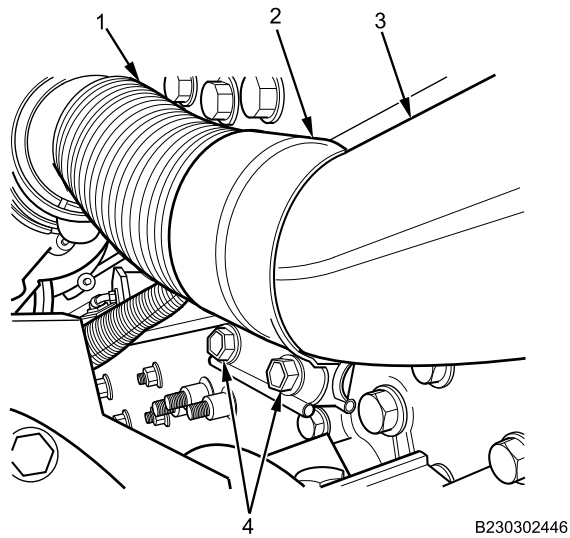
EXHAUST BRAKE REMOVAL AND INSTALLATION - (CONTINUED)

Figure 3. Turbocharger Pipe Downstream Clamp.

END OF TASK**INSTALLATION**

1. Install turbocharger pipe (Figure 4, Item 1) and pipe clamp (Figure 4, Item 2) on front intermediate exhaust pipe (Figure 4, Item 3).

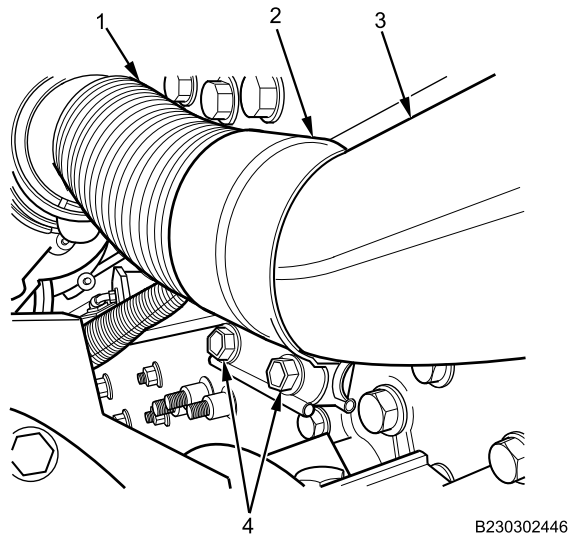


Figure 4. Turbocharger Pipe Downstream Clamp.

2. Tighten pipe clamp bolts (Figure 4, Item 4) securely.

EXHAUST BRAKE REMOVAL AND INSTALLATION - (CONTINUED)

3. Install exhaust brake (Figure 5, Item 6) and pipe clamp (Figure 5, Item 5) on turbocharger (Figure 5, Item 4). Tighten pipe clamp nut (Figure 5, Item 3) securely.

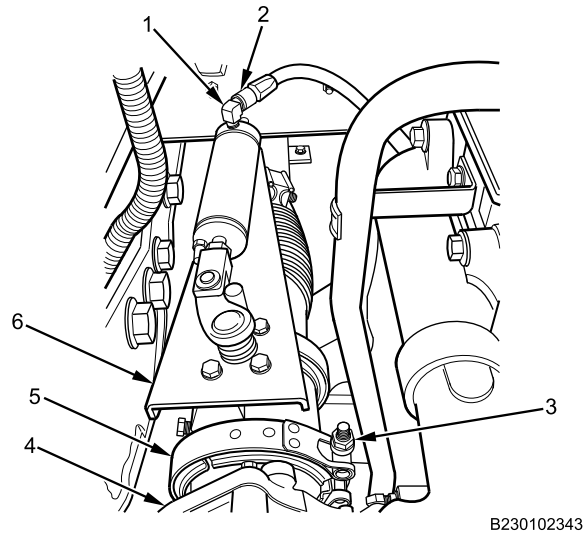


Figure 5. Exhaust Brake and Supply Air Line Connection.

4. Install exhaust brake supply air line connection (Figure 5, Item 2) on exhaust brake air line angle fitting (Figure 5, Item 1) and tighten securely.
5. Install pipe clamp (Figure 6, Item 4) on exhaust brake (Figure 6, Item 3) and turbocharger pipe (Figure 6, Item 1). Tighten pipe clamp nut (Figure 6, Item 2) securely.

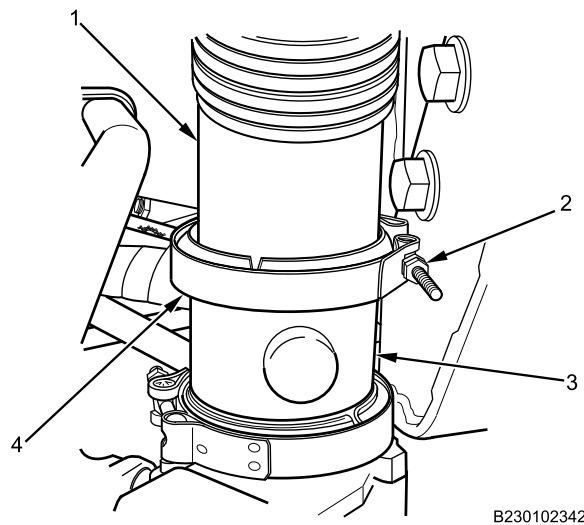


Figure 6. Exhaust Brake and Turbocharger Pipe Connection.

END OF TASK

EXHAUST BRAKE REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install front propeller shaft (WP 0468)
2. Install belly armor (WP 0606).
3. Install air intake tube (WP 0256)
4. Close engine hood (TM-9-2355-106-10).
5. Turn MAIN POWER switch on (TM-9-2355-106-10).
6. Remove wheel chocks (TM-9-2355-106-10).
7. Test-drive vehicle to verify exhaust brake system operation (TM-9-2355-106-10).
8. Set transmission in NEUTRAL (N) (TM-9-2355-106-10).
9. Set vehicle parking brake (TM-9-2355-106-10).
10. Turn engine off (TM-9-2355-106-10).
11. Turn MAIN POWER switch off (TM-9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**EXHAUST BRAKE SOLENOID REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Tape (WP 0794, Item 50)

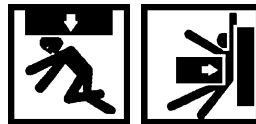
References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

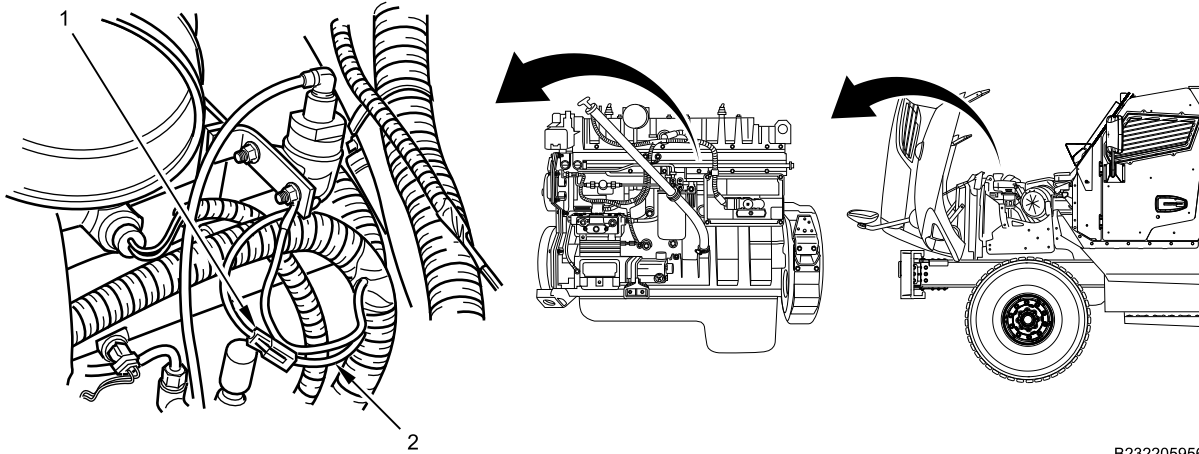
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Remove air cleaner assembly (WP 0257)

WARNING

Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

EXHAUST BRAKE SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

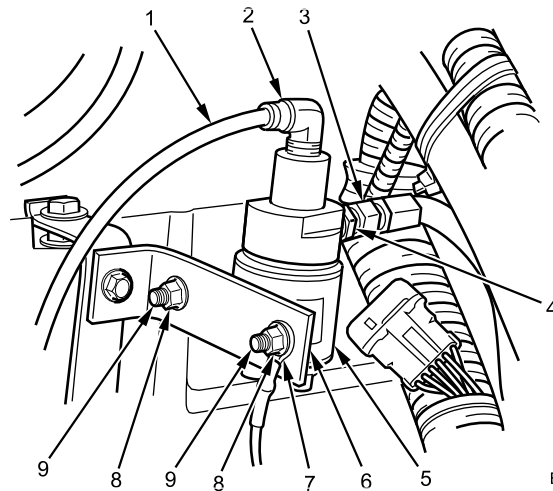
1. Disconnect exhaust brake solenoid connector (Figure 1, Item 1) from engine wiring harness (Figure 1, Item 2).



B232205956

Figure 1. Exhaust Brake Solenoid and Electrical Connector.

2. Remove BLACK nylon tube (Figure 2, Item 1) from exhaust brake solenoid (Figure 2, Item 5) by pushing hose into fitting, pushing on collar to release hose, and pulling hose out of fitting.



B232201405

Figure 2. Exhaust Brake Solenoid and Bracket.

3. Remove hose assembly (Figure 2, Item 3) from exhaust brake solenoid (Figure 2, Item 5).
4. Remove two nuts (Figure 2, Item 8), ground wire (Figure 2, Item 7), two bolts (Figure 2, Item 9), and exhaust brake solenoid (Figure 2, Item 5) from bracket (Figure 2, Item 6).
5. Remove hose fitting (Figure 2, Item 2) from exhaust brake solenoid (Figure 2, Item 5).
6. Remove hose fitting (Figure 2, Item 4) from exhaust brake solenoid (Figure 2, Item 5).

END OF TASK

EXHAUST BRAKE SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Apply thread sealant tape to all fittings.

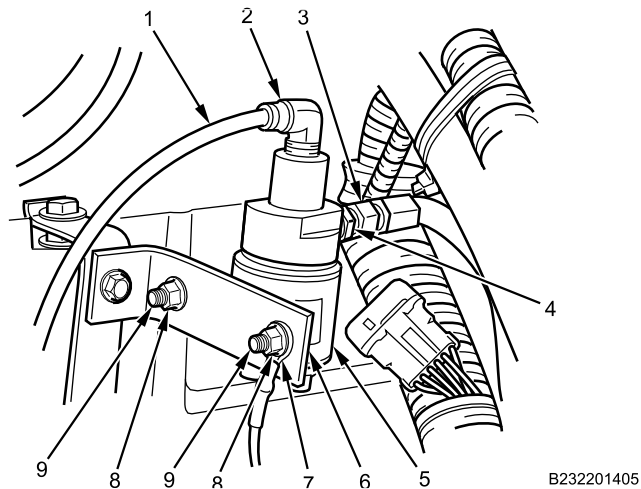


Figure 3. Exhaust Brake Solenoid and Bracket.

2. Install hose fitting (Figure 3, Item 2) on exhaust brake solenoid (Figure 3, Item 5).
3. Install hose fitting (Figure 3, Item 4) on exhaust brake solenoid (Figure 3, Item 5).
4. Install exhaust brake solenoid (Figure 3, Item 5) and ground wire (Figure 3, Item 7) on bracket (Figure 3, Item 6), with two bolts (Figure 3, Item 9) and nuts (Figure 3, Item 8). Tighten and secure.
5. Install hose assembly (Figure 3, Item 3) on exhaust brake solenoid (Figure 3, Item 5)
6. Install BLACK nylon tube (Figure 3, Item 1) on exhaust brake solenoid (Figure 3, Item 5) by pushing tube into fitting.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

7. Apply dielectric grease to all electrical connectors.

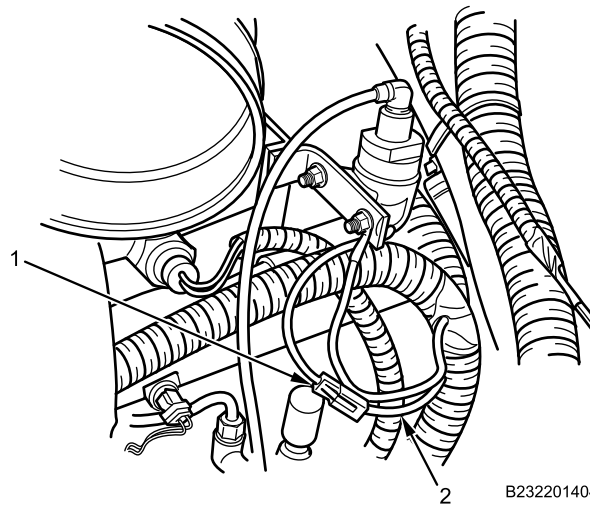
EXHAUST BRAKE SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)

Figure 4. Exhaust Brake Solenoid and Electrical Connector.

8. Connect exhaust brake solenoid connector (Figure 4, Item 1) to engine harness (Figure 4, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install air cleaner assembly (WP 0257).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Check for leaks.
5. Check dash to make sure no engine lights are illuminated (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

EXHAUST BRAKE SUPPLY AIR LINE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Socket, deep well, 3/8-inch drive, 6-pt, 15mm
(WP 0795, Item 100)

Materials/Parts

Gloves (WP 0794, Item 19)
Goggles (WP 0794, Item 20)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM 9-2355-106-10)
Air cleaner assembly removed (WP 0257)
Air intake tube (to turbo) removed (WP 0256)
Engine cover removed (WP 0649)

WARNING

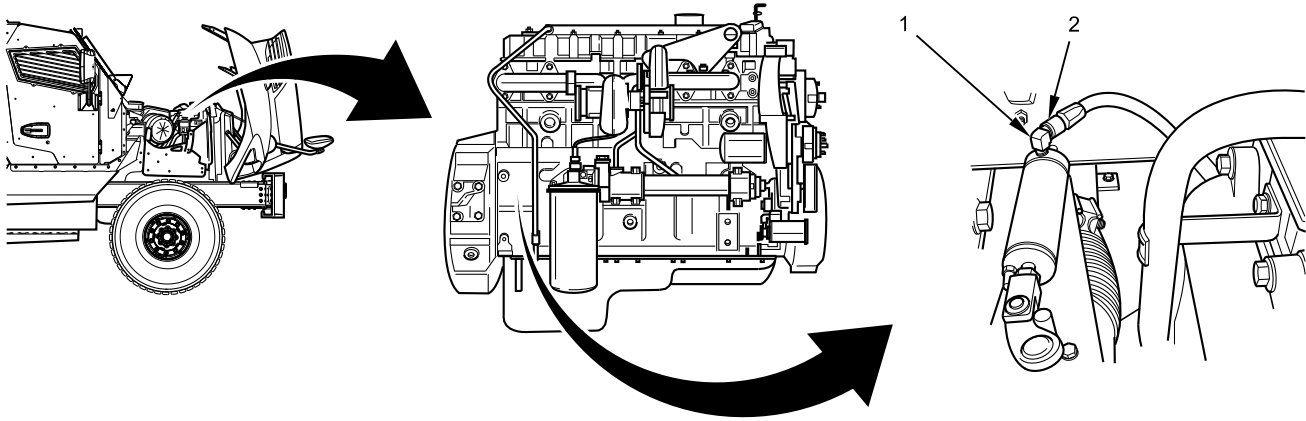


Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

EXHAUST BRAKE SUPPLY AIR LINE REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

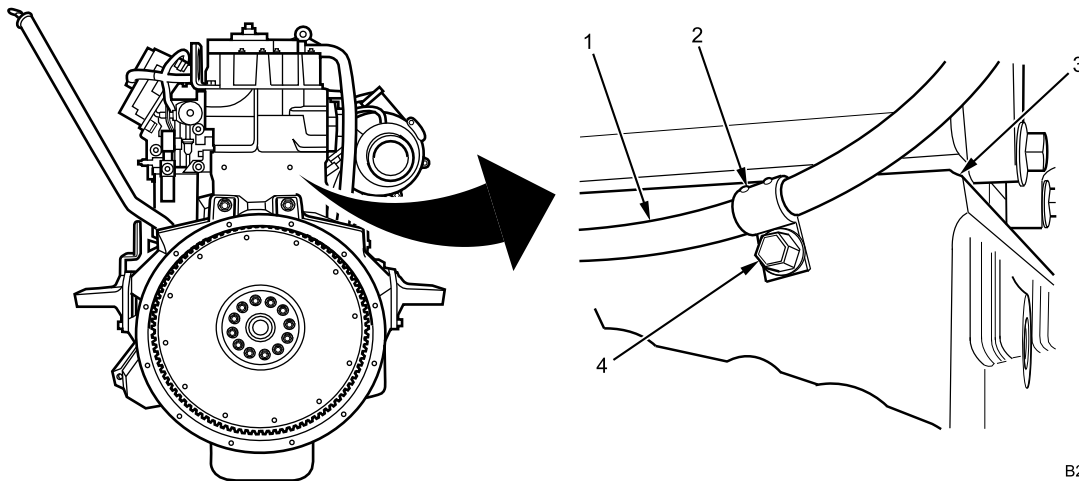
1. Remove exhaust brake supply air line connection (Figure 1, Item 2) from exhaust brake air line angle fitting (Figure 1, Item 1).



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Figure 1. Exhaust Brake Supply Air Line Connection.

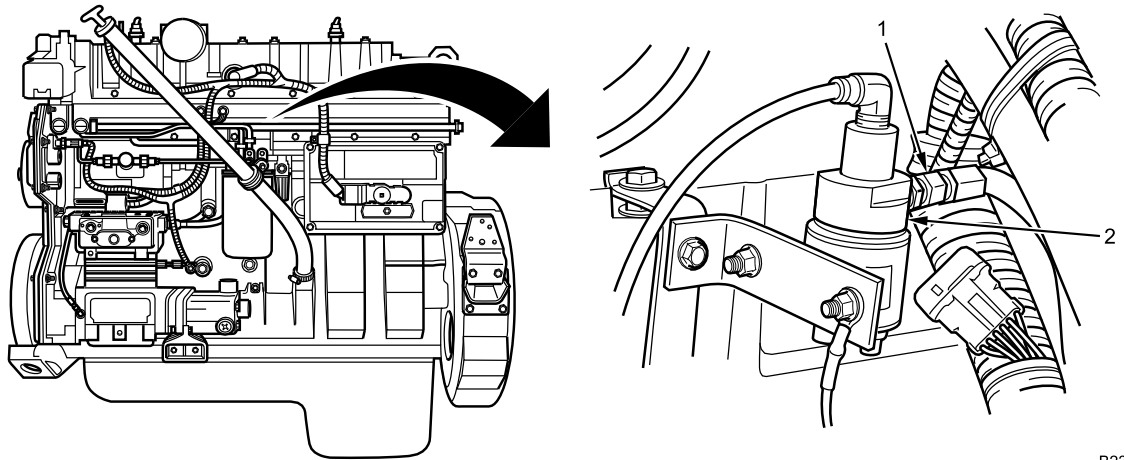
2. Remove exhaust brake supply air line clamp bolt (Figure 2, Item 4) from rear of cylinder block (Figure 2, Item 3).



B230105958

Figure 2. Exhaust Brake Supply Air Line Clamp.

3. Remove exhaust brake supply air line connection (Figure 3, Item 1) from exhaust brake valve solenoid (Figure 3, Item 2) and remove exhaust brake supply air line.

EXHAUST BRAKE SUPPLY AIR LINE REMOVAL AND INSTALLATION - (CONTINUED)

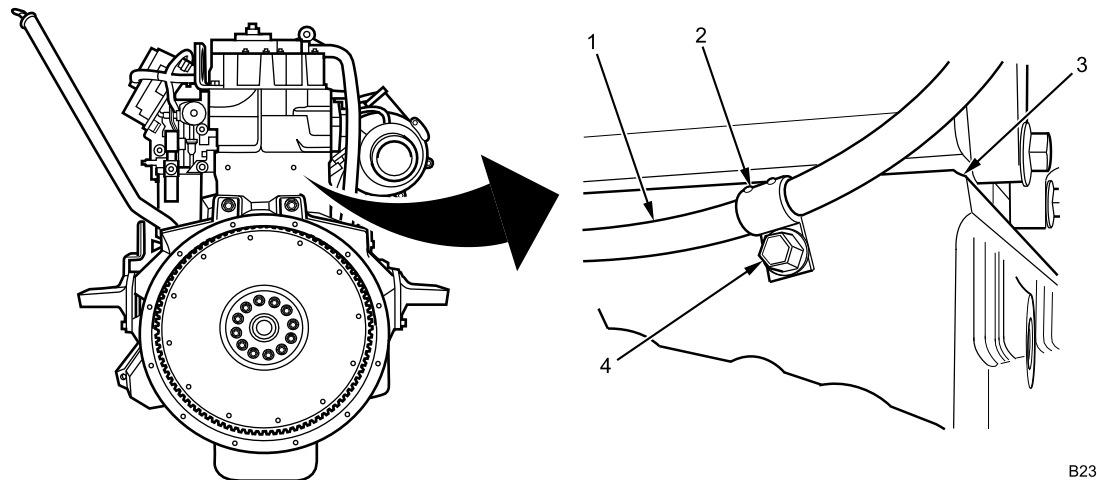
B230105959

Figure 3. Exhaust Brake Supply Air Line Connection.

4. Remove exhaust brake supply air line clamp (Figure 2, Item 2) from exhaust brake supply air line (Figure 2, Item 1).

END OF TASK**INSTALLATION**

1. Install exhaust brake supply air line clamp (Figure 4, Item 2) on exhaust brake supply air line (Figure 4, Item 1).



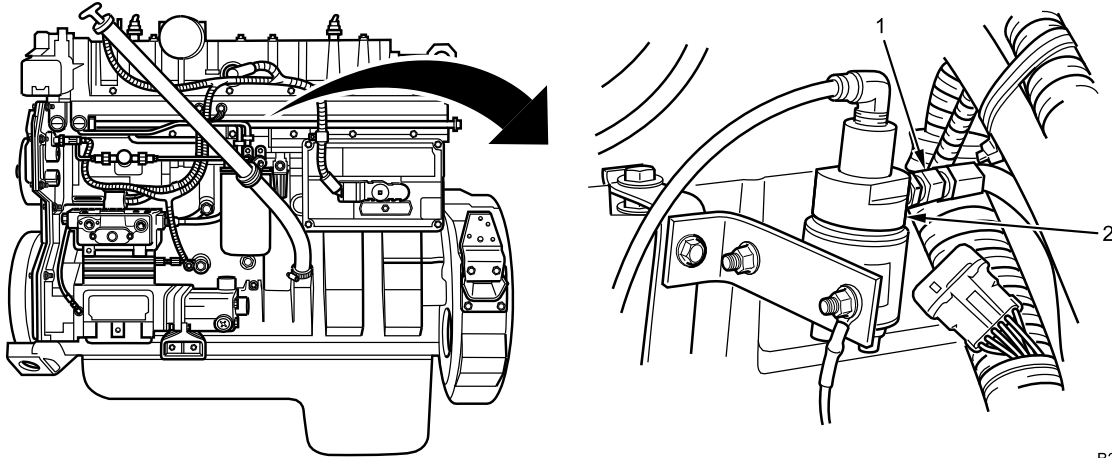
B230105958

Figure 4. Exhaust Brake Supply Air Line Clamp.

2. Install exhaust brake supply air line clamp bolt (Figure 4, Item 4) on rear of cylinder block (Figure 4, Item 3) and tighten securely.

EXHAUST BRAKE SUPPLY AIR LINE REMOVAL AND INSTALLATION - (CONTINUED)

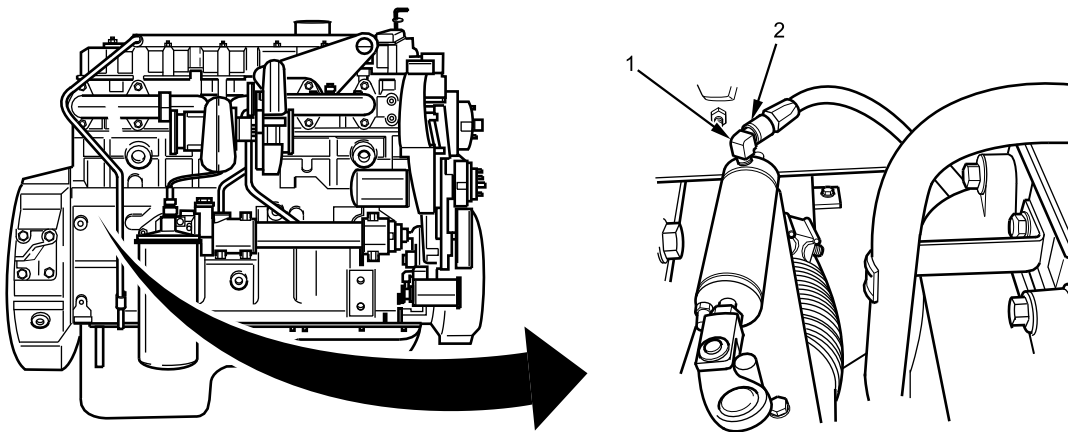
3. Install exhaust brake supply air line connection (Figure 5, Item 1) on exhaust brake valve solenoid (Figure 5, Item 2) and tighten securely.



B230105959

Figure 5. Exhaust Brake Supply Air Line Connection.

4. Install exhaust brake supply air line connection (Figure 6, Item 2) on exhaust brake air line angle fitting (Figure 6, Item 1) and tighten securely.



B230105960

Figure 6. Exhaust Brake Supply Air Line Connection.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install air intake tube (to turbo) (WP 0256).
2. Install air cleaner assembly (WP 0257).
3. Close engine hood (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Test drive vehicle to verify exhaust brake system operation (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Set vehicle parking brake (TM 9-2355-106-10).

EXHAUST BRAKE SUPPLY AIR LINE REMOVAL AND INSTALLATION - (CONTINUED)

9. Turn engine off (TM 9-2355-106-10).
10. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

FUEL INJECTOR REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Adapter, socket, wrench drive, 1/4-inch male -
3/8-inch female (WP 0795, Item 3)
Wrench, torque, dial, 3/8-inch drive, 300 lb-in.
(WP 0795, Item 147)

TM 2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Rocker cover and gasket removed (WP 0228)

Materials/Parts

Lubricating oil (WP 0794, Item 27)
Injector gasket kit (WP 0796, Item 91)

References

TM 9-2355-106-10

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

FUEL INJECTOR REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Release wire clip (Figure 1, Item 2) and disconnect electrical connector (Figure 1, Item 3) from fuel injector (Figure 1, Item 1).

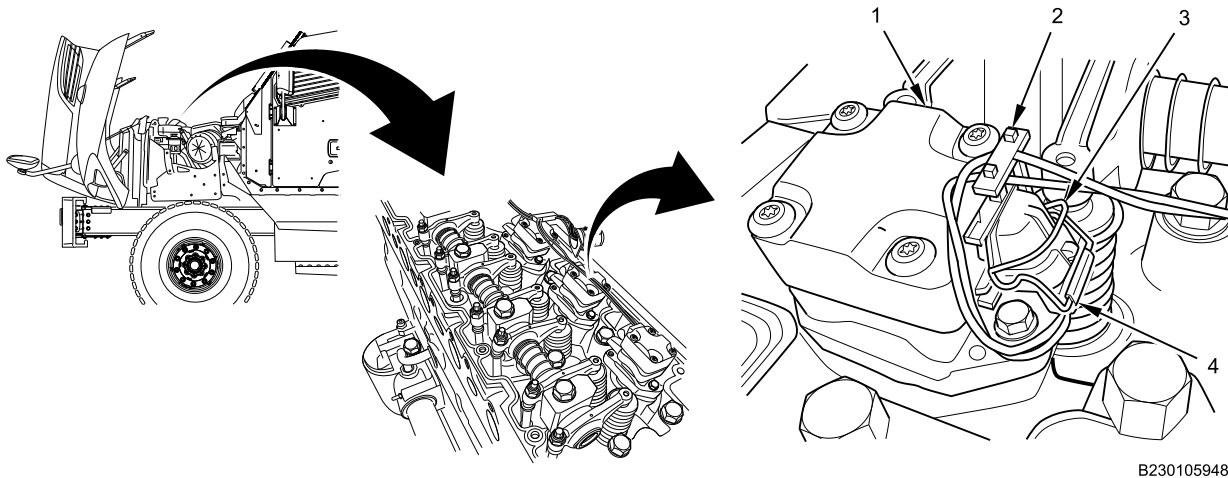


Figure 1. Fuel Injector Electrical Connector.

2. Disconnect wiring harness clip (Figure 2, Item 2) by pushing up on upper tab (Figure 2, Item 1) and pushing sideways on lower tab (Figure 2, Item 3).

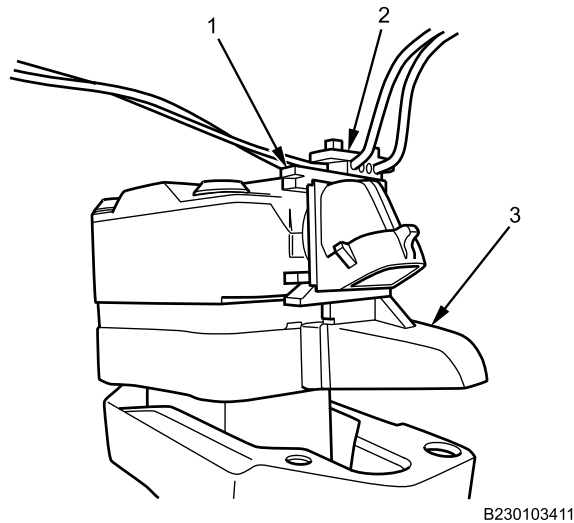


Figure 2. Fuel Injector Harness Clip.

NOTE

Fuel injectors have two different styles of bolts. Note the location of the two different bolts to ensure proper installation.

Note the orientation of the fuel injector to ensure proper installation.

3. Remove bolt (Figure 3, Item 5), shoulder bolt (Figure 3, Item 2), holddown clamp (Figure 3, Item 4), and fuel injector (Figure 3, Item 1) from cylinder head (Figure 3, Item 3).

FUEL INJECTOR REMOVAL AND INSTALLATION - (CONTINUED)

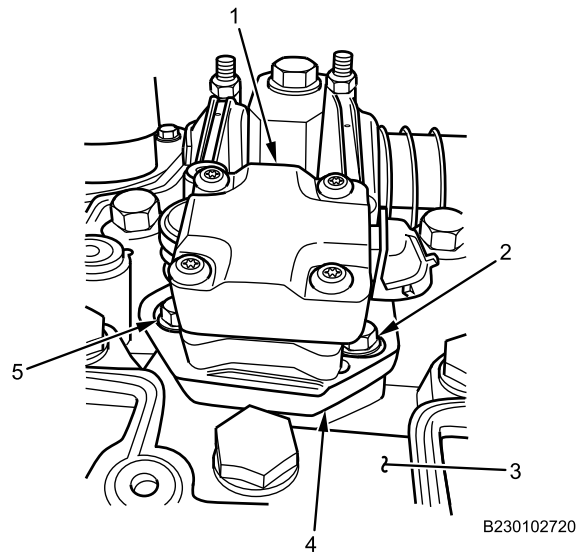
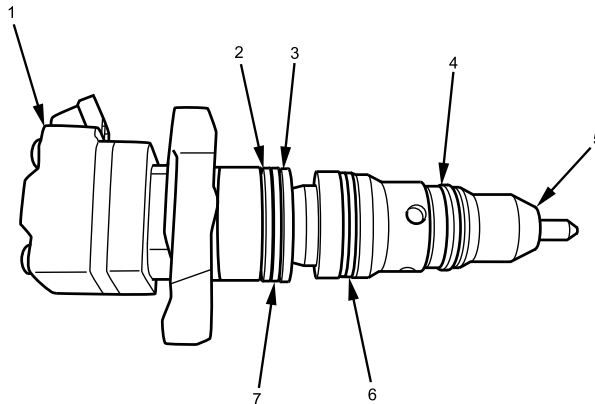


Figure 3. Fuel Injector Removal.

4. Remove gasket (Figure 4, Item 5), O-ring (Figure 4, Item 4), lower seal (Figure 4, Item 6), upper seal (Figure 4, Item 3), upper cushion ring (Figure 4, Item 7), and upper backup ring (Figure 4, Item 2) from fuel injector (Figure 4, Item 1).



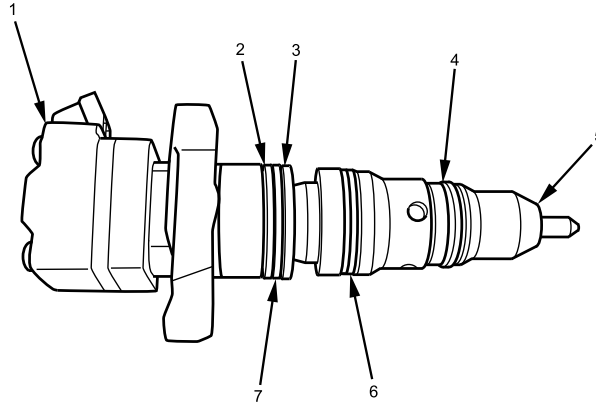
B230103412

Figure 4. Fuel Injector and Gaskets.

END OF TASK

FUEL INJECTOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

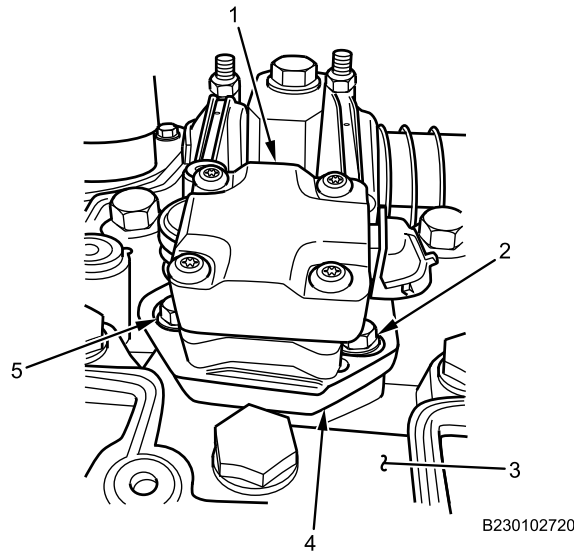
1. Install upper backup ring (Figure 5, Item 2), upper cushion ring (Figure 5, Item 7), upper seal (Figure 5, Item 3), lower seal (Figure 5, Item 6), O-ring (Figure 5, Item 4), and gasket (Figure 5, Item 5) on fuel injector (Figure 5, Item 1).



B230103412

Figure 5. Fuel Injector and Gaskets.

2. Apply clean engine oil on fuel injector seals.



B230102720

Figure 6. Fuel Injector Installation.

CAUTION

Ensure injector holddown bolts are torqued to specification. Failure to comply could result in engine damage.

3. Install fuel injector (Figure 6, Item 1) and holddown clamp into cylinder head (Figure 6, Item 3) with bolt (Figure 6, Item 5) and shoulder bolt (Figure 6, Item 2). Tighten bolt and shoulder bolt to 120 lb-in. (13 N•m).

FUEL INJECTOR REMOVAL AND INSTALLATION - (CONTINUED)

4. Connect wiring harness clip (Figure 7, Item 2) on fuel injector (Figure 7, Item 1).

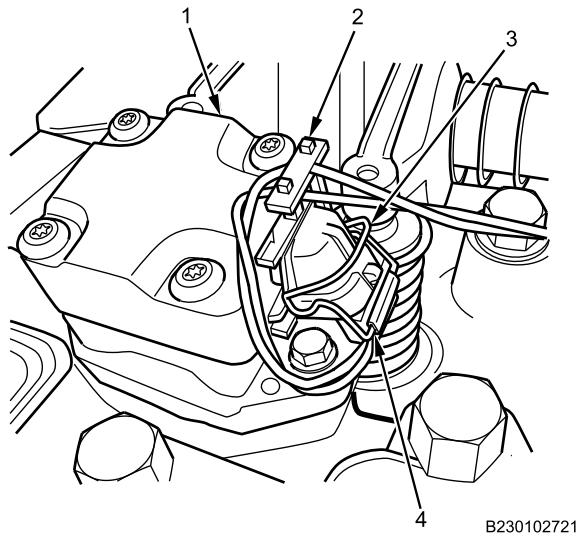


Figure 7. Fuel Injector Electrical Connector.

5. Connect electrical connector (Figure 7, Item 4) on fuel injector (Figure 7, Item 1) and snap wire clip (Figure 7, Item 3) in place.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install rocker cover and gasket (WP 0228).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and verify operation (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
drive (WP 0795, Item 145)

Materials/Parts

Sealing compound (WP 0794, Item 45)
Gasket (WP 0796, Item 73)
O-ring - (2) (WP 0796, Item 92)
O-ring (WP 0796, Item 75)
Rags (WP 0794, Item 39)
Lubricating oil (WP 0794, Item 27)
Gloves (WP 0794, Item 19)
Goggles, industrial (WP 0794, Item 20)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Left charge air cooler (CAC) hose removed
(WP 0264)
Left engine armor removed (WP 0597)
Engine cover removed (WP 0649)
Injection Control Pressure (ICP) sensor removed
(WP 0391)
Fuel pressure regulator removed (WP 0251)
Air cleaner assembly removed (WP 0257)

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

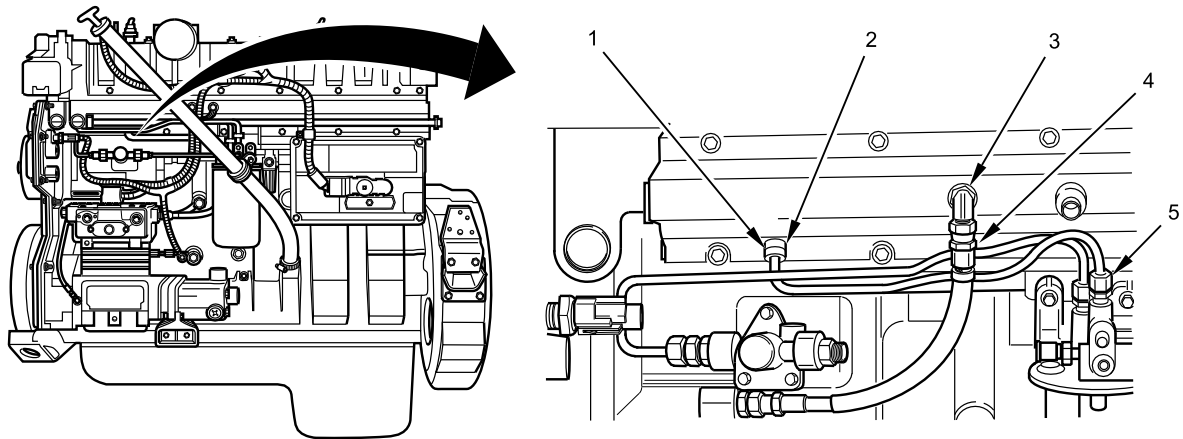
Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)

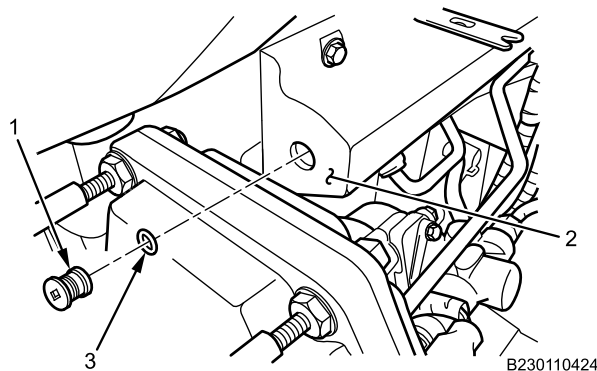
REMOVAL



B230304929

Figure 1. Fuel Lines Disconnected.

1. Position rags under fuel lines (Figure 1, Item 1 and 4).
2. Disconnect fuel line (Figure 1, Item 1) from fuel rail fitting (Figure 1, Item 2) and allow fuel to drain.
3. Disconnect fuel line (Figure 1, Item 4) from angle fitting (Figure 1, Item 3).
4. Loosen fuel line fitting (Figure 1, Item 5).



B230110424

Figure 2. Front of Oil/Fuel Manifold.

5. Position rags under front of oil/fuel manifold (Figure 2, Item 2).
6. Remove plug (Figure 2, Item 1) and seal (Figure 2, Item 3) from front of oil/fuel manifold (Figure 2, Item 2) and allow oil and fuel to drain. Discard seal.

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)

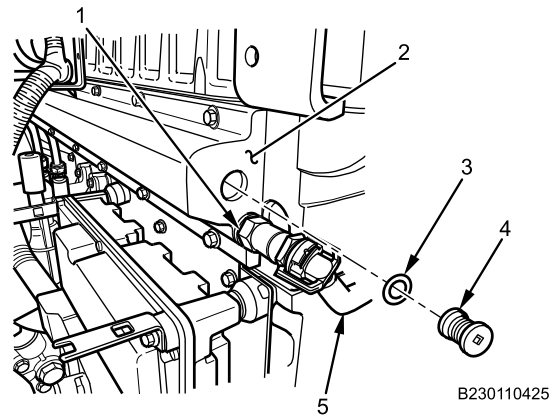


Figure 3. Rear of Oil/Fuel Manifold.

7. Position rags under fuel primer regulator (Figure 3, Item 1).
8. Remove plug (Figure 3, Item 4) and seal (Figure 3, Item 3) from rear of oil/fuel manifold (Figure 3, Item 2) and allow oil and fuel to drain. Discard seal.
9. Disconnect fuel line (Figure 3, Item 5) from fuel primer regulator (Figure 3, Item 1).

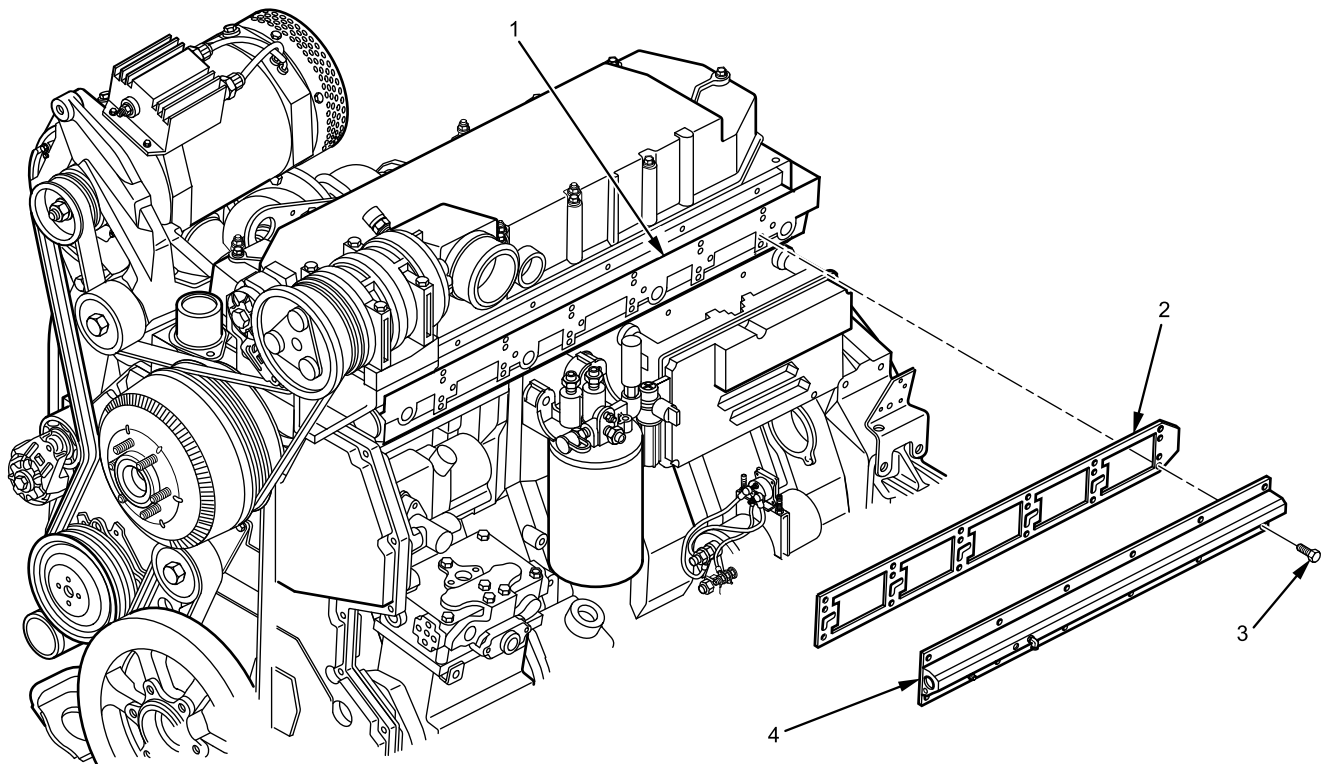


Figure 4. Oil/Fuel Manifold and Gasket.

10. Remove 12 bolts (Figure 4, Item 3), oil/fuel manifold (Figure 4, Item 4), and gasket (Figure 4, Item 2) from cylinder head (Figure 4, Item 1). Discard gasket.
11. Remove rags.

END OF TASK

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)**DISASSEMBLY****NOTE**

Note location and orientation of fittings to aid installation.

1. Remove 90 degree fitting (Figure 5, Item 3) and O-ring (Figure 5, Item 2) from oil/fuel manifold (Figure 5, Item 1). Discard O-ring.

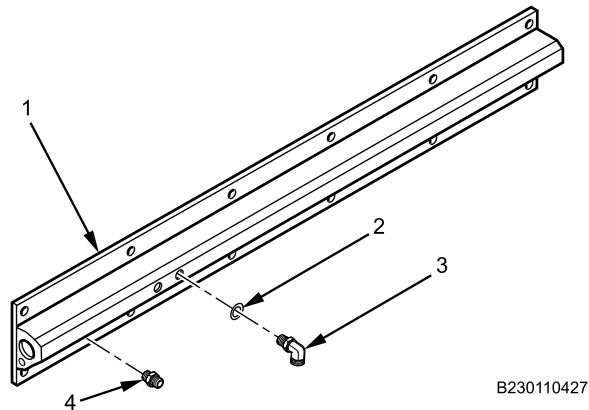


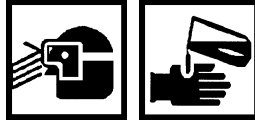
Figure 5. Oil/Fuel Manifold.

2. Remove straight fitting (Figure 5, Item 4) from oil/fuel manifold (Figure 5, Item 1).

END OF TASK**CLEANING**

1. Clean sealing compound and debris from threads on oil/fuel manifold fittings.
2. Clean any gasket residue from oil/fuel manifold gasket mating surfaces on oil/fuel manifold and cylinder head.

END OF TASK

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)**ASSEMBLY****WARNING**

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply thread sealing compound on straight fitting (Figure 6, Item 4).

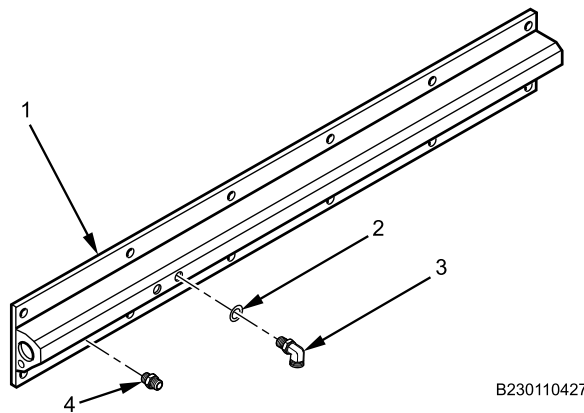


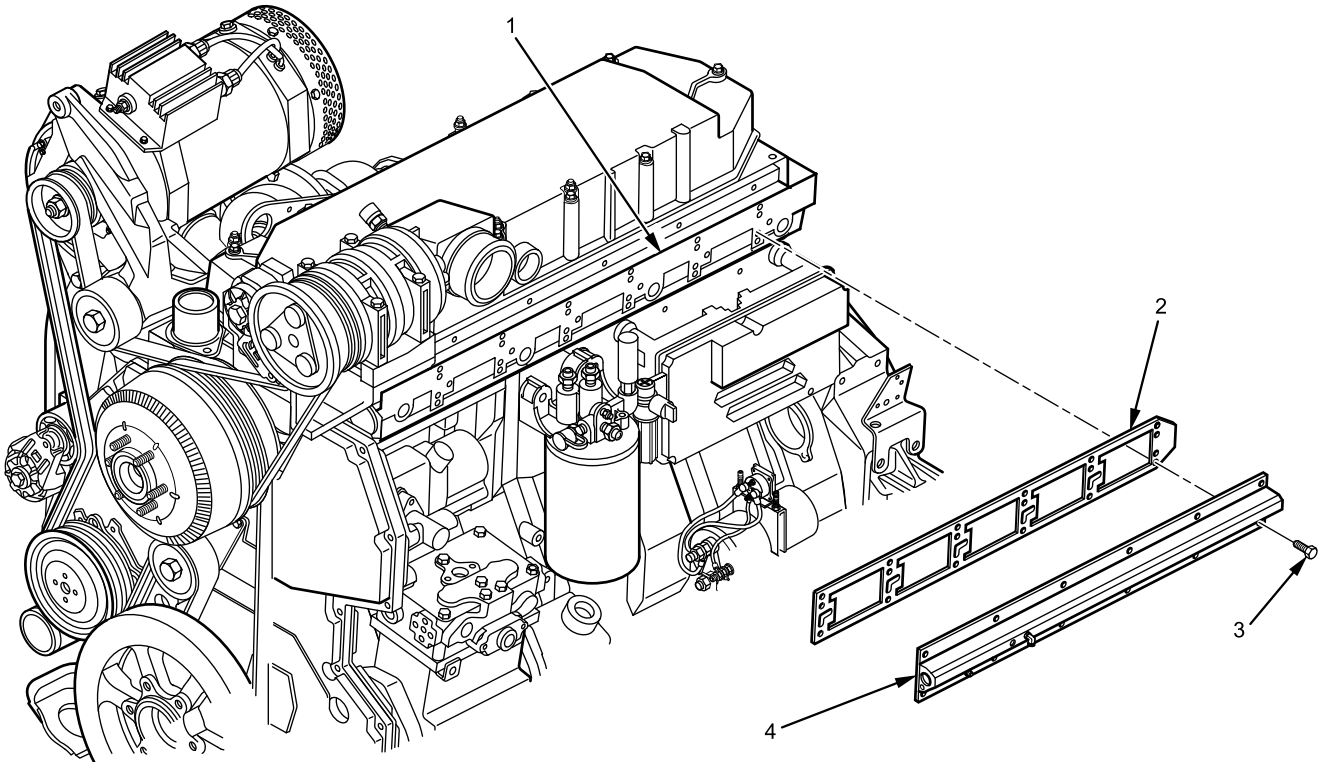
Figure 6. Oil/Fuel Manifold.

2. Install new O-ring (Figure 6, Item 2) on 90 degree fitting (Figure 6, Item 3).
3. Install fittings (Figure 6, Item 3 and 4) on oil/fuel manifold (Figure 6, Item 1) in position and orientation noted during disassembly.

END OF TASK

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)

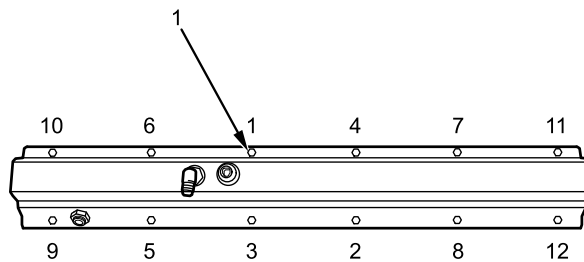
INSTALLATION



B230110426

Figure 7. Oil/Fuel Manifold and Gasket.

1. Position new gasket (Figure 7, Item 2) and oil/fuel manifold (Figure 7, Item 4) on cylinder head (Figure 7, Item 1) and install 12 bolts (Figure 7, Item 3) finger-tight.



B230110428

Figure 8. Oil/Fuel Manifold Bolt Torque Sequence.

2. Torque 12 oil/fuel manifold bolts (Figure 8, Item 1) in sequence shown to 20 lb-ft (27 N•m).

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)

WARNING

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Install new seal (Figure 9, Item 3) on rear oil/fuel manifold plug (Figure 9, Item 4).

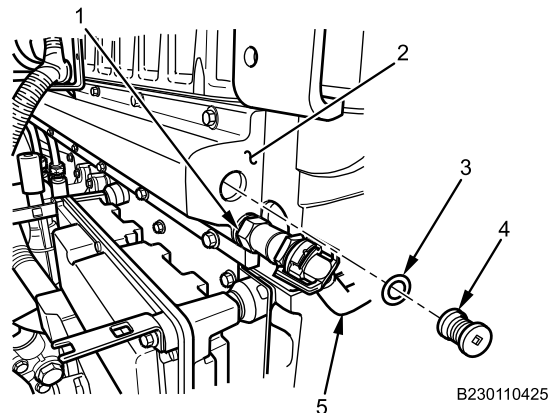


Figure 9. Rear Oil/Fuel Manifold Plug.

4. Apply thread sealing compound to rear oil/fuel manifold plug (Figure 9, Item 4), and install plug on rear of oil/fuel manifold (Figure 9, Item 2). Torque plug to 26 lb-ft (35 N•m).
5. Connect fuel line (Figure 9, Item 5) on fuel primer regulator (Figure 9, Item 1).

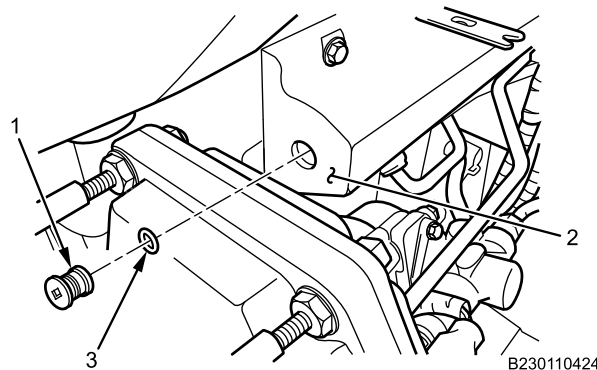
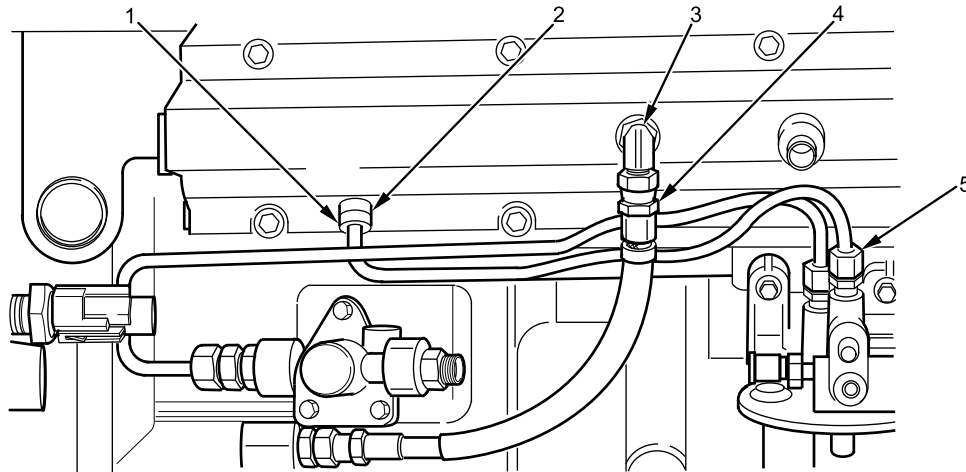


Figure 10. Front of Oil/Fuel Manifold.

6. Install new seal (Figure 10, Item 3) on front oil/fuel manifold plug (Figure 10, Item 1).
7. Apply thread sealing compound to front oil/fuel manifold plug (Figure 10, Item 1).
8. Install plug (Figure 10, Item 1) on front of oil/fuel manifold (Figure 10, Item 2) and torque to 26 lb-ft (35 N•m).

OIL/FUEL MANIFOLD REMOVAL AND INSTALLATION - (CONTINUED)

B230303545

Figure 11. Connect Fuel lines.

9. Install fuel line (Figure 11, Item 1) on fuel rail fitting (Figure 11, Item 2) and tighten securely.
10. Install fuel line (Figure 11, Item 4) on angle fitting (Figure 11, Item 3) and tighten securely.
11. Tighten fitting (Figure 11, Item 5) securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install ICP sensor (WP 0391).
2. Install fuel pressure regulator (WP 0251).
3. Install engine cover (WP 0649).
4. Install left CAC hose (WP 0264).
5. Check engine oil level (WP 0233).
6. Turn MAIN POWER switch on (TM 9-2355-106-10).
7. Prime fuel system (WP 0255).
8. Start engine and verify operation (TM 9-2355-106-10).
9. Turn engine off (TM 9-2355-106-10).
10. Turn MAIN POWER switch off (TM 9-2355-106-10).
11. Check for oil leaks (TM 9-2355-106-10).
12. Install left engine armor (WP 0597).
13. Close engine hood (TM 9-2355-106-10).
14. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL PRESSURE REGULATOR REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, combination, standard length, 12-pt, 1-1/8
inch, chrome (WP 0795, Item 136)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM 9-2355-106-10)
Engine cover removed (WP 0649)

Materials/Parts

O-Ring (WP 0796, Item 92)
Gasket (WP 0796, Item 96)
Gasket (WP 0796, Item 162)
Rags (WP 0794, Item 39)

References

TM 9-2355-106-10

WARNING



Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

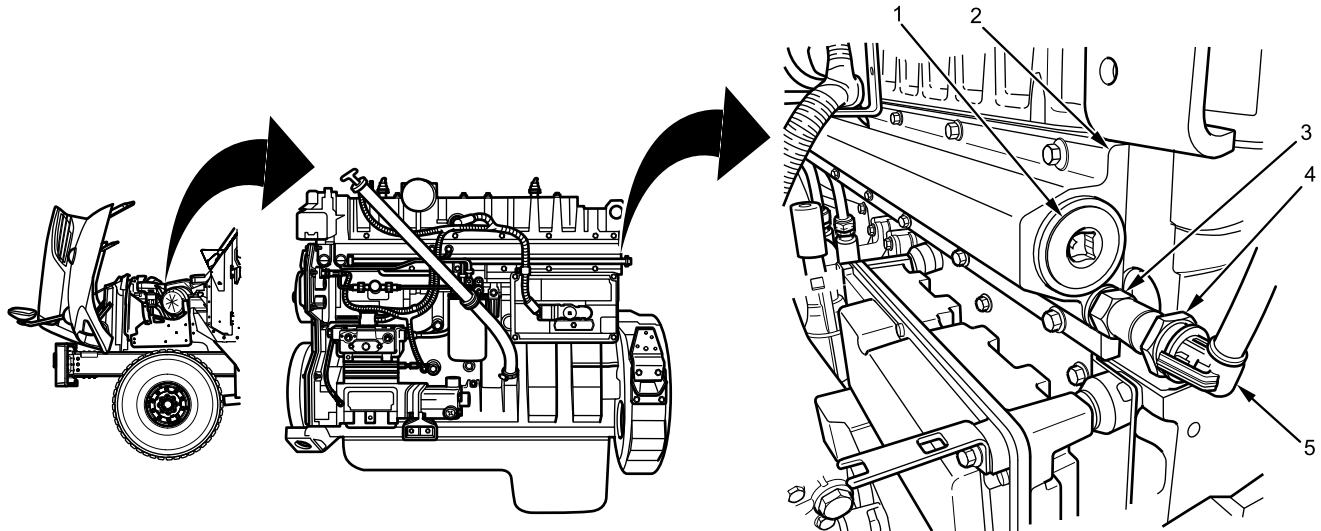
Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

FUEL PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Supply oil manifold must be drained prior to removing fuel pressure regulator to prevent any fuel leakage in cylinder bore.

1. Place drain pan under vehicle near back of engine under supply manifold end plug (Figure 1, Item 1).



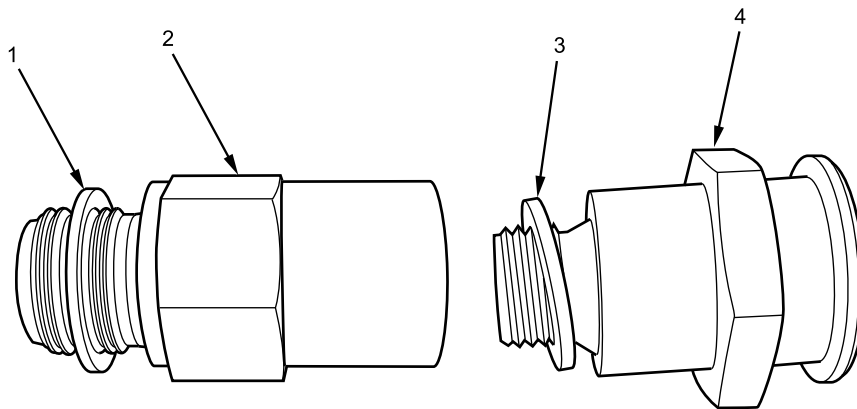
B230305984

Figure 1. Fuel Pressure Regulator Removal.

2. Remove supply manifold end plug (Figure 1, Item 1) and O-ring from supply manifold (Figure 1, Item 2). Allow manifold to drain. Remove and discard O-ring.
3. Remove fuel line from fuel regulator quick-connect (Figure 1, Item 4) by pressing clip on fuel line fitting (Figure 1, Item 5) and pulling fuel line straight off fuel regulator quick-connect.
4. Remove fuel pressure regulator (Figure 1, Item 3) from supply manifold (Figure 1, Item 2).

END OF TASK**DISASSEMBLY**

1. Remove fuel regulator quick connect (Figure 2, Item 4) and gasket (Figure 2, Item 3) from fuel pressure regulator (Figure 2, Item 2). Discard gasket.

FUEL PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)

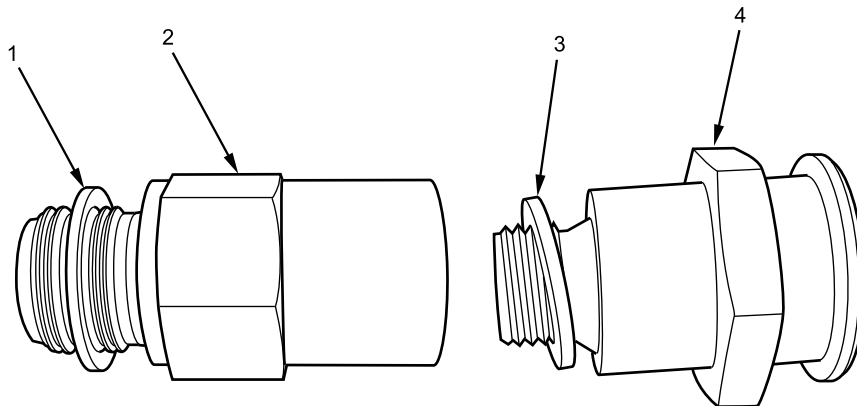
B230305975

Figure 2. Fuel Pressure Regulator Disassembly.

2. Remove and discard gasket (Figure 2, Item 1) from fuel pressure regulator (Figure 2, Item 2).

END OF TASK**ASSEMBLY**

1. Install new gasket (Figure 3, Item 3) on fuel regulator quick connect (Figure 3, Item 4).



B230305975

Figure 3. Fuel Pressure Regulator Assembly.

2. Install fuel regulator quick connect (Figure 3, Item 4) on fuel pressure regulator (Figure 3, Item 2) and tighten securely.
3. Install new gasket (Figure 3, Item 1) on fuel pressure regulator (Figure 3, Item 2).

END OF TASK

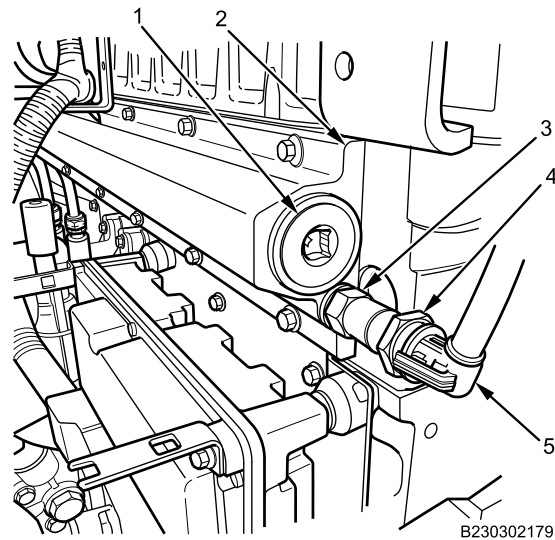
FUEL PRESSURE REGULATOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

Figure 4. Fuel Pressure Regulator Installation.

1. Install new O-ring on supply manifold end plug (Figure 4, Item 1).
2. Install supply manifold end plug (Figure 4, Item 1) on supply manifold (Figure 4, Item 2). Tighten plug to 26 lb-ft (35 N•m).
3. Install fuel pressure regulator (Figure 4, Item 3) and washer on supply manifold (Figure 4, Item 2). Tighten fuel pressure regulator securely.
4. Install fuel line (Figure 4, Item 5) on fuel regulator quick connect (Figure 4, Item 4).
5. With a rag, wipe any excess fuel and oil off supply manifold end plug (Figure 4, Item 1) and fuel pressure regulator (Figure 4, Item 3).
6. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine (TM 9-2355-106-10).
3. Check for leaks with engine running (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Install engine cover (WP 0649).
7. Close engine hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 141)
Fluid gun, direct delivery (WP 0795, Item 34)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Gasket (WP 0796, Item 87)
Rags (WP 0794, Item 39)
Tape (WP 0794, Item 50)
Lubricating oil (WP 0794, Item 30)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Left engine armor plate removed (WP 0597)
Left engine armor plate bracket removed (WP 0598)
Air cleaner assembly removed (WP 0257)
Charge air cooler hoses removed (WP 0264)
Fuel supply pump removed (WP 0253)

WARNING



Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

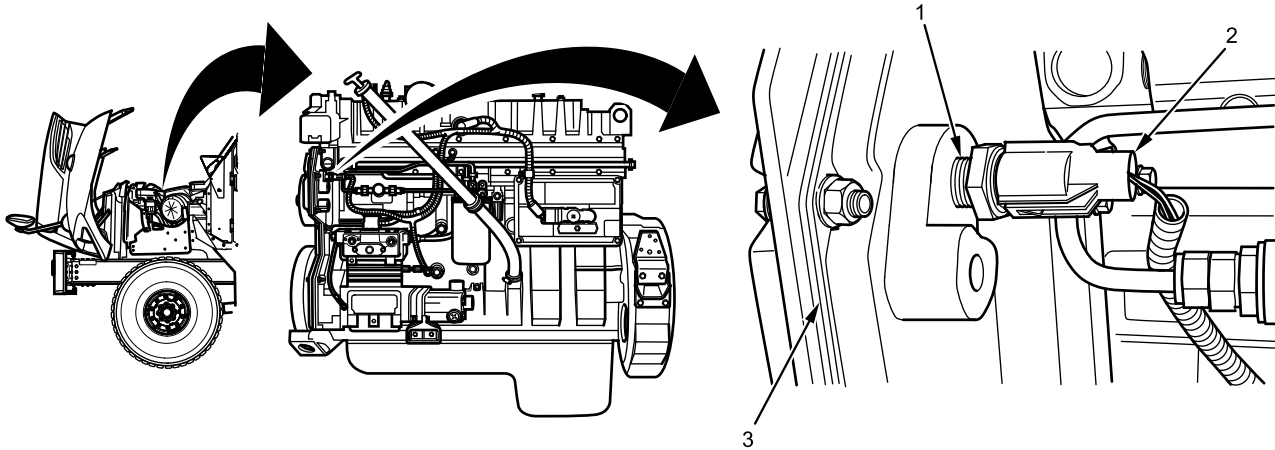
HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Dispose of used parts, rags, containers, and engine fluids in accordance with standard operating procedures. Failure to comply may result in serious injury personnel.

REMOVAL

1. Place drain pan under vehicle, below high-pressure injector pump.



B230305969

Figure 1. Engine Oil Temperature Sensor Removal.

2. Remove connector (Figure 1, Item 2) from engine oil temperature sensor (Figure 1, Item 1).

NOTE

Use rags under engine oil temperature sensor to contain oil spillage.

3. Remove engine oil temperature sensor (Figure 1, Item 1) from oil reservoir (Figure 1, Item 3).
4. Disconnect Injector Pressure Regulator (IPR) solenoid connector (Figure 2, Item 3).

HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)

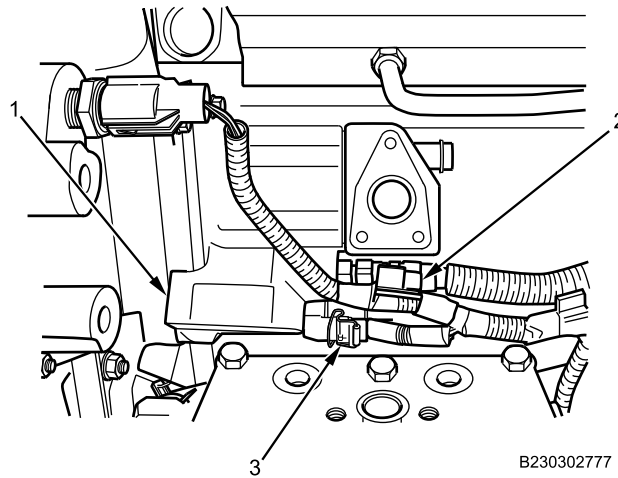


Figure 2. High-Pressure Injector Pump.

5. Remove high-pressure oil supply line (Figure 2, Item 2) at high-pressure injector pump (Figure 2, Item 1).
6. Remove lower mounting bolt (Figure 3, Item 3), upper mounting bolt (Figure 3, Item 2), and high-pressure injector pump (Figure 3, Item 1) from rear of front cover (Figure 3, Item 4). Remove and discard gasket.

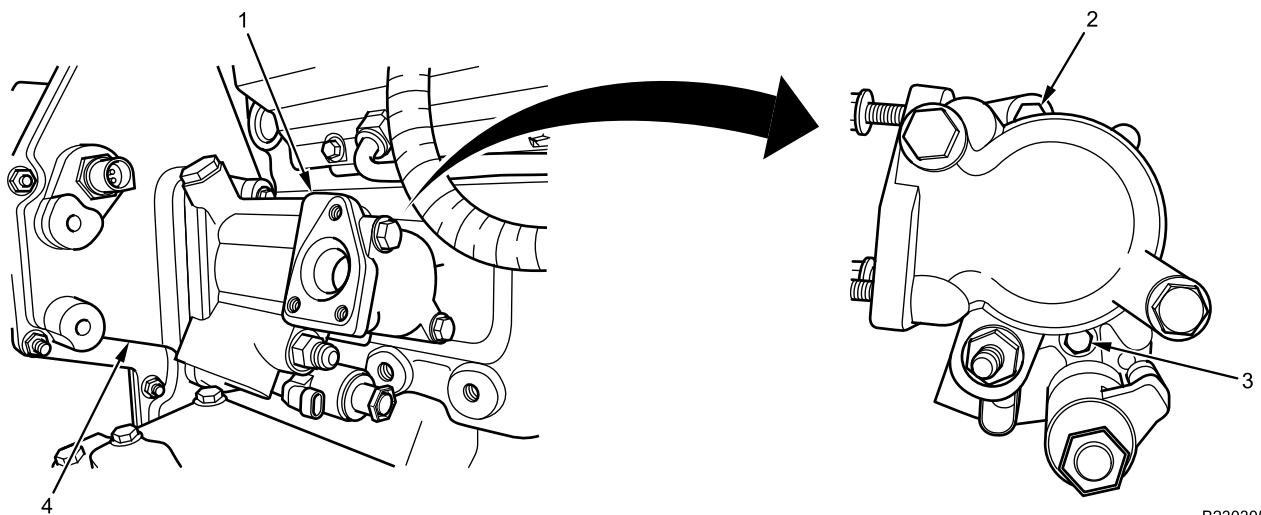
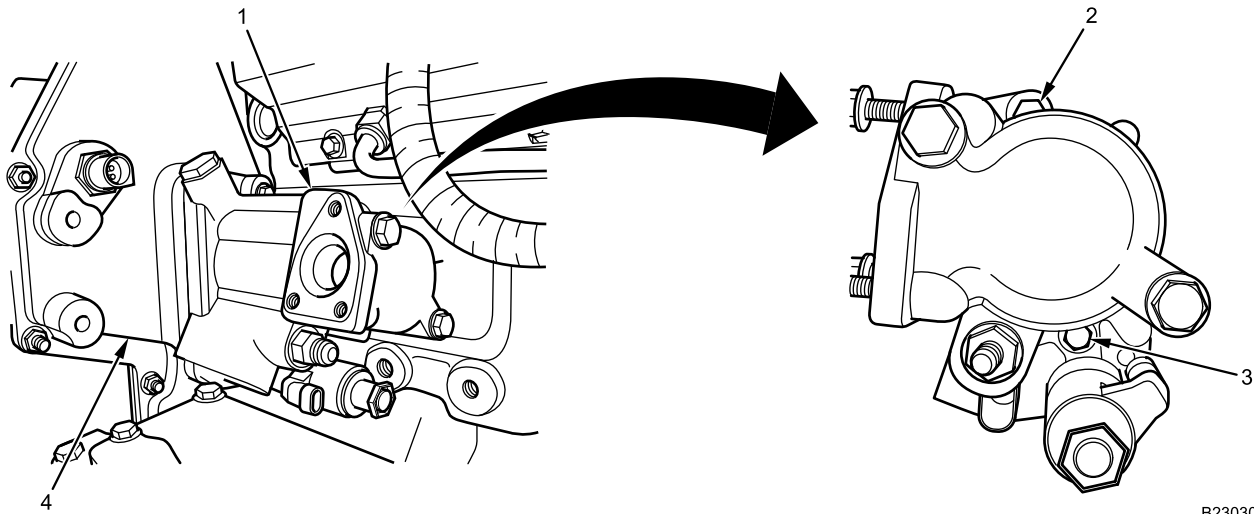


Figure 3. High-Pressure Injector Pump.

END OF TASK**INSTALLATION**

1. Install gasket on rear of front cover (Figure 4, Item 4).

HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)



B230305971

Figure 4. High-Pressure Injector Pump.

2. Install high-pressure injector pump (Figure 4, Item 1) on rear of front cover (Figure 4, Item 4).
3. Install upper mounting bolt (Figure 4, Item 2) and lower mounting bolt (Figure 4, Item 3) securing high-pressure injector pump (Figure 4, Item 1) to rear of front cover (Figure 4, Item 4). Torque bolts to 20 lb-ft (27 N•m).

HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

4. Apply dielectric grease to all electrical connectors.

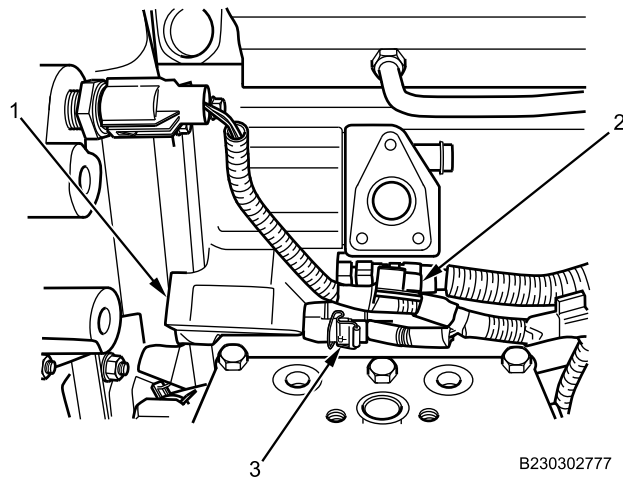
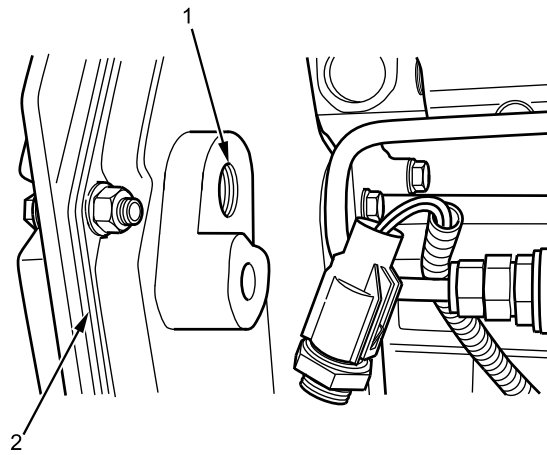


Figure 5. High-Pressure Injector Pump Lines and Connector.

5. Install high-pressure oil supply line (Figure 5, Item 2) on high-pressure injector pump (Figure 5, Item 1). Torque oil supply line fitting to 19 lb-ft (26 N•m).
6. Connect IPR solenoid connector (Figure 5, Item 3) to high-pressure injector pump (Figure 5, Item 1).
7. Prime high-pressure injector pump by adding clean engine oil through oil temperature sensor mounting hole (Figure 6, Item 1) in rear of front cover (Figure 6, Item 2) until oil reaches bottom of threaded hole.

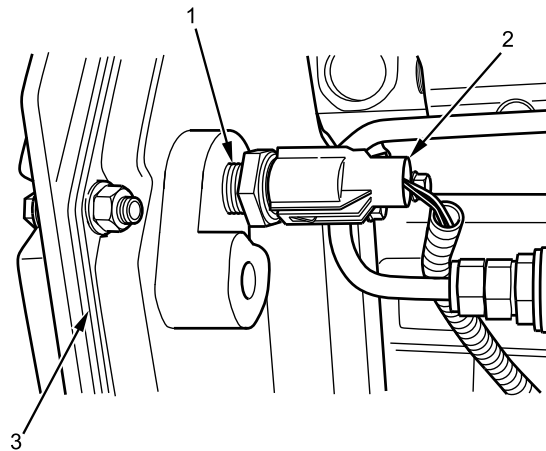
HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)

B230305972

Figure 6. Adding Engine Oil to Pump Reservoir.

HIGH-PRESSURE INJECTOR PUMP REMOVAL AND INSTALLATION - (CONTINUED)

8. Apply sealing tape on threads of engine oil temperature sensor (Figure 7, Item 1).



B230302308

Figure 7. Engine Oil Pressure Sensor.

9. Install engine oil temperature sensor (Figure 7, Item 1) in rear of front cover (Figure 7, Item 3). Tighten sensor securely.
10. Install connector (Figure 7, Item 2) on engine oil temperature sensor (Figure 7, Item 1).
11. Thoroughly clean all engine surfaces of engine oil.
12. Remove drain pan and rags.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install fuel supply pump (WP 0253).
2. Install charge air cooler hoses (WP 0264).
3. Install air cleaner assembly (WP 0257).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine and check for leaks with engine running (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install left engine armor plate bracket (WP 0598).
9. Install left side engine armor (WP 0597).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FUEL PUMP REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Wrench, torque, 40-200 lb-in., 3/8-inch drive
 (WP 0795, Item 142)
 Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Gasket (WP 0796, Item 97)
 Compound (WP 0794, Item 13)
 Rag (WP 0794, Item 39)
 Gloves (WP 0794, Item 18)
 Gloves (WP 0794, Item 19)
 Goggles, industrial (WP 0794, Item 20)
 Faceshield, industrial (WP 0794, Item 16)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secure (TM 9-2355-106-10)
 Remove left engine armor plate (WP 0597)
 Remove air cleaner assembly (WP 0257)
 Remove charge air cooler hoses (WP 0264)

References

TM 9-2355-106-10

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

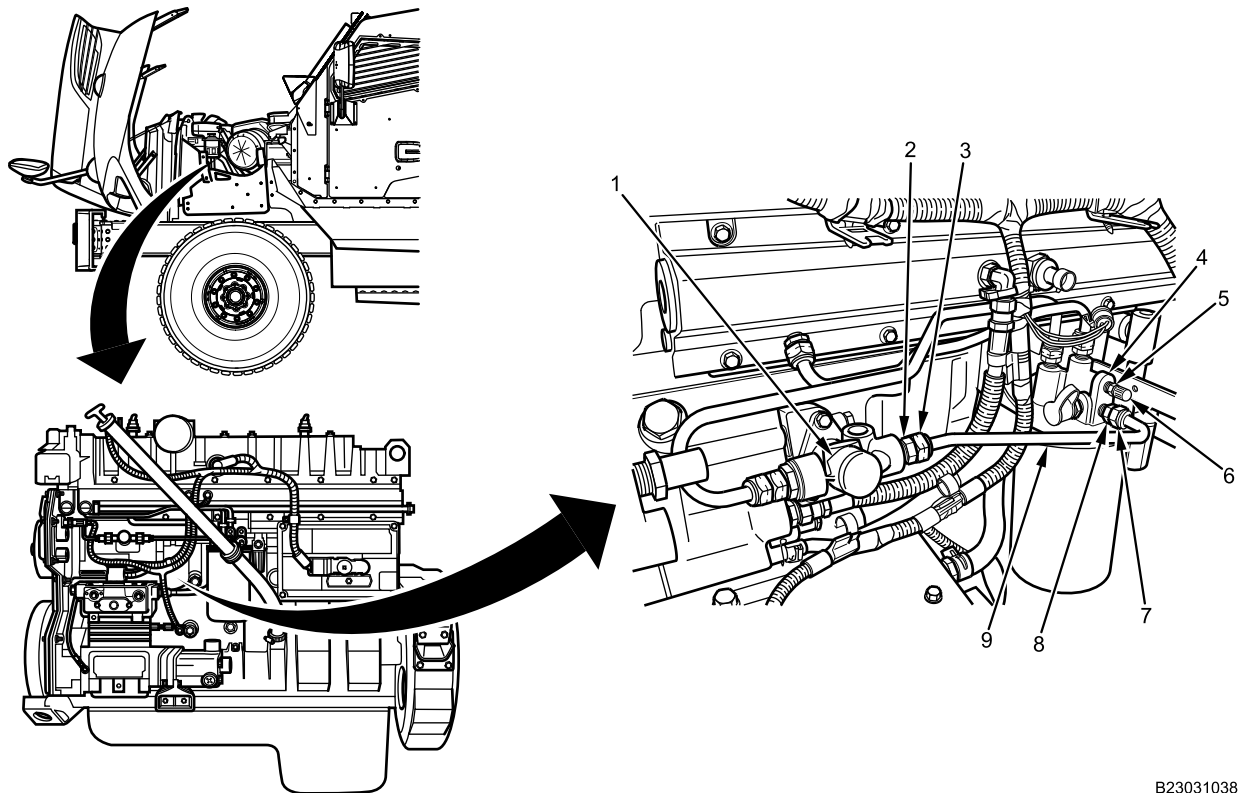
Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL



B230310381

Figure 1. Fuel Inlet Line Removal.

1. Remove cap (Figure 1, Item 6) from priming valve (Figure 1, Item 5).

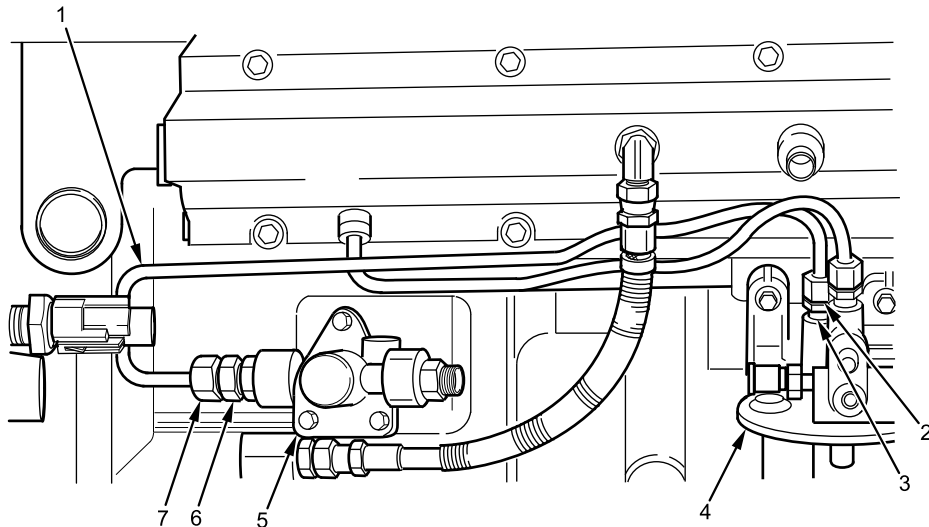
WARNING

When bleeding fuel pressure from fuel filter header, wear safety goggles and cover priming valve with rag to keep fuel from spraying personnel. Failure to comply may result in serious injury to personnel.

2. Insert small punch in end of priming valve (Figure 1, Item 5) to bleed fuel pressure from fuel filter header (Figure 1, Item 4).
3. Install cap (Figure 1, Item 6) on priming valve (Figure 1, Item 5).
4. Place drain pan under vehicle, below fuel inlet line (Figure 1, Item 9).
5. Loosen fitting (Figure 1, Item 3) from fuel pump fitting (Figure 1, Item 2) and slowly drain fuel from fuel inlet line (Figure 1, Item 9).
6. Loosen fitting (Figure 1, Item 7) from fuel filter header fitting (Figure 1, Item 8).
7. Once fuel has completely drained, remove fuel inlet line (Figure 1, Item 9) from fuel pump (Figure 1, Item 1) and fuel filter header (Figure 1, Item 4).

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)

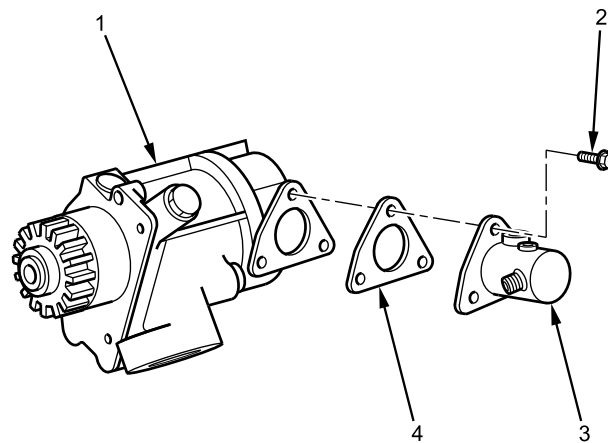
8. Remove fuel pump fitting (Figure 1, Item 2) from fuel pump (Figure 1, Item 1), and remove fuel filter header fitting (Figure 1, Item 8) from fuel filter header (Figure 1, Item 4).



B230304857

Figure 2. Fuel Filter Header Supply Line Removal.

9. Loosen fitting (Figure 2, Item 7) from fuel pump fitting (Figure 2, Item 6) and slowly drain fuel from fuel filter header supply line (Figure 2, Item 1).
10. Loosen fitting (Figure 2, Item 2) from fuel filter header fitting (Figure 2, Item 3).
11. Once fuel has completely drained, remove fuel filter header supply line (Figure 2, Item 1) from fuel pump (Figure 2, Item 5) and fuel filter header (Figure 2, Item 4).
12. Remove fuel pump fitting (Figure 2, Item 6) from fuel pump (Figure 2, Item 5), and remove fuel filter header fitting (Figure 2, Item 3) from fuel filter header (Figure 2, Item 4).



B230304860

Figure 3. Fuel Pump Removal.

13. Remove three bolts (Figure 3, Item 2) securing fuel pump (Figure 3, Item 3) to high-pressure injector pump (Figure 3, Item 1).
14. Remove fuel pump (Figure 3, Item 3) and gasket (Figure 3, Item 4) from high-pressure injector pump (Figure 3, Item 1). Discard gasket (Figure 3, Item 4).

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)

15. Clean fuel pump and high-pressure injector pump mating surfaces and inspect for damage.

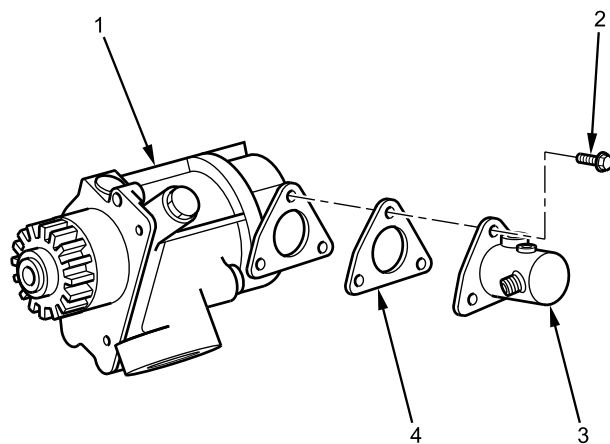
END OF TASK**INSTALLATION****WARNING**

Do not overtighten bolts for fuel pump or cross-thread connections on fuel lines. This will interfere with sealing and operation of fuel pump. If seal is not complete or lines leak due to cross-threads, fuel pump will not operate properly and vehicle may not run. Starting vehicle without fuel pressure in lines or pump may result in damage to equipment and serious injury or death to personnel.

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

CAUTION

To ensure proper installation of fuel supply pump, verify the mounting surface is clean of old gasket material so new one will seal properly. Failure to comply may result in equipment damage.

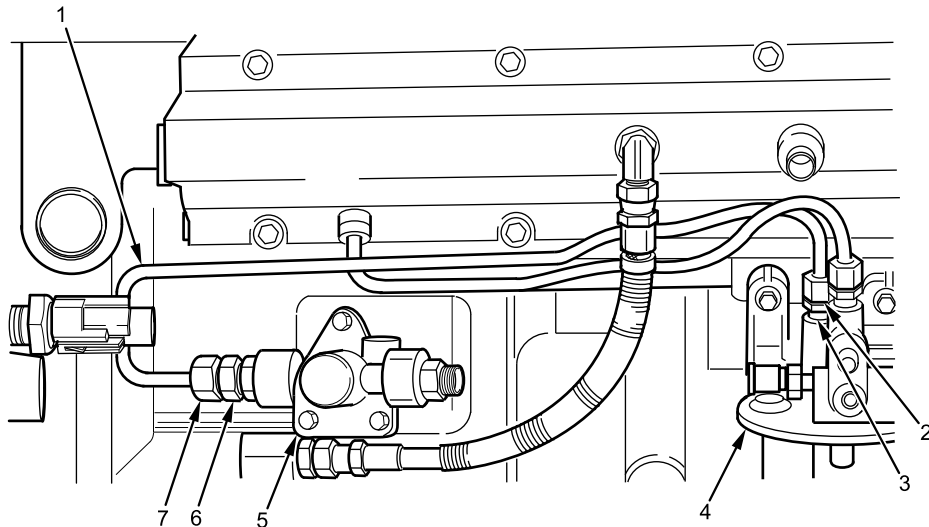


B230304860

Figure 4. Fuel Pump Installation.

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)

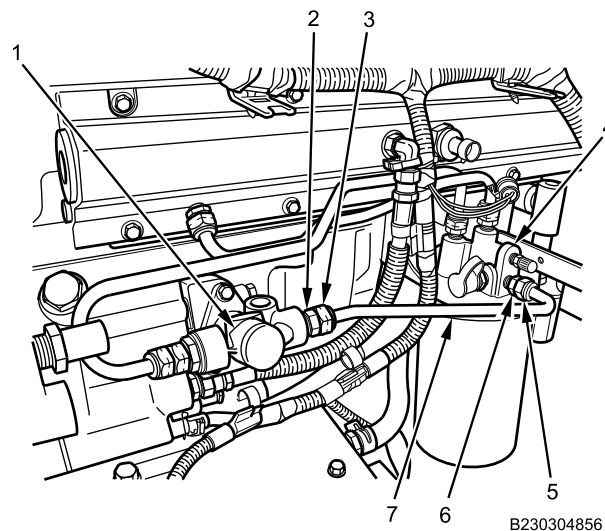
1. Install fuel pump (Figure 4, Item 3) and new gasket (Figure 4, Item 4) on high-pressure injector pump (Figure 4, Item 1) with three bolts (Figure 4, Item 2). Tighten bolts to 156 lb-in (18 N•m).



B230304857

Figure 5. Fuel Filter Header Supply Line Installation.

2. Install fuel pump fitting (Figure 5, Item 6) on fuel pump (Figure 5, Item 5), and install fuel filter header fitting (Figure 5, Item 3) on fuel filter header (Figure 5, Item 4).
3. Install fuel filter header supply line (Figure 5, Item 1) on fuel pump (Figure 5, Item 5) and fuel filter header (Figure 5, Item 4).
4. Tighten fitting (Figure 5, Item 7) on fuel pump fitting (Figure 5, Item 6) securely.
5. Tighten fitting (Figure 5, Item 2) on fuel filter header fitting (Figure 5, Item 3) securely.



B230304856

Figure 6. Fuel Inlet Line Installation.

6. Install fuel pump fitting (Figure 6, Item 2) to fuel pump (Figure 6, Item 1) and fuel filter header fitting (Figure 6, Item 6) to fuel filter header (Figure 6, Item 4).
7. Install fuel inlet line (Figure 6, Item 7) on fuel pump (Figure 6, Item 1) and fuel filter header (Figure 6, Item 4).
8. Tighten fitting (Figure 6, Item 3) on fuel pump fitting (Figure 6, Item 2) securely.
9. Tighten fitting (Figure 6, Item 5) on fuel filter header fitting (Figure 6, Item 6) securely.

FUEL PUMP REMOVAL AND INSTALLATION - (CONTINUED)

10. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install charge air cooler hoses (WP 0264).
2. Install air cleaner assembly (WP 0257).
3. Prime fuel system (WP 0255).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine (TM 9-2355-106-10).
6. Check for leaks with engine running (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Install left engine armor plate (WP 0597).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 40-200 lb-in., 3/8-inch drive
(WP 0795, Item 142)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Rags (WP 0794, Item 39)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Sleeve, compression - (6) (WP 0796, Item 119)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Left side engine armor removed (WP 0597)
Left engine armor bracket removed (WP 0598)
Air filter assembly removed (WP 0257)
Left charge air cooler pipe removed (WP 0264)
Oil gauge tube removed (WP 0232)
Fuel filter removed (WP 0269)

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove cap (Figure 1, Item 3) from priming valve (Figure 1, Item 4).

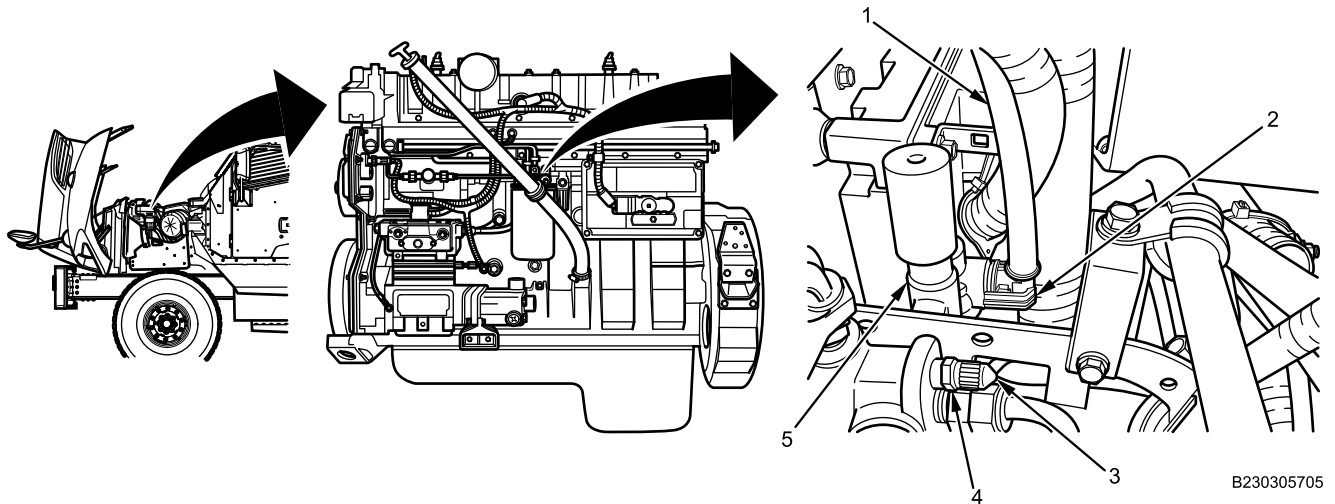


Figure 1. Fuel Line Removal.

WARNING

When bleeding fuel pressure from fuel filter header, wear safety goggles and cover priming valve with rag to keep fuel from spraying personnel. Failure to comply may result in serious injury to personnel.

2. Insert suitable object in end of priming valve (Figure 1, Item 4) to bleed fuel pressure from filter header (Figure 1, Item 5).
3. Remove fuel line (Figure 1, Item 1) from fuel filter header (Figure 1, Item 5) by pressing clip on fuel line fitting (Figure 1, Item 2) and pulling straight off fuel filter header.

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)

4. Place drain pan under vehicle, below fuel filter header assembly (Figure 2, Item 3) and lines.

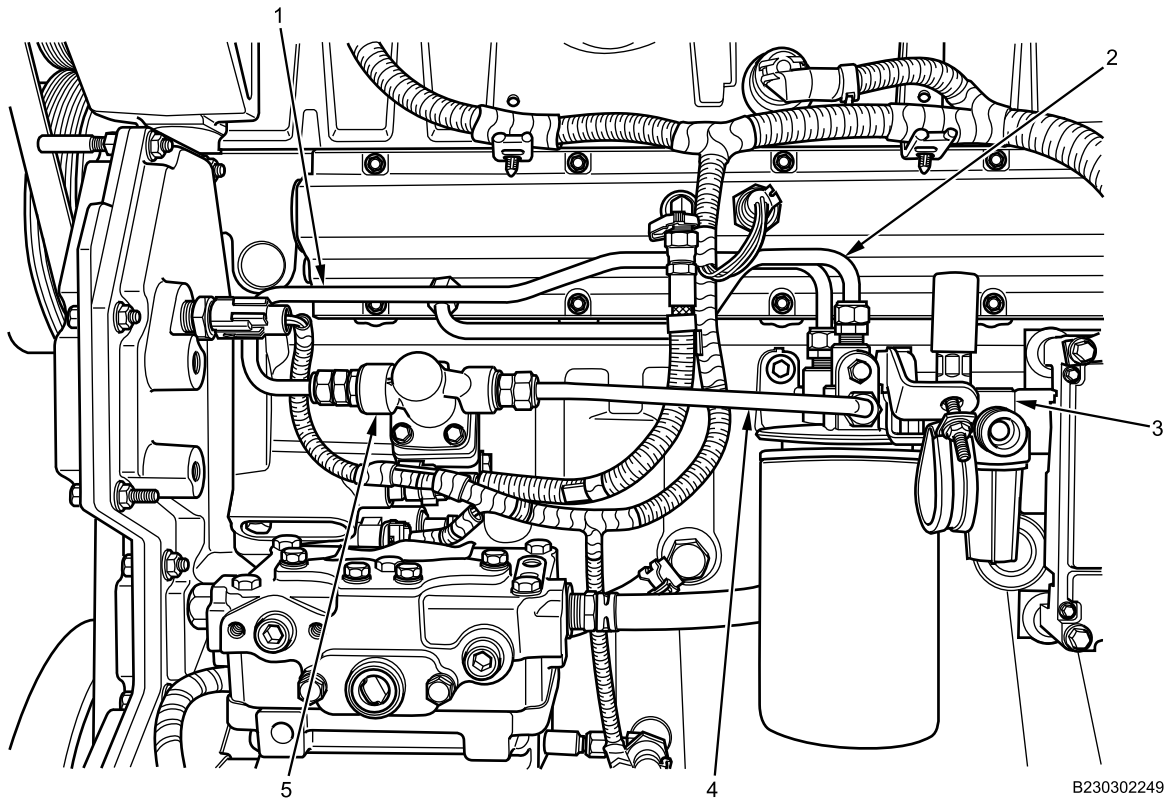


Figure 2. Fuel Filter Header Assembly and Lines.

5. Loosen fittings on fuel supply manifold line (Figure 2, Item 2) to fuel filter header assembly (Figure 2, Item 3). Allow fuel to drain from line.
6. Once fuel has completely drained, remove fuel supply manifold line (Figure 2, Item 2). Remove and discard compression sleeves from line.
7. Loosen fittings on fuel supply pump outlet line (Figure 2, Item 1) from fuel pump (Figure 2, Item 5) to fuel filter header assembly (Figure 2, Item 3), and slowly drain fuel from line.
8. Once fuel has completely drained, remove fuel supply pump outlet line (Figure 2, Item 1). Remove and discard compression sleeves from line.
9. Loosen fittings on fuel supply pump inlet line (Figure 2, Item 4) on fuel filter header assembly (Figure 2, Item 3), and slowly drain fuel from line.
10. Once fuel has completely drained, remove fuel supply pump inlet line (Figure 2, Item 4). Remove and discard compression sleeves from line.

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)

11. Remove two bolts (Figure 3, Item 3) and oil gauge bracket (Figure 3, Item 4) from fuel filter header assembly (Figure 3, Item 2)

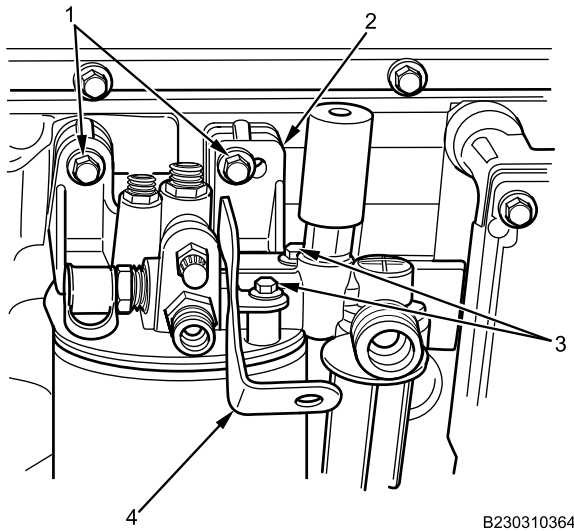


Figure 3. Fuel Filter Header Assembly.

12. Remove two bolts (Figure 3, Item 1) and fuel filter header assembly (Figure 3, Item 2) from crankcase.

END OF TASK**INSTALLATION**

1. Install fuel filter header assembly (Figure 4, Item 2) on crankcase with two bolts (Figure 4, Item 1). Torque bolts to 156 lb-in (18 N•m).

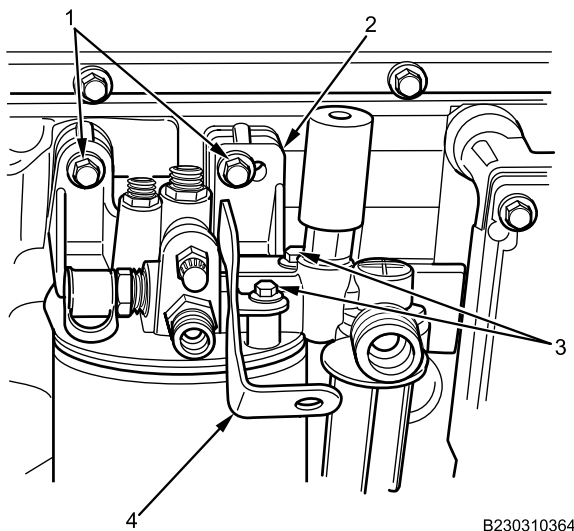


Figure 4. Fuel Filter Header Assembly.

2. Install oil gauge bracket (Figure 4, Item 4) on fuel filter header assembly (Figure 4, Item 2) with two bolts (Figure 4, Item 3).

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)

3. Install two new compression sleeves on fuel pump supply outlet line (Figure 5, Item 1).

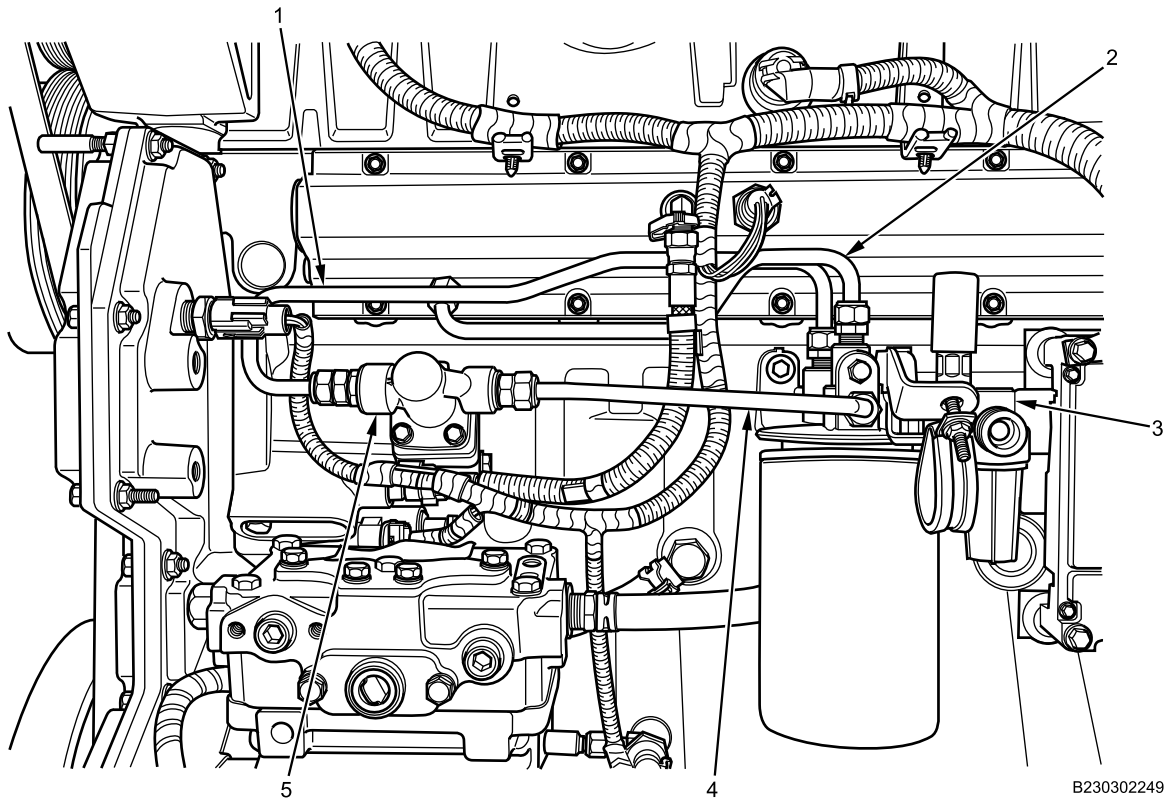
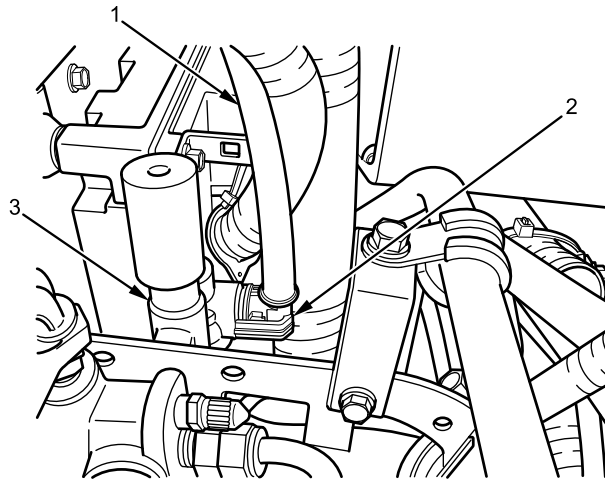


Figure 5. Fuel Filter Header Assembly and Lines.

4. Install fuel pump supply outlet line (Figure 5, Item 1) from fuel pump (Figure 5, Item 5) to fuel filter header assembly (Figure 5, Item 3). Tighten fuel line fittings securely.
5. Install two new compression sleeves on fuel supply manifold line (Figure 5, Item 2).
6. Install fuel supply manifold line (Figure 5, Item 2) on fuel filter header assembly (Figure 5, Item 3). Tighten fuel line fittings securely.
7. Install two new compression sleeves on fuel supply pump inlet line (Figure 5, Item 4).
8. Install fuel supply pump inlet line (Figure 5, Item 4) on fuel filter header assembly (Figure 5, Item 3). Tighten fuel line fittings securely.

FUEL FILTER HEADER/PRIMER PUMP REMOVAL AND INSTALLATION - (CONTINUED)

9. Install fuel line (Figure 20, Item 1) on fuel header assembly (Figure 20, Item 3) by pushing fuel line fitting (Figure 20, Item 2) on fuel header assembly until it clicks.



B230305706

Figure 6. Fuel Line Installation.

10. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install fuel filter (WP 0269).
2. Prime fuel system (WP 0255).
3. Install oil gauge tube (WP 0232).
4. Install left charge air cooler pipe (WP 0264).
5. Install air filter assembly (WP 0257).
6. Turn MAIN POWER switch on (TM 9-2355-106-10).
7. Start engine (TM 9-2355-106-10).
8. Check for fuel leaks with engine running.
9. Turn engine off (TM 9-2355-106-10).
10. Turn MAIN POWER switch off (TM 9-2355-106-10).
11. Install left engine armor bracket (WP 0598).
12. Install left side engine armor (WP 0597).
13. Close engine hood (TM 9-2355-106-10).
14. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FUEL PRIMER SEQUENCE**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

Rag (WP 0794, Item 39)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

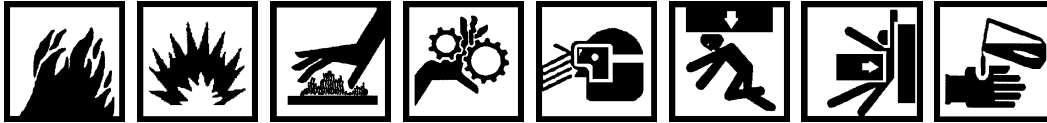
Air cleaner assembly removed (WP 0257)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10

FUEL PRIMER SEQUENCE - (CONTINUED)**WARNING**

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Armor parts are heavy. Use care when removing or installing. Do not attempt to lift without an assistant and lifting device. Failure to comply may result in serious injury or death to personnel.

Armor plate weighs approximately 100-120 lbs. Secure plate before removal of final bolt to prevent plate from falling. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Dispose of used parts, rags, containers, and engine fluids in accordance with standard operating procedures. Failure to comply may result in serious injury or death to personnel.

FUEL PRIMER SEQUENCE - (CONTINUED)**PRIMING**

1. Remove dust cap (Figure 1, Item 2) from bleed valve (Figure 1, Item 3) on fuel filter header (Figure 1, Item 4).

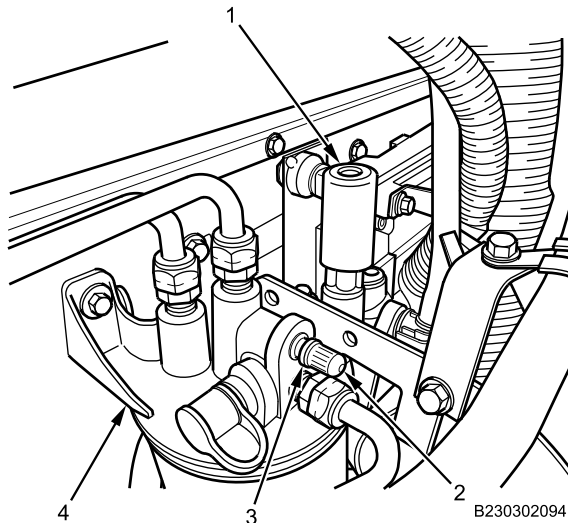


Figure 1. Fuel Bleed Valve.

2. Place rag under bleed valve (Figure 1, Item 3) to collect excess fuel.
3. Press center stem on bleed valve (Figure 1, Item 3) inward.
4. Operate priming pump (Figure 1, Item 1) until fuel discharges from bleed valve (Figure 1, Item 3). Release center stem on bleed valve.
5. Remove fuel soaked rag.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install air cleaner assembly (WP 0257).
2. Turn MAIN POWER switch on (TM-9-2355-106-10).
3. Crank engine for 15 seconds or until engine starts (TM-9-2355-106-10).
4. Run engine to operating temperature (TM-9-2355-106-10).
5. Operate engine until it runs smoothly (TM-9-2355-106-10).
6. Verify fuel gauge and fuel system operation (TM-9-2355-106-10).
7. Check for leaks with engine running (TM-9-2355-106-10).
8. Turn ignition switch off (TM-9-2355-106-10).
9. Turn MAIN POWER switch off (TM-9-2355-106-10).
10. Close engine hood (TM-9-2355-106-10).
11. Remove wheel chocks (TM-9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

AIR INTAKE TUBE (TO TURBO) REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Cable lock straps - (2) (WP 0796, Item 124)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

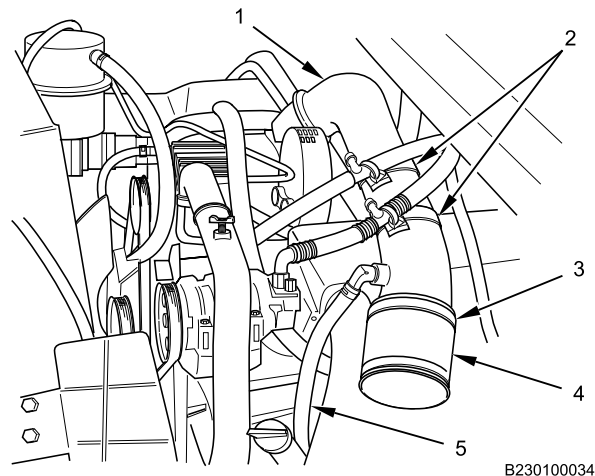
WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

REMOVAL

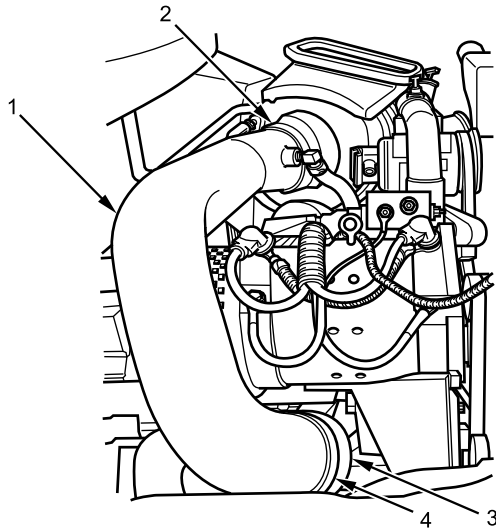


B230100034

Figure 1. Air Intake Tube.

1. Loosen clamp (Figure 1, Item 3) on upper hose (Figure 1, Item 4).
2. Remove air compressor hose (Figure 1, Item 5) from air intake tube (Figure 1, Item 1).
3. Remove and discard two cable lock straps (Figure 1, Item 2) from air intake tube (Figure 1, Item 1).

AIR INTAKE TUBE (TO TURBO) REMOVAL AND INSTALLATION - (CONTINUED)



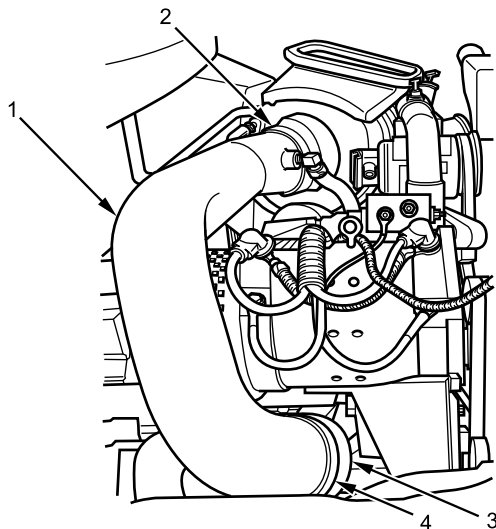
B230100035

Figure 2. Right Side Air Intake Tube.

4. Loosen clamp (Figure 2, Item 4) on lower hose (Figure 2, Item 3).
5. Remove air intake tube (Figure 2, Item 1) from upper and lower hoses (Figure 2, Item 2 and 3) .

END OF TASK**INSTALLATION****CAUTION**

Ensure that clamps are in good condition with no rust, damage, or corrosion. Replace if necessary. Failure to comply may result in damage to equipment.



B230100035

Figure 3. Right Side Air Intake Tube.

1. Install air intake tube (Figure 3, Item 1) on upper and lower hoses (Figure 3, Item 2 and 3).
2. Install clamp (Figure 3, Item 4) on lower hose (Figure 3, Item 3) and tighten clamp securely.

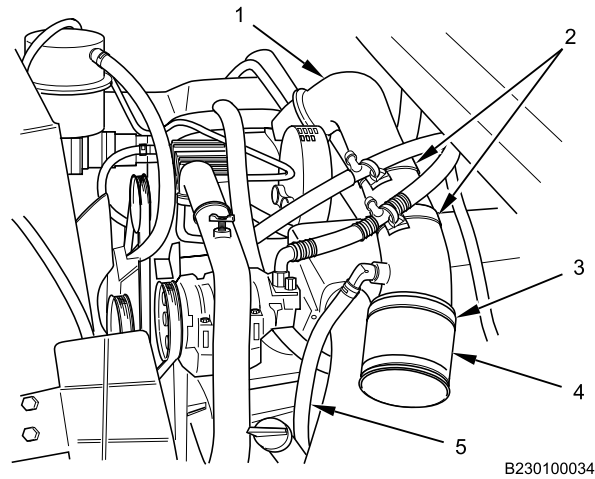
AIR INTAKE TUBE (TO TURBO) REMOVAL AND INSTALLATION - (CONTINUED)

Figure 4. Air Intake Tube.

3. Install air compressor hose (Figure 4, Item 5) on air intake tube (Figure 4, Item 1).
4. Install clamp (Figure 4, Item 3) on upper hose (Figure 4, Item 4) and tighten securely.
5. Install two new cable lock straps (Figure 4, Item 2) on air intake tube (Figure 4, Item 1).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and verify air intake system works and check for leaks (TM 9-2355-106-10).
3. Turn engine off (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Close engine hood (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AIR CLEANER ASSEMBLY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Top left side armor plate removed (WP 0597)

Equipment Condition

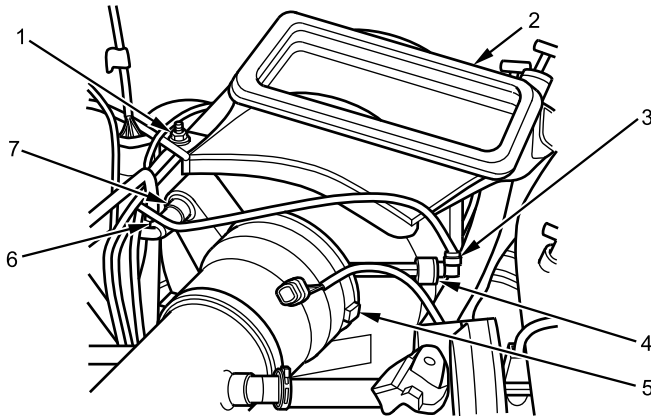
Parking brake set (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

AIR CLEANER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Loosen hose clamp (Figure 1, Item 5) and remove hose.



B230100105

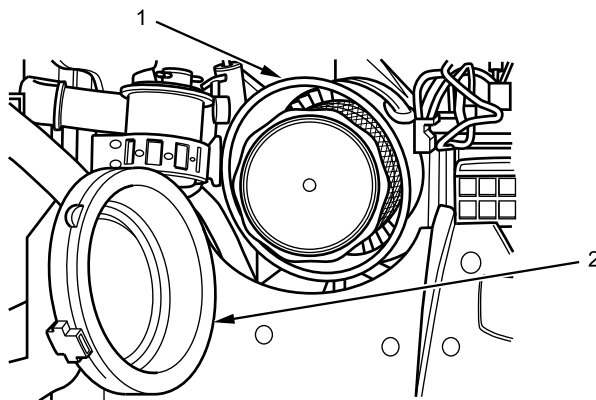
Figure 1. Air Cleaner Assembly.

2. Remove two hex nuts (Figure 1, Item 1) securing air cleaner assembly (Figure 1, Item 2) to support bracket.
3. Disconnect intake air temperature (IAT) sensor connector (Figure 1, Item 6).
4. Disconnect air filter restrictor gauge tubing (Figure 1, Item 3) from air filter restrictor angle fitting (Figure 1, Item 4).

NOTE

Do not bump filter while in the housing; it can cause dirt and debris to enter clean side piping of turbocharger.

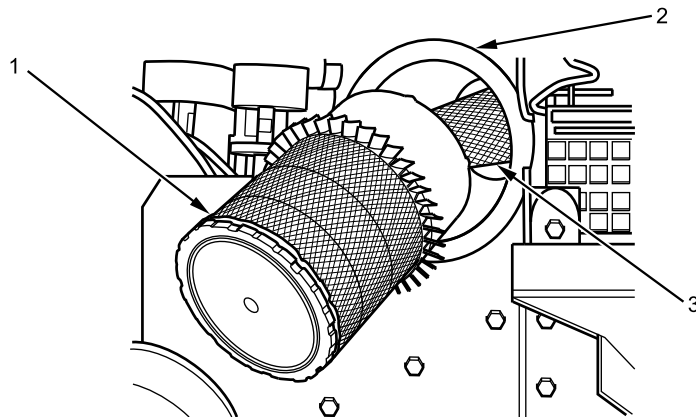
5. Remove air cleaner assembly (Figure 1, Item 2).
6. Remove IAT sensor (Figure 1, Item 7) from air cleaner assembly (Figure 1, Item 2).
7. Remove air filter restrictor angle fitting (Figure 1, Item 4) from air cleaner assembly (Figure 1, Item 2).



B230100106

Figure 2. Air Cleaner Assembly Side View.

8. Remove air filter lid (Figure 2, Item 2) from air cleaner assembly (Figure 2, Item 1).

AIR CLEANER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

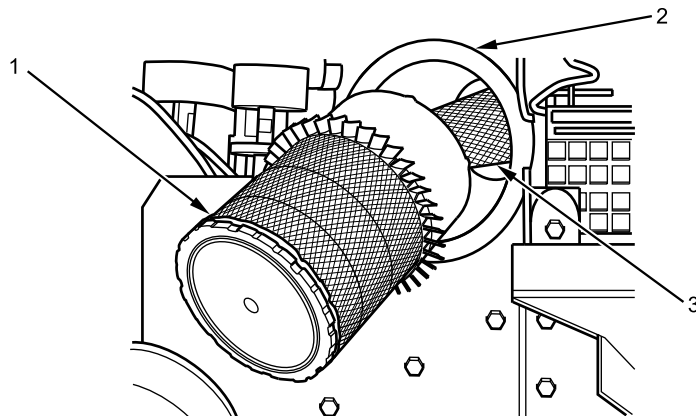
B230100107

Figure 3. Air Filters.

9. Remove primary air filter (Figure 3, Item 1) and secondary air filter (Figure 3, Item 3) from air cleaner assembly (Figure 3, Item 2).

END OF TASK**INSTALLATION****NOTE**

Inspect filter elements for damaged or non-resilient rubber gasket. Inspect filter element body for dents or excessive pleat bunching. If any of the conditions exist, replace filter.



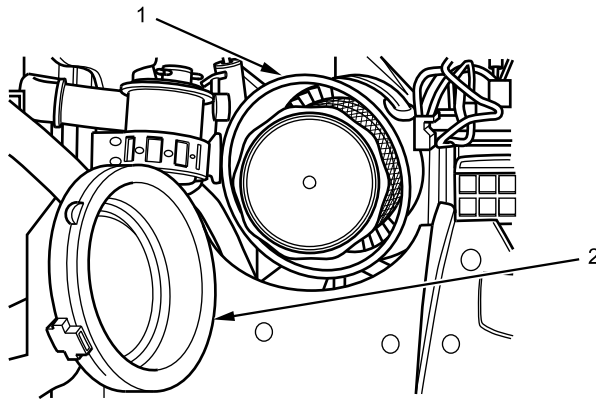
B230100107

Figure 4. Air Filters.

1. Install secondary air filter (Figure 4, Item 3) and primary air filter (Figure 4, Item 1) into air cleaner assembly (Figure 4, Item 2).

AIR CLEANER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

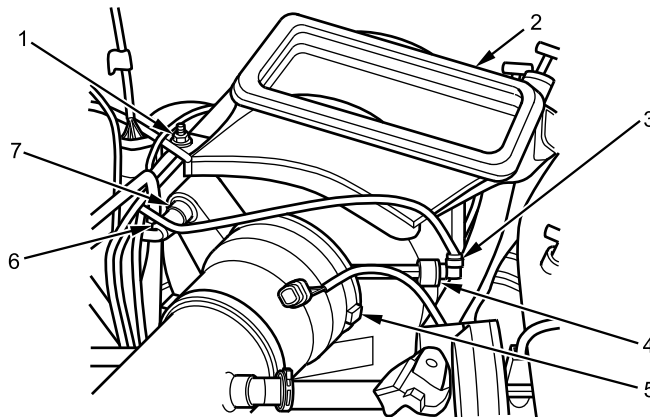
2. Install air filter lid (Figure 5, Item 2) on air cleaner assembly (Figure 5, Item 1).



B230100106

Figure 5. Air Cleaner Assembly Side View.

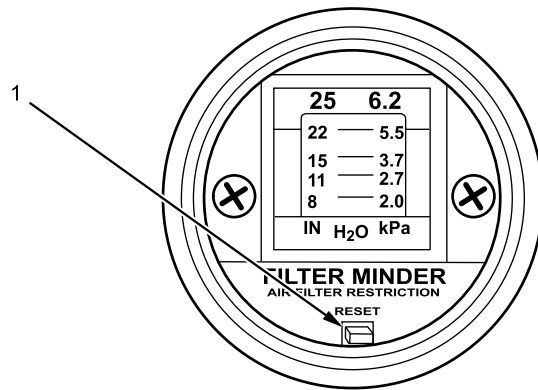
3. Install IAT sensor (Figure 6, Item 7) and air filter restrictor angle fitting (Figure 6, Item 4) into air cleaner assembly (Figure 6, Item 2).



B230100105

Figure 6. Air Cleaner Assembly.

4. Install air cleaner assembly (Figure 6, Item 2) on support bracket with two hex nuts (Figure 6, Item 1).
5. Connect IAT sensor connector (Figure 6, Item 6) and air filter restrictor gauge tubing (Figure 6, Item 3).
6. Install hose and clamp (Figure 6, Item 5).
7. Reset air filter restriction gauge on instrument panel by pushing reset button (Figure 7, Item 1). AMBER indicator will drop below window.

AIR CLEANER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230100111

Figure 7. Air Filter Restriction Gauge.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and verify operation (TM 9-2355-106-10).
3. Turn engine off (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Install top left side armor plate (WP 0597).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AIR CLEANER SUPPORT REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit, (GMTK)
 (WP 0795, Item 37)
 Wrench, torque, 40-200 lb-in., 3/8-inch drive
 (WP 0795, Item 142)
 Wrench, torque, 20-100 lb-ft, 3/8-inch drive
 (WP 0795, Item 141)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
 Faceshield, industrial (WP 0794, Item 16)
 Compound (WP 0794, Item 13)
 Grease (WP 0794, Item 22)
 Gloves (WP 0794, Item 18)
 Cable lock strap - (3) (WP 0796, Item 124)
 Wire tags (WP 0796, Item 65)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)
 Battery cables disconnected (WP 0404)
 Air cleaner assembly removed (WP 0257)
 Power Distribution Center (PDC) junction box
 removed (WP 0334)

References

TM 9-2355-106-10

REMOVAL
WARNING

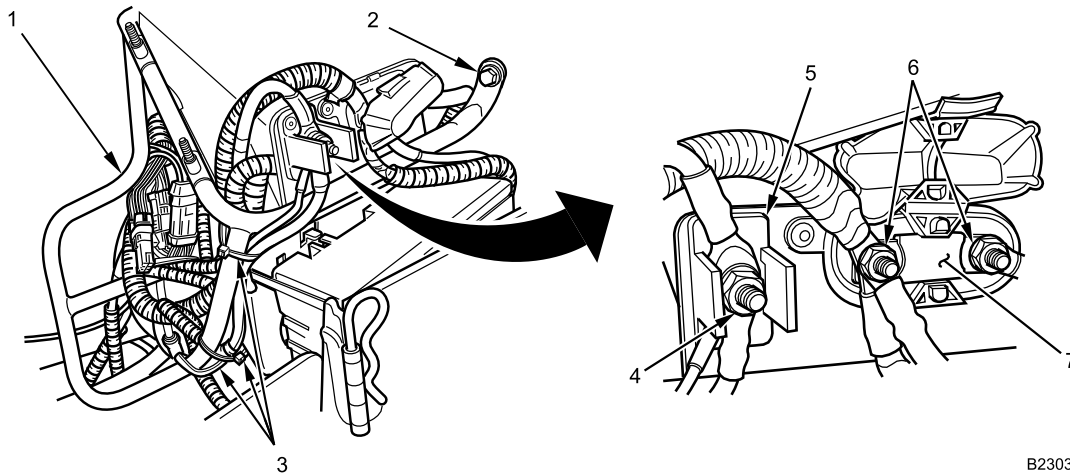
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

Note routing and location of wiring and cable lock straps during removal for proper installation.

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)

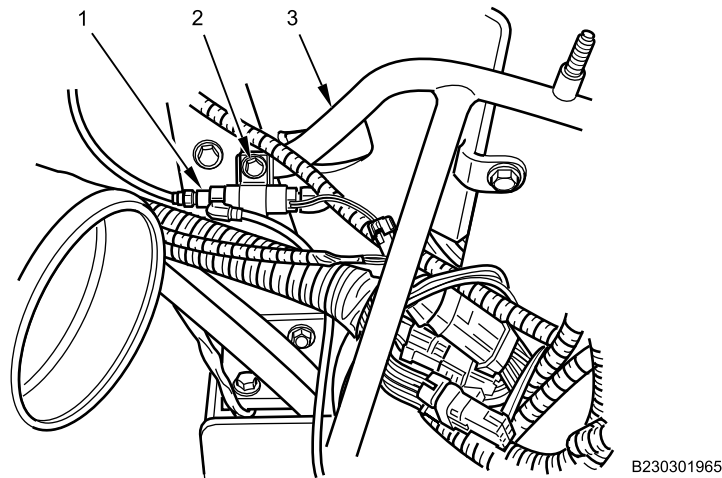
1. Remove and discard cable lock straps (Figure 1, Item 3) from air cleaner support (Figure 1, Item 1).



B230303255

Figure 1. Air Cleaner Support.

2. Remove nut (Figure 1, Item 4) and wiring harnesses from 24V underhood junction block (Figure 1, Item 5) on air cleaner support (Figure 1, Item 1).
3. Remove nut (Figure 1, Item 6) and wiring harnesses from 24V fuse holder (Figure 1, Item 7) on air cleaner support (Figure 1, Item 1).
4. Remove left upper bolt (Figure 1, Item 2) from air cleaner support (Figure 1, Item 1).
5. Remove right upper bolt (Figure 2, Item 2) from cooling fan actuator solenoid (Figure 2, Item 1) and air cleaner support (Figure 2, Item 3).

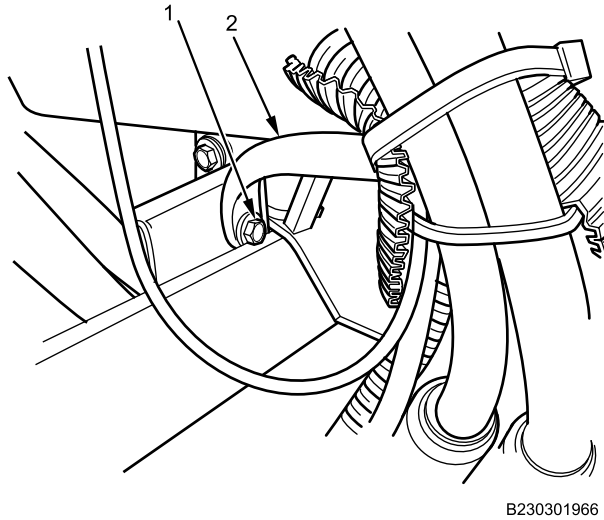


B230301965

Figure 2. Air Cleaner Support.

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)

6. Remove right lower bolt (Figure 3, Item 1) from air cleaner support (Figure 3, Item 2) and remove air cleaner support.



B230301966

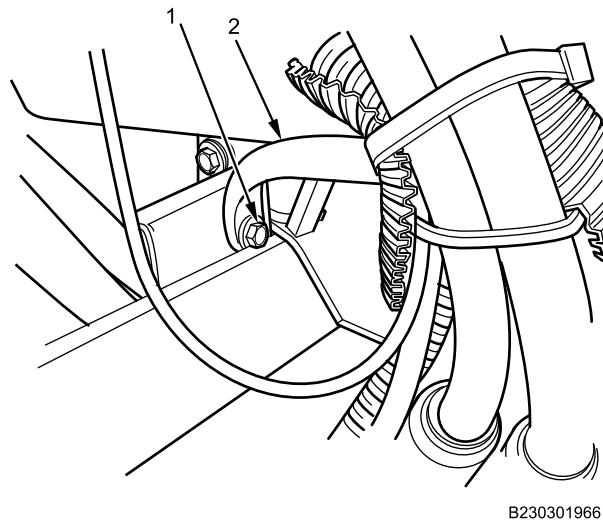
Figure 3. Air Cleaner Support.

END OF TASK

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to air cleaner support bolt (Figure 4, Item 1).



B230301966

Figure 4. Air Cleaner Support.

2. Position air cleaner support (Figure 4, Item 2) and loosely install right lower bolt (Figure 4, Item 1) on air cleaner support.
3. Apply corrosion preventive compound to air cleaner support bolt (Figure 5, Item 2).

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)

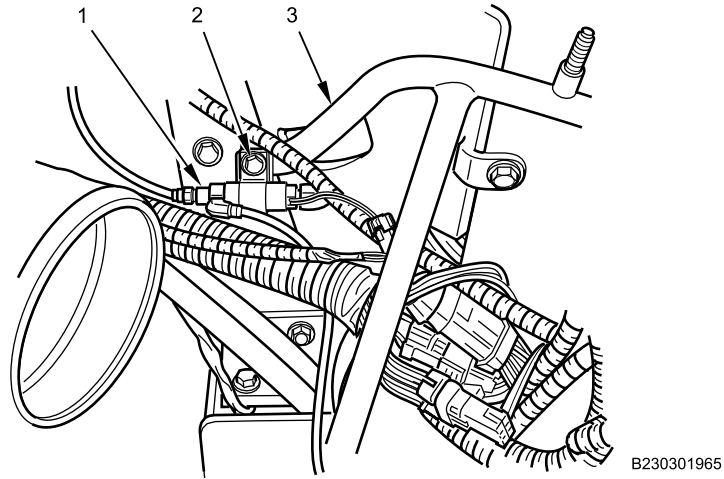


Figure 5. Air Cleaner Support.

4. Loosely install right upper bolt (Figure 5, Item 2) on cooling fan actuator solenoid (Figure 5, Item 1) and air cleaner support (Figure 5, Item 3).
5. Apply corrosion preventive compound to air cleaner support bolt (Figure 6, Item 4).

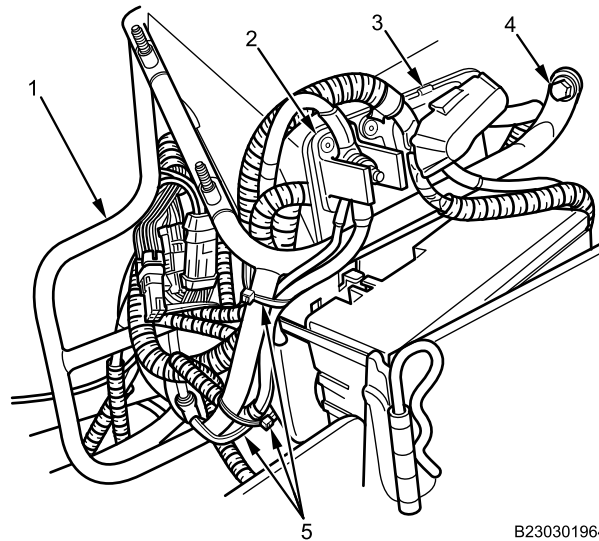


Figure 6. Air Cleaner Support.

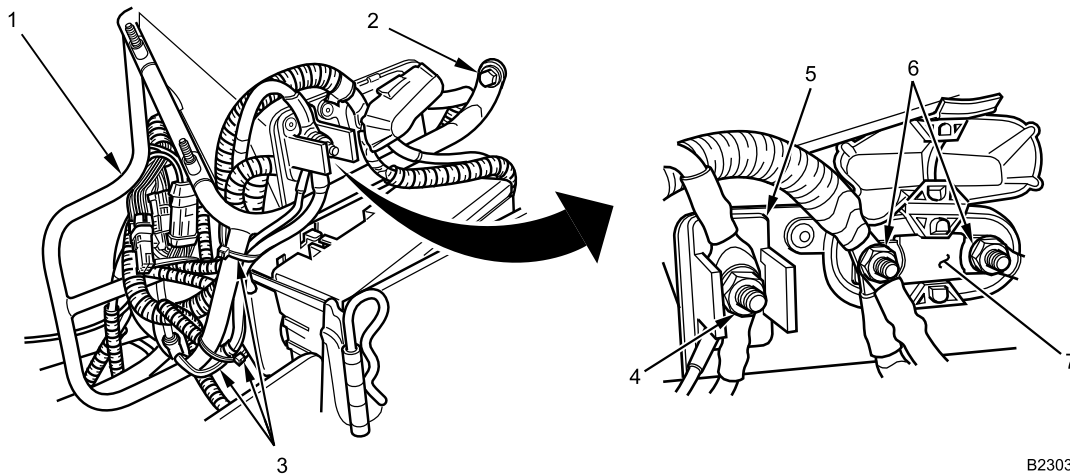
6. Loosely install left upper bolt (Figure 6, Item 4) on air cleaner support (Figure 6, Item 1).
7. Torque air cleaner support bolts (Figure 4, Item 1), (Figure 5, Item 2), and (Figure 6, Item 4) to 21-27 lb-ft (28-37 N•m).

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

8. Apply dielectric grease to wiring harnesses and nut (Figure 7, Item 6) on 24V fuse holder (Figure 7, Item 7).



B230303255

Figure 7. Air Cleaner Support.

9. Install wiring harnesses and nut (Figure 7, Item 6) on 24V fuse holder (Figure 7, Item 7). Tighten nuts securely.
10. Apply dielectric grease to wiring harnesses and nut (Figure 7, Item 4) on 24V underhood junction block (Figure 7, Item 5).
11. Install wiring harnesses and nut (Figure 7, Item 4) on 24V underhood junction block (Figure 7, Item 5). Torque nut to 155-190 lb-in. (18-22 N•m).
12. Install new cable lock straps (Figure 7, Item 3) on air cleaner support (Figure 7, Item 1).

END OF TASK

AIR CLEANER SUPPORT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install PDC junction box (WP 0334).
2. Install air cleaner assembly (WP 0257).
3. Connect battery cables (WP 0404).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Verify electrical system operation (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

AIR FILTER RESTRICTION GAUGE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

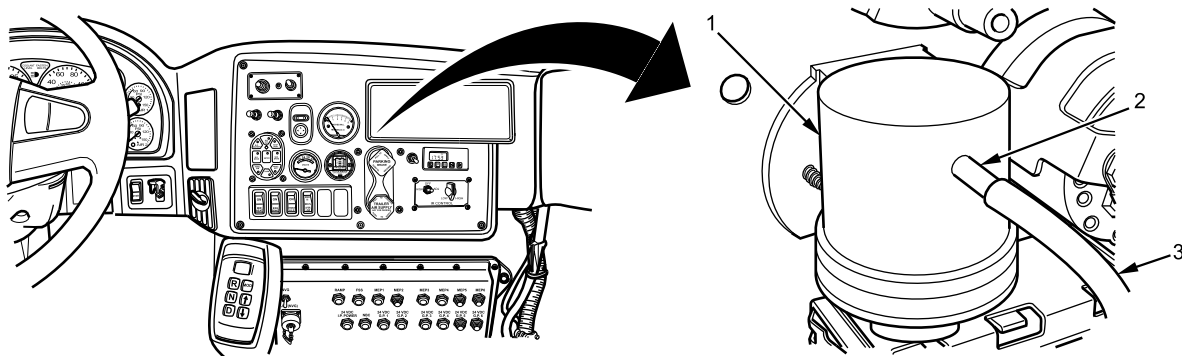
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) storage bin removed (WP 0563)

REMOVAL

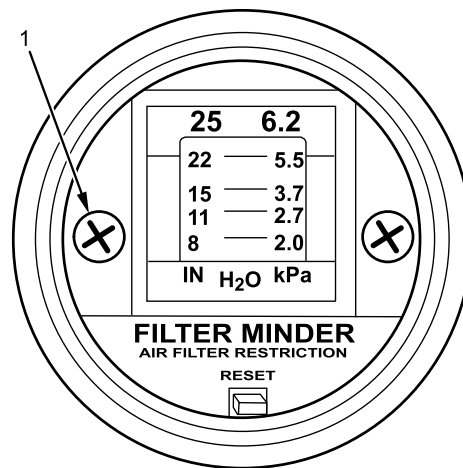
1. Remove hose (Figure 1, Item 3) from fitting (Figure 1, Item 2) at rear of air filter restriction gauge (Figure 1, Item 1).



B230610397

Figure 1. Air Filter Restriction Gauge Viewed From Behind Instrument Panel.

2. Remove two screws (Figure 2, Item 1) at front of air filter restriction gauge.



B230601274

Figure 2. Air Filter Restriction Gauge.

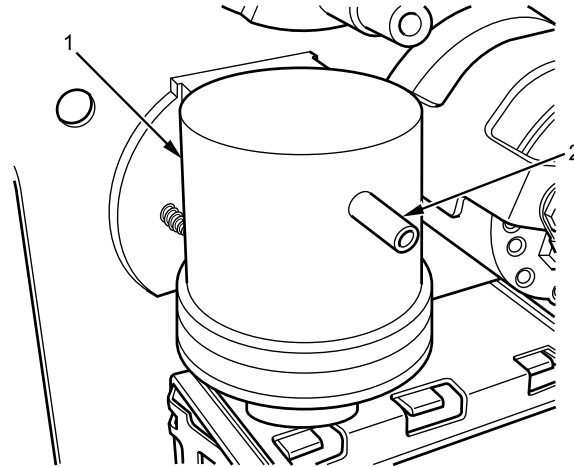
3. Remove air filter restriction gauge.

END OF TASK

AIR FILTER RESTRICTION GAUGE REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

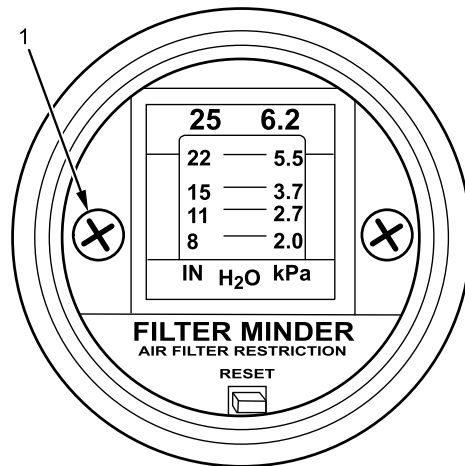
1. Install hose on fitting (Figure 3, Item 2) at rear of air filter restriction gauge (Figure 3, Item 1).



B230601275

Figure 3. Air Filter Restriction Gauge Viewed From Behind Instrument Panel.

2. Position air filter restriction gauge.



B230601274

Figure 4. Air Filter Restriction Gauge.

3. Install two screws (Figure 4, Item 1) on front of air filter restriction gauge. Tighten screws securely.

END OF TASK

AIR FILTER RESTRICTION GAUGE REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install IP storage bin (WP 0563).
2. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

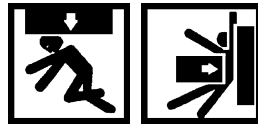
Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Battery cables disconnected (WP 0404)

Driver Control Mounting (DCM) bracket assembly removed (WP 0646)

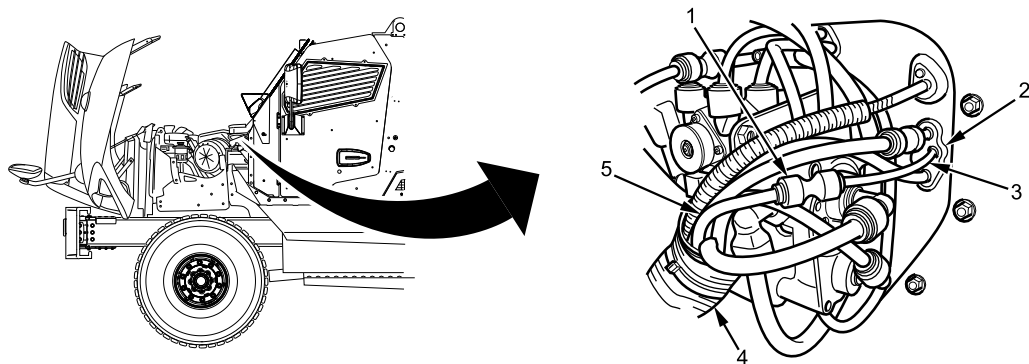
Exterior armor removed (WP 0647)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Disconnect air line union (Figure 1, Item 1) from air filter restriction gauge tubing air line (Figure 1, Item 5).



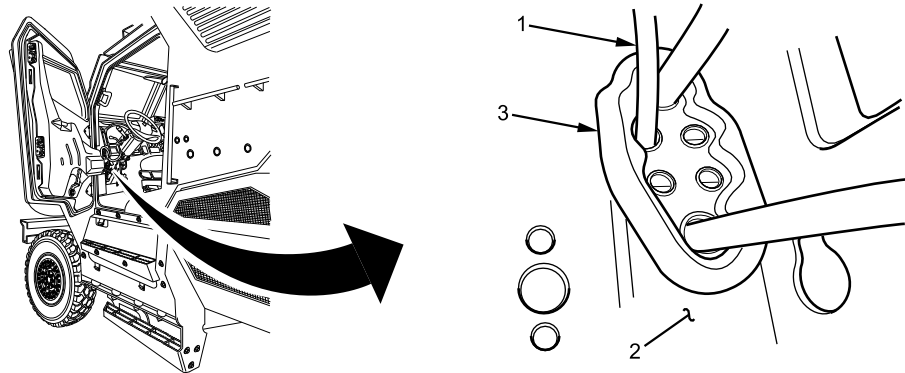
B230610400

Figure 1. Air Line Union.

2. Remove air filter restriction gauge tubing air line (Figure 1, Item 5) from bottom of harness conduit (Figure 1, Item 4).
3. Disconnect air line union (Figure 1, Item 1) from air filter restriction gauge tubing air line (Figure 1, Item 3) in firewall grommet (Figure 1, Item 2).

CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION - (CONTINUED)

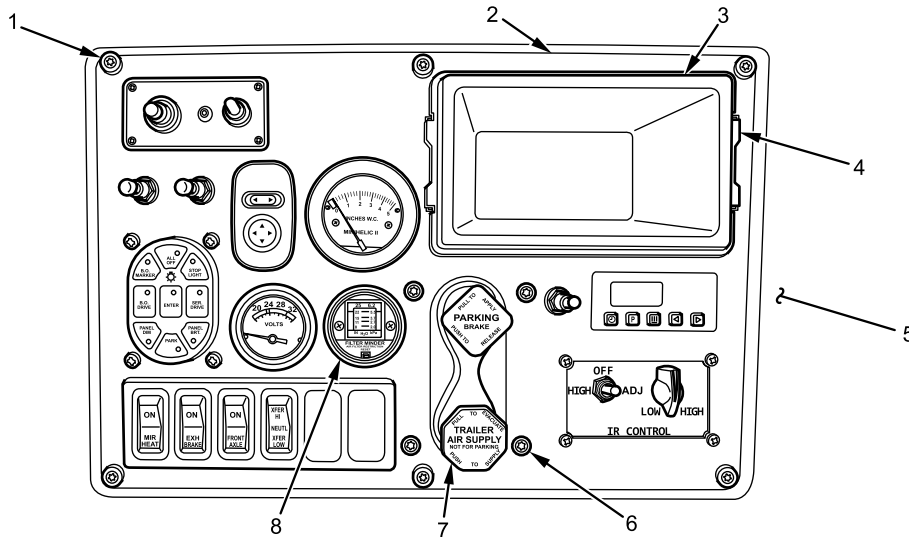
4. Inside cabin, remove air filter restriction gauge tubing air line (Figure 2, Item 1) from grommet (Figure 2, Item 3) on cabin firewall (Figure 2, Item 2).



B230612221

Figure 2. Firewall Grommet.

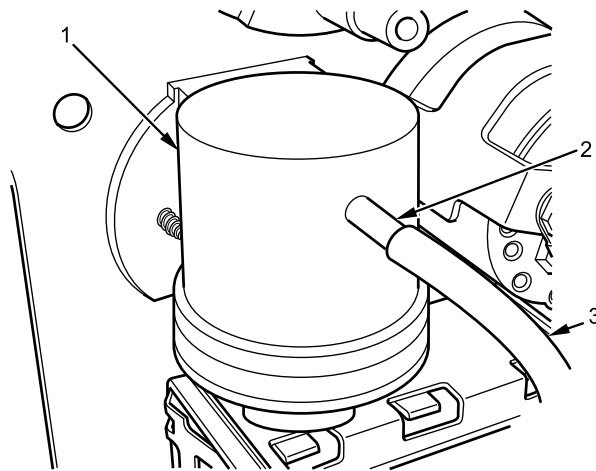
5. Push in on storage bin retainers (Figure 3, Item 4) and pull storage bin (Figure 3, Item 3) from instrument panel (IP) center trim panel (Figure 3, Item 2).



B230603361

Figure 3. IP Center Trim Panel.

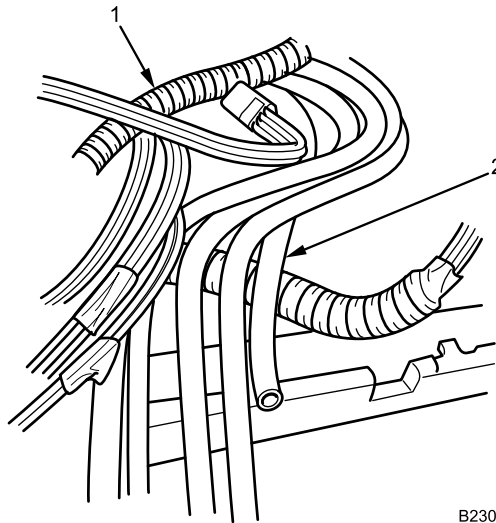
6. Remove six screws (Figure 3, Item 1) securing IP center trim panel (Figure 3, Item 2) to IP (Figure 3, Item 5).
7. Remove four screws (Figure 3, Item 6) from hand brake control valve (Figure 3, Item 7).
8. Pull IP center trim panel (Figure 3, Item 2) back to gain access to gauge (Figure 3, Item 8) connection.
9. Disconnect air filter restriction gauge tubing air line (Figure 4, Item 3) from air filter restriction gauge fitting (Figure 4, Item 2) on air filter restriction gauge (Figure 4, Item 1).

**CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION
- (CONTINUED)**

B230601980

Figure 4. Air Filter Restriction Gauge Connection.

10. Remove air filter restriction gauge tubing air line (Figure 5, Item 2) from IP harness (Figure 5, Item 1)



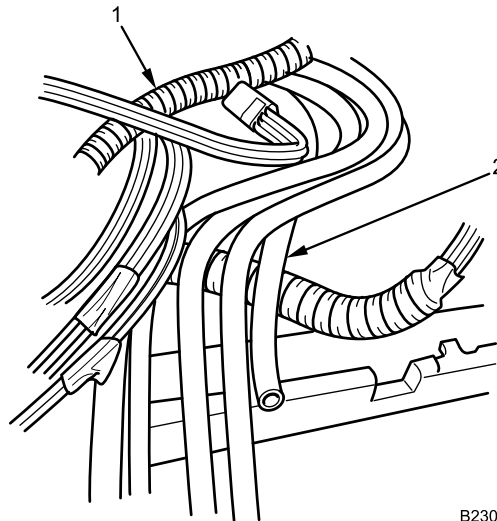
B230603362

Figure 5. IP Harness

END OF TASK

**CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION
- (CONTINUED)****INSTALLATION**

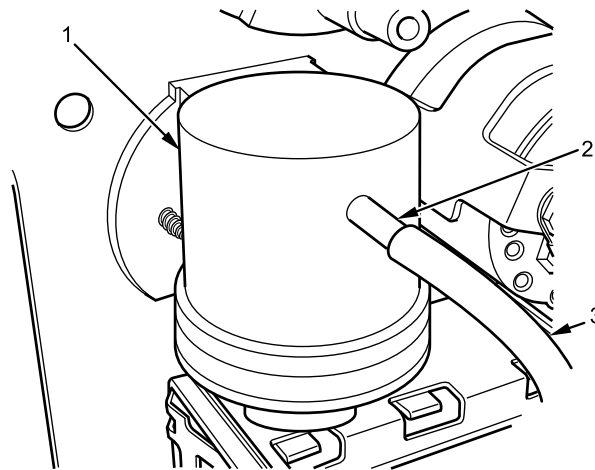
1. Install air filter restriction gauge tubing air line (Figure 6, Item 2) on IP harness (Figure 6, Item 1).



B230603362

Figure 6. IP Harness.

2. Connect air filter restriction gauge tubing air line (Figure 7, Item 3) on air filter restriction gauge fitting (Figure 7, Item 2) on air filter restriction gauge (Figure 7, Item 1).

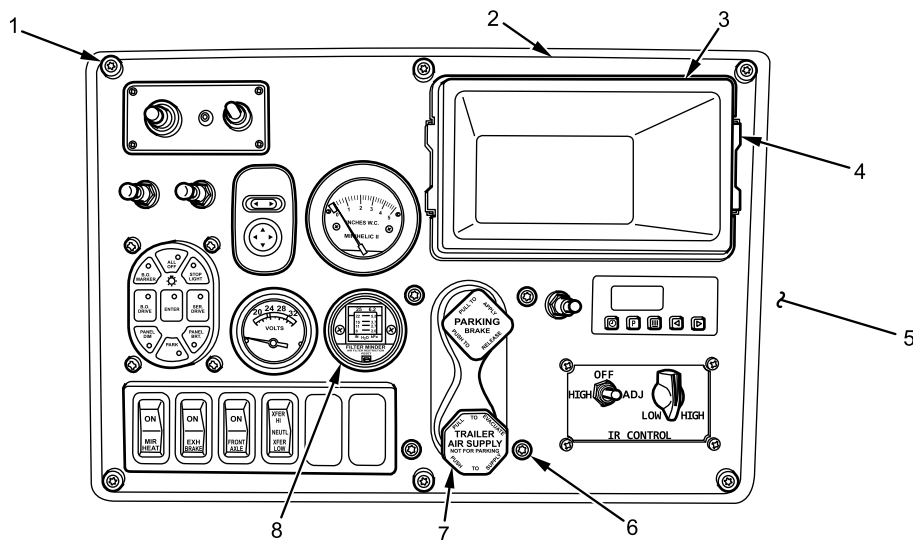


B230601980

Figure 7. Air Filter Restriction Gauge Connection.

CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION - (CONTINUED)

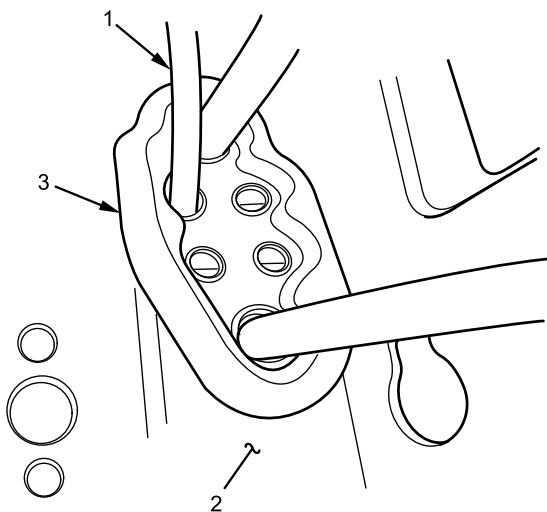
3. Install four screws (Figure 8, Item 6) on hand brake control valve (Figure 8, Item 7) and tighten securely.



B230603361

Figure 8. IP Center Trim Panel.

4. Align IP center trim panel (Figure 8, Item 2) to IP opening.
5. Install six screws (Figure 8, Item 1) securing IP center trim panel (Figure 8, Item 2) to IP (Figure 8, Item 5).
6. Install storage bin (Figure 8, Item 3) in IP opening and push forward to engage retainers (Figure 8, Item 4).
7. Inside cabin install air filter restriction gauge tubing air line (Figure 9, Item 1) on grommet (Figure 9, Item 3) on firewall (Figure 9, Item 2).



B230601979

Figure 9. Firewall Grommet.

CENTER PANEL AIR FILTER RESTRICTION GAUGE TUBING AND FITTING REMOVAL AND INSTALLATION - (CONTINUED)

8. Connect air line union (Figure 10, Item 1) on air filter restriction gauge tubing air line (Figure 10, Item 3) in firewall grommet (Figure 10, Item 2).

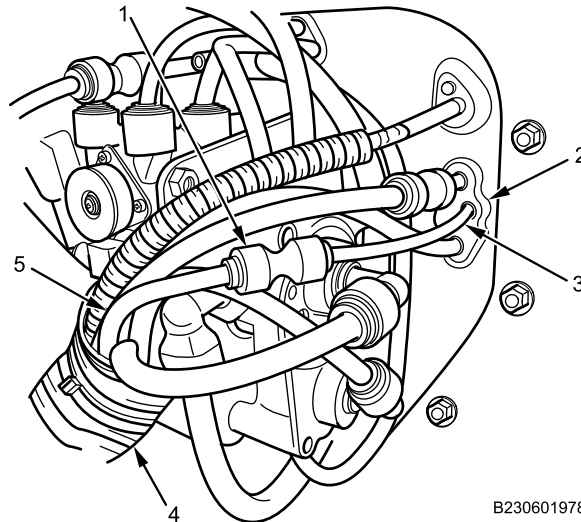


Figure 10. Air Line Union.

9. Install air filter restriction gauge tubing air line (Figure 10, Item 5) in harness conduit (Figure 10, Item 4).
10. Connect air line union (Figure 10, Item 1) on air filter restriction gauge tubing air line (Figure 10, Item 5) in harness conduit (Figure 10, Item 4).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install DCM bracket assembly exterior armor (WP 0646) or (WP 0647).
2. Connect battery cables (WP 0404).
3. Close engine hood (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Test-drive vehicle to verify air filter restriction gauge operation (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Set parking brake (TM 9-2355-106-10).
9. Turn engine off (TM 9-2355-106-10).
10. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

TURBOCHARGER ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Gloves (WP 0794, Item 19)
Gasket (WP 0796, Item 72)
Goggles, industrial (WP 0794, Item 20)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM 9-2355-106-10)
Air intake tube removed (WP 0256)
Exhaust brake removed (WP 0246)
Turbocharger lubricant lines removed (WP 0262)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0246
WP 0256
WP 0262

WARNING



Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

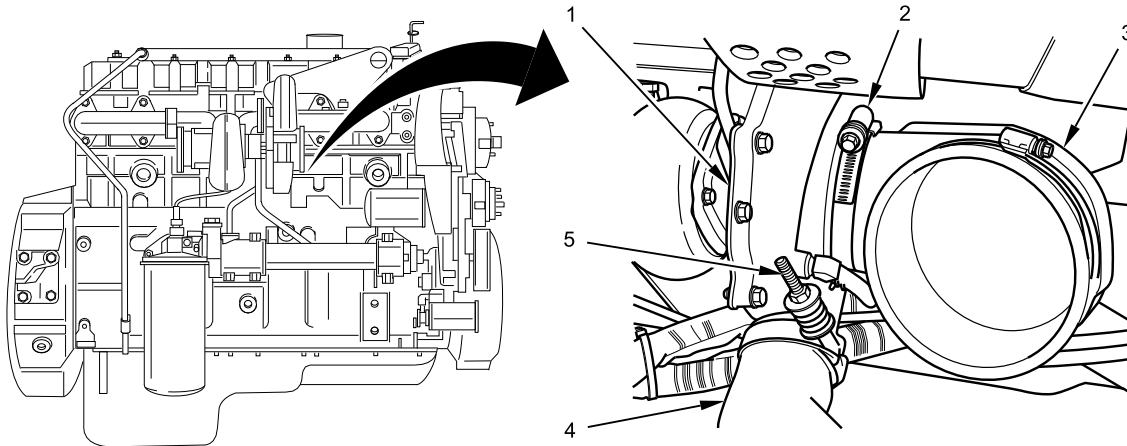
Use care when working with hot turbocharger, turbocharger lubricant lines, and turbocharger oil. Wear goggles, work gloves, and long sleeves for protection. Avoid contact with hot turbocharger or turbocharger oil when draining oil. If oil temperature is above 220°F (104°C), allow to cool before draining from turbocharger. Failure to comply may result in serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may flammable and may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel. Failure to comply may result in environmental damage and injury to personnel.

TURBOCHARGER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

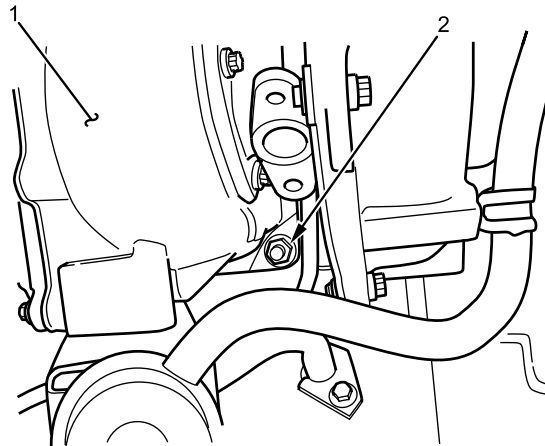
1. Loosen turbocharger air cleaner elbow hose clamp (Figure 1, Item 2) from turbocharger air cleaner elbow hose (Figure 1, Item 3) and remove hose from turbocharger (Figure 1, Item 1).



B230310382

Figure 1. Turbocharger Hose Connections.

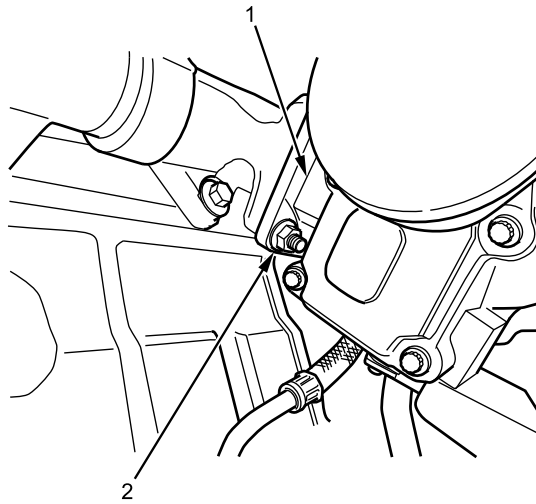
2. Loosen charge air cooler elbow hose clamp (Figure 1, Item 5) from charge air cooler elbow hose (Figure 1, Item 4) and remove hose from turbocharger (Figure 1, Item 1).
3. Remove lower right turbocharger flange nut (Figure 2, Item 2) from turbocharger (Figure 2, Item 1).



B230302353

Figure 2. Turbocharger Flange Nut.

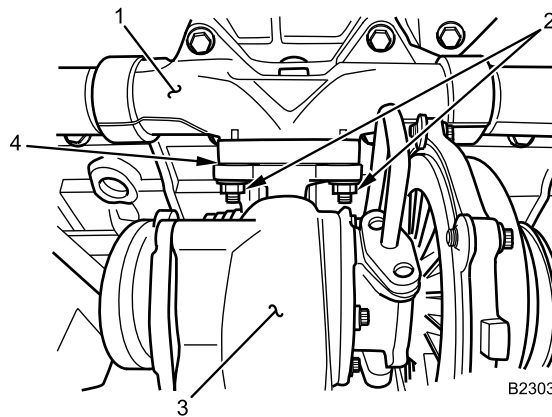
4. Remove lower left turbocharger flange nut (Figure 3, Item 2) from turbocharger (Figure 3, Item 1).

TURBOCHARGER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230302354

Figure 3. Turbocharger Flange Nut.

5. Remove upper turbocharger flange nuts (Figure 4, Item 2) from turbocharger (Figure 4, Item 3), and remove turbocharger from exhaust manifold (Figure 4, Item 1).



B230310383

Figure 4. Turbocharger Mounting.

6. Remove turbocharger flange gasket (Figure 4, Item 4) from exhaust manifold (Figure 4, Item 1). Discard gasket (Figure 4, Item 4).

END OF TASK

TURBOCHARGER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

1. Install new turbocharger flange gasket (Figure 5, Item 4) on exhaust manifold (Figure 5, Item 1).

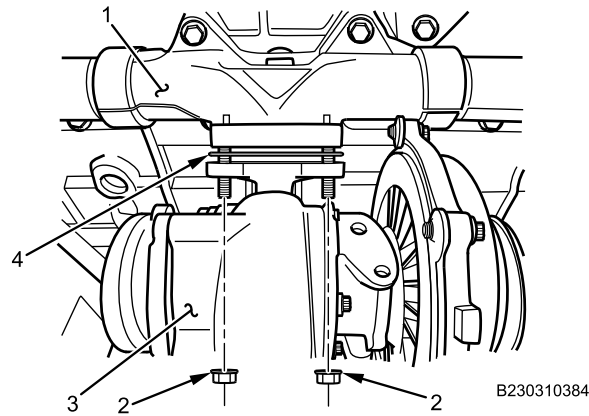


Figure 5. Turbocharger Mounting.

2. Position turbocharger (Figure 5, Item 3) on exhaust manifold (Figure 5, Item 1) and loosely install upper turbocharger flange nuts (Figure 5, Item 2).
3. Loosely install lower left turbocharger flange nut (Figure 6, Item 2) on turbocharger (Figure 6, Item 1).

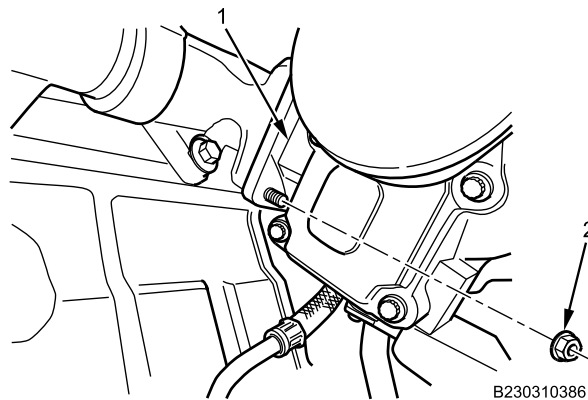


Figure 6. Turbocharger Flange Nut.

4. Loosely install lower right turbocharger flange nut (Figure 7, Item 2) on turbocharger (Figure 7, Item 1).

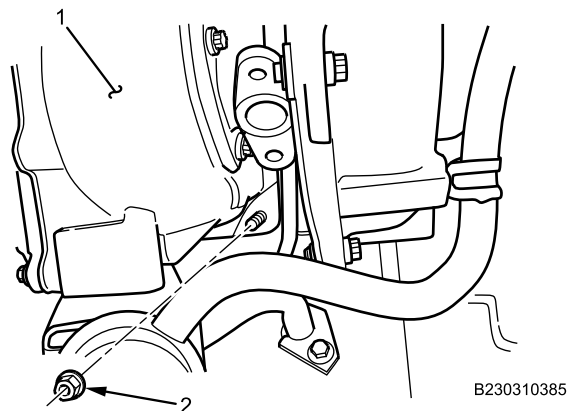


Figure 7. Turbocharger Flange Nut.

TURBOCHARGER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

5. Tighten turbocharger flange nuts (Figure 5, Item 2), (Figure 6, Item 2), (Figure 7, Item 2) securely.
6. Install turbocharger air cleaner elbow hose (Figure 8, Item 2) on turbocharger (Figure 8, Item 5) with turbocharger air cleaner elbow hose clamp (Figure 8, Item 1). Tighten clamp securely.

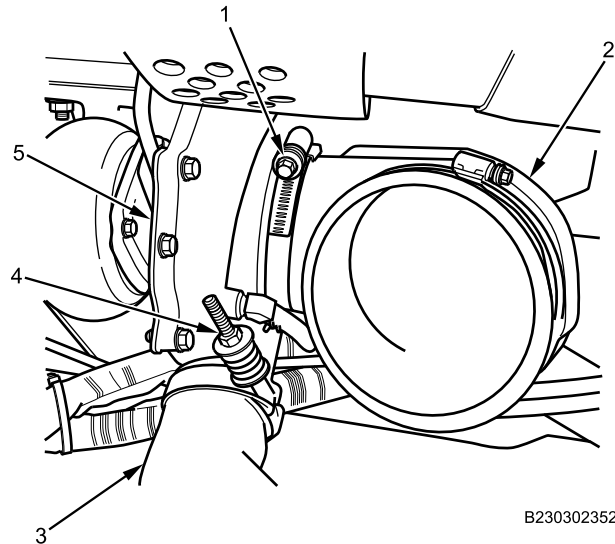


Figure 8. Turbocharger Hose Connections.

7. Install charge air cooler elbow hose (Figure 8, Item 3) on turbocharger (Figure 8, Item 5) with charge air cooler elbow hose clamp (Figure 8, Item 4). Tighten clamp securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install turbocharger lubricant lines (WP 0262).
2. Install exhaust brake (WP 0246).
3. Install air intake tube (WP 0256).
4. Close engine hood (TM 9-2355-106-10).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Start engine (TM 9-2355-106-10).
7. Allow engine to warm up to normal operating temperature (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).
9. Test-drive vehicle to verify turbocharger operation.
10. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
11. Set vehicle parking brake (TM 9-2355-106-10).
12. Turn engine off (TM 9-2355-106-10).
13. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

O-ring - (2) (WP 0796, Item 60)
Gasket (WP 0796, Item 70)
Gasket (WP 0796, Item 116)
O-ring (WP 0796, Item 54)
O-ring (WP 0796, Item 95)

Equipment Condition

Parking brake set (TM 9-2355-106-23)
Transmission set in NEUTRAL (N) (TM 9-2355-106-23)
Engine off (TM 9-2355-106-23)
MAIN POWER switch off (TM 9-2355-106-23)
Wheels chocked (TM 9-2355-106-23)
Engine hood open and secured (TM 9-2355-106-23)
Air intake tube removed (WP 0256)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

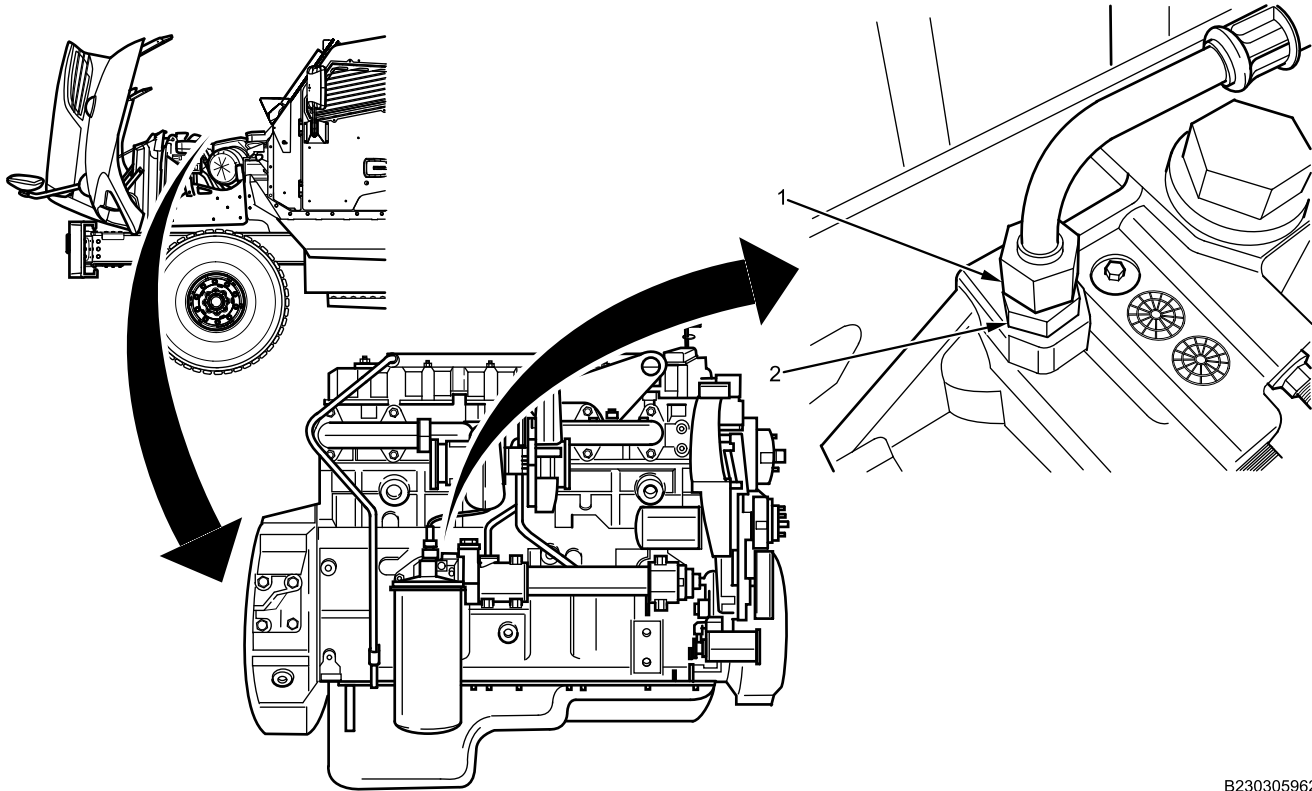
Use care when working with hot turbocharger, turbocharger lubricant lines, and turbocharger oil. Wear goggles, work gloves, and long sleeves for protection. Avoid contact with hot turbocharger or turbocharger oil when draining oil. If oil temperature is above 220°F (104°C), allow to cool before draining from turbocharger. Failure to comply may result in serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

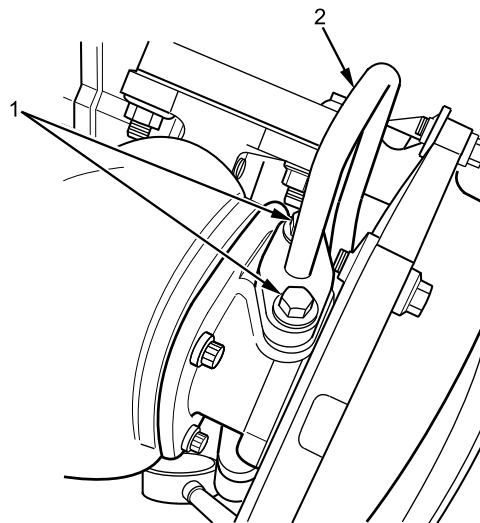
1. Disconnect turbocharger lubricant supply line fitting (Figure 1, Item 1) from turbocharger oil fitting (Figure 1, Item 2) on oil cooler assembly.



B230305962

Figure 1. Turbocharger Lubricant Supply Line Connection.

2. Remove turbocharger lubricant supply line flange bolts (Figure 2, Item 1) from turbocharger lubricant supply line (Figure 2, Item 2) on turbocharger.

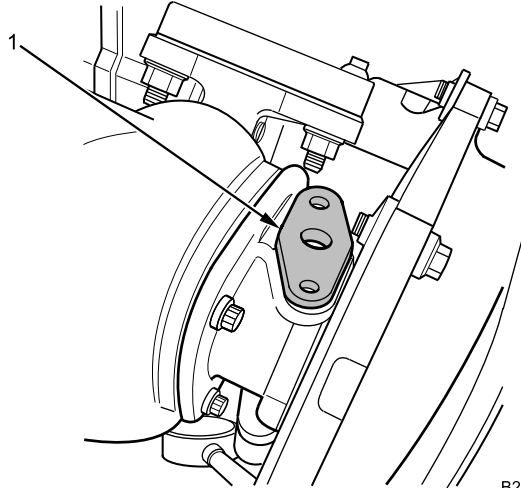


B230302349

Figure 2. Turbocharger Lubricant Supply Line Connection.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

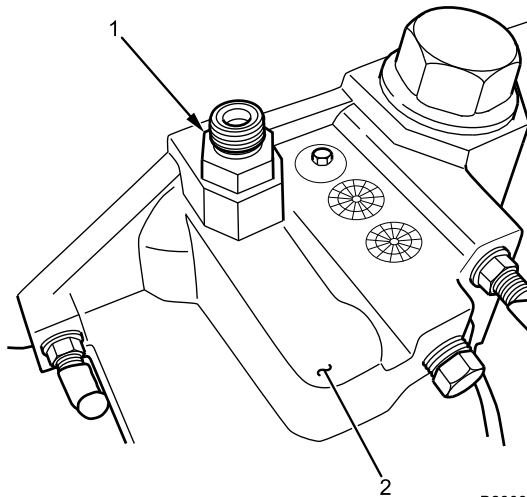
3. Remove turbocharger lubricant supply line (Figure 2, Item 2) from engine.
4. Remove turbocharger lubricant supply line flange gasket (Figure 3, Item 1) from turbocharger. Discard gasket (Figure 3, Item 1).



B230302479

Figure 3. Turbocharger Lubricant Supply Line Flange Gasket.

5. Remove turbocharger oil fitting (Figure 4, Item 1) from oil cooler assembly (Figure 4, Item 2).

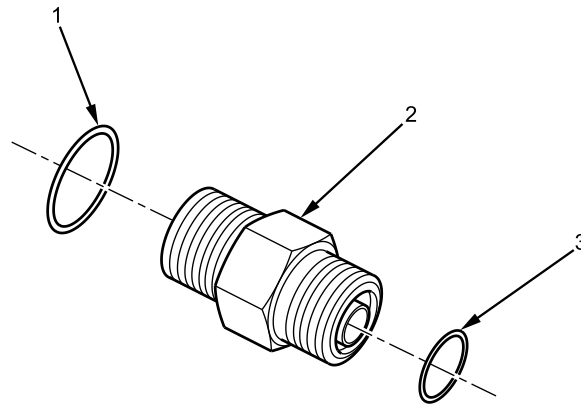


B230302359

Figure 4. Turbocharger Oil Fitting.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

- Remove turbocharger oil fitting upper O-ring seal (Figure 5, Item 3) and lower O-ring seal (Figure 5, Item 1) from turbocharger oil fitting (Figure 5, Item 2). Discard both O-ring seals.

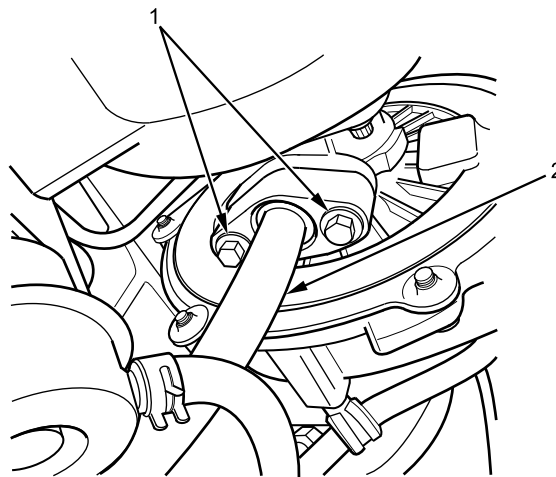


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Figure 5. Turbocharger Oil Fitting O-Rings.

END OF TASK**TURBOCHARGER LUBRICANT DRAIN TUBE REMOVAL**

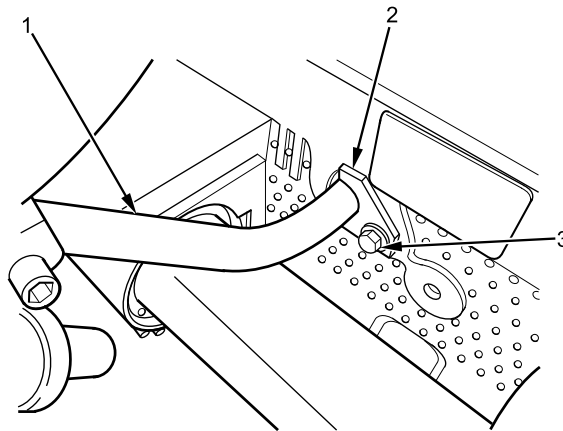
- Remove turbocharger lubricant drain tube flange bolts (Figure 6, Item 1) from turbocharger lubricant drain tube (Figure 6, Item 2) on turbocharger.



B230302350

Figure 6. Turbocharger Lubricant Drain Tube Connection.

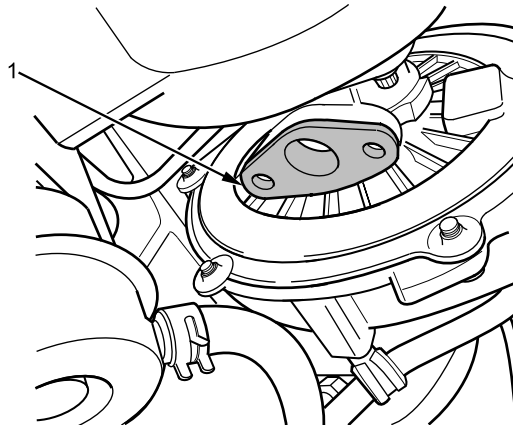
- Remove turbocharger lubricant drain tube bracket bolt (Figure 7, Item 3) and turbocharger lubricant drain tube bracket (Figure 7, Item 2) from engine block.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

B230302351

Figure 7. Turbocharger Lubricant Drain Tube Connection.

3. Remove turbocharger lubricant drain tube (Figure 7, Item 1) from engine block.
4. Remove turbocharger lubricant drain tube flange gasket (Figure 8, Item 1) from turbocharger. Discard gasket.



B230302480

Figure 8. Turbocharger Lubricant Drain Tube Flange Gasket.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove turbocharger drain tube flange (Figure 9, Item 1) from turbocharger drain tube (Figure 9, Item 2).

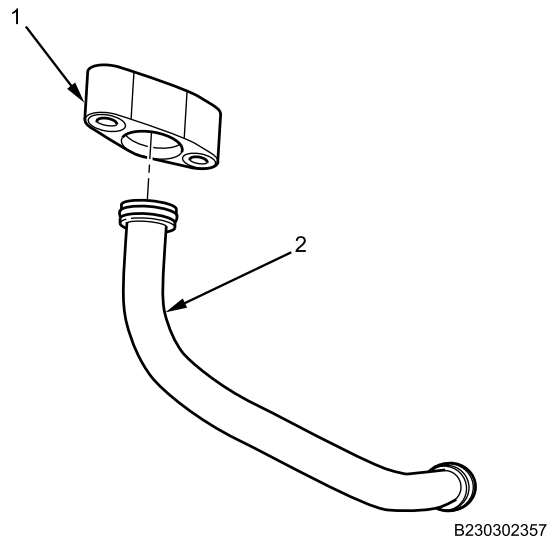


Figure 9. Turbocharger Lubricant Drain Tube Flange.

6. Remove turbocharger drain tube upper and lower O-ring seals (Figure 10, Item 2) from turbocharger drain tube (Figure 10, Item 1). Discard O-ring seals.

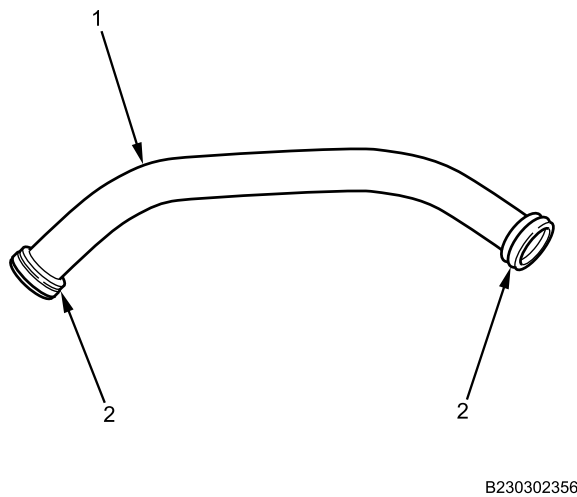
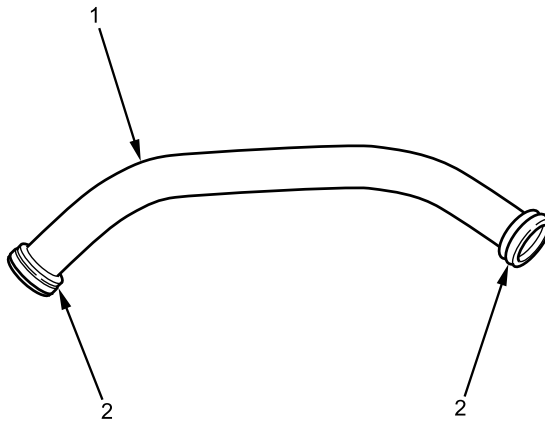


Figure 10. Turbocharger Lubricant Drain Tube O-Rings.

END OF TASK

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)**TURBOCHARGER LUBRICANT DRAIN TUBE INSTALLATION**

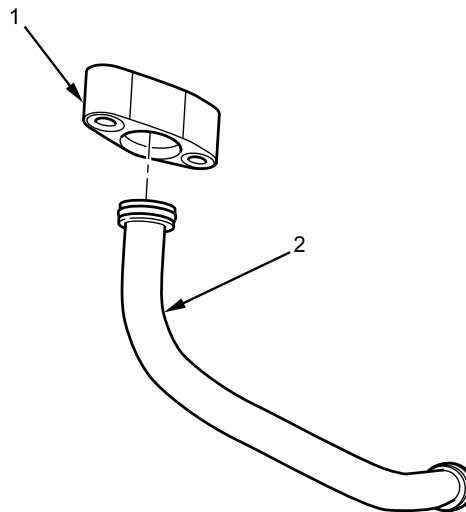
1. Install new turbocharger drain tube upper and lower O-ring seals (Figure 11, Item 2) on turbocharger drain tube (Figure 11, Item 1).



B230302356

Figure 11. Turbocharger Lubricant Drain Tube O-Rings.

2. Install turbocharger drain tube flange (Figure 12, Item 1) on turbocharger drain tube (Figure 12, Item 2).

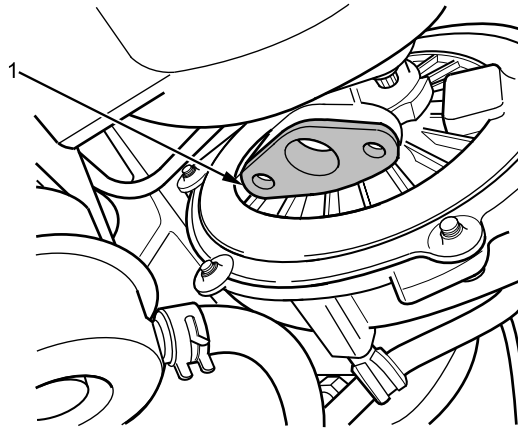


B230302357

Figure 12. Turbocharger Lubricant Drain Tube Flange.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

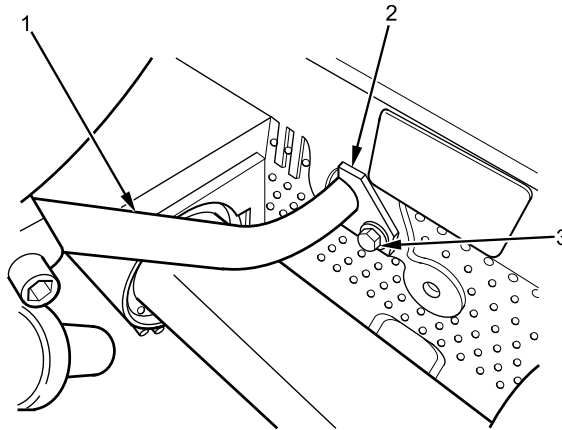
3. Install new turbocharger lubricant drain tube flange gasket (Figure 13, Item 1) on turbocharger.



B230302480

Figure 13. Turbocharger Lubricant Drain Tube Flange Gasket.

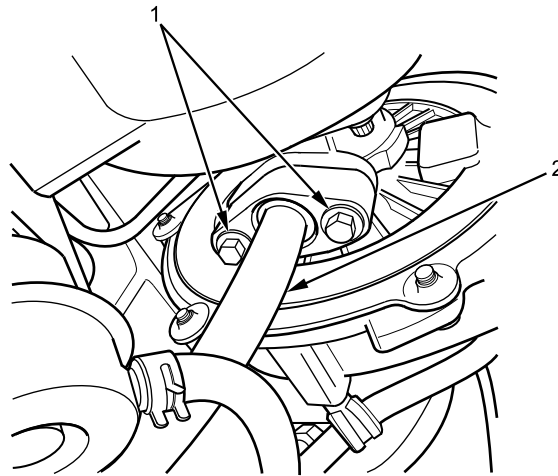
4. Install turbocharger lubricant drain tube (Figure 14, Item 1) on engine block.



B230302351

Figure 14. Turbocharger Lubricant Drain Tube Connection.

5. Loosely install turbocharger lubricant drain tube bracket (Figure 14, Item 2) and turbocharger lubricant drain tube bracket bolt (Figure 14, Item 3) on turbocharger lubricant drain tube (Figure 14, Item 1) and engine block.
6. Install turbocharger lubricant drain tube flange bolts (Figure 15, Item 1) on turbocharger lubricant drain tube (Figure 15, Item 2).

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

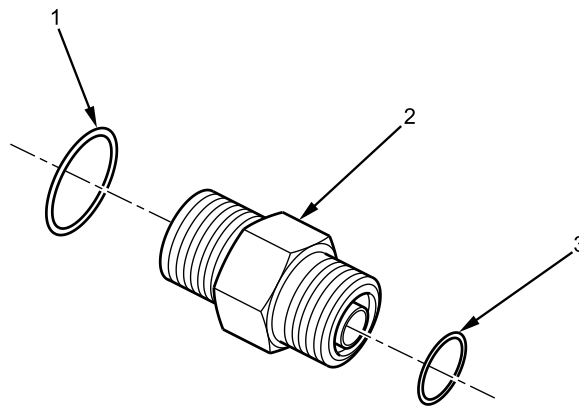
B230302350

Figure 15. Turbocharger Lubricant Drain Tube Connection.

7. Tighten flange bolts (Figure 15, Item 1) and bracket bolt (Figure 14, Item 3) securely.

END OF TASK**TURBOCHARGER LUBRICANT SUPPLY LINE INSTALLATION**

1. Install new turbocharger oil fitting upper O-ring seal (Figure 16, Item 3) and lower O-ring seal (Figure 16, Item 1) on turbocharger oil fitting (Figure 16, Item 2).



B230302360

Figure 16. Turbocharger Oil Fitting O-Rings.

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

2. Install turbocharger oil fitting (Figure 17, Item 1) on oil cooler assembly (Figure 17, Item 2) and tighten securely.

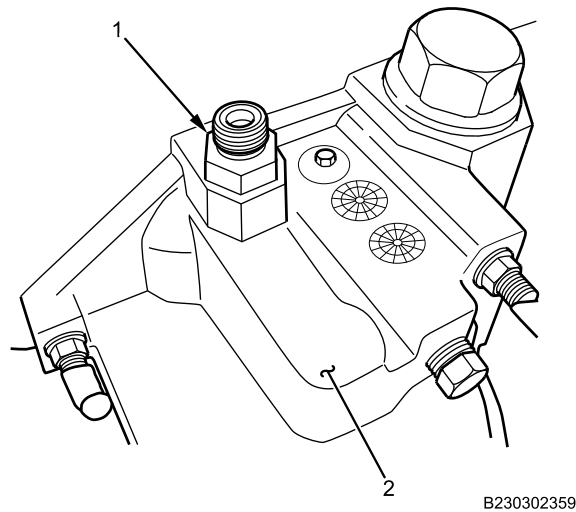


Figure 17. Turbocharger Oil Fitting.

3. Install new turbocharger lubricant supply line flange gasket (Figure 18, Item 1) on turbocharger.

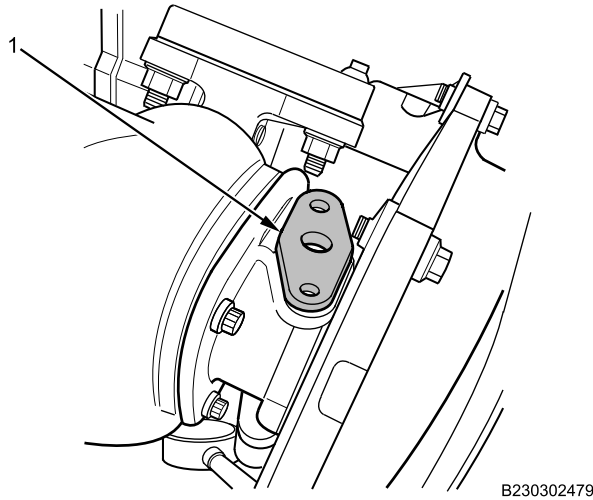
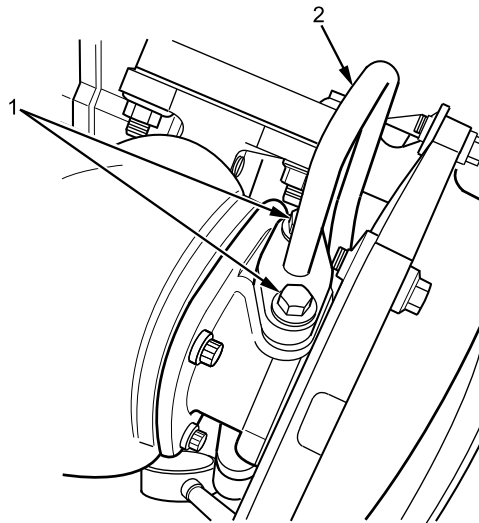


Figure 18. Turbocharger Lubricant Supply Line Flange Gasket.

4. Install turbocharger lubricant supply line (Figure 19, Item 2) on turbocharger and loosely install turbocharger lubricant supply line flange bolts (Figure 19, Item 1).

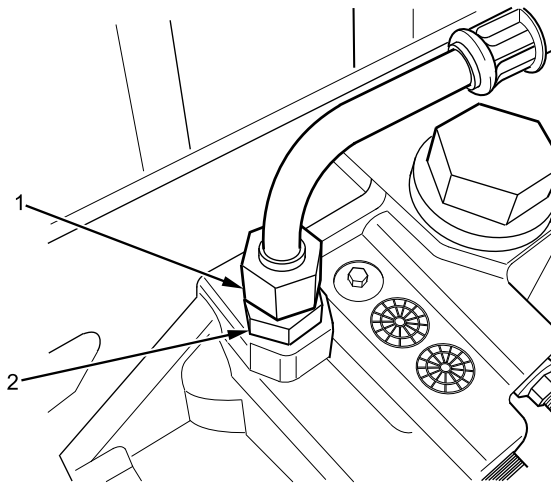
TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)



B230302349

Figure 19. Turbocharger Lubricant Supply Line Connection.

5. Connect turbocharger lubricant supply line fitting (Figure 20, Item 1) on turbocharger oil fitting (Figure 20, Item 2).



B230302348

Figure 20. Turbocharger Lubricant Supply Line Connection.

6. Tighten flange bolts (Figure 19, Item 1) and fitting (Figure 20, Item 1) securely.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install air intake tube (WP 0256).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-23).
4. Turn MAIN POWER switch on (TM-9 2355-106-23).
5. Test-drive vehicle to verify turbocharger lubricant line operation (TM 9-2355-106-23).

TURBOCHARGER LUBRICANT LINES REMOVAL AND INSTALLATION - (CONTINUED)

6. Set transmission in NEUTRAL (N) (TM 9-2355-106-23).
7. Set vehicle parking brake (TM 9-2355-106-23).
8. Turn engine off (TM 9-2355-106-23).
9. Turn MAIN POWER switch off (TM 9-2355-106-23).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 143)
Wrench, torque, 40-200 lb-in. 3/8-inch drive
(WP 0795, Item 142)
Adapter, socket wrench, 3/8-inch drive female -
1/2-inch male (WP 0795, Item 2)

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine shut off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood removed (WP 0575)
Armor grille removed (WP 0567)
Radiator surge overflow tank removed (WP 0281)
Deaeration tank removed (WP 0279)

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

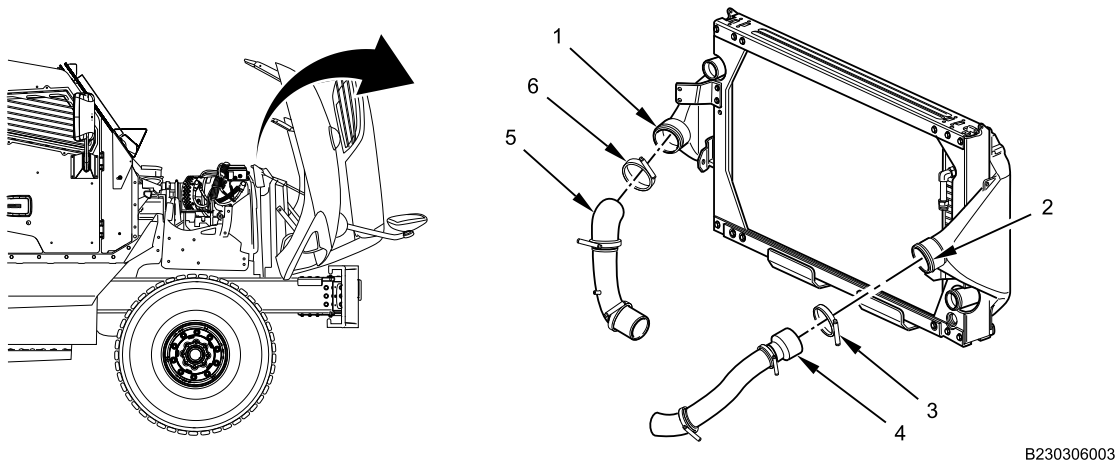
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

CAUTION

To prevent dirt and debris from entering the engine, clean all hoses and clamps prior to removing, and cover turbocharger outlet and intake manifold while the hoses are disconnected. Failure to comply could result in damage to the engine.

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

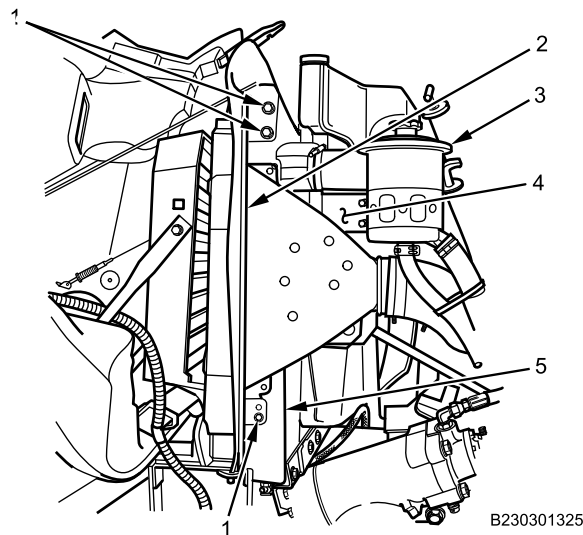
REMOVAL



B230306003

Figure 1. CAC Pipes and Hoses.

1. Loosen clamps (Figure 1, Item 3 and 6) on CAC (Figure 1, Item 1 and 2).
2. Remove hose (Figure 1, Item 4) from right side of CAC assembly (Figure 1, Item 2).
3. Remove hose (Figure 1, Item 5) from left side of CAC assembly (Figure 1, Item 1).



B230301325

Figure 2. Left Side CAC Assembly.

4. Remove three bolts (Figure 2, Item 1) fastening left side hood seal (Figure 2, Item 2) to radiator assembly (Figure 2, Item 5).
5. Position aside left side hood seal (Figure 2, Item 2).
6. Remove two bolts (not shown) fastening power steering reservoir bracket (Figure 2, Item 4) to radiator assembly (Figure 2, Item 5).
7. Move power steering reservoir (Figure 2, Item 3) aside.

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

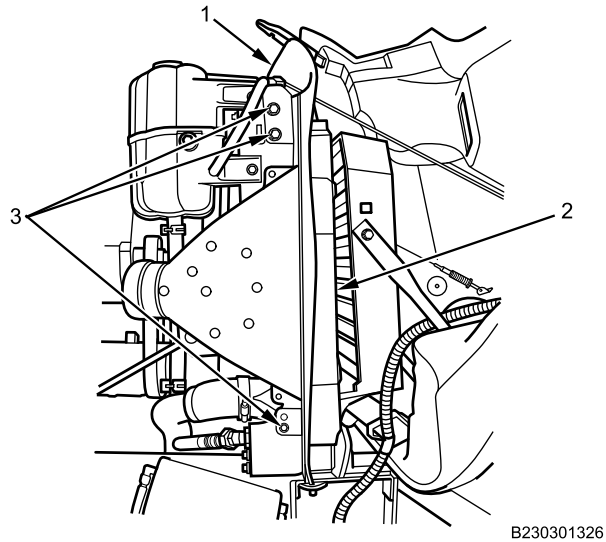


Figure 3. Right Side CAC Assembly.

8. Remove three bolts (Figure 3, Item 3) fastening right side hood seal (Figure 3, Item 1) to radiator assembly (Figure 3, Item 2).
9. Position right side hood seal (Figure 3, Item 1) aside.

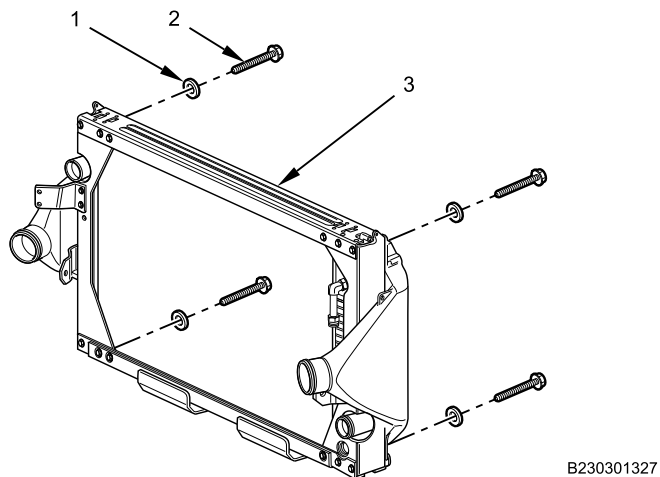


Figure 4. Radiator and CAC Assembly.

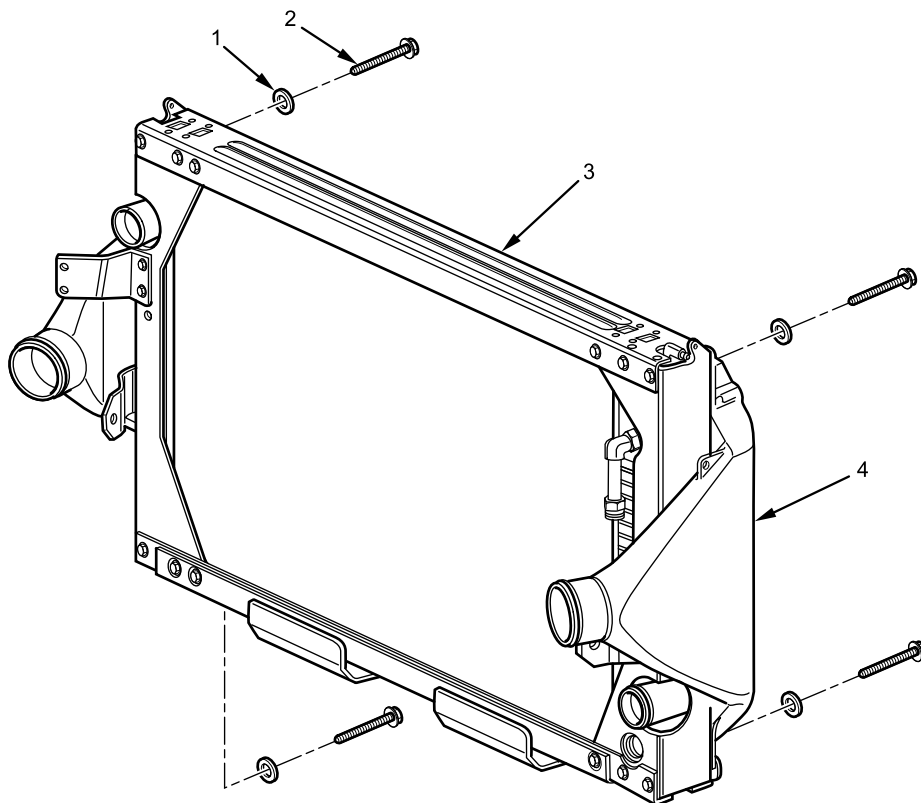
10. Remove four bolts (Figure 4, Item 2) and washers (Figure 4, Item 1) from CAC assembly (Figure 4, Item 3).
11. With assistant, rotate left side of CAC assembly (Figure 4, Item 3) upward and remove.

END OF TASK

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****CAUTION**

Inspect the charge air cooler for cracks or damage. Replace if necessary. Failure to comply may result in damage to the equipment.

Ensure that clamps are in good condition with no rust, damage, or corrosion. Replace if necessary. Failure to comply may result in damage to equipment.



B230306004

Figure 5. Radiator and CAC Assembly.

1. With assistant, install CAC assembly (Figure 5, Item 4) to radiator (Figure 5, Item 3) with four bolts (Figure 5, Item 2) and washers (Figure 5, Item 1). Torque bolts to 47 lb-ft (64 N•m).

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

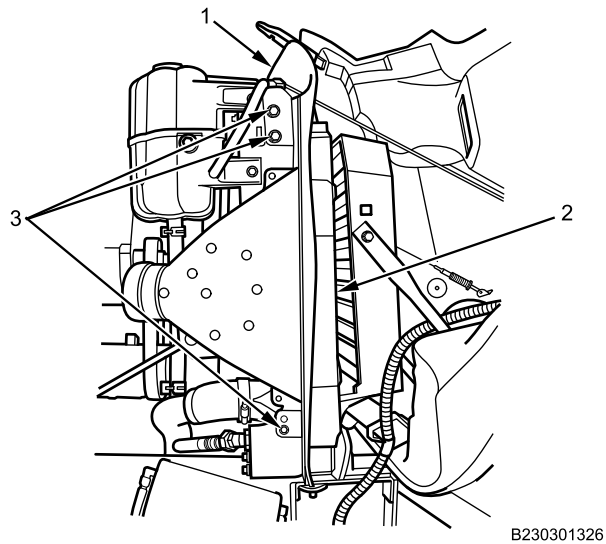


Figure 6. Right Side CAC Assembly.

2. Install right side hood seal (Figure 6, Item 1) to radiator assembly (Figure 6, Item 2) with three bolts (Figure 6, Item 3). Torque bolts to 47 lb-ft (64 N•m).

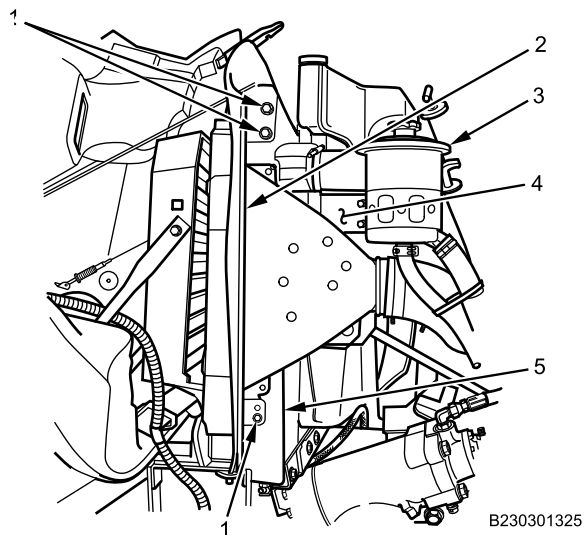
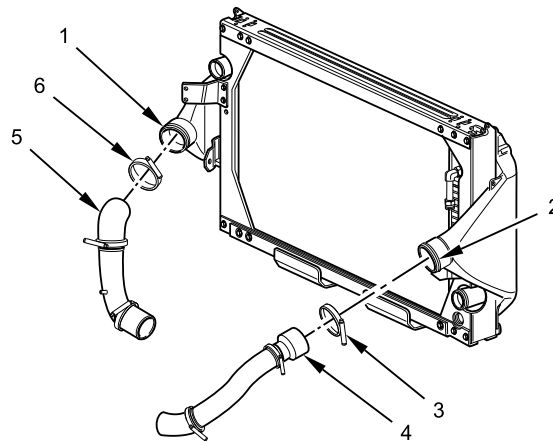


Figure 7. Left Side CAC Assembly.

3. Position power steering reservoir (Figure 7, Item 3) to radiator (Figure 7, Item 5).
4. Install two bolts (not shown) fastening power steering reservoir bracket (Figure 7, Item 4) to radiator (Figure 7, Item 5) and tighten securely.
5. Install left side hood seal (Figure 7, Item 2) to radiator assembly (Figure 7, Item 5) with three bolts (Figure 7, Item 1). Torque bolts to 47 lb-ft (64 N•m).

CHARGE AIR COOLER (CAC) ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230100112

Figure 8. CAC Pipes and Hoses.

6. Install clamp (Figure 8, Item 3) over hose (Figure 8, Item 4) and connect hose to right side of CAC assembly (Figure 8, Item 2). Torque clamp to 50-60 lb-in. (6-7 N•m).
7. Install clamp (Figure 8, Item 6) over hose (Figure 8, Item 5) and connect hose on left side of CAC assembly (Figure 8, Item 1). Torque clamp to 50-60 lb-in. (6-7 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install deaeration tank (WP 0279)
2. Install radiator surge overflow tank (WP 0281)
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine (TM 9-2355-106-10).
5. Verify that CAC system works and check for leaks.
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install armor grille (WP 0567).
9. Install hood (WP 0575).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

CHARGE AIR COOLER (CAC) HOSE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, dial, 300 lb-in., 3/8-inch drive
(WP 0795, Item 147)

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Air cleaner assembly removed (WP 0257)

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

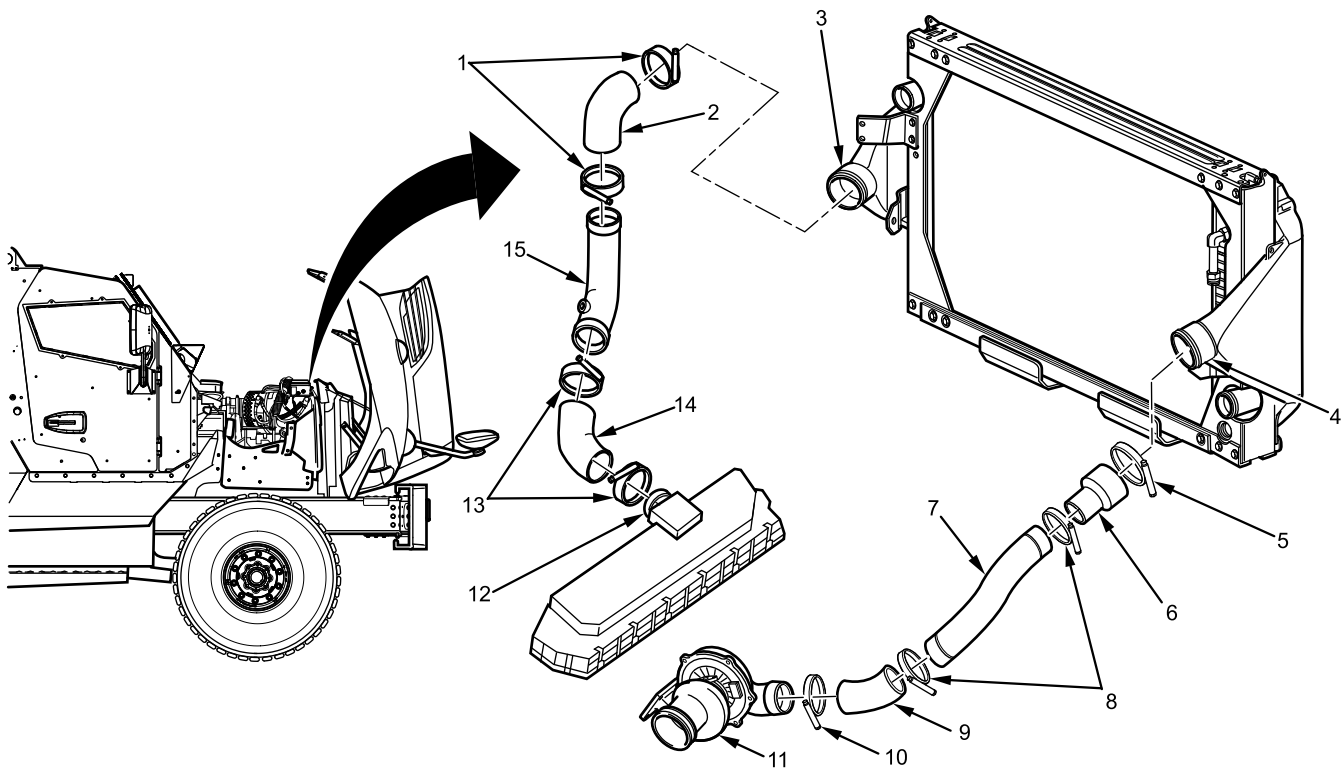
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

CHARGE AIR COOLER (CAC) HOSE REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****CAUTION**

To prevent dirt and debris from entering the engine, clean all hoses and clamps prior to removing, and cover turbocharger outlet and intake manifold while the hoses are disconnected. Failure to comply could result in damage to the engine.

NOTE

Note and mark orientation of pipes and hoses prior to removal to aid in installation.



B230306005

Figure 1. Charge Air Cooler Pipes and Hoses.

1. Remove clamp (Figure 1, Item 5) from right side of CAC assembly (Figure 1, Item 4).
2. Remove clamps (Figure 1, Item 8) from right side pipe (Figure 1, Item 7).
3. Remove clamp (Figure 1, Item 10) from turbocharger (Figure 1, Item 11).
4. Remove hose (Figure 1, Item 6) at CAC assembly and hose (Figure 1, Item 9) with pipe (Figure 1, Item 7) at turbocharger (Figure 1, Item 11).
5. Remove clamps (Figure 1, Item 1) from left side of CAC assembly (Figure 1, Item 3).
6. Remove clamps (Figure 1, Item 13) from intake manifold (Figure 1, Item 12).
7. Remove hose (Figure 1, Item 14) at intake manifold (Figure 1, Item 12) and hose (Figure 1, Item 2) with pipe (Figure 1, Item 15) at left side of CAC assembly (Figure 1, Item 3).

END OF TASK

CHARGE AIR COOLER (CAC) HOSE REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****CAUTION**

Ensure that clamps are in good condition with no rust, damage, or corrosion. Replace if necessary. If the bridge gap is less than 1/8 in. (3.2 mm), replace with smaller diameter clamp. Failure to comply may result in damage to equipment.

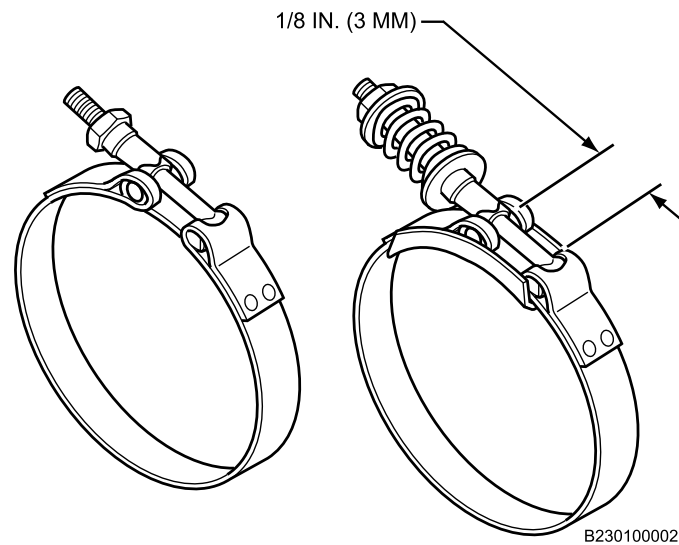
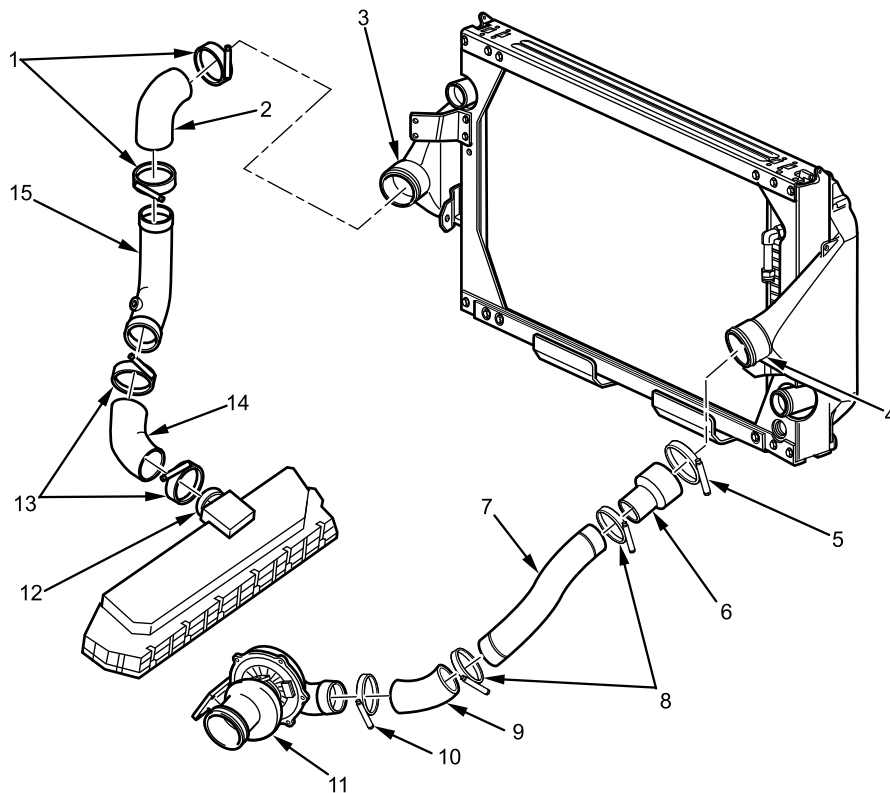


Figure 2. Clamps.

CHARGE AIR COOLER (CAC) HOSE REMOVAL AND INSTALLATION - (CONTINUED)

B230100001

Figure 3. Charge Air Cooler Pipes and Hoses.

1. Install clamps (Figure 3, Item 8) on right side pipe (Figure 3, Item 7). Connect hoses (Figure 3, Item 6 and 9) on right side pipe (Figure 3, Item 7).
2. Install clamp (Figure 3, Item 10) over turbocharger (Figure 3, Item 11) and clamp (Figure 3, Item 5) over right side of CAC assembly (Figure 3, Item 4).
3. Connect hoses (Figure 3, Item 6 and 9) with pipe (Figure 3, Item 7) to turbocharger (Figure 3, Item 11) and right side of CAC assembly (Figure 3, Item 4).
4. Install clamps (Figure 3, Item 1 and 13) over left side pipe (Figure 3, Item 15).
5. Connect hoses (Figure 3, Item 2 and 14) to left side pipe (Figure 3, Item 15).
6. Connect hoses (Figure 3, Item 2 and 14) with pipe (Figure 3, Item 15) to intake manifold (Figure 3, Item 12) and left side of CAC assembly (Figure 3, Item 3).
7. Torque all clamps (Figure 3, Item 1, 5, 8, 10 and 13) to 50-60 lb-in. (6-7 N•m).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install air cleaner assembly (WP 0257).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Verify CAC system works and check for leaks.
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Close engine hood (TM 9-2355-106-10).

CHARGE AIR COOLER (CAC) HOSE REMOVAL AND INSTALLATION - (CONTINUED)

8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**FUEL TANK REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Jack, transmission (WP 0795, Item 61)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Snapping Pliers Tool Kit (WP 0795, Item 92)

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Gasket (WP 0796, Item 116)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

Personnel Required

Maintainer, (2)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Belly armor removed (WP 0606)

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

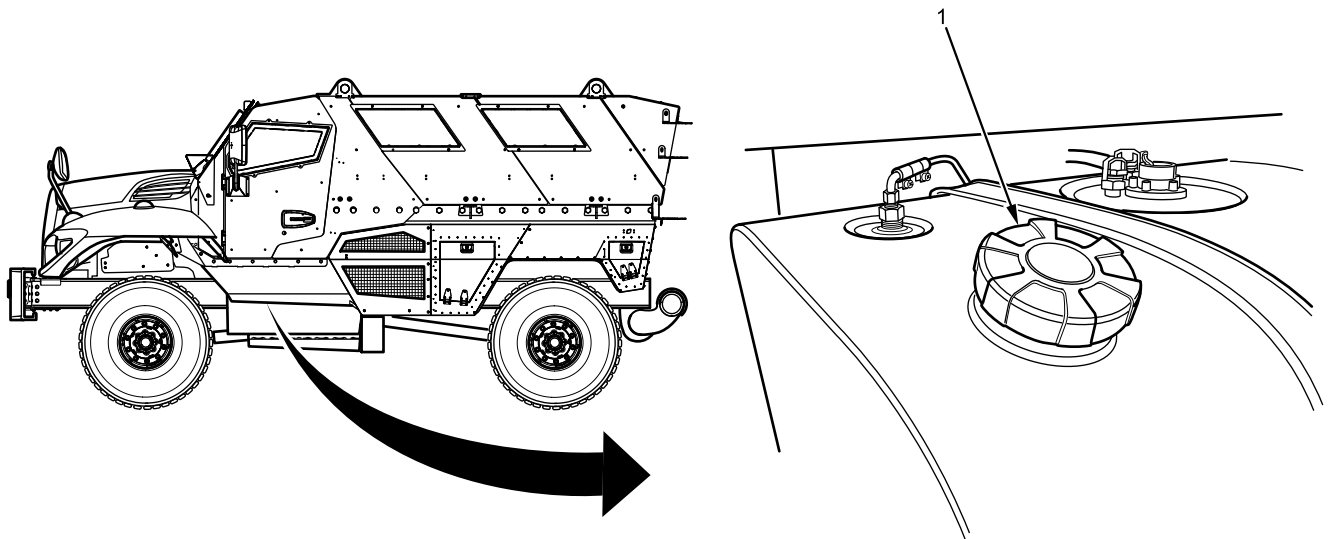
Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Follow all standard operating procedures for use, storage, and disposal of hazard materials. Failure to comply may result in injury to personnel and damage to the environment.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

Accidental or intentional introduction of liquid contaminants into the environment is a violation of state, federal, and military regulations. Store, install, and dispose of containers in accordance with standard operating procedures. Refer to Army Petroleum, Oil, and Lubricants (POL) (para. 1-8) for information concerning storage, use, and disposal of liquid contaminants. Failure to comply may result in damage to environment and serious injury or death to personnel.

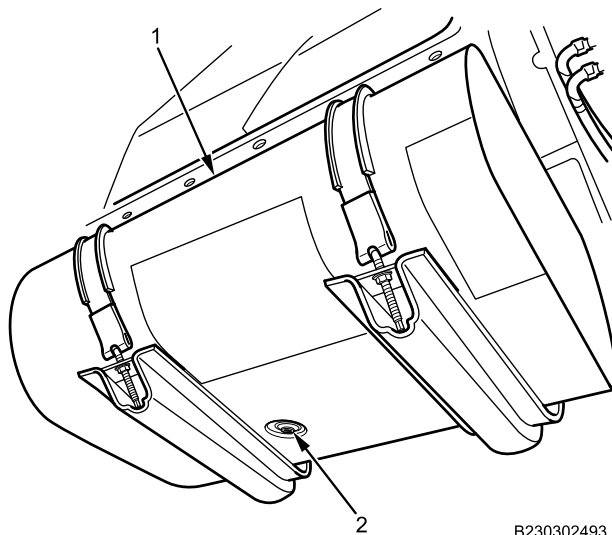
REMOVAL



B230310493

Figure 1. Fuel Tank Cap.

1. Loosen fuel tank cap (Figure 1, Item 1) to vent fuel tank for draining.

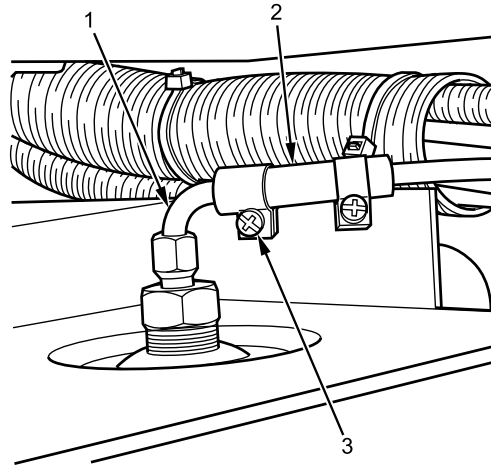


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Figure 2. Fuel Tank Drain Plug.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

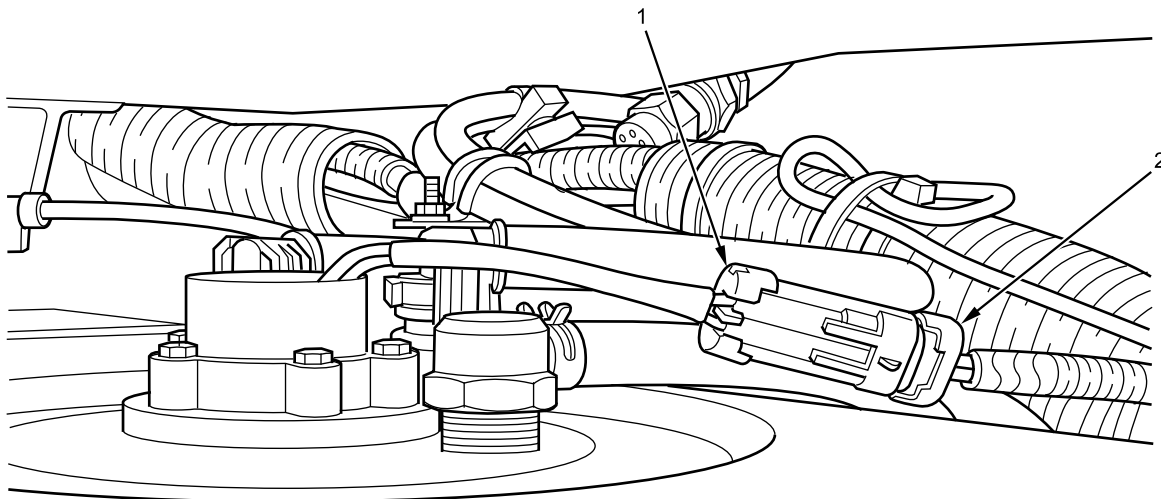
2. Position drain pan under drain plug (Figure 2, Item 2).
3. Remove drain plug (Figure 2, Item 2) from fuel tank (Figure 2, Item 1) and drain fuel into drain pan. Replace drain plug and tighten securely.



B230302494

Figure 3. Fuel-Fired Heater Fuel Pump Fuel Line.

4. Loosen fuel hose clamp (Figure 3, Item 3). Remove fuel line hose (Figure 3, Item 2) and clamp from fuel tank pickup pipe (Figure 3, Item 1).
5. Drain fuel from fuel line hose (Figure 3, Item 2) into drain pan.



B230302495

Figure 4. Fuel Level Sensor Harness.

6. Disconnect fuel sender harness (Figure 4, Item 1) from chassis wiring harness connector (Figure 4, Item 2).

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

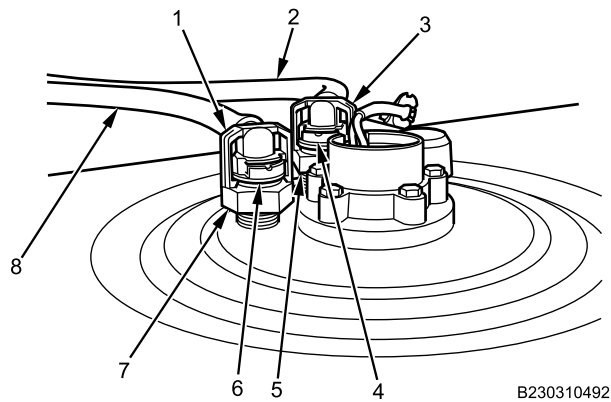


Figure 5. Fuel Tank Feed and Return Lines.

7. Disconnect fuel feed line (Figure 5, Item 2) and return line (Figure 5, Item 8) from two fuel tank connectors (Figure 5, Item 5 and 7) by depressing coupling disconnect tabs (Figure 5, Item 4 and 6) and pulling up on couplings (Figure 5, Item 1 and 3).
8. Drain fuel from fuel line tubing (Figure 5, Item 1 and 2) into drain pan.

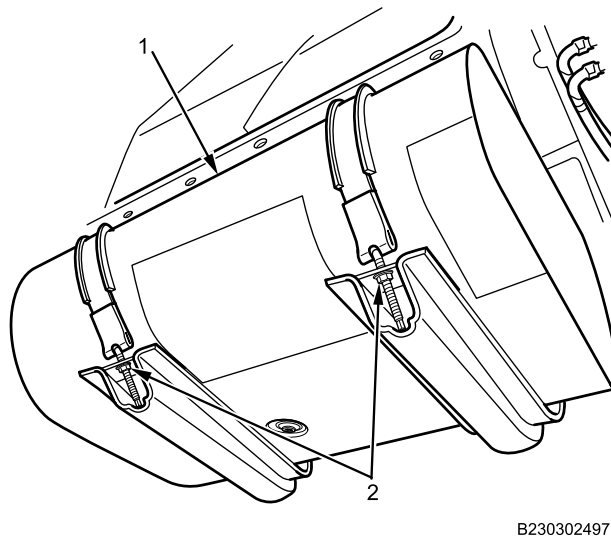


Figure 6. Fuel Tank Mounting Straps.

9. Remove nuts (Figure 6, Item 2) from fuel tank mounting straps.
10. Remove drain pan.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

11. With crewmember assistance, remove fuel tank (Figure 6, Item 1) from fuel tank supports, using transmission jack.

END OF TASK

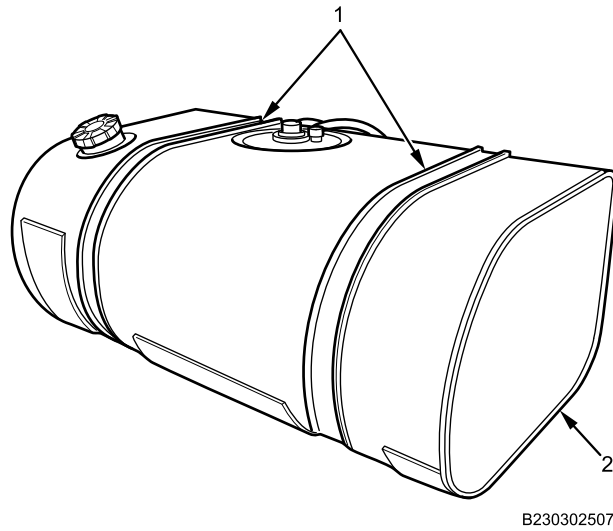
FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)**DISASSEMBLY**

Figure 7. Fuel Tank Strap Linings.

1. Remove strap linings (Figure 7, Item 1) from fuel tank (Figure 7, Item 2).

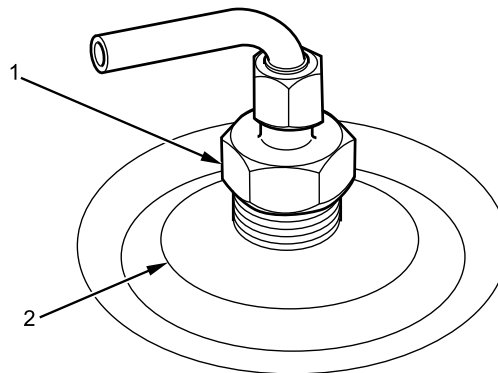
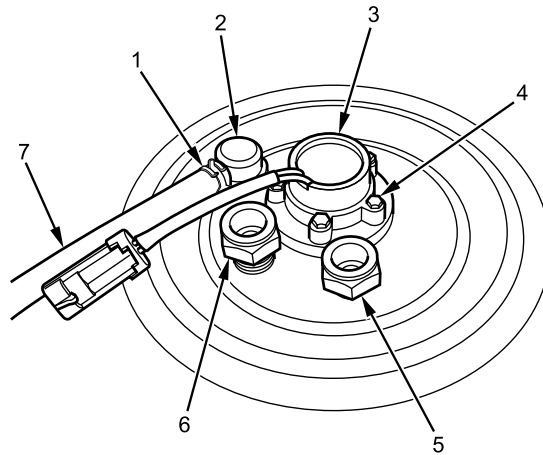


Figure 8. Fuel-Fired Heater Fuel Tank Outlet.

2. Remove fuel fired pickup tube (Figure 8, Item 1) from fuel tank (Figure 8, Item 2).

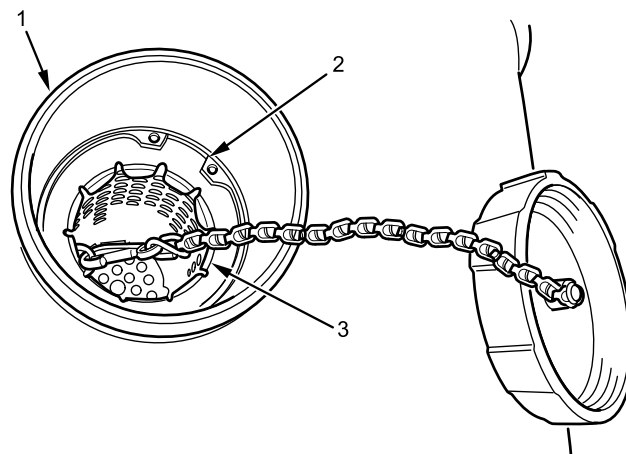
FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)



B230302505

Figure 9. Fuel Tank Level Sender, Feed, Vent, and Return Line Connections.

3. Loosen clamp (Figure 9, Item 1) and remove vent hose (Figure 9, Item 7) from vent hose fitting (Figure 9, Item 2).
4. Remove fuel return hose fitting (Figure 9, Item 5) from fuel tank.
5. Remove fuel feed hose fitting (Figure 9, Item 6) from fuel tank.
6. Remove five fuel sender bolts (Figure 9, Item 4) from fuel sender (Figure 9, Item 3), and remove sender and gasket from fuel tank. Discard gasket.
7. Remove vent hose fitting (Figure 9, Item 2) from fuel tank.



B230302506

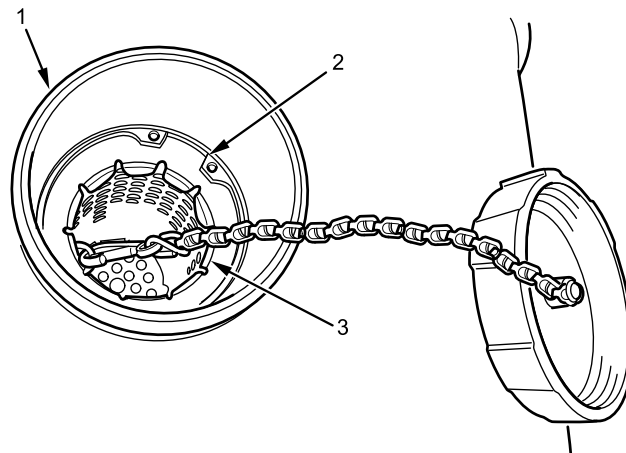
Figure 10. Fuel Tank Anti-Siphon Screen.

8. Remove internal snapping (Figure 10, Item 2) from fuel tank neck (Figure 10, Item 1).
9. Remove fuel cap and anti-siphon screen assembly (Figure 10, Item 3) from fuel tank neck (Figure 10, Item 1).

END OF TASK

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

ASSEMBLY



B230302506

Figure 11. Fuel Tank Anti-Siphon Screen.

1. Install fuel cap and anti-siphon screen assembly (Figure 11, Item 3) on fuel tank neck (Figure 11, Item 1).
2. Install internal snapping (Figure 11, Item 2) on fuel tank neck (Figure 11, Item 1).

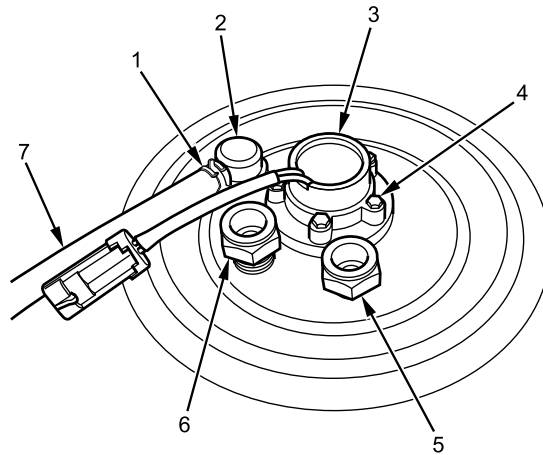
WARNING



Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

3. Apply corrosion preventive compound to fuel sender bolts (Figure 12, Item 4).

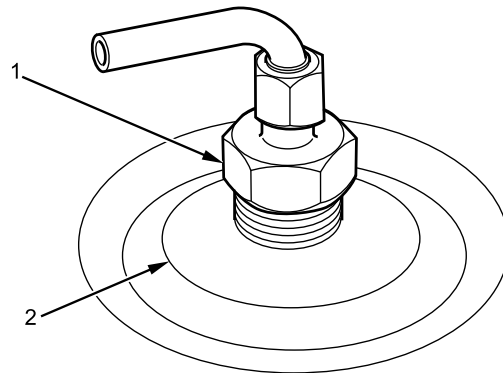
FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)



B230302505

Figure 12. Fuel Tank Level Sender, Feed, Vent, and Return Line Connections.

4. Install new gasket, fuel sender (Figure 12, Item 3), and five bolts (Figure 12, Item 4) on fuel tank. Tighten bolts securely.
5. Install fuel feed hose fitting (Figure 12, Item 6) on fuel tank and tighten securely.
6. Install fuel return hose fitting (Figure 12, Item 5) on fuel tank and tighten securely.
7. Install vent hose fitting (Figure 12, Item 2) on fuel tank and tighten securely.
8. Install vent hose (Figure 12, Item 7) and clamp (Figure 12, Item 1) on vent hose fitting (Figure 12, Item 2).



B230310491

Figure 13. Fuel-Fired Heater Fuel Tank Outlet.

9. Install fuel fired heater pickup tube (Figure 13, Item 1) on fuel tank (Figure 13, Item 2) and tighten securely.

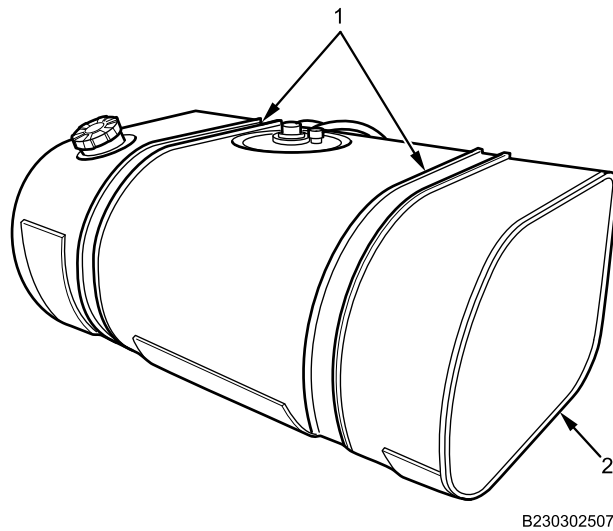
FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

Figure 14. Fuel Tank Strap Linings.

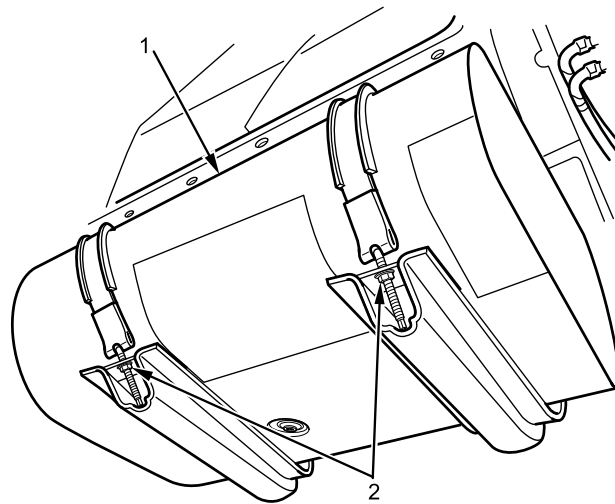
10. Install strap linings (Figure 14, Item 1) on fuel tank (Figure 14, Item 2).

END OF TASK**INSTALLATION****WARNING**

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use proper lifting device for weight of item. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

1. With crewmember assistance, install fuel tank (Figure 15, Item 1) on fuel tank supports, using transmission jack.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)



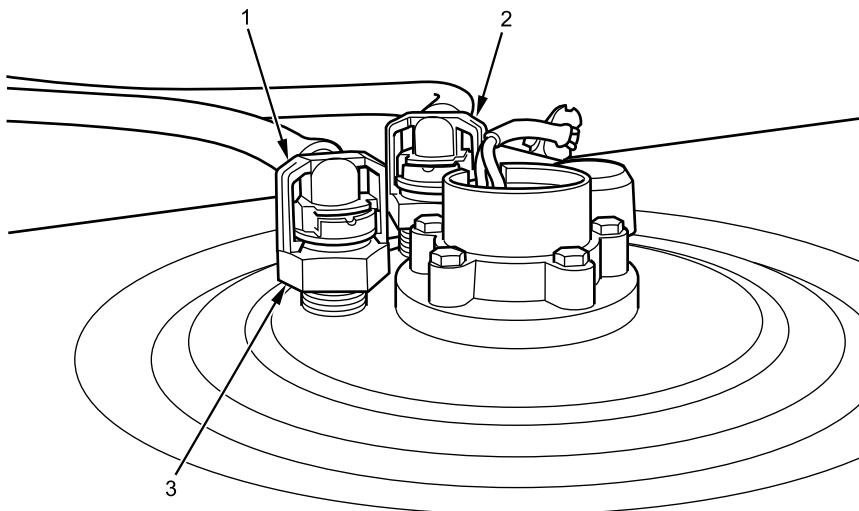
B230302497

Figure 15. Fuel Tank Mounting Straps.

NOTE

Ensure there is clearance between fuel tank and fender armor panel prior to tightening fuel tank mounting straps.

2. Install nuts (Figure 15, Item 2) on fuel tank mounting straps and tighten securely.
3. Connect fuel feed line (Figure 16, Item 2) and return line (Figure 16, Item 1) on two fuel tank connectors (Figure 16, Item 3).



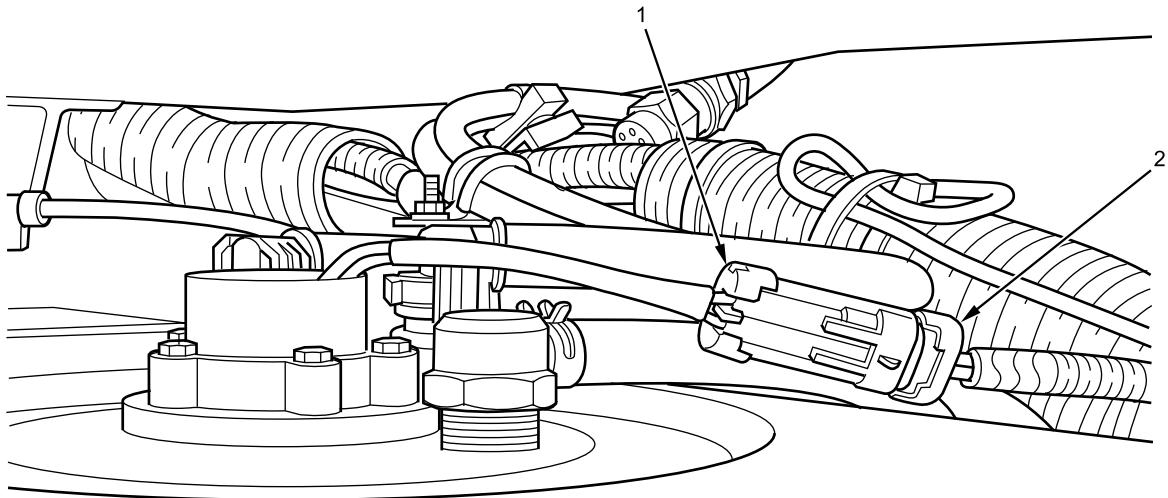
B230302496

Figure 16. Fuel Tank Feed and Return Lines.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

4. Apply dielectric grease to fuel sender harness (Figure 17, Item 1).

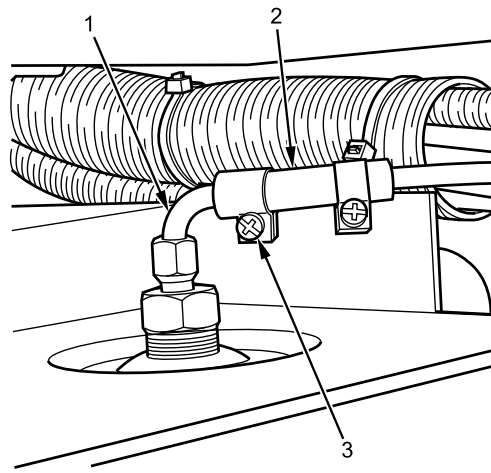


B230302495

Figure 17. Fuel Level Sensor Harness.

5. Connect fuel sender harness (Figure 17, Item 1) on chassis wiring harness connector (Figure 17, Item 2).
6. Install fuel line hose (Figure 18, Item 2) and clamp (Figure 18, Item 3) on fuel tank outlet fitting (Figure 18, Item 1). Tighten fuel hose clamp securely.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

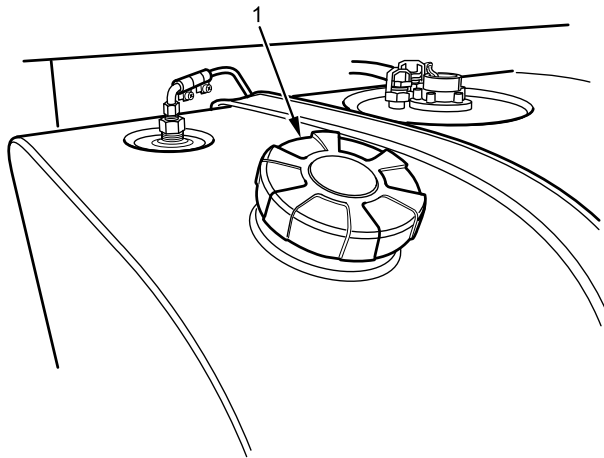


B230302494

Figure 18. Fuel-Fired Heater Fuel Pump Fuel Line.

FUEL TANK REMOVAL AND INSTALLATION - (CONTINUED)

7. Fill fuel tank and install fuel tank cap (Figure 19, Item 1).



B230302492

Figure 19. Fuel Tank Cap.

8. Inspect for static fuel leaks.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Remove wheel chocks (TM 9-2355-106-10).
3. Prime fuel system (WP 0255).
4. Test-drive vehicle to verify fuel-fire heater and fuel tank system operation.
5. Inspect for fuel leaks.
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).
10. Install belly armor (WP 0606).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL TANK BRACKET REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Fuel tank removed (WP 0265)
Fuel tank straps removed (WP 0267)

References

TM 9-2355-106-10
TM 9-2355-106-23P

REMOVAL

1. Remove nut (Figure 1, Item 3), and remove fuel-fired heater fuel pump (Figure 1, Item 1) from right fuel tank support (Figure 1, Item 2).

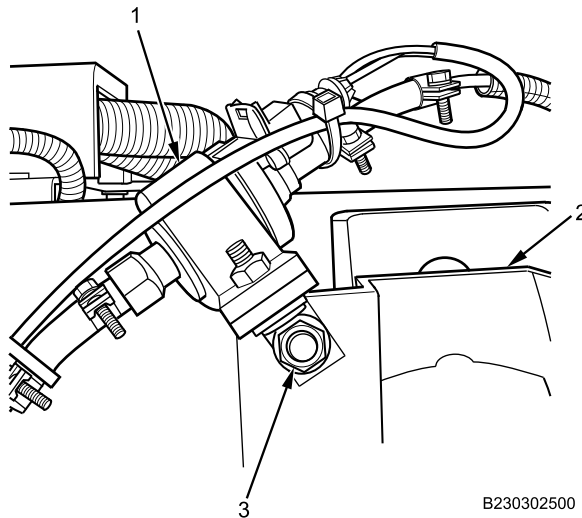
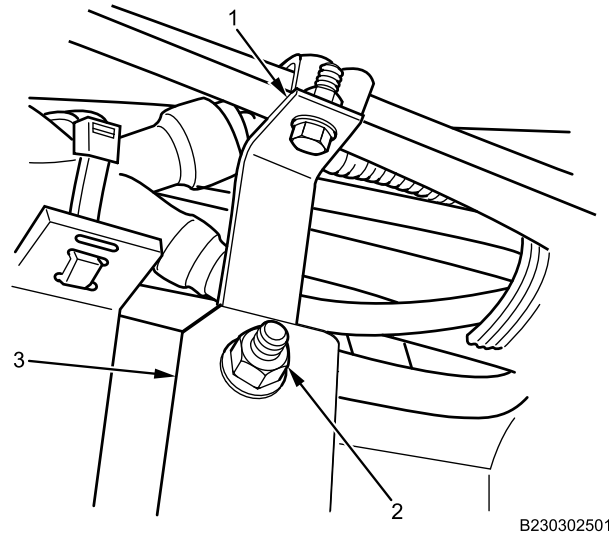


Figure 1. Fuel-Fired Heater Fuel Pump.

FUEL TANK BRACKET REMOVAL AND INSTALLATION - (CONTINUED)

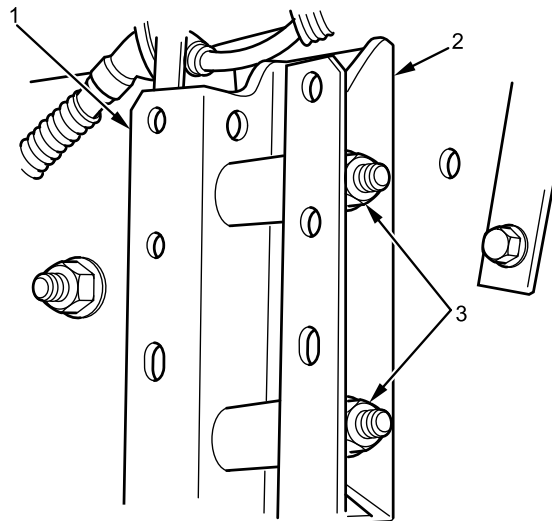
2. Remove nut (Figure 2, Item 2), and remove harness mounting strap (Figure 2, Item 1) from left fuel tank support (Figure 2, Item 3).



B230302501

Figure 2. Harness Mounting Strap.

3. Remove bolts and nuts (Figure 3, Item 3) from each fuel tank support (Figure 3, Item 1) and fuel tank bracket (Figure 3, Item 2). Remove supports.



B230302502

Figure 3. Fuel Tank Support.

FUEL TANK BRACKET REMOVAL AND INSTALLATION - (CONTINUED)

4. Remove bolts (Figure 4, Item 3) from each fuel tank bracket (Figure 4, Item 2) on left frame rail (Figure 4, Item 1). Remove brackets.

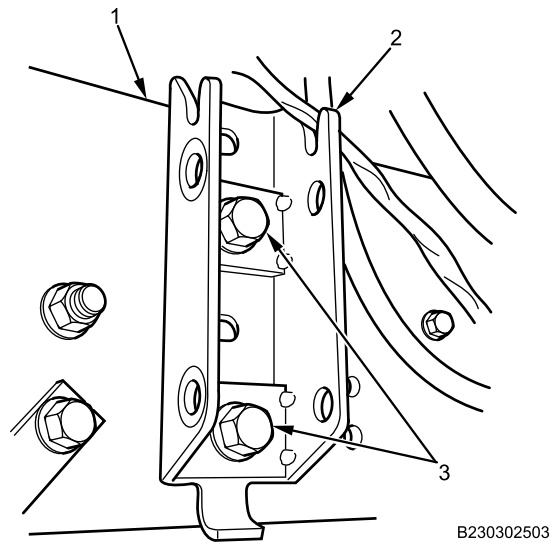


Figure 4. Fuel Tank Bracket.

END OF TASK

FUEL TANK BRACKET REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to fuel tank bracket bolts (Figure 5, Item 3).

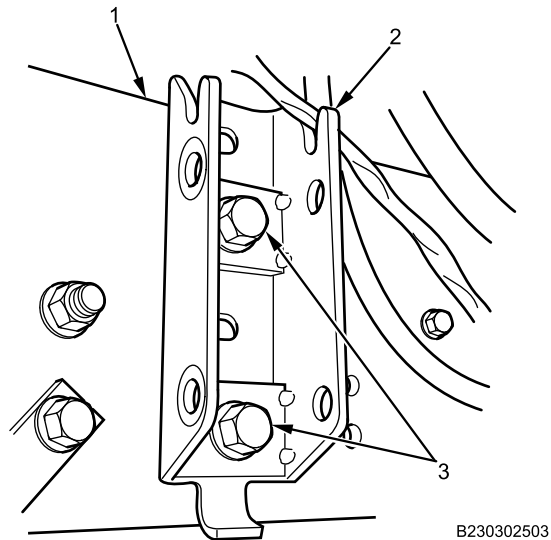
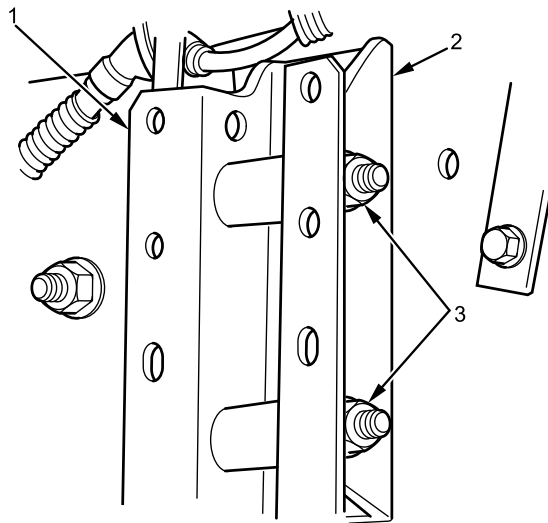


Figure 5. Fuel Tank Bracket.

2. Position each fuel tank bracket (Figure 5, Item 2) on left frame rail (Figure 5, Item 1), and install bolts (Figure 5, Item 3). Tighten bolts securely.

FUEL TANK BRACKET REMOVAL AND INSTALLATION - (CONTINUED)

3. Apply corrosion preventive compound to fuel tank support bolts and nuts (Figure 6, Item 3).



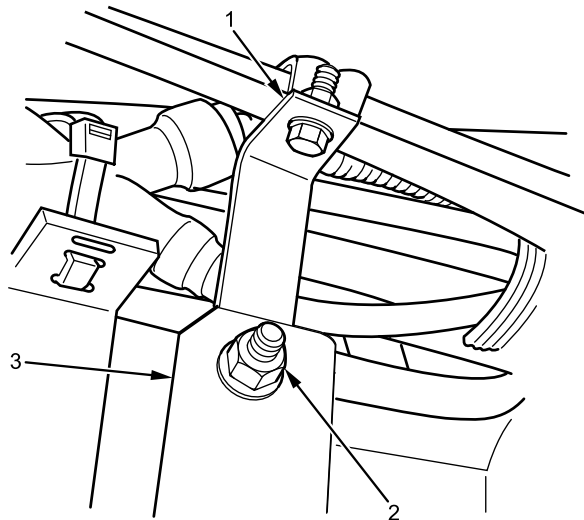
B230302502

Figure 6. Fuel Tank Support.

NOTE

Nuts in next step are loosely installed to aid in installation of fuel tank straps.

4. Position each fuel tank support (Figure 6, Item 1) on fuel tank bracket (Figure 6, Item 2), and loosely install nuts (Figure 6, Item 3).
5. Apply corrosion preventive compound to harness mounting strap nut (Figure 7, Item 2).



B230302501

Figure 7. Harness Mounting Strap.

6. Position harness mounting strap (Figure 7, Item 1) on left fuel tank support (Figure 7, Item 3), and install nut (Figure 7, Item 2). Tighten nut securely.

FUEL TANK BRACKET REMOVAL AND INSTALLATION - (CONTINUED)

7. Apply corrosion preventive compound to fuel pump mounting nut (Figure 8, Item 3).

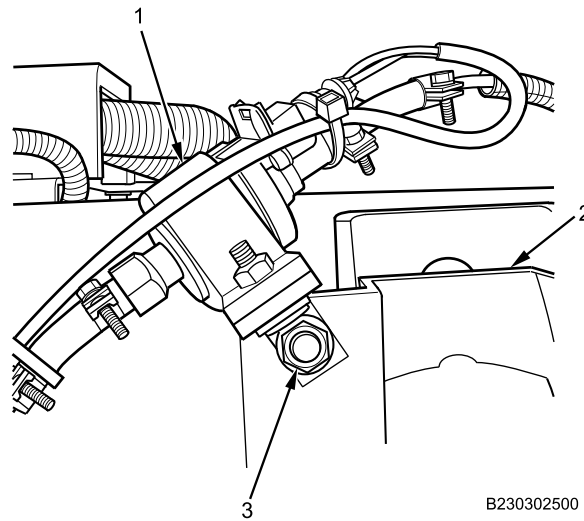


Figure 8. Fuel-Fired Heater Fuel Pump.

8. Position fuel-fired heater fuel pump (Figure 8, Item 1) on right fuel tank support (Figure 8, Item 2), and install nut (Figure 8, Item 3). Tighten nut securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install fuel tank straps (WP 0267).
2. Install Fuel tank (WP 0265).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FUEL TANK STRAP REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Pin, cotter - (4) (WP 0796, Item 21)

Equipment Condition

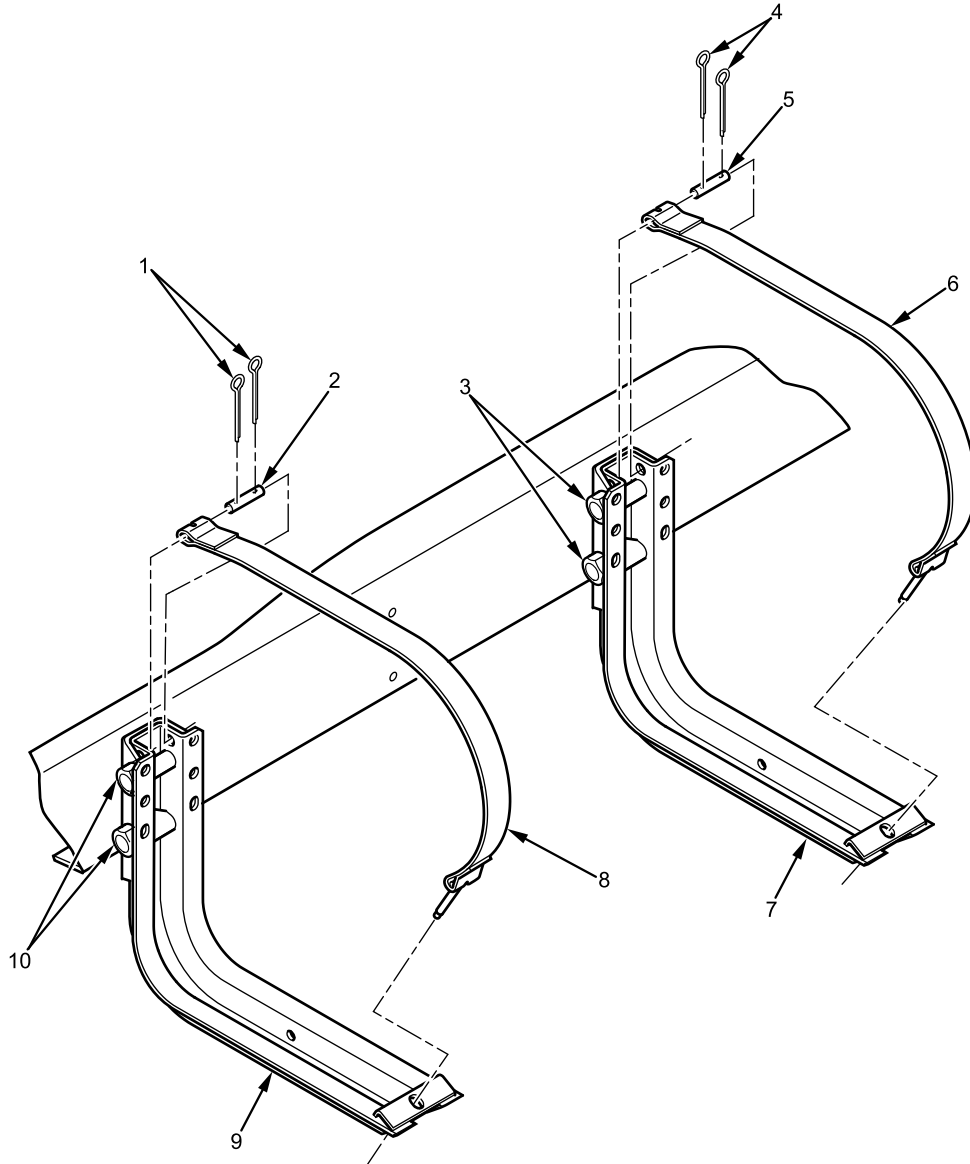
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Fuel tank removed (WP 0265)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

FUEL TANK STRAP REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove cotter pins (Figure 1, Item 1 and 4) from pins (Figure 1, Item 2 and 5) on each fuel tank mounting strap (Figure 1, Item 6 and 8). Discard cotter pins.



B230310494

Figure 1. Fuel Tank Mounting Strap Cotter Pins.

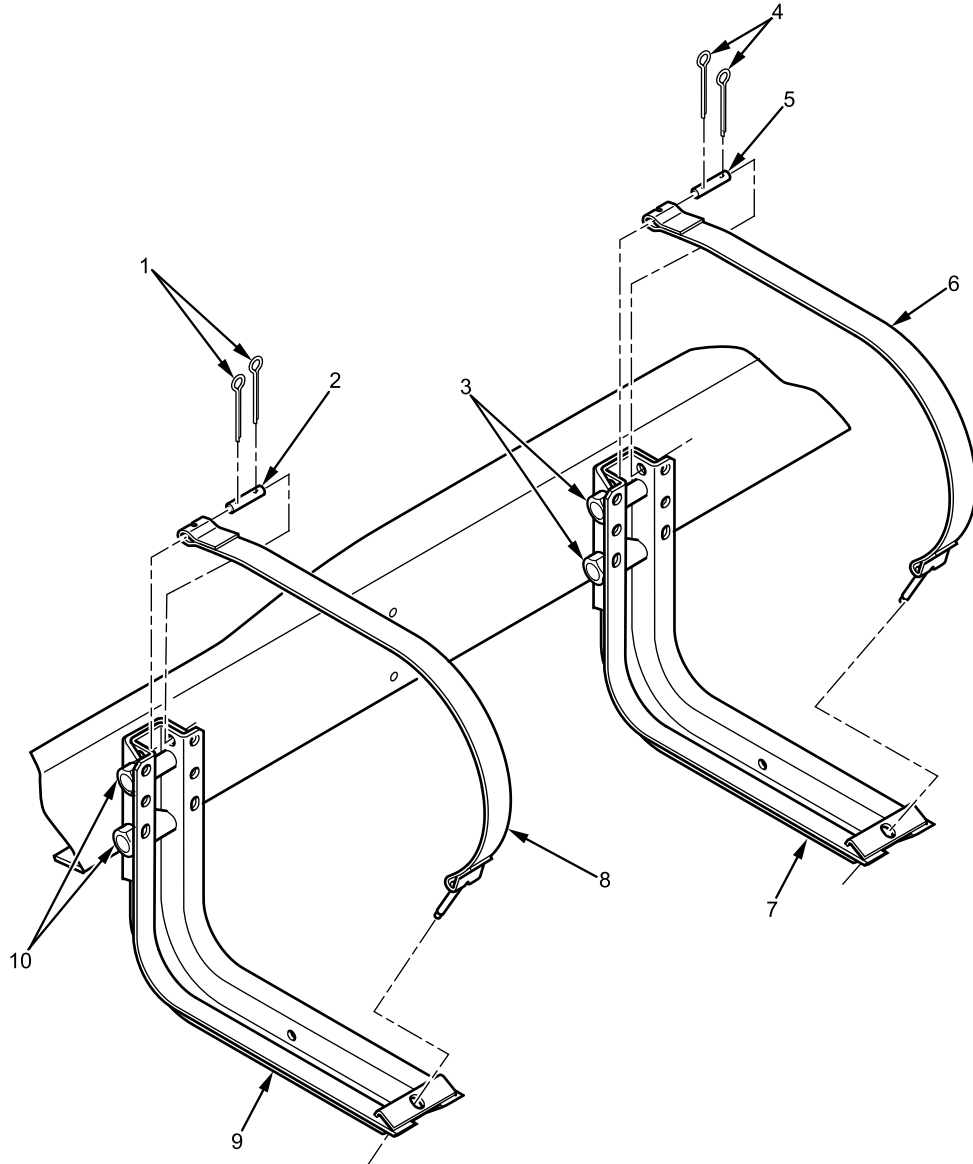
2. Loosen fuel tank support nuts (Figure 1, Item 3 and 10).
3. Remove pins (Figure 1, Item 2 and 5) from each fuel tank mounting strap (Figure 1, Item 6 and 8), and remove strap from each fuel tank support (Figure 1, Item 7 and 9).

END OF TASK

FUEL TANK STRAP REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

1. Position fuel tank mounting straps (Figure 2, Item 6 and 8) on fuel tank supports (Figure 2, Item 7 and 9) and install pins (Figure 2, Item 2 and 5).



B230310494

Figure 2. Fuel Tank Mounting Strap Pins.

2. Install new cotter pins (Figure 2, Item 1 and 4) on pins (Figure 2, Item 2 and 5) securing fuel tank mounting straps (Figure 2, Item 6 and 8) to fuel tank supports (Figure 2, Item 7 and 9).
3. Tighten fuel tank support nuts (Figure 2, Item 3 and 10).

END OF TASK

FUEL TANK STRAP REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install fuel tank (WP 0265).
2. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FUEL HOSE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0255

WP 0667

WP 0649

WP 0606

Materials/Parts

Compound (WP 0794, Item 13)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Cable lock strap - (2) (WP 0796, Item 120)
Cable lock strap - (3) (WP 0796, Item 124)

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Belly armor removed (WP 0606)

Engine cover removed (WP 0649)

Personnel Required

Maintainer (2)

References

TM 9-2355-106-10

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

Fuel line coupling fittings are made of plastic. Use care when removing.

Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid in installation.

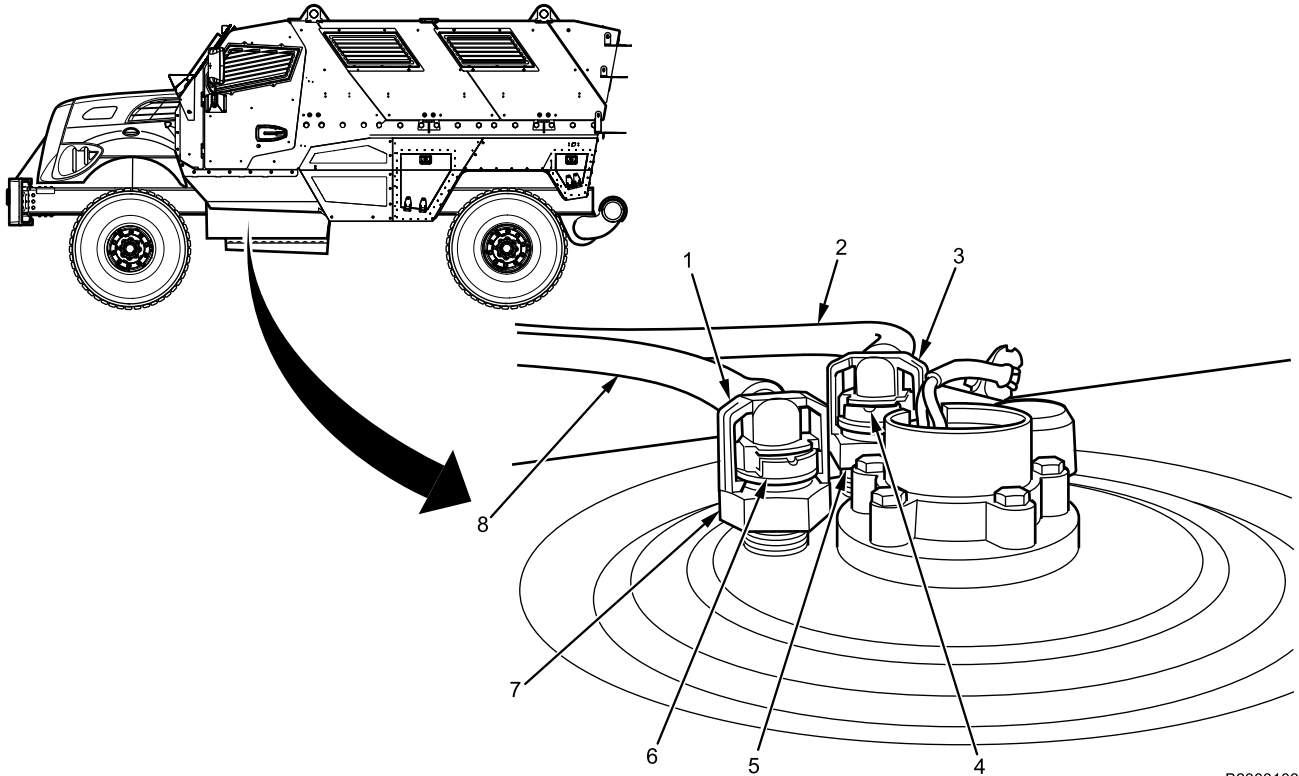
FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

All fuel line couplings are disconnected the same way.

1. Disconnect SILVER fuel hose return line (Figure 1, Item 8) from fuel tank fitting (Figure 1, Item 7) by depressing coupling disconnect tab (Figure 1, Item 6) and pulling up on coupling (Figure 1, Item 1).



B230310387

Figure 1. Fuel Tank Draw and Return Line Hoses.

2. Disconnect PURPLE fuel hose draw line (Figure 1, Item 2) from fuel tank fitting (Figure 1, Item 5) by depressing coupling disconnect tab (Figure 1, Item 4) and pulling up on coupling (Figure 1, Item 3). Drain fuel from fuel hose (Figure 1, Item 2 and 8) into drain pan.

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

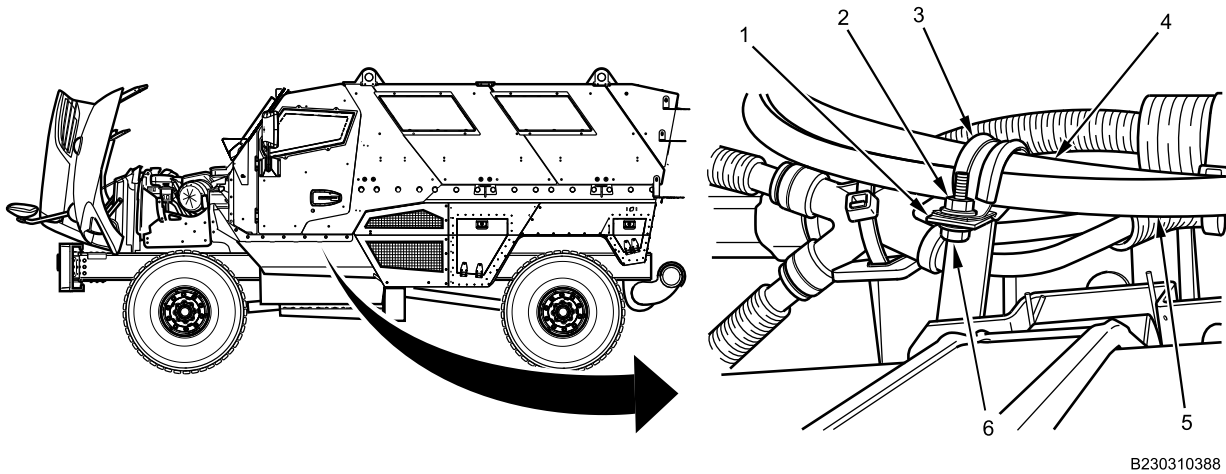


Figure 2. Fuel Hose Cushioned Clamp.

3. Remove bolt (Figure 2, Item 6) and nut (Figure 2, Item 2) from fuel hose cushioned clamp (Figure 2, Item 3) and extension clip (Figure 2, Item 1).
4. Remove fuel hose cushioned clamp (Figure 2, Item 3) from fuel hoses (Figure 2, Item 4 and 5).

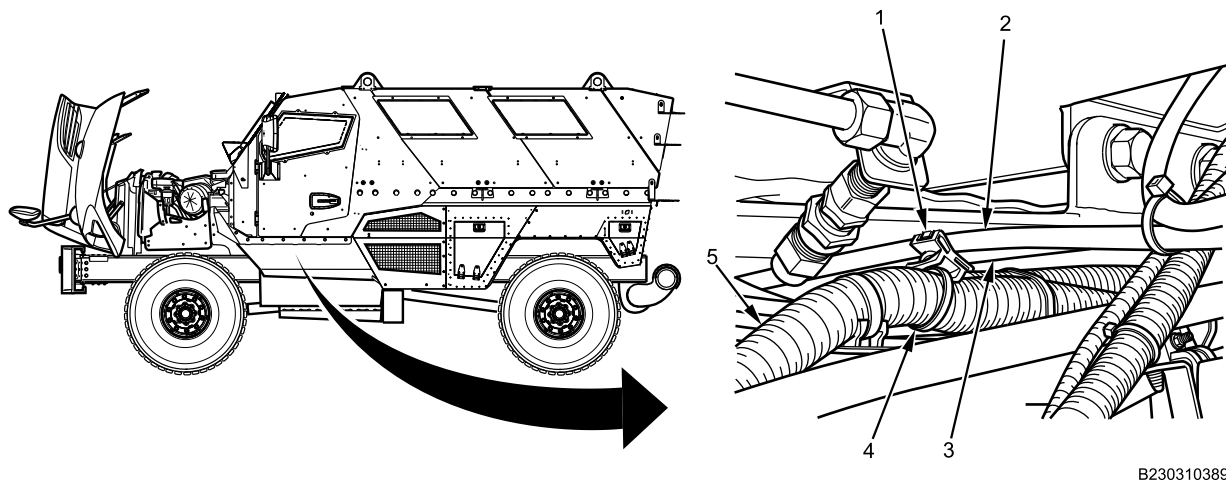


Figure 3. Fuel Hose Retainer.

5. Remove and discard cable lock strap (Figure 3, Item 1) from fuel hoses (Figure 3, Item 2 and 3) and saddle (Figure 3, Item 4) on wiring harness conduit (Figure 3, Item 5) outboard of left frame rail.

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

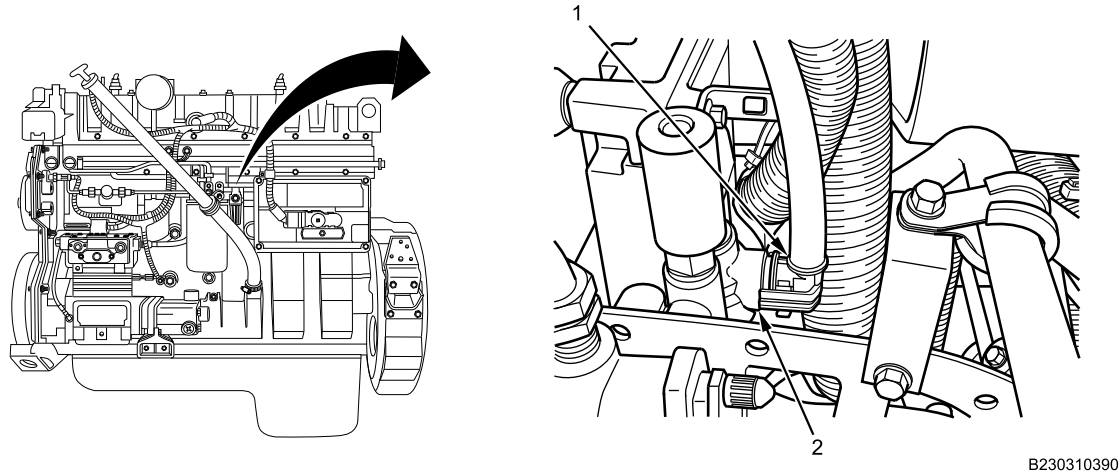


Figure 4. Fuel Pump Fuel Hose Feed Line.

6. Disconnect BLACK fuel hose feed line (Figure 4, Item 1) from fuel pump fuel filter header fitting (Figure 4, Item 2).

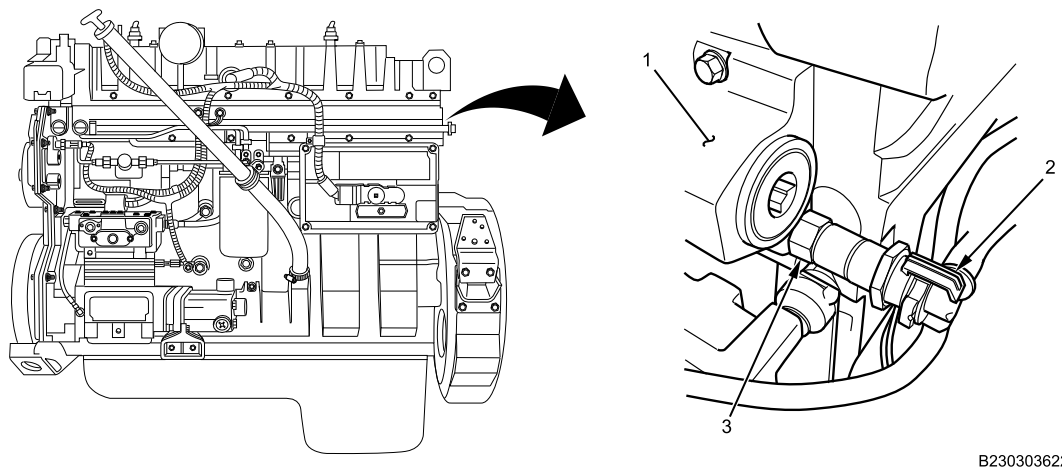
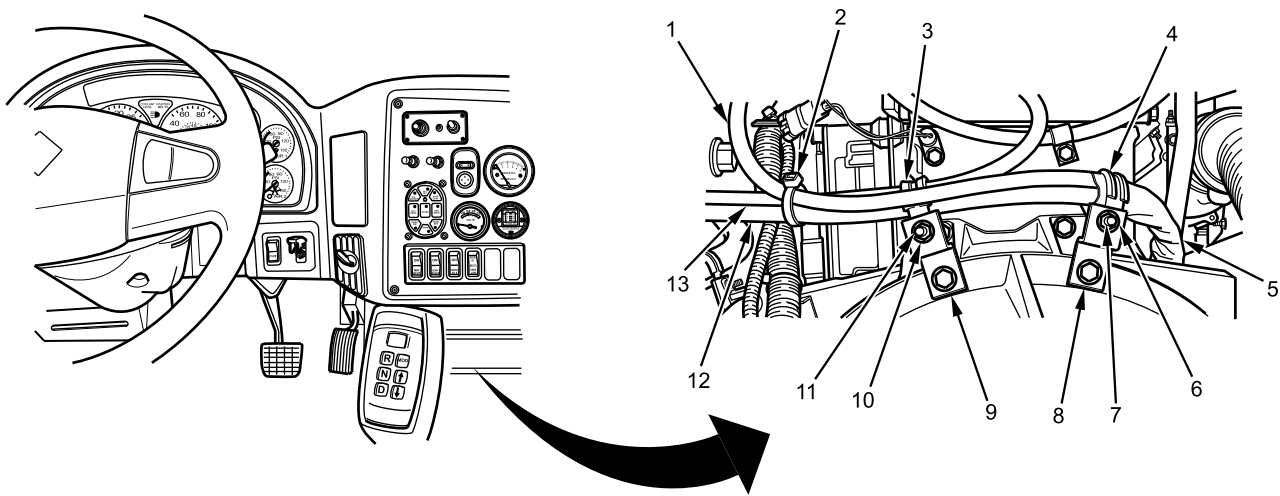


Figure 5. Fuel Rail Fuel Hose Return Line.

7. Disconnect SILVER fuel hose return line (Figure 5, Item 2) from valve regulator fitting (Figure 5, Item 3) on rear of fuel rail (Figure 5, Item 1).

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

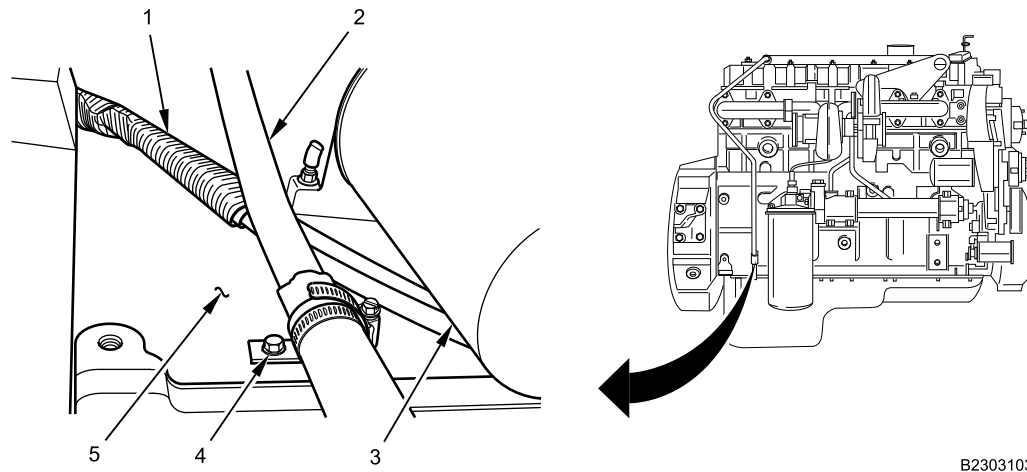


B230310391

Figure 6. Fuel Hose Retainers.

8. Remove and discard cable lock strap (Figure 6, Item 2) from fuel hoses (Figure 6, Item 1, 12, and 13).
9. Remove bolt (Figure 6, Item 11) and nut (Figure 6, Item 10) from fuel hose cushioned clamp (Figure 6, Item 3) and extension clip (Figure 6, Item 9).
10. Remove fuel hose cushioned clamp (Figure 6, Item 3) from fuel hoses (Figure 6, Item 12 and 13).
11. Remove SILVER fuel hose (Figure 6, Item 13) from vehicle.
12. Remove bolt (Figure 6, Item 7) and nut (Figure 6, Item 6) from fuel hose cushioned clamp (Figure 6, Item 4) and extension clip (Figure 6, Item 8).
13. Remove fuel hose cushioned clamp (Figure 6, Item 4) from hose insulator (Figure 6, Item 5) on fuel hoses (Figure 6, Item 1 and 12).

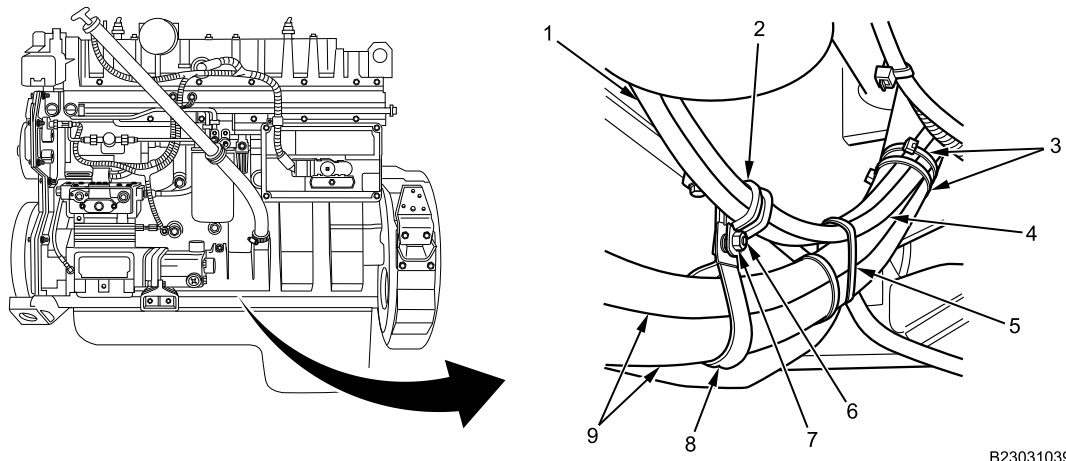
FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)



B230310392

Figure 7. Fuel Hose Routing.

14. Remove breather tube bolt (Figure 7, Item 4).
15. Remove fuel hoses (Figure 7, Item 1) from between engine block (Figure 7, Item 5) and breather tube (Figure 7, Item 2) and oil filter (Figure 7, Item 3).



B230310393

Figure 8. Fuel Hose Retainers.

16. Remove bolt (Figure 8, Item 6) and nut (Figure 8, Item 7) from fuel hose cushioned clamp (Figure 8, Item 2) and extension clip (Figure 8, Item 8).
17. Remove fuel hose cushioned clamp (Figure 8, Item 2) from fuel hoses (Figure 8, Item 1 and 4).
18. Remove and discard three cable lock straps (Figure 8, Item 3 and 5) from fuel hoses (Figure 8, Item 1 and 4) and transmission cooler hoses (Figure 8, Item 9).

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

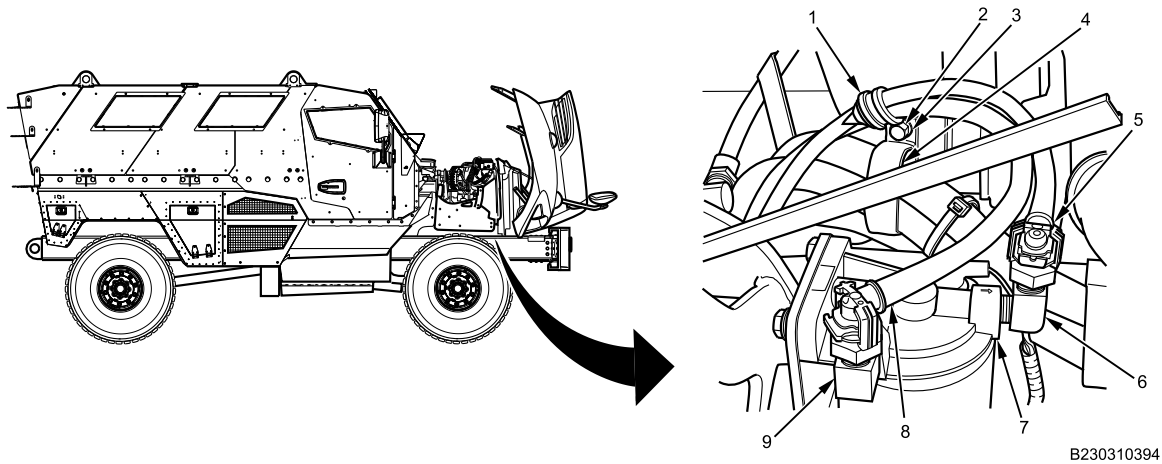


Figure 9. Fuel Filter Separator Fuel Hoses.

19. Remove bolt (Figure 9, Item 2) and nut (Figure 9, Item 3) from fuel hose cushioned clamp (Figure 9, Item 1) and extension clip (Figure 9, Item 4).
20. Remove fuel hose cushioned clamp (Figure 9, Item 1) from fuel hose feed line (Figure 9, Item 5) and fuel hose draw line (Figure 9, Item 8).
21. Disconnect BLACK fuel hose feed line (Figure 9, Item 5) from fuel/water separator (Figure 9, Item 7) outlet fitting (Figure 9, Item 6).
22. Disconnect PURPLE fuel hose draw line (Figure 9, Item 8) from fuel/water separator (Figure 9, Item 7) inlet fitting (Figure 9, Item 9).
23. Remove fuel hose feed line (Figure 9, Item 5), fuel hose draw line (Figure 9, Item 8) and drain pan.

END OF TASK

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. With assistant, position new BLACK fuel hose feed line (Figure 10, Item 5) and new PURPLE fuel hose draw line (Figure 10, Item 8) onto vehicle.

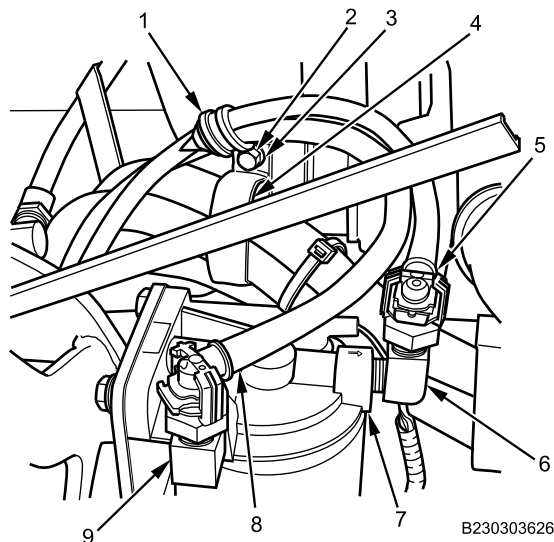


Figure 10. Fuel Filter Separator Fuel Hoses.

2. Apply corrosion preventive compound to fuel hose cushioned clamp bolt (Figure 10, Item 2) and nut (Figure 10, Item 3).
3. Install fuel hose cushioned clamp (Figure 10, Item 1) on fuel hoses (Figure 10, Item 5 and 8).
4. Connect BLACK fuel hose feed line (Figure 10, Item 5) on fuel/water separator (Figure 10, Item 7) outlet fitting (Figure 10, Item 6).
5. Connect PURPLE fuel hose draw line (Figure 10, Item 8) on fuel/water separator (Figure 10, Item 7) inlet fitting (Figure 10, Item 9).

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Ensure enough fuel hose length between separator connections and clamp. Do not kink fuel hose.

6. Install bolt (Figure 10, Item 2) and nut (Figure 10, Item 3) on fuel hose cushioned clamp (Figure 10, Item 1) and extension clip (Figure 10, Item 4). Tighten bolt securely.
7. Install fuel hose cushioned clamp (Figure 11, Item 2) on fuel hoses (Figure 11, Item 1 and 4).

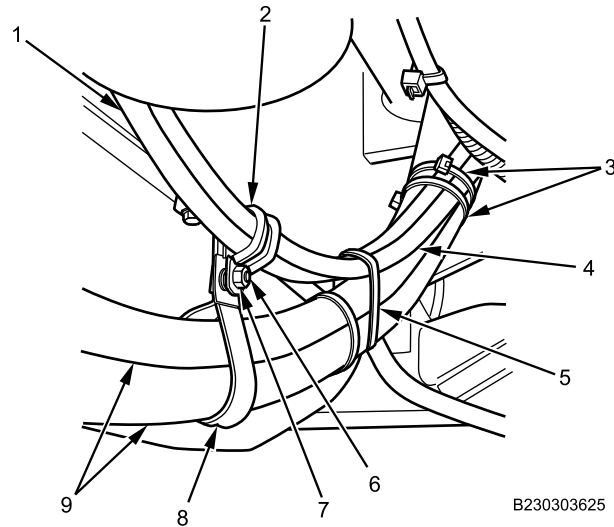


Figure 11. Fuel Hose Retainers.

8. Install three new cable lock straps (Figure 11, Item 3 and 5) on fuel hoses (Figure 11, Item 1 and 4) and transmission cooler hoses (Figure 11, Item 9).
9. Apply corrosion preventive compound to fuel hose cushioned clamp bolt (Figure 11, Item 6) and nut (Figure 11, Item 7) .
10. Install bolt (Figure 11, Item 6) and nut (Figure 11, Item 7) on fuel hose cushioned clamp (Figure 11, Item 2) and extension clip (Figure 11, Item 8). Tighten bolt securely.

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

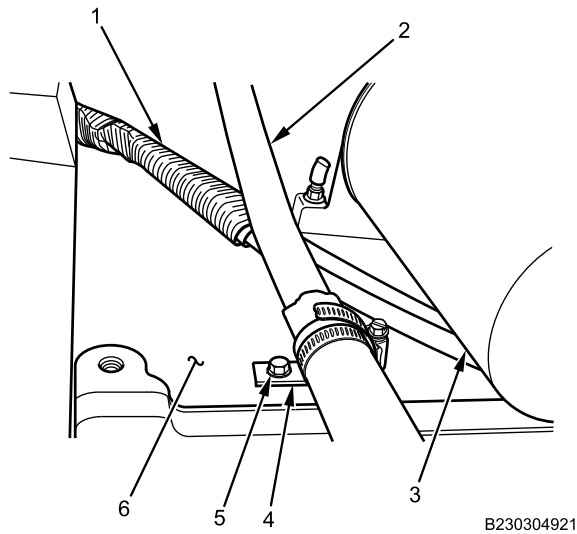


Figure 12. Fuel Hose Routing.

11. Install breather tube clip (Figure 12, Item 4) and breather tube (Figure 12, Item 2) on engine block (Figure 12, Item 6) with breather tube bolt (Figure 12, Item 5).
12. Position fuel hoses (Figure 12, Item 1) underneath breather tube (Figure 12, Item 2) and oil filter (Figure 12, Item 3).
13. Align hose insulator (Figure 13, Item 5) on PURPLE and BLACK fuel hoses (Figure 13, Item 1 and 12) where fuel hose cushioned clamp (Figure 13, Item 4) will be installed.

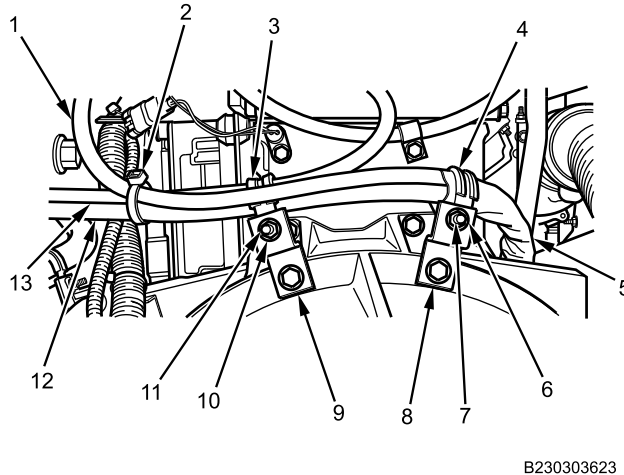


Figure 13. Fuel Hose Retainers.

14. Install fuel hose cushioned clamp (Figure 13, Item 4) on hose insulator (Figure 13, Item 5) and PURPLE and BLACK fuel hoses (Figure 13, Item 1 and 12).
15. Apply corrosion preventive compound to fuel hose cushioned clamp bolts (Figure 13, Item 6 and 11) and nuts (Figure 13, Item 7 and 10).
16. Loosely install bolt (Figure 13, Item 7) and nut (Figure 13, Item 6) on fuel hose cushioned clamp (Figure 13, Item 4) and extension clip (Figure 13, Item 8).
17. Install fuel hose cushioned clamp (Figure 13, Item 3) on PURPLE and SILVER fuel hoses (Figure 13, Item 12 and 13).

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

18. Loosely install bolt (Figure 13, Item 11) and nut (Figure 13, Item 10) on fuel hose cushioned clamp (Figure 13, Item 3) and extension clip (Figure 13, Item 9).
19. Loosely install new cable lock strap (Figure 13, Item 2) on all fuel hoses (Figure 13, Item 1, 12, and 13).

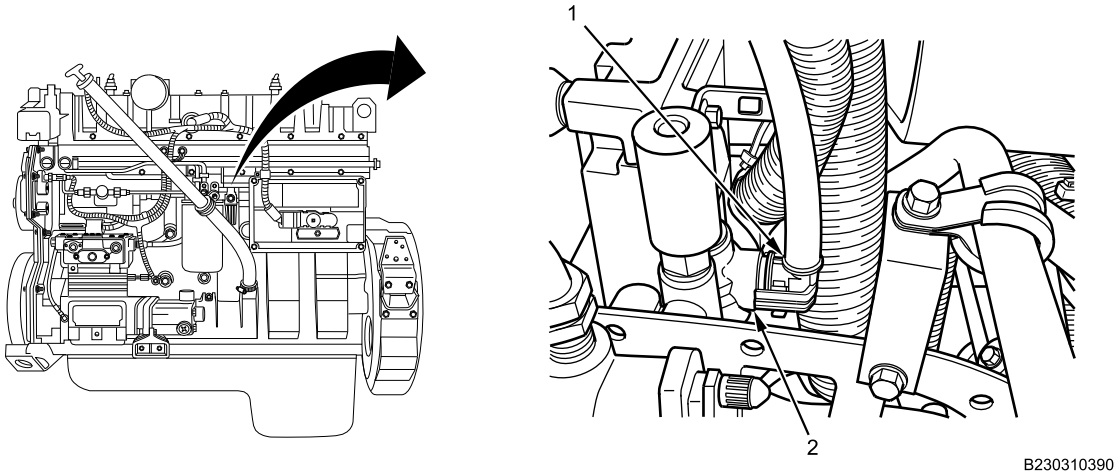


Figure 14. Fuel Pump Fuel Hose Feed Line.

20. Connect BLACK fuel hose feed line (Figure 14, Item 1) on fuel pump fuel filter header fitting (Figure 14, Item 2).

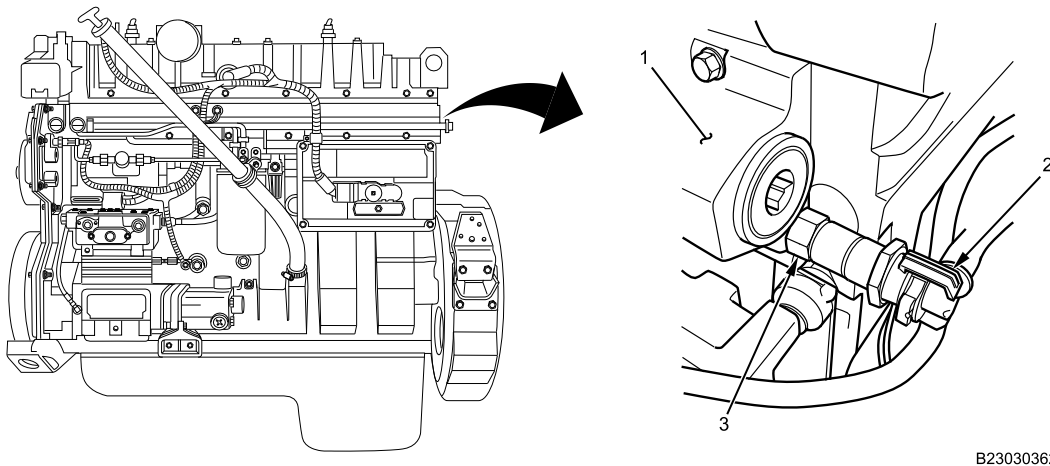
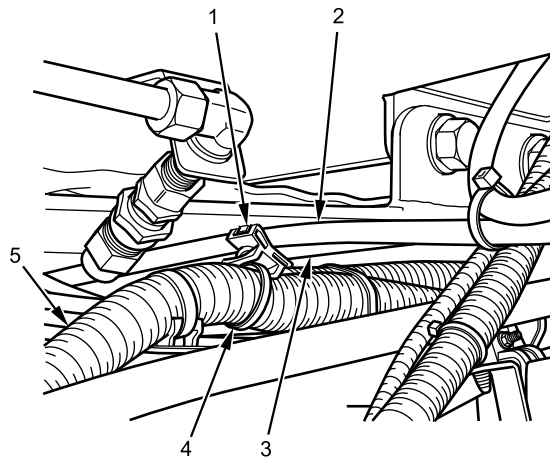


Figure 15. Fuel Rail Fuel Hose Return Line.

21. Connect SILVER fuel hose return line (Figure 15, Item 2) on valve regulator fitting (Figure 15, Item 3) on rear of fuel rail (Figure 15, Item 1).
22. Tighten clamp bolts (Figure 13, Item 7 and 11), nuts (Figure 13, Item 6 and 10), and cable lock strap (Figure 13, Item 2) securely.

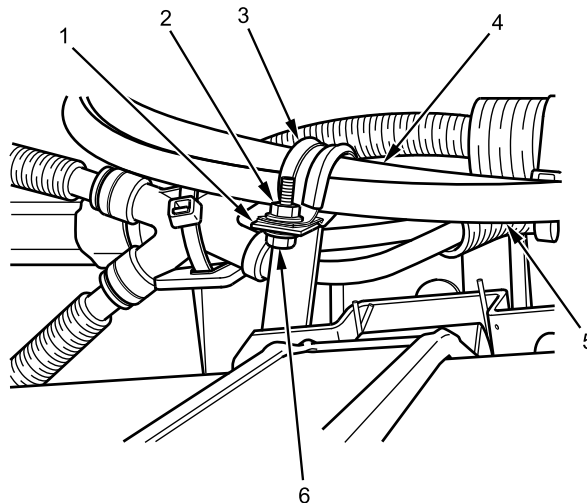
FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)



B230304898

Figure 16. Fuel Hose Retainer.

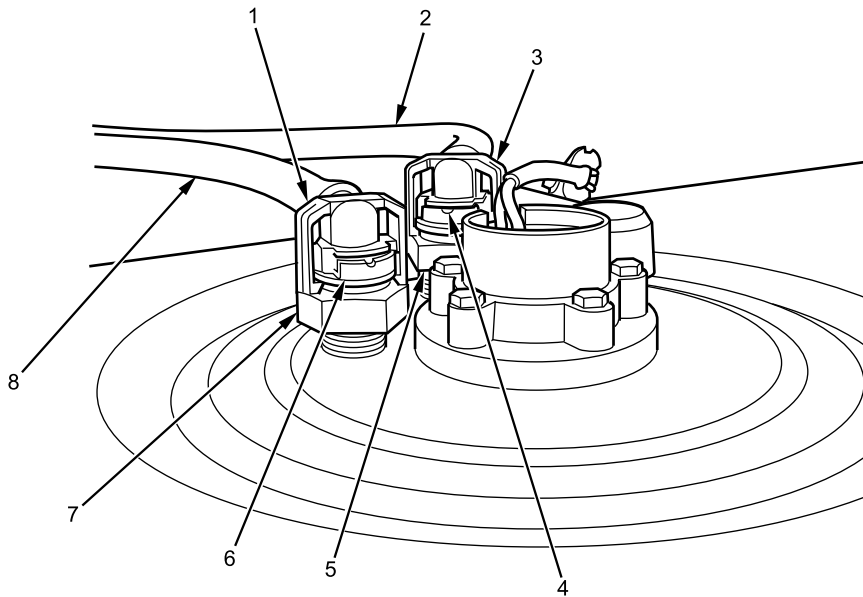
23. Install new cable lock strap (Figure 16, Item 4) on fuel hoses (Figure 16, Item 2 and 3) and saddle (Figure 16, Item 1) on wiring harness conduit (Figure 16, Item 5) outboard of left frame rail.



B230303619

Figure 17. Fuel Hose Retainer.

24. Apply corrosion preventive compound to fuel hose cushioned clamp bolt (Figure 17, Item 6) and nut (Figure 17, Item 2).
25. Install fuel hose cushioned clamp (Figure 17, Item 3) on fuel hoses (Figure 17, Item 4 and 5).
26. Install bolt (Figure 17, Item 6) and nut (Figure 17, Item 2) on fuel hose cushioned clamp (Figure 17, Item 3) and extension clip (Figure 17, Item 1).

FUEL HOSE REMOVAL AND INSTALLATION - (CONTINUED)

B230310395

Figure 18. Fuel Tank Draw and Return Line Hoses.

27. Connect SILVER fuel hose return line (Figure 18, Item 6) on fuel tank fitting (Figure 18, Item 8) by pushing down on coupling (Figure 18, Item 1) until coupling disconnect tab (Figure 18, Item 7) clicks and it is fully seated.
28. Connect PURPLE fuel hose draw line (Figure 18, Item 2) on fuel tank fitting (Figure 18, Item 5) by pushing down on coupling (Figure 18, Item 3) until coupling disconnect tab clicks (Figure 18, Item 4) and it is fully seated.
29. Turn MAIN POWER switch on (TM 9-2355-106-10).
30. Prime fuel system (WP 0255).
31. Start engine (TM 9-2355-106-10).
32. Remove wheel chocks (TM 9-2355-106-10).
33. Test-drive vehicle to verify fuel-fire heater and fuel tank system operation (TM 9-2355-106-10).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Parking brake set (TM 9-2355-106-10).
2. Transmission set in NEUTRAL (N) (TM 9-2355-106-10).
3. Engine off (TM 9-2355-106-10).
4. Battery MAIN POWER off (TM 9-2355-106-10).
5. Wheels chocked (TM 9-2355-106-10).
6. Install belly armor (WP 0606).
7. Install engine cover (WP 0649).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL FILTER AND STRAINER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Wrench, filter, strap (WP 0795, Item 139)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

O-ring (WP 0796, Item 61)
Strainer, fuel (WP 0796, Item 56)
Filter (WP 0796, Item 74)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Left side engine armor plate removed (WP 0597)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

FUEL FILTER AND STRAINER REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

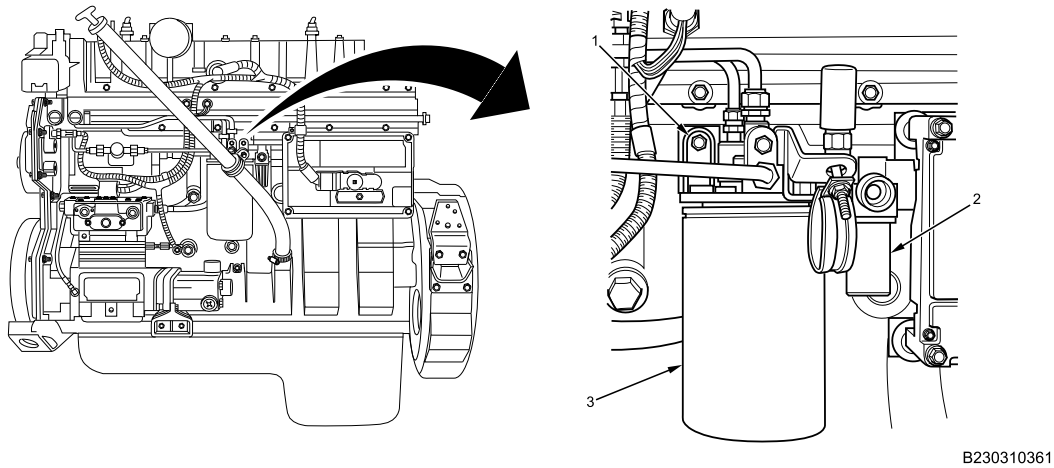
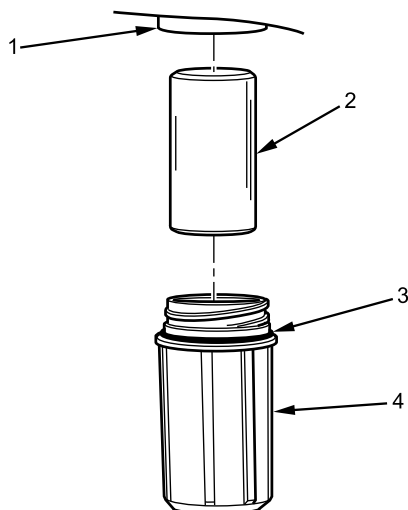


Figure 1. Fuel Filter and Strainer.

1. Place drain pan under left side of vehicle near fuel filter (Figure 1, Item 3).
2. Using filter wrench/strap, remove fuel filter (Figure 1, Item 3) and gasket from fuel filter header (Figure 1, Item 1). Discard fuel filter.
3. Remove fuel prescreen bowl (Figure 1, Item 2) from fuel filter header (Figure 1, Item 1). Discard fuel strainer and O-ring.

END OF TASK

INSTALLATION



B230300151

Figure 2. Fuel Strainer.

1. Install new fuel strainer (Figure 2, Item 2) into fuel prescreen bowl (Figure 2, Item 4).
2. Install new O-ring (Figure 2, Item 3) on fuel prescreen bowl (Figure 2, Item 4).
3. Install fuel prescreen bowl (Figure 2, Item 4) containing new strainer (Figure 2, Item 2) and O-ring (Figure 2, Item 3) on header assembly (Figure 2, Item 1).

FUEL FILTER AND STRAINER REMOVAL AND INSTALLATION - (CONTINUED)

- Lubricate fuel filter gasket with clean diesel fuel.

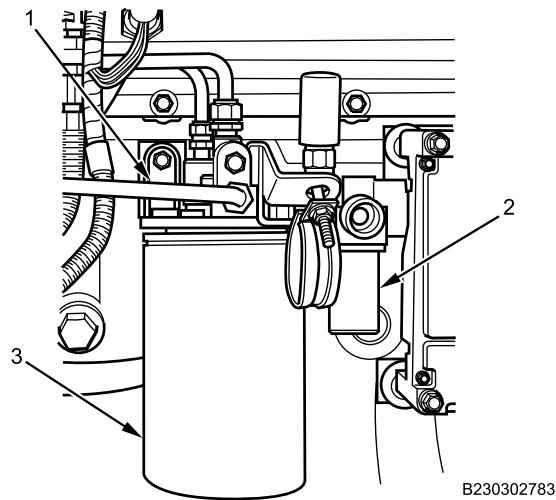


Figure 3. Fuel Filter and Strainer.

NOTE

Install fuel filter dry. Do not add fuel to fuel filter prior to installation.

- Install fuel filter (Figure 3, Item 3) on header (Figure 3, Item 1). Tighten filter by hand until gasket touches filter header. Tighten filter an additional 1/2 turn.
- Wipe off any excess fuel from fuel filter (Figure 3, Item 3) and fuel strainer (Figure 3, Item 2).
- Remove drain pan from under vehicle.

END OF TASK**FOLLOW-ON MAINTENANCE**

- Turn MAIN POWER switch on (TM 9-2355-106-10).
- Prime fuel system and check for leaks (WP 0255).
- Start engine; run to operating temperature (TM 9-2355-106-10).
- Verify gauge and system operation (TM 9-2355-106-10).
- Check for leaks with engine running.
- Turn engine off (TM 9-2355-106-10).
- Turn MAIN POWER switch off (TM 9-2355-106-10).
- Install left side engine armor plate (WP 0597).
- Close engine hood (TM 9-2355-106-10).
- Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL/WATER SEPARATOR FILTER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Wrench, filter, strap (WP 0795, Item 139)

Materials/Parts

Fuel/water separator filter (WP 0796, Item 46)
Grease (WP 0794, Item 22)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Fuel/water separator drained (TM 9-2355-106-10)

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

FUEL/WATER SEPARATOR FILTER REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Fuel/water separator filter is located on the right front frame rail.

REMOVAL

1. Disconnect water-in-fuel sensor connector (Figure 1, Item 4), located at bottom of sediment bowl (Figure 1, Item 3).

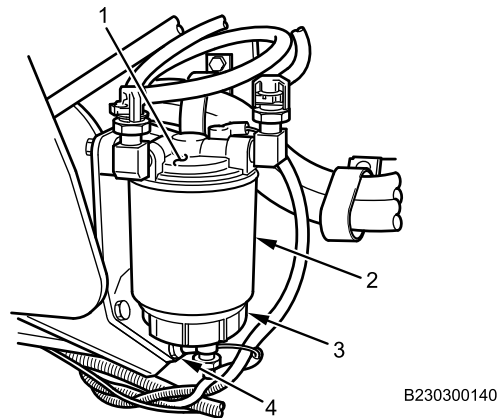


Figure 1. Fuel/Water Separator Filter.

2. Using filter wrench, strap, remove fuel/water separator filter (Figure 1, Item 2) from fuel/water separator housing (Figure 1, Item 1).
3. Remove sediment bowl (Figure 1, Item 3) from filter (Figure 1, Item 2).

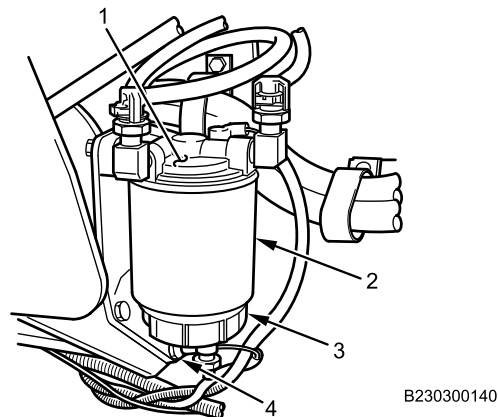
END OF TASK**INSTALLATION**

Figure 2. Fuel/Water Separator Filter.

NOTE

Do not add fuel to fuel filter prior to installation.

1. Install sediment bowl (Figure 2, Item 3) on filter (Figure 2, Item 2).

FUEL/WATER SEPARATOR FILTER REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Do not use wrench to tighten filter.

2. Install filter (Figure 2, Item 2) on housing (Figure 2, Item 1) and hand tighten.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease to connector (Figure 2, Item 4).
4. Connect water-in-fuel sensor connector (Figure 2, Item 4).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Prime fuel system and check for leaks (WP 0255).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Verify gauge and system operation (TM 9-2355-106-10).
5. Check for leaks with engine running (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Antiseize compound (WP 0794, Item 6)
Grease (WP 0794, Item 22)
Lockwasher - (2) (WP 0796, Item 177)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

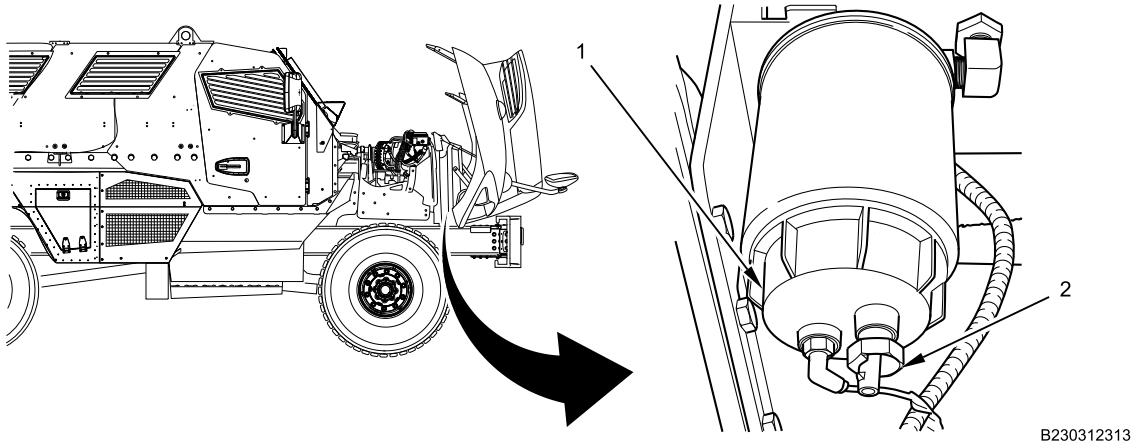
NOTE

Fuel/water separator filter is located on outboard side of the right front frame rail.

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION - (CONTINUED)**PURGE****NOTE**

If more than one pint is drained, priming of system may be needed.

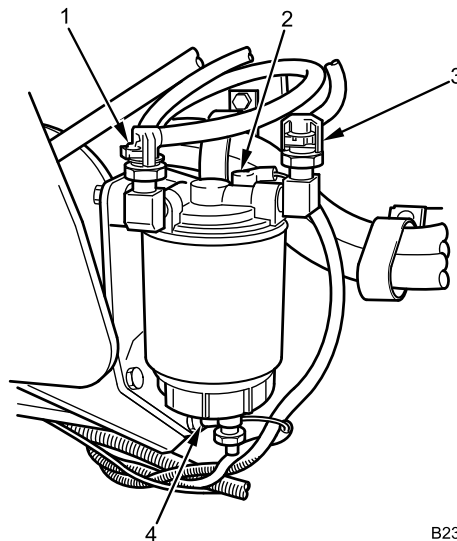
1. Open drain (Figure 1, Item 2) to evacuate contaminants from fuel/water separator sediment bowl (Figure 1, Item 1) into drain pan.



B230312313

Figure 1. Purging Sediment Bowl.

2. Close drain (Figure 1, Item 2) on sediment bowl (Figure 1, Item 1).

END OF TASK**REMOVAL**

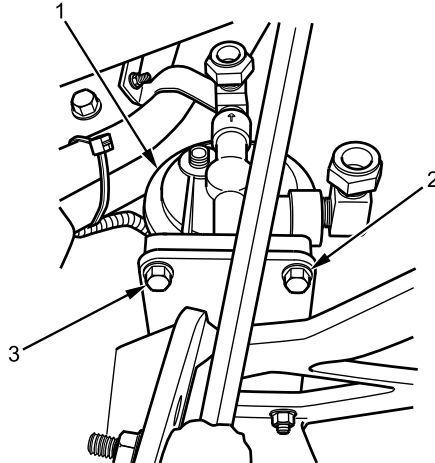
B230302513

Figure 2. Fuel/Water Separator Assembly Connections.

1. Disconnect water-in-fuel sensor connector (Figure 2, Item 4), located at bottom of sediment bowl.

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION - (CONTINUED)

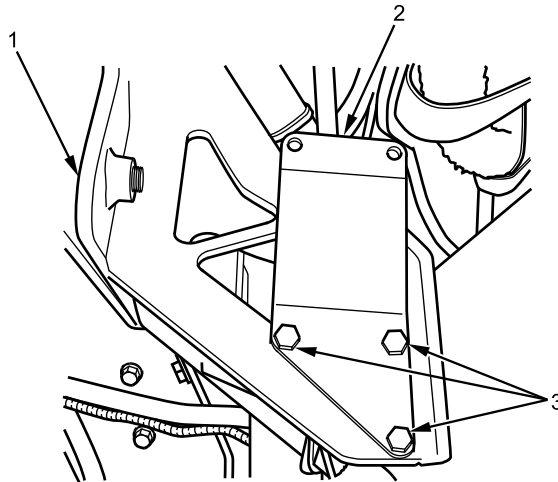
2. Disconnect Positive Temperature Coefficient (PTC) heater connector (Figure 2, Item 2), located at top of filter head.
3. Disconnect fuel inlet hose connector (Figure 2, Item 1) and fuel outlet hose connector (Figure 2, Item 3), located at top of filter head.



B230302514

Figure 3. Fuel/Water Separator Assembly.

4. Remove fuel/water separator assembly mounting bolts (Figure 3, Item 3) and lockwashers (Figure 3, Item 2) from fuel/water separator assembly (Figure 3, Item 1) and remove assembly. Discard lockwashers (Figure 3, Item 2).
5. Drain fuel from fuel/water separator assembly (Figure 3, Item 1) into drain pan.



B230302515

Figure 4. Fuel/Water Separator Assembly Mounting Bracket.

6. Remove fuel/water separator assembly mounting bracket bolts and flange nuts (Figure 4, Item 3) from armor support bracket (Figure 4, Item 1), and remove fuel/water separator assembly mounting bracket (Figure 4, Item 2).

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION - (CONTINUED)

7. Remove drain pan.

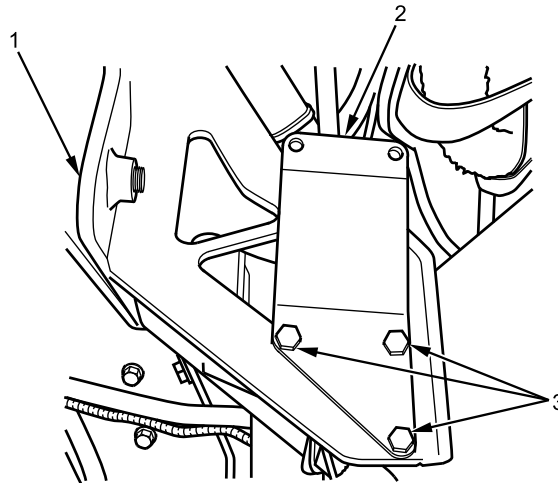
END OF TASK

INSTALLATION

WARNING



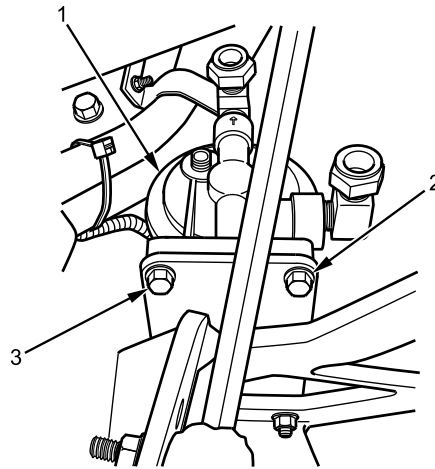
Antiseize compound can cause skin, eye, and respiratory irritation. Inhalation can cause difficulty breathing, dizziness, headache, and nausea. Wear eye protection and use only with adequate ventilation. Do not use near heat, sparks, or open flame. Wash hands and eyes after using compound. In case of skin contact, wash affected area with soap and water, and seek medical attention if irritation persists. If compound contacts eyes, flush eyes with water for at least 15 minutes, and obtain medical attention if irritation persists. In case of accidental ingestion, do not induce vomiting. Slowly drink 1-2 glasses of water or milk, and seek medical attention. Store compound in a closed container away from heat. Dispose of it in accordance with standard operating procedures. Failure to comply may result in injury to personnel.



B230302515

Figure 5. Fuel/Water Separator Assembly Mounting Bracket.

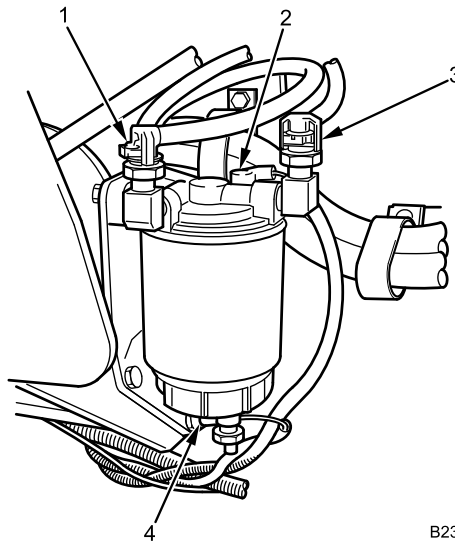
1. Apply antiseize compound to mounting bracket bolts (Figure 5, Item 3).
2. Position mounting bracket (Figure 5, Item 2) on armor support bracket (Figure 5, Item 1). Install mounting bracket bolts and flange nuts (Figure 5, Item 3) and tighten securely.

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION - (CONTINUED)


B230302514

Figure 6. Fuel/Water Separator Assembly.

3. Apply antiseize compound to fuel/water separator assembly mounting bolts (Figure 6, Item 2 and 3).
4. Position fuel/water separator assembly (Figure 6, Item 1) on mounting bracket. Install assembly mounting bolts (Figure 6, Item 3) and new lockwashers (Figure 6, Item 2) and tighten securely.



B230302513

Figure 7. Fuel/Water Separator Assembly Connections.

5. Connect fuel inlet hose connector (Figure 7, Item 1) and fuel outlet hose connector (Figure 7, Item 3) at top of filter head.

FUEL/WATER SEPARATOR ASSEMBLY PURGE, REMOVAL, AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

6. Apply dielectric grease to connectors (Figure 7, Item 2 and 4).
7. Connect PTC heater connector (Figure 7, Item 2) at top of filter head.
8. Connect water-in-fuel sensor connector (Figure 7, Item 4), at bottom of sediment bowl.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Prime fuel system and check for leaks (WP 0255).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Verify fuel system operation.
5. Check for leaks with engine running.
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Compound (WP 0794, Item 13)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Gloves (WP 0794, Item 18)
Cable lock strap (WP 0796, Item 138)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Left side engine armor plate removed (WP 0597)
Ether canister removed (WP 0273)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

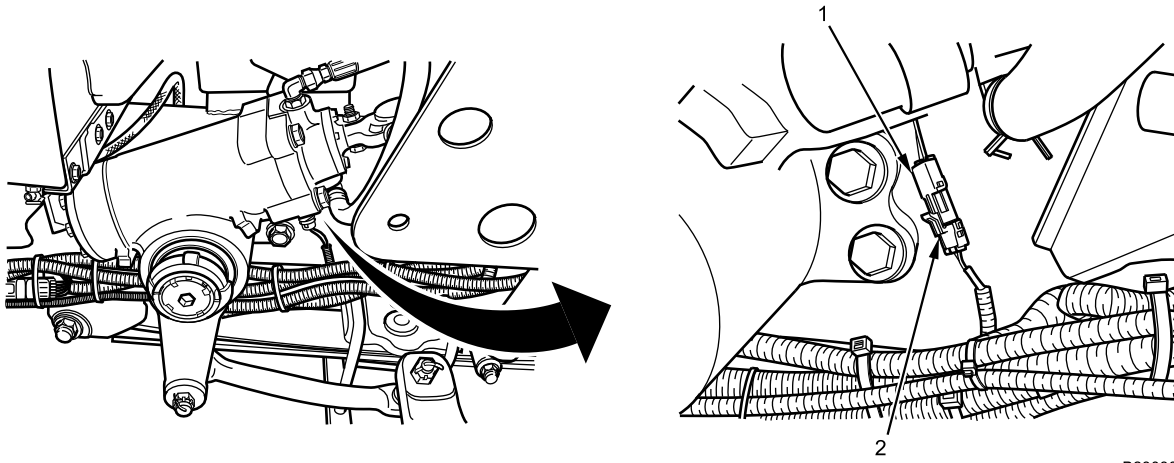
Ether canisters contain hazardous, combustible and flammable materials. Handle with care and dispose of in accordance with standard operating procedures. Use approved respirator with dual organic vapor/mist and particulate cartridge. Avoid contact with skin and eyes, and avoid breathing fumes. If swallowed, do not induce vomiting. Obtain immediate medical attention. Failure to comply may result in serious injury or death to personnel.

Ether canisters are pressurized, combustible and flammable. Keep away from flames and sparks. Do not incinerate or puncture canister. Do not expose to temperatures above 120°F (49°C). Do not store spare canister in vehicle cab. Failure to comply may result in serious injury or death to personnel.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

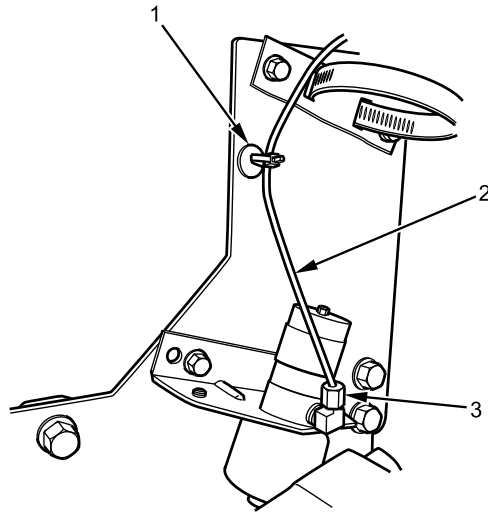
1. Disconnect electrical connector (Figure 1, Item 1) from wiring harness (Figure 1, Item 2).



B230305597

Figure 1. Electrical Harness Connector.

2. Remove ether line (Figure 2, Item 2) from ether (cold) start valve assembly elbow fitting (Figure 2, Item 3).



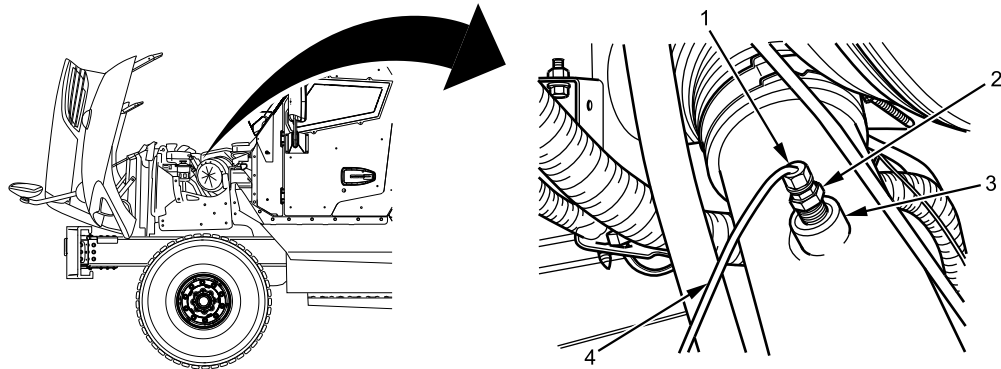
B230303016

Figure 2. Ether (Cold) Start Valve Tubing.

3. Remove ether line (Figure 2, Item 2) from cable lock strap (Figure 2, Item 1). Discard cable lock strap.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

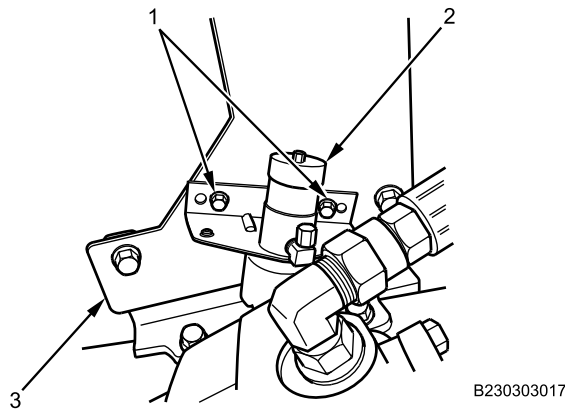
4. Remove pipe coupling (Figure 3, Item 1) and ether line (Figure 3, Item 4) from atomizer jet assembly (Figure 3, Item 2).



B230610102

Figure 3. Ether (Cold) Start Valve Tubing and Atomizer Jet Assembly.

5. Remove atomizer jet assembly (Figure 3, Item 2) from charge air cooler air duct pipe fitting (Figure 3, Item 3).
6. Remove two bolts (Figure 4, Item 1) and ether (cold) start valve assembly (Figure 4, Item 2) from ether (cold) start valve assembly bracket (Figure 4, Item 3).



B230303017

Figure 4. Ether (Cold) Start Valve Assembly.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove two bolts (Figure 5, Item 2) and ether canister mounting bracket (Figure 5, Item 3) from ether (cold) start valve assembly bracket (Figure 5, Item 1).

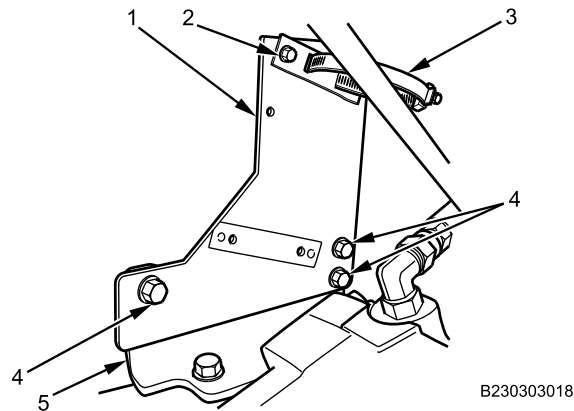


Figure 5. Ether (Cold) Start Valve Assembly Bracket.

8. Remove three bolts (Figure 5, Item 4) and ether (cold) start valve assembly bracket (Figure 5, Item 1) from ether (cold) start valve frame bracket (Figure 5, Item 5).
9. Remove two nuts, bolts (Figure 6, Item 2), and ether (cold) start valve frame bracket (Figure 6, Item 1) from frame (Figure 6, Item 3).

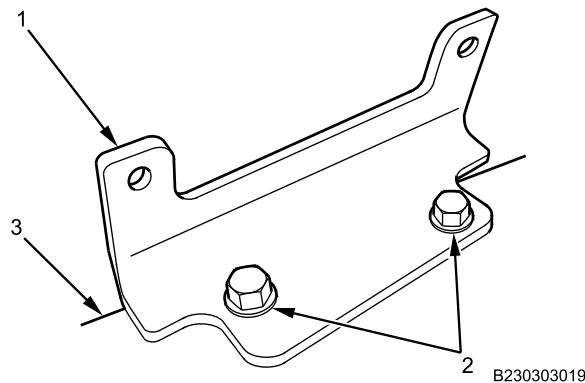


Figure 6. Ether (Cold) Start Valve Frame Bracket.

END OF TASK

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to nuts and bolts.

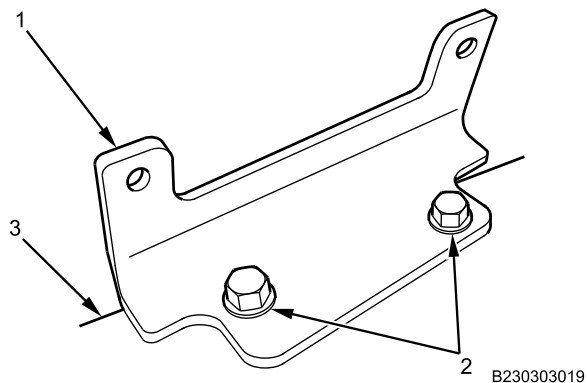


Figure 7. Ether (Cold) Start Valve Frame Bracket.

2. Install two nuts, bolts (Figure 7, Item 2), and ether (cold) start valve frame bracket (Figure 7, Item 1) on frame (Figure 7, Item 3). Tighten bolts securely.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

3. Apply corrosion preventive compound to bolts.

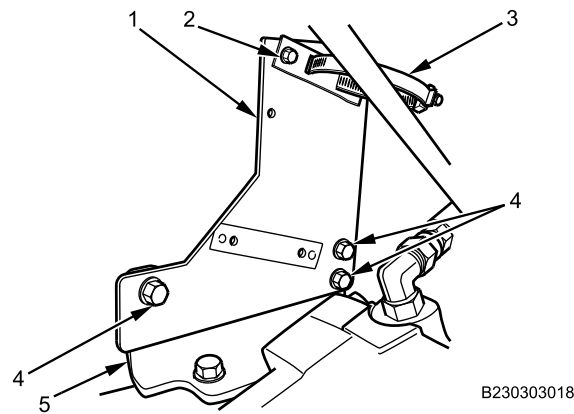


Figure 8. Ether (Cold) Start Valve Assembly Bracket.

4. Install ether (cold) start valve assembly bracket (Figure 8, Item 1) on ether (cold) start valve frame bracket (Figure 8, Item 5) with three bolts (Figure 8, Item 4). Tighten bolts securely.
5. Install ether canister mounting bracket (Figure 8, Item 3) on ether (cold) start valve assembly bracket (Figure 8, Item 1) with two bolts (Figure 8, Item 2). Tighten bolts securely.
6. Apply corrosion preventive compound to bolts.

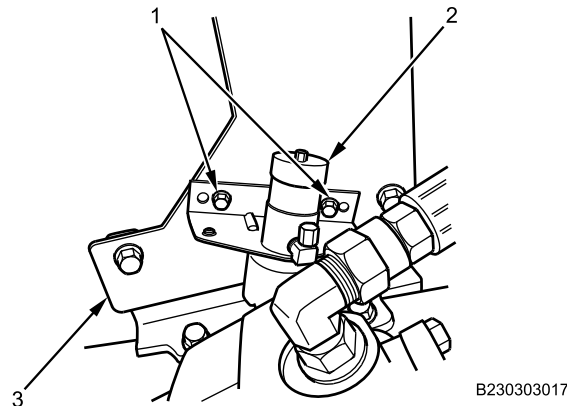
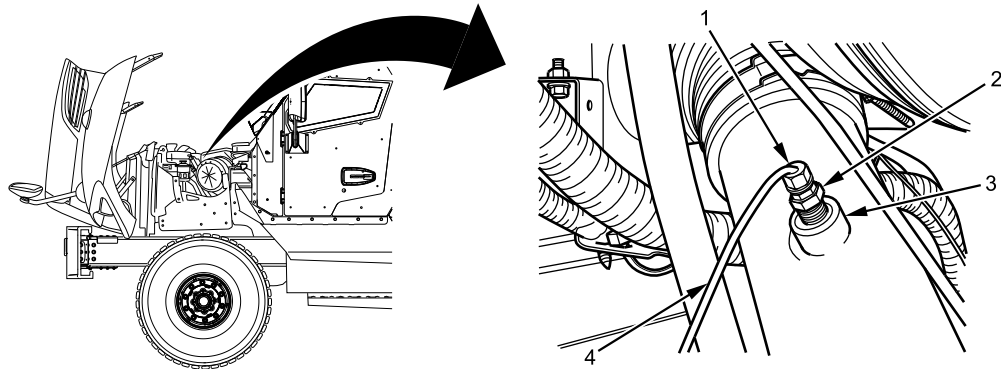


Figure 9. Ether (Cold) Start Valve Assembly.

7. Install ether (cold) start valve assembly (Figure 9, Item 2) on ether (cold) start valve assembly bracket (Figure 9, Item 3) with two bolts (Figure 9, Item 1). Tighten bolts securely.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

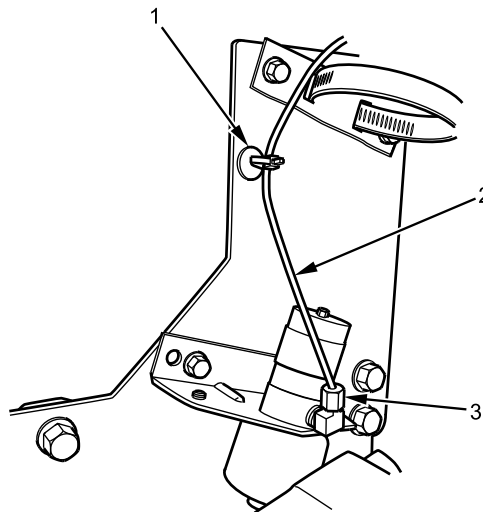
8. Install atomizer jet assembly (Figure 10, Item 2) on charge air cooler air duct pipe fitting (Figure 10, Item 3). Tighten atomizer jet assembly securely.



B230610102

Figure 10. Ether (Cold) Start Valve Tubing and Atomizer Jet Assembly.

9. Install pipe coupling (Figure 10, Item 1) and ether line (Figure 10, Item 4) on atomizer jet assembly (Figure 10, Item 2). Tighten pipe coupling securely.
10. Install ether line (Figure 11, Item 2) on bracket with new cable lock strap (Figure 11, Item 1).



B230303016

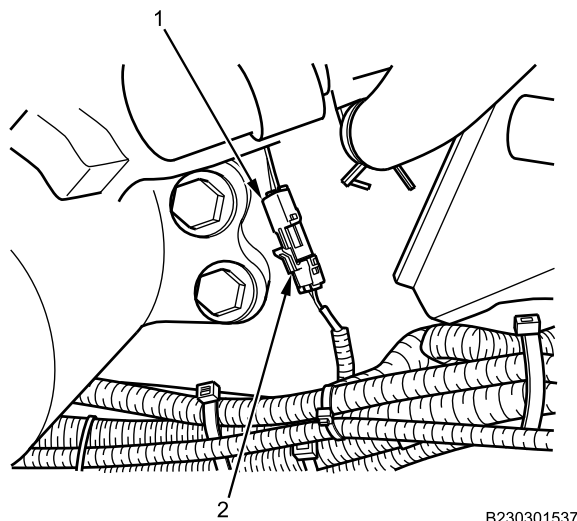
Figure 11. Ether (Cold) Start Valve Tubing.

11. Install ether line (Figure 11, Item 2) on ether (cold) start valve assembly elbow fitting (Figure 11, Item 3) and tighten pipe coupling securely.

ETHER (COLD) START VALVE AND ATOMIZER ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

12. Apply dielectric grease in electrical connector (Figure 12, Item 1) and connect to wiring harness (Figure 12, Item 2).



B230301537

Figure 12. Electrical Harness Connector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install ether canister (WP 0273).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Check for leaks (TM 9-2355-106-10).
5. Check instrument panel (IP) cluster and ensure no lights are illuminated (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install left side engine armor plate (WP 0597).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ETHER CANISTER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Left engine armor plate removed (WP 0597)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING



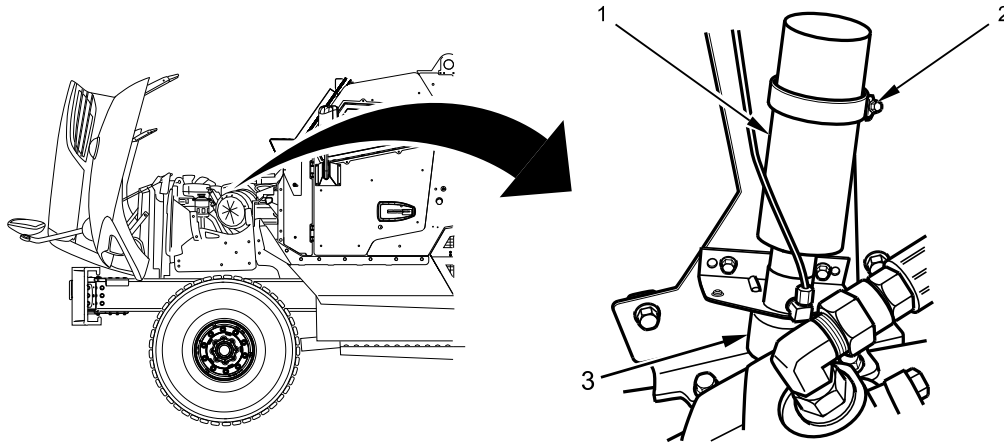
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Ether canisters contain hazardous, combustible and flammable materials. Handle with care and dispose of in accordance with standard operating procedures. Use approved respirator with dual organic vapor/mist and particulate cartridge. Avoid contact with skin and eyes, and avoid breathing fumes. If swallowed, do not induce vomiting. Obtain immediate medical attention. Failure to comply may result in serious injury or death to personnel.

Ether canisters are pressurized, combustible and flammable. Keep away from flames and sparks. Do not incinerate or puncture canister. Do not expose to temperatures above 120°F (49°C). Do not store spare canister in vehicle cab. Failure to comply may result in serious injury or death to personnel.

ETHER CANISTER REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Loosen ether canister mounting clamp (Figure 1, Item 2).



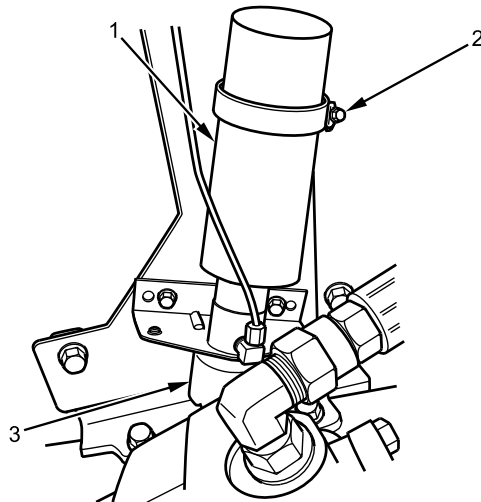
B230310352

Figure 1. Ether Canister.

2. Unscrew ether canister (Figure 1, Item 1) from ether (cold) start valve assembly (Figure 1, Item 3) and remove from clamp (Figure 1, Item 2).

END OF TASK**INSTALLATION**

1. Install ether canister (Figure 2, Item 1) into ether (cold) start valve assembly (Figure 2, Item 3) and tighten firmly.



B230301583

Figure 2. Ether Canister.

2. Tighten ether canister mounting clamp (Figure 2, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).

ETHER CANISTER REMOVAL AND INSTALLATION - (CONTINUED)

2. Start engine, using ether (cold) start (TM 9-2355-106-10).
3. Check for leaks.
4. Check dash to make sure no engine lights are illuminated (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Install left engine armor plate (WP 0597).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine cover removed (WP 0649)

WARNING

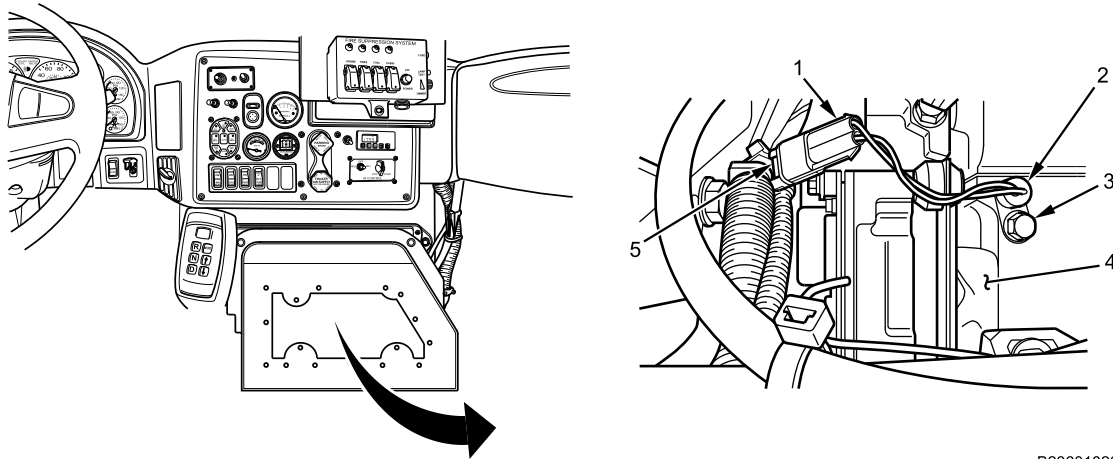
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Ether cold start thermostatic switch is located on left rear of cylinder head next to engine control module.

REMOVAL

1. Disconnect ether cold start thermostatic switch harness connector (Figure 1, Item 1) from engine wiring harness (Figure 1, Item 5).



B236010202

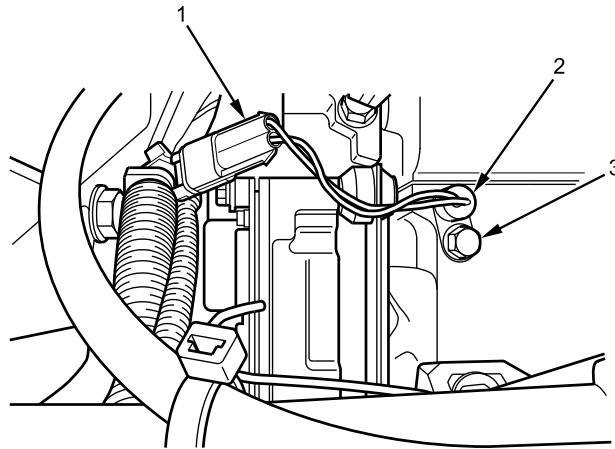
Figure 1. Ether Cold Start Thermostatic Switch.

2. Remove ether cold start thermostatic switch retaining bolt (Figure 1, Item 3) and ether cold start thermostatic switch (Figure 1, Item 2) from left rear of engine cylinder head (Figure 1, Item 4).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Install ether cold start thermostatic switch (Figure 2, Item 2) and ether cold start thermostatic switch retaining bolt (Figure 2, Item 3) on left rear of engine cylinder head. Tighten bolt securely.

ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

B230602843

Figure 2. Ether Cold Start Thermostatic Switch.

2. Apply dielectric grease to ether cold start thermostatic switch harness connector (Figure 2, Item 1).
3. Connect ether cold start thermostatic switch harness connector (Figure 2, Item 1) on engine wiring harness .

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on.
2. Verify ether start system operation.
3. Turn MAIN POWER switch off.
4. Engine cover installed (WP 0649).
5. Remove wheel chocks.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
EXHAUST PIPE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Faceshield, industrial (WP 0794, Item 16)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 18)
Gloves (WP 0794, Item 19)
Compound (WP 0794, Item 13)
Coupling, pipe (WP 0796, Item 4)
Locknut - (2) (WP 0796, Item 132)
Locknut - (8) (WP 0796, Item 153)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Belly armor removed (WP 0606)
Muffler removed (WP 0276)
Exhaust brake removed (WP 0246)

References

TM 9-2355-106-10

REMOVAL**WARNING**

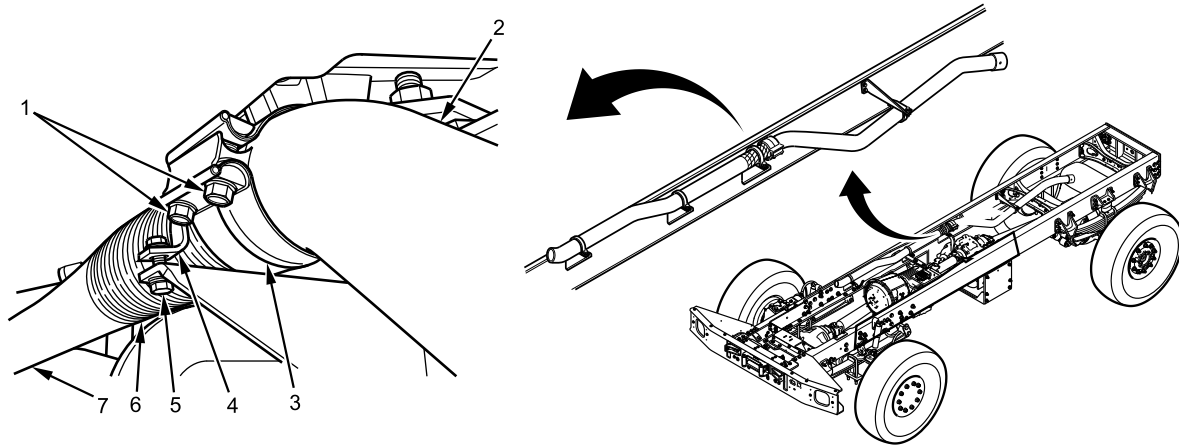
Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not remove hot exhaust system from vehicle. Bolts can stretch, crack, and break when hot. Allow exhaust system to cool before loosening bolts on C-clamps. Failure to comply may result in damage to equipment and injury or death to personnel.

EXHAUST PIPE REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Note exhaust pipe alignment before removal to aid in installation.

1. Loosen two bolts (Figure 1, Item 1) on exhaust pipe coupling (Figure 1, Item 3) securing front of rear intermediate exhaust pipe (Figure 1, Item 2) to flex pipe (Figure 1, Item 6).



B230405997

Figure 1. Rear Exhaust Pipe Clamps.

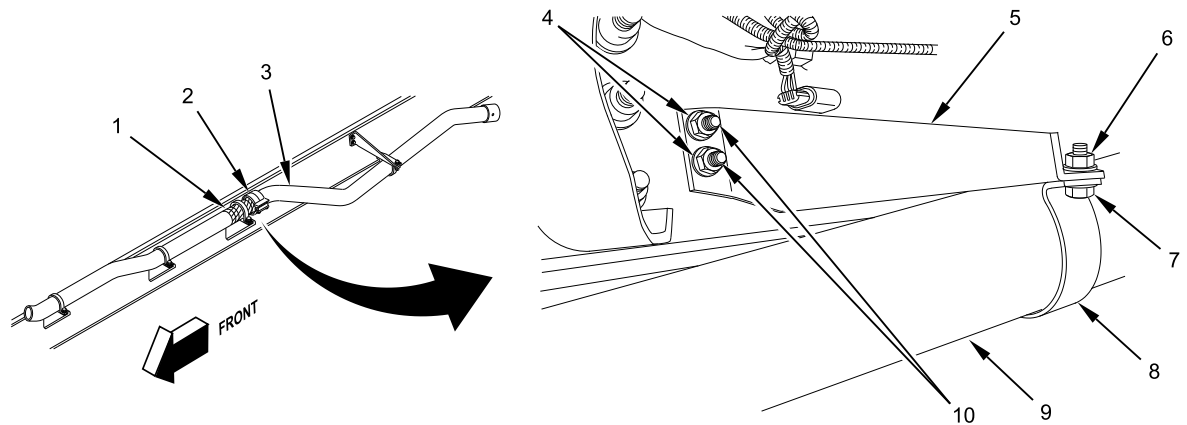
2. Remove two bolts and locknuts (Figure 1, Item 5) securing exhaust loop clamp (Figure 1, Item 4) to flex pipe (Figure 1, Item 6) between front and rear intermediate exhaust pipes (Figure 1, Item 7 and 2). Discard locknuts (Figure 1, Item 5).

NOTE

Rear intermediate exhaust pipe and hanger are removed together. Exhaust pipe hanger is located at the middle of rear intermediate exhaust pipe.

3. Remove two bolts (Figure 2, Item 10) and locknuts (Figure 2, Item 4) securing exhaust pipe hanger (Figure 2, Item 5) to frame (Figure 2, Item 9). Discard locknuts (Figure 2, Item 4).

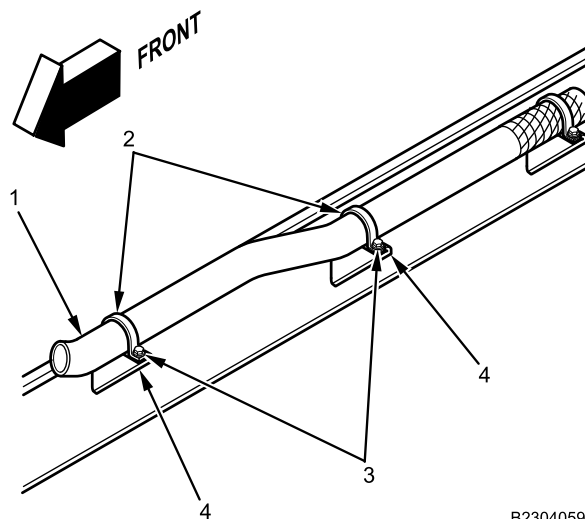
EXHAUST PIPE REMOVAL AND INSTALLATION - (CONTINUED)



B230405998

Figure 2. Rear Exhaust Pipe Hanger.

4. Remove rear intermediate exhaust pipe (Figure 2, Item 3) from flex pipe (Figure 2, Item 1) and vehicle.
5. Remove and discard exhaust pipe coupling (Figure 2, Item 2).
6. Remove two bolts (Figure 2, Item 7) and locknuts (Figure 2, Item 6) securing exhaust loop clamp (Figure 2, Item 8) to rear intermediate exhaust pipe (Figure 2, Item 3). Discard locknuts.
7. Remove four bolts (Figure 3, Item 3) and locknuts securing two exhaust loop clamps (Figure 3, Item 2) to exhaust pipe hangers (Figure 3, Item 4). Two bolts and locknuts not shown. Discard locknuts.



B230405999

Figure 3. Front Exhaust Pipe Clamps.

8. Remove front intermediate exhaust pipe (Figure 3, Item 1) from vehicle.

END OF TASK

EXHAUST PIPE REMOVAL AND INSTALLATION - (CONTINUED)

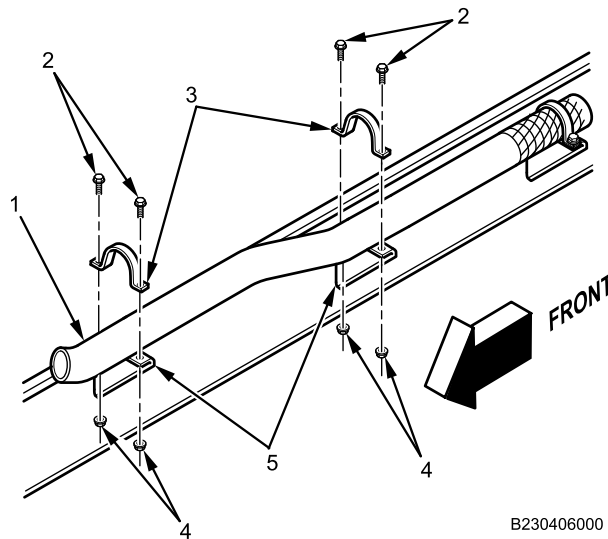
INSTALLATION

WARNING



Corrosion preventive compound is toxic. Use only in well-ventilated area. Use approved respirator with dual organic vapor/mist and particulate cartridge. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

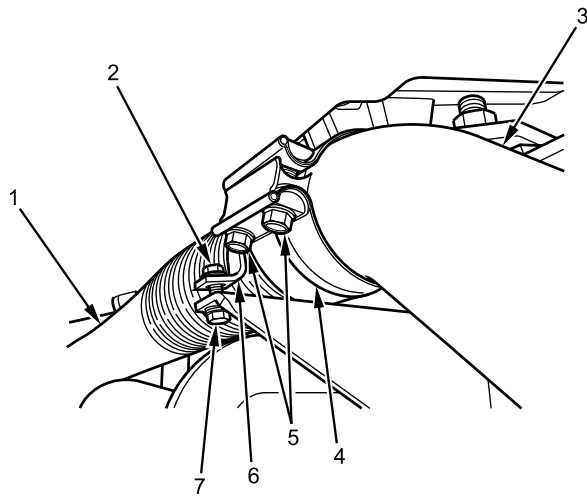
1. Apply corrosion preventive compound to removed bolts and new locknuts.
2. Install front intermediate exhaust pipe (Figure 4, Item 1) and two exhaust loop clamps (Figure 4, Item 3) on exhaust pipe hangers (Figure 4, Item 5) using four bolts (Figure 4, Item 2) and new locknuts (Figure 4, Item 4). Do not tighten.



B230406000

Figure 4. Front Exhaust Pipe Mounting.

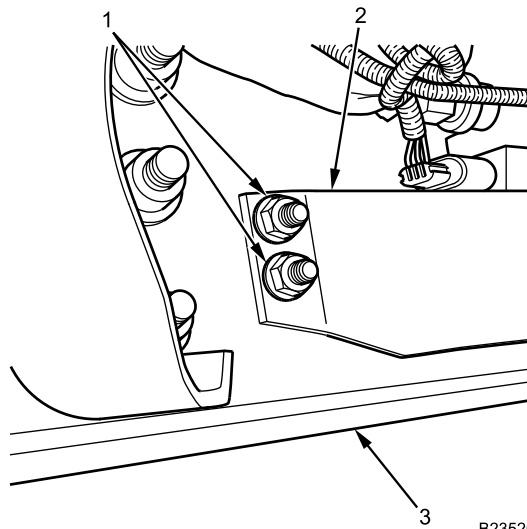
3. Align front intermediate exhaust pipe (Figure 4, Item 1) as noted during removal, and securely tighten four bolts (Figure 4, Item 2) and locknuts (Figure 4, Item 4) on exhaust loop clamps (Figure 4, Item 3).
4. Install rear intermediate exhaust pipe (Figure 5, Item 3) to front intermediate exhaust pipe (Figure 5, Item 1) with new pipe coupling (Figure 5, Item 4). Do not tighten pipe coupling bolts (Figure 5, Item 5).

EXHAUST PIPE REMOVAL AND INSTALLATION - (CONTINUED)

B230603210

Figure 5. Rear Exhaust Mounting Clamps.

5. Install exhaust loop clamp (Figure 5, Item 6) with two bolts (Figure 5, Item 7) and new locknuts (Figure 5, Item 2). Do not tighten.
6. Install exhaust pipe hanger (Figure 6, Item 2) on frame (Figure 6, Item 3) with two bolts and new locknuts (Figure 6, Item 1). Tighten securely.

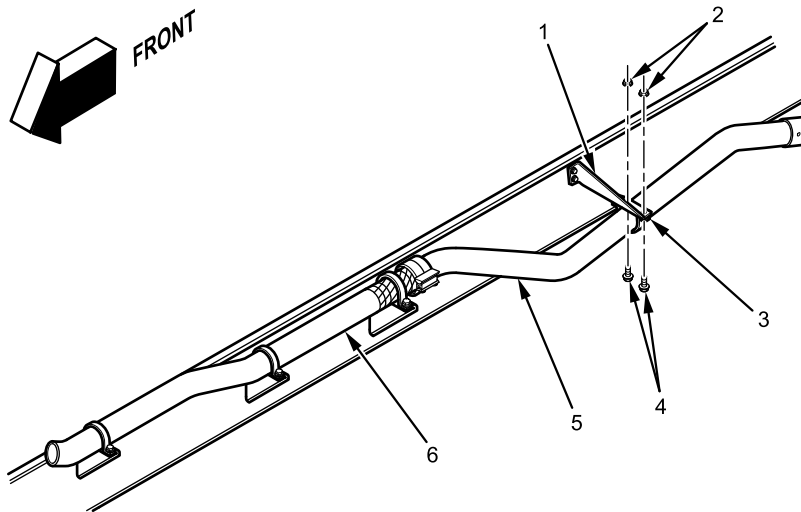


B235203112

Figure 6. Rear Exhaust Hanger.

EXHAUST PIPE REMOVAL AND INSTALLATION - (CONTINUED)

7. Install exhaust loop clamp (Figure 7, Item 3) on exhaust pipe hanger (Figure 7, Item 1) with two bolts (Figure 7, Item 4) and new locknuts (Figure 7, Item 2). Do not tighten.



B230603206

Figure 7. Rear Exhaust Pipe Mounting.

8. Align front intermediate exhaust pipe (Figure 7, Item 6) and rear intermediate exhaust pipe (Figure 7, Item 5) as noted during removal.
9. Tighten coupling bolts (Figure 7, Item 4) and exhaust loop clamp fasteners (Figure 7, Item 2) securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install exhaust brake (WP 0246).
2. Install muffler (WP 0276).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine and check for exhaust leaks (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Install belly armor (WP 0606).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

MUFFLER AND SHIELD REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
C-clamp (WP 0795, Item 24)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Gloves (WP 0794, Item 19)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine shut off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Rear frame crossmember removed (WP 0549)

Personnel Required

Maintainer - (2)

REMOVAL

WARNING



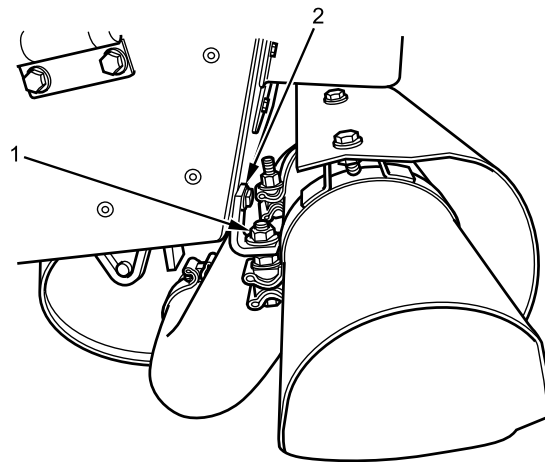
Exhaust system components can be hot. Do not touch with bare hands or allow contact with other skin surface. Wear protective work gloves and long sleeves. Do not use exhaust tailpipe as a step. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not remove hot exhaust system from vehicle. Bolts can stretch, crack, and break when hot. Allow exhaust system to cool before loosening bolts on C-clamps. Failure to comply may result in damage to equipment and injury or death to personnel.

Muffler and tailpipe assembly are heavy. Do not attempt to lift muffler and tailpipe assembly without assistance from crewmember. Wear safety goggles and work gloves. Failure to comply may result in damage to equipment and serious injury or death to personnel.

MUFFLER AND SHIELD REMOVAL AND INSTALLATION - (CONTINUED)

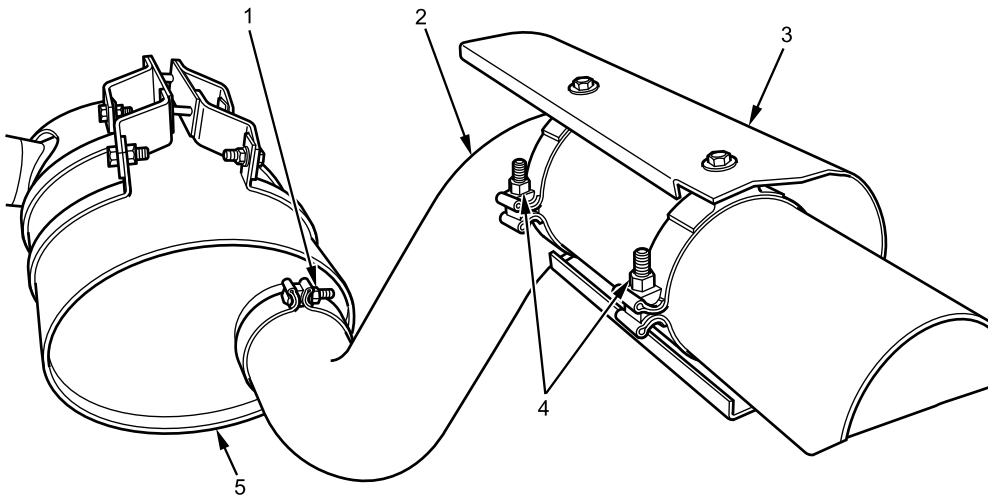
1. Remove nut (Figure 1, Item 1) from tailpipe bracket (Figure 1, Item 2).



B230403644

Figure 1. Tailpipe Bracket.

2. Loosen two nuts (Figure 2, Item 4) on shield assembly (Figure 2, Item 3).



B230403645

Figure 2. Muffler and Tailpipe Assembly.

3. Remove shield assembly (Figure 2, Item 3) from tailpipe (Figure 2, Item 2).
4. Loosen C-clamp nut (Figure 2, Item 1) that attaches tailpipe (Figure 2, Item 2) to muffler (Figure 2, Item 5).
5. Remove tailpipe (Figure 2, Item 2) from muffler (Figure 2, Item 5).

MUFFLER AND SHIELD REMOVAL AND INSTALLATION - (CONTINUED)

6. Loosen C-clamp (Figure 3, Item 6) that attaches exhaust pipe (Figure 3, Item 7) to muffler (Figure 3, Item 5).

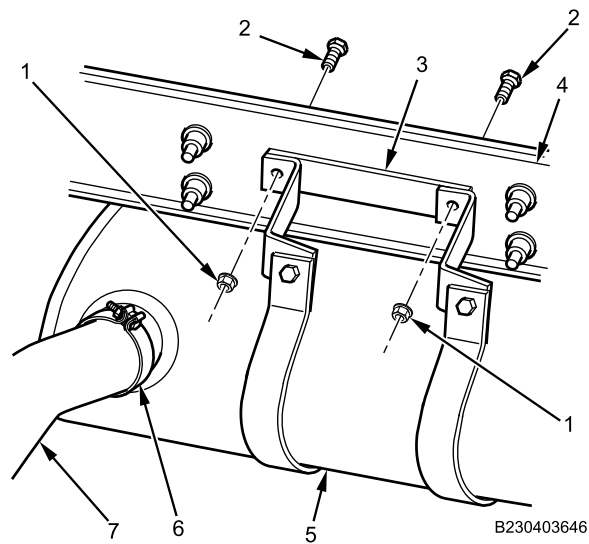


Figure 3. Muffler Holding Strap.

7. With maintainer assistance, support muffler and tailpipe assembly (Figure 3, Item 5).
8. Remove two nuts (Figure 3, Item 1) and bolts (Figure 3, Item 2) from muffler holding strap (Figure 3, Item 3) and crossmember (Figure 3, Item 4).
9. With assistance, remove muffler (Figure 3, Item 5) from exhaust pipe (Figure 3, Item 7).
10. Remove muffler holding strap (Figure 3, Item 3) from muffler (Figure 3, Item 5).

END OF TASK

MUFFLER AND SHIELD REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to all removed bolts (Figure 4, Item 2) and nuts (Figure 4, Item 1).

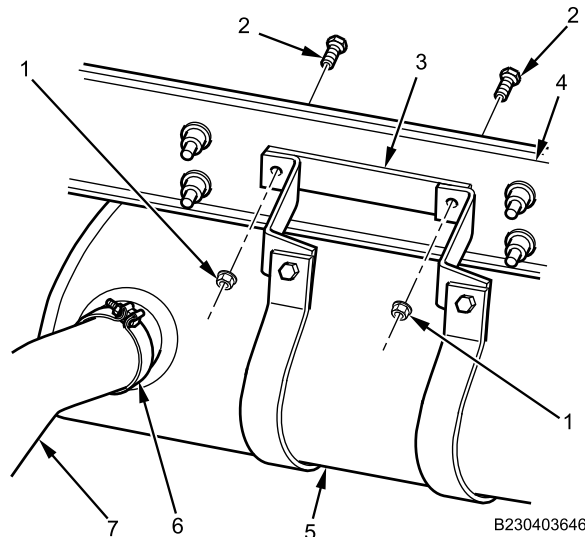
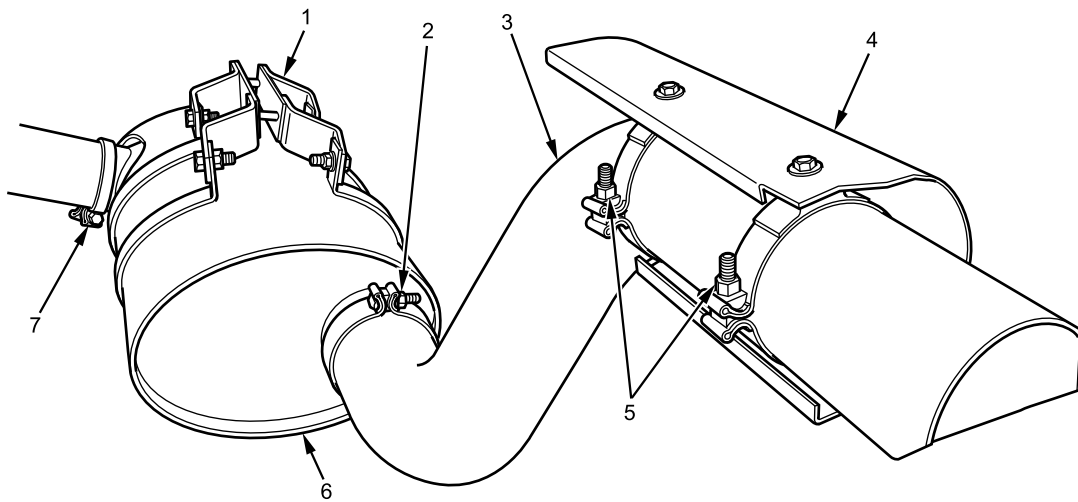


Figure 4. Muffler Holding Strap.

2. Position muffler holding strap (Figure 4, Item 3) on muffler (Figure 4, Item 5).
3. With assistance, insert exhaust pipe (Figure 4, Item 7) into muffler inlet port (Figure 4, Item 5) approximately 2-1/4 inches deep.
4. With maintainer assistance and a C-clamp, install muffler holding strap (Figure 4, Item 3) on frame crossmember (Figure 4, Item 4) with two bolts (Figure 4, Item 2) and nuts (Figure 4, Item 1). Do not tighten.
5. Install C-clamp (Figure 4, Item 6) on exhaust pipe (Figure 4, Item 7) to muffler (Figure 4, Item 5) connection. Do not tighten.
6. Install tailpipe (Figure 5, Item 3) into muffler outlet port (Figure 5, Item 6) approximately 2-1/4 inches deep.

MUFFLER AND SHIELD REMOVAL AND INSTALLATION - (CONTINUED)

B230401496

Figure 5. Muffler and Tailpipe Assembly.

7. Install C-clamp (Figure 5, Item 2) on muffler (Figure 5, Item 6) to tailpipe (Figure 5, Item 3) connection. Do not tighten.
8. Install shield assembly (Figure 5, Item 4) on tailpipe (Figure 5, Item 3) with two nuts (Figure 5, Item 5). Do not tighten.
9. Align muffler and tailpipe assembly (Figure 5, Item 3 and 6) to ensure suitable clearance from vehicle body and chassis.
10. Tighten two nuts and bolts on muffler holding strap (Figure 5, Item 1) securely.
11. Tighten C-clamp (Figure 5, Item 7) securely.

MUFFLER AND SHIELD REMOVAL AND INSTALLATION - (CONTINUED)

12. Align tailpipe (Figure 6, Item 6) and shield assembly (Figure 6, Item 4) to ensure suitable clearance from vehicle body and chassis.

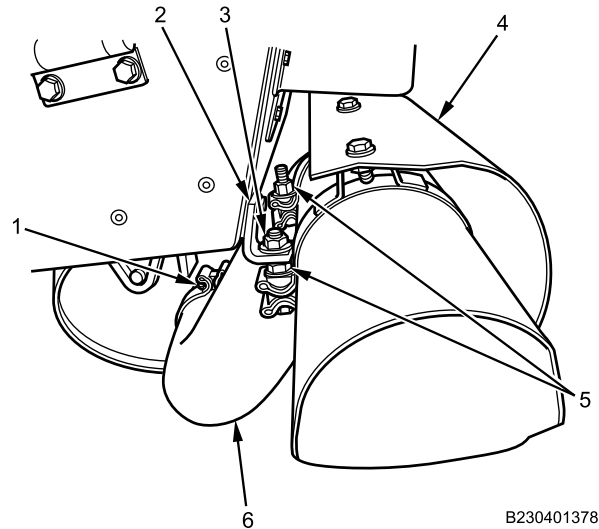


Figure 6. Tail Pipe Bracket.

13. Tighten C-clamp (Figure 6, Item 1) securely.
 14. Tighten two shield assembly nuts (Figure 6, Item 5) securely.
 15. Install tailpipe hanger nut (Figure 6, Item 3) on tailpipe hanger bracket (Figure 6, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install rear frame crossmember (WP 0549).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine, check for exhaust leaks (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**COOLING SYSTEM DRAIN AND FILL**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Terminal Test Kit (WP 0795, Item 122)

Materials/Parts

Antifreeze (WP 0794, Item 5)
Grease (WP 0794, Item 22)
Rag,wiping (WP 0794, Item 39)
Gloves (WP 0794, Item 19)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Clamp (WP 0796, Item 129)
Clamp - (2) (WP 0796, Item 45)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM
9-2355-106-10)

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)**WARNING**

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

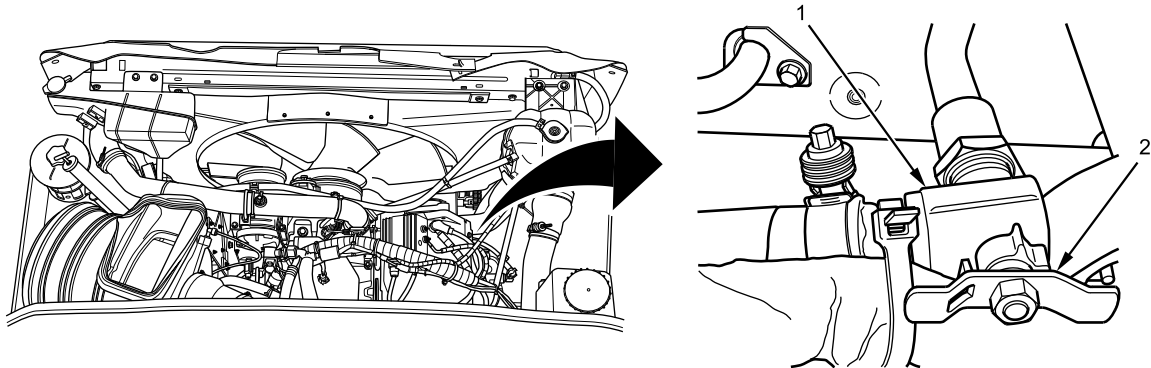
Follow all standard operating procedures for use, storage, and disposal of hazardous materials. Failure to comply may result in injury to personnel and damage to the environment.

Accidental or intentional introduction of liquid contaminants into the environment is a violation of state, federal, and military regulations. Store, install, and dispose of containers in accordance with standard operating procedures. Refer to Army Petroleum, Oil, and Lubricants (POL) (para. 1-8) for information concerning storage, use, and disposal of liquid contaminants. Failure to comply may result in damage to environment and serious injury or death to personnel.

DRAIN

1. Ensure coolant outlet valve (Figure 1, Item 1) is open by turning handle (Figure 1, Item 2) counterclockwise.

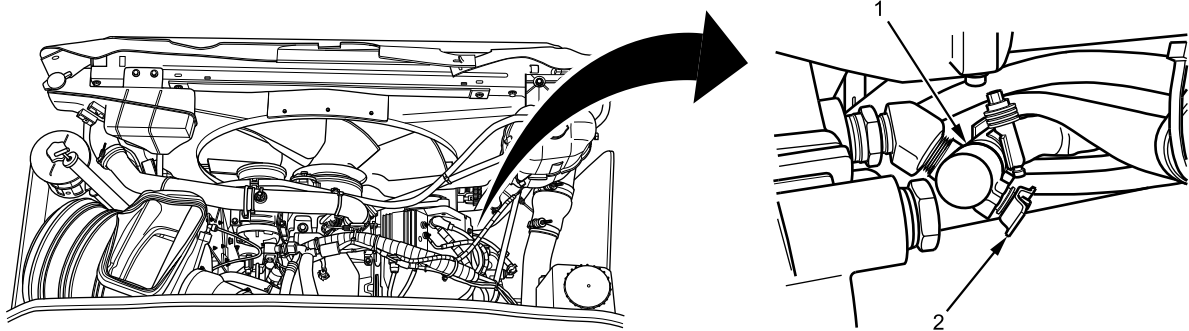
COOLING SYSTEM DRAIN AND FILL - (CONTINUED)



B230510487

Figure 1. Heater Coolant Engine Outlet Valve.

2. Ensure coolant inlet valve (Figure 2, Item 1) is open by turning handle (Figure 2, Item 2) counterclockwise.



B230510486

Figure 2. Heater Coolant Engine Inlet Valve.

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)

3. Remove cap (Figure 3, Item 2) from deaeration tank (Figure 3, Item 1).

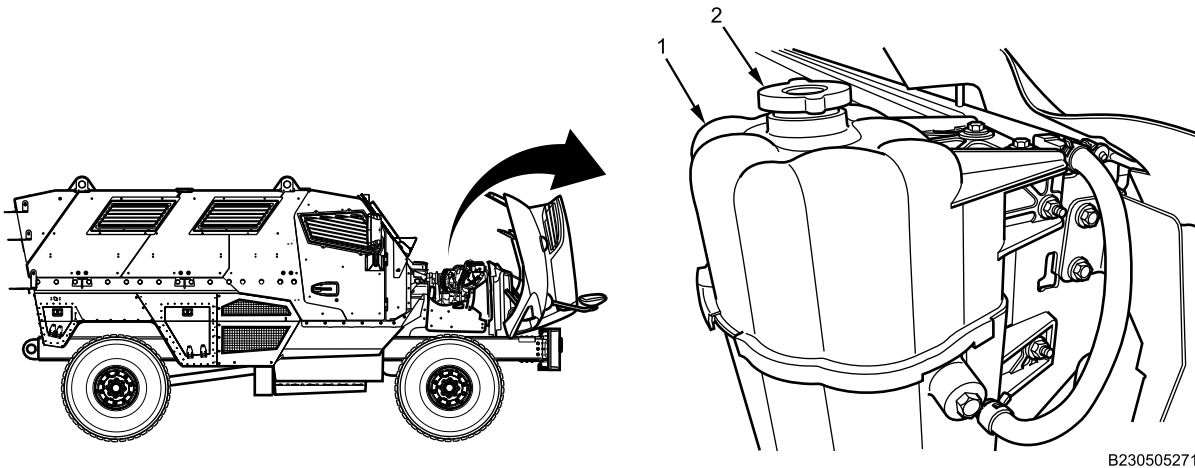


Figure 3. Right Side of Deaeration Tank.

4. Open cap (Figure 4, Item 1) on surge overflow tank (Figure 4, Item 2).

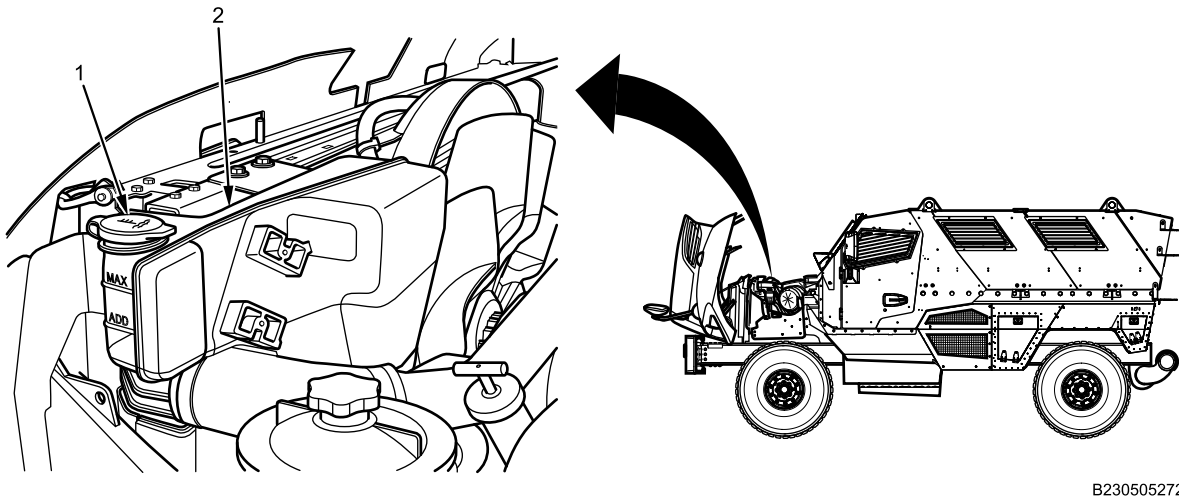
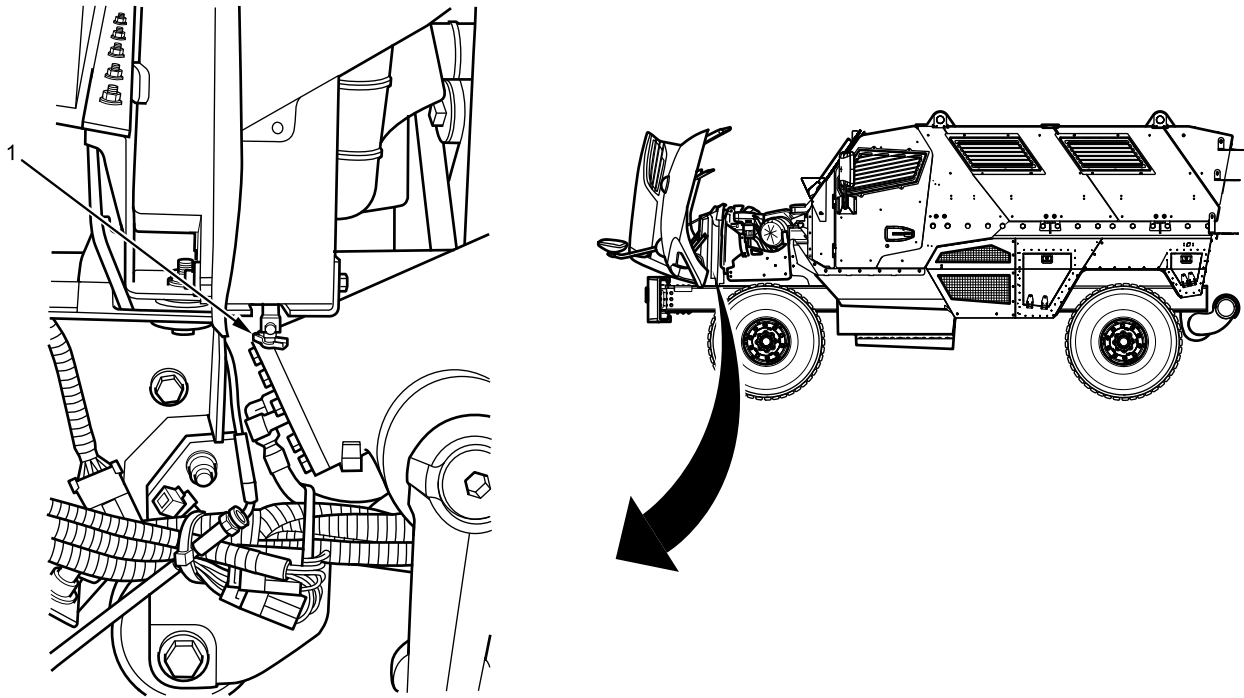


Figure 4. Radiator Coolant Surge Overflow Tank.

5. Place drain pan under radiator drain valve (Figure 5, Item 1).

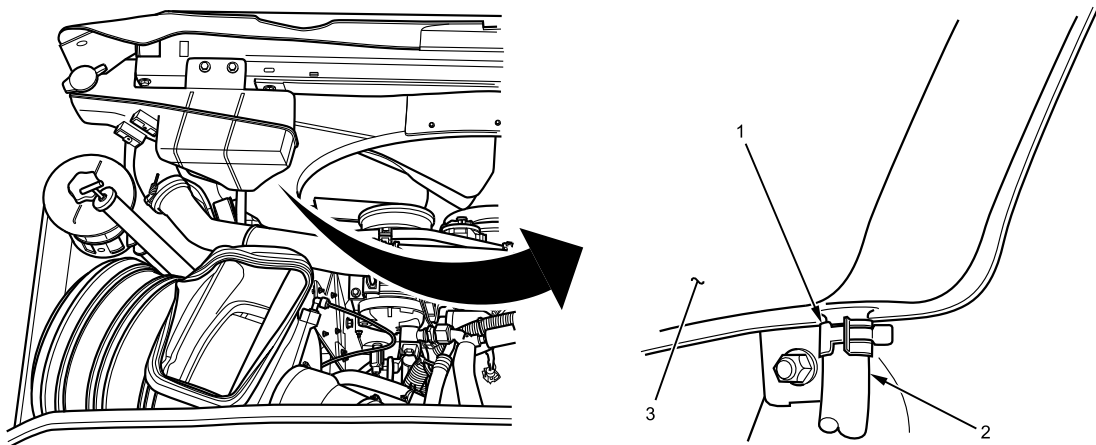
COOLING SYSTEM DRAIN AND FILL - (CONTINUED)



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Figure 5. Radiator — Left Side.

6. Open drain valve (Figure 5, Item 1) and drain coolant.
7. Loosen clamp (Figure 6, Item 1) and disconnect hose (Figure 6, Item 2) from bottom of surge overflow tank (Figure 6, Item 3). Allow tank to drain into drain pan.



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Figure 6. Radiator Coolant Surge Overflow Tank.

8. Remove clamp (Figure 6, Item 1) from hose (Figure 6, Item 2) and discard.

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)

9. Place drain pan under fuel-fired heater (Figure 7, Item 4).

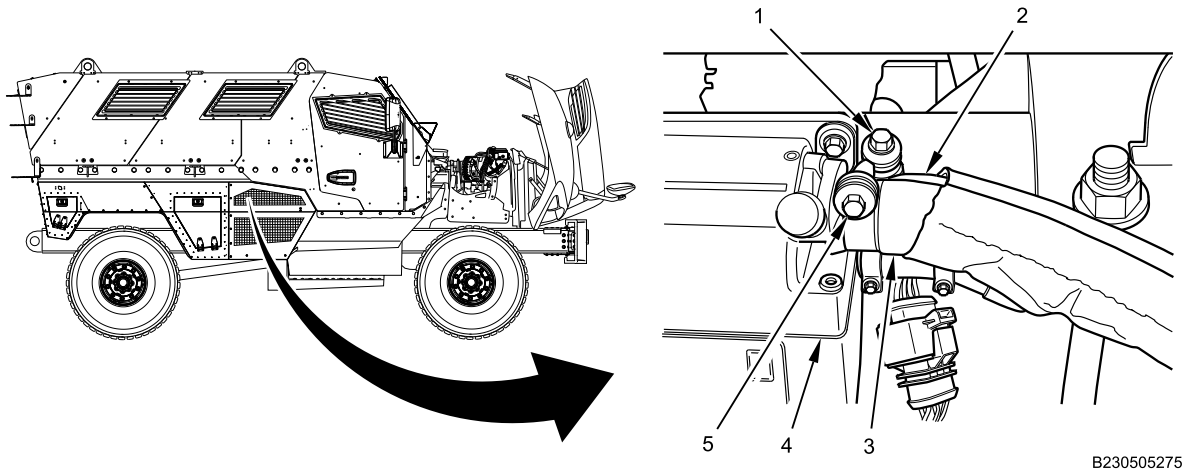


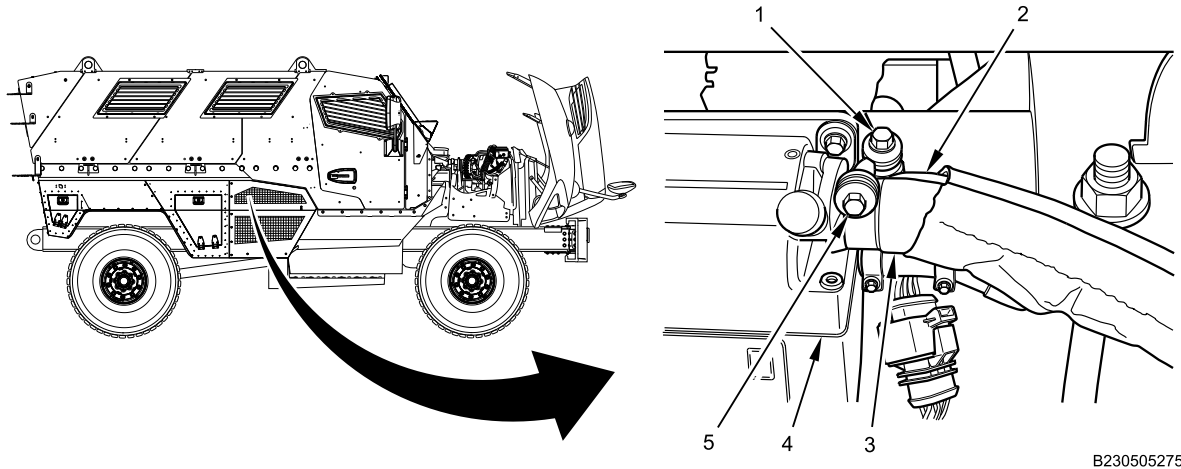
Figure 7. Coolant Hoses Removal.

10. Loosen clamp (Figure 7, Item 5) and remove coolant inlet hose (Figure 7, Item 3) from heater (Figure 7, Item 4). Discard clamp (Figure 7, Item 5).
11. Loosen clamp (Figure 7, Item 1) and remove coolant outlet hose (Figure 7, Item 2) from heater (Figure 7, Item 4). Discard clamp (Figure 7, Item 1).
12. Drain coolant from heater (Figure 7, Item 4) and hoses (Figure 7, Item 2 and 3).
13. Remove drain pan.

END OF TASK

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)**FILL**

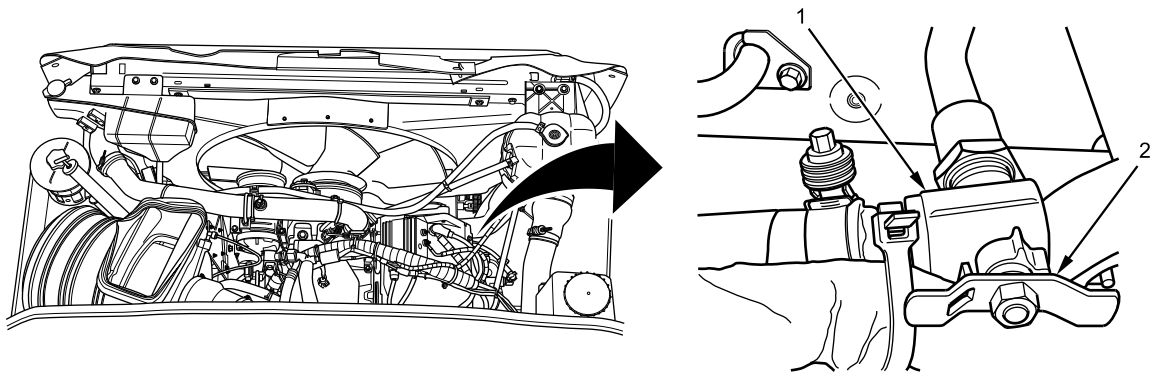
1. Install coolant outlet hose (Figure 8, Item 2) on heater (Figure 8, Item 4) with new clamp (Figure 8, Item 1) and tighten securely.



B230505275

Figure 8. Coolant Hoses Installation.

2. Install coolant inlet hose (Figure 8, Item 3) on heater (Figure 8, Item 4) with new clamp (Figure 8, Item 5) and tighten securely.
3. Close coolant outlet valve (Figure 9, Item 1) by turning handle (Figure 9, Item 2) clockwise.

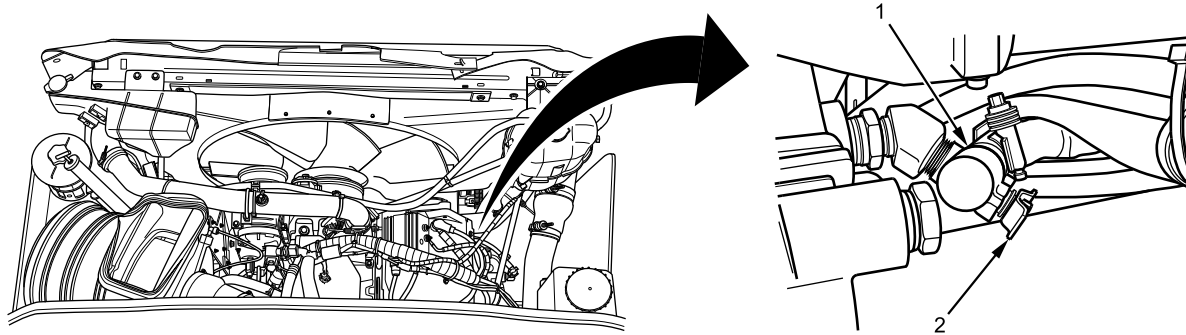


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Figure 9. Heater Coolant Engine Outlet Valve.

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)

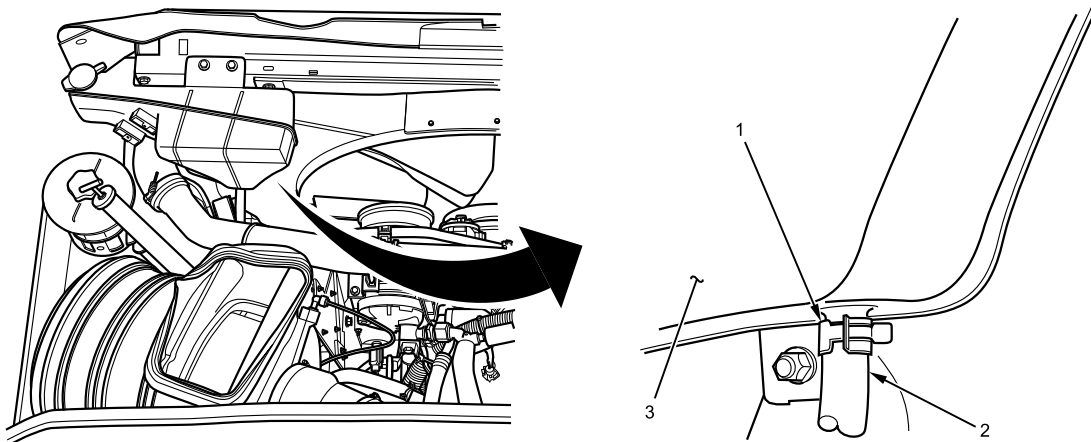
4. Close coolant inlet valve (Figure 10, Item 1) by turning handle (Figure 10, Item 2) counterclockwise.



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Figure 10. Heater Coolant Engine Inlet Valve.

5. Install new clamp (Figure 11, Item 1) on hose (Figure 11, Item 2).

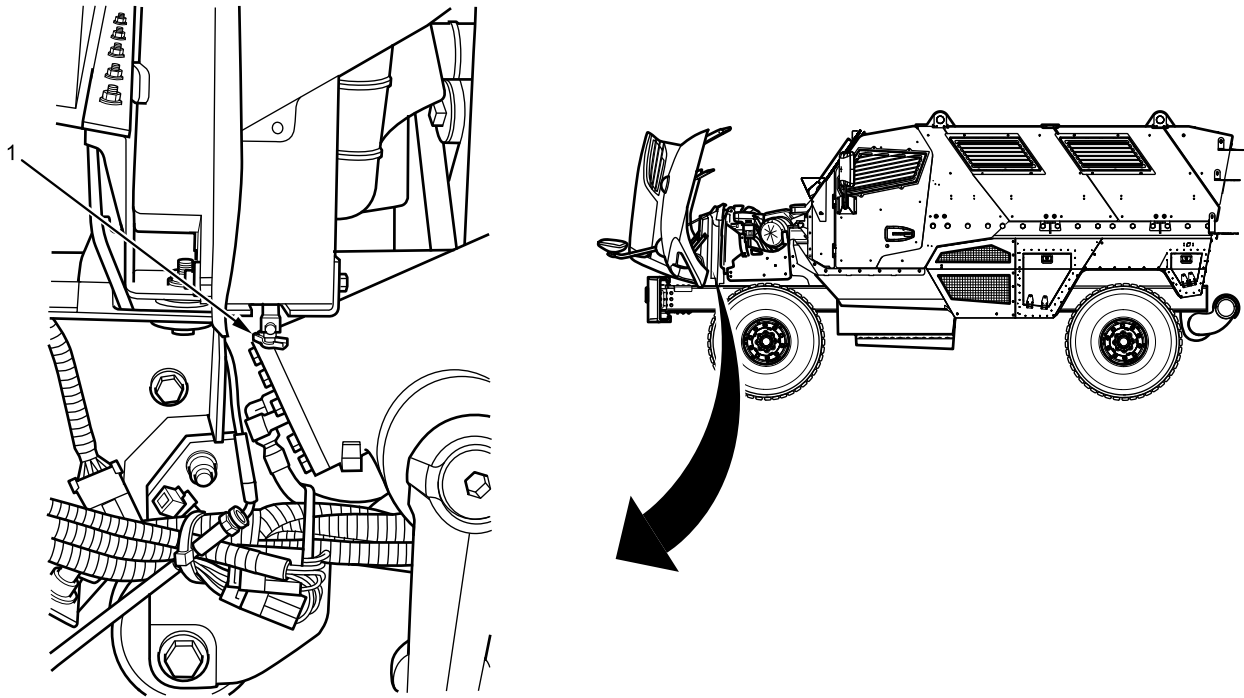


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Figure 11. Radiator Coolant Surge Overflow Tank.

6. Install hose on surge overflow tank (Figure 11, Item 3).
7. Close drain valve (Figure 12, Item 1).

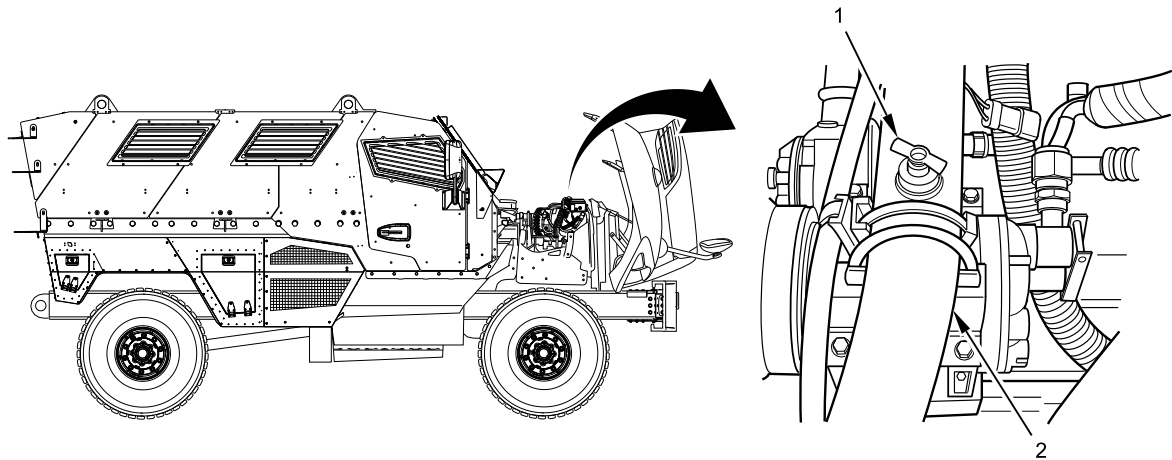
COOLING SYSTEM DRAIN AND FILL - (CONTINUED)



B230505273

Figure 12. Radiator Drain Valve.

8. Turn air bleed valve (Figure 13, Item 1) on upper hose (Figure 13, Item 2) counterclockwise until valve is completely opened.

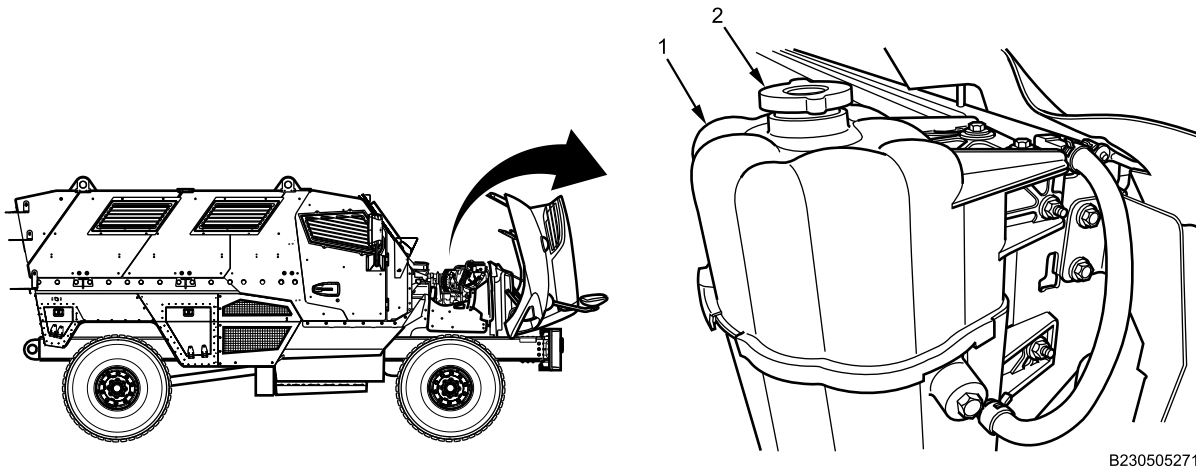


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Figure 13. Air Bleed Valve Opened.

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)

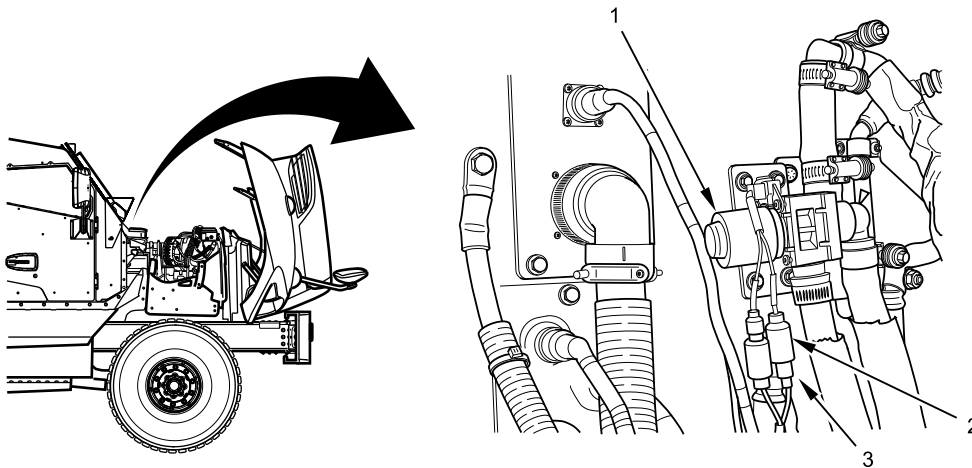
9. Fill deaeration tank (Figure 14, Item 1) with 50/50 mixture of antifreeze/water until coolant is flowing from air bleed valve.



B230505271

Figure 14. Right Side of Deaeration Tank.

10. Turn air bleed valve (Figure 13, Item 1) clockwise until valve is completely closed.
 11. Disconnect BROWN wire electrical connector (Figure 15, Item 2) on 3-way valve (Figure 15, Item 1) from wiring harness (Figure 15, Item 3).

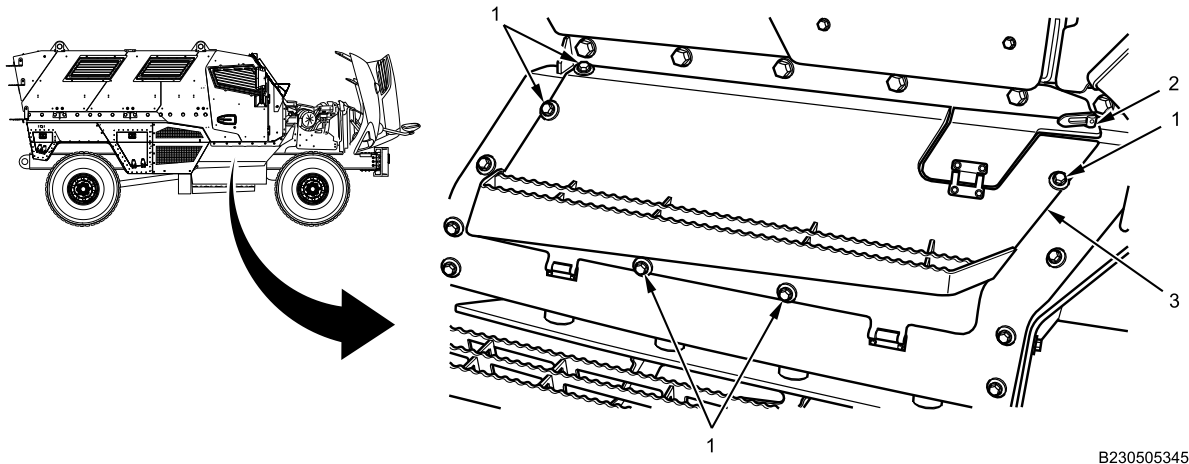


B230510488

Figure 15. Brown Wire Disconnected.

12. Remove five bolts (Figure 16, Item 1) and flat washers from battery door (Figure 16, Item 3).

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)



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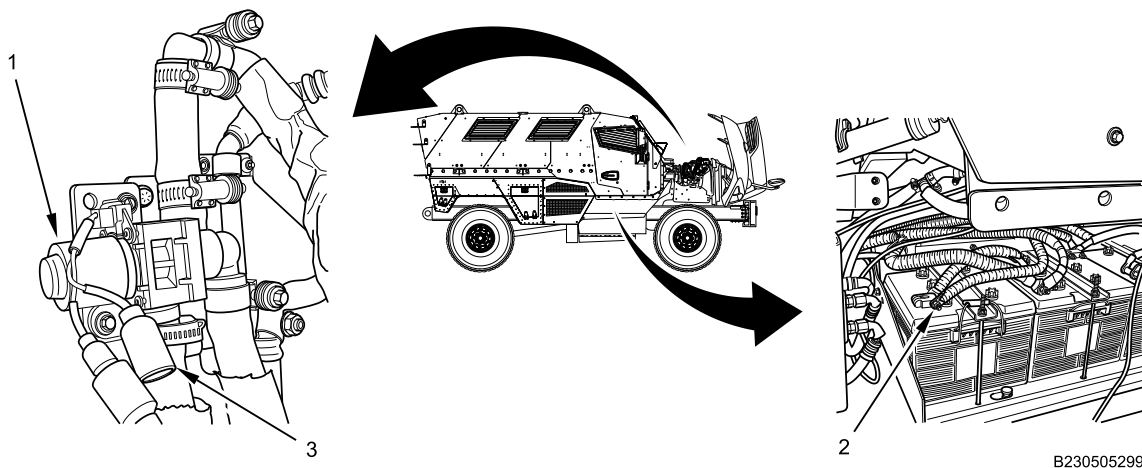
Figure 16. Battery Door.

13. Flip access door lever (Figure 16, Item 2) to up position.
14. Open battery door (Figure 16, Item 3).
15. Turn battery disconnect switch on (TM 9-2355-106-10).
16. Turn ignition switch on (TM 9-2355-106-10).

NOTE

3-way valve must be open to completely fill coolant system.

17. Connect jumper wire between brown wire (Figure 17, Item 2) on 3-way valve (Figure 17, Item 1) and 24V power source (Figure 17, Item 3).



B230505299

Figure 17. Jumper Wire.

18. Turn fuel-fired heater on (TM 9-2355-106-10).
19. Fill deaeration tank (Figure 14, Item 1) with 50/50 mixture of antifreeze/water to top of tank.
20. Install pressure cap (Figure 14, Item 2) on deaeration tank (Figure 14, Item 1).

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)

21. Turn fuel-fired heater off (TM 9-2355-106-10).
22. Turn ignition switch off (TM 9-2355-106-10).
23. Turn MAIN POWER switch off (TM 9-2355-106-10).
24. Remove jumper wire.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

25. Apply dielectric grease in BROWN wire electrical connector (Figure 18, Item 2) on 3-way valve (Figure 18, Item 1) and connect onto wiring harness (Figure 18, Item 3).

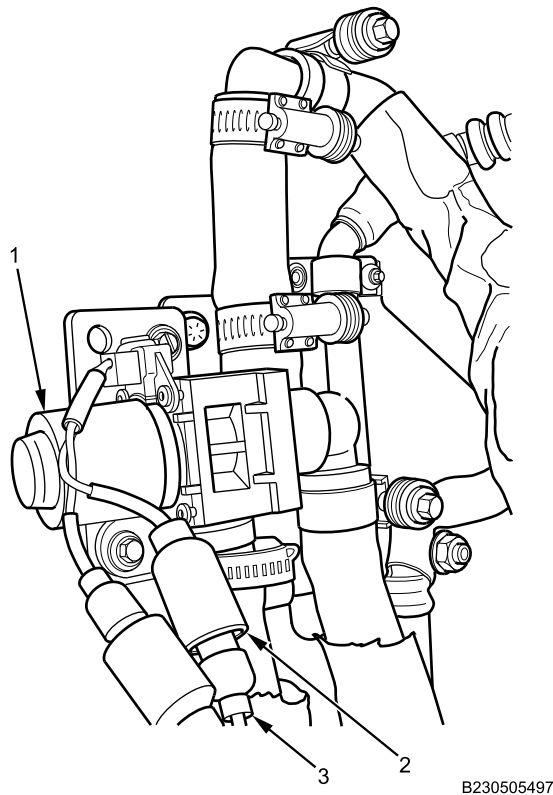
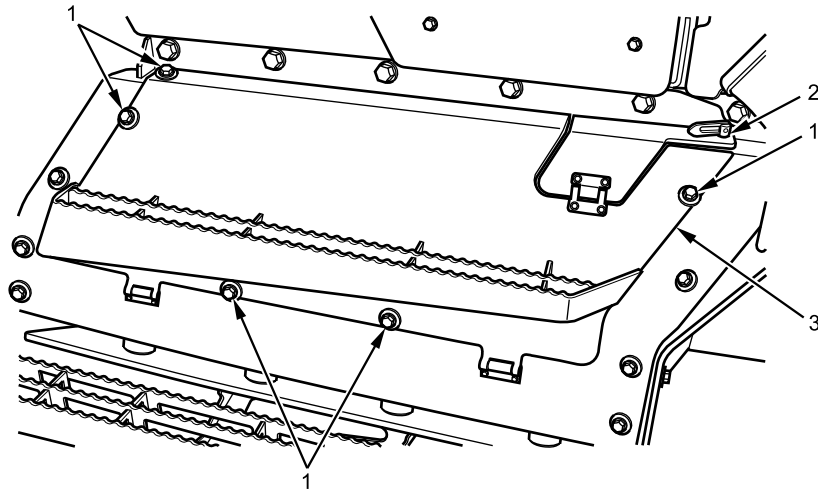


Figure 18. Brown Wire Connected.

26. Close battery access door (Figure 19, Item 3) and install five bolts (Figure 19, Item 1) and flat washers. Tighten securely.

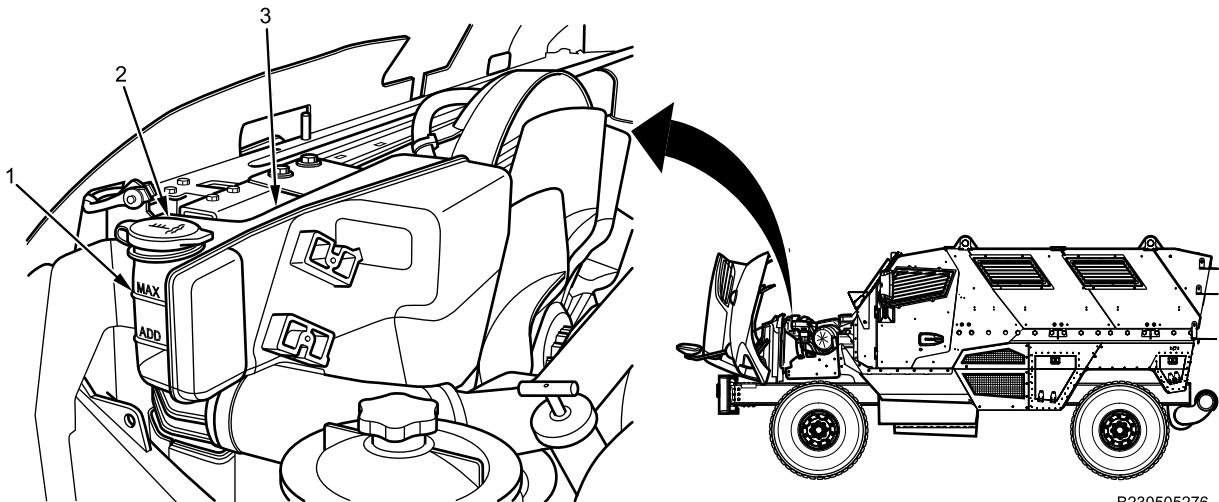
COOLING SYSTEM DRAIN AND FILL - (CONTINUED)



B230505498

Figure 19. Battery Door.

27. Flip access door lever (Figure 19, Item 2) to down position.
28. Fill surge overflow tank (Figure 20, Item 3) with 50/50 mixture of antifreeze/water until level is at MAX mark (Figure 20, Item 1) on tank.



B230505276

Figure 20. Radiator Coolant Surge Overflow Tank.

29. Close cap (Figure 20, Item 2) on surge overflow tank (Figure 20, Item 3).
30. Remove drain pan.

END OF TASK

COOLING SYSTEM DRAIN AND FILL - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and run to operating temperature (TM 9-2355-106-10).
3. Inspect for coolant leaks.
4. Verify correct gauge and temperature operation (TM 9-2355-106-10).
5. Verify correct heater operation (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Top off coolant surge overflow reservoir and deaeration tank.
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
RADIATOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Cap and plug set (WP 0795, Item 23)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Rag (WP 0794, Item 39)
Gloves (WP 0794, Item 18)
Gloves (WP 0794, Item 19)
Antifreeze (WP 0794, Item 5)
Locknut - (4) (WP 0796, Item 132)
O-ring - (2) (WP 0796, Item 105)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood removed (WP 0575)
Radiator drained (WP 0277)
Surge overflow tank removed (WP 0281)
Deaeration tank removed (WP 0279)
Radiator fan and fan shroud removed (WP 0282)
Charge Air Cooler (CAC) radiator assembly removed (WP 0263)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10

WARNING

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

Allow engine to cool for 15 minutes.

Wrap a thick cloth around cap to be removed.

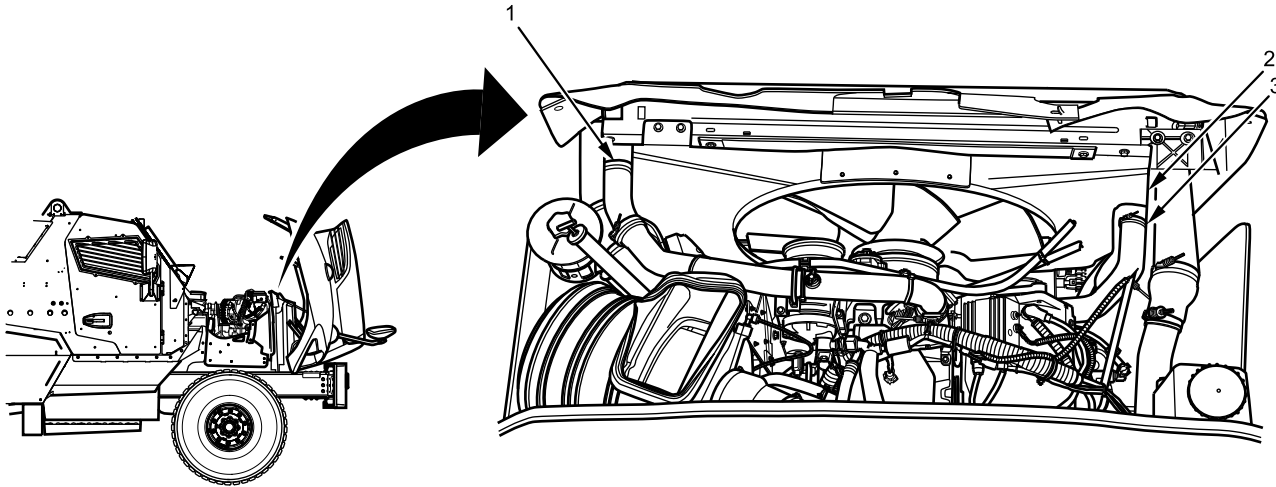
Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.

Continue to turn cap counterclockwise to remove.

Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect upper and lower radiator hoses (Figure 1, Item 1 and 3) from radiator (Figure 1, Item 2).



B230506035

Figure 1. Radiator Hose Connections.

WARNING

Use caution when working on warm transmission lines. Fluids may be hotter than the surface you are touching. Failure to comply may result in serious injury to personnel.

2. Place drain pan under transmission cooling lines (Figure 2, Item 4) at radiator (Figure 2, Item 1).

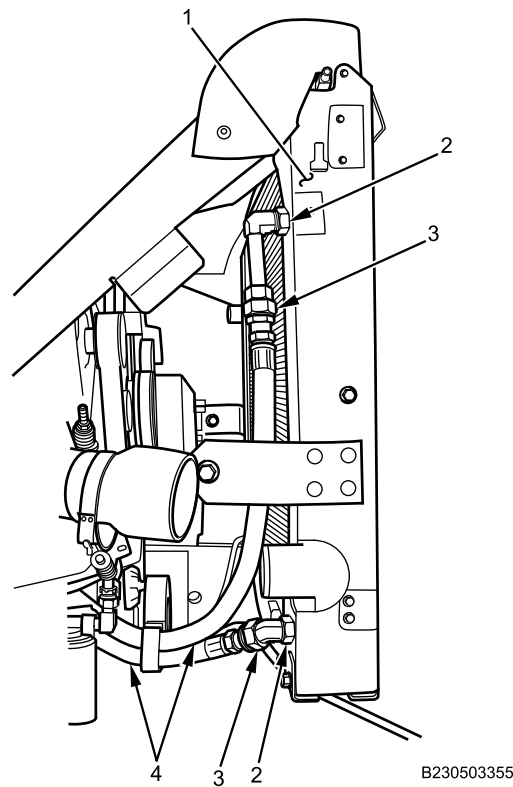
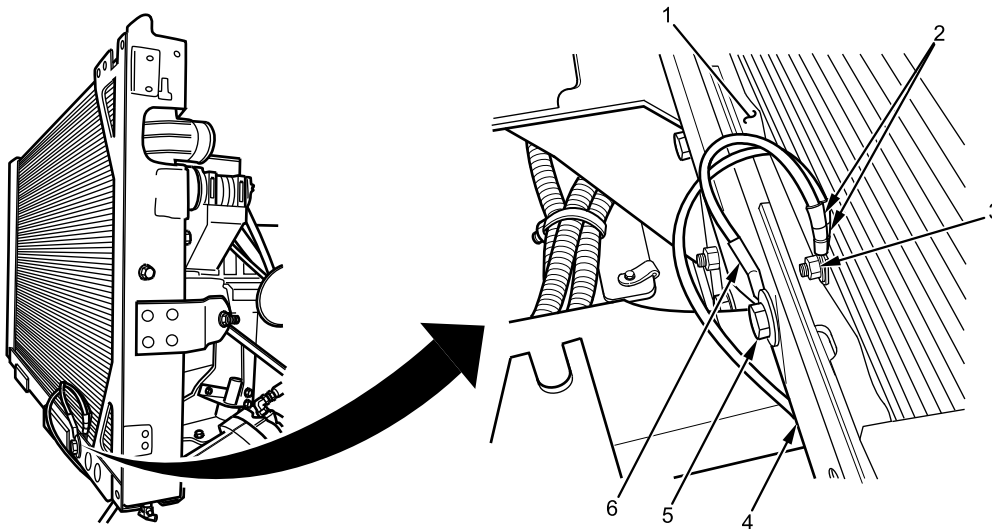
RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Transmission Cooling Lines at Radiator.

3. Clean any corrosion, rust, and contamination around transmission cooling line fittings (Figure 2, Item 2) and connectors (Figure 2, Item 2) with a rag.
4. Disconnect transmission cooling line connectors (Figure 2, Item 3) from transmission cooling line fittings (Figure 2, Item 2).
5. Remove O-rings from transmission cooling line connectors (Figure 2, Item 3). Discard O-rings.
6. Cap transmission cooling line connectors (Figure 2, Item 3) and set aside.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove nut (Figure 3, Item 3) and ground wire connectors (Figure 3, Item 2) from radiator (Figure 3, Item 1).



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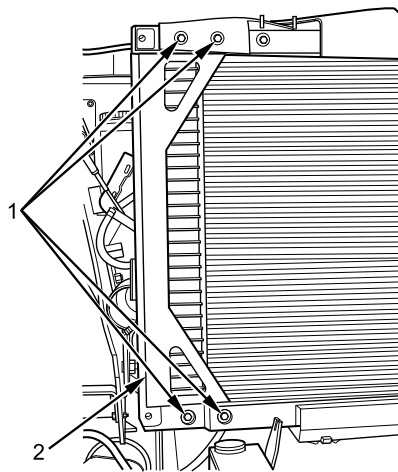
Figure 3. Radiator Ground Wire.

8. Remove bolt (Figure 3, Item 5) and ground wire connector (Figure 3, Item 6) from radiator support frame (Figure 3, Item 4).
9. Set ground wire connectors (Figure 3, Item 2 and 6) aside.

NOTE

Right side shown, left side similar.

10. Remove eight bolts (Figure 4, Item 1) from front side radiator supports (Figure 4, Item 2).



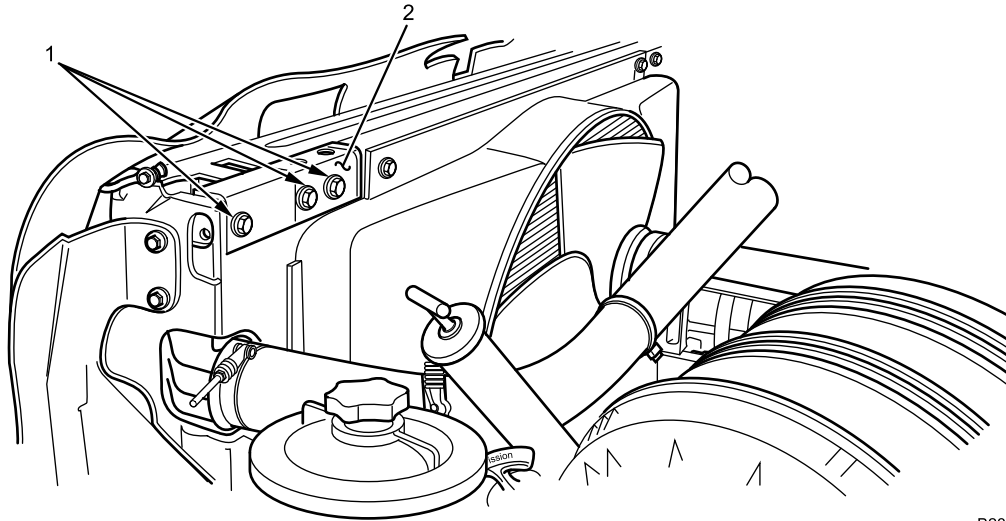
B230501411

Figure 4. Radiator Side Support.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

11. Remove six rear bolts (Figure 5, Item 1) and upper radiator support frame (Figure 5, Item 2).



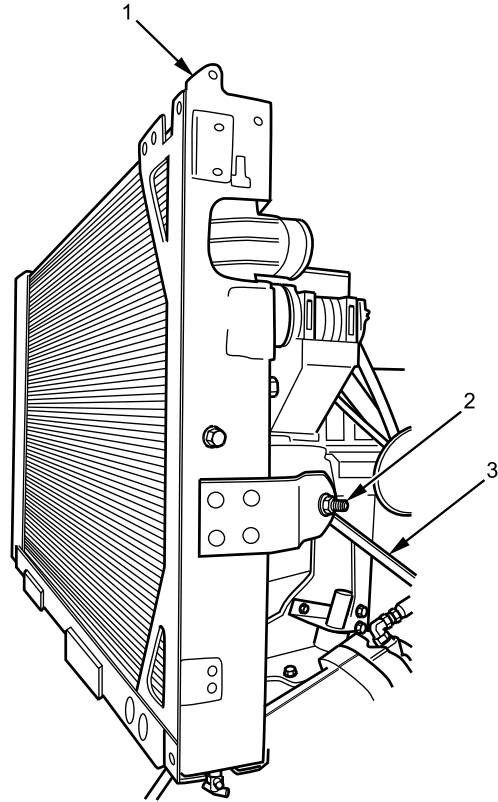
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Figure 5. Upper Left Rear Radiator Support Frame.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

12. Remove two bolts (Figure 6, Item 2), washers, and locknuts securing stay rods (Figure 6, Item 3) to side radiator supports (Figure 6, Item 1). Discard locknuts.



B230503502

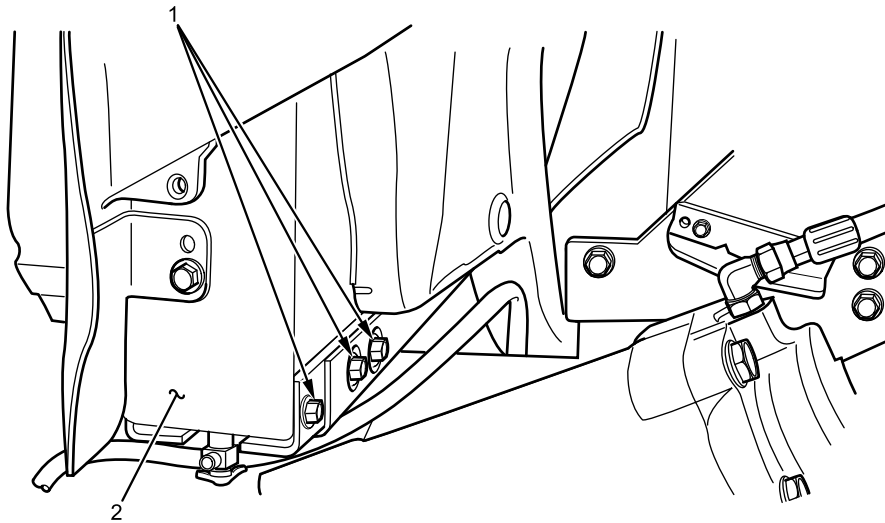
Figure 6. Radiator Stay Rods.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

Have assistant hold radiator in place while performing the following step:

13. Remove six rear bolts (Figure 7, Item 1) from lower side radiator support (Figure 7, Item 2).



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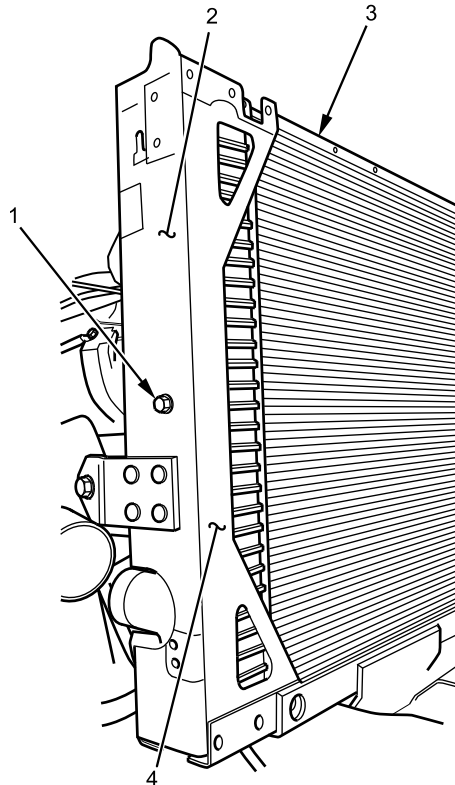
Figure 7. Lower Left Rear Radiator Support Frame.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Right side shown, left side similar.

Have assistant help with performing the following four steps:

14. Remove two side radiator support bolts (Figure 8, Item 1) from radiator (Figure 8, Item 3).



B230503356

Figure 8. Right Side Radiator.

15. Remove two front radiator support panels (Figure 8, Item 4) from radiator (Figure 8, Item 3).
16. Remove two side radiator support panels (Figure 8, Item 2) from radiator (Figure 8, Item 3).
17. Remove radiator (Figure 8, Item 3) from vehicle.

NOTE

Right side shown, left side similar.

18. Remove two lower bolts (Figure 9, Item 2), washers (Figure 9, Item 3), and locknuts (Figure 9, Item 5) from stay rods (Figure 9, Item 1) and brackets (Figure 9, Item 4). Discard locknuts.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

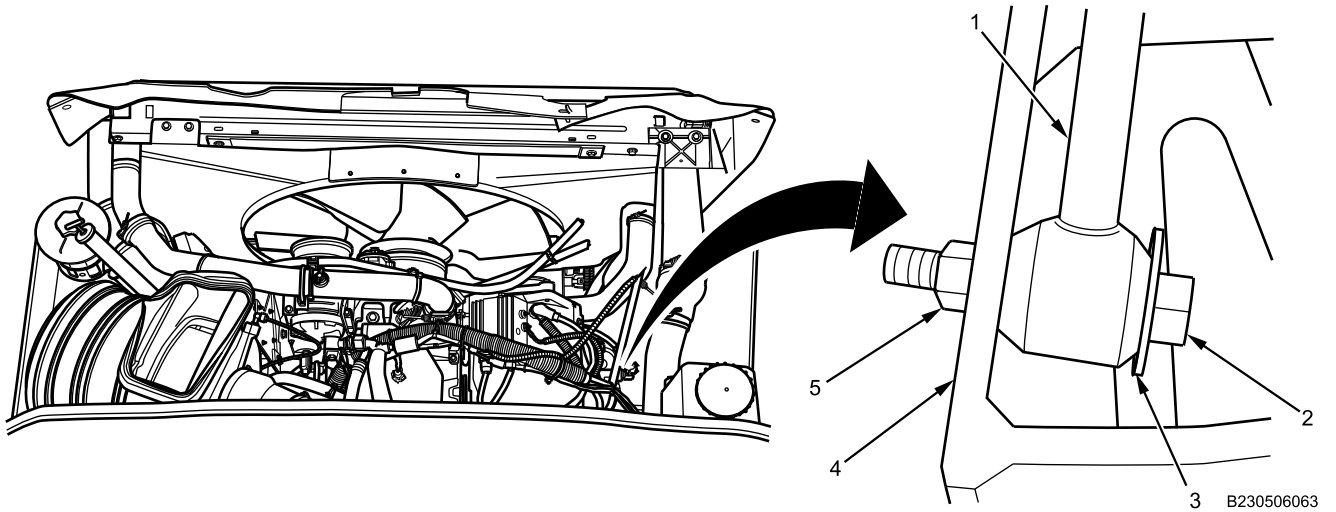
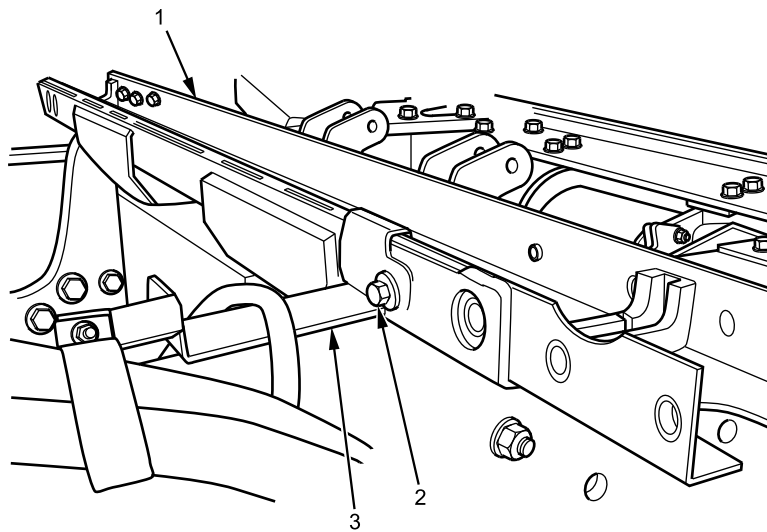


Figure 9. Lower Radiator Stay Rod End.

19. Remove stay rods (Figure 9, Item 1).
20. Remove bolt (Figure 10, Item 2), washer, and radiator hose support bracket (Figure 10, Item 3) from lower radiator support (Figure 10, Item 1).

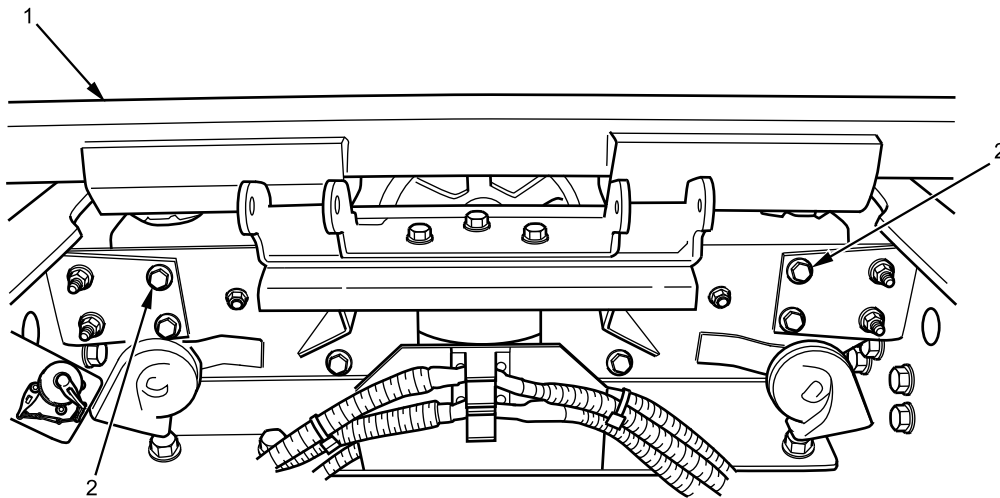


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Figure 10. Radiator Hose Support Bracket.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

21. Loosen two frame crossmember bracket bolts (Figure 11, Item 2) below radiator support (Figure 11, Item 1).



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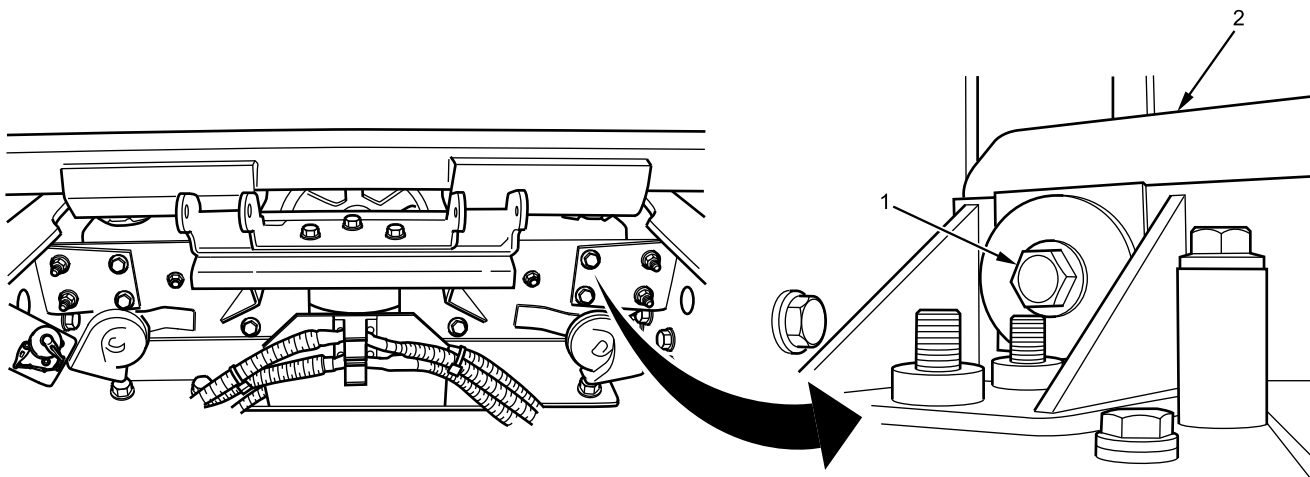
Figure 11. Frame Crossmember Bracket Bolts.

NOTE

Left side shown, right side similar.

Lower radiator support bolts are located under lower radiator support.

22. Remove two lower radiator support bolts (Figure 12, Item 1) and lower radiator support (Figure 12, Item 2) from frame.



B230506068

Figure 12. Lower Radiator Support Bolt.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

23. Remove upper and lower transmission cooling line fittings (Figure 13, Item 2 and 3) from radiator (Figure 13, Item 1).
24. Remove radiator drain valve (Figure 13, Item 4) from radiator (Figure 13, Item 1).

END OF TASK**INSTALLATION**

1. Install radiator drain valve (Figure 13, Item 4) on radiator (Figure 13, Item 1).

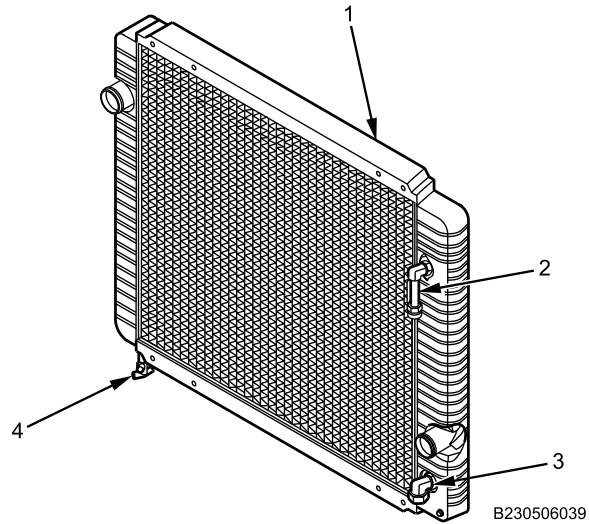
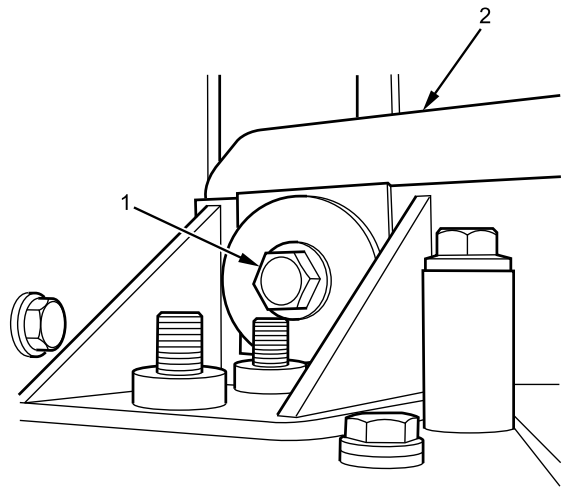


Figure 13. Transmission Cooling Line Fittings and Drain Valve.

2. Install upper and lower transmission cooling line fittings (Figure 13, Item 2 and 3) on radiator (Figure 13, Item 1).

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

3. Position lower radiator support (Figure 14, Item 2) to frame.



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Figure 14. Lower Radiator Support Bolt.

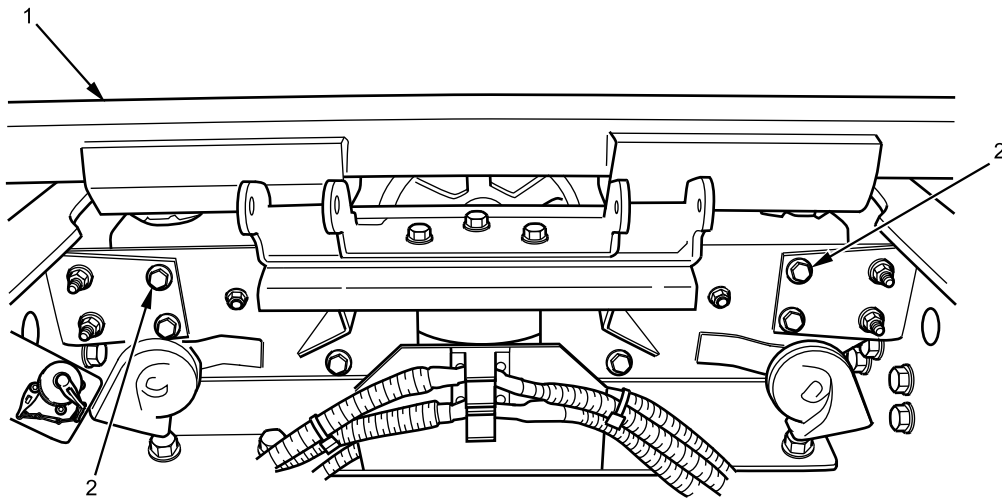
NOTE

Left side shown, right side similar.

4. Install two bolts (Figure 14, Item 1) under lower radiator support (Figure 14, Item 2). Left side shown, right side similar.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

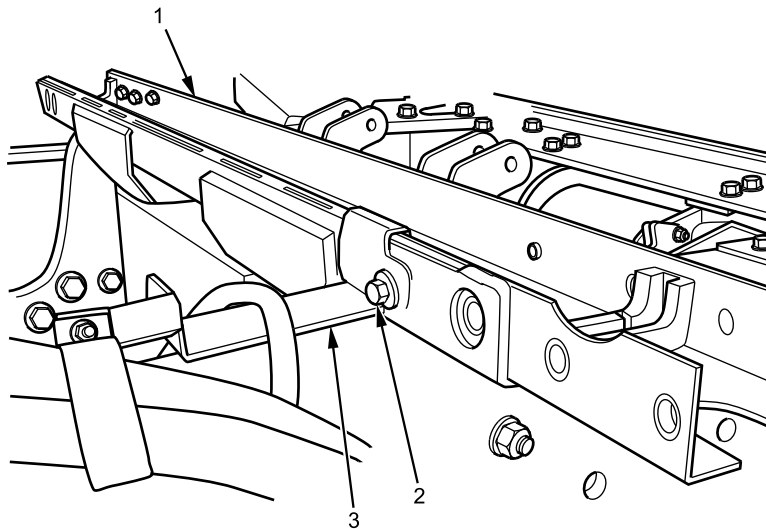
5. Tighten two frame crossmember bracket bolts (Figure 15, Item 2) below radiator support (Figure 15, Item 1).



B230503358

Figure 15. Frame Crossmember Bracket Bolts.

6. Install radiator hose support bracket (Figure 16, Item 3) to lower radiator support (Figure 16, Item 1) with bolt (Figure 16, Item 2) and washer.



B230503359

Figure 16. Radiator Hose Support Bracket.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

7. Install stay rods (Figure 17, Item 1) on brackets (Figure 17, Item 4) with stay rod bolts (Figure 17, Item 2), washers (Figure 17, Item 3), and new locknuts (Figure 17, Item 5). Finger-tighten bolts. Right side shown, left side similar.

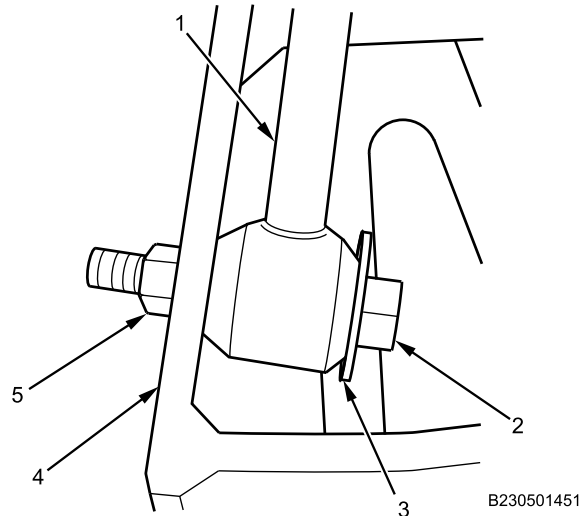


Figure 17. Radiator Stay Rod Lower End.

NOTE

Left side shown, right side similar.

Have assistant help with performing the following two steps:

8. Position side radiator supports (Figure 18, Item 3) to radiator while lowering radiator onto lower radiator support (Figure 18, Item 2).

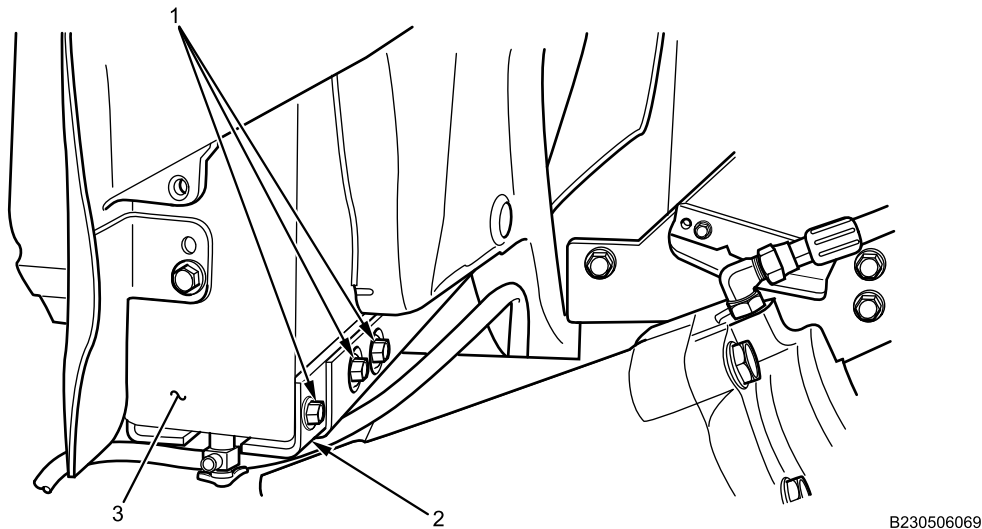


Figure 18. Lower Left Rear Radiator Support Frame.

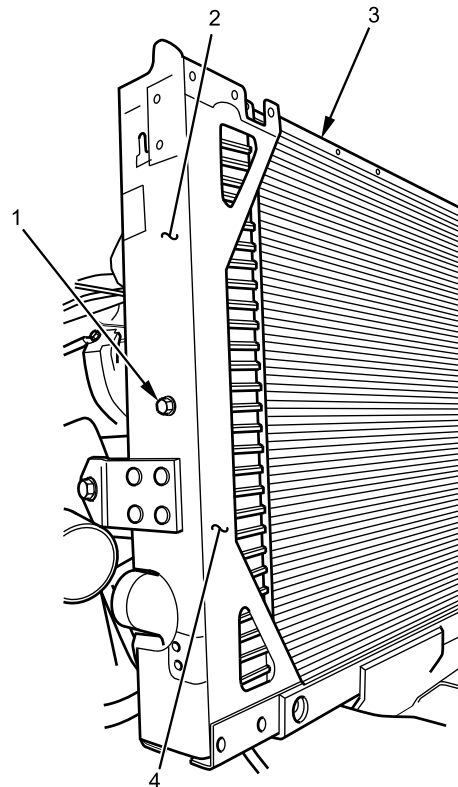
9. Install six rear bolts (Figure 18, Item 1) to side radiator support (Figure 18, Item 3). Tighten securely.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Right side shown, left side similar.

Have assistant help with performing the following two steps:

10. Position two side radiator support panels (Figure 19, Item 2) on radiator (Figure 19, Item 3).



B230503356

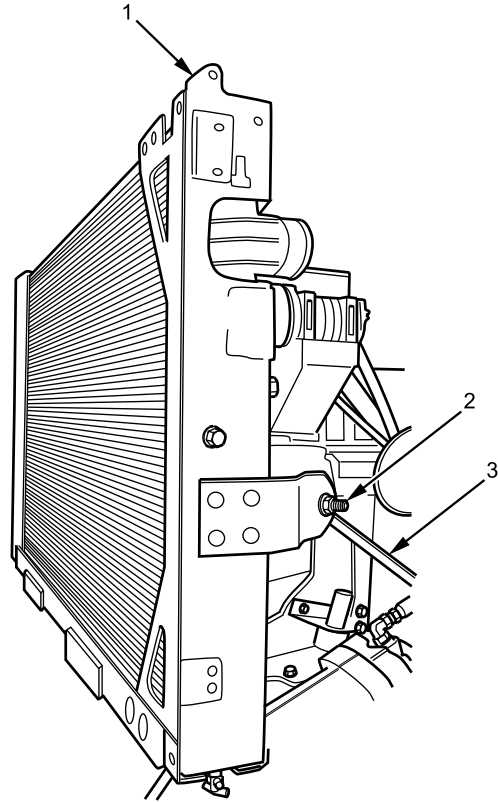
Figure 19. Right Side Radiator.

11. Install front radiator support panels (Figure 19, Item 4) on radiator (Figure 19, Item 3).
12. Install two side radiator support bolts (Figure 19, Item 1) on radiator (Figure 19, Item 3).

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

13. Install stay rods (Figure 20, Item 3) to side radiator supports (Figure 20, Item 1) with two bolts (Figure 20, Item 2), washers, and new locknuts. Tighten bolts (Figure 20, Item 2) and nuts securely.



B230503502

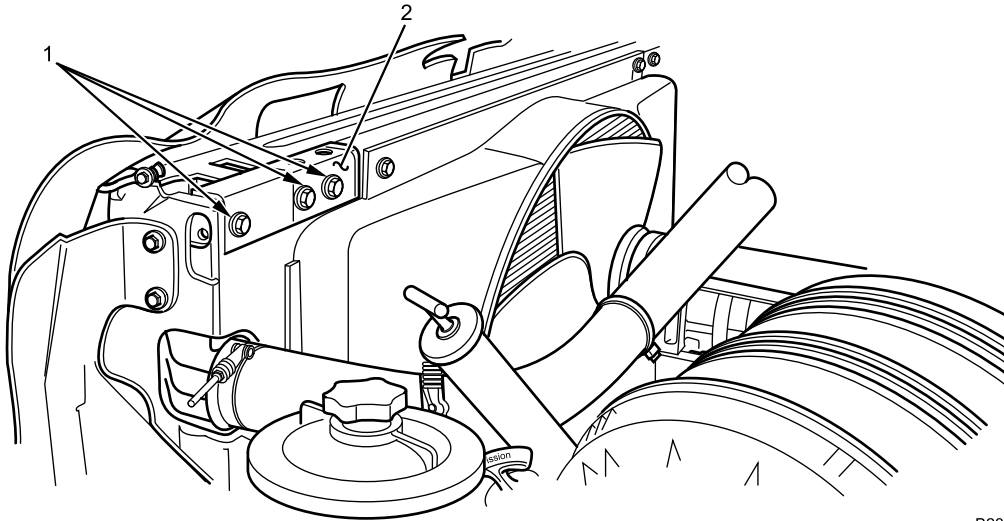
Figure 20. Radiator Stay Rods.

14. Tighten lower stay rod bolts securely.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

15. Install upper radiator support frame (Figure 21, Item 2) on radiator with six rear bolts (Figure 21, Item 1).



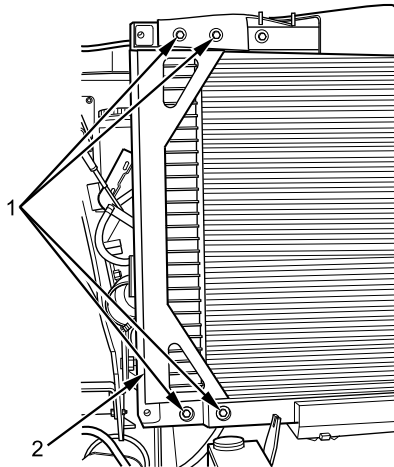
B230503432

Figure 21. Upper Left Rear Radiator Support Frame.

NOTE

Right side shown, left side similar.

16. Install eight bolts (Figure 22, Item 1) to front side radiator supports (Figure 22, Item 2).



B230501411

Figure 22. Side Radiator Support.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)

17. Install ground wire connector (Figure 23, Item 6) and bolt (Figure 23, Item 5) to radiator support frame (Figure 23, Item 4). Tighten securely.

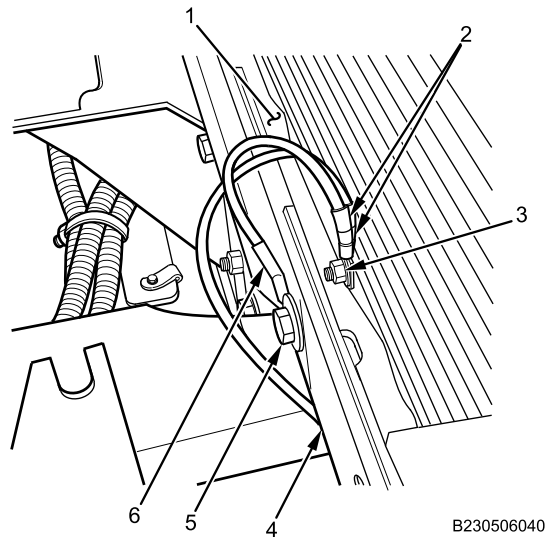


Figure 23. Radiator Ground Wire.

18. Install ground wire connectors (Figure 23, Item 2) and nut (Figure 23, Item 3) to radiator (Figure 23, Item 1). Tighten securely.
19. Lubricate new O-rings with clean transmission oil and install on transmission cooling line connectors (Figure 24, Item 3).

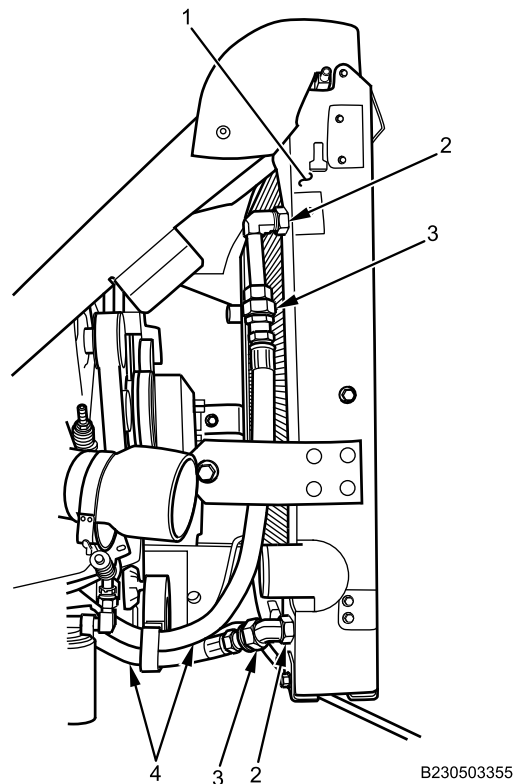
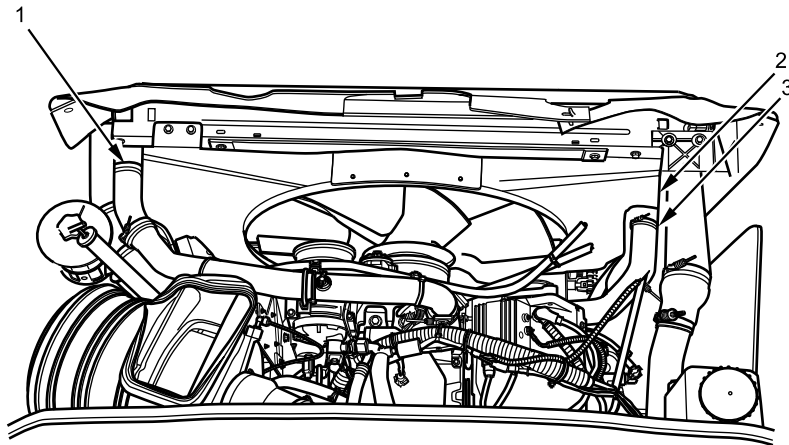


Figure 24. Transmission Cooling Lines at Radiator.

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**CAUTION**

Do not cross-thread or overtighten transmission cooling line connections when installing. Failure to comply may result in leaks.

20. Install transmission cooling line connectors (Figure 24, Item 3) on transmission cooling line fittings (Figure 24, Item 2) and tighten securely.
21. Clean any excess transmission fluid from radiator (Figure 24, Item 1) and transmission cooling lines (Figure 24, Item 4) with a rag.
22. Remove drain pan.
23. Connect upper and lower radiator hoses (Figure 25, Item 1 and 3) to radiator (Figure 25, Item 2).



B230506041

Figure 25. Radiator Hose Connections.

END OF TASK

RADIATOR REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install CAC assembly (WP 0263).
2. Install deaeration tank (WP 0279).
3. Install surge overflow tank (WP 0281).
4. Fill cooling system with 50/50 mixture of antifreeze/water (WP 0277).
5. Turn MAIN POWER switch on (TM 9-2355-106-10).
6. Start engine and run to operating temperature (TM 9-2355-106-10).
7. Inspect for coolant leaks (TM 9-2355-106-10).
8. Verify correct gauge and temperature operation (TM 9-2355-106-10).
9. Verify correct heater operation (TM 9-2355-106-10).
10. Verify correct transmission fluid level (TM 9-2355-106-10).
11. Turn engine off (TM 9-2355-106-10).
12. Turn MAIN POWER switch off (TM 9-2355-106-10).
13. Top off coolant surge overflow reservoir and deaeration tank (WP 0277).
14. Install, adjust, and close engine hood (WP 0575).
15. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**DEAERATION TANK REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 18)
Rag (WP 0794, Item 39)
Antifreeze (WP 0794, Item 5)
Clamp - (3) (WP 0796, Item 129)
Clamp (WP 0796, Item 130)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIL POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM
9-2355-106-10)
Cooling system drained (WP 0277)

References

TM 9-2355-106-10

DEAERATION TANK REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

DEAERATION TANK REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

Note and mark orientation of hoses during removal to aid in installation.

1. Place drain pan under deaeration tank (Figure 1, Item 4).

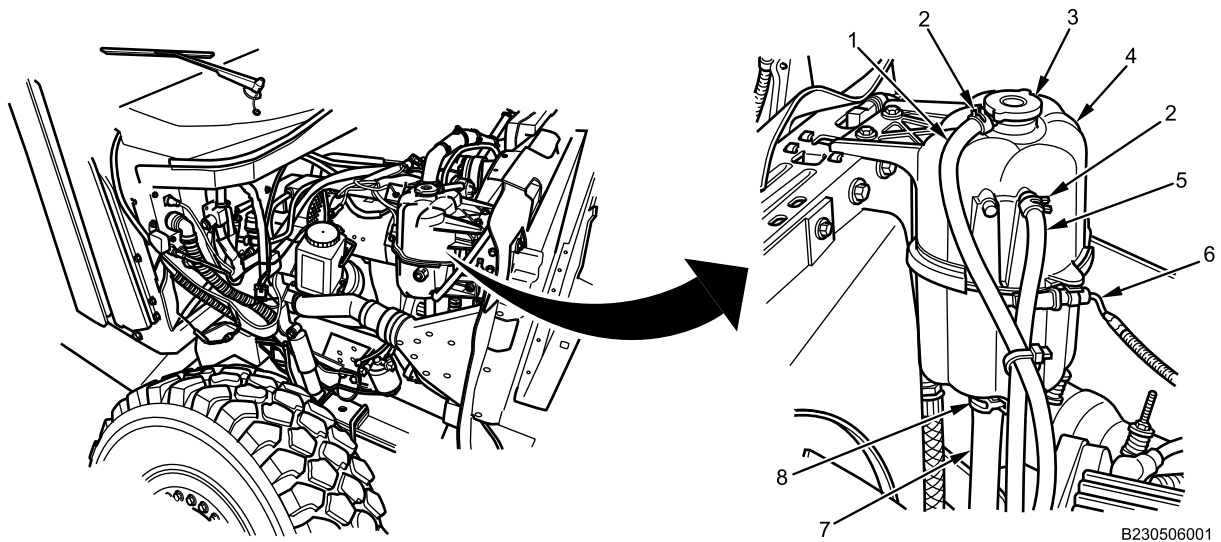


Figure 1. Left Side of Deaeration Tank.

2. Remove cap (Figure 1, Item 3) from deaeration tank (Figure 1, Item 4).
3. Disconnect electrical connector (Figure 1, Item 6) from deaeration tank (Figure 1, Item 4).
4. Loosen clamp (Figure 1, Item 8) and disconnect bottom hose (Figure 1, Item 7) from deaeration tank (Figure 1, Item 4). Discard clamp.
5. Loosen clamp (Figure 1, Item 2) and disconnect deaeration tank top hose (Figure 1, Item 1) from deaeration tank (Figure 1, Item 4). Discard clamp.
6. Loosen clamp (Figure 1, Item 2) and disconnect deaeration tank upper hose (Figure 1, Item 5) from deaeration tank (Figure 1, Item 4). Discard clamp.

DEAERATION TANK REMOVAL AND INSTALLATION - (CONTINUED)

7. Loosen clamp (Figure 2, Item 5) and disconnect deaeration tank lower hose (Figure 2, Item 4) from deaeration tank (Figure 2, Item 6). Discard clamp.

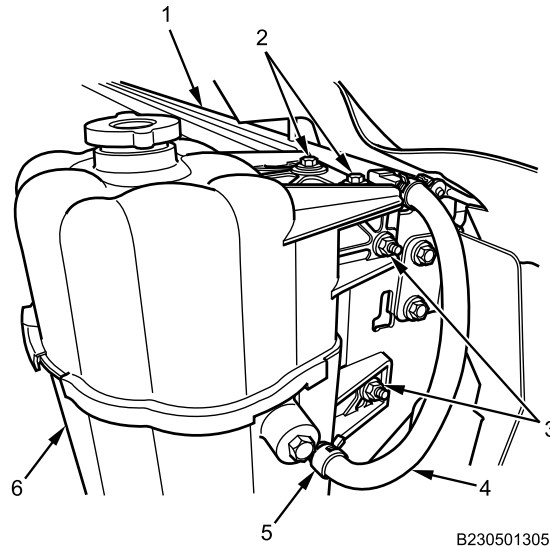


Figure 2. Right Side of Deaeration Tank.

8. Remove two side nuts (Figure 2, Item 3) fastening deaeration tank (Figure 2, Item 6) to radiator (Figure 2, Item 1).
9. Remove two top bolts (Figure 2, Item 2) fastening deaeration tank (Figure 2, Item 6) to radiator (Figure 2, Item 1).
10. Remove deaeration tank (Figure 2, Item 6) from radiator (Figure 2, Item 1).

END OF TASK**INSTALLATION**

1. Install deaeration tank (Figure 2, Item 7) over mounting studs (Figure 2, Item 3) on radiator frame (Figure 2, Item 1).
2. Install two top bolts (Figure 2, Item 2) fastening deaeration tank (Figure 2, Item 7) to radiator (Figure 2, Item 1) and tighten securely.
3. Install two side nuts (Figure 2, Item 4) fastening deaeration tank (Figure 2, Item 7) to radiator (Figure 2, Item 1) and tighten securely.
4. Install new clamp (Figure 2, Item 6) on lower hose (Figure 2, Item 5) and connect to deaeration tank (Figure 2, Item 7).
5. Install new clamp (Figure 3, Item 2) on upper hose (Figure 3, Item 1) and connect to deaeration tank (Figure 3, Item 4).

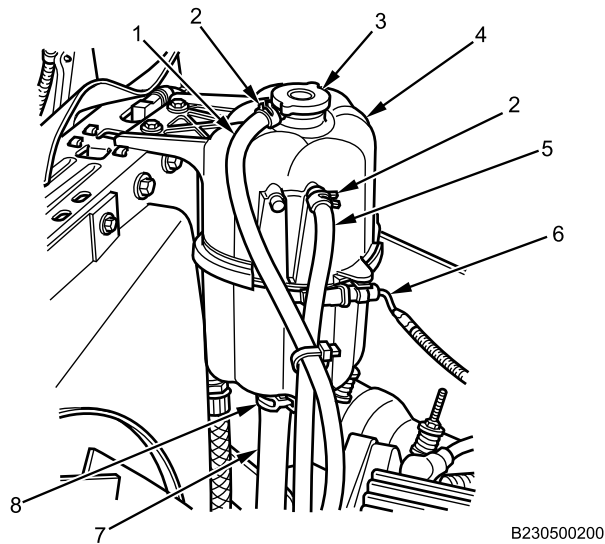
DEAERATION TANK REMOVAL AND INSTALLATION - (CONTINUED)

Figure 3. Left Side of Deaeration Tank.

6. Install new clamp (Figure 3, Item 2) on top hose (Figure 3, Item 5) and connect to deaeration tank (Figure 3, Item 4).
7. Install new clamp (Figure 3, Item 8) on bottom hose (Figure 3, Item 7) and connect to deaeration tank (Figure 3, Item 4).
8. Connect electrical connector (Figure 3, Item 6) to deaeration tank (Figure 3, Item 4).
9. Install cap (Figure 3, Item 3) on deaeration tank (Figure 3, Item 4).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Fill cooling system with 50/50 mixture of antifreeze/coolant (WP 0277).
2. Turn MAIL POWER switch on (TM 9-2355-106-10).
3. Start engine and run to operating temperature (TM 9-2355-106-10).
4. Inspect for coolant leaks.
5. Verify correct gauge and temperature operation (TM 9-2355-106-10).
6. Verify correct heater operation (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIL POWER switch off (TM 9-2355-106-10).
9. Top off coolant overflow surge reservoir and deaeration tank (WP 0277).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
DEAERATION TANK PRESSURE CAP REMOVAL AND INSTALLATION

INITIAL SETUP:**Materials/Parts**

Goggles, industrial (WP 0794, Item 20)
 Gloves (WP 0794, Item 18)
 Rag (WP 0794, Item 39)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

Engine cooled (TM 9-2355-106-10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

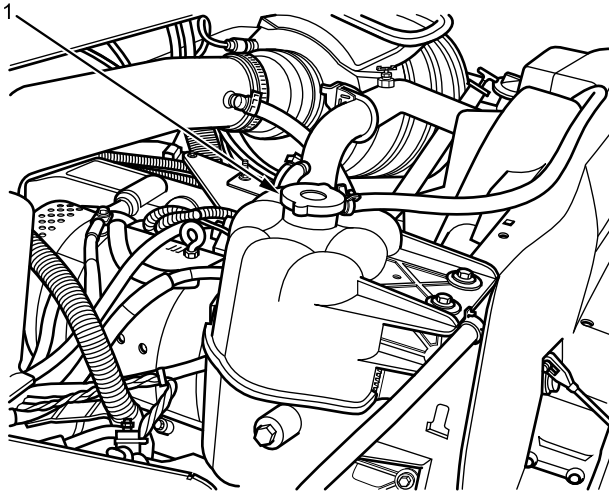
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

DEAERATION TANK PRESSURE CAP REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Wrap a rag around deaeration tank pressure cap (Figure 1, Item 1).



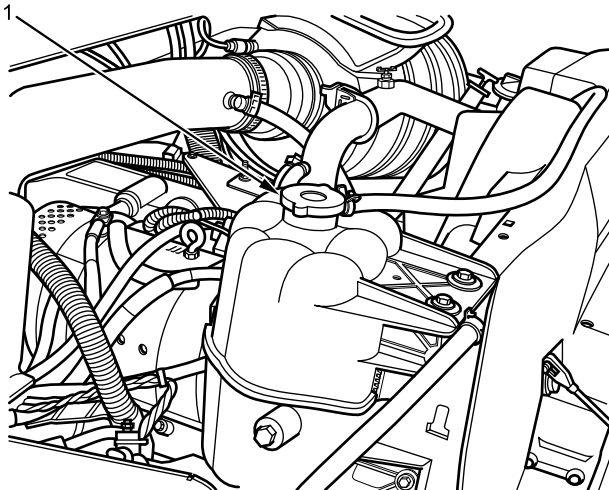
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Figure 1. Right Side of Deaeration Tank.

2. Push tank pressure cap (Figure 1, Item 1) down, then turn cap slowly counterclockwise to its first notch position.
3. Pause to allow pressure to escape.
4. Continue to push down and turn tank pressure cap (Figure 1, Item 1) counterclockwise to remove.

END OF TASK**INSTALLATION**

1. Place tank pressure cap (Figure 2, Item 1) on deaeration tank.



B230500184

Figure 2. Right Side of Deaeration Tank.

2. Push down and turn tank pressure cap (Figure 2, Item 1) clockwise to first notch position.
3. Continue to push down and turn tank pressure cap (Figure 2, Item 1) clockwise to fully tighten.

END OF TASK

DEAERATION TANK PRESSURE CAP REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine and run to operating temperature (TM 9-2355-106-10).
3. Inspect for coolant leaks (TM 9-2355-106-10).
4. Verify correct gauge and temperature operation (TM 9-2355-106-10).
5. Verify correct heater operation (TM 9-2355-106-10).
6. Shut engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Top off coolant surge overflow reservoir and deaeration tank (WP 0277).
9. Clean up spills and dispose of rags.
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**RADIATOR SURGE OVERFLOW TANK REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)
Antifreeze (WP 0794, Item 5)
Clamp (WP 0796, Item 129)
Locknut (WP 0796, Item 170)
Rags (WP 0794, Item 39)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM
9-2355-106-10)

ReferencesTM 9-2355-106-10

RADIATOR SURGE OVERFLOW TANK REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

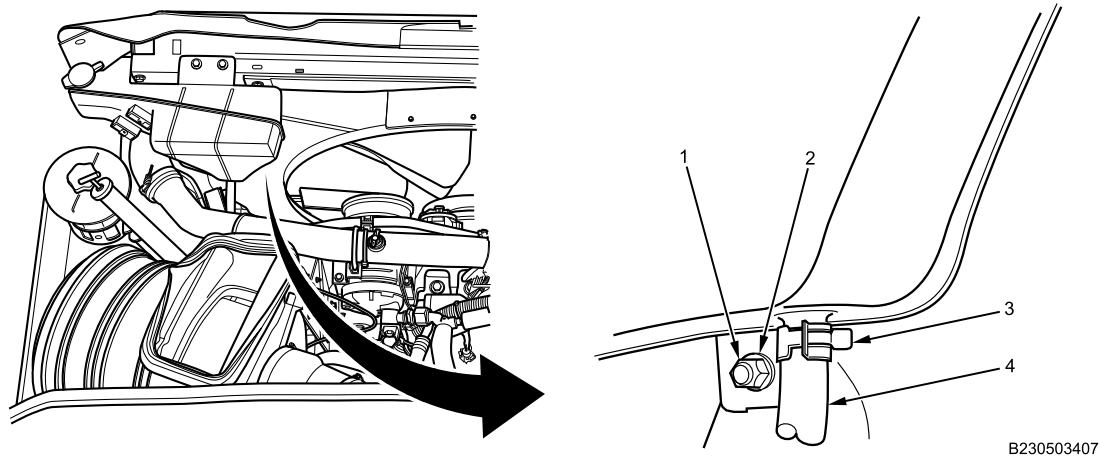
- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove locknut (Figure 1, Item 1) and washer (Figure 1, Item 2) securing bottom of surge overflow tank to radiator. Discard locknut.

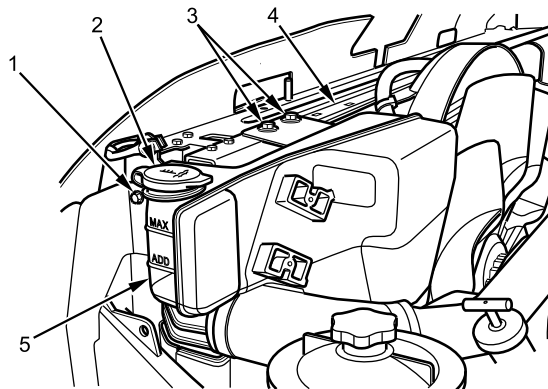
RADIATOR SURGE OVERFLOW TANK REMOVAL AND INSTALLATION - (CONTINUED)



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Figure 1. Bottom of Surge Overflow Tank.

2. Remove two bolts (Figure 2, Item 3) securing surge overflow tank (Figure 2, Item 5) to radiator (Figure 2, Item 4).



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Figure 2. Upper Surge Overflow Tank.

3. Remove bolt (Figure 2, Item 1) securing left side of surge overflow tank (Figure 2, Item 5) to radiator (Figure 2, Item 4).
4. Separate surge overflow tank (Figure 2, Item 5) from radiator (Figure 2, Item 4).
5. Open cap (Figure 2, Item 2) and pour coolant into drain pan.
6. Remove clamp (Figure 1, Item 3) and disconnect hose (Figure 1, Item 4) from bottom of surge overflow tank.

END OF TASK

RADIATOR SURGE OVERFLOW TANK REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Connect hose (Figure 3, Item 4) to bottom of surge overflow tank and install new clamp (Figure 3, Item 3) on hose end.

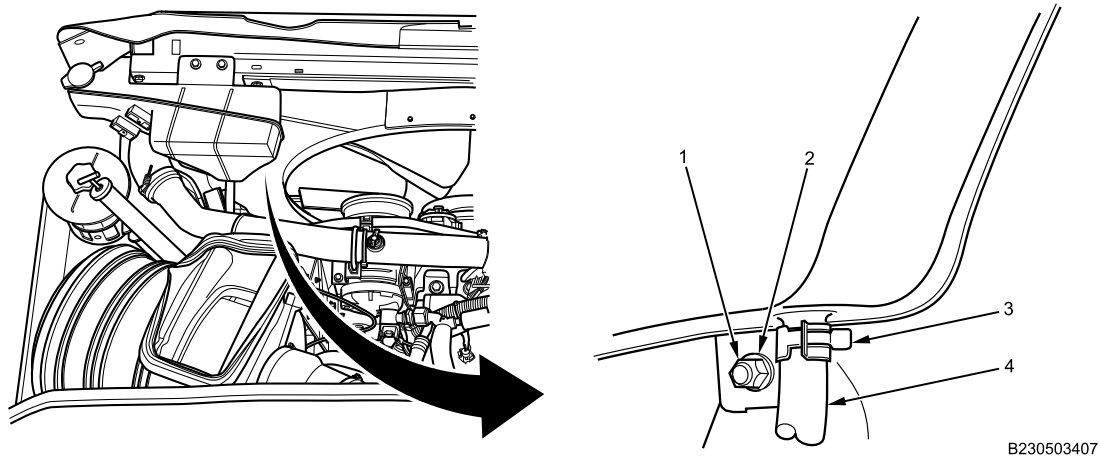


Figure 3. Bottom of Surge Overflow Tank.

2. Position surge overflow tank to radiator and install washer (Figure 3, Item 2) and new locknut (Figure 3, Item 1). Tighten nut securely.
3. Install two bolts (Figure 4, Item 3) from upper surge overflow tank (Figure 4, Item 5) to radiator (Figure 4, Item 4). Tighten bolts securely.

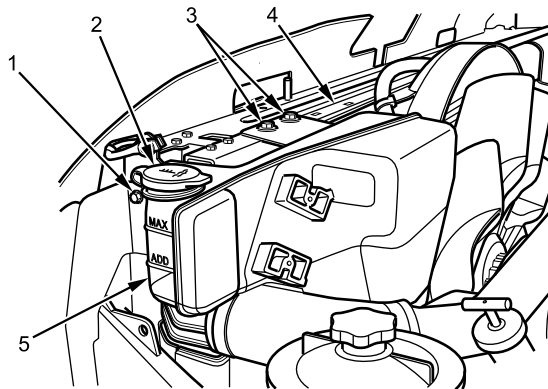


Figure 4. Upper Surge Overflow Tank.

4. Install bolt (Figure 4, Item 1) securing left side of surge overflow tank (Figure 4, Item 5) to radiator (Figure 4, Item 4).
5. Open cap (Figure 4, Item 2) on surge overflow tank (Figure 4, Item 5).
6. Fill surge overflow tank with 50/50 mixture of antifreeze/water until level is at MAX mark on tank.
7. Close cap (Figure 4, Item 1) on surge overflow tank.

END OF TASK

RADIATOR SURGE OVERFLOW TANK REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Inspect for coolant leaks.
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

RADIATOR FAN AND FAN SHROUD REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Antifreeze (WP 0794, Item 5)
Compound (WP 0794, Item 13)
Lockwasher - (6) (WP 0796, Item 24)
Gloves (WP 0794, Item 18)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM 9-2355-106-10)
Engine cooled
Deaeration tank removed (WP 0279)
Surge overflow tank removed (WP 0281)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING



Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

RADIATOR FAN AND FAN SHROUD REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove two bolts (Figure 1, Item 2) securing sides of fan shroud. Right side shown; left side similar.

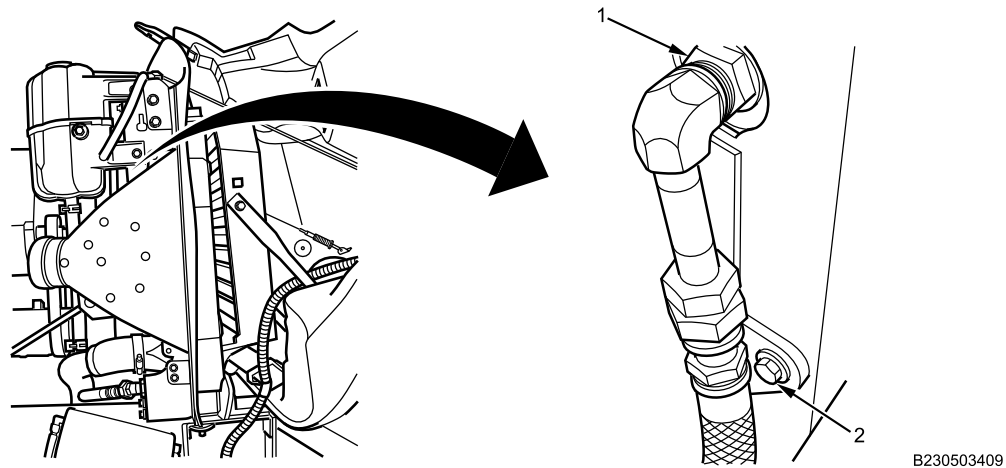


Figure 1. Right Fan Shroud Bolt.

NOTE

Do not completely remove transmission oil cooler fitting from radiator.

2. Loosen upper transmission oil cooler fitting jamnut (Figure 1, Item 1) and turn fitting aside to allow clearance for shroud removal.
3. Remove two bolts (Figure 2, Item 1) securing top of fan shroud (Figure 2, Item 2) and place shroud over cooling fan (Figure 2, Item 3) assembly.

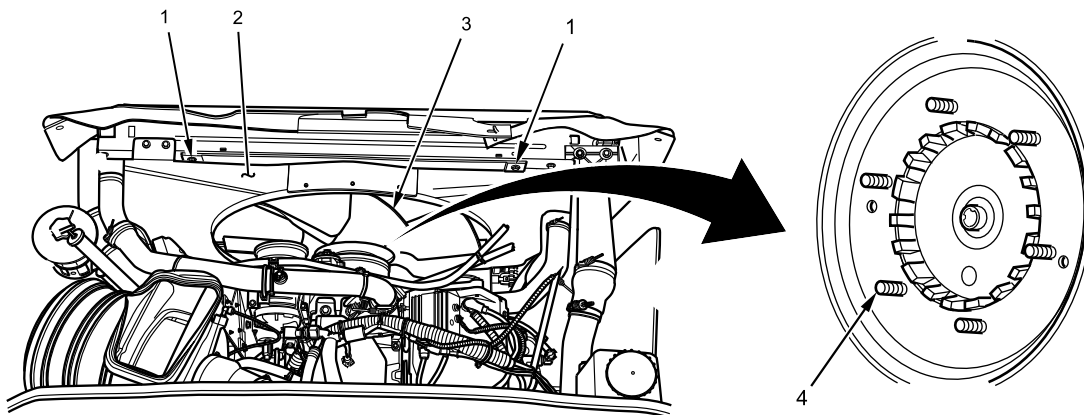


Figure 2. View of Engine Compartment from Above.

4. Remove six nuts, lockwashers, and flat washers from studs (Figure 2, Item 4) securing fan (Figure 2, Item 3). Discard lockwashers.
5. Remove fan (Figure 2, Item 3) and shroud (Figure 2, Item 2) together.

END OF TASK

RADIATOR FAN AND FAN SHROUD REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

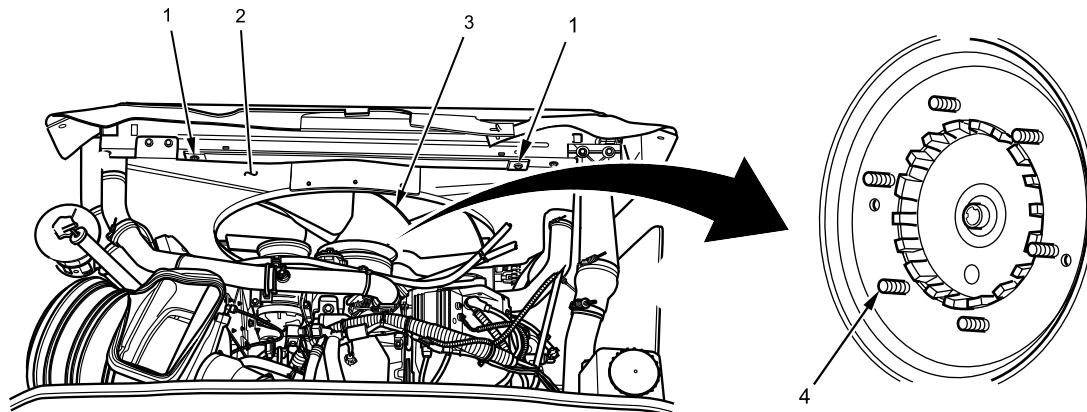
Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to all bolts.
2. Place fan shroud and fan into position.

CAUTION

All nuts and bolts should be finger-tightened when first installed to allow proper alignment of parts. Failure to comply may result in damage to equipment.

3. Position fan (Figure 3, Item 3) on studs (Figure 3, Item 4).



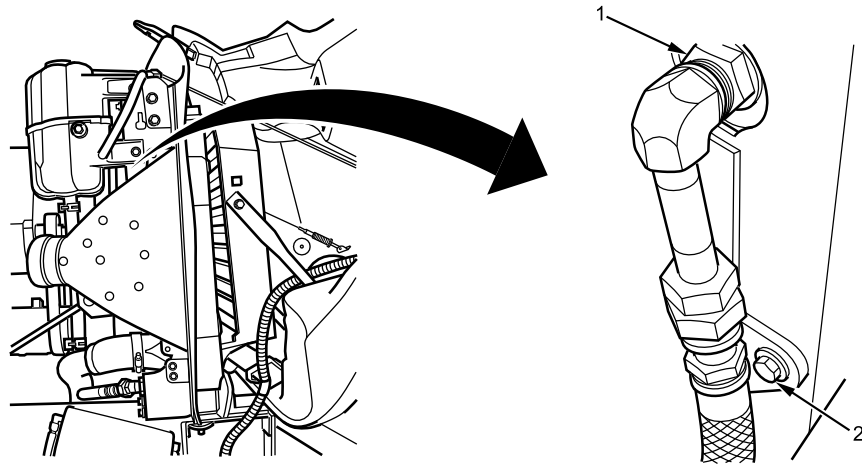
B230510338

Figure 3. View of Engine Compartment from Above.

4. Install six nuts, new lockwashers, and flat washers on studs (Figure 3, Item 4) securing fan (Figure 3, Item 3), and tighten finger-tight.
5. Tighten nuts securely.
6. Position fan shroud (Figure 3, Item 2) against radiator and install two bolts (Figure 3, Item 1) securing top of fan shroud and tighten finger-tight.

RADIATOR FAN AND FAN SHROUD REMOVAL AND INSTALLATION - (CONTINUED)

7. Install two bolts (Figure 4, Item 2) securing sides of fan shroud and tighten finger-tight. Right side shown; left side similar.



B230503409

Figure 4. Right Fan Shroud Bolt.

8. Tighten all fan shroud bolts securely.
 9. Return transmission oil cooler fitting to original position and tighten jam nut (Figure 4, Item 1) securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install surge overflow tank (WP 0281).
2. Install deaeration tank (WP 0279).
3. Verify correct alignment of fan shroud and fan.
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine (TM 9-2355-106-10).
6. Verify operation and clearance of fan shroud and fan.
7. Check for coolant leaks.
8. Check coolant level.
9. Turn engine off (TM 9-2355-106-10).
10. Turn MAIN POWER switch off (TM 9-2355-106-10).
11. Close engine hood (TM 9-2355-106-10).
12. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

THERMOSTAT REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Torque wrench (20-100 lb-ft) (WP 0795, Item 141)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Cable lock strap - (as needed) (WP 0796, Item 124)
O-ring (WP 0796, Item 94)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 18)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Cooling system drained (WP 0277)

References

TM 9-2355-106-10

WARNING



Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

THERMOSTAT REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove two nuts (Figure 1, Item 3) and U-bolt (Figure 1, Item 1) from upper radiator pipe (Figure 1, Item 2).

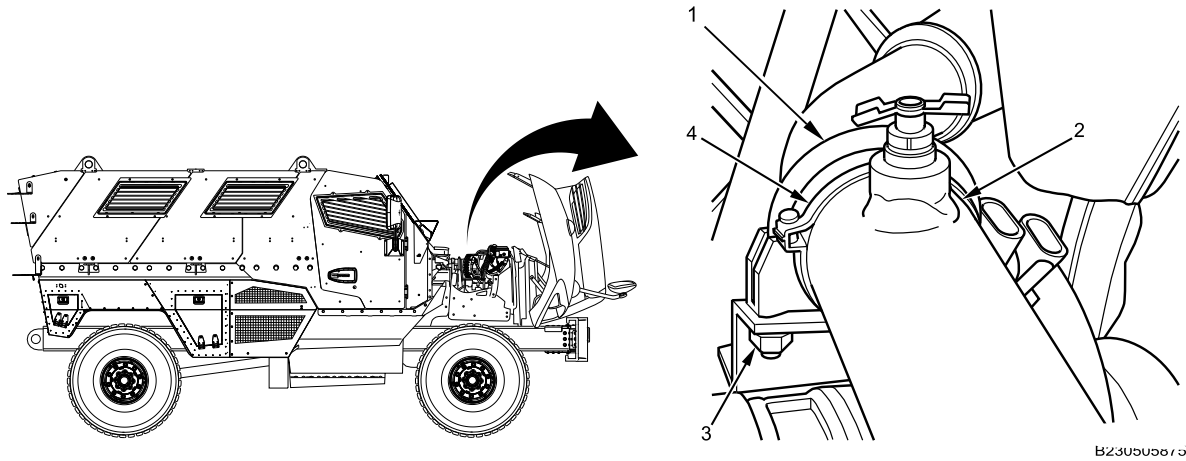


Figure 1. Inlet Radiator Pipe Bracket.

2. Remove and discard cable lock straps (Figure 1, Item 4) as necessary.
3. Loosen radiator hose clamp nut (Figure 2, Item 4).

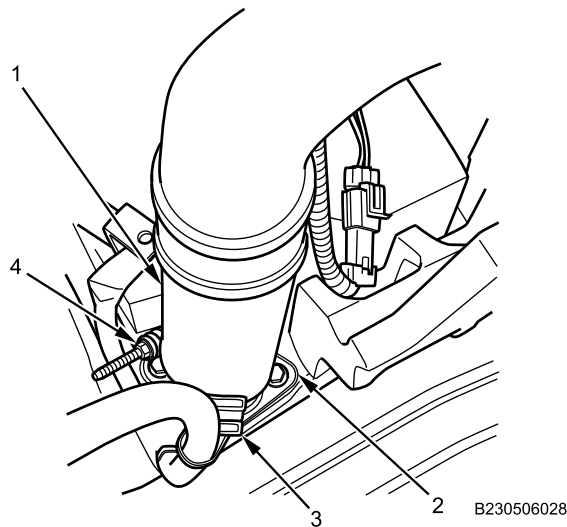
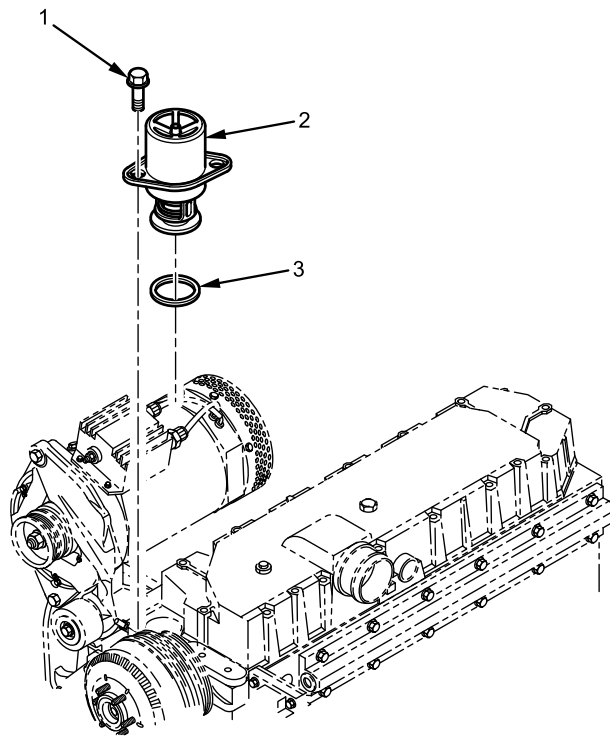


Figure 2. Thermostat and Inlet Radiator Pipe.

4. Remove and discard cable lock straps (Figure 2, Item 3) as required.
5. Separate radiator hose (Figure 2, Item 1) from thermostat assembly (Figure 2, Item 2).
6. Remove two bolts (Figure 3, Item 1) from thermostat assembly (Figure 3, Item 2).

THERMOSTAT REMOVAL AND INSTALLATION - (CONTINUED)

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Figure 3. Thermostat Assembly Removal.

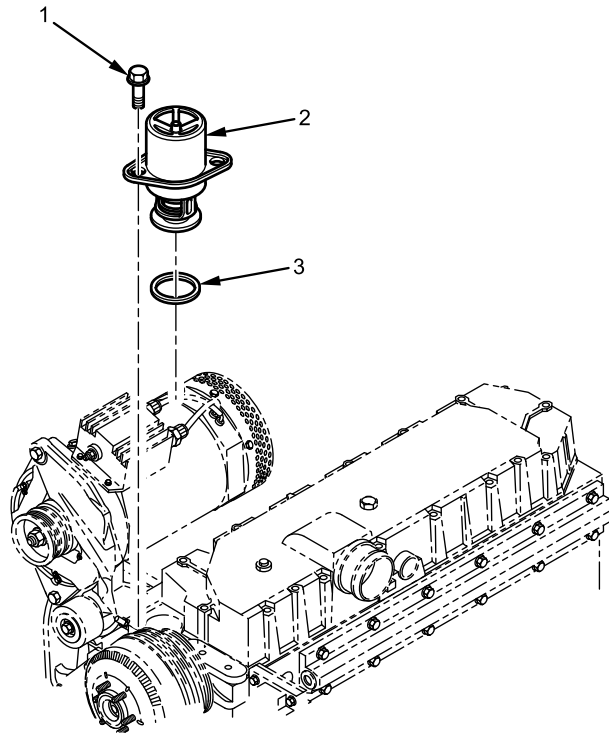
7. Remove thermostat assembly (Figure 3, Item 2) from engine.
8. Remove O-ring (Figure 3, Item 3) from thermostat assembly (Figure 3, Item 2). Discard O-ring.

END OF TASK

THERMOSTAT REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

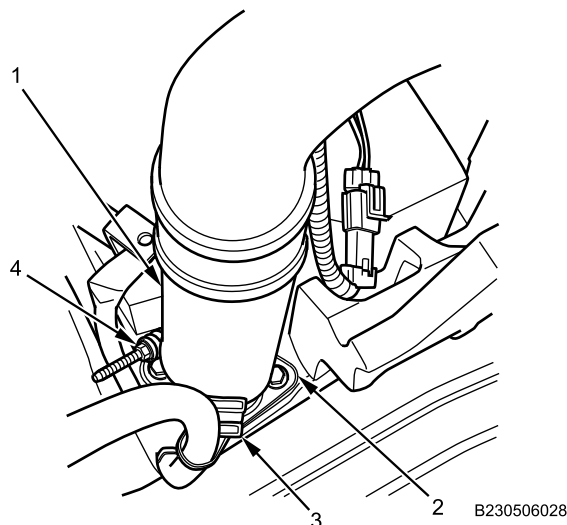
1. Install new O-ring (Figure 4, Item 3) on thermostat (Figure 4, Item 2).



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Figure 4. Thermostat Assembly Installation.

2. Install thermostat assembly (Figure 4, Item 2) on engine with two bolts (Figure 4, Item 1). Torque bolts to 23 lb-ft (31 N•m).
3. Install radiator hose (Figure 5, Item 1) on thermostat assembly (Figure 5, Item 2) and tighten clamp nut (Figure 5, Item 4) securely.



B230506028

Figure 5. Thermostat and Inlet Radiator Pipe.

THERMOSTAT REMOVAL AND INSTALLATION - (CONTINUED)

4. Install new cable lock straps (Figure 5, Item 3) as necessary.
5. Install upper radiator pipe (Figure 6, Item 2) on A/C compressor bracket with U-bolt (Figure 6, Item 1) and two nuts (Figure 6, Item 3). Tighten nuts securely.

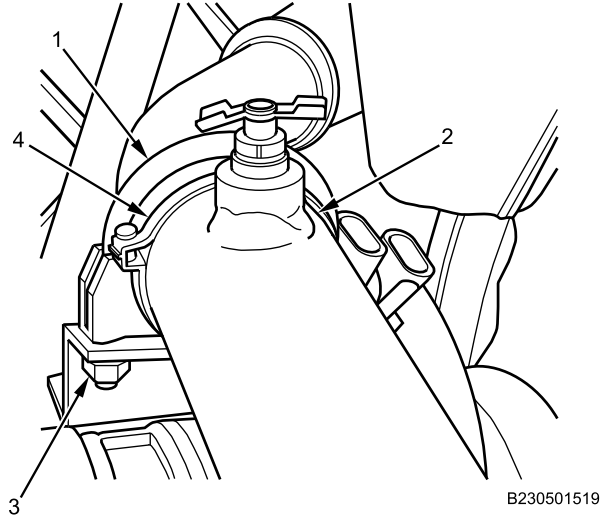


Figure 6. Inlet Radiator Pipe Bracket.

6. Install new cable lock straps (Figure 6, Item 4) where removed.

END OF TASK

THERMOSTAT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Fill cooling system (WP 0277).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Check for coolant leaks (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Close engine hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**WATER INLET ELBOW REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Faceshield, industrial (WP 0794, Item 16)
Goggles, industrial (WP 0794, Item 20)
Antifreeze (WP 0794, Item 5)
Compound (WP 0794, Item 13)
Rags (WP 0794, Item 39)
Gasket - (1) (WP 0796, Item 42)
Gloves (WP 0794, Item 18)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Belly armor removed (WP 0606)

ReferencesTM 9-2355-106-10

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Engine fluids (oil, fuel, and coolant) may be hazardous to human health and the environment. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids, filters, and other contaminated materials in accordance with standard operating procedures. Failure to comply may result in environmental damage and injury to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

Allow engine to cool for 15 minutes.

Wrap a thick cloth around cap to be removed.

Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.

Continue to turn cap counterclockwise to remove.

Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Water inlet elbow is located at bottom right front of engine.

1. Place drain pan under inlet hose lower elbow (Figure 1, Item 1).

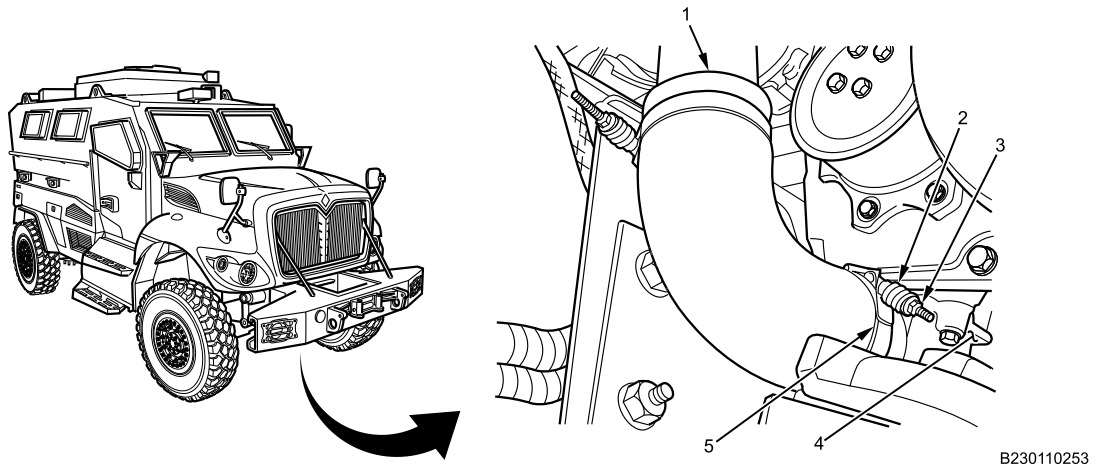


Figure 1. Inlet Hose Lower Elbow Removal.

2. Remove nut (Figure 1, Item 3) and spring (Figure 1, Item 2) from hose clamp (Figure 1, Item 5).
3. Remove inlet hose lower elbow (Figure 1, Item 1) from water inlet elbow (Figure 1, Item 4) and let drain into drain pan.
4. Remove three bolts (Figure 2, Item 2) attaching water inlet elbow (Figure 2, Item 1) to engine (Figure 2, Item 3).

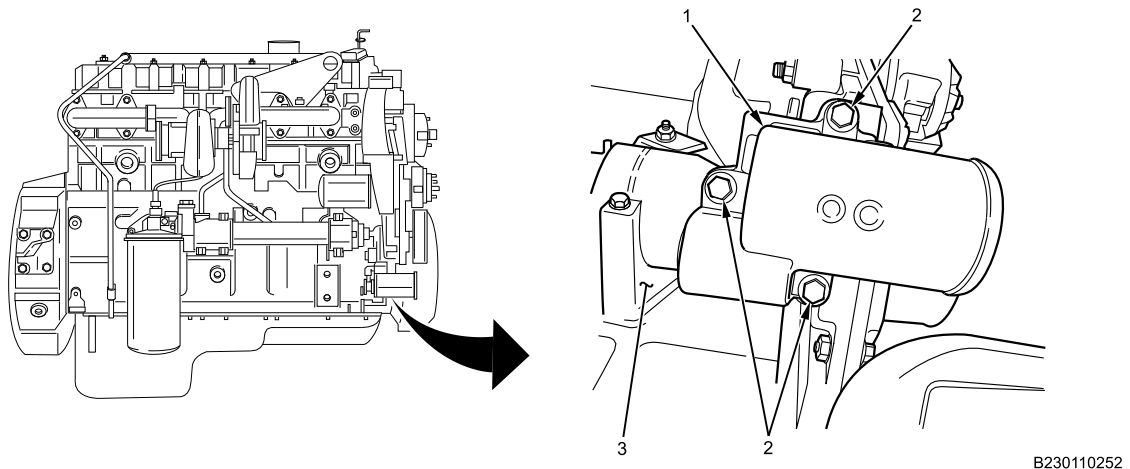
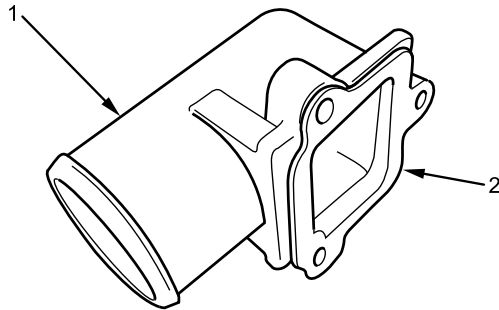


Figure 2. Water Inlet Elbow Removal.

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove water inlet elbow (Figure 2, Item 1) from vehicle.
6. Remove and discard gasket (Figure 3, Item 2) from water inlet elbow (Figure 3, Item 1).

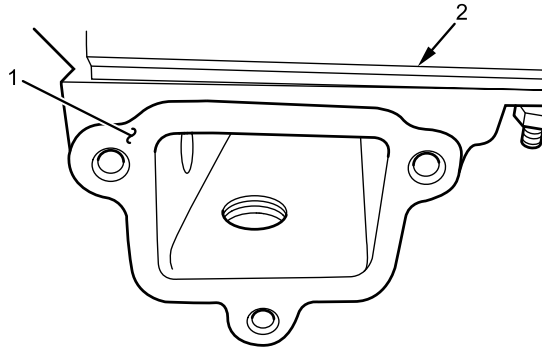


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Figure 3. Water Inlet Elbow Gasket.

END OF TASK**INSTALLATION**

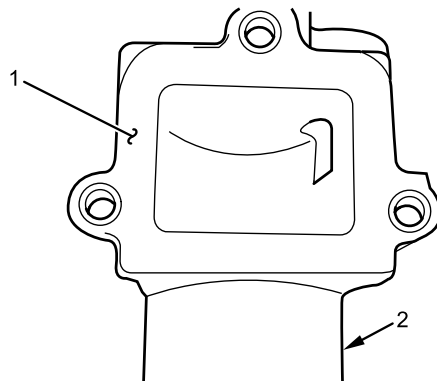
1. Scrape any remaining gasket residue from mating surface area (Figure 4, Item 1) on engine (Figure 4, Item 2), and clean with dry rag.



B230103745

Figure 4. Water Inlet Elbow Engine Mount.

2. Using dry rag, clean mating surface area (Figure 5, Item 1) on water inlet elbow (Figure 5, Item 2).



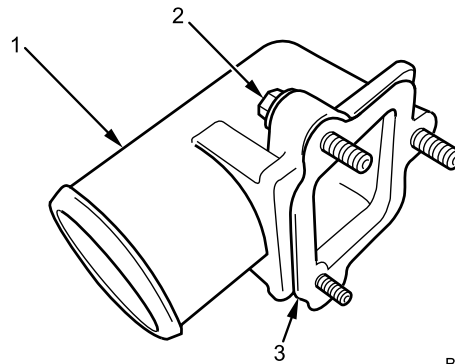
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Figure 5. Water Inlet Elbow.

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

3. Install new gasket (Figure 6, Item 3) on water inlet elbow (Figure 6, Item 1).



B230104005

Figure 6. Water Inlet Elbow Gasket Installation.

4. Apply corrosion preventive compound to three water inlet elbow mounting bolts (Figure 6, Item 2).

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)

5. Install water inlet elbow (Figure 7, Item 1) on engine (Figure 7, Item 3) with three bolts (Figure 7, Item 2) and tighten securely.

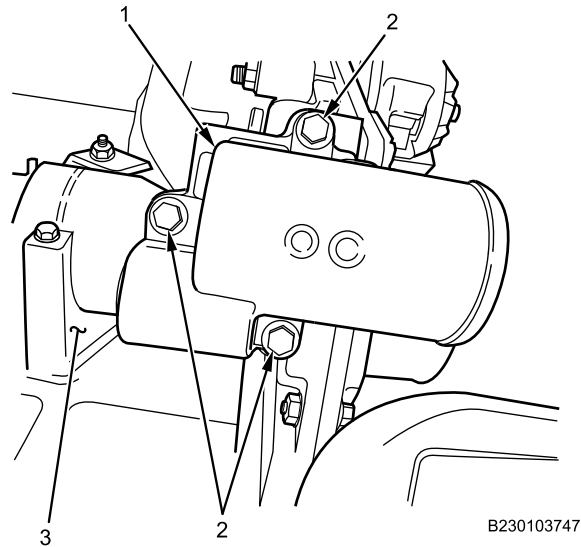


Figure 7. Water Inlet Elbow Installation.

6. Install inlet hose lower elbow (Figure 8, Item 1) on water inlet elbow (Figure 8, Item 4).

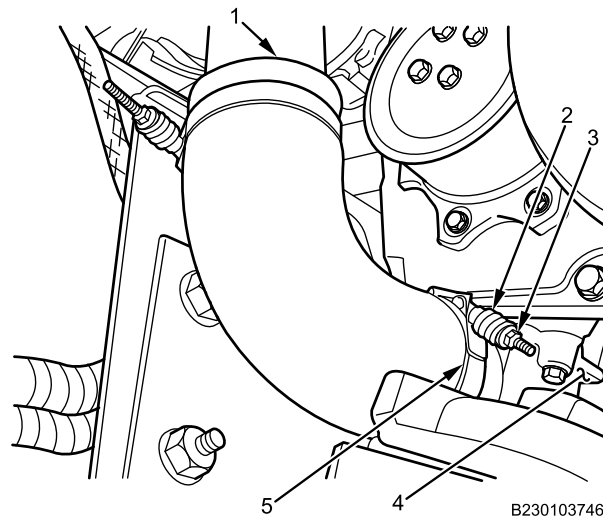


Figure 8. Inlet Hose Lower Elbow Installation.

7. Install spring (Figure 8, Item 2) and nut (Figure 8, Item 3) on hose clamp (Figure 8, Item 5). Tighten securely.

END OF TASK

WATER INLET ELBOW REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Refill coolant system (WP 0277).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine; run to operating temperature (TM 9-2355-106-10).
4. Checks for leaks (TM 9-2355-106-10).
5. Check dash to make sure no engine lights are illuminated (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install belly armor (WP 0606).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**RADIATOR PIPES/HOSES REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Antifreeze (WP 0794, Item 5)
Cable lock strap - (as needed) (WP 0796, Item 124)
Lockwasher - (2) (WP 0796, Item 10)
Clamp - (6) (WP 0796, Item 140)
Rag (WP 0794, Item 39)
Goggles, industrial (WP 0794, Item 20)
Gloves (WP 0794, Item 19)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Cooling system drained (WP 0277)

ReferencesTM 9-2355-106-10

RADIATOR PIPES/HOSES REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Hoses, pipes, and valves containing engine coolant can be hot. Use caution when directed to feel parts for temperature conditions. Use gloves if necessary. Failure to comply may result in injury to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

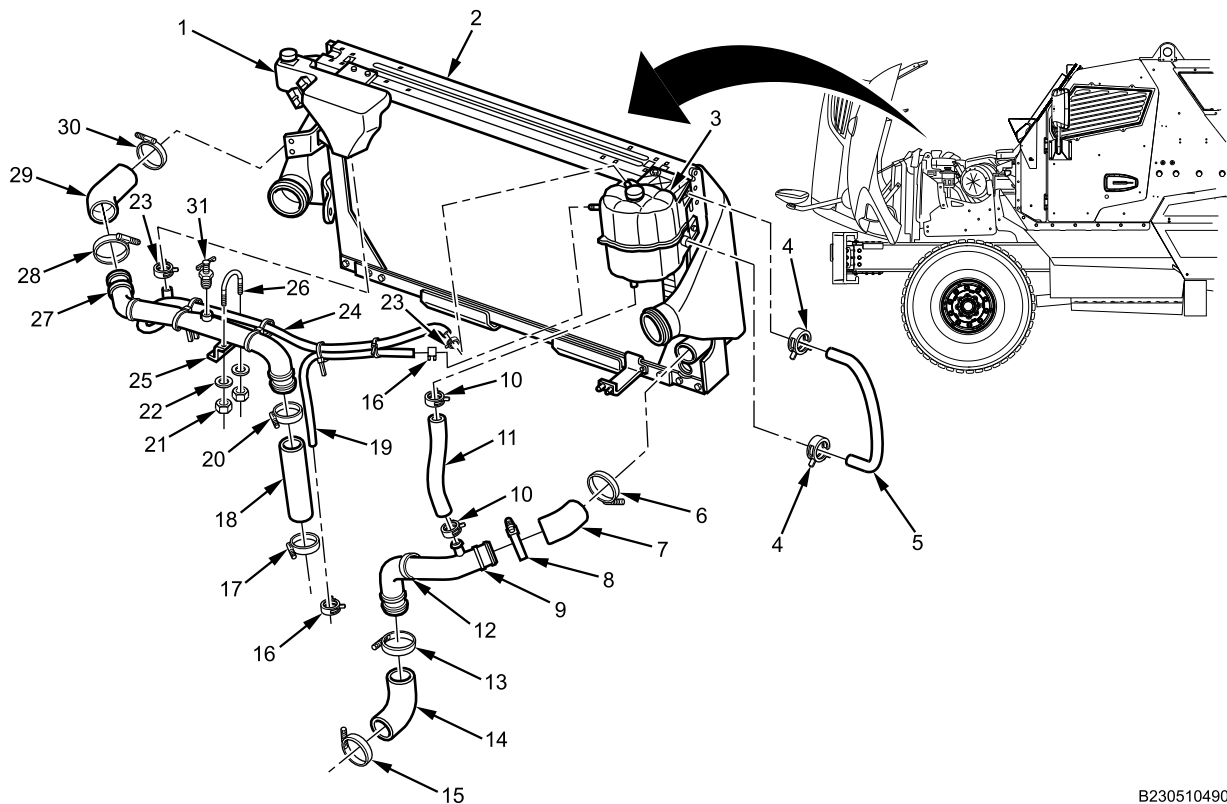
Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

REMOVAL

1. Position drain pan under outlet hose lower elbow (Figure 1, Item 14).
2. Disconnect clamp (Figure 1, Item 12) from bracket at radiator (Figure 1, Item 2).

RADIATOR PIPES/HOSES REMOVAL AND INSTALLATION - (CONTINUED)



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Figure 1. Radiator Pipes/Hoses.

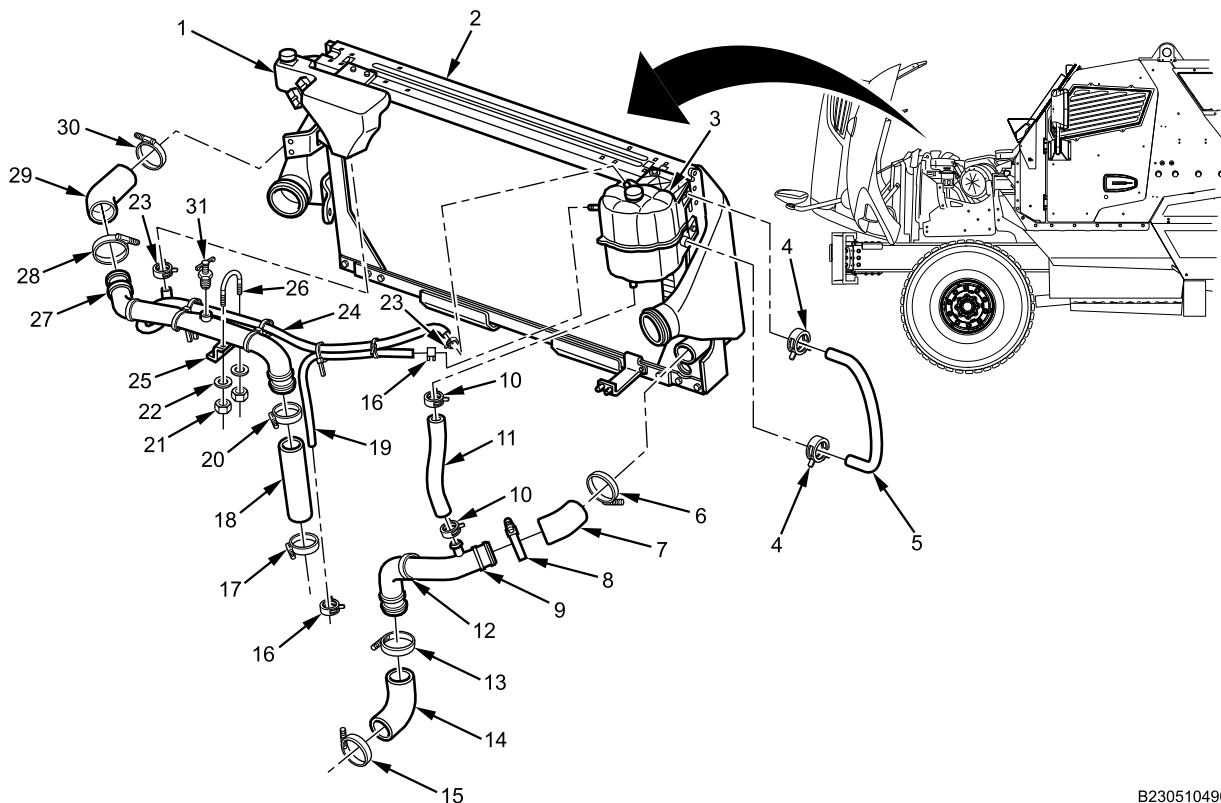
3. Loosen clamp (Figure 1, Item 15) and remove elbow (Figure 1, Item 14) from engine. Allow coolant to drain into pan.
4. Loosen two clamps (Figure 1, Item 10) and remove hose (Figure 1, Item 11) from deaeration tank (Figure 1, Item 3) and engine.
5. Remove two clamps (Figure 1, Item 10) from hose (Figure 1, Item 11). Discard clamps.
6. Loosen clamp (Figure 1, Item 6) and remove outlet pipe/hose assembly.
7. Loosen clamps (Figure 1, Item 13 and 8) and separate outlet pipe (Figure 1, Item 9) from elbow (Figure 1, Item 14) and elbow (Figure 1, Item 7).
8. Loosen two clamps (Figure 1, Item 4) and remove hose (Figure 1, Item 5).
9. Loosen two clamps (Figure 1, Item 16) and disconnect both ends of hose (Figure 1, Item 19).
10. Remove two clamps (Figure 1, Item 16) from hose (Figure 1, Item 19). Discard clamps.
11. Loosen two clamps (Figure 1, Item 23) and disconnect ends of hose (Figure 1, Item 24) from surge overflow tank (Figure 1, Item 1) and deaeration tank (Figure 1, Item 3).
12. Remove two clamps (Figure 1, Item 23) from hose (Figure 1, Item 24). Discard clamps.

RADIATOR PIPES/HOSES REMOVAL AND INSTALLATION - (CONTINUED)

13. Loosen clamp (Figure 2, Item 17) securing hose (Figure 2, Item 18) to engine.
14. Loosen clamp (Figure 2, Item 30).
15. Remove bleed valve (Figure 2, Item 31).
16. Remove two nuts (Figure 2, Item 21), lockwashers (Figure 2, Item 22), and U-bolt (Figure 2, Item 26) from bracket (Figure 2, Item 25) at HVAC compressor. Discard lockwashers.
17. Remove inlet pipe/hose assembly from bracket (Figure 2, Item 25) at HVAC compressor.
18. Loosen clamps (Figure 2, Item 28 and 20) and separate inlet pipe (Figure 2, Item 27) from elbow (Figure 2, Item 29) and hose (Figure 2, Item 18).
19. Remove and discard cable lock straps as necessary.

END OF TASK**INSTALLATION**

1. Connect inlet pipe (Figure 2, Item 27) to elbow (Figure 2, Item 29) and hose (Figure 2, Item 18) with new clamps (Figure 2, Item 28 and 20). Tighten clamps finger-tight.



B230510490

Figure 2. Radiator Pipes/Hoses.

2. Position clamp (Figure 2, Item 30) on elbow (Figure 2, Item 29).
3. Position clamp (Figure 2, Item 17) on hose (Figure 2, Item 18).
4. Position inlet pipe/hose assembly on radiator (Figure 2, Item 2), engine, and bracket (Figure 2, Item 25) at HVAC compressor.

RADIATOR PIPES/HOSES REMOVAL AND INSTALLATION - (CONTINUED)

5. Install U-bolt (Figure 2, Item 26) on bracket (Figure 2, Item 25) with two nuts (Figure 2, Item 21) and new lockwashers (Figure 2, Item 22). Tighten nuts securely.
6. Install bleed valve (Figure 2, Item 31).
7. Tighten clamps (Figure 2, Item 17, 20, 28, and 30) securely.
8. Position two clamps (Figure 2, Item 23) on ends of hose (Figure 2, Item 24).
9. Install hose (Figure 2, Item 24) on fitting at cap on deaeration tank (Figure 2, Item 3) and bottom of surge overflow tank (Figure 2, Item 1) with two clamps (Figure 2, Item 23).
10. Position two new clamps (Figure 2, Item 16) on ends of hose (Figure 2, Item 19).
11. Install hose (Figure 2, Item 19) on fitting on side of deaeration tank (Figure 2, Item 3) and fitting on engine with two new clamps (Figure 2, Item 16).
12. Install hose (Figure 2, Item 5) with two clamps (Figure 2, Item 4).
13. Install new cable lock straps where removed.
14. Connect outlet pipe (Figure 2, Item 9) to elbow (Figure 2, Item 14) and elbow (Figure 2, Item 7) with clamp (Figure 2, Item 13) and clamp (Figure 2, Item 8). Tighten clamps finger-tight.
15. Position clamp (Figure 2, Item 15) on elbow (Figure 2, Item 14).
16. Position clamp (Figure 2, Item 6) on elbow (Figure 2, Item 7).
17. Install outlet pipe/hose assembly on radiator (Figure 2, Item 2) and engine.
18. Install clamp (Figure 2, Item 12) on bracket at radiator (Figure 2, Item 2) and tighten securely.
19. Tighten clamps (Figure 2, Item 6, 8, 13, and 15) securely.
20. Position two clamps (Figure 2, Item 10) on ends of hose (Figure 2, Item 11).
21. Install hose (Figure 2, Item 11) on fitting at bottom of deaeration tank (Figure 2, Item 3) and fitting on outlet pipe (Figure 2, Item 9) with two clamps (Figure 2, Item 10).
22. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Fill cooling system (WP 0277).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ENGINE WATER PUMP REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, dial, 3/8-inch drive, 300 lb-in.
(WP 0795, Item 147)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)

Materials/Parts

Rags (WP 0794, Item 39)
Water pump seal (WP 0796, Item 64)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM 9-2355-106-10)
Right engine armor removed (WP 0599)
Radiator drained (WP 0277)
Lower radiator hose removed (WP 0285)
Radiator fan and fan shroud removed (WP 0282)
A/C belt removed (WP 0244)
Serpentine belt removed (WP 0240)

ENGINE WATER PUMP REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Wear safety goggles and work gloves while servicing cooling system. Label all connections and reference areas before removing parts. Failure to comply may result in damage to equipment and serious injury or death to personnel.

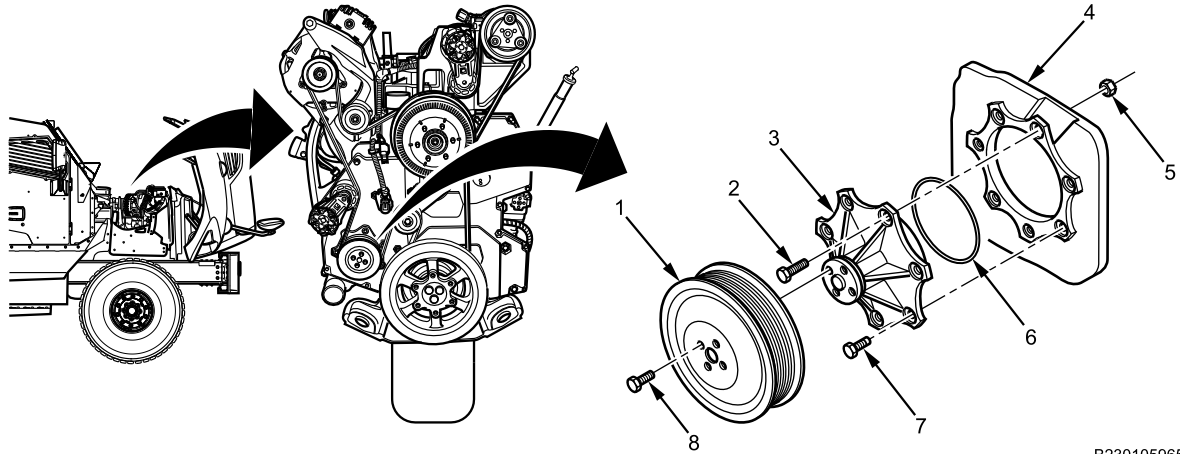
Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Cooling system components become pressurized and extremely hot during normal operation. To prevent serious injury from hot coolant or scalding steam, use the following safety procedure when removing radiator cap, surge tank cap, or deaeration cap:

- Allow engine to cool for 15 minutes.
- Wrap a thick cloth around cap to be removed.
- Loosen cap slowly one-quarter to one-half turn counterclockwise, and pause to allow pressure to release.
- Continue to turn cap counterclockwise to remove.
- Ensure all personnel stay clear of radiator while engine is running. Air in radiator will be released, which may cause hot coolant to spray out. Failure to comply may result in serious injury to personnel.

ENGINE WATER PUMP REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove four pulley bolts (Figure 1, Item 8) and remove water pump pulley (Figure 1, Item 1).



B230105965

Figure 1. Water Pump and Pulley Assembly.

2. Remove bolt (Figure 1, Item 2) and nut (Figure 1, Item 5) from water pump (Figure 1, Item 3).
3. Remove remaining six bolts (Figure 1, Item 7) securing water pump (Figure 1, Item 3) to front cover (Figure 1, Item 4).
4. Remove water pump (Figure 1, Item 3).
5. Remove seal (Figure 1, Item 6) from water pump (Figure 1, Item 3) or front cover (Figure 1, Item 4).

END OF TASK

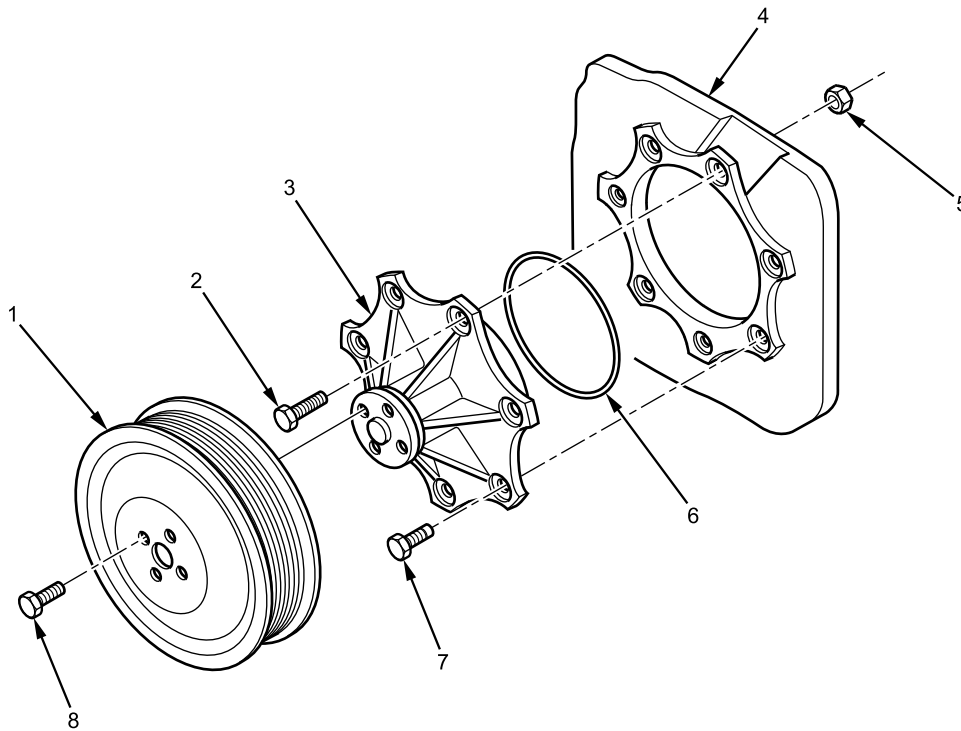
ENGINE WATER PUMP REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

NOTE

Ensure water pump and front cover surfaces are clean and free of broken seal pieces.

1. Install water pump seal (Figure 2, Item 6) on water pump (Figure 2, Item 3).



B230103392

Figure 2. Water Pump and Pulley Assembly.

2. Install water pump (Figure 2, Item 3) on front cover (Figure 2, Item 4) with six bolts (Figure 2, Item 7) and finger-tighten.
3. Install bolt (Figure 2, Item 2) and nut (Figure 2, Item 5) on water pump (Figure 2, Item 3) and torque to 66 lb-in. (7.5 N•m).
4. Torque six bolts (Figure 2, Item 7) to 66 lb-in. (7.5 N•m).
5. Install pump pulley (Figure 2, Item 1) on water pump (Figure 2, Item 3) with four bolts (Figure 2, Item 8).
6. Torque bolts (Figure 2, Item 8) to 66 lb-in. (7.5 N•m).

END OF TASK

ENGINE WATER PUMP REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Install A/C belt (WP 0244).
3. Install radiator fan and fan shroud (WP 0282).
4. Install lower radiator hose (WP 0285).
5. Fill cooling system (WP 0277).
6. Install right engine armor (WP 0599).
7. Turn MAIN POWER switch on (TM 9-2355-106-10).
8. Start engine and run to operating temperature (TM 9-2355-106-10).
9. Inspect for coolant leaks.
10. Verify correct gauge and temperature operation (TM 9-2355-106-10).
11. Verify correct heater operation (TM 9-2355-106-10).
12. Turn engine off (TM 9-2355-106-10).
13. Turn MAIN POWER switch off (TM 9-2355-106-10).
14. Top off coolant surge overflow reservoir and deaeration tank (WP 0277).
15. Close engine hood (TM 9-2355-106-10).
16. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, dial, 3/8-inch drive, 300 lb-in.
(WP 0795, Item 147)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM 9-2355-106-10)
Cooling fan and fan shroud removed (WP 0282)
Air conditioning (A/C) belt removed (WP 0244)
Air tanks and reservoirs drained (TM 9-2355-106-10)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING



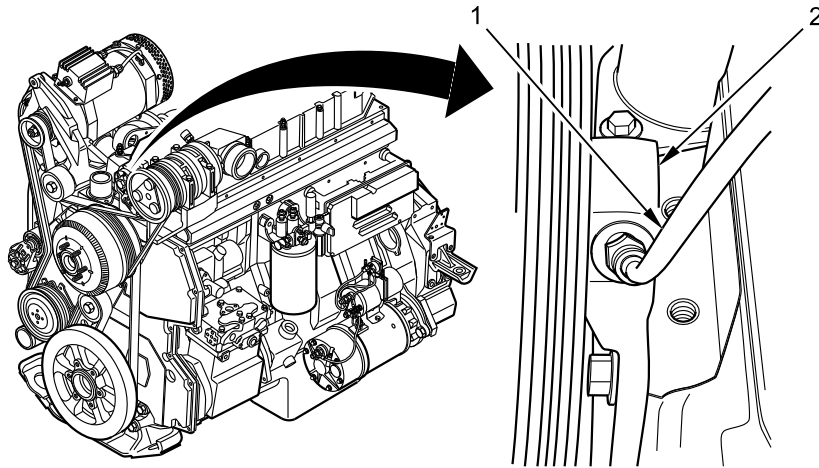
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Do not disconnect any air line or fitting until system pressure has been relieved. Hoses may whip and injure personnel, and air under pressure can penetrate skin. Failure to comply may result in serious injury or death to personnel.

COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect air line (Figure 1, Item 1) from fan drive assembly (Figure 1, Item 2).



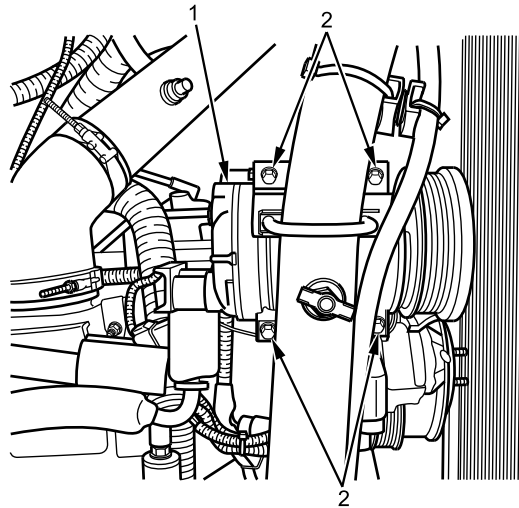
B230510257

Figure 1. Fan Drive Air Line.

CAUTION

Do not disconnect A/C lines from A/C compressor. Failure to comply may result in damage to equipment.

3. Remove four bolts (Figure 2, Item 2) securing A/C compressor (Figure 2, Item 1) to A/C compressor bracket.

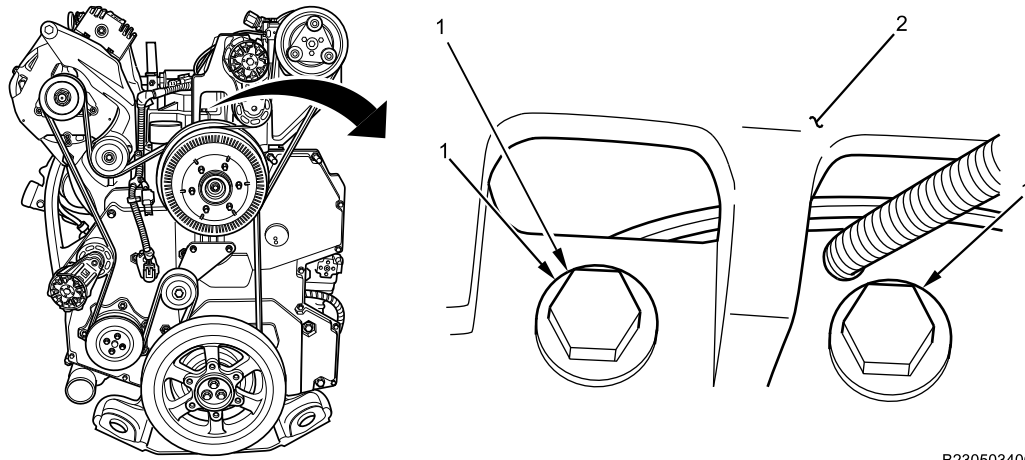


B230503405

Figure 2. Top of A/C Compressor.

4. Remove A/C compressor (Figure 2, Item 1) and set aside.
5. Remove two bolts (Figure 3, Item 1) securing A/C compressor bracket (Figure 3, Item 2) to engine. Remove A/C compressor bracket from engine.

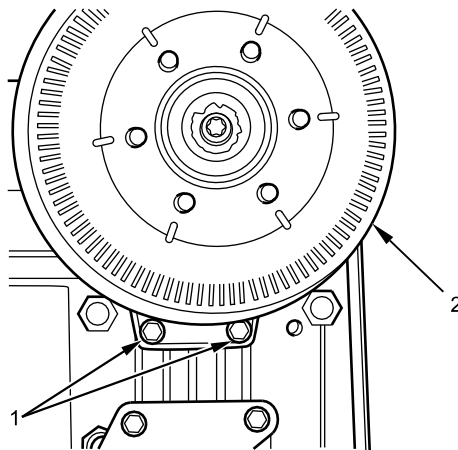
COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)



B230503406

Figure 3. A/C Compressor Bracket Bolts.

6. Remove two bolts (Figure 4, Item 1) securing bottom of fan drive to engine.



005399

Figure 4. Front of Fan Drive Assembly.

7. Separate fan drive (Figure 4, Item 2) from engine.

END OF TASK

COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

1. Position fan drive (Figure 5, Item 2) to engine.

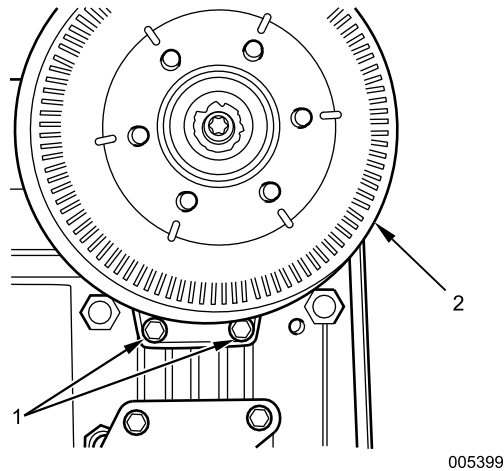


Figure 5. Front of Fan Drive Assembly.

2. Install two bolts (Figure 5, Item 1) securing bottom of fan drive (Figure 5, Item 2) to engine, and torque bolts to 13 lb-ft (18 N•m).
3. Position A/C compressor bracket (Figure 6, Item 2) on engine.

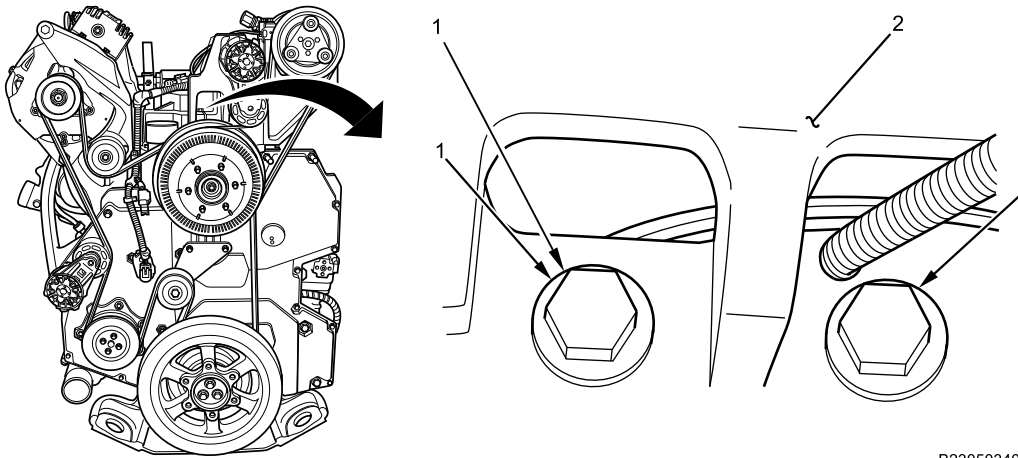


Figure 6. A/C Compressor Bracket Bolts.

4. Install two bolts (Figure 6, Item 1) on A/C compressor bracket (Figure 6, Item 2). Tighten bolts securely.
5. Connect air line (Figure 7, Item 1) to fan drive assembly (Figure 7, Item 2).

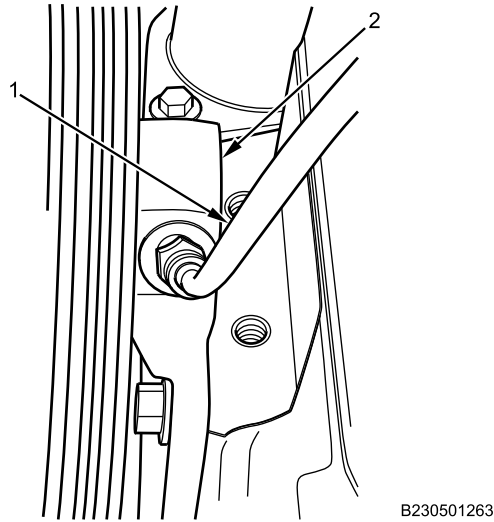
COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 7. Fan Drive Air Line.

6. Install A/C compressor (Figure 8, Item 1) on A/C compressor bracket with four bolts (Figure 8, Item 2) and tighten bolts securely.

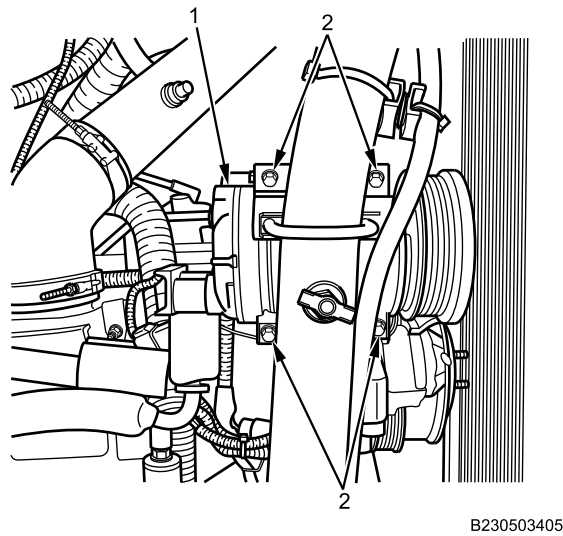


Figure 8. Top of A/C Compressor.

END OF TASK

COOLING FAN DRIVE ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install A/C belt (WP 0244).
2. Install cooling fan and shroud (WP 0282).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify clearance of fan and fan shroud.
5. Start engine (TM 9-2355-106-10).
6. Refill air tanks (TM 9-2355-106-10).
7. Inspect for air leaks (TM 9-2355-106-10).
8. Verify correct gauge operation (TM 9-2355-106-10).
9. Verify correct cooling fan operation (TM 9-2355-106-10).
10. Turn engine off (TM 9-2355-106-10).
11. Turn MAIN POWER switch off (TM 9-2355-106-10).
12. Close engine hood (TM 9-2355-106-10).
13. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

COOLING FAN ACTUATOR SOLENOID REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Tape (WP 0794, Item 50)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood opened and secured (TM 9-2355-106-10)
Air tanks and reservoirs drained (TM 9-2355-106-10)

WARNING



Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

Before working on air brake system or any auxiliary pressurized system, make sure air pressure has been drained from all reservoirs. Failure to comply may result in serious injury or death to personnel.

Air drain valves are under pressure. Wear protective goggles and do not place face in front of air drain valves while draining air reservoirs. Open air drain valves slowly to release air pressure gradually. Failure to comply may result in serious injury or death to personnel.

Do not disconnect any air line or fitting until system pressure has been relieved. Hoses may whip and injure personnel, and air under pressure can penetrate skin. Failure to comply may result in serious injury or death to personnel.

Do not operate vehicle with air pressure system loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

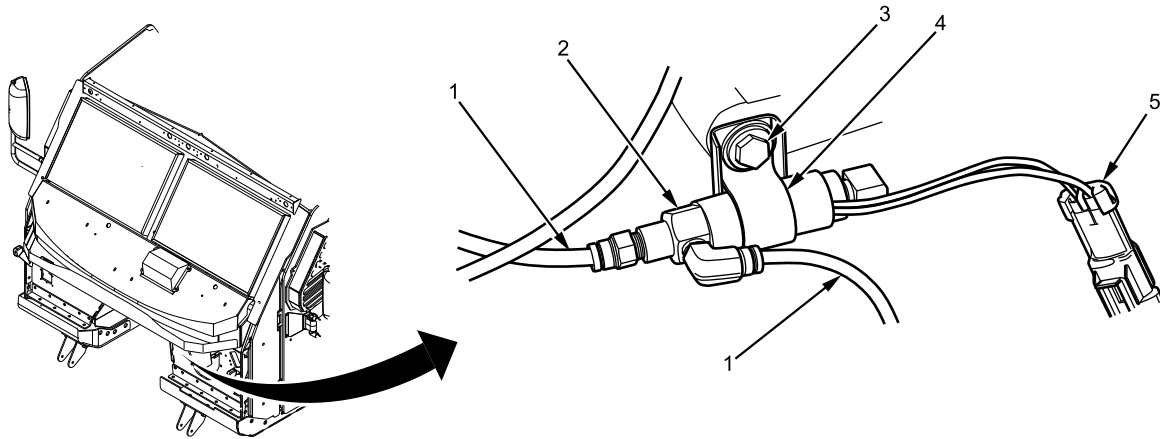
Let air pressure build in both tanks to 100 psi (689 kPa) before releasing the parking brake. Low air pressure may affect vehicle braking capability. Failure to comply may result in injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Disconnect electrical connector (Figure 1, Item 5).

COOLING FAN ACTUATOR SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)



B230503533

Figure 1. Fan Actuator Solenoid.

2. Disconnect air lines (Figure 1, Item 1) from solenoid (Figure 1, Item 2).
3. Remove bolt (Figure 1, Item 3) securing solenoid clamp (Figure 1, Item 4) to firewall.
4. Remove solenoid (Figure 1, Item 2) from clamp (Figure 1, Item 4).

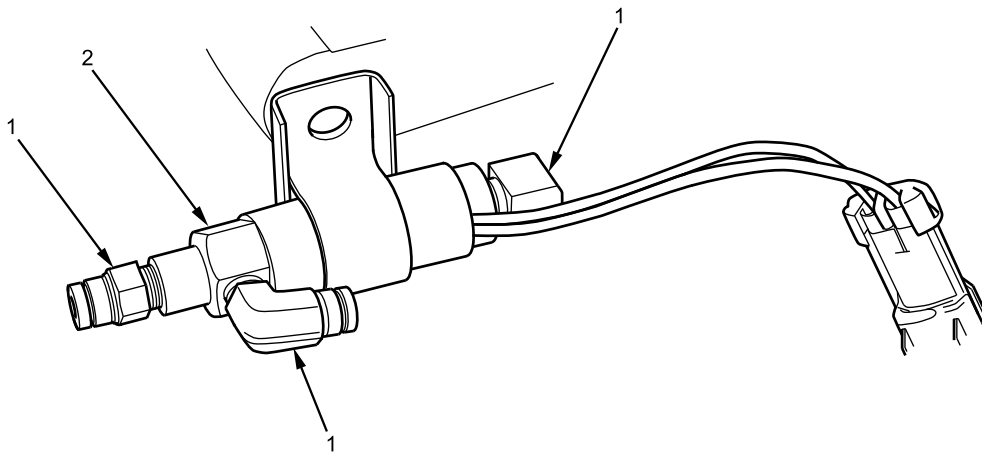
END OF TASK

DISASSEMBLY

NOTE

Note location and orientation of fittings to aid installation.

1. Remove three fittings (Figure 2, Item 1) from solenoid (Figure 2, Item 2). Clean sealing compound and debris from threads on fittings.



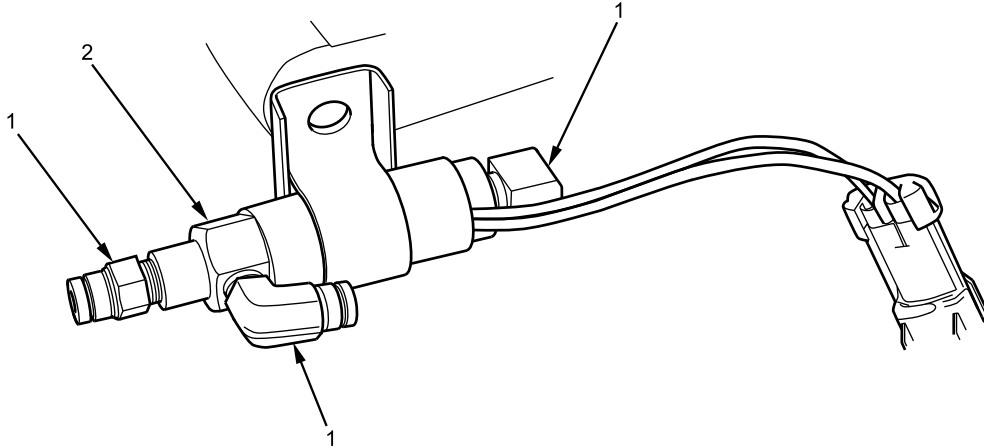
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Figure 2. Cooling Fan Solenoid.

END OF TASK

COOLING FAN ACTUATOR SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**ASSEMBLY**

1. Apply thread sealing tape to threads on three fittings (Figure 3, Item 1).



B230503534

Figure 3. Cooling Fan Solenoid.

2. Install three fittings (Figure 3, Item 1) on solenoid (Figure 3, Item 2) in locations and orientation noted during removal. Tighten fittings securely.

END OF TASK

COOLING FAN ACTUATOR SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Install clamp (Figure 4, Item 4) on solenoid (Figure 4, Item 2).

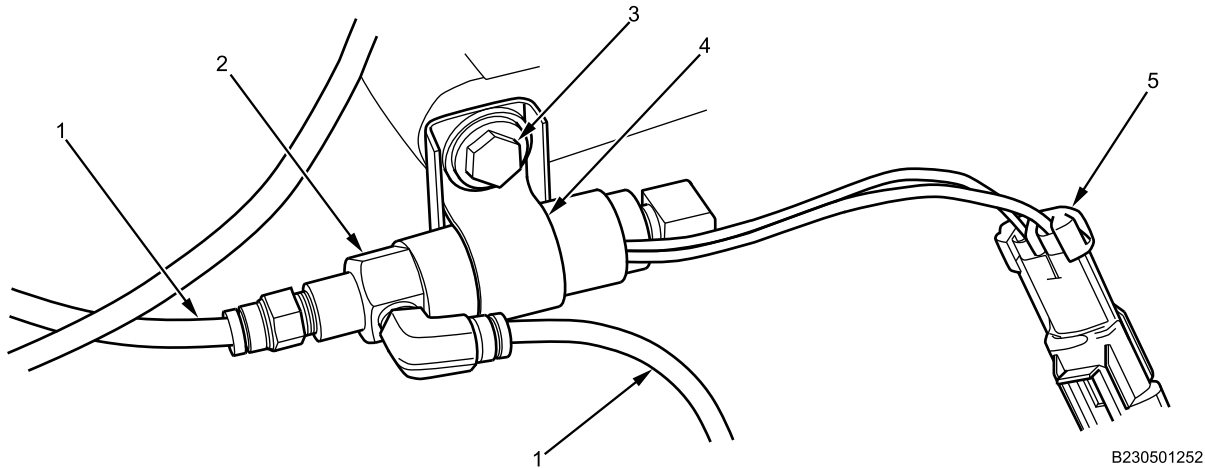


Figure 4. Fan Actuator Solenoid.

2. Install bolt (Figure 4, Item 3) securing solenoid clamp (Figure 4, Item 4) to chassis. Tighten bolt securely.
3. Connect air lines (Figure 4, Item 1) to solenoid (Figure 4, Item 2).

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

4. Apply dielectric grease to electrical connector (Figure 4, Item 5).
5. Connect electrical connector (Figure 4, Item 5).

END OF TASK

COOLING FAN ACTUATOR SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine (TM 9-2355-106-10).
3. Refill air tanks (TM 9-2355-106-10).
4. Inspect for air leaks (TM 9-2355-106-10).
5. Verify correct gauge operation (TM 9-2355-106-10).
6. Verify correct cooling fan operation (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ALTERNATOR REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 20-100 lb-ft, 3/8-inch drive
(WP 0795, Item 141)
Wrench, torque, 40-200 lb-in. 3/8-inch drive
(WP 0795, Item 142)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)
Lifting sling (WP 0795, Item 68)
Lifting device (WP 0795, Item 67)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock straps - (3) (WP 0796, Item 124)
Lockwasher - (2) (WP 0796, Item 10)
Lockwasher - (2) (WP 0796, Item 9)
Lockwasher (WP 0796, Item 14)
Compound (WP 0794, Item 13)
Wire tags (WP 0796, Item 33)

Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER Switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Serpentine belt removed (WP 0240)

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

Before removing alternator, label all wires and connection points.

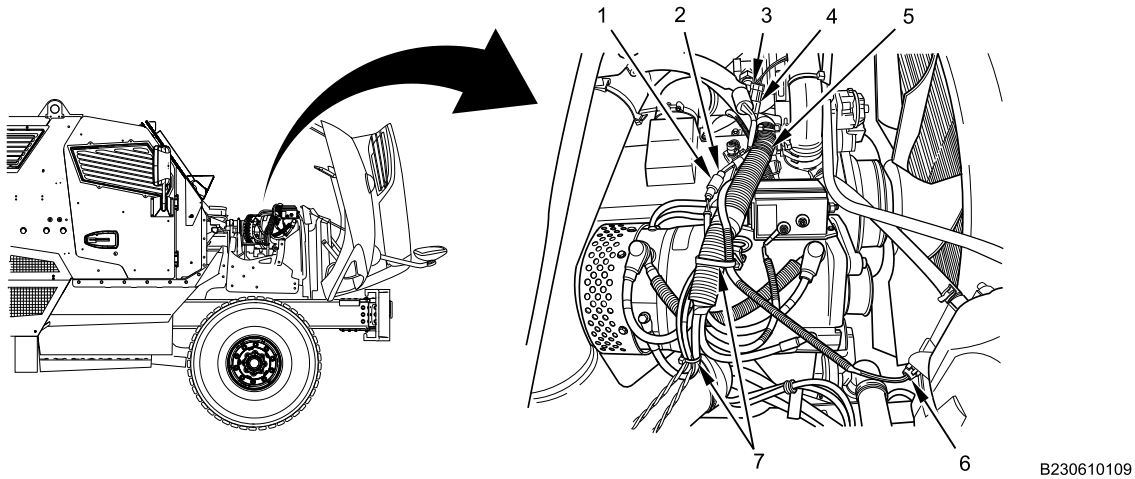


Figure 1. Sensor Wiring Removal.

1. Disconnect A/C pressure switch (Figure 1, Item 2) from A/C harness (Figure 1, Item 1).
2. Disconnect A/C compressor connector (Figure 1, Item 3) from engine harness (Figure 1, Item 4).
3. Cut and discard cable lock straps (Figure 1, Item 5 and 7) from lift ring and harness bundle.
4. Disconnect coolant level sensor connector (Figure 1, Item 6) from coolant level sensor.

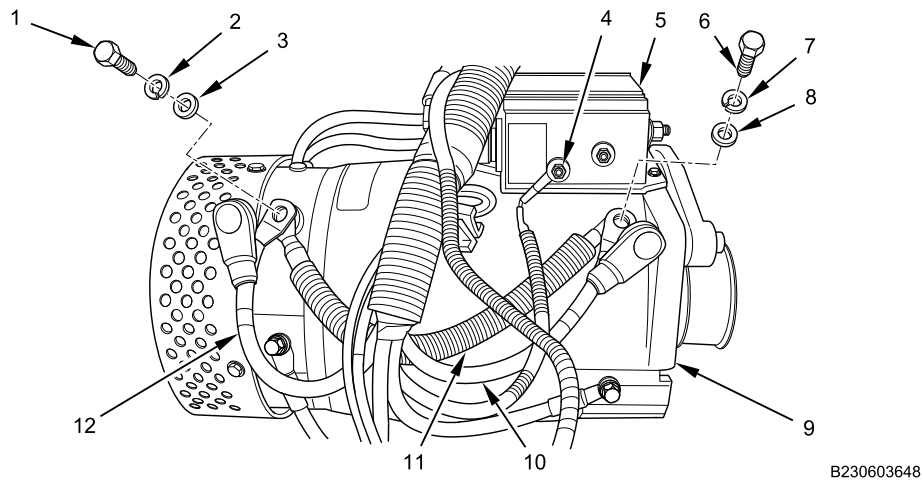


Figure 2. Alternator Positive Cable Removal.

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove two bolts (Figure 2, Item 1 and 6), lockwashers (Figure 2, Item 2 and 7), flat washers (Figure 2, Item 3 and 8), two positive cables (Figure 2, Item 10 and 12), and jumper cable (Figure 2, Item 11) from alternator (Figure 2, Item 9). Discard lockwashers.
6. Remove nut (Figure 2, Item 4) and 24V ignition wire from voltage regulator (Figure 2, Item 5).

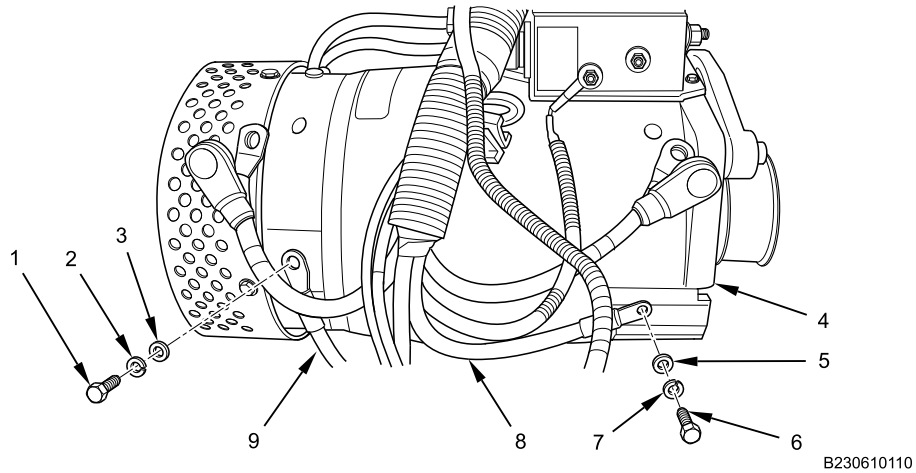


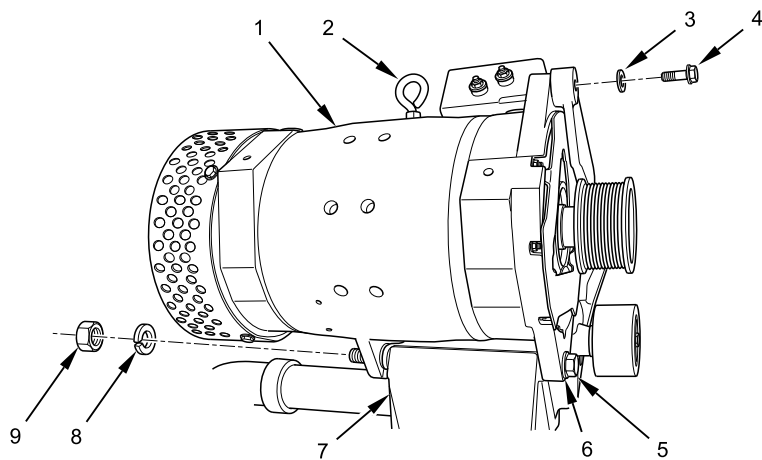
Figure 3. Alternator Negative Cable Removal.

7. Remove two bolts (Figure 3, Item 1 and 6), lockwashers (Figure 3, Item 2 and 7), flat washers (Figure 3, Item 3 and 5), and two negative cables (Figure 2, Item 8 and 9) from alternator (Figure 3, Item 4). Discard lockwashers.

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Prior to moving heavy components with lifting device, clear path of travel and clear personnel from area. Use proper lifting device for weight of item. Use extreme caution if lifting objects overhead or backing up. Stop and lower load as soon as possible. Failure to comply may result in damage to equipment and serious injury or death to personnel.

8. Attach suitable lifting device to alternator lift ring (Figure 4, Item 2).



B230610111

Figure 4. Alternator Mounting Bolt Removal.

9. Remove alternator upper mounting bolt (Figure 4, Item 4) and flat washer (Figure 4, Item 3) from alternator (Figure 4, Item 1).
10. Remove nut (Figure 4, Item 9) and lockwasher (Figure 4, Item 8) from lower mounting bolt (Figure 4, Item 5). Discard lockwasher.
11. Remove lower mounting bolt (Figure 4, Item 5) and flat washer (Figure 4, Item 6) from alternator (Figure 4, Item 1).
12. With lifting device, lift alternator (Figure 4, Item 1) from alternator mounting bracket (Figure 4, Item 7) and remove from vehicle.

END OF TASK

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)

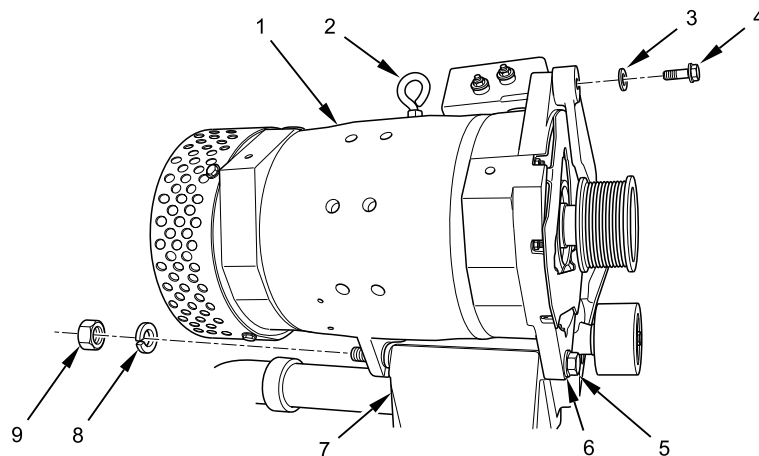
INSTALLATION

WARNING



Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to all mounting bolts and nuts.



B230610111

Figure 5. Alternator Mounting Bolt Installation

2. Attach suitable lifting device to alternator lift ring (Figure 5, Item 2).
3. Lift alternator (Figure 5, Item 1) into engine compartment and align on lower mounting bracket (Figure 5, Item 7).
4. Install lower mounting bolt (Figure 5, Item 5) and flat washer (Figure 5, Item 6) through lower mounting bracket (Figure 5, Item 7).
5. Install new lockwasher (Figure 5, Item 8) and nut (Figure 5, Item 9) on bolt (Figure 5, Item 5). Do not tighten.
6. Install upper mounting bolt (Figure 5, Item 4) and flat washer (Figure 5, Item 3) on alternator (Figure 5, Item 1).
7. Tighten top mounting bolt (Figure 5, Item 4) to 34 lb-ft (46 N•m).
8. Tighten lower mounting bolt (Figure 5, Item 5) to 115 lb-ft (156 N•m).
9. Remove lifting device from alternator (Figure 5, Item 1).
10. Position engine wiring harness on alternator.

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)

WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

11. Apply dielectric grease to all electrical connections.

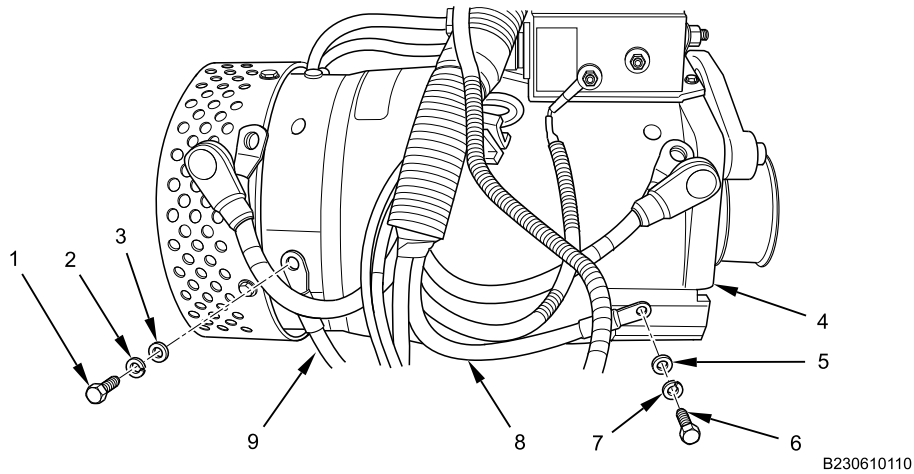


Figure 6. Alternator Negative Cable Installation

12. Install two negative cables (Figure 6, Item 8 and 9) on alternator (Figure 6, Item 4) with two flat washers (Figure 6, Item 3 and 5), new lockwashers (Figure 6, Item 2 and 7), and bolts (Figure 6, Item 1 and 6). Tighten bolts to 80 lb-in (9 N•m).

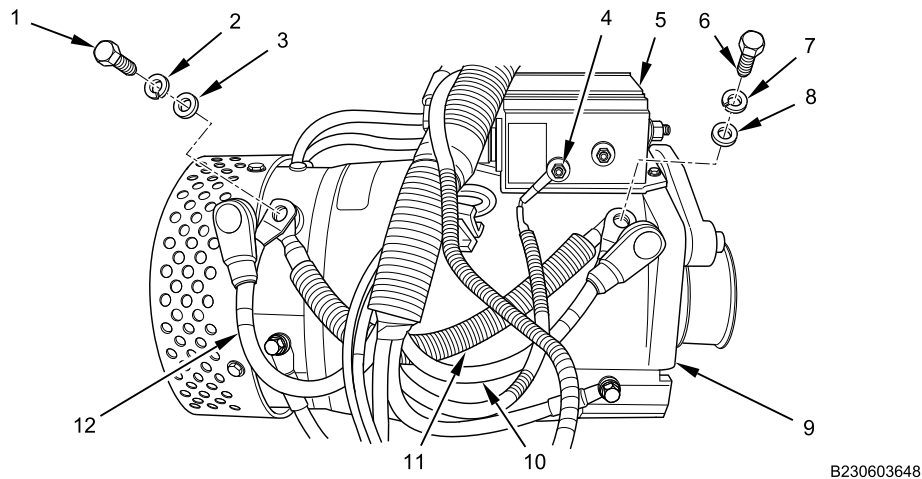


Figure 7. Alternator Positive Cable Installation.

ALTERNATOR REMOVAL AND INSTALLATION - (CONTINUED)

13. Install two positive cables (Figure 7, Item 10 and 12) and jumper cable (Figure 7, Item 11) on alternator (Figure 7, Item 9) with two flat washers (Figure 7, Item 3 and 8), new lockwashers (Figure 7, Item 2 and 7), and bolts (Figure 7, Item 1 and 6). Tighten bolts to 177 lb-in (20 N•m).
14. Install 24V ignition wire on voltage regulator (Figure 7, Item 5) with nut (Figure 7, Item 4). Tighten nut securely.
15. Connect A/C pressure switch connector (Figure 8, Item 2) to A/C harness connector (Figure 8, Item 1).

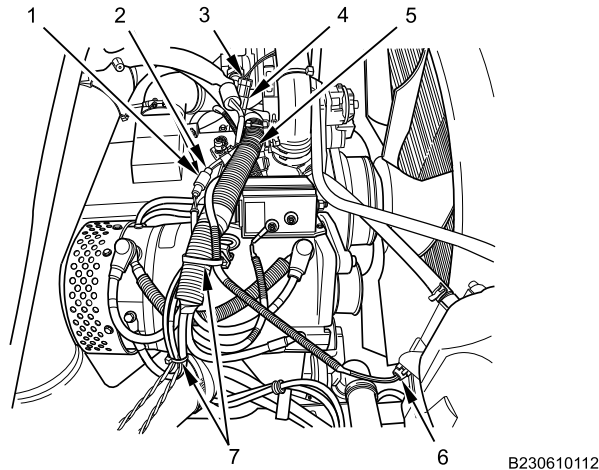


Figure 8. Sensor Wiring Installation.

16. Connect compressor connector (Figure 8, Item 3) to engine harness connector (Figure 8, Item 4).
17. Install new cable lock straps (Figure 8, Item 5 and 7) to secure harness to lift ring and harness bundle.
18. Connect coolant level sensor connector (Figure 8, Item 6) to coolant level sensor.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Connect battery cables (WP 0404).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine (TM 9-2355-106-10).
5. Verify charging system output on voltage gauge (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close and secure hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ALTERNATOR BRACKET REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Adapter, socket, wrench drive, 3/8-inch female -
1/2-inch male (WP 0795, Item 2)
Socket, socket wrench, 3/8-inch drive, 6 pt, deep, 10
mm (WP 0795, Item 108)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
drive (WP 0795, Item 145)

Materials/Parts

Compound (WP 0794, Item 13)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

References

TM 9-2355-106-10

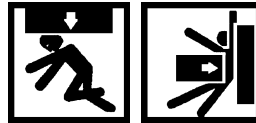
TM 9-2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Alternator removed (WP 0289)
Camshaft position sensor removed (WP 0393)
Serpentine belt tensioner removed (WP 0242)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ALTERNATOR BRACKET REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove bolt (Figure 1, Item 1) from fuel/water separator fuel line retainer (Figure 1, Item 2) and alternator bracket (Figure 1, Item 3).

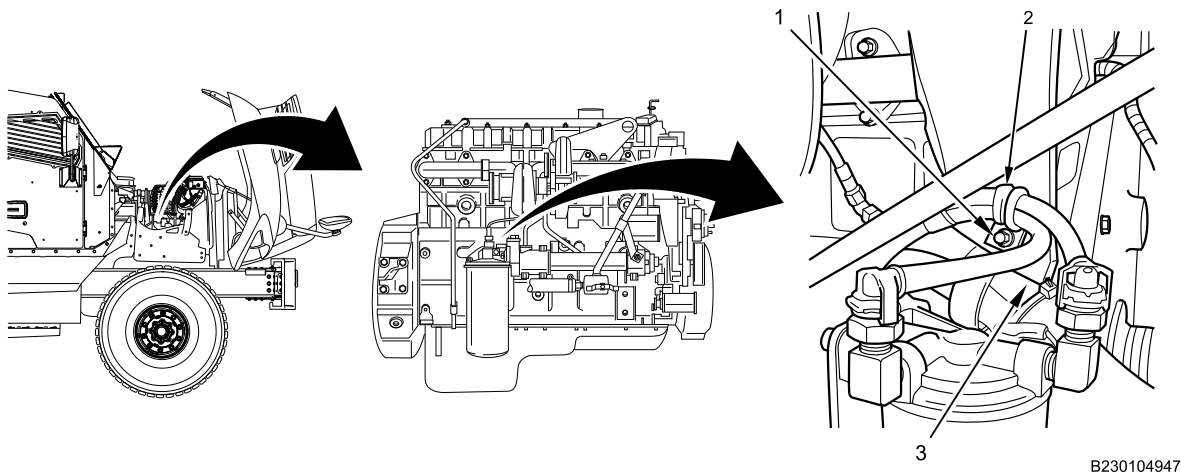
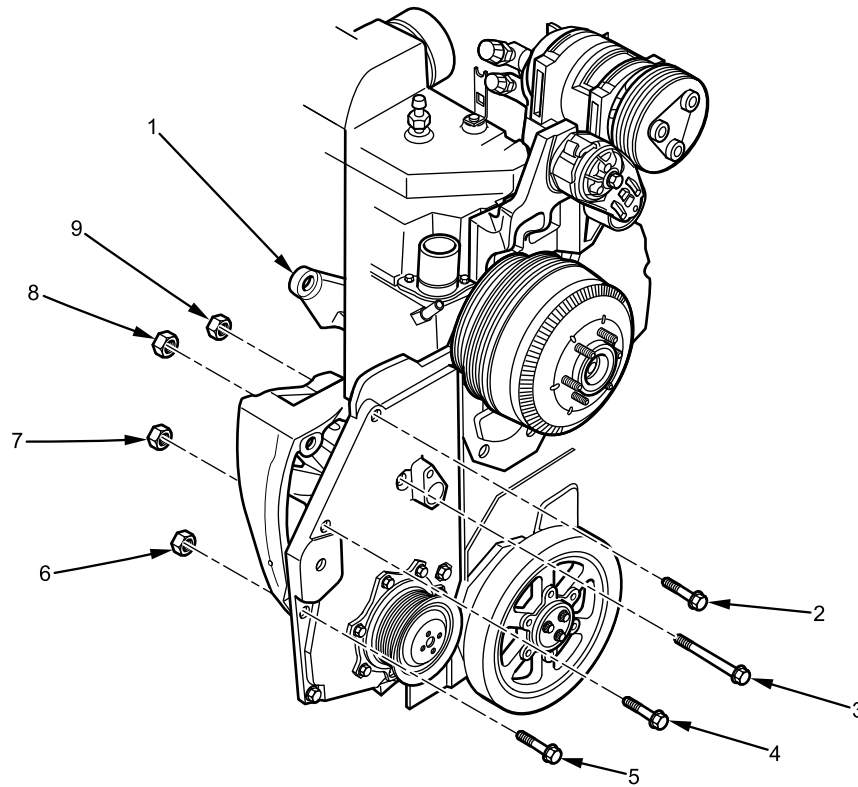


Figure 1. Fuel/Water Separator Hose Bracket Mounting Bolt.

2. Remove four bolts (Figure 2, Item 2, 3, 4, and 5) and nuts (Figure 2, Item 6, 7, 8, and 9) from alternator bracket (Figure 2, Item 1).

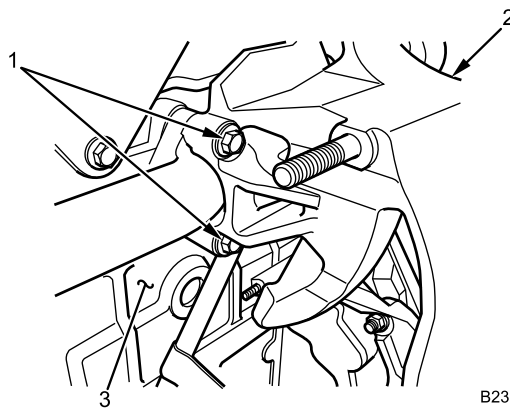
ALTERNATOR BRACKET REMOVAL AND INSTALLATION - (CONTINUED)



B230110108

Figure 2. Alternator Bracket and Bolts.

3. Remove two bolts (Figure 3, Item 1) and alternator bracket (Figure 3, Item 2) from engine (Figure 3, Item 3).



B230104949

Figure 3. Alternator Bracket Removal.

END OF TASK

ALTERNATOR BRACKET REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Apply corrosion preventive compound to all mounting bolts and nuts.

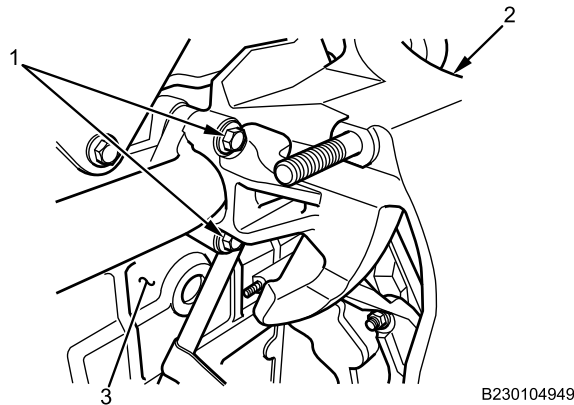
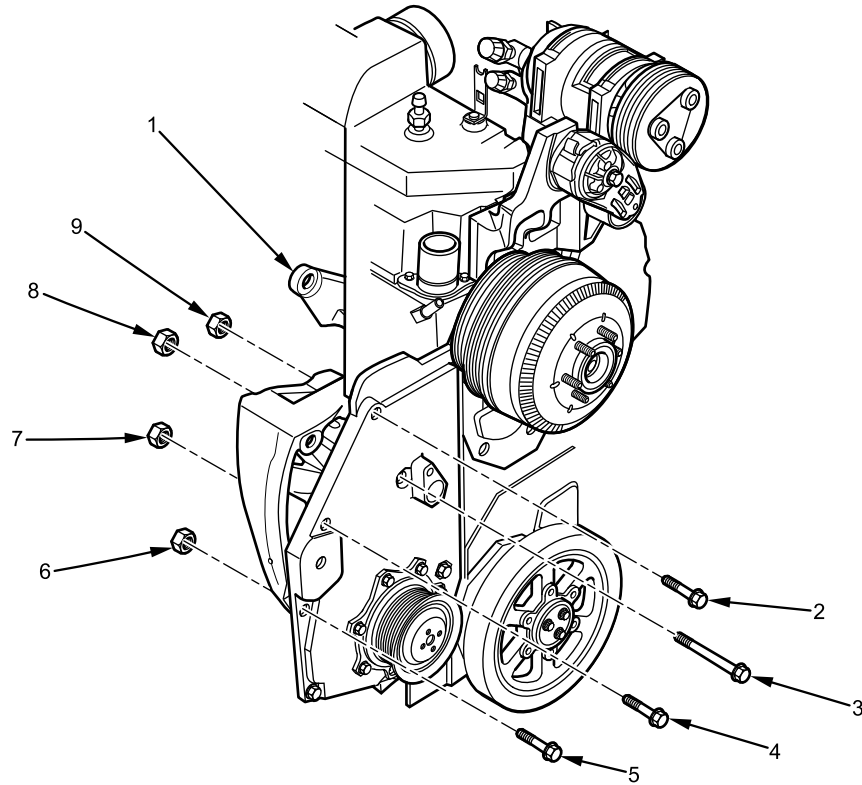


Figure 4. Alternator Bracket Installation.

2. Install alternator bracket (Figure 4, Item 2) on engine (Figure 4, Item 3) with two bolts (Figure 4, Item 1) and finger tighten.
3. Install four bolts (Figure 5, Item 2, 3, 4, and 5) and nuts (Figure 5, Item 6, 7, 8, and 9) on alternator bracket (Figure 5, Item 1) finger tight.

ALTERNATOR BRACKET REMOVAL AND INSTALLATION - (CONTINUED)



B230110108

Figure 5. Alternator Bracket and Bolts.

4. Tighten two bolts (Figure 4, Item 1) to 60 lb-ft (81 N•m).
5. Tighten four bolts (Figure 5, Item 2, 3, 4, and 5) and nuts (Figure 5, Item 6, 7, 8, and 9) to 16 lb-ft (21 N•m).

ALTERNATOR BRACKET REMOVAL AND INSTALLATION - (CONTINUED)

6. Install bolt (Figure 6, Item 1) through fuel/water separator fuel line retainer (Figure 6, Item 2) on alternator bracket (Figure 6, Item 3). Tighten bolt securely.

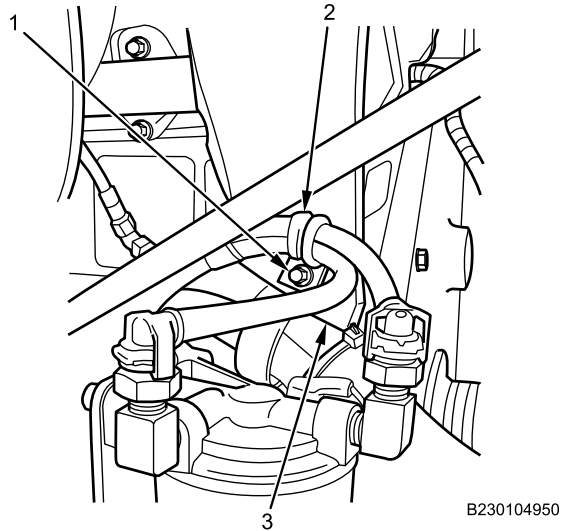


Figure 6. Fuel/Water Separator Hose Bracket Mounting Bolt.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt tensioner (WP 0242).
2. Install camshaft position sensor (WP 0393).
3. Install alternator (WP 0289).
4. Close and secure hood (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ALTERNATOR PULLEY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)
Socket, socket wrench, 1/2-inch drive, 6 pt, deep,
1-1/16-inch (WP 0795, Item 106)

Materials/Parts

Locknut (WP 0796, Item 5)

References

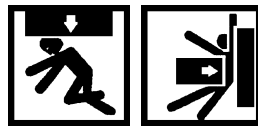
TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

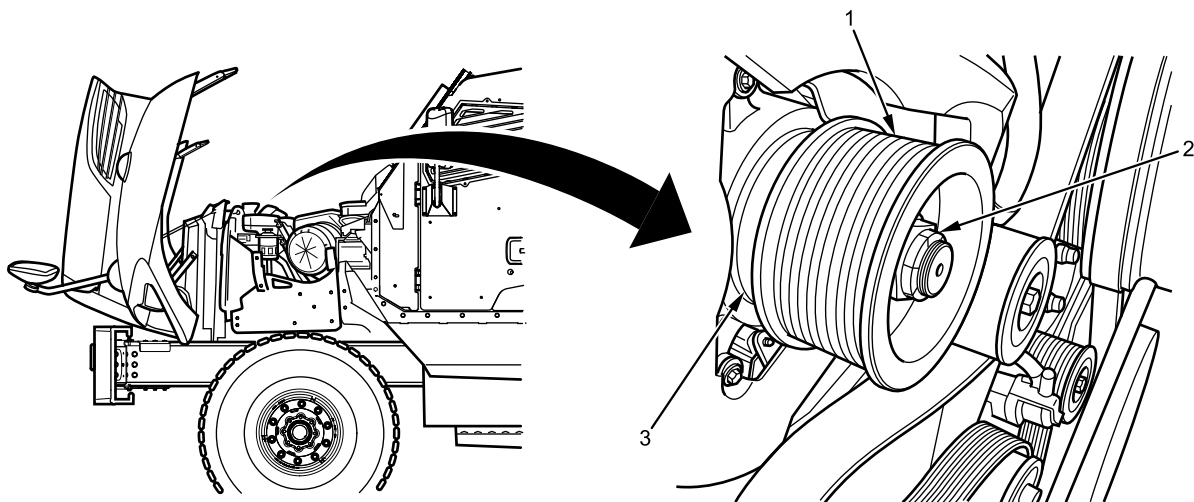
Parking brake set (TM 9-2355-106-23)
Transmission set in NEUTRAL (N) (TM
9-2355-106-23)
Engine off (TM 9-2355-106-23)
MAIN POWER switch off (TM 9-2355-106-23)
Wheels chocked (TM 9-2355-106-23)
Serpentine belt removed (WP 0240)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Grasp sleeve (Figure 1, Item 3) at rear of alternator pulley (Figure 1, Item 1) with adjustable pliers to keep pulley from turning, while removing locknut (Figure 1, Item 2) and washer. Discard locknut.



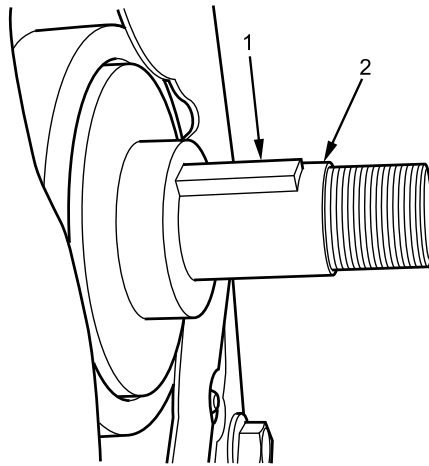
B230605973

Figure 1. Alternator Pulley Removal.

2. Remove alternator pulley (Figure 1, Item 1) from alternator.

ALTERNATOR PULLEY REMOVAL AND INSTALLATION - (CONTINUED)

3. Ensure alternator pulley key (Figure 2, Item 1) stays in shaft (Figure 2, Item 2).

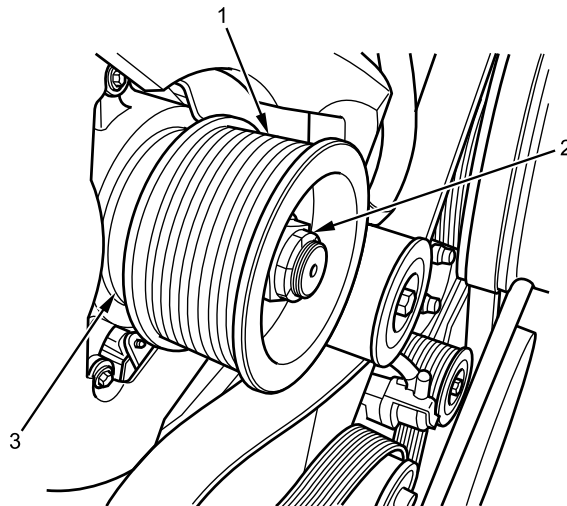


B230601606

Figure 2. Alternator Shaft.

END OF TASK**INSTALLATION**

1. Align slot in pulley (Figure 1, Item 1) to key (Figure 2, Item 1) on shaft (Figure 2, Item 2), and slide pulley onto alternator shaft.
2. Install alternator pulley washer and new locknut.
3. Grasp sleeve (Figure 3, Item 3) at rear of alternator pulley (Figure 3, Item 1) with adjustable pliers to keep pulley from turning, and torque locknut (Figure 3, Item 2) to 70-80 lb-ft (95-108 N•m).



B230605974

Figure 3. Alternator Pulley Installation.

END OF TASK

ALTERNATOR PULLEY REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install serpentine belt (WP 0240).
2. Remove wheel chocks (TM 9-2355-106-23).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

STARTER MOTOR REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Torque wrench, 50-250 lb-ft, 1/2-inch drive
(WP 0795, Item 143)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap (WP 0796, Item 120)
Cable lock strap (WP 0796, Item 124)
Cable lock strap (WP 0796, Item 159)
Lockwasher (WP 0796, Item 22)
Lockwasher - (3) (WP 0796, Item 178)
Wire tags (WP 0794, Item 49)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)
Belly armor removed (WP 0606)

WARNING



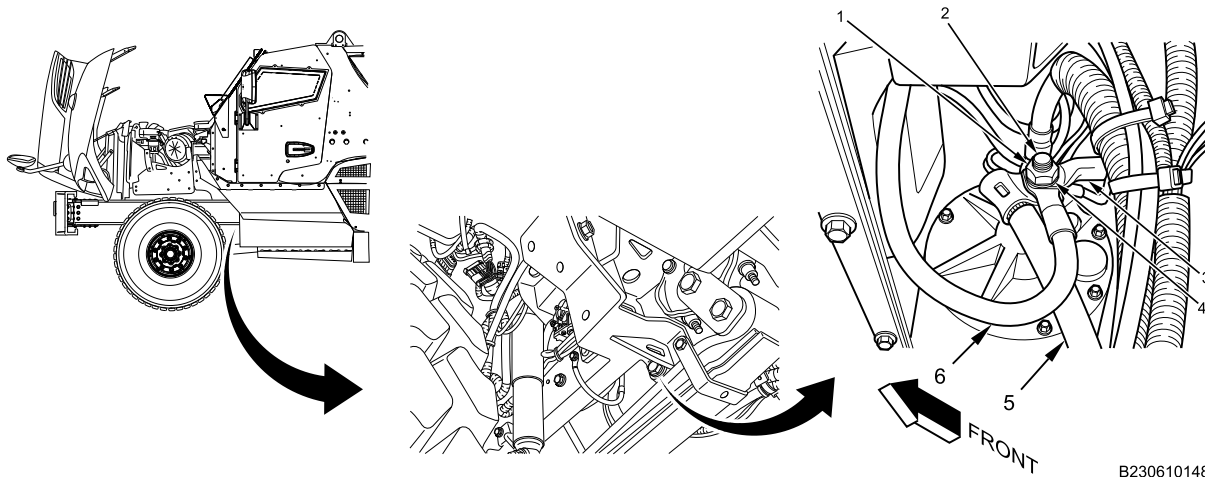
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Some engine components are heavy and bulky and require assistance for lifting. Use assistance of crewmember or lifting device as required. Failure to comply may result in damage to equipment and serious injury to personnel.

STARTER MOTOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Before removing starter motor, label all wires and connection points.

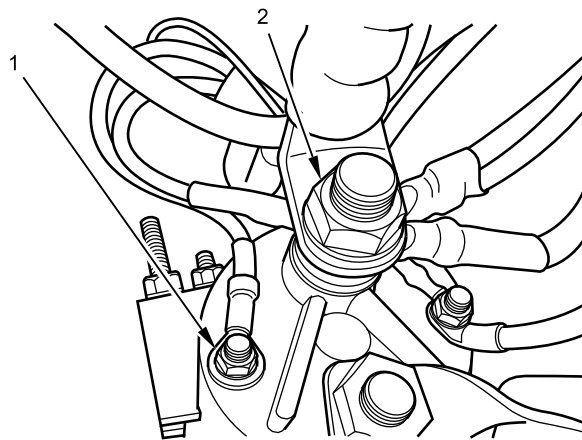
1. Remove nut (Figure 1, Item 1), lockwasher (Figure 1, Item 4), battery-to-starter ground cable (Figure 1, Item 5), starter-to-frame ground cable (Figure 1, Item 3), and starter-to-engine ground cable (Figure 1, Item 6) from starter motor ground stud (Figure 1, Item 2). Discard lockwasher.



B230610148

Figure 1. Starter Ground Cable Removal.

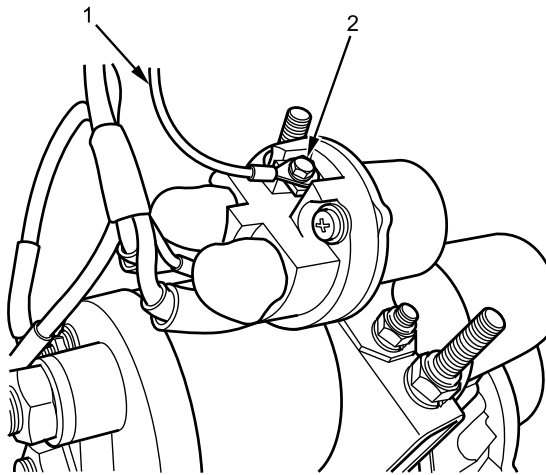
2. Remove cable lock straps as necessary and discard.
3. Remove wires from B+ post (Figure 2, Item 2) on solenoid.



B230602107

Figure 2. Solenoid Wiring.

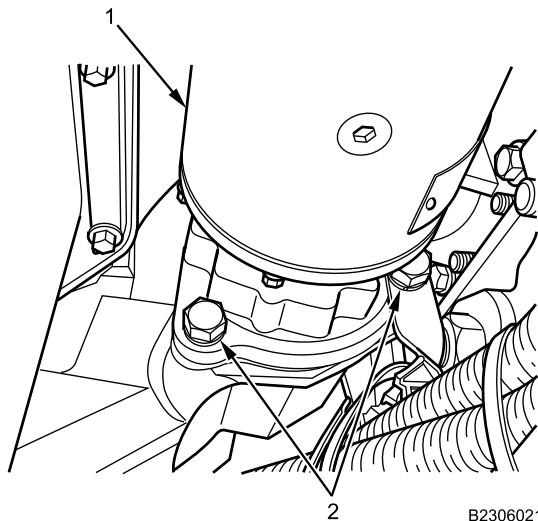
4. Disconnect nut and wire from terminal S (Figure 2, Item 1) on solenoid.
5. Remove helper solenoid bolt (Figure 3, Item 2) and set wire (Figure 3, Item 1) aside.

STARTER MOTOR REMOVAL AND INSTALLATION - (CONTINUED)

B230602109

Figure 3. Helper Solenoid Connector.

6. With assistant, remove three bolts and lockwashers (Figure 4, Item 2) from starter (Figure 4, Item 1). One bolt is at top of starter. Discard lockwashers.



B230602106

Figure 4. Starter Bolts.

7. Remove starter (Figure 4, Item 1) from vehicle.

END OF TASK

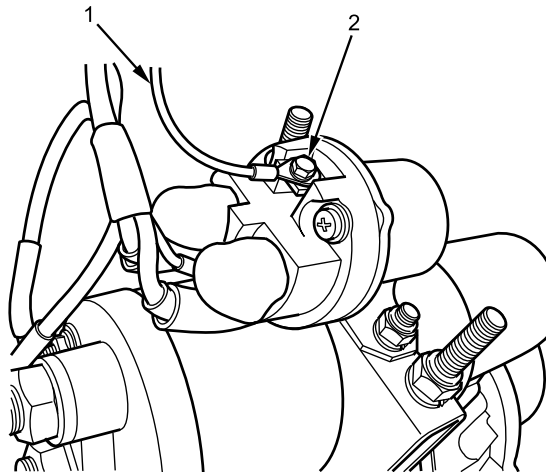
STARTER MOTOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install wire (Figure 5, Item 1) on helper solenoid with bolt (Figure 5, Item 2). Tighten bolt securely.



B230602109

Figure 5. Helper Solenoid Connector.

2. With assistant, install starter with two bolts (Figure 6, Item 2) and new lockwashers. Finger tighten bolts to help support starter (Figure 6, Item 1). Install upper bolt and new lockwasher. Torque all bolts to 120 lb-ft (163 N•m).

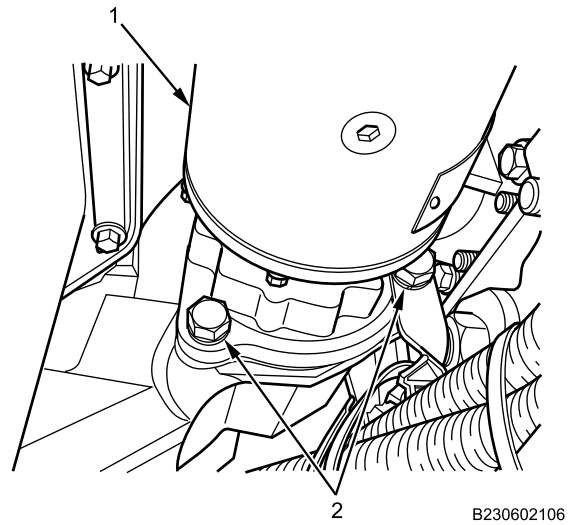
STARTER MOTOR REMOVAL AND INSTALLATION - (CONTINUED)

Figure 6. Starter Bolts.

3. Install wires and nut on B+ post (Figure 7, Item 2) on solenoid. Tighten nut securely.

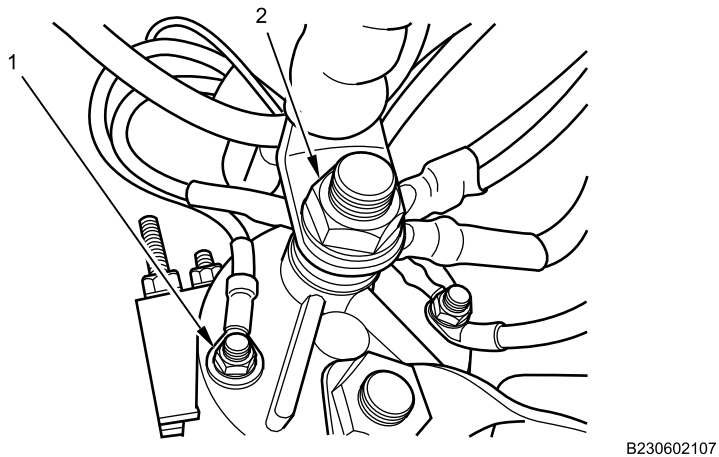


Figure 7. Solenoid Wiring.

4. Install wire and nut on terminal S (Figure 7, Item 1) on solenoid. Tighten nut securely.

STARTER MOTOR REMOVAL AND INSTALLATION - (CONTINUED)

5. Connect starter-to-battery ground cable (Figure 8, Item 5), starter-to-frame ground cable (Figure 8, Item 3), and starter-to-engine ground cable (Figure 8, Item 6) on starter motor ground stud (Figure 8, Item 2) with new lockwasher (Figure 8, Item 4) and nut (Figure 8, Item 1). Tighten nut securely.

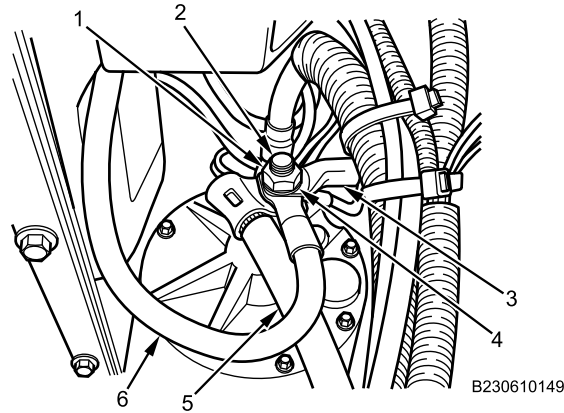


Figure 8. Starter Ground Cable Installation.

6. Install new cable lock straps as necessary.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Install belly armor (WP 0606).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
TRANSMISSION FLUID TEMPERATURE GAUGE AND HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel cluster removed (WP 0297)

Materials/Parts

Grease (WP 0794, Item 27)

References

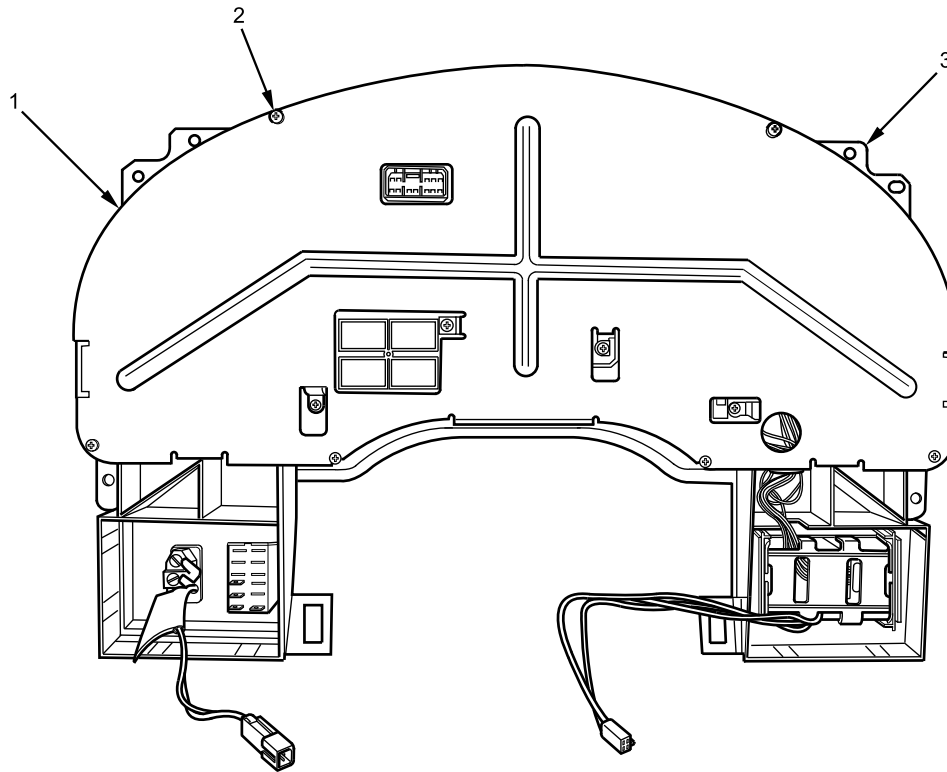
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

TRANSMISSION FLUID TEMPERATURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

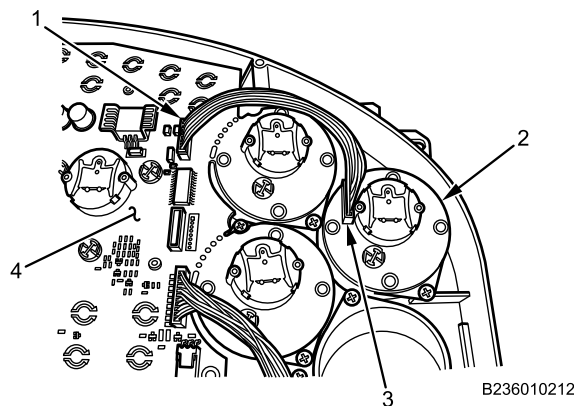
REMOVAL



B236010213

Figure 1. Instrument Panel Cluster Back Cover Removal.

1. Remove 10 instrument panel cluster back cover screws (Figure 1, Item 2) and instrument panel cluster back cover (Figure 1, Item 1).
2. Remove instrument panel cluster back cover (Figure 1, Item 1) from instrument panel cluster (Figure 1, Item 3).



B236010212

Figure 2. Transmission Fluid Temperature Gauge and Harness.

3. Disconnect transmission fluid temperature gauge harness connector (Figure 2, Item 1) from instrument cluster circuit board (Figure 2, Item 4).
4. Disconnect transmission fluid temperature gauge harness connector (Figure 2, Item 3) from transmission fluid temperature gauge (Figure 2, Item 2).

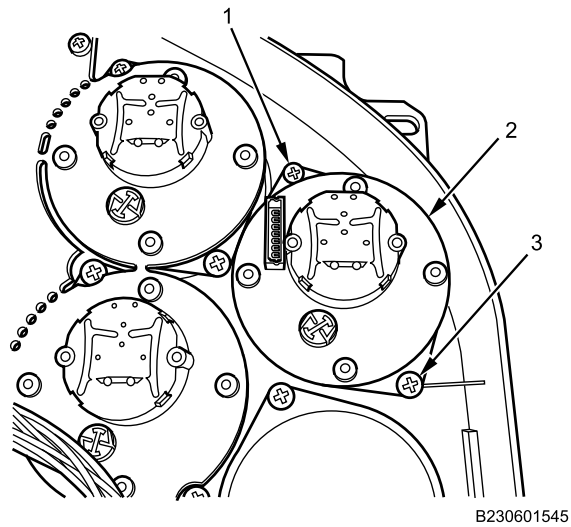
**TRANSMISSION FLUID TEMPERATURE GAUGE AND HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)**

Figure 3. Transmission Fluid Temperature Gauge Removal.

5. Remove two screws (Figure 3, Item 1 and 3) from transmission fluid temperature gauge (Figure 3, Item 2).

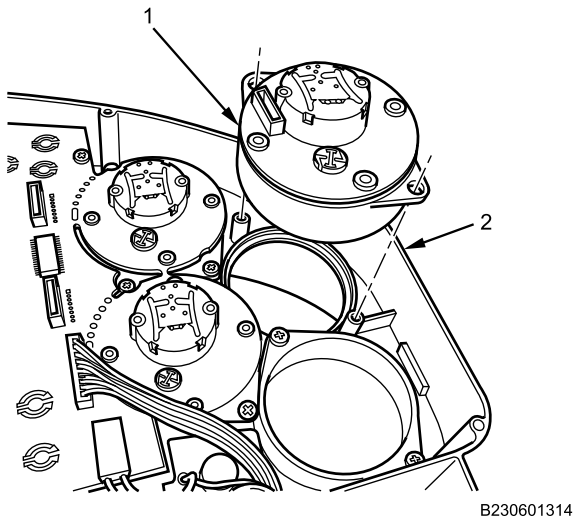


Figure 4. Transmission Fluid Temperature Gauge Removal.

6. Remove transmission fluid temperature gauge (Figure 4, Item 1) from instrument cluster panel (Figure 4, Item 2).

END OF TASK

TRANSMISSION FLUID TEMPERATURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease on all harness connectors before installation.

1. Install transmission fluid temperature gauge (Figure 5, Item 2) on instrument cluster panel with mounting screws (Figure 5, Item 1 and 3). Tighten securely.

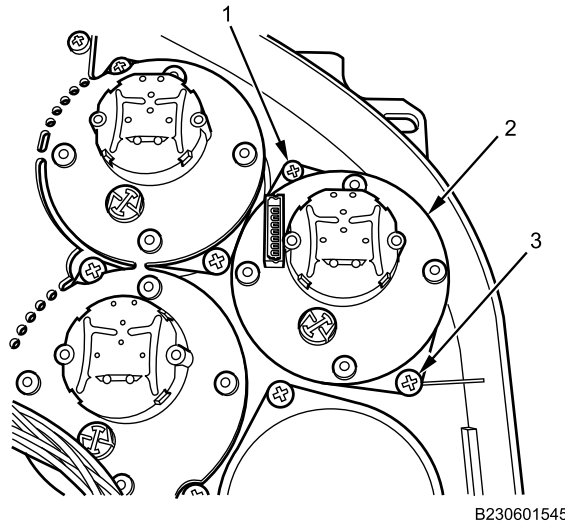


Figure 5. Transmission Fluid Temperature Gauge Installation.

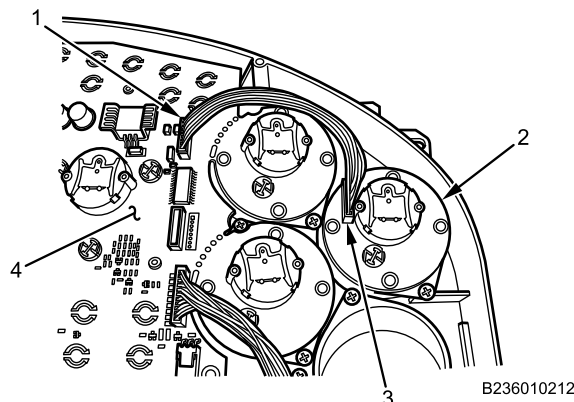
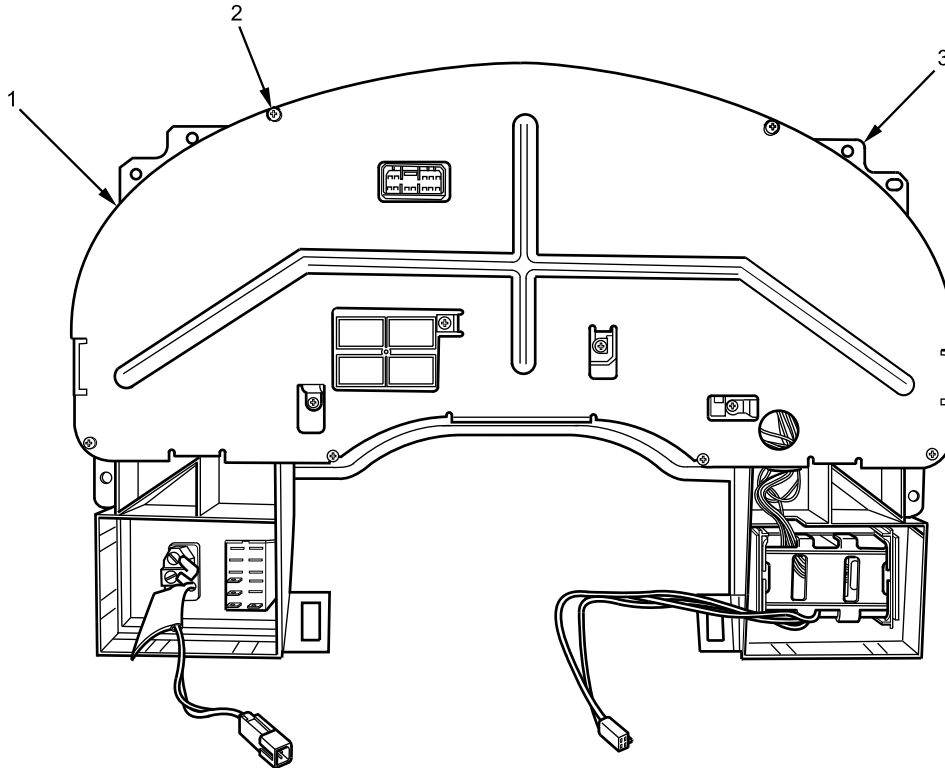


Figure 6. Transmission Fluid Temperature Gauge Harness.

TRANSMISSION FLUID TEMPERATURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

2. Connect transmission fluid temperature gauge harness connector (Figure 6, Item 3) on transmission fluid temperature gauge (Figure 6, Item 2).
3. Connect transmission fluid temperature gauge harness connector (Figure 6, Item 1) on instrument cluster circuit board (Figure 6, Item 4).
4. Install instrument panel cluster back cover (Figure 7, Item 1) on instrument panel cluster (Figure 7, Item 3) with 10 screws (Figure 7, Item 2). Tighten securely.



B236010213

Figure 7. Instrument Panel Cluster Back Cover Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument panel cluster (WP 0297).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify instrument panel cluster operation (TM 9-2355-106-10).
5. Set vehicle parking brake (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR 1 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel cluster removed (WP 0297)

Materials/Parts

Grease (WP 0794, Item 22)

References

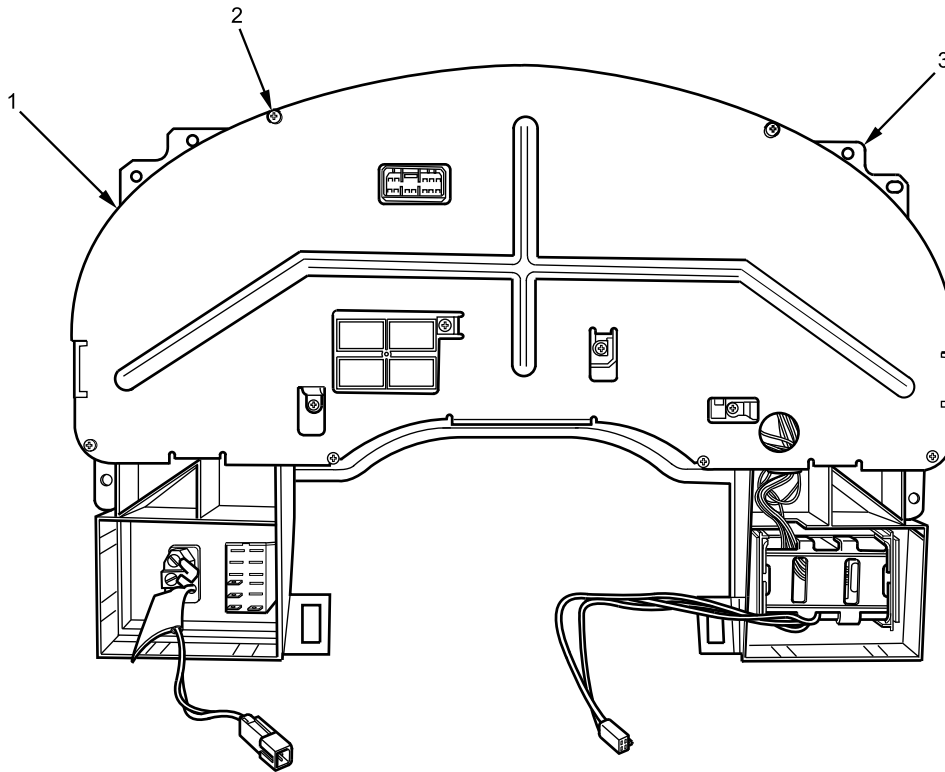
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

AIR 1 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

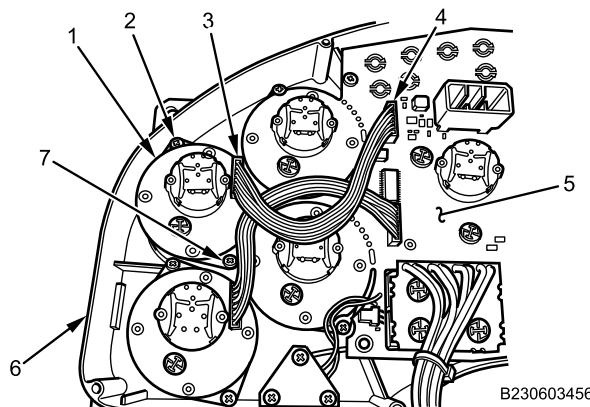
REMOVAL



B236010213

Figure 1. Instrument Panel Cluster Back Cover Removal.

1. Remove 10 screws (Figure 1, Item 2) from instrument panel cluster back cover (Figure 1, Item 1).
2. Remove instrument panel cluster back cover (Figure 1, Item 1) from instrument panel cluster (Figure 1, Item 3).
3. Locate Air 1 pressure gauge (Figure 2, Item 1) and Air 1 pressure gauge harness assembly connectors (Figure 2, Item 3 and 4).



B230603456

Figure 2. Air 1 Pressure Gauge and Harness Removal.

4. Disconnect Air 1 pressure gauge harness connector (Figure 2, Item 4) from instrument cluster circuit board (Figure 2, Item 5).
5. Disconnect Air 1 pressure gauge harness connector (Figure 2, Item 3) from Air 1 pressure gauge (Figure 2, Item 1).
6. Remove two screws (Figure 2, Item 2 and 7) from Air 1 pressure gauge (Figure 2, Item 1).

AIR 1 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

- Remove Air 1 pressure gauge (Figure 2, Item 1) from instrument cluster panel (Figure 2, Item 6).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

- Apply dielectric grease on all harness connectors before installation.
- Install Air 1 pressure gauge (Figure 3, Item 1) on instrument cluster panel (Figure 3, Item 6) with two screws (Figure 3, Item 2 and 7). Tighten securely.

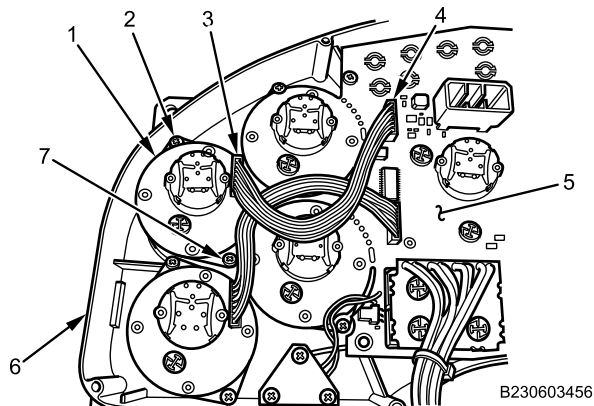
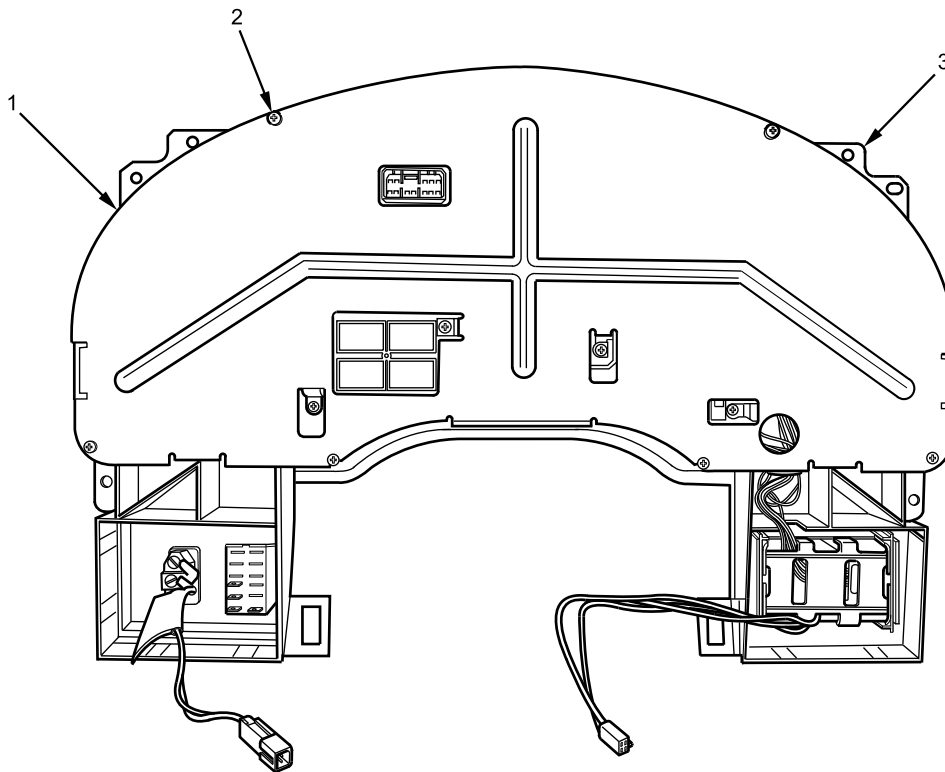


Figure 3. Air 1 Pressure Gauge Installation.

- Connect Air 1 pressure gauge harness connector (Figure 3, Item 3) on Air 1 pressure gauge (Figure 3, Item 1).
- Connect Air 1 pressure gauge harness connector (Figure 3, Item 4) on instrument cluster circuit board (Figure 3, Item 5).

AIR 1 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B236010213

Figure 4. Instrument Panel Cluster Back Cover Installation.

5. Install instrument panel cluster back cover (Figure 4, Item 1) on instrument panel cluster (Figure 4, Item 3) with 10 screws (Figure 4, Item 2). Tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument panel cluster (WP 0297).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify instrument panel cluster operation (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AIR 2 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel cluster removed (WP 0297)

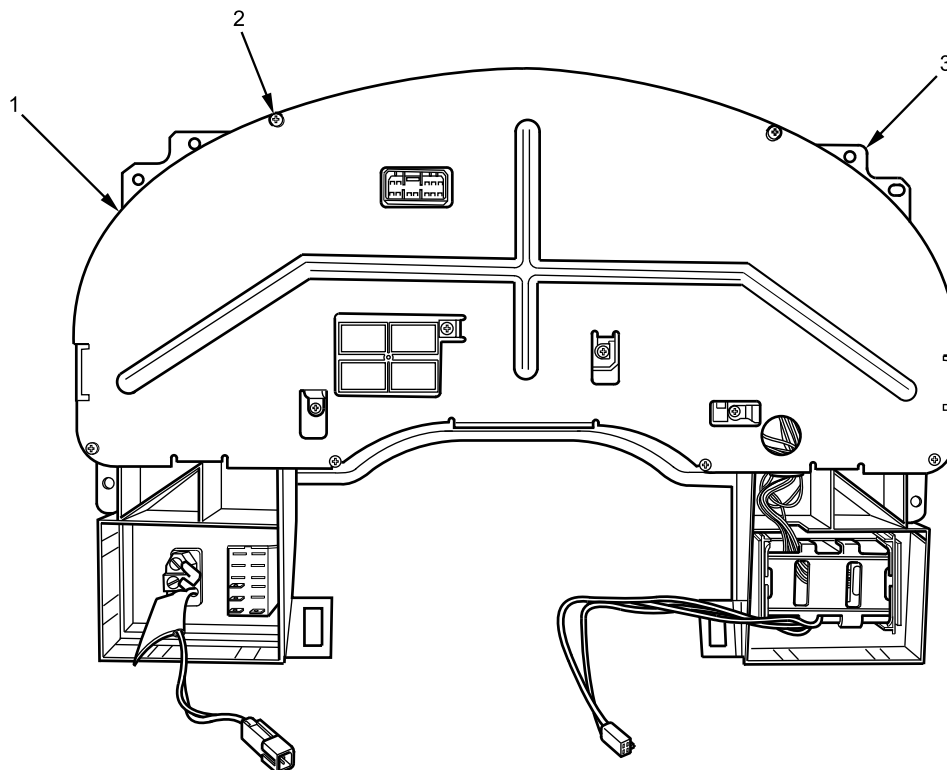
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

AIR 2 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

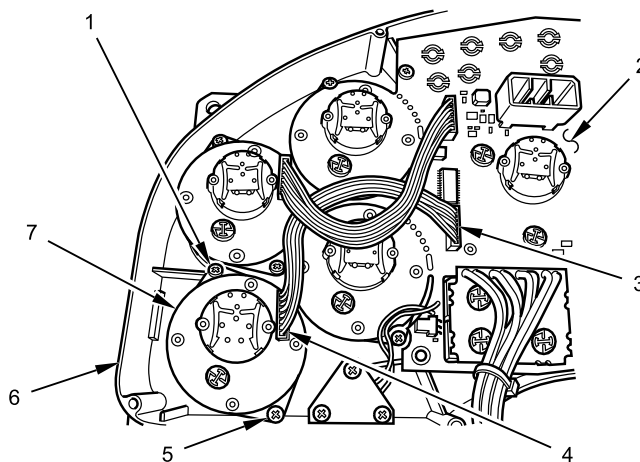
1. Remove 10 screws (Figure 1, Item 2) from instrument panel cluster (Figure 1, Item 3).



B236010213

Figure 1. Instrument Panel Cluster Back Cover Removal.

2. Remove instrument panel cluster back cover (Figure 1, Item 1) from instrument panel cluster (Figure 1, Item 3).
3. Disconnect Air 2 pressure gauge harness connector (Figure 2, Item 3) from instrument cluster circuit board (Figure 2, Item 2).



B230601320

Figure 2. Air 2 Pressure Gauge and Harness.

4. Disconnect Air 2 pressure gauge harness connector (Figure 2, Item 4) from Air 2 pressure gauge (Figure 2, Item 7).

AIR 2 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove two screws (Figure 2, Item 1 and 5) from Air 2 pressure gauge (Figure 2, Item 7).
6. Remove Air 2 pressure gauge (Figure 2, Item 7) from instrument panel cluster (Figure 2, Item 6).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

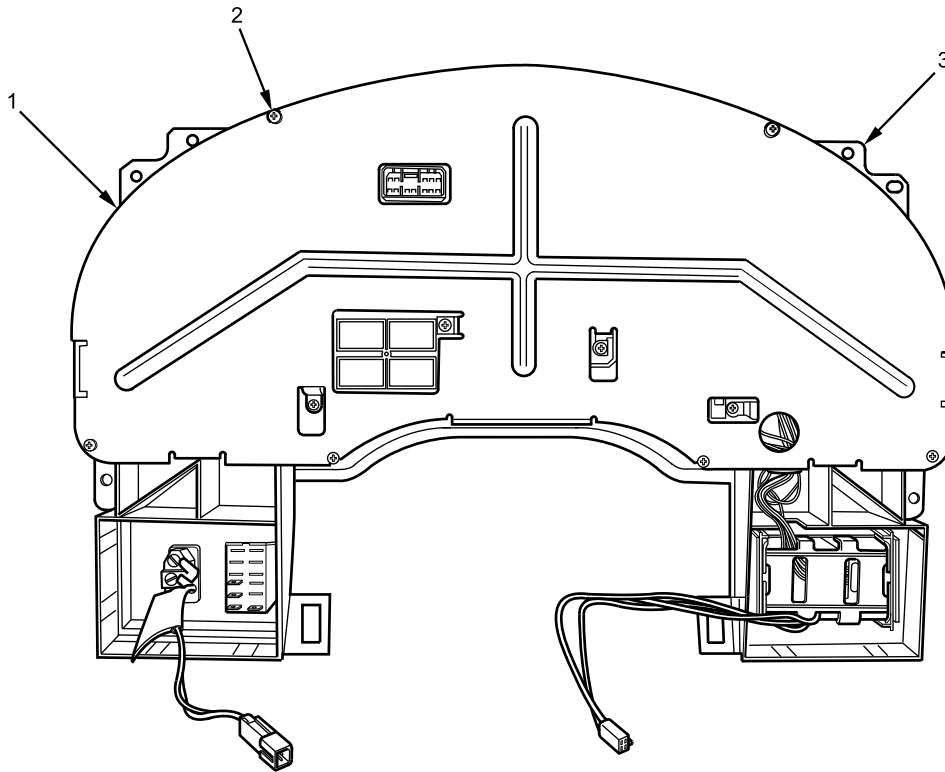
NOTE

Apply dielectric grease on all wiring harness connectors before installation.

1. Install Air 2 pressure gauge (Figure 2, Item 7) on instrument panel cluster (Figure 2, Item 6) with two screws (Figure 2, Item 1 and 5). Tighten securely.
2. Connect Air 2 pressure gauge harness connector (Figure 2, Item 4) on Air 2 pressure gauge (Figure 2, Item 7).
3. Connect Air 2 pressure gauge harness connector (Figure 2, Item 3) on instrument cluster circuit board (Figure 2, Item 2).

AIR 2 PRESSURE GAUGE AND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

4. Install instrument panel cluster back cover (Figure 3, Item 1) on instrument panel cluster (Figure 3, Item 3) with 10 screws (Figure 3, Item 2). Tighten securely.



B236010213

Figure 3. Instrument Panel Cluster Back Cover Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument panel cluster (WP 0297).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify instrument panel cluster operation (TM 9-2355-106-10).
5. Set vehicle parking brake (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MAIN POWER SWITCH REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

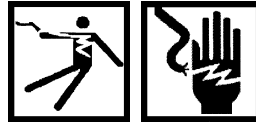
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

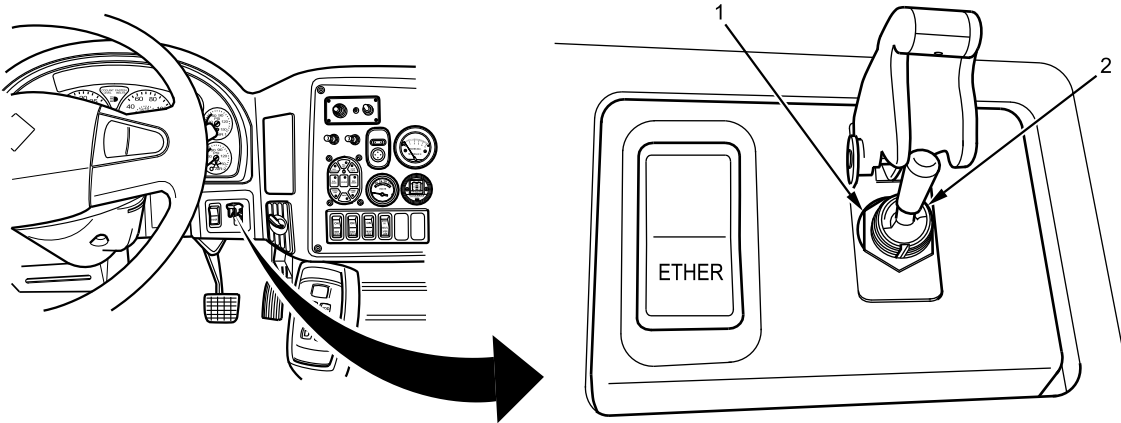
Turn off ignition switch and MAIN POWER switch before performing electrical system maintenance. Failure to comply may result in serious injury or death to personnel.

NOTE

Before removing MAIN POWER switch, note orientation of switch by looking at keyway position.

MAIN POWER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

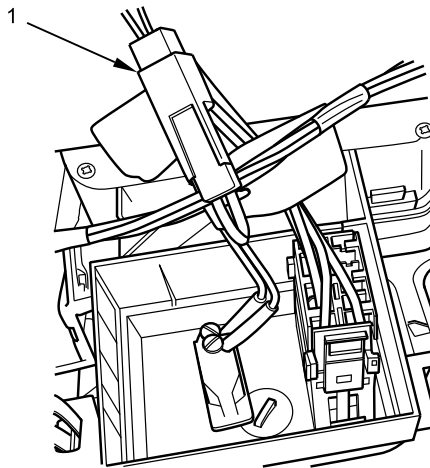
1. Remove nut (Figure 1, Item 1) and lockwasher from front of MAIN POWER switch (Figure 1, Item 2).



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Figure 1. MAIN POWER Switch.

2. Remove MAIN POWER switch (Figure 1, Item 2) from instrument panel (IP).
3. Unplug MAIN POWER switch connector (Figure 2, Item 1) from IP harness.



B230601091

Figure 2. MAIN POWER Switch Wiring.

END OF TASK

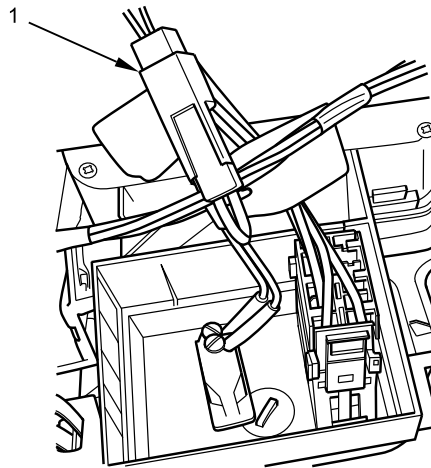
MAIN POWER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Connect MAIN POWER switch connector (Figure 3, Item 1) to IP harness.

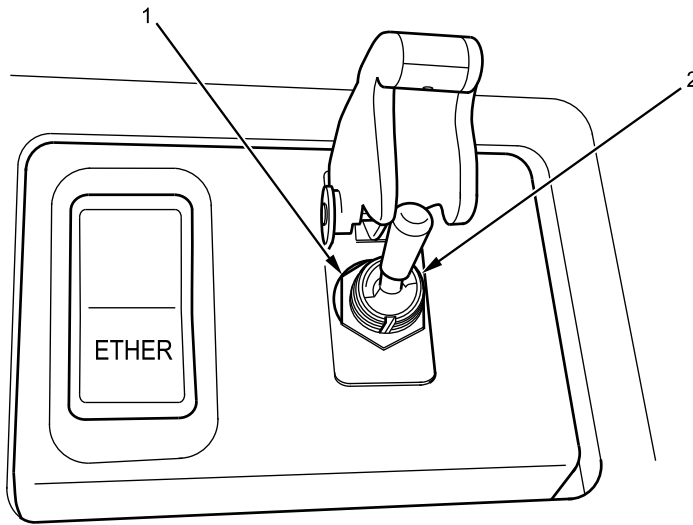


B230601091

Figure 3. MAIN POWER Switch Wiring.

MAIN POWER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

2. Install MAIN POWER switch (Figure 4, Item 2) on IP, ensuring keyway is in down position.



B230601090

Figure 4. MAIN POWER Switch Installation.

3. Install nut (Figure 4, Item 1) and lockwasher on front of MAIN POWER switch (Figure 4, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)
Steering column covers removed (WP 0565)
Instrument panel cluster closeout removed (WP 0578)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove four IP cluster mounting screws (Figure 1, Item 2 through 5) from IP cluster (Figure 1, Item 1).

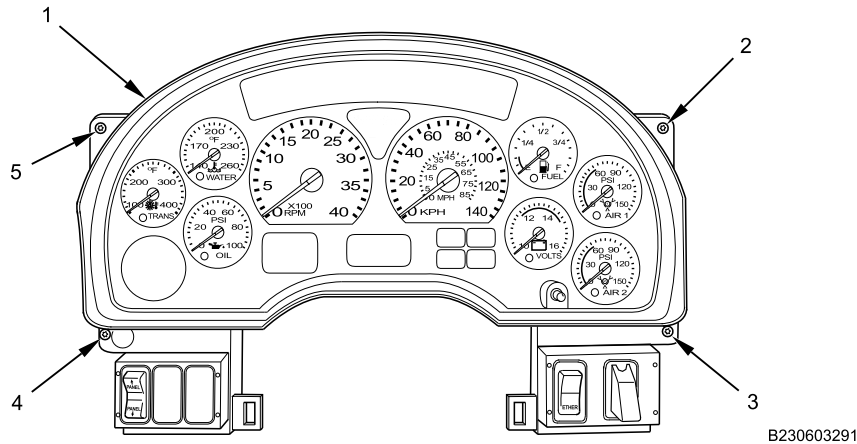


Figure 1. IP Cluster Mounting Screws.

2. Tilt IP cluster (Figure 1, Item 1) towards steering wheel in order to access all harness connections behind IP cluster.

NOTE

Mark and label all wiring for proper installation.

3. Disconnect IP cluster wiring harness connector (Figure 2, Item 1) from IP cluster right side warning panel harness connector (Figure 2, Item 2).

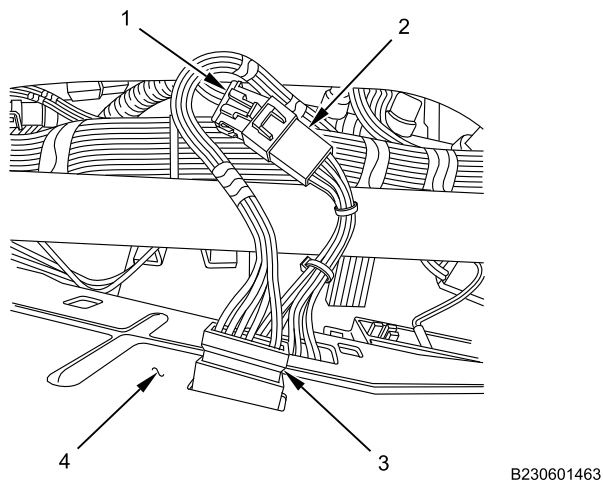
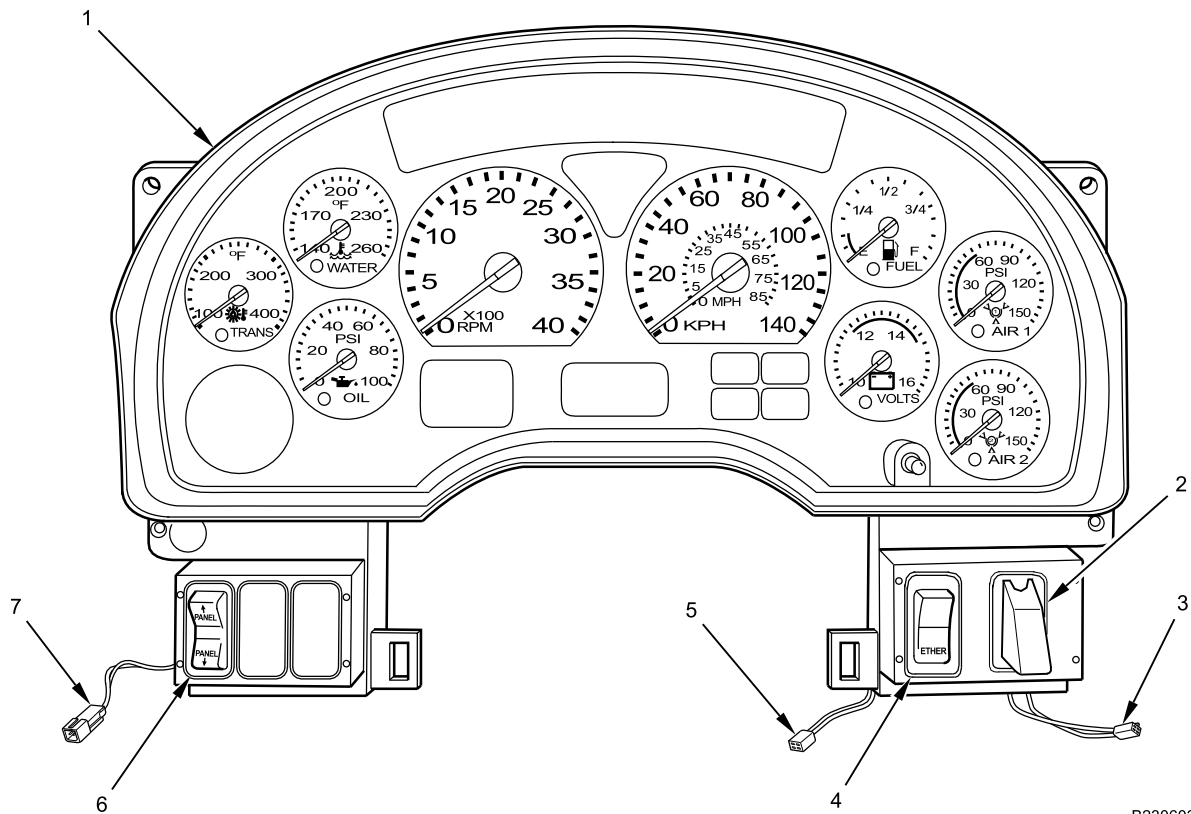


Figure 2. IP Cluster Harness Connections.

4. Disconnect IP cluster wiring harness connector (Figure 2, Item 3) from IP cluster (Figure 2, Item 4).
5. Disconnect IP cluster lower wiring harness connector (Figure 3, Item 3) from battery disconnect switch (Figure 3, Item 2).

INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION - (CONTINUED)



B230603298

Figure 3. Front View IP Cluster.

6. Disconnect IP cluster lower wiring harness connector (Figure 3, Item 5) from ether start switch (Figure 3, Item 4).
7. Disconnect IP cluster lower wiring harness connector (Figure 3, Item 7) from LCD panel dimmer switch (Figure 3, Item 6).
8. Remove IP cluster (Figure 3, Item 1).

END OF TASK

INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

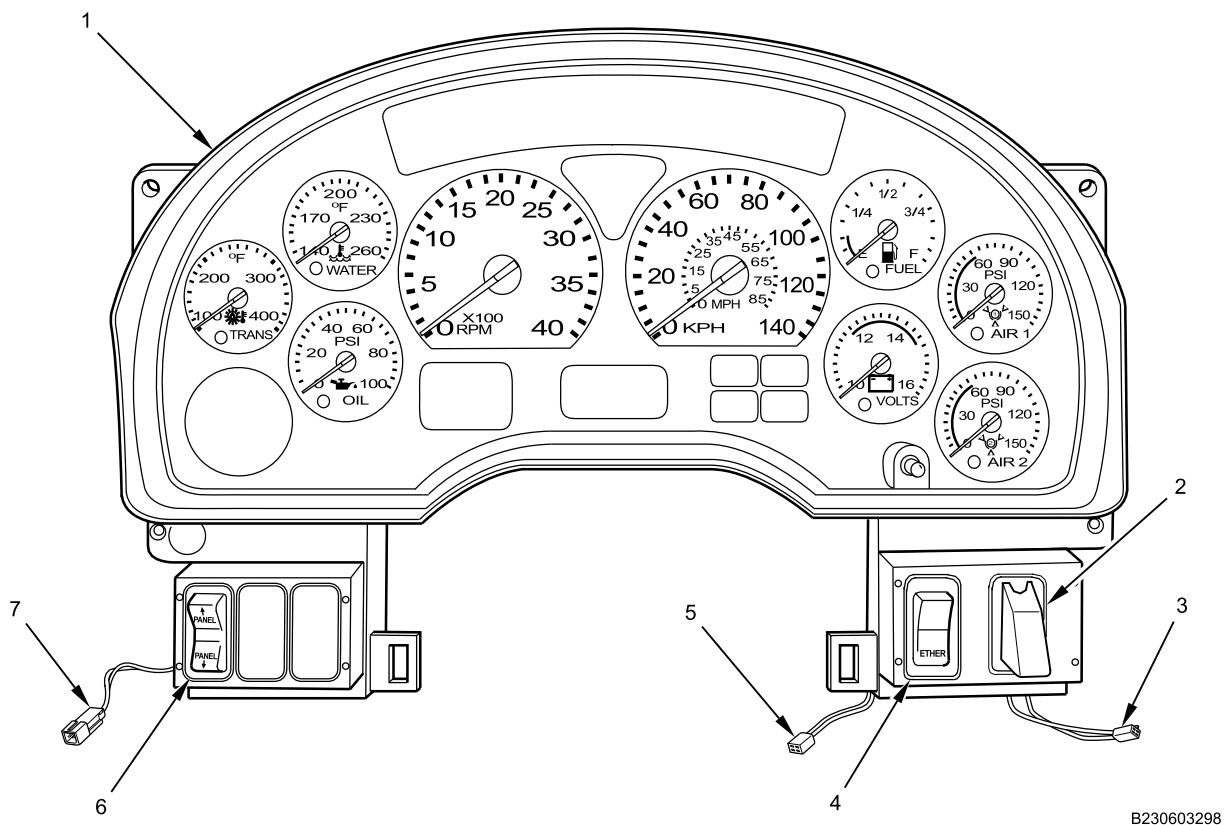
WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Place IP cluster (Figure 4, Item 1) into position in order to connect instrument panel harness connectors.

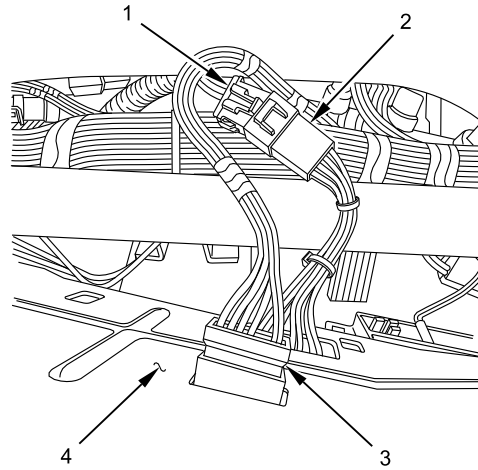


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Figure 4. IP Cluster Harness Connections.

2. Connect IP cluster lower wiring harness connector (Figure 4, Item 7) to LCD panel dimmer switch (Figure 4, Item 6) on IP cluster (Figure 4, Item 1) lower switch panel.
3. Connect IP cluster lower wiring harness connector (Figure 4, Item 5) to ether start switch (Figure 4, Item 4) on IP cluster (Figure 4, Item 1) lower switch panel.
4. Connect IP cluster lower wiring harness connector (Figure 4, Item 3) to battery disconnect switch (Figure 4, Item 2).

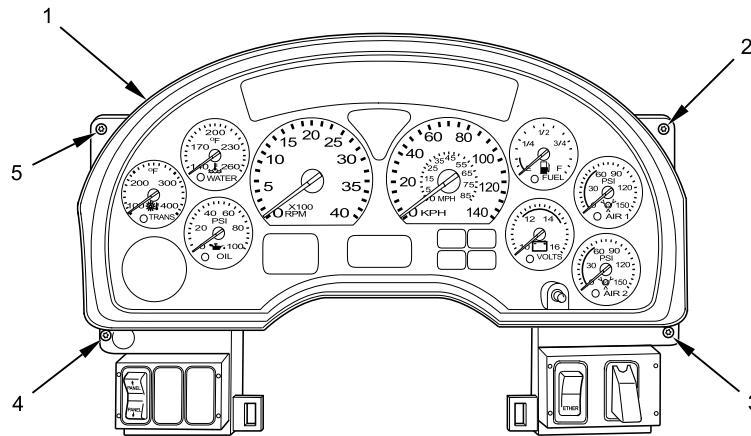
INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION - (CONTINUED)



B230601463

Figure 5. IP Cluster Harness Connections.

5. Apply dielectric grease in wire connectors (Figure 5, Item 1 and 3).
6. Connect IP cluster wiring harness connector (Figure 5, Item 3) to IP cluster (Figure 5, Item 4).
7. Connect IP cluster wiring harness connector (Figure 5, Item 1) on IP cluster right side warning panel harness connector (Figure 5, Item 2).



B230603291

Figure 6. IP Cluster.

8. Install four screws (Figure 6, Item 2 through 5) attaching IP cluster (Figure 6, Item 1) to IP. Tighten cluster screws securely.

END OF TASK

INSTRUMENT PANEL CLUSTER (IPC) REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Remove wheel chocks (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Test-drive vehicle to verify IP cluster operation (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Install steering column covers (WP 0565).
10. Install IP cluster closeout (WP 0578).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INSTRUMENT PANEL CLUSTER (IPC) RIGHT SIDE WARNING PANEL REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel cluster removed (WP 0297)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

INSTRUMENT PANEL CLUSTER (IPC) RIGHT SIDE WARNING PANEL REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove right side warning panel assembly screw (Figure 1, Item 2) and right side warning panel assembly (Figure 1, Item 1) from rear of instrument panel cluster (Figure 1, Item 3).

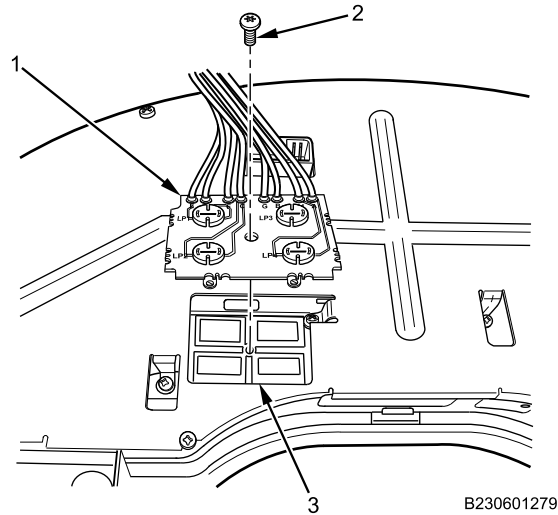


Figure 1. Right Side Warning Panel Assembly.

END OF TASK

INSTALLATION

CAUTION

Warning panel assembly and harness leads must be oriented properly or damage to circuit board will occur.

1. Install right side warning panel assembly (Figure 2, Item 1) on rear of instrument panel cluster (Figure 2, Item 4), with harness leads (Figure 2, Item 3) towards top of instrument panel cluster.

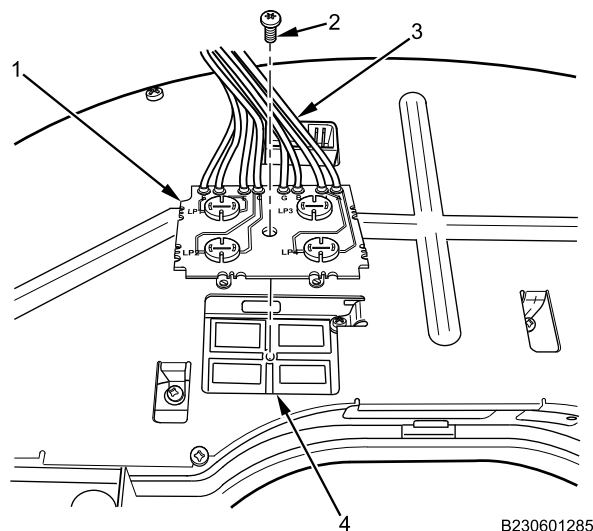


Figure 2. Right Side Warning Panel Assembly.

INSTRUMENT PANEL CLUSTER (IPC) RIGHT SIDE WARNING PANEL REMOVAL AND INSTALLATION - (CONTINUED)

2. Install right side warning panel assembly screw (Figure 2, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument cluster (WP 0297).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify instrument cluster operation.
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Instrument panel cluster removed (WP 0297)

Instrument panel cluster right side warning panel
removed (WP 0298)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

CAUTION

Care must be used in order to eliminate possible damage to circuit board when removing bulb assembly.

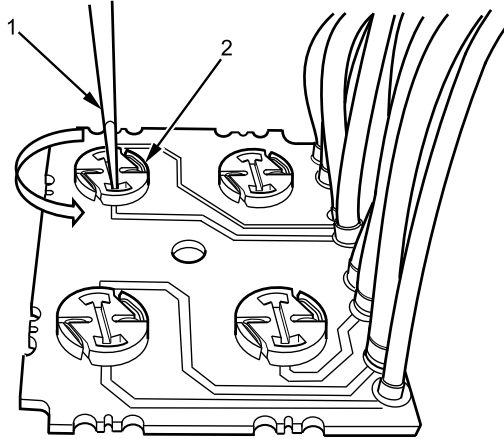
NOTE

The procedure for removing any gauge illumination bulb is the same. Only one bulb removal is shown.

INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

WARNING LIGHT BULB REMOVAL

1. Using a flat bladed tool (Figure 1, Item 1) rotate bulb assembly base socket (Figure 1, Item 2) counterclockwise and remove warning light bulb.

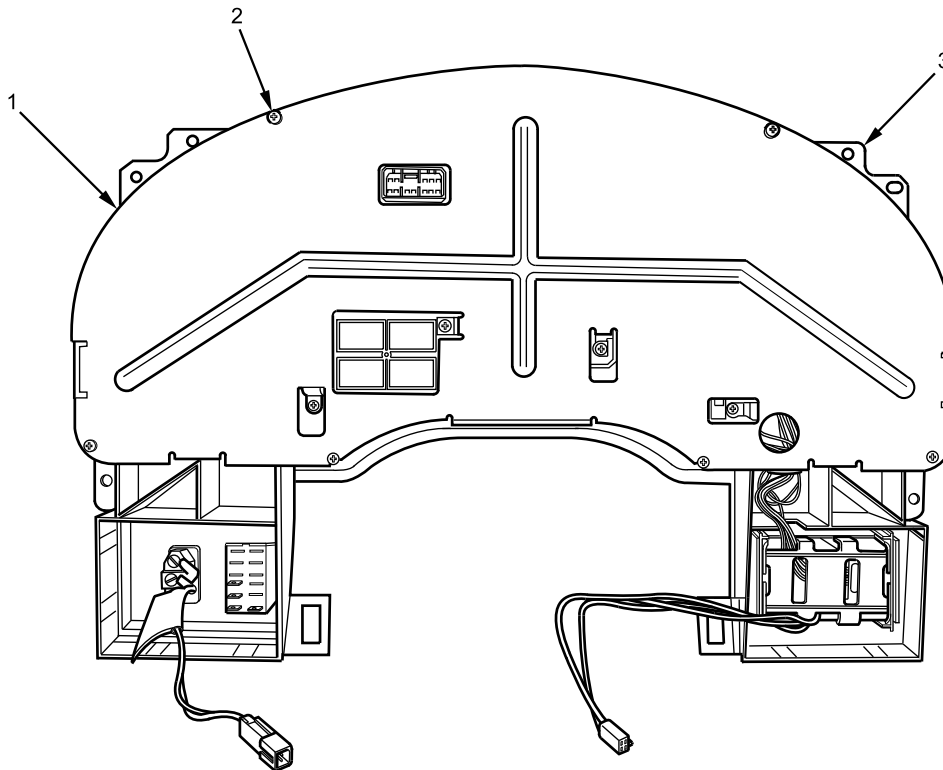


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Figure 1. Warning Light Bulb Removal.

END OF TASK

GAUGE ILLUMINATION BULB REMOVAL



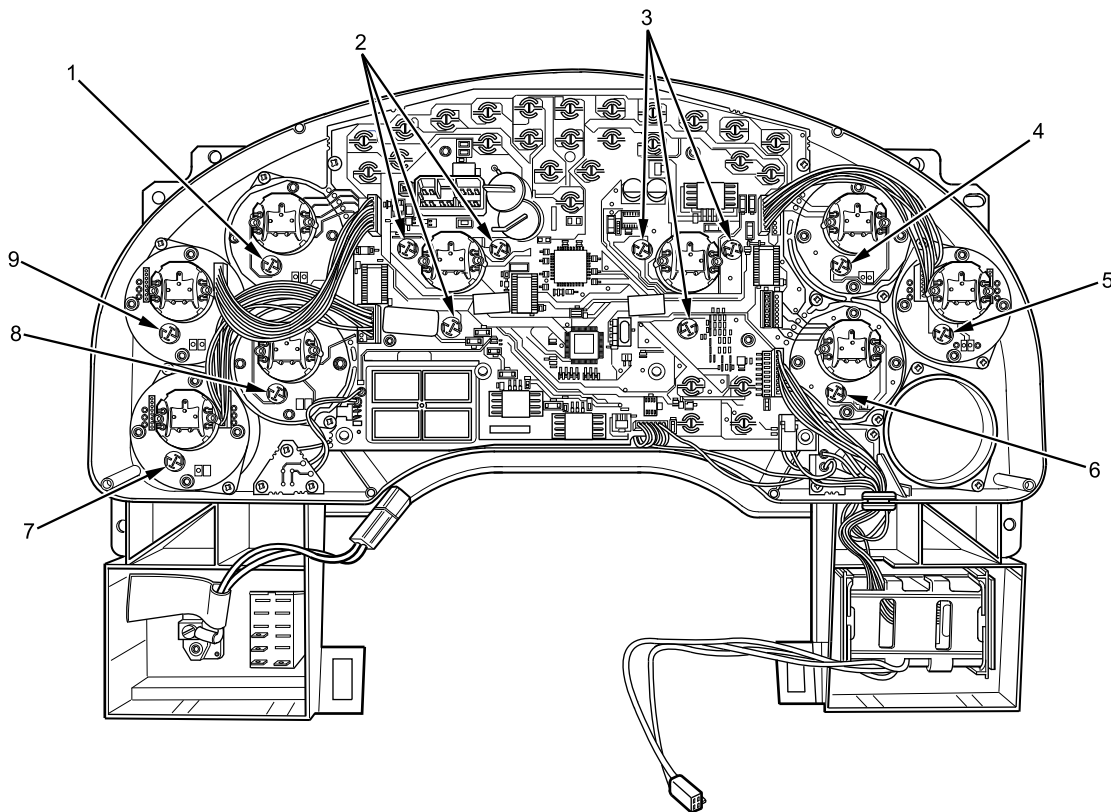
B236010213

Figure 2. Instrument Panel Cluster Back Cover Removal.

1. Remove 10 screws (Figure 2, Item 2) from instrument panel cluster (Figure 2, Item 3).

INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

2. Remove instrument panel cluster back cover (Figure 2, Item 1) from instrument panel cluster (Figure 2, Item 3).
3. Identify illumination bulb to be removed, using the following list:
 - a. Fuel level (Figure 3, Item 1)
 - b. Speedometer (Figure 3, Item 2)
 - c. Tachometer (Figure 3, Item 3)
 - d. Water temperature (Figure 3, Item 4)
 - e. Transmission fluid temperature (Figure 3, Item 5)
 - f. Oil pressure (Figure 3, Item 6)
 - g. Air 2 pressure (Figure 3, Item 7)
 - h. Voltmeter (Figure 3, Item 8)
 - i. Air 1 pressure (Figure 3, Item 9)



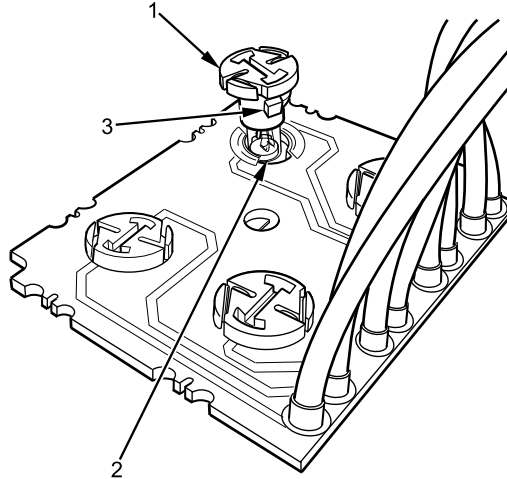
B236010214

Figure 3. Serviceable Gauge Bulb Identification.

END OF TASK

INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)**WARNING LIGHT BULB INSTALLATION**

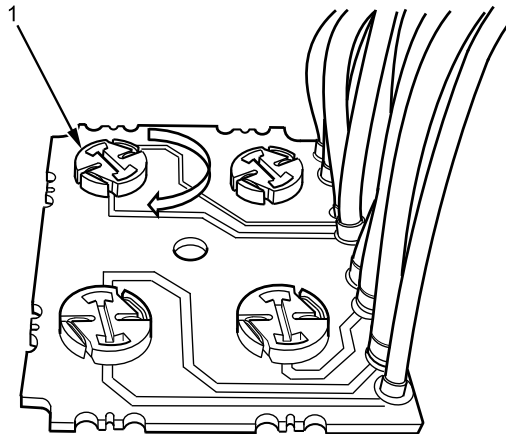
1. Align tabs (Figure 4, Item 3) in bulb assembly (Figure 4, Item 1) with notches in circuit board (Figure 4, Item 2) and install bulb assembly.



B230601283

Figure 4. Right Side Warning Panel Bulb Installation.

2. Rotate bulb assembly base socket (Figure 5, Item 1) clockwise to install.



B230603461

Figure 5. Warning Light Bulb Installation.

END OF TASK

INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)**GAUGE ILLUMINATION BULB INSTALLATION**

1. Align tabs (Figure 6, Item 2) in bulb assembly (Figure 6, Item 1) with notches in circuit board (Figure 6, Item 3) and install bulb assembly.

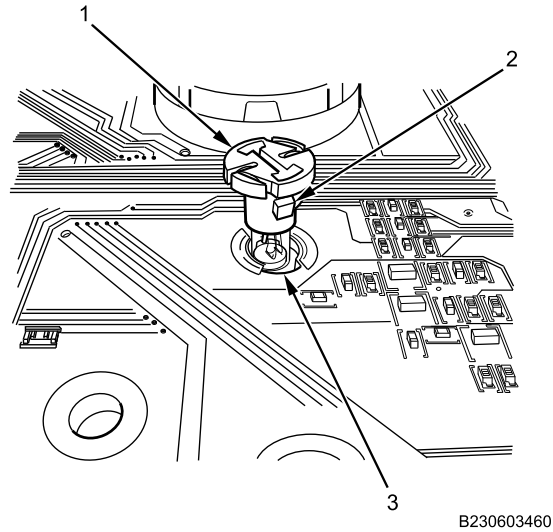


Figure 6. Bulb Installation.

2. Rotate bulb assembly base socket (Figure 7, Item 1) clockwise to install.

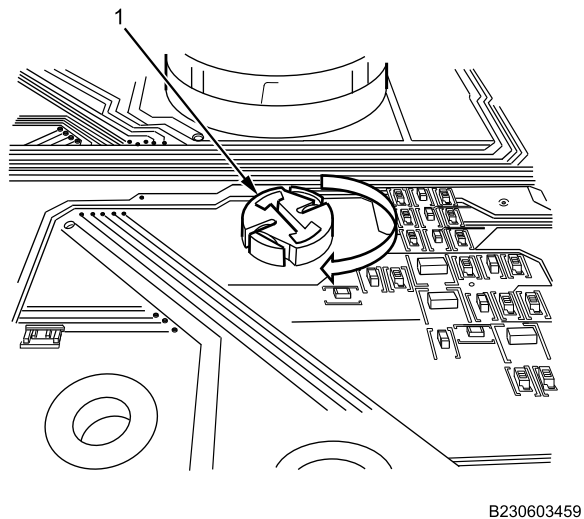
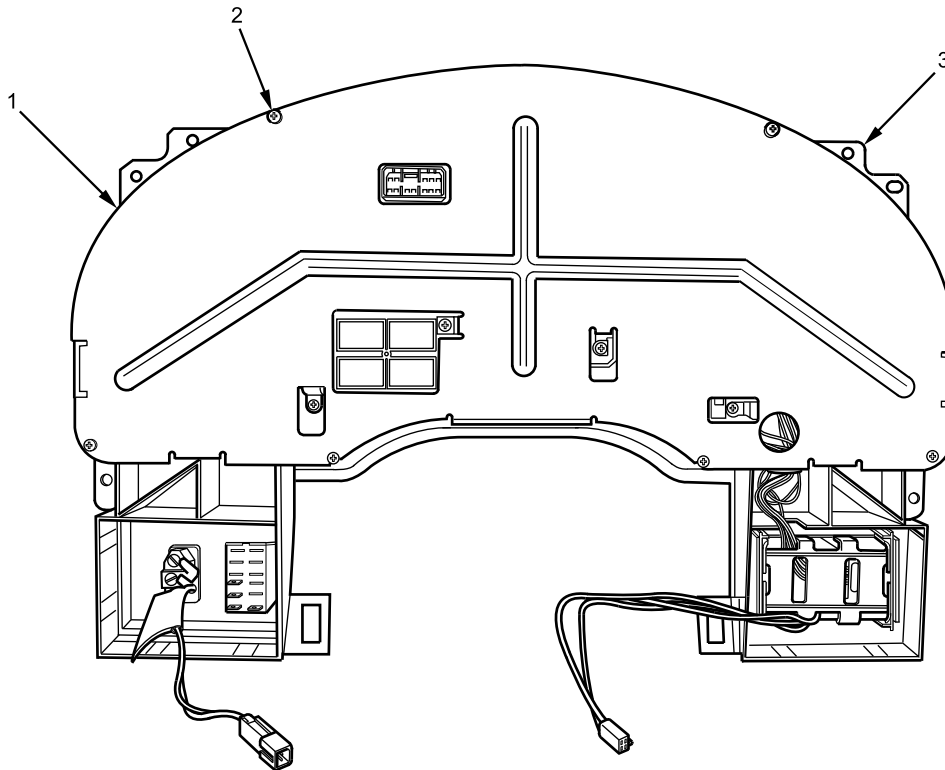


Figure 7. Bulb Installation.

INSTRUMENT PANEL (IP) LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

3. Install instrument panel cluster back cover (Figure 8, Item 1) on instrument panel cluster (Figure 8, Item 3) with 10 screws (Figure 8, Item 2). Tighten securely.



B236010213

Figure 8. Instrument Panel Cluster Back Cover Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument panel cluster right side warning panel (WP 0298).
2. Install instrument panel cluster (WP 0297).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify instrument cluster operation (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

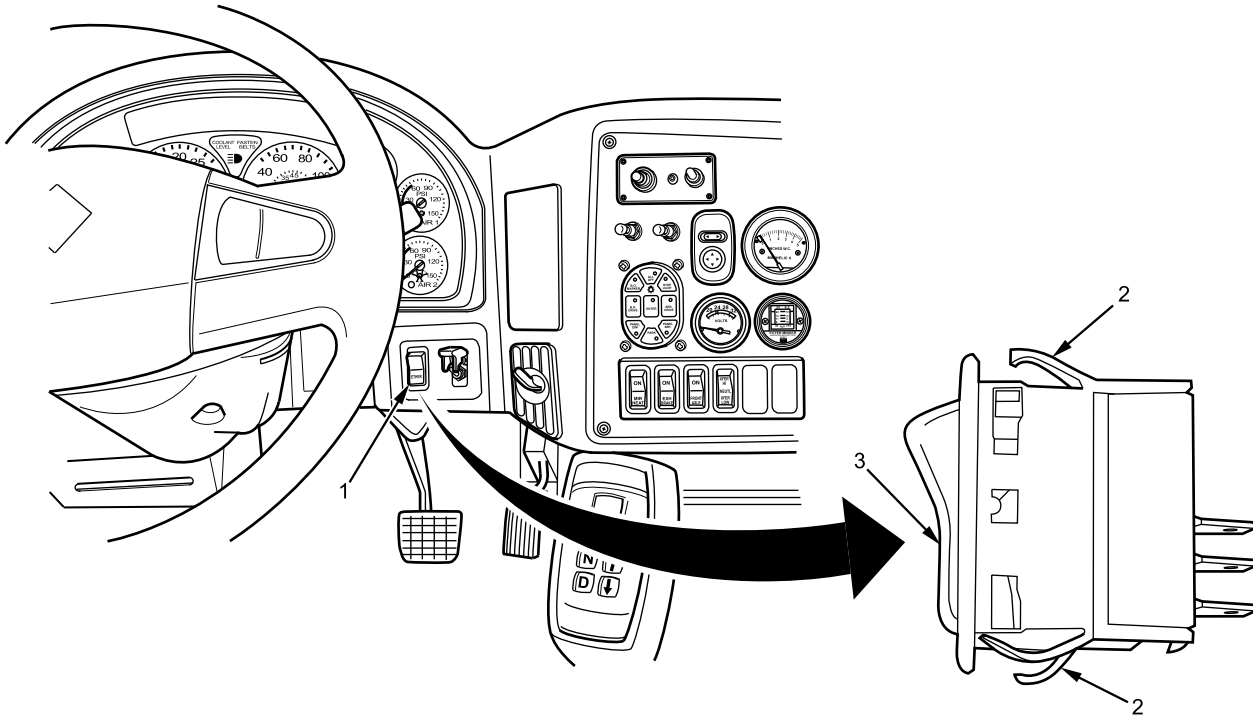
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel Cluster (IPC) removed (WP 0297)

REMOVAL**WARNING**

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

1. Pinch ether start switch retaining tabs (Figure 1, Item 2) together and push ether start switch (Figure 1, Item 3) through front of IP cluster (Figure 1, Item 1).



B230604934

Figure 1. Ether Start Switch.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. From front of IP cluster, push ether start switch (Figure 2, Item 1) in IP cluster opening until flush with panel.

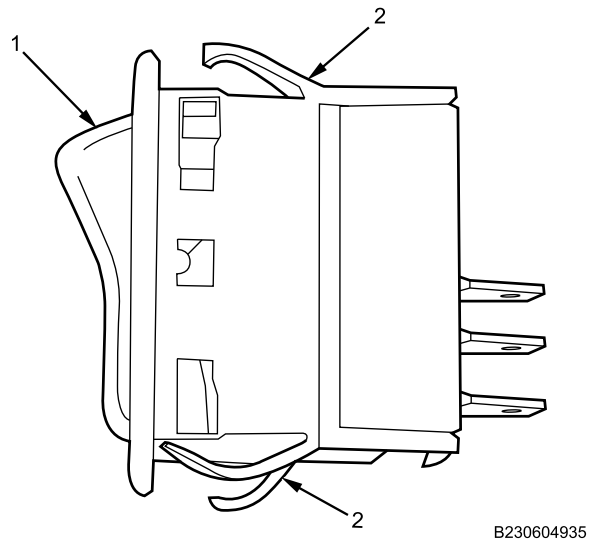
ETHER COLD START THERMOSTATIC SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Ether Start Switch.

2. Ensure ether switch retaining tabs (Figure 2, Item 2) are locked in position.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IPC (WP 0297).
2. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ROCKER SWITCH REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
DIN Removal Tools (2504954C1) (WP 0795, Item
28)

TM 9-2355-106-23P
WP 0782

Equipment Condition

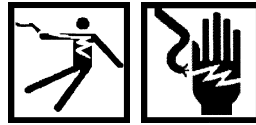
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10

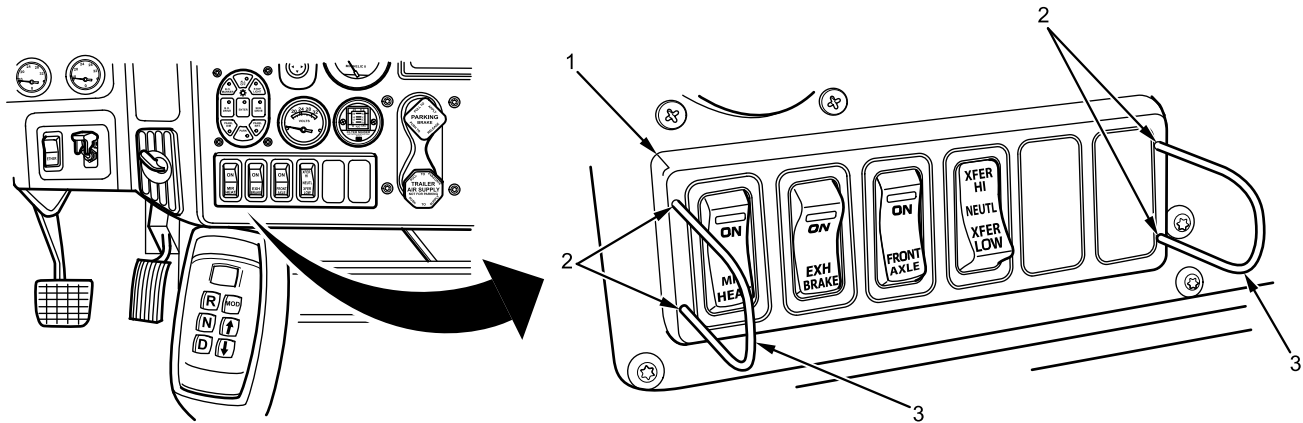
WARNING

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ROCKER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

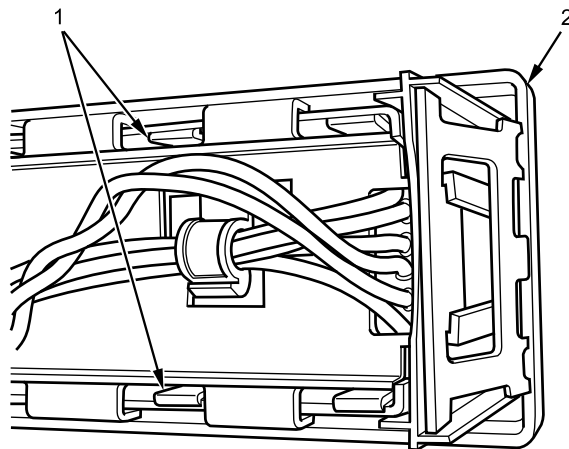
1. Insert DIN tool (Figure 1, Item 3) into holes (Figure 1, Item 2) of rocker switch panel assembly (Figure 1, Item 1) to disengage retainers.



B230606007

Figure 1. Rocker Switch Panel Assembly Removal.

2. Remove rocker switch panel assembly (Figure 1, Item 1) from instrument panel (IP) opening, leave electrical connectors connected.
3. Remove DIN tool (Figure 1, Item 3) from holes (Figure 1, Item 2) of rocker switch panel assembly (Figure 1, Item 1).
4. Squeeze retainers (Figure 2, Item 1) to disengage rocker switch from rocker switch panel assembly (Figure 2, Item 2).

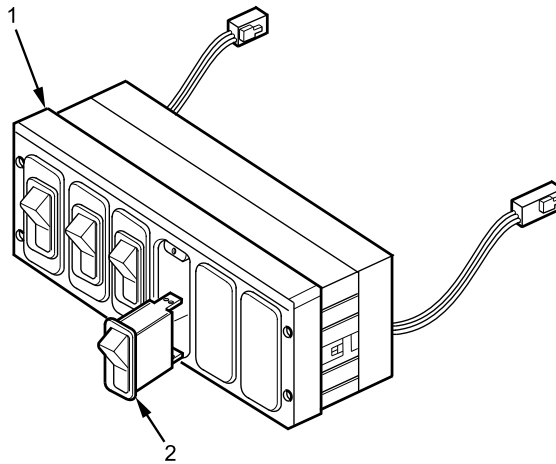


B230606016

Figure 2. Rocker Switch Retainers.

ROCKER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

5. Pull rocker switch (Figure 3, Item 2) from rocker switch panel assembly (Figure 3, Item 1).



B230603005

Figure 3. Rocker Switch Removal.

END OF TASK

INSTALLATION

WARNING



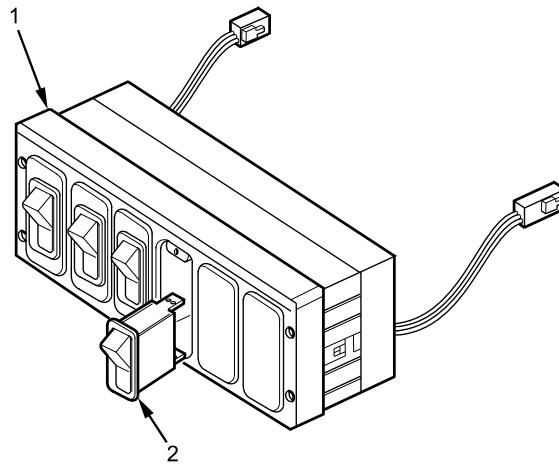
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

ROCKER SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

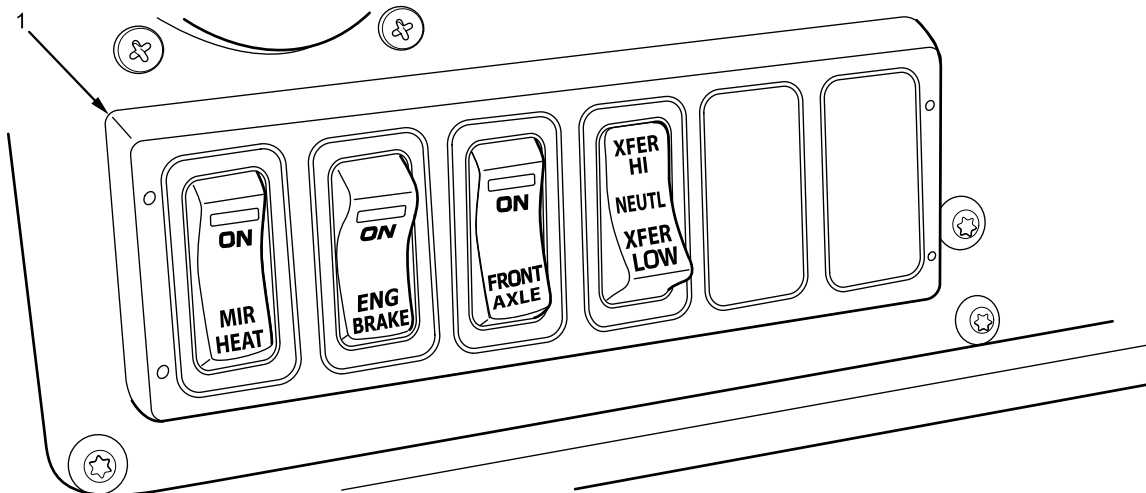
1. Position rocker switch (Figure 4, Item 2) to rocker switch panel assembly (Figure 4, Item 1) and push in to engage retainers.



B230603005

Figure 4. Rocker Switch Installation.

2. Push panel assembly (Figure 5, Item 1) inward to engage retainers.



B230606017

Figure 5. Rocker Switch Panel Assembly Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify rocker switch operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

KEYLESS IGNITION SWITCH REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

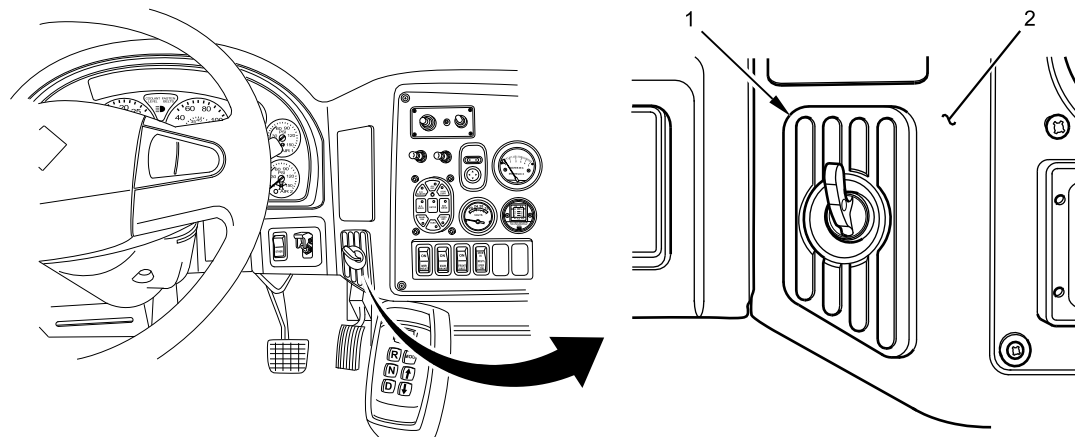
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove keyless ignition switch cover (Figure 1, Item 1) by pulling away from instrument panel (IP) (Figure 1, Item 2).

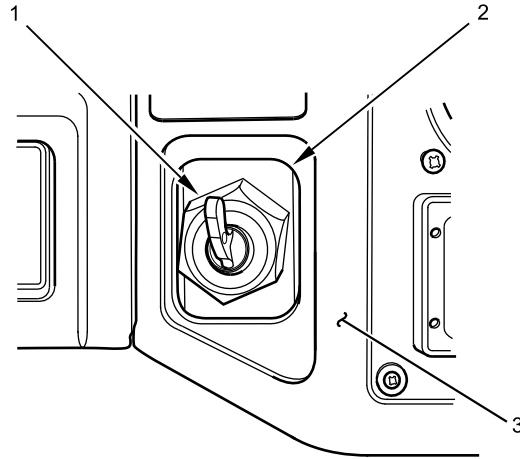


B230606083

Figure 1. Keyless Ignition Switch Cover.

KEYLESS IGNITION SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

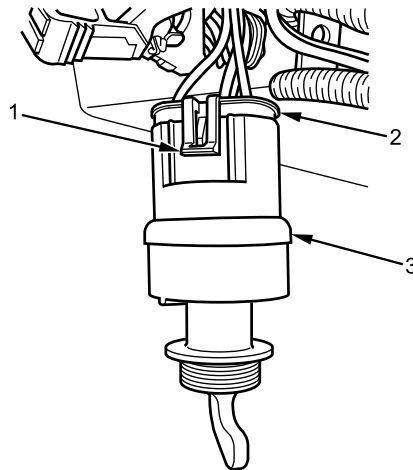
2. Remove nut (Figure 2, Item 1) from front of keyless ignition switch (Figure 2, Item 2).
3. Remove keyless ignition switch (Figure 2, Item 2) from IP (Figure 2, Item 3).



B230603314

Figure 2. Keyless Ignition Switch Nut.

4. Lift retainer (Figure 3, Item 1) while pulling out on connector (Figure 3, Item 2) to remove from keyless ignition switch (Figure 3, Item 3).



B230601259

Figure 3. Keyless Ignition Switch Wiring.

END OF TASK

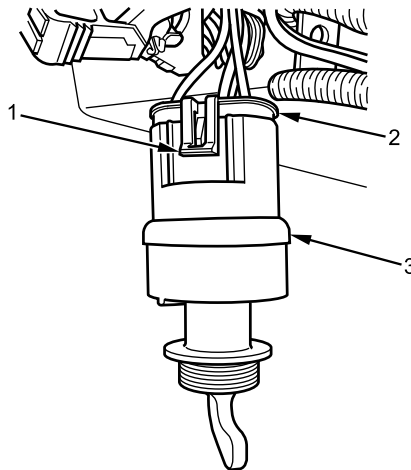
KEYLESS IGNITION SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Connect keyless ignition switch connector (Figure 4, Item 2) to keyless ignition switch (Figure 4, Item 3).



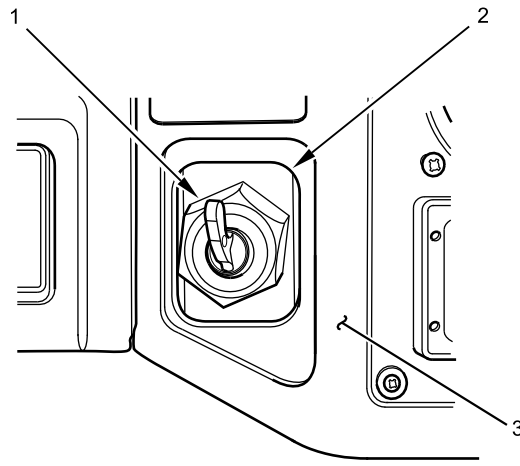
B230601259

Figure 4. Keyless Ignition Switch Wiring.

2. Ensure connection retainer (Figure 4, Item 1) is fully engaged on keyless ignition switch (Figure 4, Item 3).

KEYLESS IGNITION SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

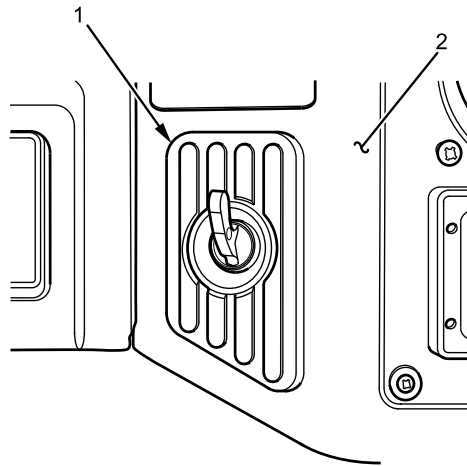
3. Install keyless ignition switch (Figure 5, Item 2) on IP (Figure 5, Item 3).



B230603314

Figure 5. Keyless Ignition Switch Installation.

4. Install nut (Figure 5, Item 1) on front of keyless ignition switch (Figure 5, Item 2) and tighten securely.
5. Install keyless ignition switch cover (Figure 6, Item 1) by pressing into IP (Figure 6, Item 2).



B230603313

Figure 6. Keyless Ignition Switch Cover.

END OF TASK

KEYLESS IGNITION SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine to verify repair (TM 9-2355-106-10).
4. Shut off engine (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

MASTER VEHICLE LIGHT SWITCH (MVLS) REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

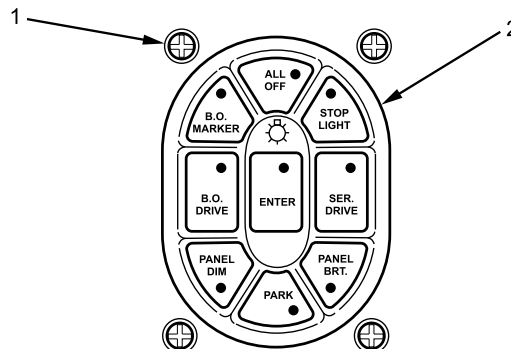
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel (IP) center trim panel removed
(WP 0581)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove four screws (Figure 1, Item 1) securing MVLS (Figure 1, Item 2) to IP center trim panel.



B230600255

Figure 1. MVLS.

2. Remove MVLS from IP center trim panel.

END OF TASK

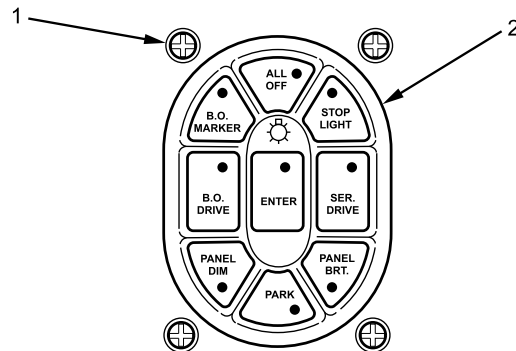
MASTER VEHICLE LIGHT SWITCH (MVLS) REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position MVLS (Figure 2, Item 2) on IP center trim panel.



B230600255

Figure 2. MVLS Installation.

2. Install screws (Figure 2, Item 1) securing MVLS to IP and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify MVLS operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
24V GAUGE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) center trim panel removed
(WP 0581)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Mark or tag all wires for proper installation.

24V GAUGE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove bulb socket (Figure 1, Item 1) by pulling outward.

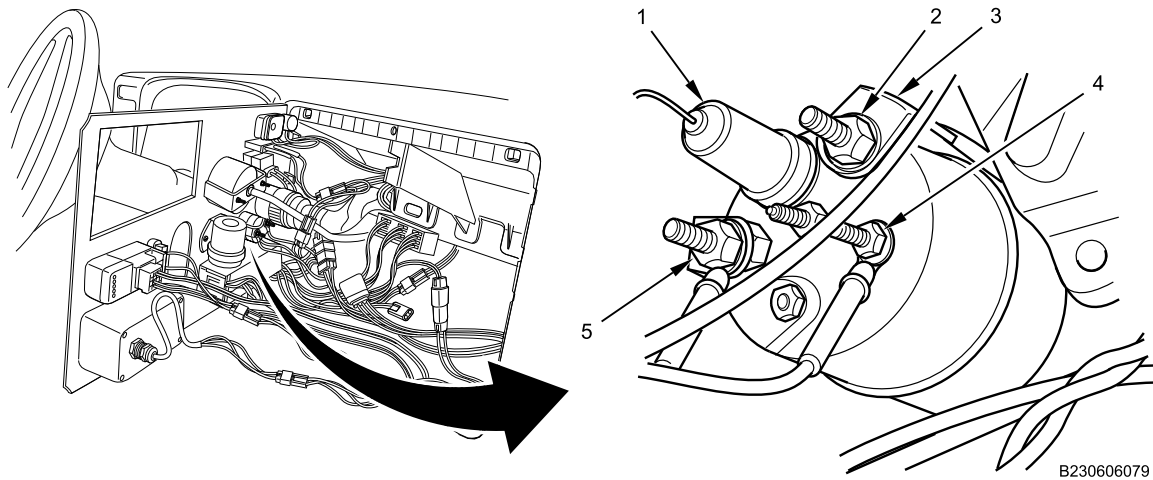


Figure 1. 24V Gauge Removal.

2. Remove nuts (Figure 1, Item 4 and 5) securing electrical connectors to 24V gauge.
3. Remove nut (Figure 1, Item 2) securing 24V gauge retainer (Figure 1, Item 3).
4. Remove 24V gauge (Figure 2, Item 1) from IP.

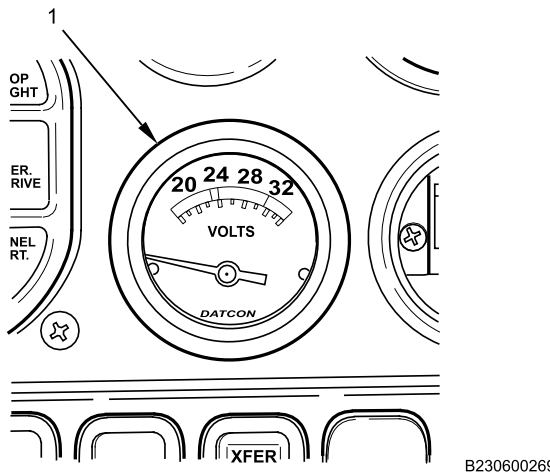


Figure 2. 24V Gauge Front.

END OF TASK

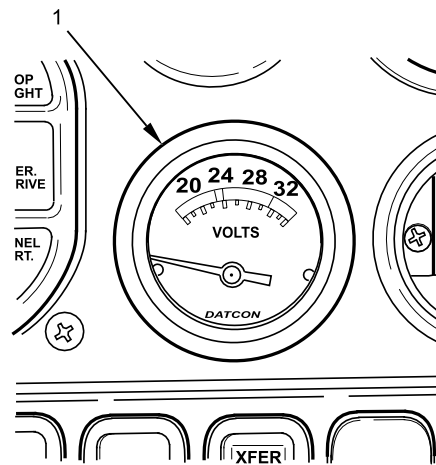
24V GAUGE REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position 24V gauge (Figure 3, Item 1) into IP.



B230600269

Figure 3. 24V Gauge Front.

24V GAUGE REMOVAL AND INSTALLATION - (CONTINUED)

2. Install retainer (Figure 4, Item 3) on rear of 24V gauge.

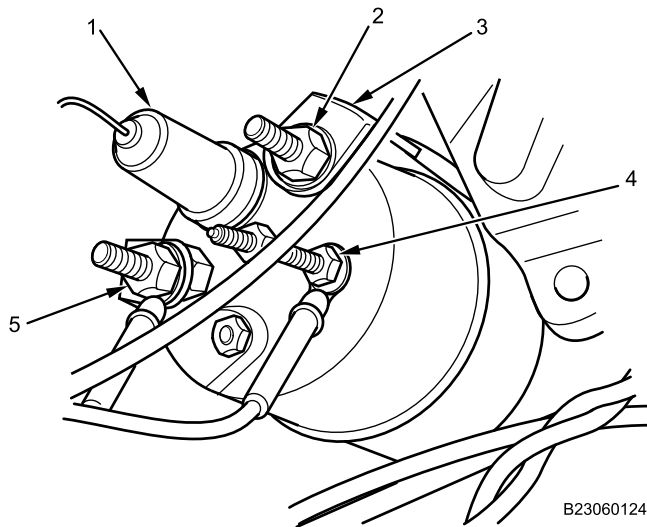


Figure 4. 24V Gauge Installation.

3. Install nut (Figure 4, Item 2) securing 24V gauge to retainer and tighten securely.
4. Install nuts (Figure 4, Item 4 and 5) securing electrical connectors to 24V gauge and tighten securely.
5. Install bulb socket (Figure 4, Item 1) by pushing into gauge.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify gauge operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**24V GAUGE BULB REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 2355-106-23P
WP 0786

WP 0782

Equipment Condition

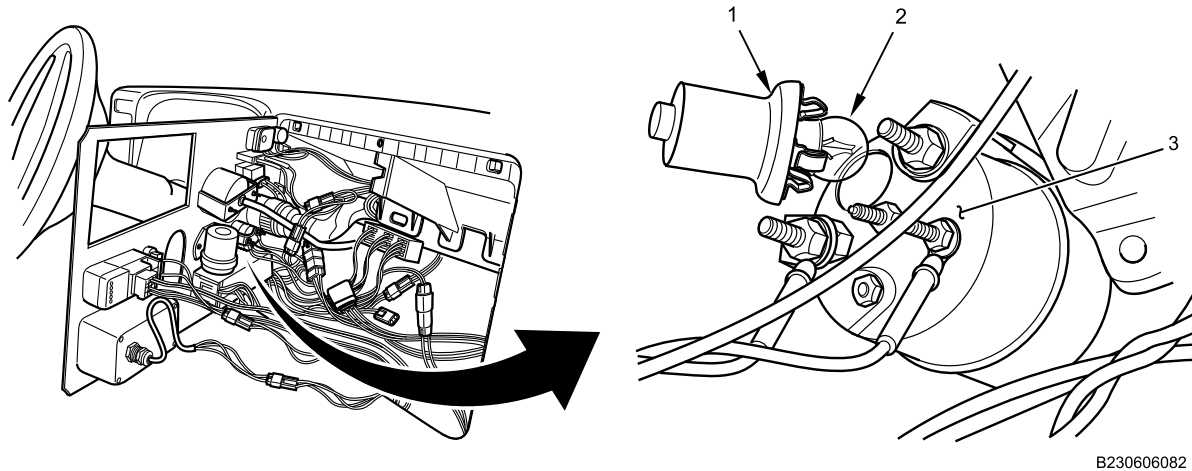
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) center trim panel removed
(WP 0581)

WARNING

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24V GAUGE BULB REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove socket (Figure 1, Item 1) by pulling outward from 24V gauge (Figure 1, Item 3).



B230606082

Figure 1. 24V Gauge Bulb Removal.

2. Remove bulb (Figure 1, Item 2) from socket (Figure 1, Item 1).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to bulb contacts.

1. Install bulb (Figure 2, Item 2) on socket (Figure 2, Item 1).

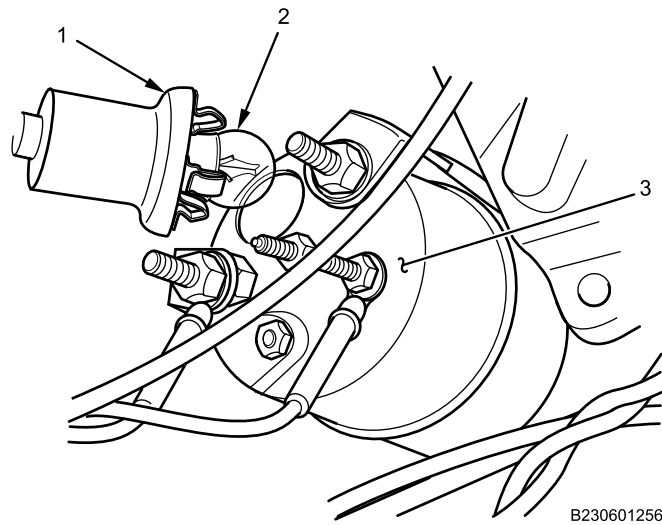
24V GAUGE BULB REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. 24V Gauge Bulb Installation.

2. Position socket (Figure 2, Item 1) on 24V gauge (Figure 2, Item 3) and push toward gauge until flush.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify bulb operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**MIRROR REMOTE CONTROL SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Instrument panel (IP) center trim panel removed
(WP 0581)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

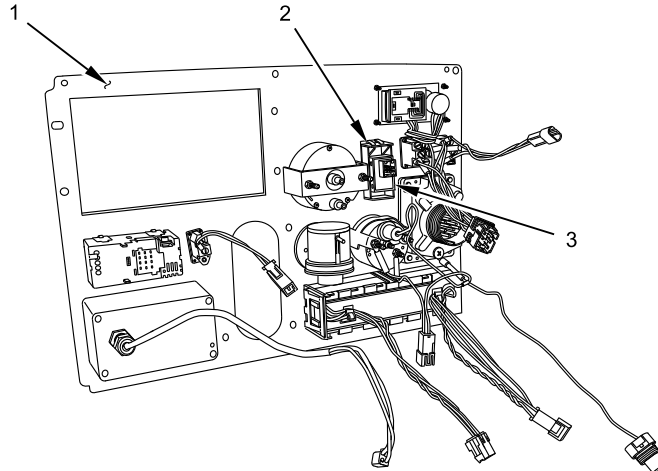
WARNING

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MIRROR REMOTE CONTROL SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Press down upper retainer (Figure 1, Item 2) securing mirror remote control switch (Figure 1, Item 3) to IP center trim panel (Figure 1, Item 1) and push outward.



B236010215

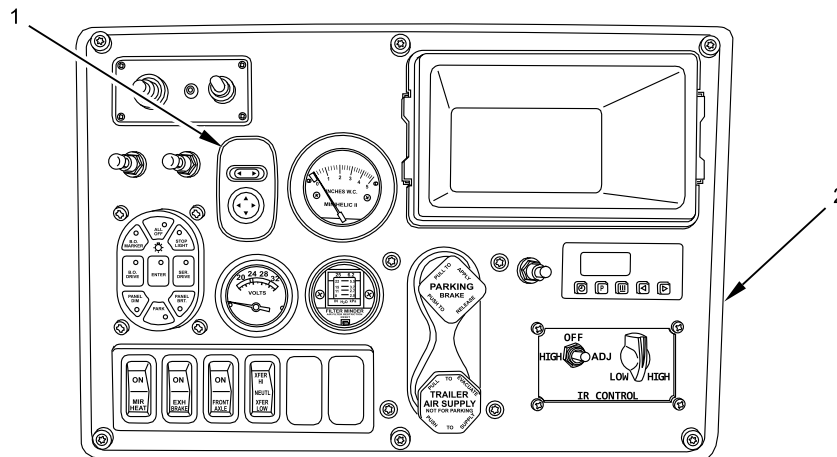
Figure 1. Mirror Remote Control Switch.

2. Remove mirror remote control switch (Figure 1, Item 3) from IP center trim panel (Figure 1, Item 1).

END OF TASK

INSTALLATION

1. Position mirror remote control switch (Figure 2, Item 1) on IP center trim panel (Figure 2, Item 2) and push in until retainers are engaged.



B236010216

Figure 2. Mirror Switch Installation.

2. Ensure mirror remote control switch (Figure 2, Item 1) is flush with IP center trim panel (Figure 2, Item 2).

END OF TASK

MIRROR REMOTE CONTROL SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify operation of mirror remote control switch (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Screwdriver attachment, Torx bit, 1/4-in. drive, T-20
(WP 0795, Item 8)

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
FSS control unit bracket removed (WP 0738)

Materials/Parts

Grease (WP 0794, Item 27)

References

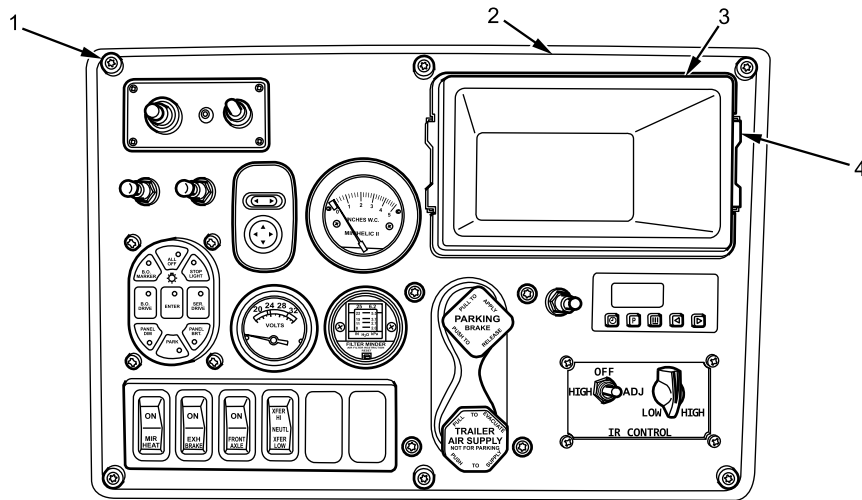
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

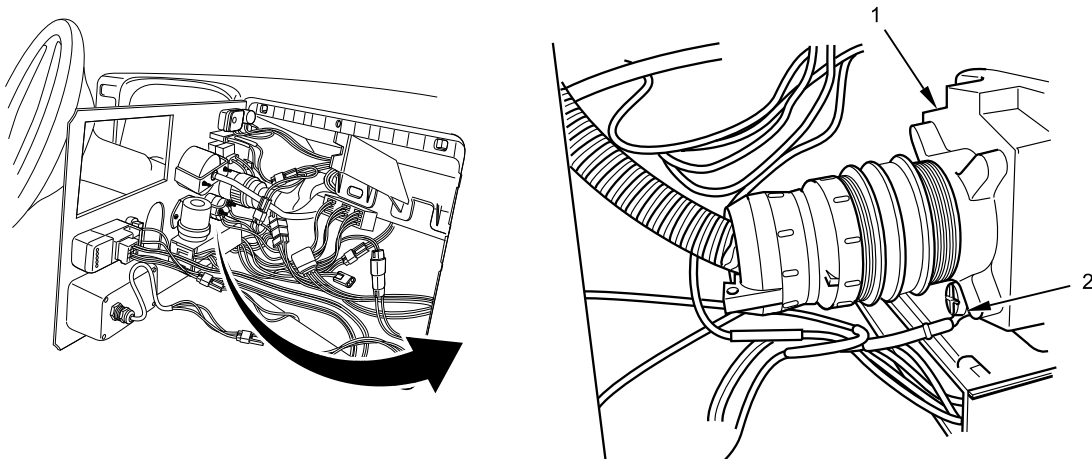
REMOVAL



B230601238

Figure 1. Instrument Panel Center Trim Panel.

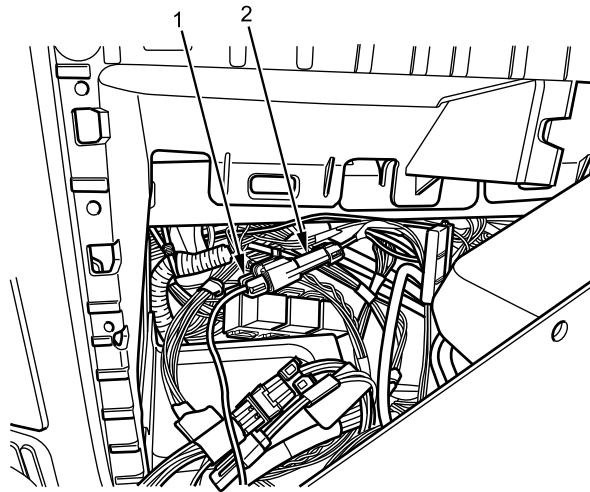
1. Push in on storage bin retainers (Figure 1, Item 4) and pull storage bin (Figure 1, Item 3) from IP center trim panel (Figure 1, Item 2).
2. Remove six screws (Figure 1, Item 1) securing IP center trim panel (Figure 1, Item 2) to IP.
3. Pull out IP center trim panel (Figure 1, Item 2) to gain access to MVLS ground wire.



B236010220

Figure 2. MVLS Ground Wire.

4. Remove screw and washer (Figure 2, Item 2) securing ground wire from rear of MVLS (Figure 2, Item 1).

**MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)**

B230604368

Figure 3. MVLS Ground Wire Connector.

5. Unplug MVLS ground harness connector (Figure 3, Item 1) from IP ground harness connector (Figure 3, Item 2).
6. Remove MVLS ground harness.

END OF TASK

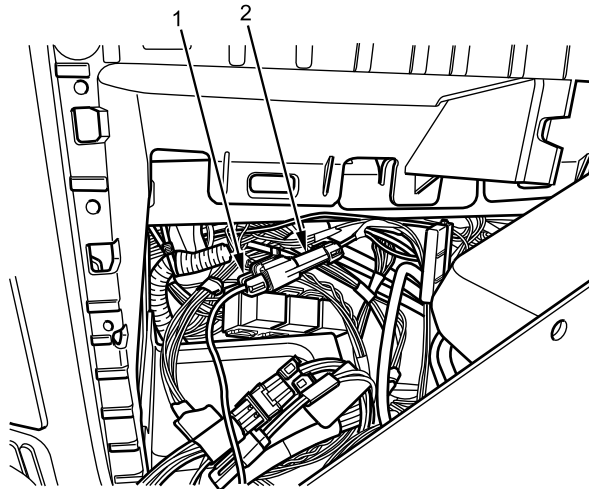
**MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections.

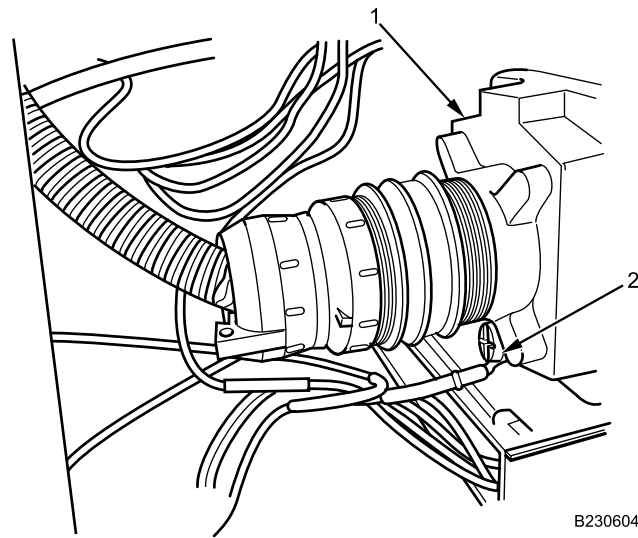
1. Connect MVLS ground harness connector (Figure 4, Item 1) to IP harness connector (Figure 4, Item 2).



B230604368

Figure 4. MVLS Ground Wire Connector.

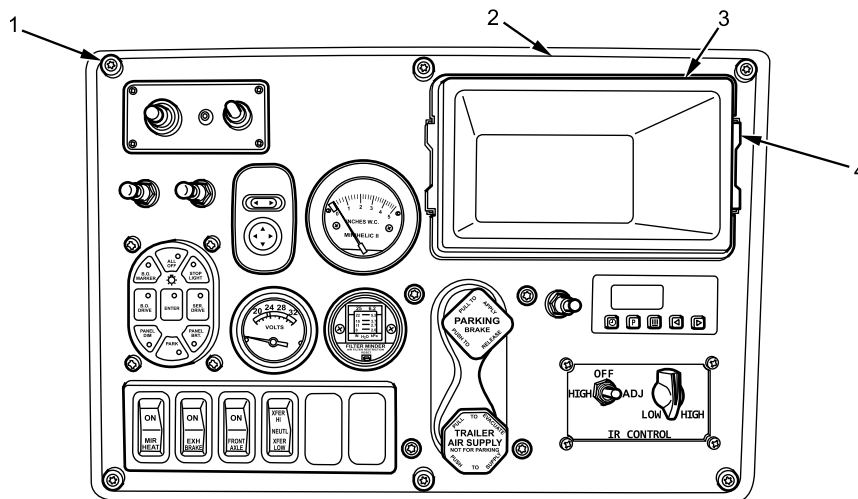
MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604369

Figure 5. MVLS Ground Wire.

2. Connect MVLS ground wire with screw and washer (Figure 3, Item 2) on rear of MVLS (Figure 3, Item 1). Tighten securely.
3. Install IP center trim panel (Figure 6, Item 2) with six screws (Figure 6, Item 1). Tighten securely.



B230601238

Figure 6. IP Center Trim Panel.

4. Install storage bin (Figure 6, Item 3) in IP opening and push to engage retainers (Figure 6, Item 4).

END OF TASK

**MASTER VEHICLE LIGHT SWITCH (MVLS) GROUND HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****FOLLOW-ON MAINTENANCE**

1. Install FSS control unit bracket (WP 0738).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify MVLS operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INFRARED (IR) LIGHT SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 21)

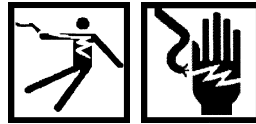
References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) storage bin removed
(WP 0563)

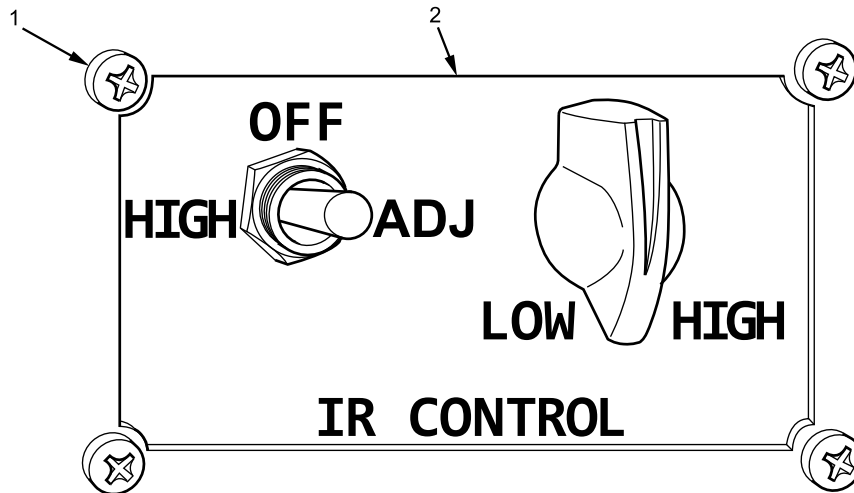
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

INFRARED (IR) LIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove four screws (Figure 1, Item 1) securing IR control switch (Figure 1, Item 2) to IP center trim panel.



B230600288

Figure 1. IR Control Switch in IP Center Trim Panel.

2. Disconnect electrical connection from back of IR control switch and remove through IP storage bin opening .

END OF TASK

INSTALLATION

WARNING

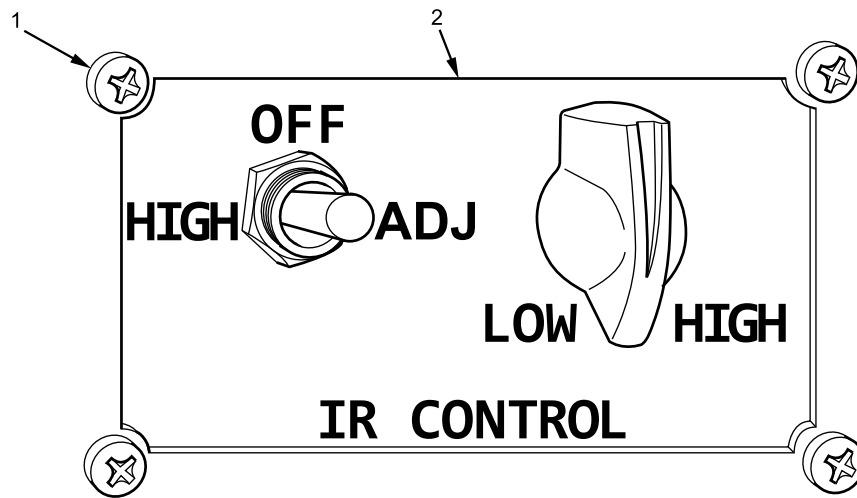


Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install IR control switch (Figure 2, Item 2) through IP storage bin opening.

INFRARED (IR) LIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)


B230600288

Figure 2. IR Control Switch in IP Center Trim Panel.

2. Connect electrical connection on back of IR control switch (Figure 2, Item 2).
3. Install IR control switch (Figure 2, Item 2) to IP center trim panel with four screws (Figure 2, Item 1) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP storage bin (WP 0563).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify IR switch operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MASTER REAR DOOR/RAMP SWITCH REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tag - (2) (WP 0794, Item 33)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) center trim panel removed
(WP 0581)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

MASTER REAR DOOR/RAMP SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Label all wires before removal.

REMOVAL

1. Remove nut (Figure 1, Item 1) securing door/ramp switch (Figure 1, Item 2) to IP center trim panel (Figure 1, Item 3).

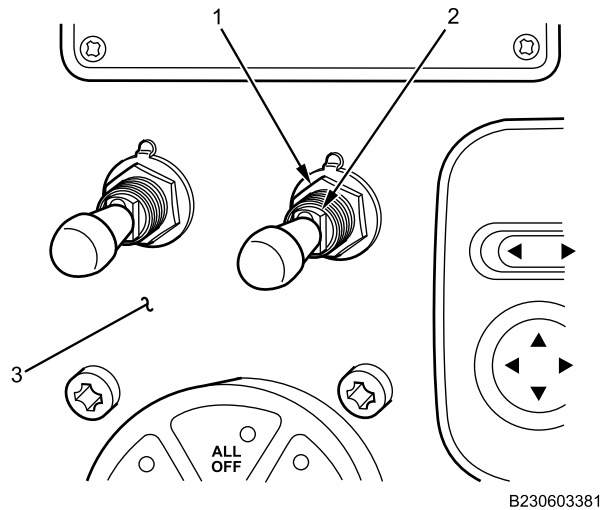
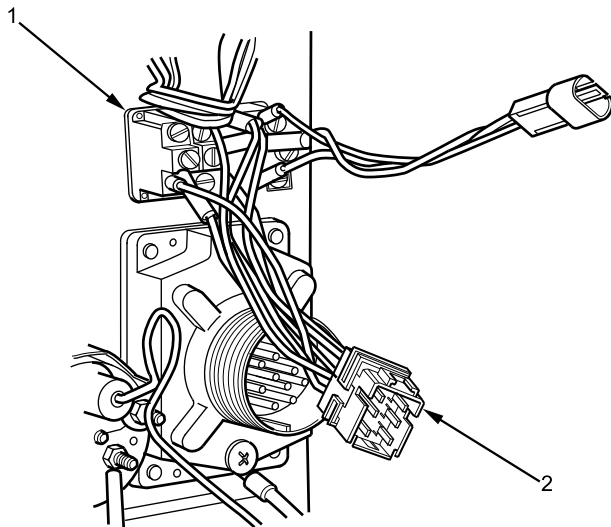


Figure 1. Master Rear Door/Ramp Switch Removal.

2. Remove door/ramp switch (Figure 1, Item 2) from IP center trim panel.
3. Disconnect harness connector (Figure 2, Item 2) from door/ramp switch (Figure 2, Item 1).



B230601244

Figure 2. Master Rear Door/Ramp Switch Connector.

END OF TASK

MASTER REAR DOOR/RAMP SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections.

1. Position door/ramp switch (Figure 3, Item 2) on IP center trim panel (Figure 3, Item 3) and install nut (Figure 3, Item 1) and tighten securely.

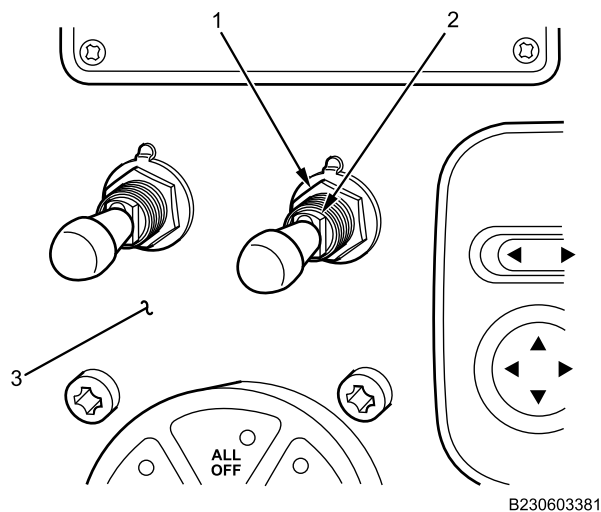
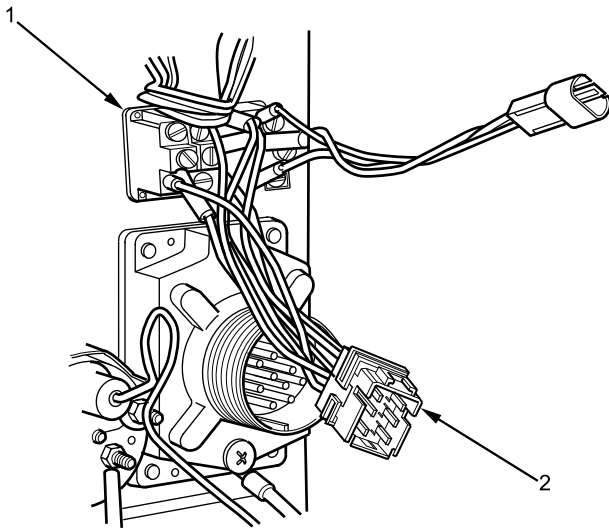


Figure 3. Master Rear Door/Ramp Switch Installation.

MASTER REAR DOOR/RAMP SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

2. Connect harness connector (Figure 4, Item 2) to door/ramp switch (Figure 4, Item 1).



B230601244

Figure 4. Master Rear Door/Ramp Switch Connector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify door/ramp switch operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MASTER REAR DOOR/RAMP SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Screwdriver, Torx, T27, 4-inch long (WP 0795, Item
88)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Fire Suppression System (FSS) control unit bracket
removed (WP 0738)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

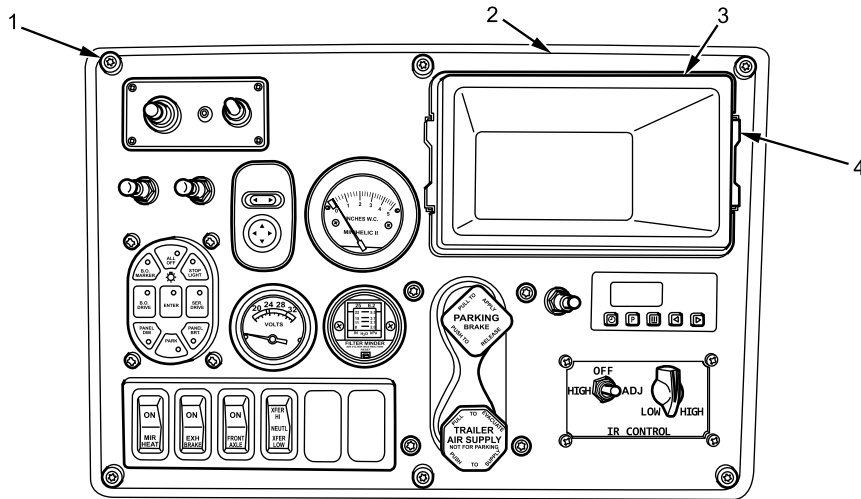
MASTER REAR DOOR/RAMP SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Label all wires before removal to aid in installation.

REMOVAL

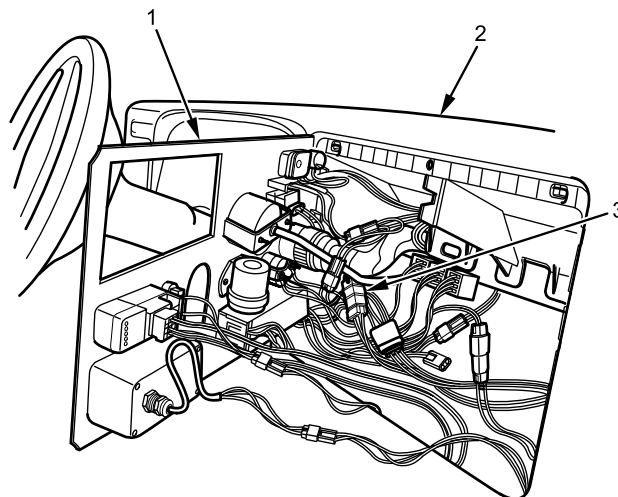
1. Remove six screws (Figure 1, Item 1) securing IP center trim panel (Figure 1, Item 2) to IP.



B230601238

Figure 1. IP Center Trim Panel.

2. Push in on storage bin retainers (Figure 1, Item 4), and pull storage bin (Figure 1, Item 3) from IP center trim panel (Figure 1, Item 2).
3. Pull center trim panel (Figure 2, Item 1) away from IP (Figure 2, Item 2), and disconnect master rear door/ramp switch jumper harness connector (Figure 2, Item 3).



B230605846

Figure 2. IP Center Panel.

4. Remove six screws securing master rear door/ramp switch jumper harness to master rear door/ramp switch. Remove harness from switch.

END OF TASK

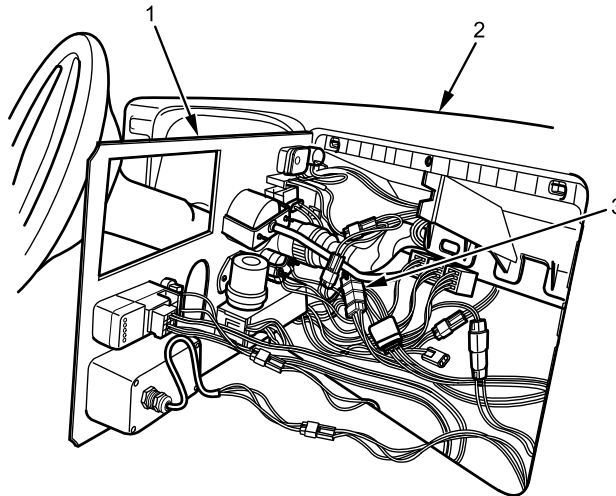
MASTER REAR DOOR/RAMP SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections before installation.

1. Install six screws securing master rear door/ramp switch jumper harness to master rear door/ramp switch. Tighten screws securely.
2. Connect master rear door/ramp switch jumper harness connector (Figure 3, Item 3) to IP harness.



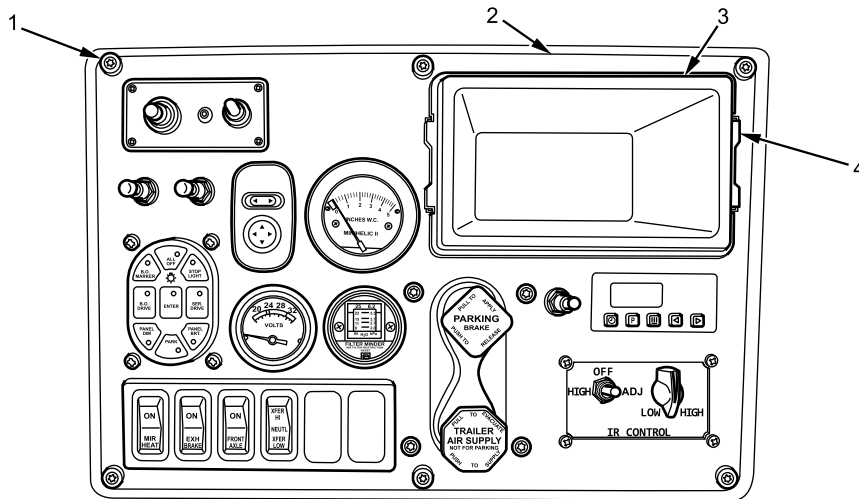
B230605846

Figure 3. IP Center Panel.

3. Place IP center trim panel (Figure 3, Item 1) on IP (Figure 3, Item 2).

MASTER REAR DOOR/RAMP SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

4. Install six screws (Figure 4, Item 1) securing IP center trim panel (Figure 4, Item 2) to IP. Tighten screws securely.



B230601238

Figure 4. IP Center Trim Panel.

5. Install storage bin (Figure 4, Item 3) in IP center trim panel opening and push forward to engage retainers (Figure 4, Item 4).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install FSS control unit bracket (WP 0738).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify master rear door/ramp switch operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**MASTER CREW LIGHT SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) center trim panel removed
(WP 0581)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

MASTER CREW LIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove nut (Figure 1, Item 1) securing crew light switch (Figure 1, Item 2) to IP center trim panel (Figure 1, Item 3).

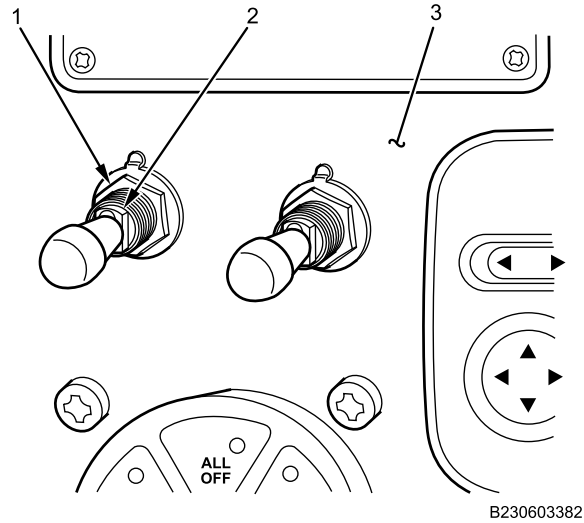


Figure 1. Master Crew Light Switch Removal.

2. Remove crew light switch (Figure 1, Item 2) from IP center trim panel.
3. Disconnect electrical harness connector (Figure 2, Item 2) from crew light switch (Figure 2, Item 1).

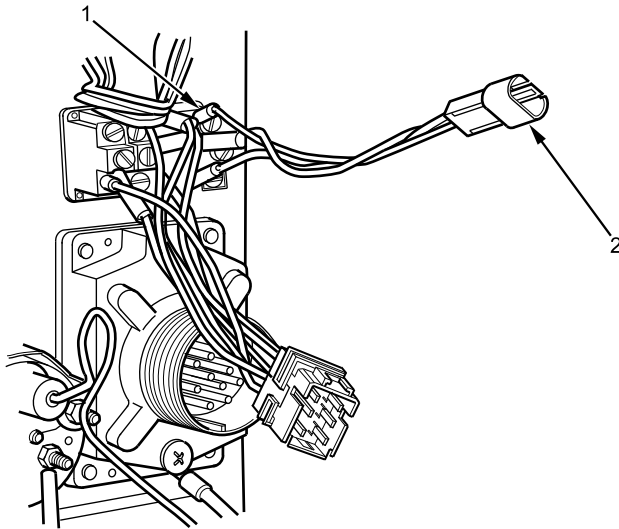


Figure 2. Master Crew Light Switch Connector.

END OF TASK

MASTER CREW LIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections.

1. Position crew light switch (Figure 3, Item 2) on IP center trim panel (Figure 3, Item 3), install nut (Figure 3, Item 1) and tighten securely.

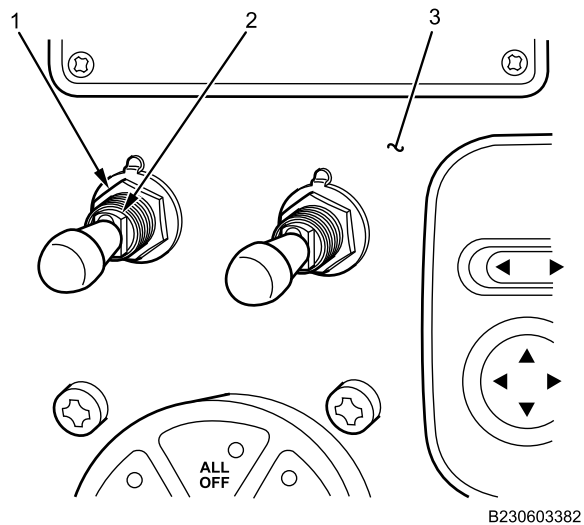
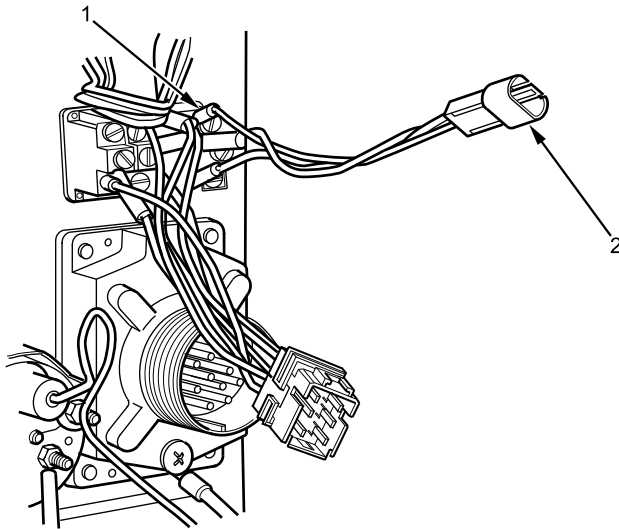


Figure 3. Master Crew Light Switch Installation.

MASTER CREW LIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

2. Connect electrical harness connector (Figure 4, Item 2) to crew light switch (Figure 4, Item 1).



B230601243

Figure 4. Master Crew Light Switch Connector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify crew light switch (TM9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Screwdriver, Torx, T27, 4-inch long (WP 0795, Item
88)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Fire Suppression System (FSS) control unit bracket
removal (WP 0738)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove nut and two washers (Figure 1, Item 1) securing crew light switch (Figure 1, Item 2) to instrument panel (IP) center trim panel (Figure 1, Item 3).

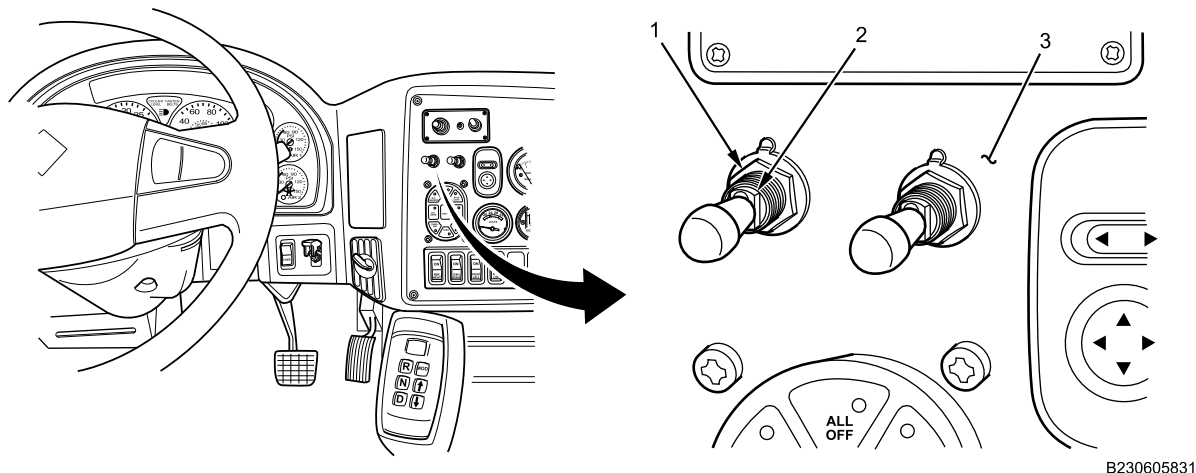


Figure 1. Master Crew Light Switch Removal.

2. Remove six screws (Figure 2, Item 1) securing IP center trim panel (Figure 2, Item 2) to IP.

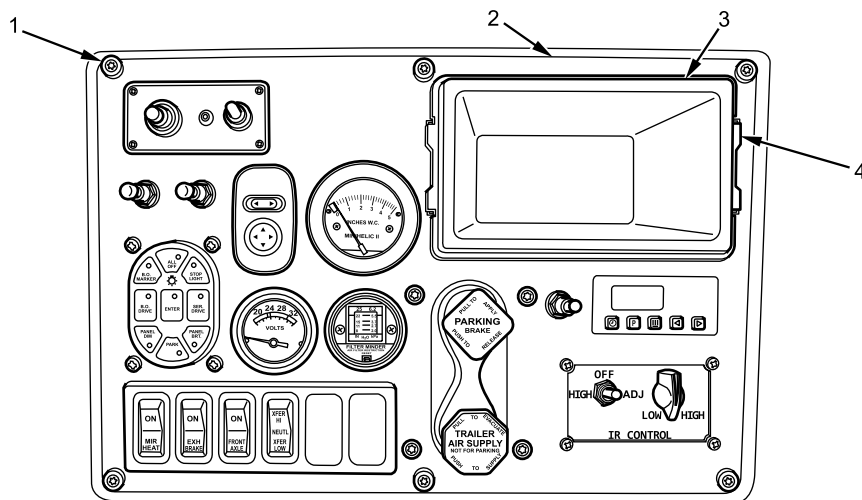
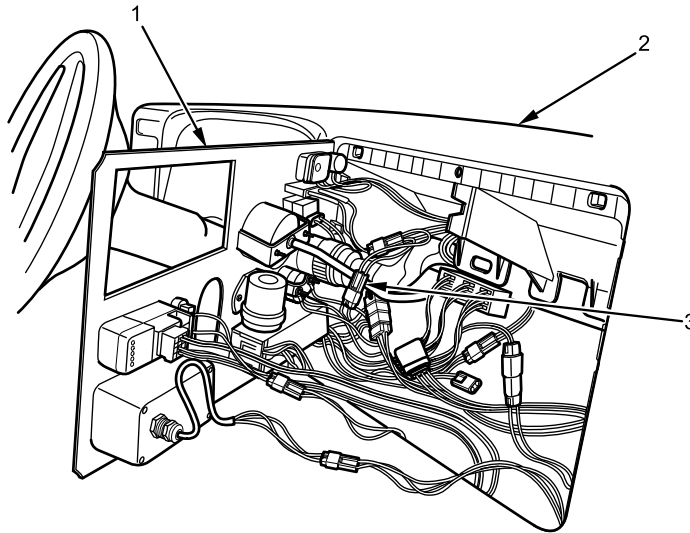


Figure 2. IP Center Trim Panel.

3. Push in on storage bin retainers (Figure 2, Item 4) and pull storage bin (Figure 2, Item 3) from IP center trim panel (Figure 2, Item 2).

MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

4. Pull center trim panel (Figure 3, Item 1) away from IP (Figure 3, Item 2) and disconnect master crew light switch jumper harness connector (Figure 3, Item 3).



B230605830

Figure 3. IP Center Panel.

5. Remove master crew light switch jumper harness.

END OF TASK

MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)
INSTALLATION**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install master crew light switch (Figure 4, Item 2) on IP center trim panel (Figure 4, Item 3) with nut and two washers (Figure 4, Item 1). Tighten securely.

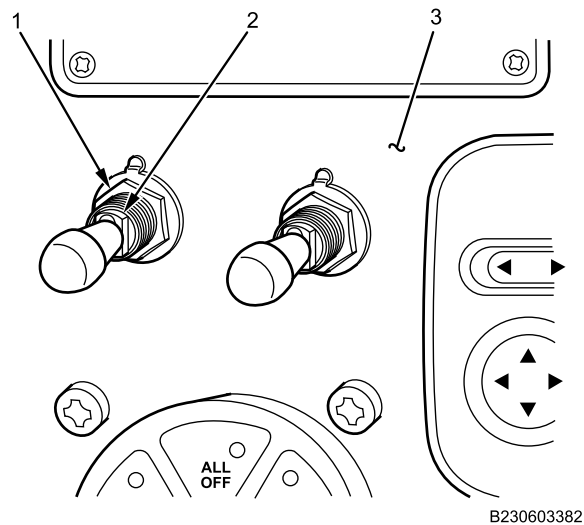
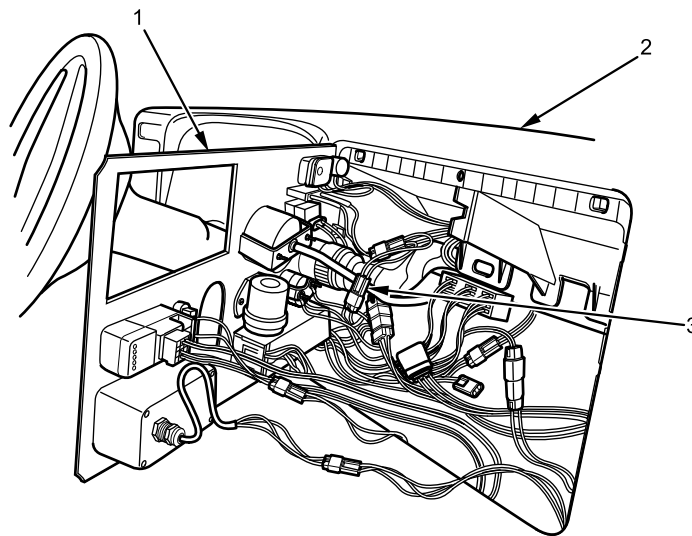


Figure 4. Master Crew Light Switch Installation.

2. Connect master crew light switch jumper harness connector (Figure 5, Item 3) to IP harness.

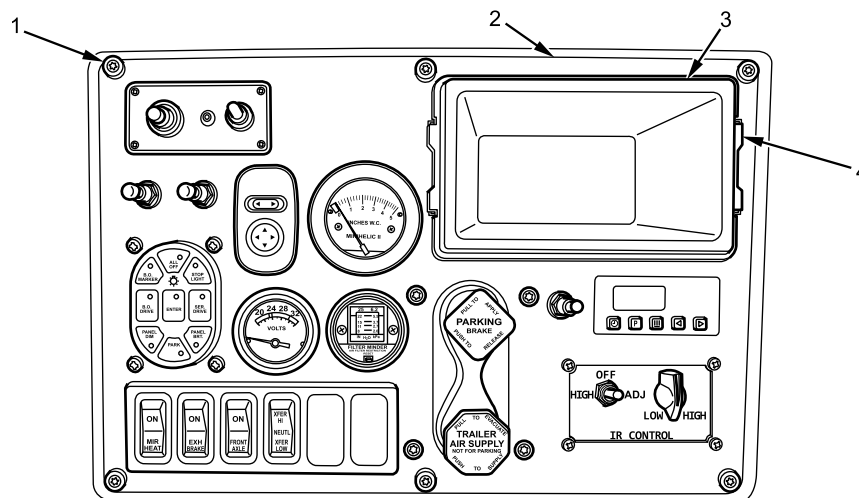
MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230605830

Figure 5. IP Center Panel.

3. Place IP center trim panel (Figure 5, Item 1) on IP (Figure 5, Item 2).
4. Install six screws (Figure 6, Item 1) securing IP center trim panel (Figure 6, Item 2) to IP.



B230601238

Figure 6. IP Center Trim Panel.

5. Install storage bin (Figure 6, Item 3) in IP center trim opening and push forward to engage retainers (Figure 6, Item 4).

END OF TASK

MASTER CREW LIGHT SWITCH JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. FSS control unit bracket installed (WP 0738).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify master crew light switch operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
SPOTLIGHT CONTROL REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Locknut - (4) (WP 0796, Item 15)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument Panel (IP) center trim panel removed
(WP 0581)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

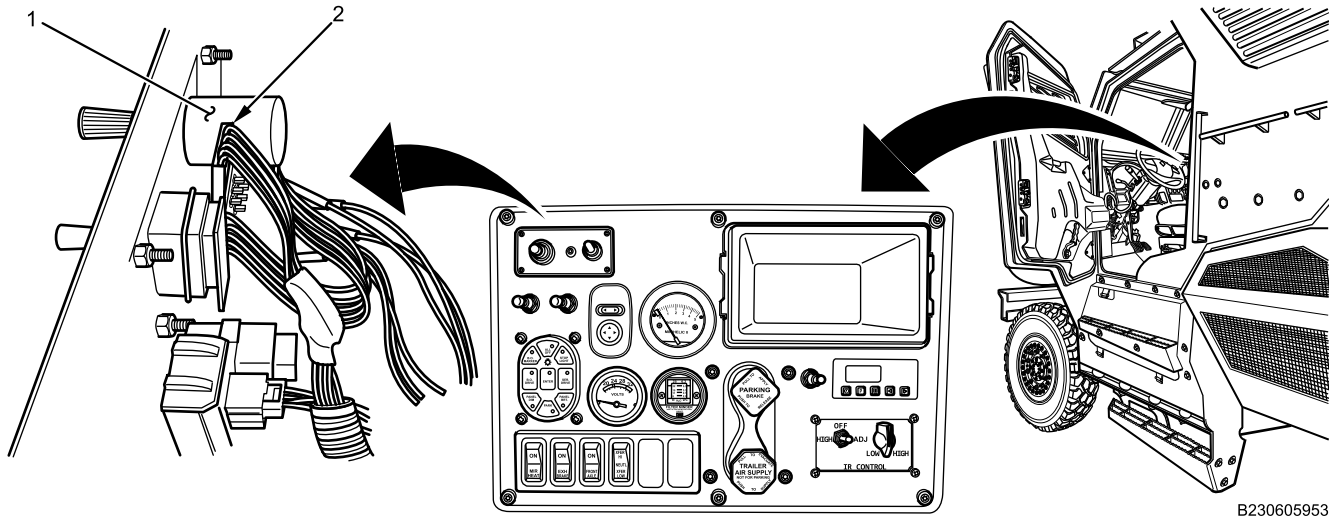
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

SPOTLIGHT CONTROL REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

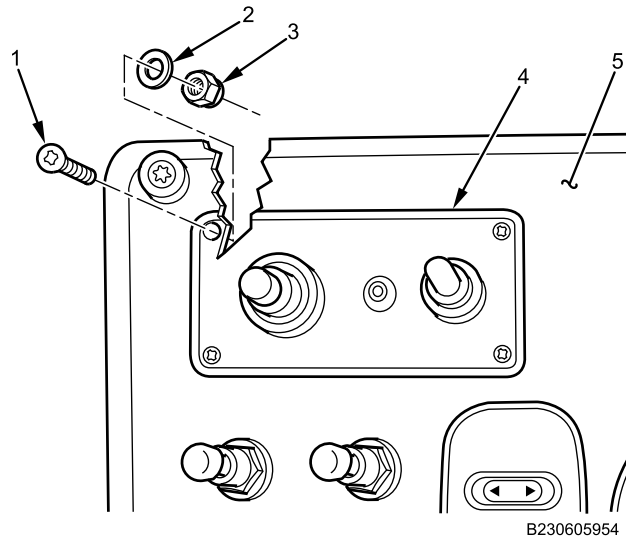
1. Disconnect electrical connector (Figure 1, Item 2) from back of spotlight control (Figure 1, Item 1).



B230605953

Figure 1. Spotlight Control Wiring.

2. Remove locknuts (Figure 2, Item 3), washers (Figure 2, Item 2), and screws (Figure 2, Item 1) securing spotlight control (Figure 2, Item 4) to IP center trim panel (Figure 2, Item 5). Discard locknuts.



B230605954

Figure 2. Spotlight Control Removal.

3. Remove spotlight control (Figure 2, Item 4) from IP center trim panel (Figure 2, Item 5).

END OF TASK

SPOTLIGHT CONTROL REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position spotlight control (Figure 3, Item 4) on IP center trim panel (Figure 3, Item 5).

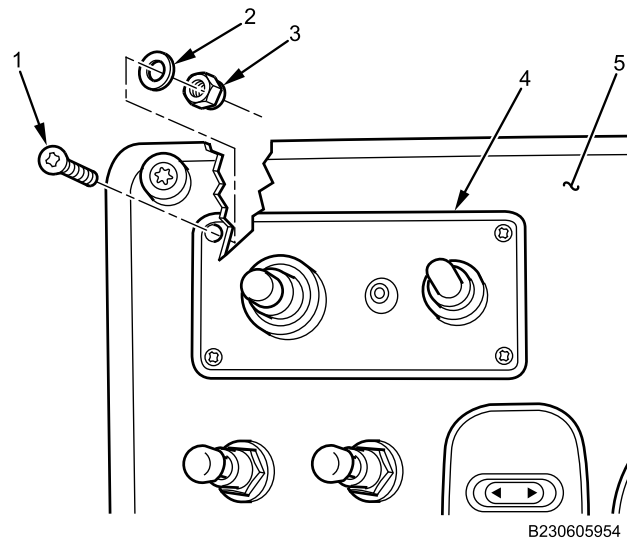


Figure 3. Spotlight Control Installation.

2. Install screws (Figure 3, Item 1), washers (Figure 3, Item 2), and new locknuts (Figure 3, Item 3) securing spotlight control (Figure 3, Item 4) to IP center trim panel (Figure 3, Item 5).

SPOTLIGHT CONTROL REMOVAL AND INSTALLATION - (CONTINUED)

3. Connect electrical connector (Figure 4, Item 2) to back of spotlight control (Figure 4, Item 1).

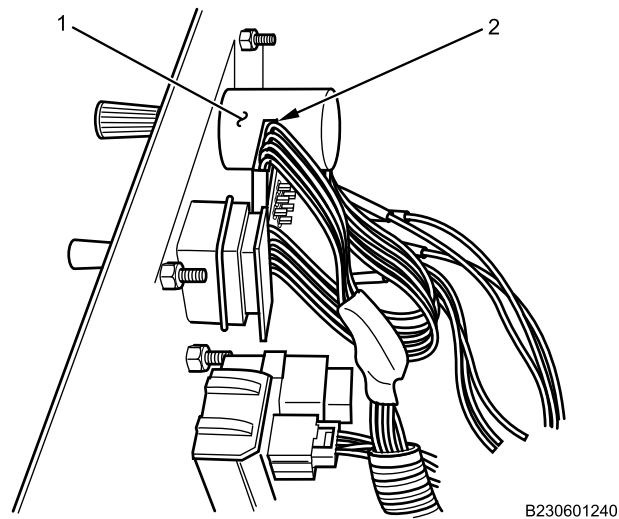


Figure 4. Spotlight Control Wiring.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify spotlight operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Lifting sling (WP 0795, Item 68)
Lifting device (WP 0795, Item 67)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Locknut - (9) (WP 0796, Item 148)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Cabin door safely secured open (WP 0608)
Door trim panel removed (WP 0626)
Door mounted mirror removed (WP 0682)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10

WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Cabin door must be secured in the open position by using heavy duty winch straps to prevent accidental closure during vehicle maintenance. Pull door hinge pin prior to securing door open. Failure to comply may result in serious injury or death to personnel.

Use the appropriate lifting strap sling or chain hoist for the type of load. Always clean and inspect lifting strap slings and chain hoists prior to use. Inspect for damage such as wear, corrosion, elongation, tears, or punctures. Replace lifting strap slings or chain hoists that are damaged. Failure to comply may result in component damage and death or injury to personnel.

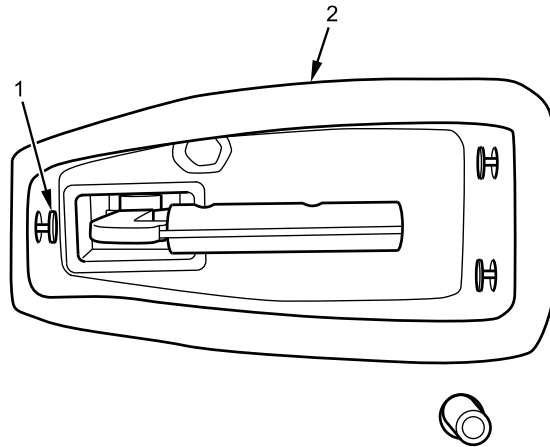
Armor parts are heavy. Use care when removing or installing. Do not attempt to lift without an assistant and lifting device. Failure to comply may result in serious injury or death to personnel.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

This procedure is the same for right and left side mirror harness. Left side procedure shown.

REMOVAL

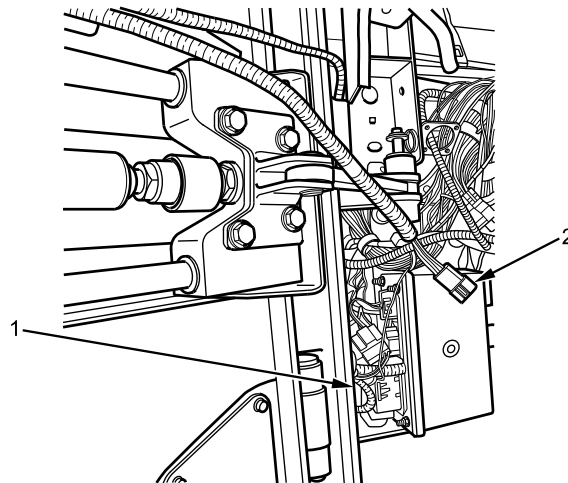
1. Remove three pine tree fasteners (Figure 1, Item 1) from door handle trim (Figure 1, Item 2). Remove trim.



B231801647

Figure 1. Door Handle Trim.

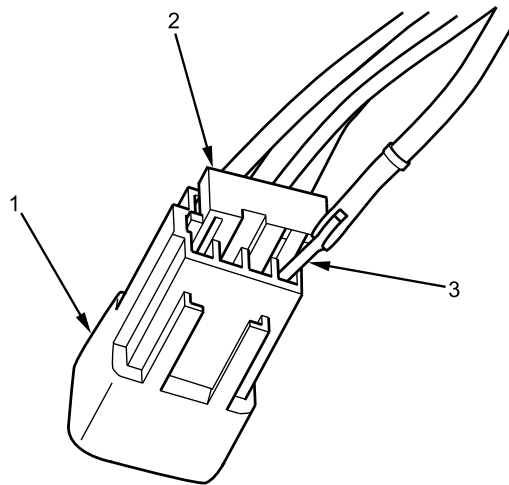
2. Disconnect power mirror harness connector (Figure 2, Item 2) located under driver side kick panel (Figure 2, Item 1).



B231801652

Figure 2. Kick Panel Power Mirror Harness Connector.

3. Remove terminal retaining clip (Figure 3, Item 2) from harness connector (Figure 3, Item 1).

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B231801649

Figure 3. Power Mirror Harness Connector.

NOTE

Mark and tag all wires properly for installation.

4. Remove five wires from harness connector (Figure 3, Item 1) by releasing terminals (Figure 3, Item 3) from connector.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Use two slings to properly balance armor plate.

5. Secure lifting slings to window guard and attach slings to lifting device.

NOTE

Carefully route power mirror harness through door while armor plate is being removed.

6. With assistance, remove eight bolts and washers (Figure 4, Item 3) from door armor panel (Figure 4, Item 2), and slowly remove door armor panel with power mirror harness from door (Figure 4, Item 1).

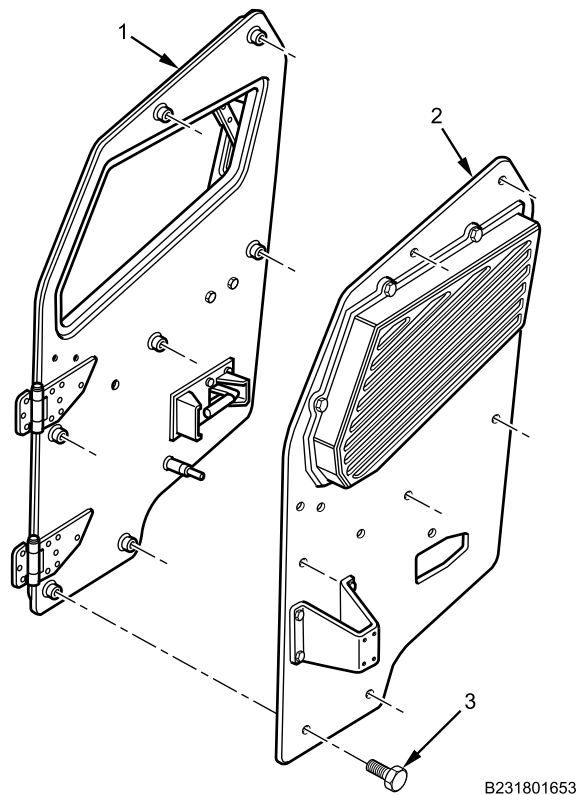


Figure 4. Door Armor.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove four bolts (Figure 5, Item 3), locknuts, and washers (Figure 5, Item 1) from mirror mounting plate (Figure 5, Item 2). Remove mounting plate and power mirror harness. Discard locknuts.

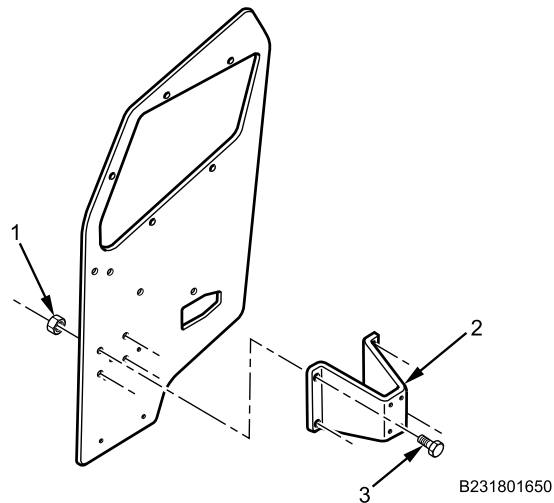


Figure 5. Mirror Mounting Plate.

8. Remove power mirror harness (Figure 6, Item 1) by pulling through mirror mounting plate (Figure 6, Item 2) and armor door.

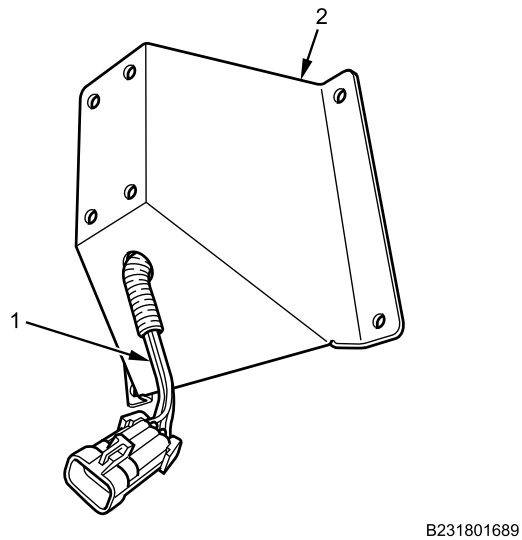


Figure 6. Mirror Harness.

END OF TASK

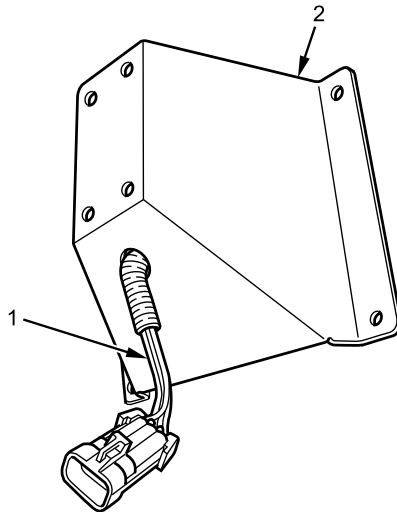
MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install power mirror harness (Figure 7, Item 1) through mirror mounting plate (Figure 7, Item 2) and armor door.



B231801689

Figure 7. Mirror Harness.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

2. Install mirror mounting plate (Figure 8, Item 2) with four bolts (Figure 8, Item 3), washers, and new locknuts (Figure 8, Item 1). Tighten bolts securely.

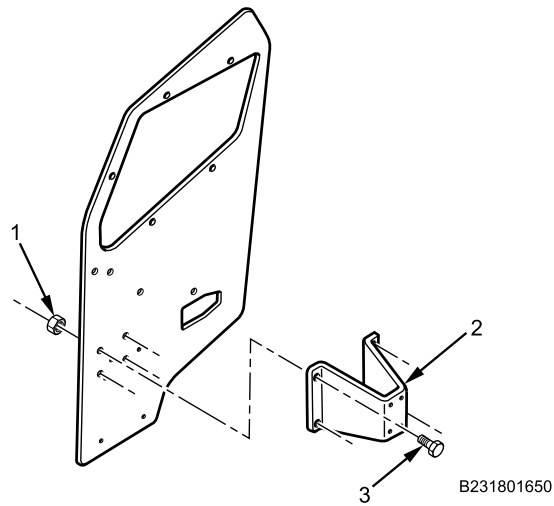


Figure 8. Mirror Mounting Plate.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Carefully route power mirror harness through location hole on door while armor panel is being installed.

3. With assistance, slowly install door armor panel (Figure 9, Item 2) on door (Figure 9, Item 1) with eight bolts and washers (Figure 9, Item 3) while routing power mirror harness through door. Tighten bolts securely.

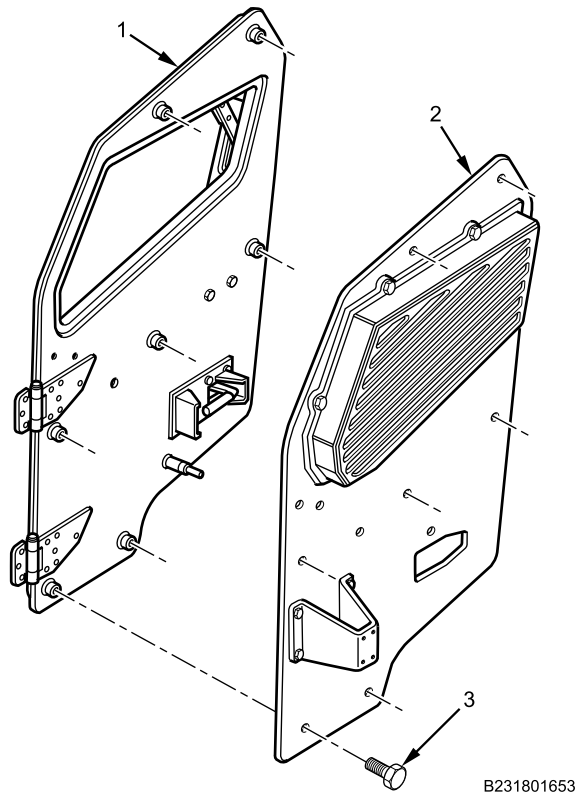
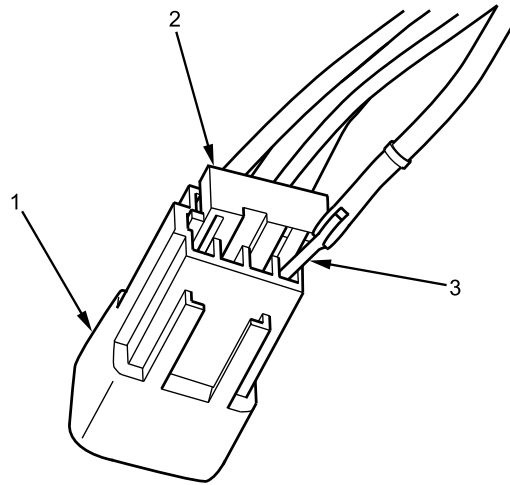


Figure 9. Door Armor.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

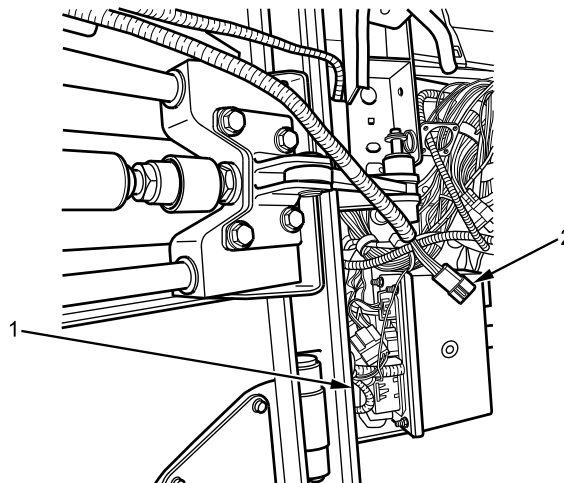
4. Install five terminals (Figure 10, Item 3) in correct location on power mirror harness connector (Figure 10, Item 1).



B231801649

Figure 10. Power Mirror Harness Connector.

5. Install terminal retaining clip (Figure 10, Item 2) in connector (Figure 10, Item 1).
6. Connect power mirror harness connector (Figure 11, Item 2) to harness under driver side kick panel (Figure 11, Item 1).

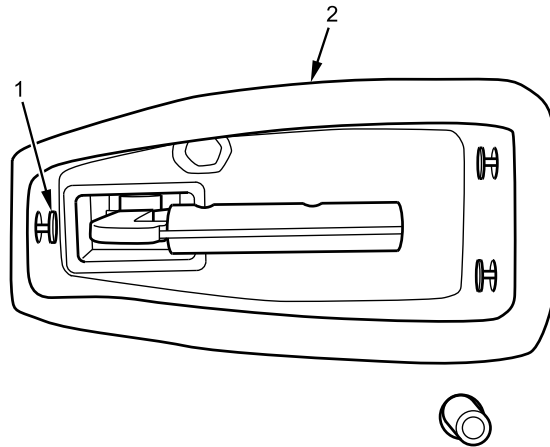


B231801652

Figure 11. Kick Panel Power Mirror Harness Connector.

MIRROR REMOTE CONTROL SWITCH WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

7. Install door handle trim (Figure 12, Item 2) on door armor with three pine tree fasteners (Figure 12, Item 1).



B231801647

Figure 12. Door Handle Trim.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install door trim panel (WP 0626).
2. Install door mounted mirror (WP 0682).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify mirror operation (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Remove cabin door securing chain hoists and lifting strap (WP 0608).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ANTILOCK BRAKE SYSTEM (ABS) BLINK CODE SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ANTILOCK BRAKE SYSTEM (ABS) BLINK CODE SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove ABS blink code switch (Figure 1, Item 2) from instrument panel harness connector (Figure 1, Item 1).

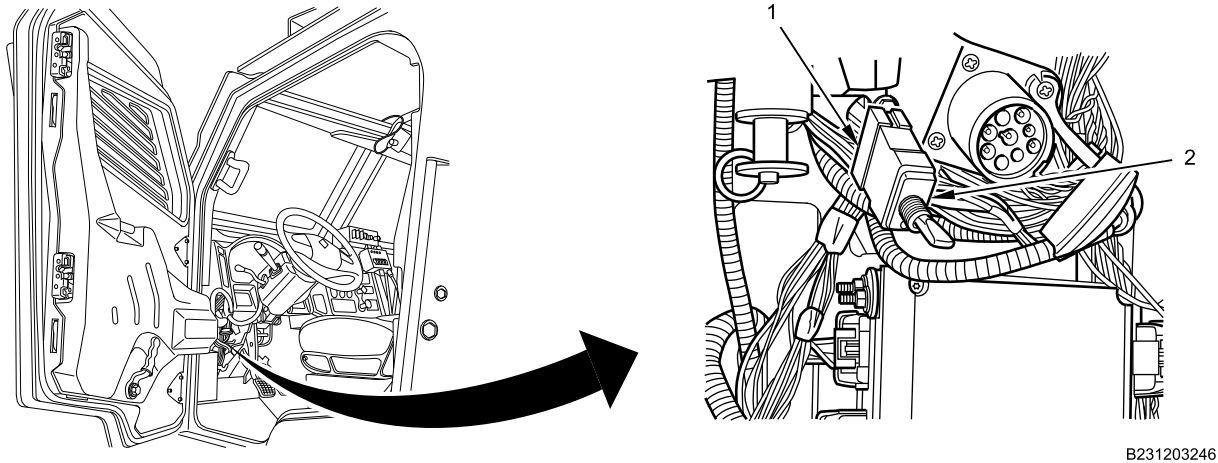


Figure 1. ABS Blink Code Switch.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install switch (Figure 2, Item 2) on harness connector (Figure 2, Item 1).

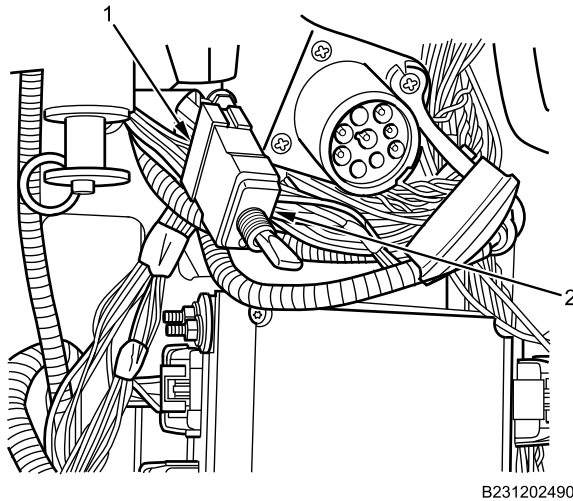
ANTILOCK BRAKE SYSTEM (ABS) BLINK CODE SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. ABS Blink Code Switch.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify ABS brake operation (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

CRUISE CONTROL SWITCH MODULE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Horn button assembly removed (WP 0403)

Materials/Parts

Grease (WP 0794, Item 22)

References

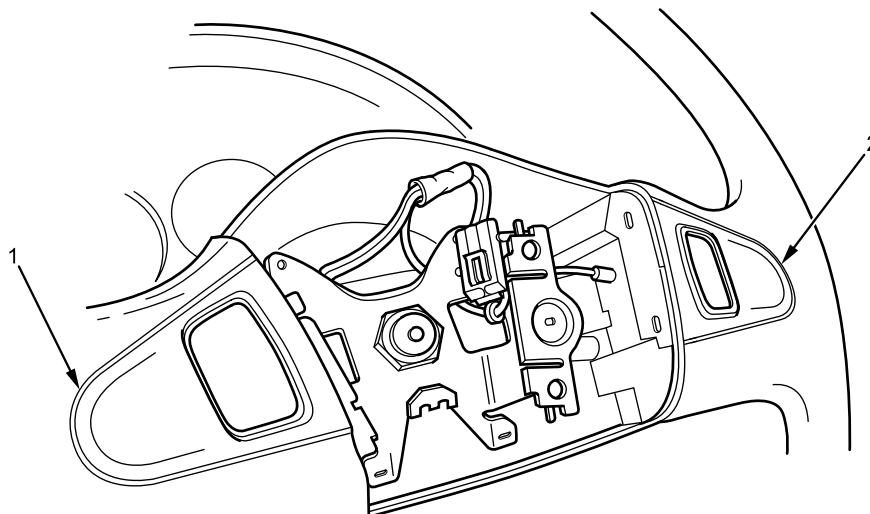
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Slide cruise control switch module (Figure 1, Item 1 or 2) inward toward center of steering wheel.



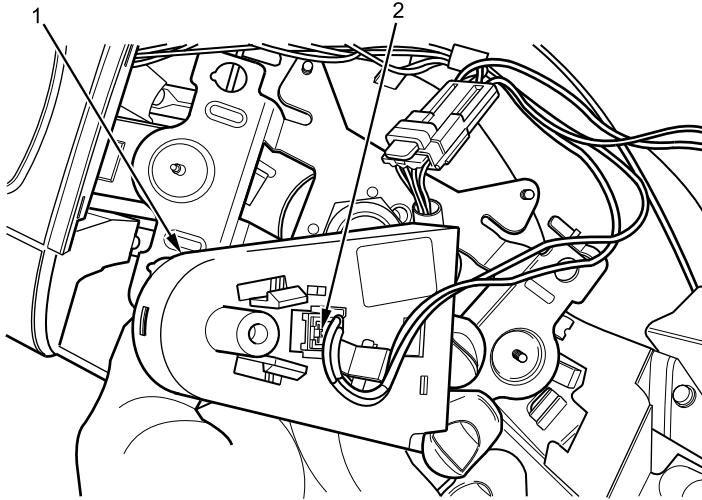
B230600305

Figure 1. Cruise Control Switch Module Removal.

CRUISE CONTROL SWITCH MODULE REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Right side shown, left side similar.

2. Disconnect electrical connector (Figure 2, Item 2) from back of cruise control switch module (Figure 2, Item 1).



B230601251

Figure 2. Cruise Control Switch Module Wiring.

END OF TASK**INSTALLATION****WARNING**

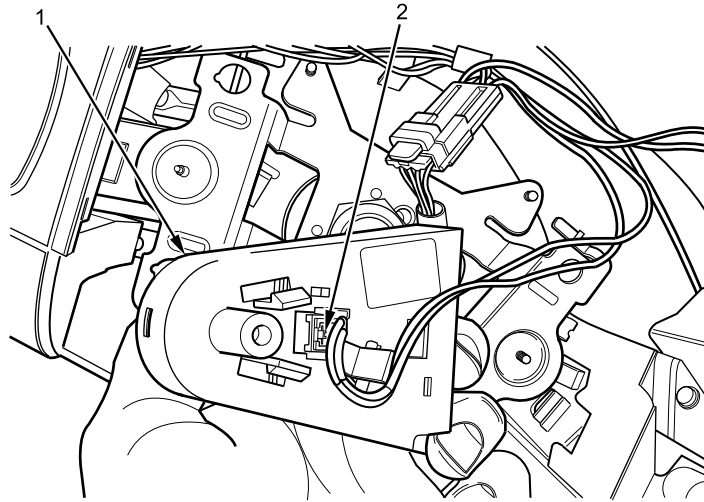
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

CRUISE CONTROL SWITCH MODULE REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Apply dielectric grease to all electrical connections.

Right side shown, left side similar.

1. Connect electrical connector (Figure 3, Item 2) to back of cruise control switch module (Figure 3, Item 1).



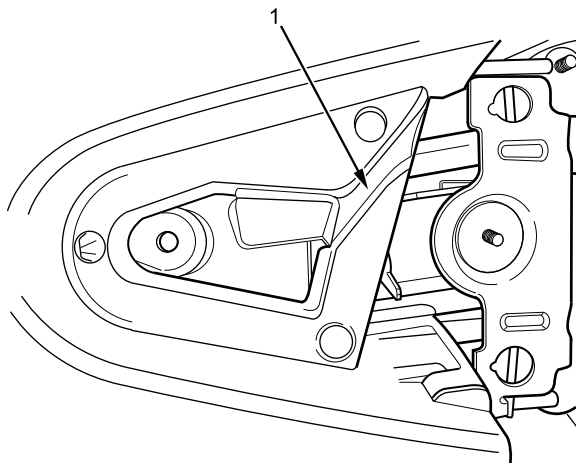
B230601251

Figure 3. Cruise Control Switch Module Wiring.

NOTE

Left side shown, right side similar.

2. Ensure harness is pushed into slot (Figure 4, Item 1) in steering wheel.

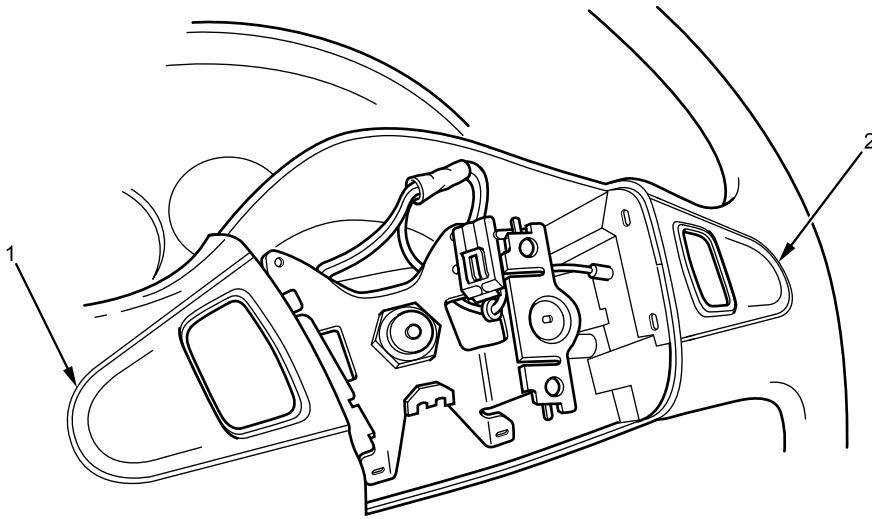


B230601250

Figure 4. Cruise Control Switch Wire Routing.

CRUISE CONTROL SWITCH MODULE REMOVAL AND INSTALLATION - (CONTINUED)

3. Position cruise control switch module (Figure 5, Item 1 or 2) on steering wheel and slide outward to secure.



B230600305

Figure 5. Cruise Control Switch Module Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install horn button assembly (WP 0403).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify cruise control operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INSTRUMENT PANEL (IP) CIRCUIT BREAKER, FUSE, AND RELAY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit, (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

IP right side closeout removed (WP 0580)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

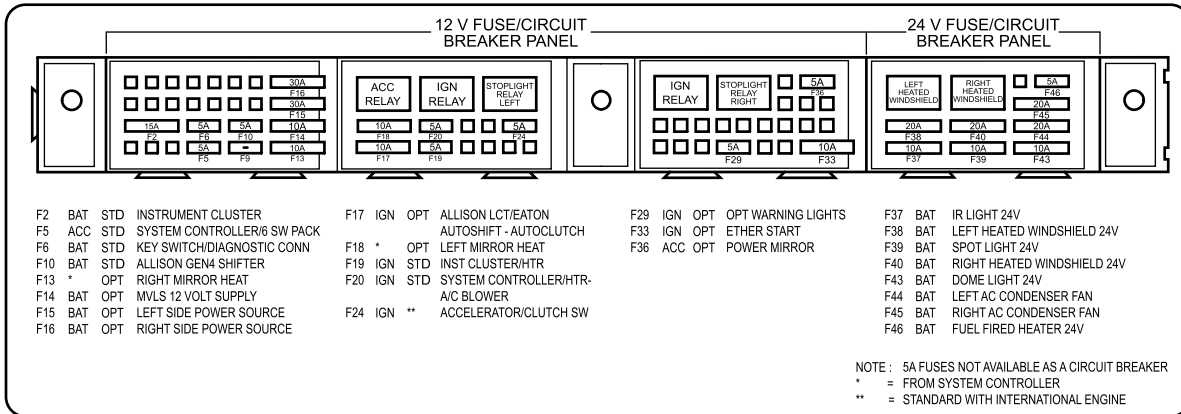
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Turn off ignition switch and battery disconnect switch before performing electrical system maintenance. Failure to comply may result in serious injury or death to personnel.

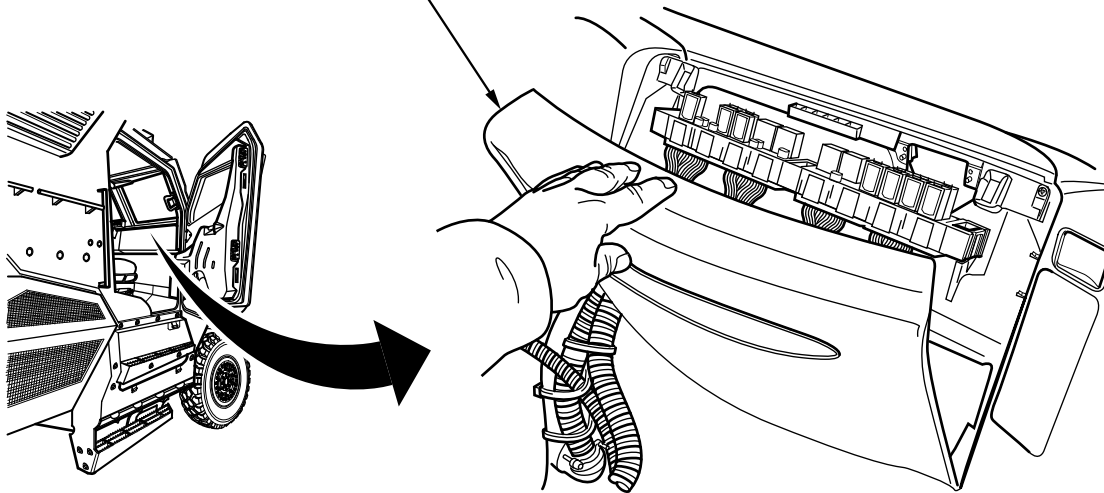
INSTRUMENT PANEL (IP) CIRCUIT BREAKER, FUSE, AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove circuit breaker, fuse, and/or relay by pulling outward from IP fuse block.



NSN 7690-01-556-5909



B230610303

Figure 1. IP Circuit Breakers, Fuses, and Relays.

END OF TASK

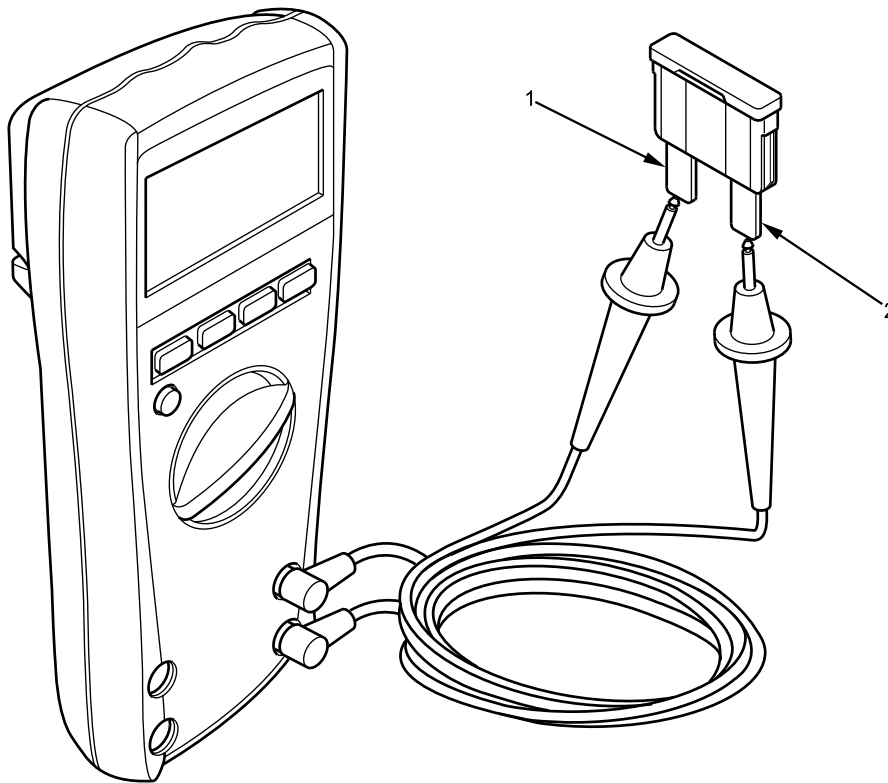
**INSTRUMENT PANEL (IP) CIRCUIT BREAKER, FUSE, AND RELAY REMOVAL AND INSTALLATION -
(CONTINUED)****TEST AND INSPECTION****NOTE**

Multimeter will read OL for a faulty fuse or circuit breaker.

Perform step 1 only to test fuse.

Perform steps 2 and 3 only to test circuit breaker.

1. With fuse removed, measure resistance between both terminals (Figure 2, Item 1 and 2) of fuse with multimeter.



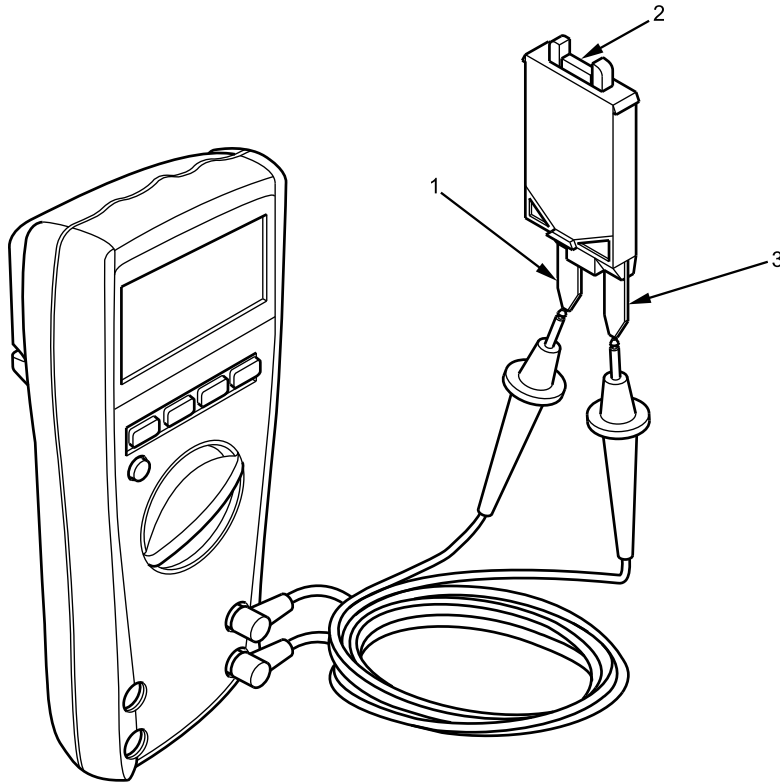
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Figure 2. Testing for Faulty Fuse.

**INSTRUMENT PANEL (IP) CIRCUIT BREAKER, FUSE, AND RELAY REMOVAL AND INSTALLATION -
(CONTINUED)****NOTE**

Multimeter will read OL for a faulty circuit breaker.

2. Push in reset button on circuit breaker (Figure 3, Item 2). If reset button does not remain in, circuit breaker is faulty.



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Figure 3. Testing for Faulty Circuit Breaker.

3. Measure resistance between both terminals (Figure 3, Item 1 and 3) of circuit breaker with multimeter.

END OF TASK

INSTRUMENT PANEL (IP) CIRCUIT BREAKER, FUSE, AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Do not use a circuit breaker, fuse, or relay with higher amperage rating than listed for a particular application. Using higher amperage will overheat the electrical circuit, causing melted components and possible fire. Failure to comply may result in damage to equipment and serious injury or death to personnel.

1. Install circuit breaker and/or fuse on IP fuse block.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP right side closeout (WP 0580).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify relay operation (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INSTRUMENT PANEL (IP) CENTER RELAY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel (IP) center trim panel removal
(WP 0581)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

INSTRUMENT PANEL (IP) CENTER RELAY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove relay (Figure 1, Item 1, 2, and/or 3) from instrument panel harness connector (Figure 1, Item 4, 5, and/or 6). Refer to Table 1 for proper relay position identification.

Table 1. Instrument Panel Center Relay Location.

ITEM NUMBER	RELAY DESCRIPTION	ITEM NUMBER	INSTRUMENT PANEL HARNESS SCHEMATIC RELAY BLOCK AND WIRING CIRCUIT NUMBER
1	Left turn enable relay	4	1878 Relay block - A56 Wiring circuit
2	Right turn enable relay	5	1877 Relay block - A57 Wiring circuit
3	Flash to pass relay	6	1876 Relay block - A102 Wiring circuit

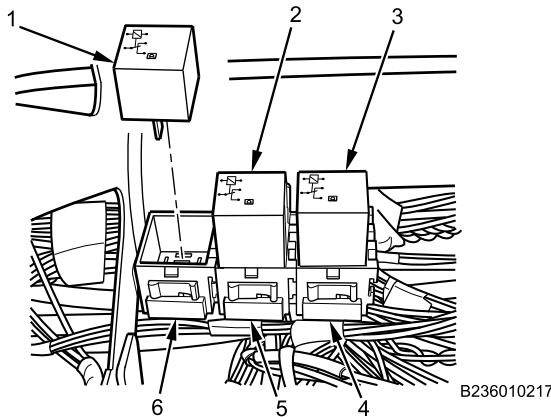


Figure 1. Instrument Panel Center Relays.

END OF TASK

INSTALLATION

WARNING



Do not use a circuit breaker, fuse, or relay with a different amperage rating than listed for a particular application. Using circuit protection devices with a higher amperage could overheat the electrical circuit, causing melted components and possible fire. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease on all relay connections before installation.

1. Install relay (Figure 2, Item 1, 2, and/or 3) on instrument panel harness connector (Figure 2, Item 4, 5, and/or 6). Refer to Table 1 for proper relay position identification.

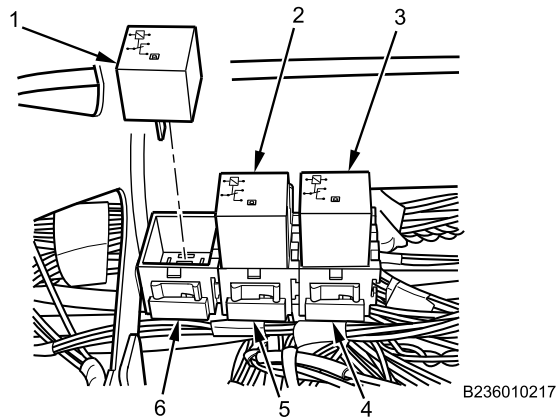
INSTRUMENT PANEL (IP) CENTER RELAY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Instrument Panel Center Relays.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install (IP) center trim panel (WP 0581).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify relay operation (TM 9-2355-106-10).
5. Set vehicle parking brake (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Cable lock straps - (12) (WP 0796, Item 124)
Lockwasher - (2) (WP 0796, Item 168)
Cable lock straps - (4) (WP 0796, Item 136)
Locknut (WP 0796, Item 143)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Hood opened and secured (TM 9-2355-106-10)
Instrument panel cluster removed (WP 0297)
Instrument panel (IP) center trim panel removed
(WP 0581)
Instrument panel right side closeout removed
(WP 0580)
Transmission auto shift control module removed
(WP 0452)
Left side cowl body armor panel removed (WP 0644)
Left engine armor plate bracket removed (WP 0598)
Left side inner wheel deflector plate armor removed
(WP 0601)
Air cleaner support removed (WP 0258)
Driver control mounting bracket assembly exterior
armor removed (WP 0646)
Steering column wiring harness removed (WP 0324)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

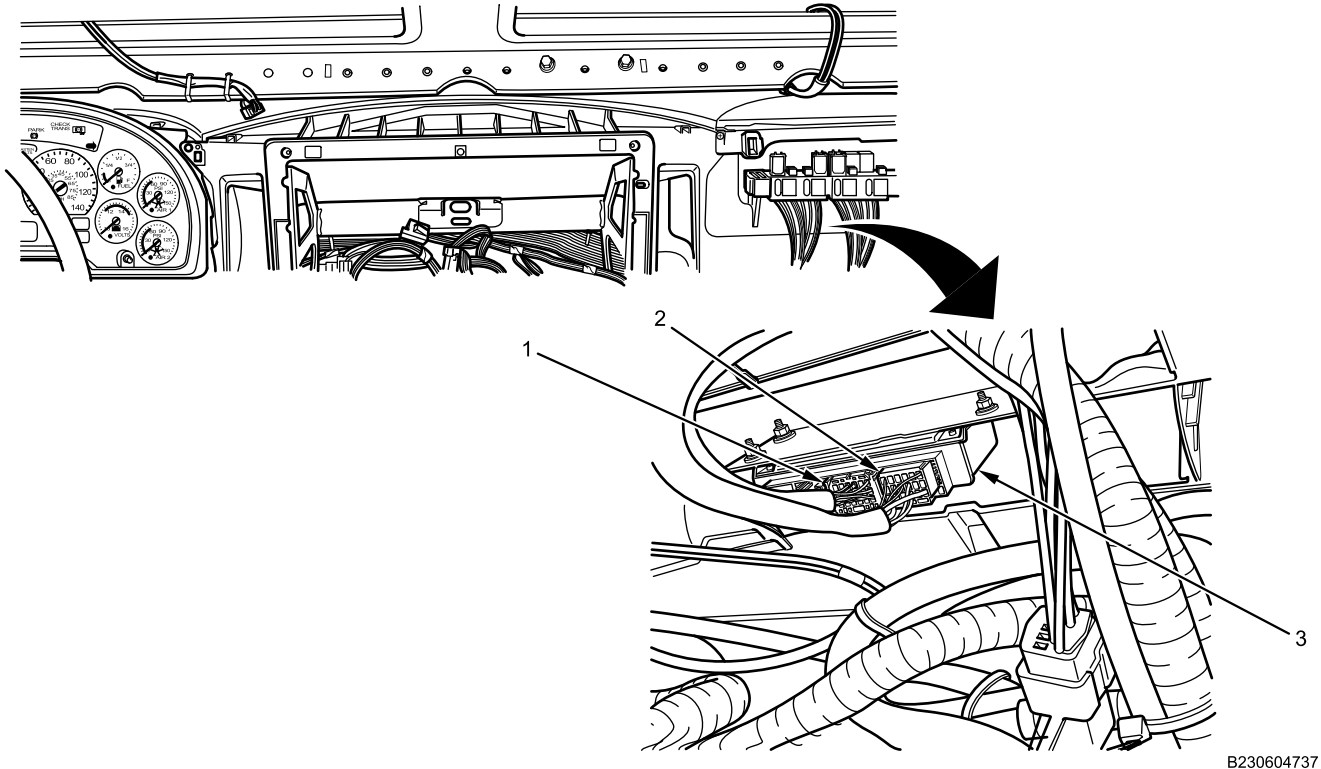
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

Note location of harness connectors and cable lock straps to ensure proper installation.



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Figure 1. Anti-Lock Brake System (ABS) Control Module Connectors.

1. Locate ABS control module (Figure 1, Item 3) mounted under right side of IP.
2. Disconnect outboard IP harness BLACK connector (Figure 1, Item 2) and inboard IP harness GRAY connector (Figure 1, Item 1) from ABS control module (Figure 1, Item 3).

NOTE

Large ground cable needs to be removed to access IP harness ground wire.

3. From under right side of IP, remove bolt (Figure 2, Item 1) and ground cables (Figure 2, Item 2 and 3) from mounting boss (Figure 2, Item 4).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

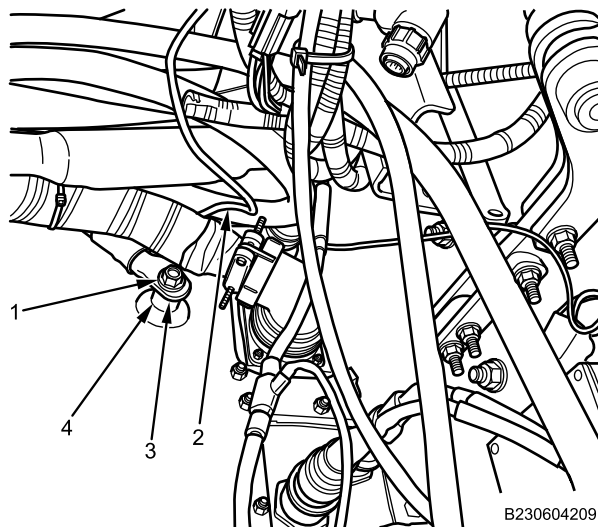
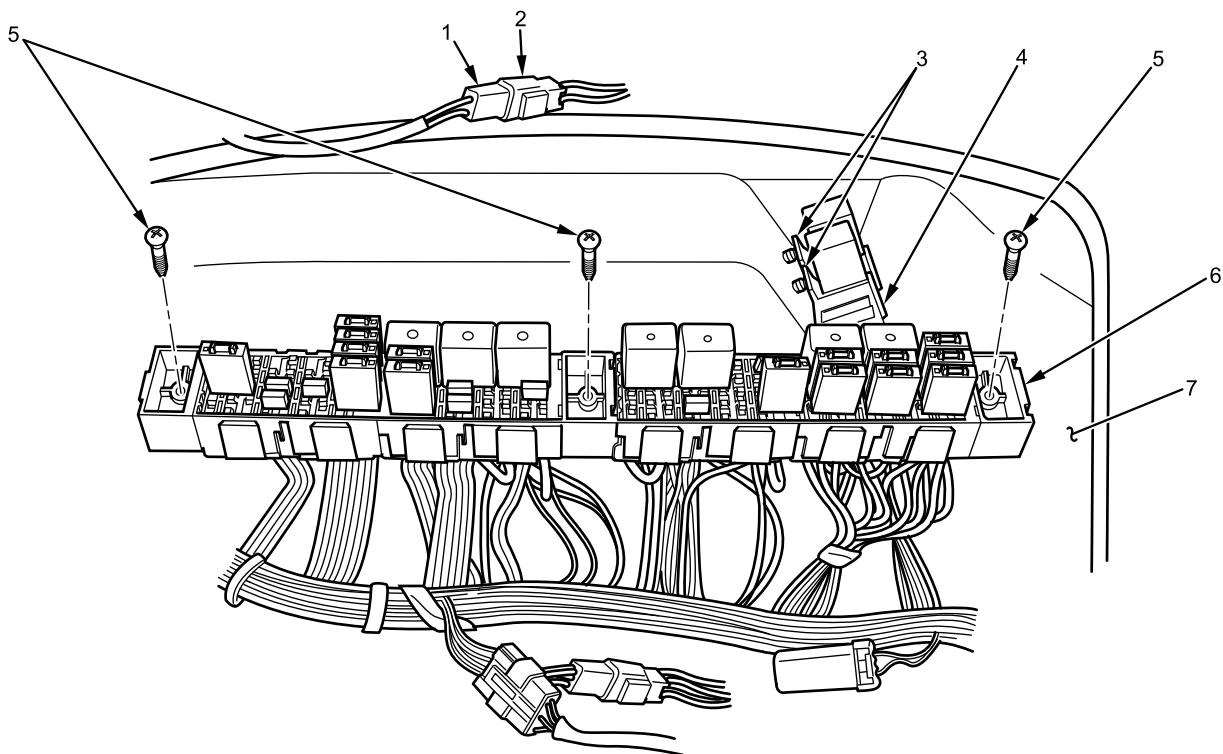


Figure 2. Ground Cable Removal.

4. Remove three screws (Figure 3, Item 5) and fuse/relay center (Figure 3, Item 6) from IP (Figure 3, Item 7).



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Figure 3. IP Circuit Breaker, Fuse, and Relay Center Removal.

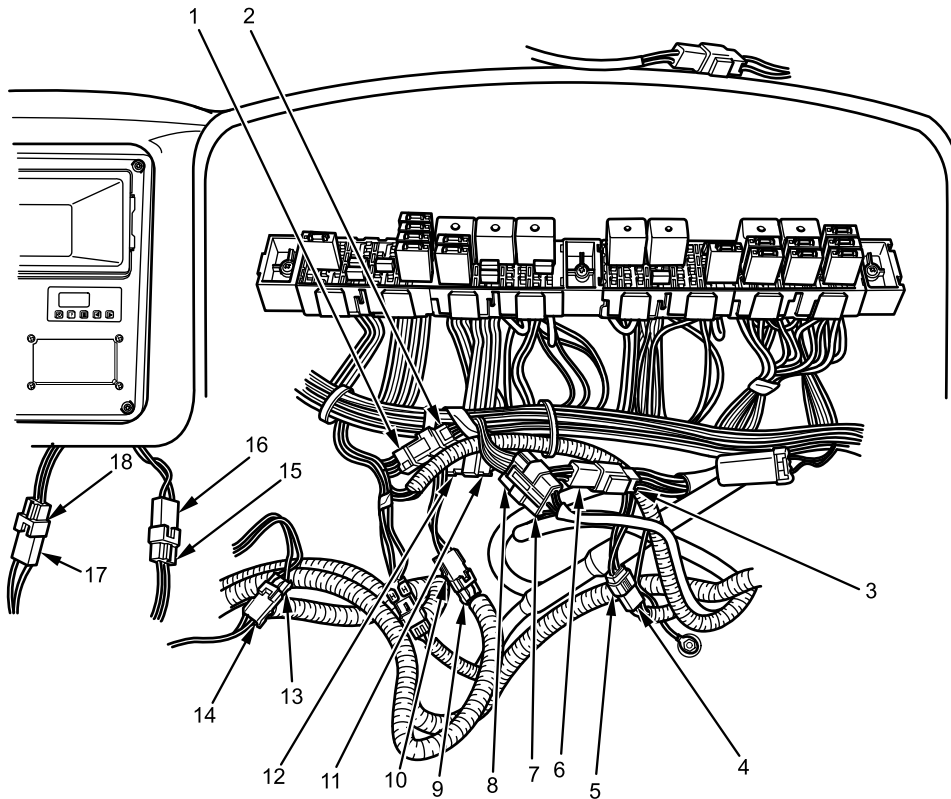
5. Disconnect right heated windshield harness (Figure 3, Item 1) from IP harness connector (Figure 3, Item 2).
6. Remove two push-in fasteners (Figure 3, Item 3) and relay panel (Figure 3, Item 4) from IP (Figure 3, Item 7).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Note the orientation of IP harness and cable lock straps to ensure proper installation.

7. Disconnect ramp control harness connector (Figure 4, Item 2) from IP harness connector (Figure 4, Item 1).

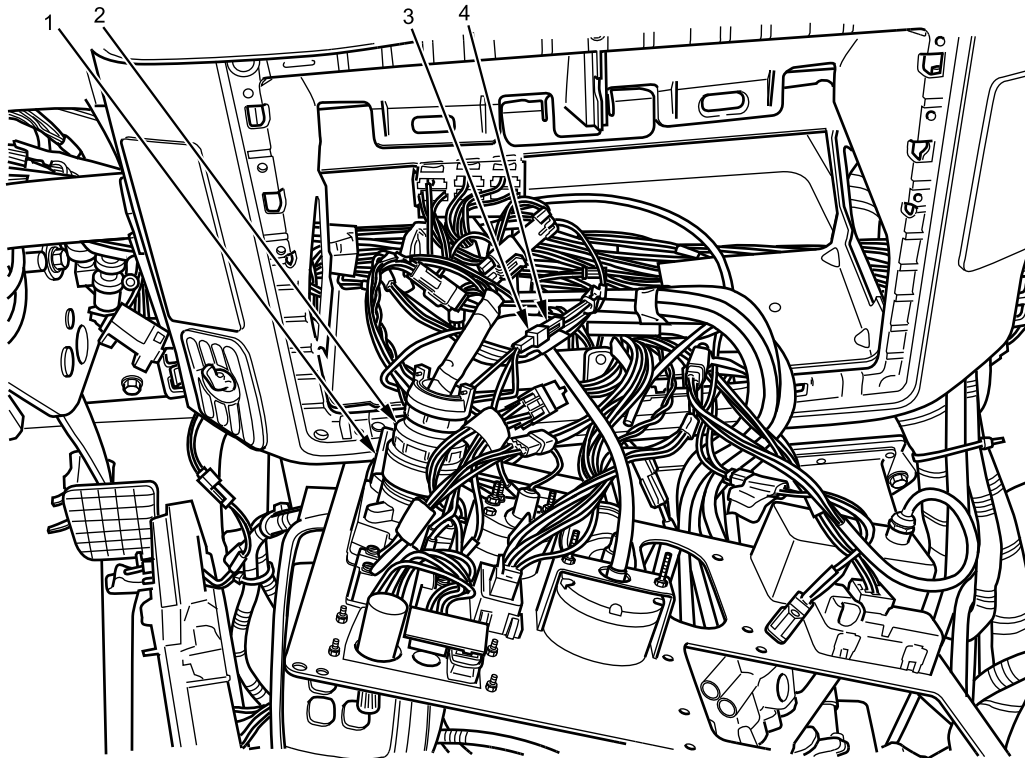


B230604211

Figure 4. Right Side IP Harness Connector Removal.

8. Disconnect roof marker lamp harness connector (Figure 4, Item 12) from IP harness connector (Figure 4, Item 11).
9. Disconnect 24V power input harness connector (Figure 4, Item 9) from IP harness connector (Figure 4, Item 10).
10. Disconnect dome lamp harness connector (Figure 4, Item 6) from IP harness connector (Figure 4, Item 3).
11. Disconnect spotlight harness connector (Figure 4, Item 14) from IP harness connector (Figure 4, Item 13).
12. Disconnect HVAC harness connector (Figure 4, Item 7) from IP harness connector (Figure 4, Item 8).
13. Disconnect right door harness connector (Figure 4, Item 4) from IP harness connector (Figure 4, Item 5).
14. Disconnect right side power socket connector (Figure 4, Item 15) from IP harness connector (Figure 4, Item 16).
15. Disconnect left side power socket connector (Figure 4, Item 17) from IP harness connector (Figure 4, Item 18).
16. Disconnect master vehicle light switch (MVLS) harness connector (Figure 5, Item 2) from MVLS (Figure 5, Item 1) by turning collar counterclockwise.

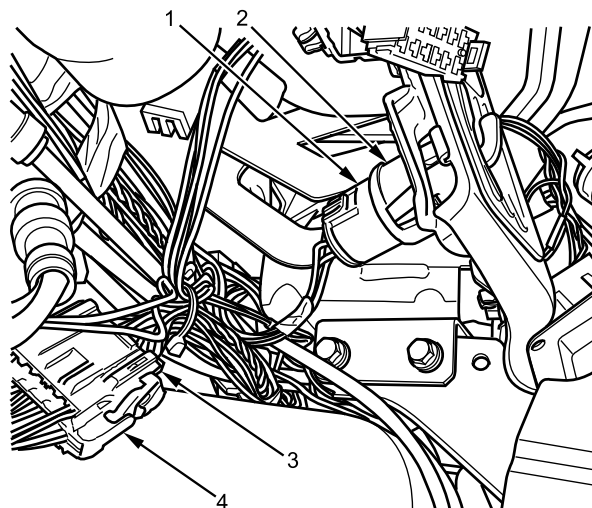
INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604212

Figure 5. Center IP Harness Connector Removal.

17. Disconnect 24V meter IP harness connector (Figure 5, Item 4) from 24V meter pigtail connector (Figure 5, Item 3).
18. Disconnect keyless switch IP harness connector (Figure 6, Item 1) from keyless switch (Figure 6, Item 2).



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Figure 6. Keyless Switch Connector.

19. Disconnect 40-way in-line steering column harness connector (Figure 6, Item 4) from IP harness connector (Figure 6, Item 3).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

20. Remove four screws (Figure 7, Item 1) and diagnostic link connector (Figure 7, Item 3) from bracket (Figure 7, Item 2).

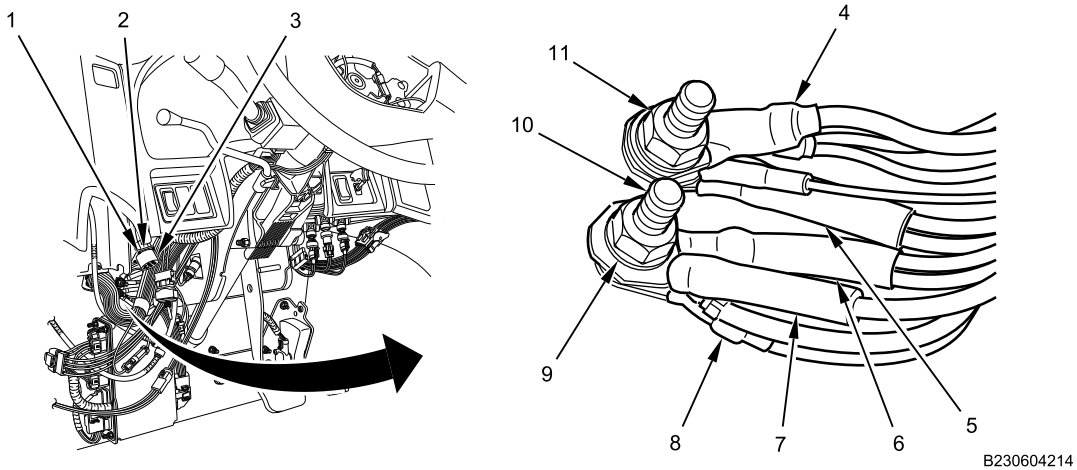


Figure 7. Diagnostic Connector and Ground Leads.

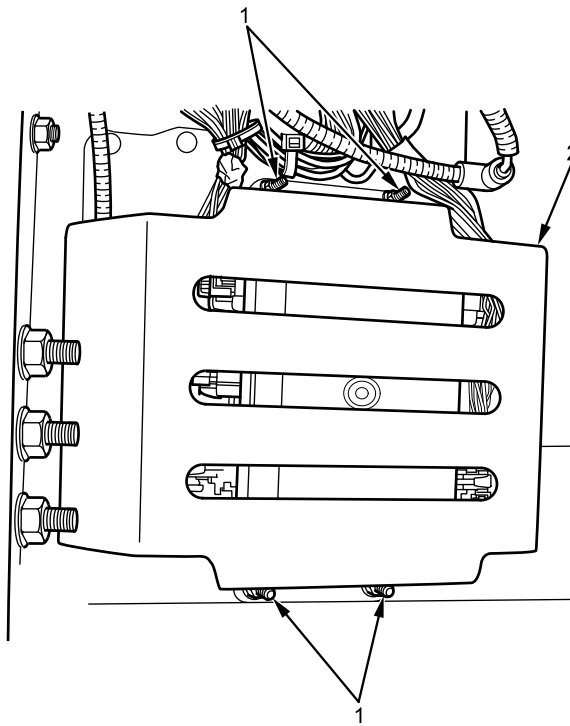
21. Remove two nuts (Figure 7, Item 10), lockwashers (Figure 7, Item 9), and five ground wires (Figure 7, Item 4, 5, 6, 7, and 8) from ground studs (Figure 7, Item 11). Discard lockwashers.

NOTE

Early models do not use ESC module cover.

22. Remove four nuts (Figure 8, Item 1) and ESC module cover (Figure 8, Item 2) from bulkhead.

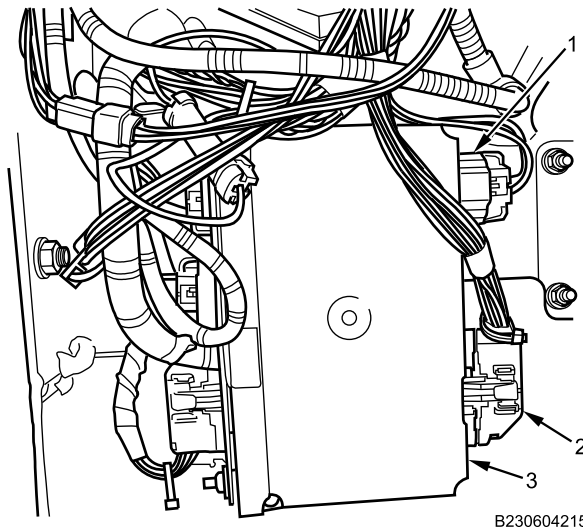
INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



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Figure 8. Electrical System Control (ESC) Module Cover Removal.

23. Disconnect IP harness booster connector (Figure 9, Item 1) from ESC module (Figure 9, Item 3).



B230604215

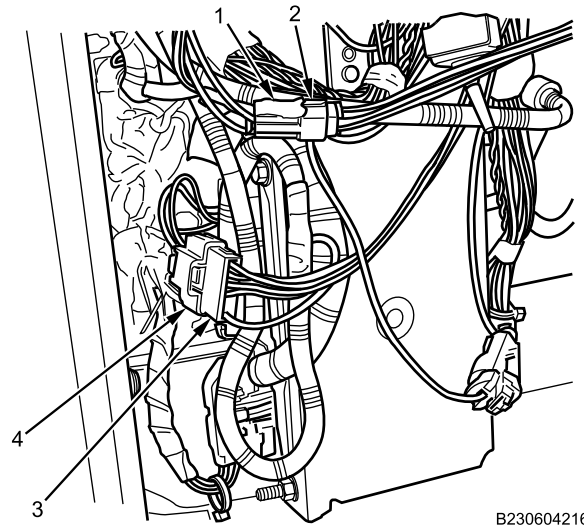
Figure 9. ESC Module Connectors.

24. Disconnect IP harness ESC connector (Figure 9, Item 2) from ESC module (Figure 9, Item 3).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

First design uses three connectors at the ESC module. Replacement harnesses use only two connectors.

25. Disconnect IP harness stop/turn light connector (Figure 10, Item 3) from ESC module harness (Figure 10, Item 4).

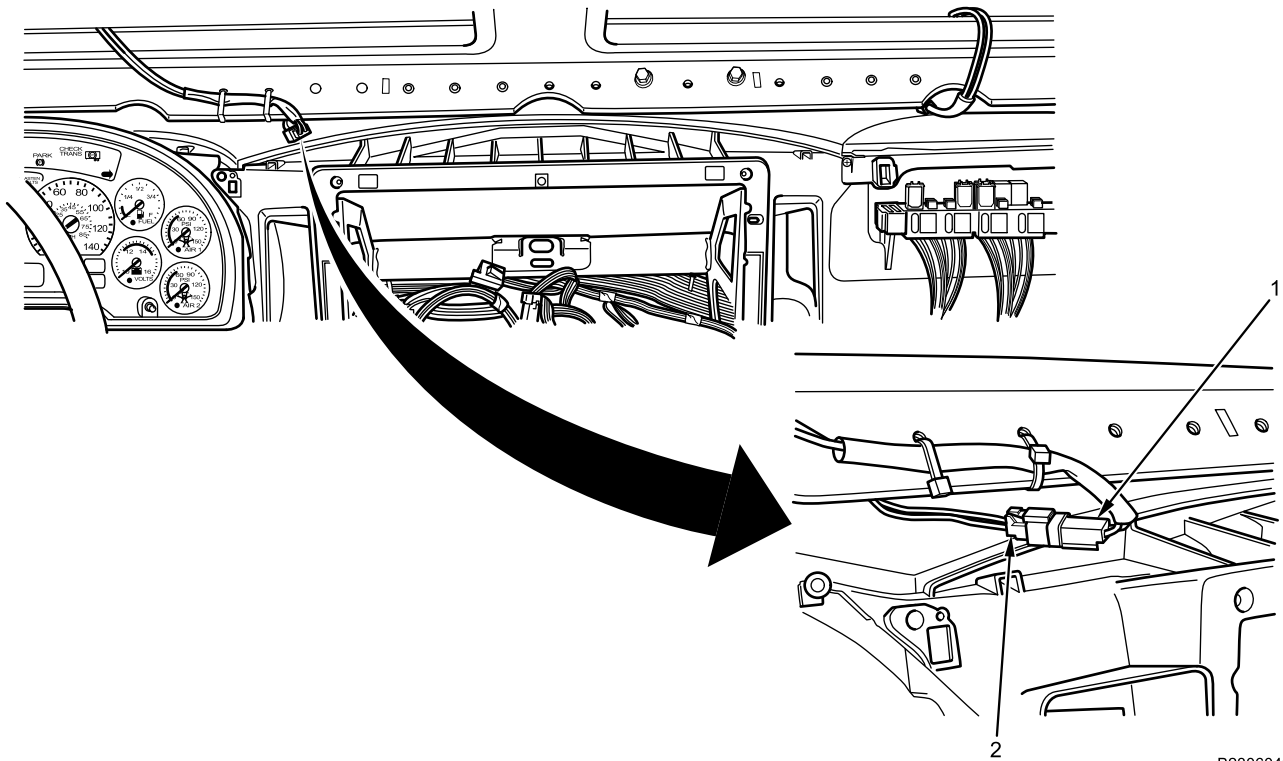


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Figure 10. Stop/Turn Lighting and Drivers Door In-Line Connectors.

26. Disconnect IP harness left door in-line connector (Figure 10, Item 2) from left door harness connector (Figure 10, Item 1).
27. Disconnect IP harness left heated windshield connector (Figure 11, Item 1) from IP harness connector (Figure 11, Item 2).

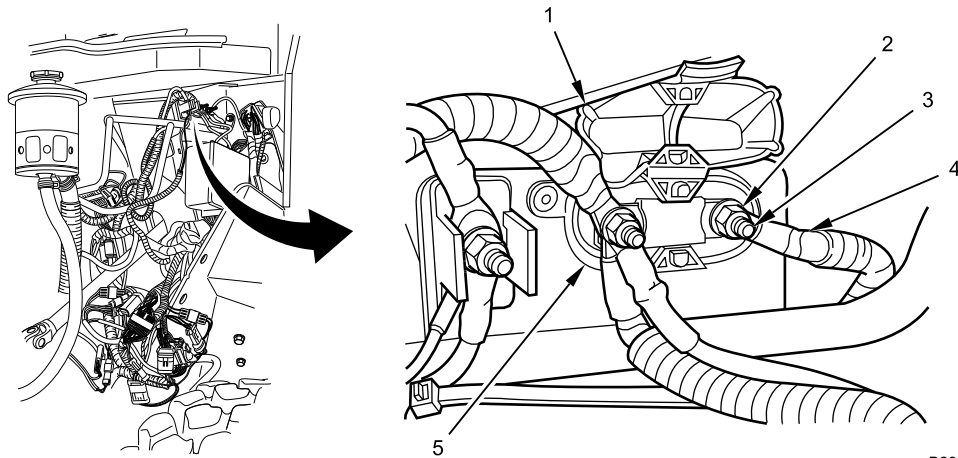
INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



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Figure 11. Left Heated Windshield Harness.

28. Under hood of vehicle, lift cover (Figure 12, Item 1) to access mega-fuse block (Figure 12, Item 5).



B230604218

Figure 12. Mega-Fuse Ring Connector.

29. Remove locknut (Figure 12, Item 2) and battery feed cable (Figure 12, Item 4) from stud (Figure 12, Item 3). Discard locknut.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

30. Release four tabs (Figure 13, Item 2) and remove cover (Figure 13, Item 1) from pass-through connector.

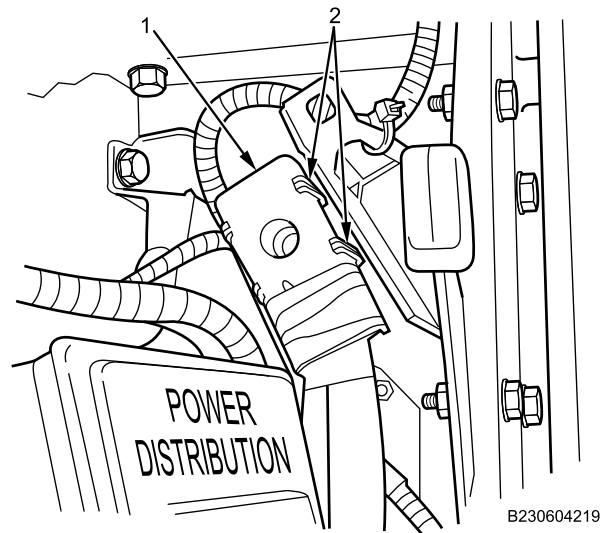


Figure 13. Front of Dash Pass-Through.

31. Remove screw (Figure 14, Item 1) and Power Distribution Center (PDC) harness connector (Figure 14, Item 2) from bulkhead (Figure 14, Item 3).

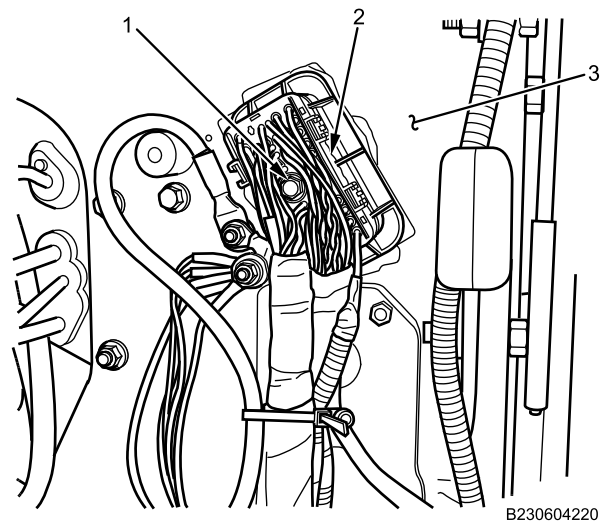


Figure 14. Front of Dash Pass-Through Connector.

32. Release two snap locks (Figure 15, Item 1) on IP harness bulkhead connector (Figure 15, Item 2). Push connector through bulkhead.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

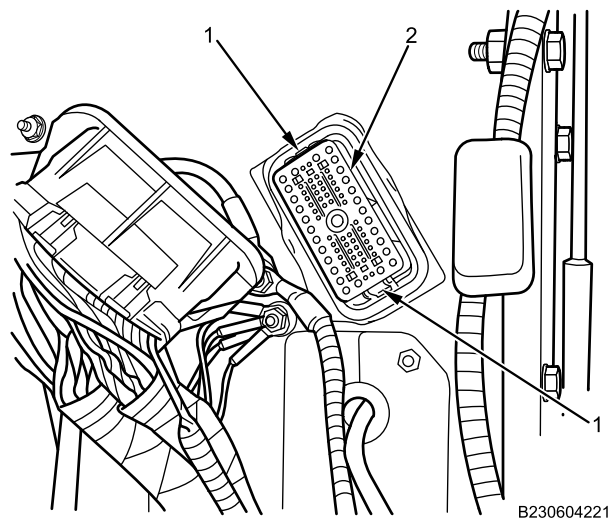


Figure 15. IP Harness Bulkhead Connector.

33. Remove cable lock straps (Figure 16, Item 1) as necessary to access battery feed cable (Figure 16, Item 2). Discard cable lock straps.

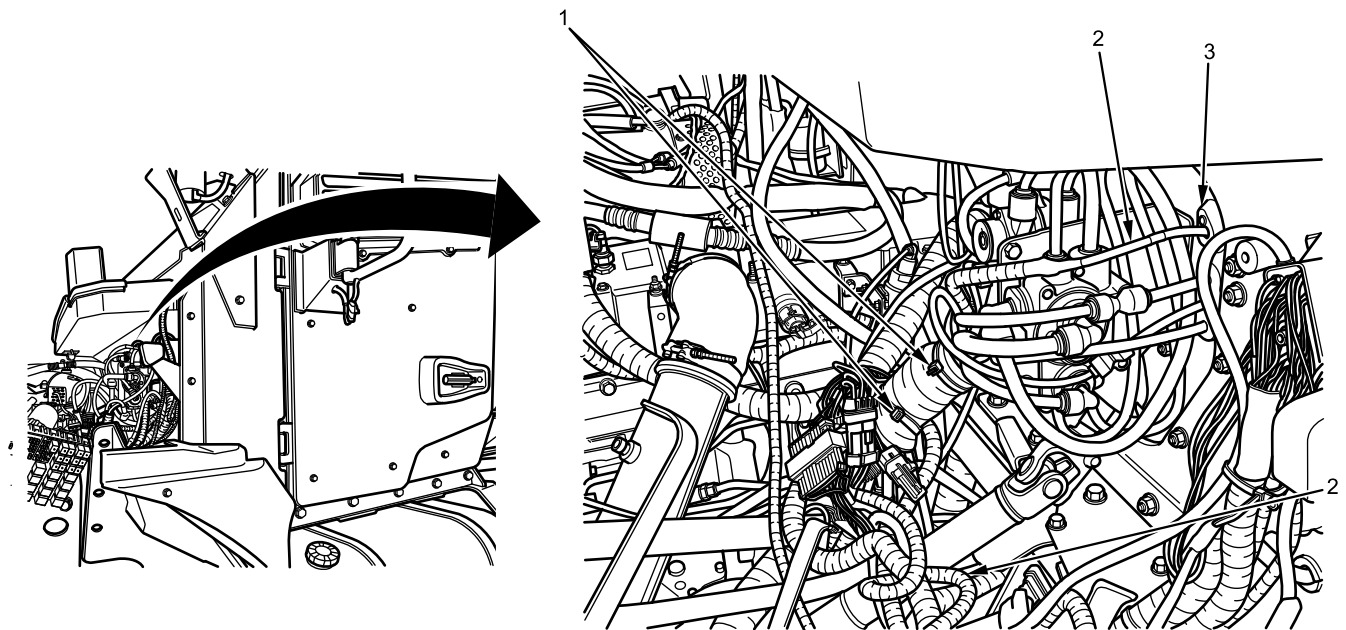
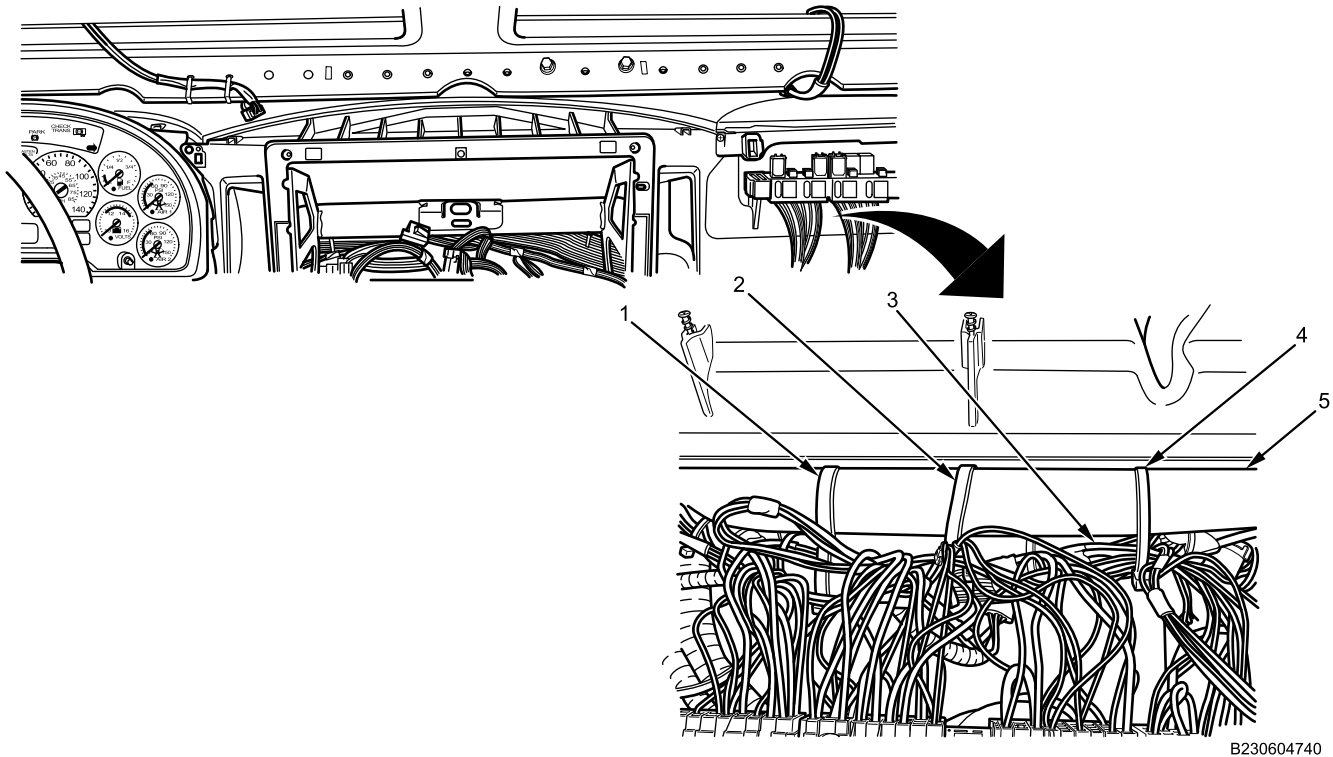


Figure 16. Battery Feed Cable Removal.

34. Push battery feed cable (Figure 16, Item 2) and grommet (Figure 16, Item 3) through bulkhead.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

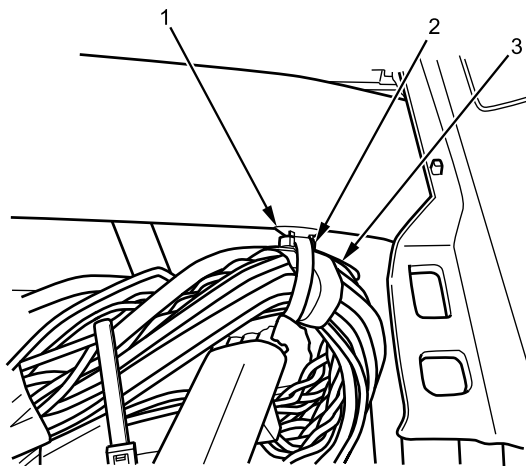
35. Remove three wiring harness cable lock straps (Figure 17, Item 1, 2, and 4) from IP wiring harness bundle (Figure 17, Item 3) and IP brace (Figure 17, Item 5) through IP right side closeout opening. Discard cable lock straps.



B230604740

Figure 17. Right Side IP Harness Cable Lock Strap Removal.

36. Remove right side wiring harness cable lock strap (Figure 18, Item 2) from IP wiring harness bundle (Figure 18, Item 3) and IP brace cable lock strap retainer (Figure 18, Item 1) through IP right side closeout opening. Discard cable lock strap.

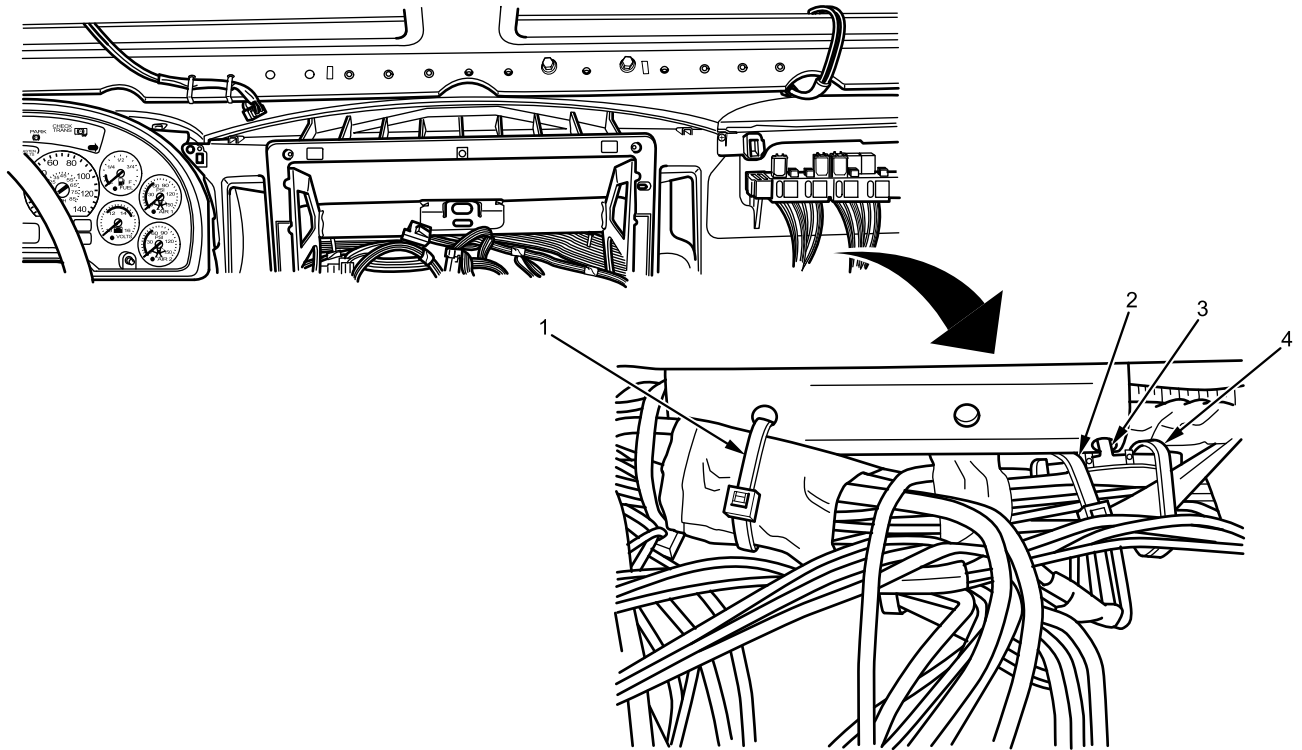


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Figure 18. Right Side IP Harness Cable Lock Strap Removal.

37. Remove left wiring harness cable lock strap (Figure 19, Item 1) from IP wiring harness bundle and IP brace bracket through IP right side closeout opening. Discard cable lock strap.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



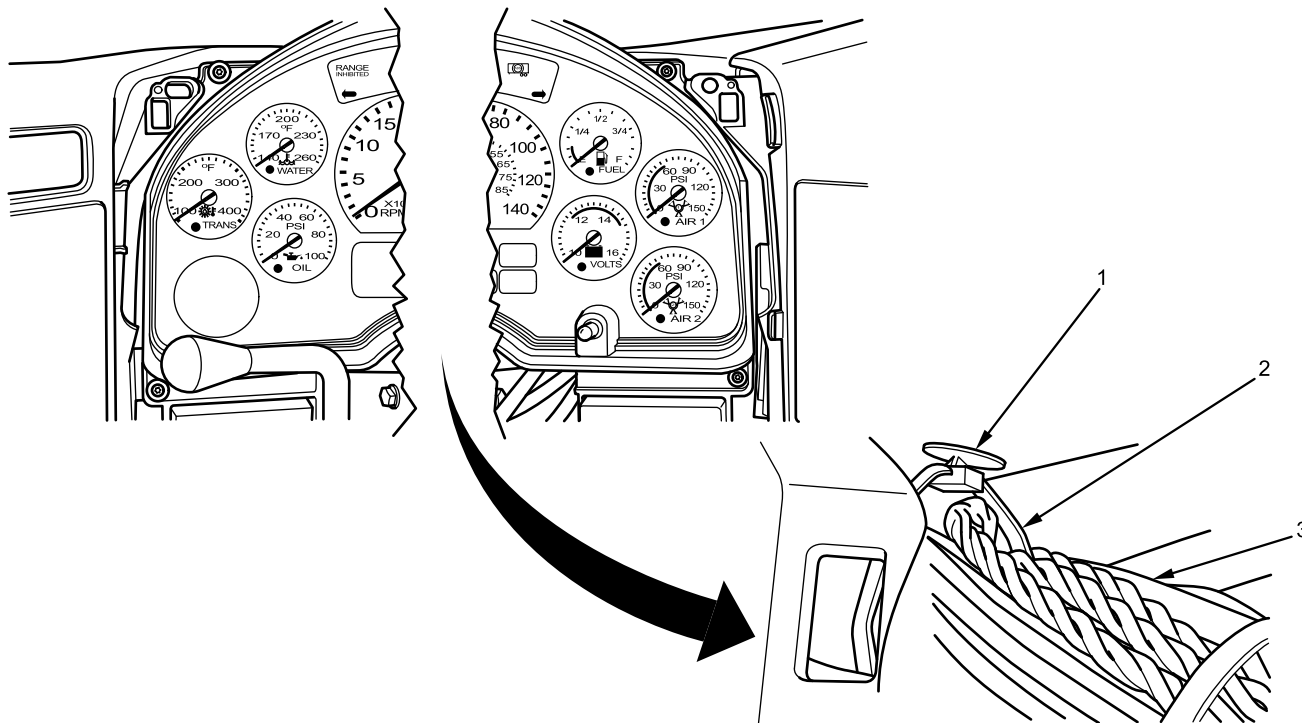
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Figure 19. Right Side IP Harness Cable Lock Strap Removal.

38. Remove two right wiring harness cable lock straps (Figure 19, Item 2 and 4) from IP wiring harness bundle and IP brace bracket clip (Figure 19, Item 3). Discard cable lock straps.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

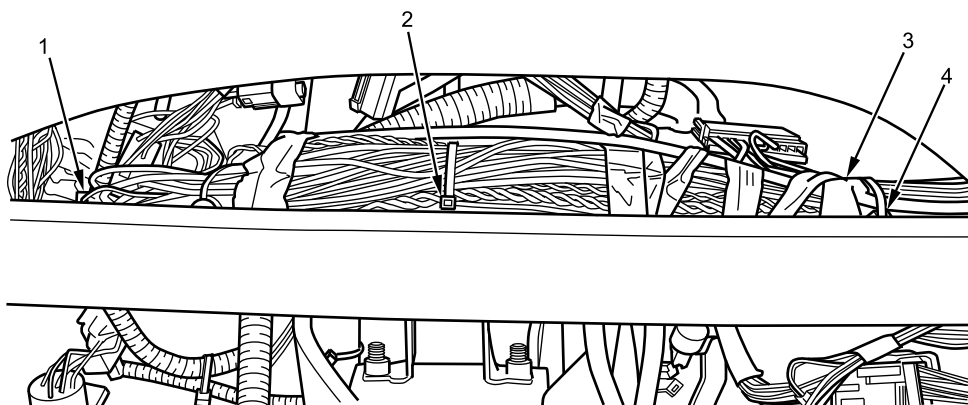
39. Remove left side wiring harness cable lock strap (Figure 20, Item 2) from IP wiring harness bundle (Figure 20, Item 3) and IP brace cable lock strap retainer (Figure 20, Item 1) through IP left side closeout opening. Discard cable lock strap.



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Figure 20. Left Side IP Harness Cable Lock Strap Removal.

40. Remove three wiring harness cable lock straps (Figure 21, Item 1, 2, and 4) from IP wiring harness bundle (Figure 21, Item 3) and IP brace cable lock strap retainers through IP center closeout opening. Discard cable lock straps.



B230604228

Figure 21. Center IP Harness Cable Lock Strap Removal.

41. Remove three wiring harness cable lock straps (Figure 22, Item 1, 2, and 4) from IP wiring harness bundle (Figure 22, Item 3) and IP brace cable lock strap retainers through IP cluster opening. Discard cable lock straps.

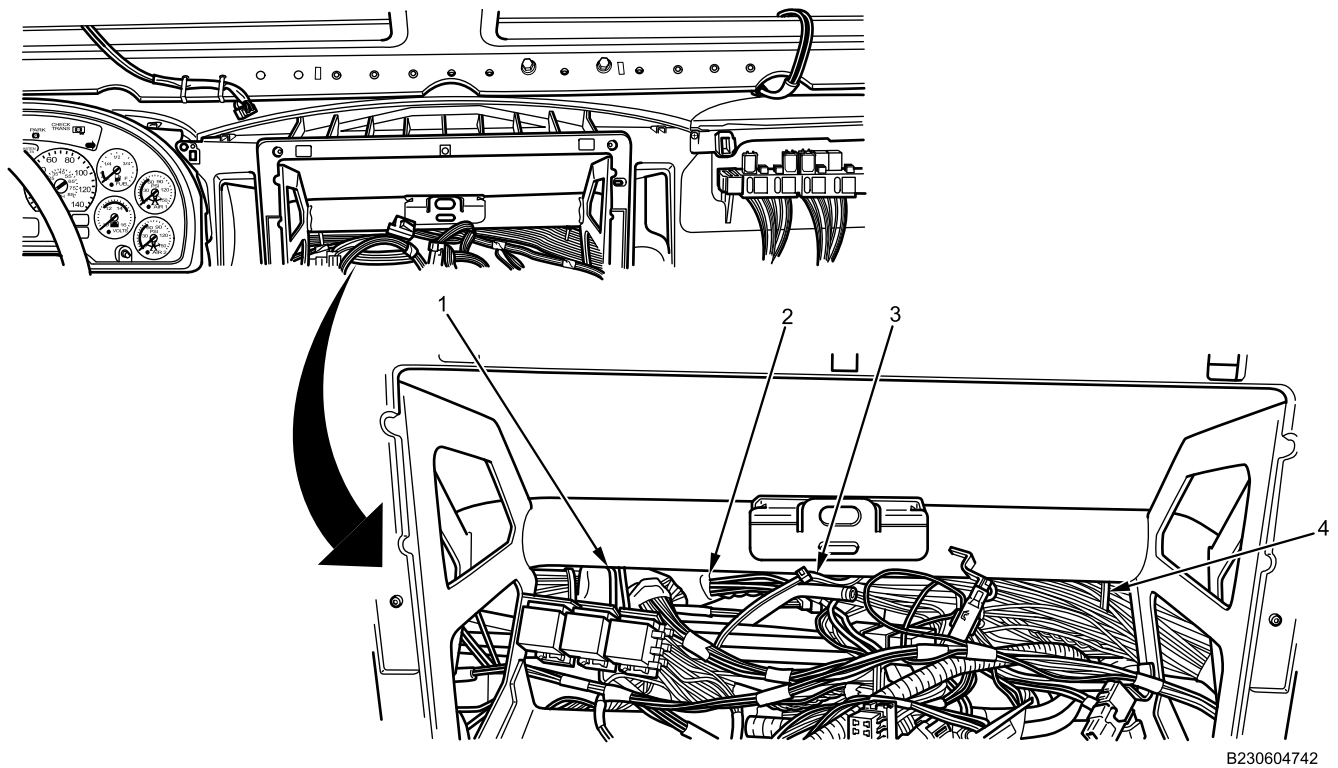
INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

Figure 22. Center IP Harness Cable Lock Strap Removal.

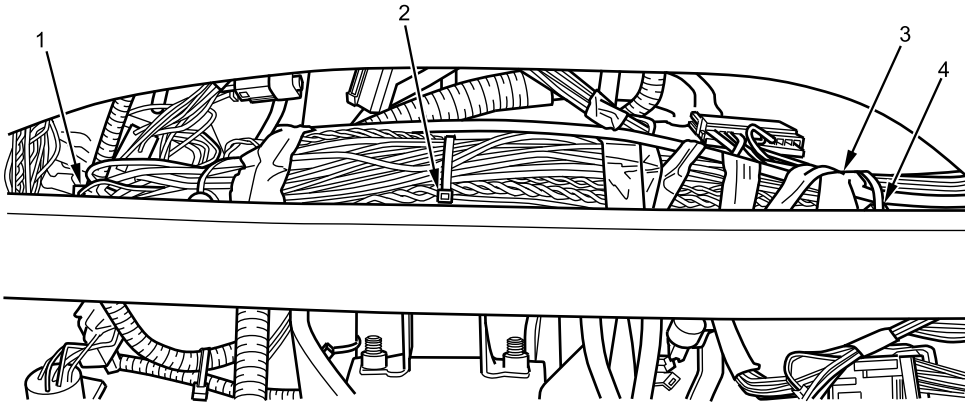
42. Remove IP harness (Figure 22, Item 3) from vehicle.

END OF TASK

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all electrical connectors.
2. Position IP wiring harness on IP.
3. Install three new wiring harness cable lock straps (Figure 23, Item 1, 2, and 4) on IP wiring harness bundle (Figure 23, Item 3) and IP brace cable lock strap retainers to IP cluster opening.

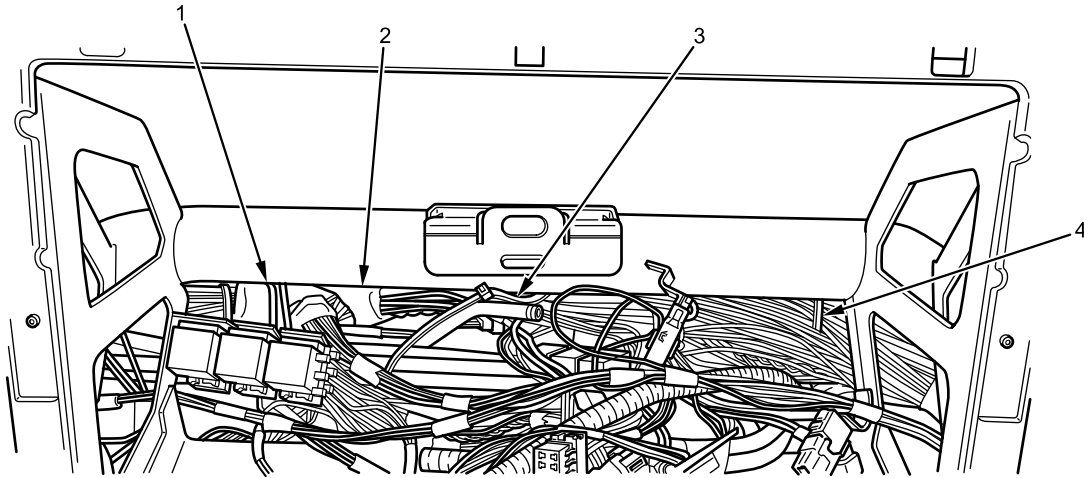


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Figure 23. Center IP Harness Cable Lock Strap Installation.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

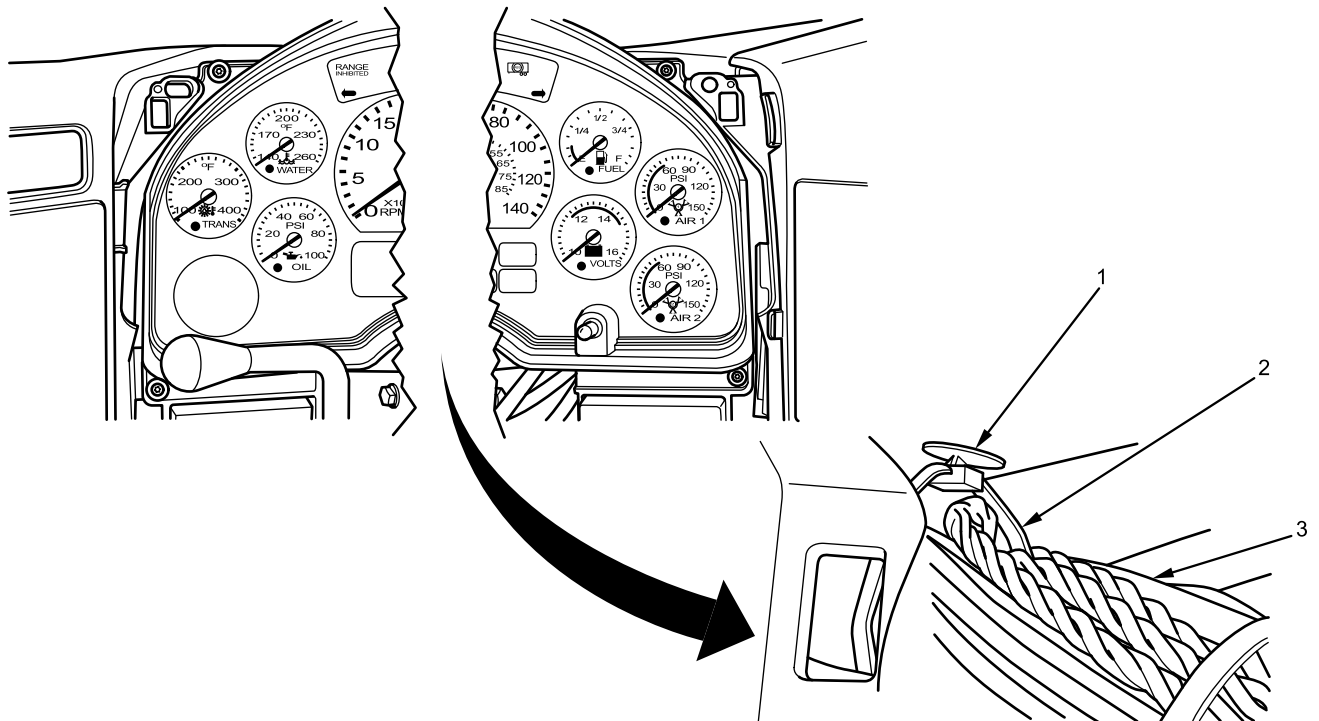
4. Install three new wiring harness cable lock straps (Figure 24, Item 1, 3, and 4) on IP wiring harness bundle (Figure 24, Item 2) and IP brace cable lock strap retainers through IP center closeout opening.



B230604227

Figure 24. Center IP Harness Cable Lock Strap Installation.

5. Install new left side wiring harness cable lock strap (Figure 25, Item 2) on IP wiring harness bundle (Figure 25, Item 3) and IP brace cable lock strap retainer (Figure 25, Item 1) through IP left side closeout opening.

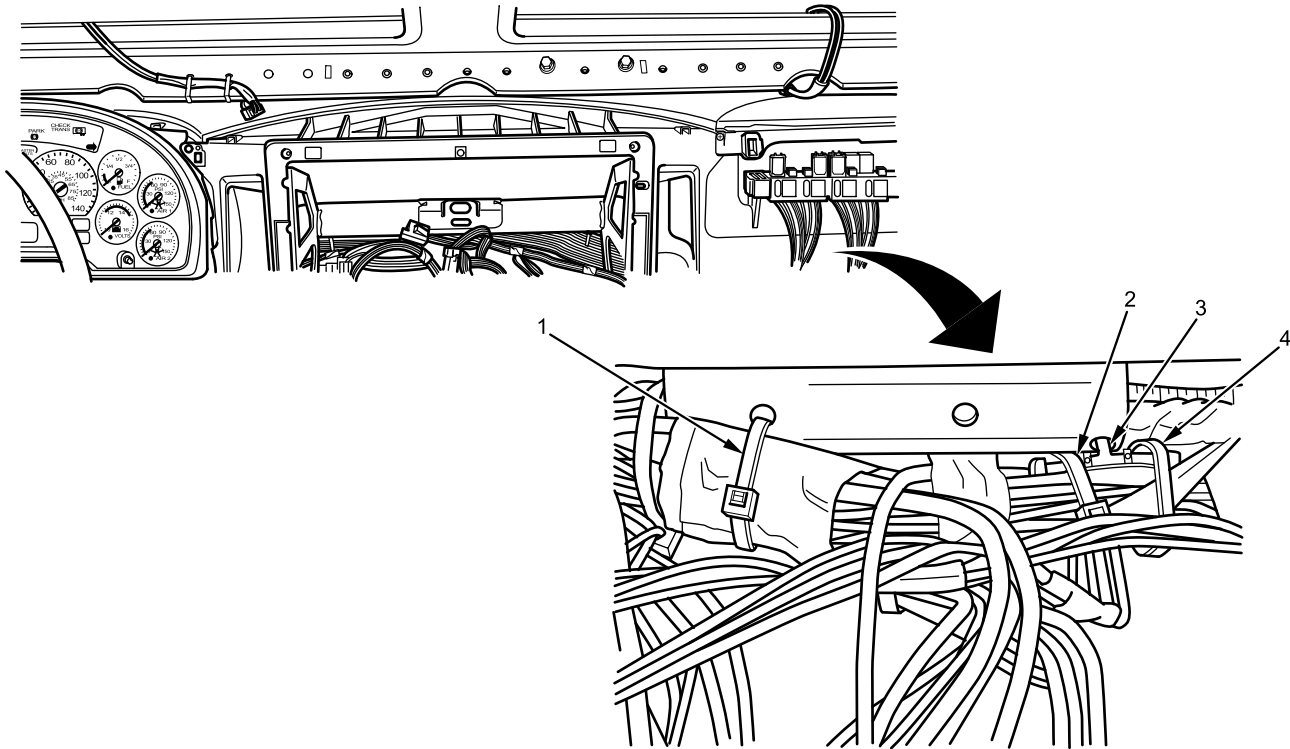


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Figure 25. Left Side IP Harness Cable Lock Strap Installation.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

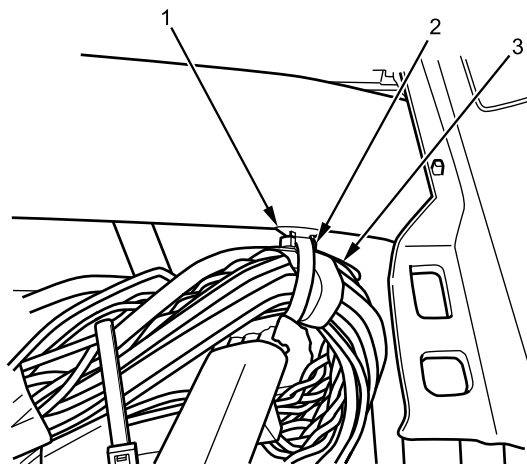
6. Install left wiring harness cable lock strap (Figure 26, Item 1) on IP wiring harness bundle and IP brace bracket through IP right side closeout opening.



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Figure 26. Right Side IP Harness Cable Lock Strap Installation.

7. Install two right wiring harness cable lock straps (Figure 26, Item 2 and 4) on IP wiring harness bundle and IP brace bracket clip (Figure 26, Item 3).
8. Install new right side wiring harness cable lock strap (Figure 27, Item 2) on IP wiring harness bundle (Figure 27, Item 3) and IP brace cable lock strap retainer (Figure 27, Item 1) through IP right side closeout opening.

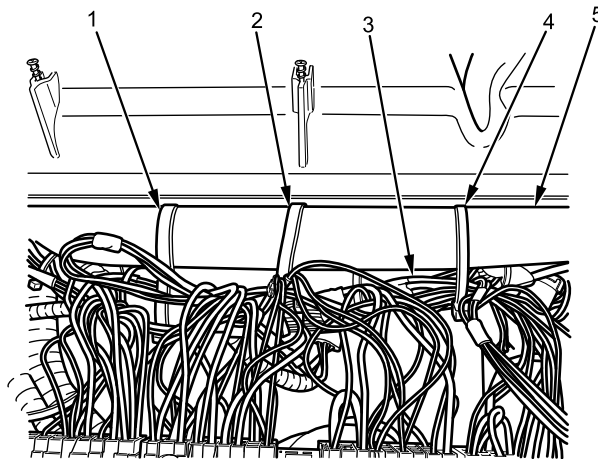


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Figure 27. Right Side IP Harness Cable Lock Strap Installation.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

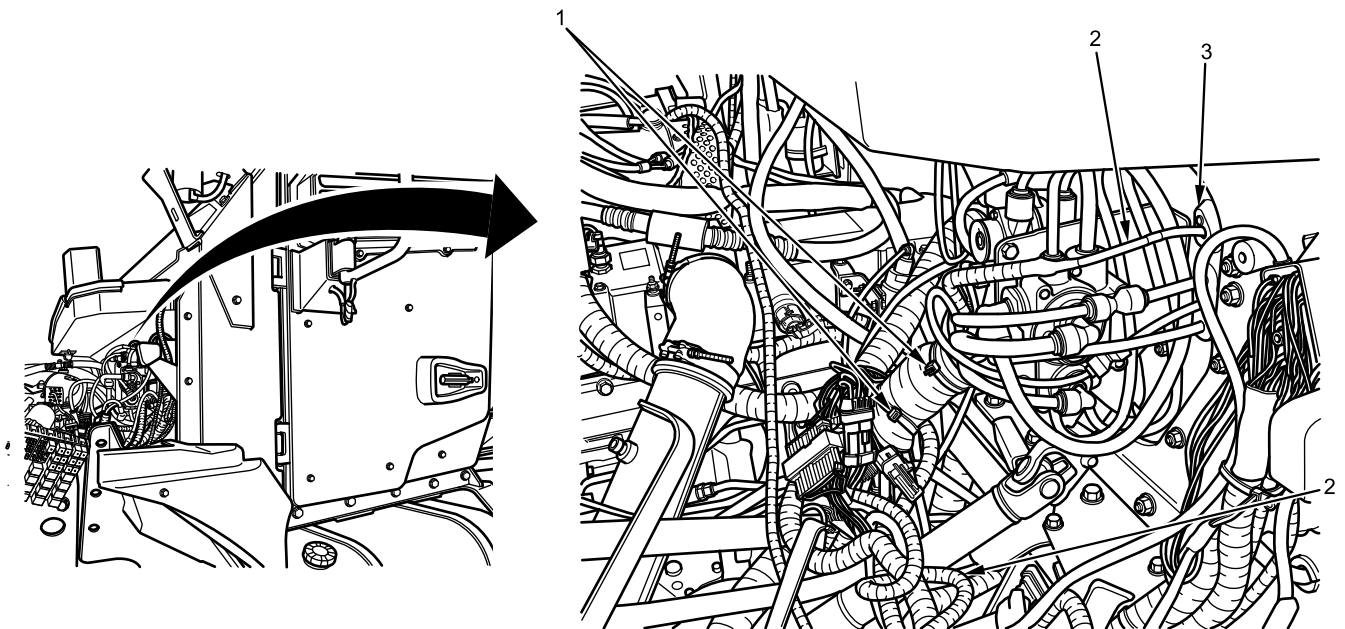
9. Install three new wiring harness cable lock straps (Figure 28, Item 1, 2, and 4) on IP wiring harness bundle (Figure 28, Item 3) and IP brace (Figure 28, Item 5) through IP right side closeout opening.



B230604223

Figure 28. Right Side IP Harness Cable Lock Strap Installation.

10. Push battery feed cable (Figure 29, Item 2) and grommet (Figure 29, Item 3) through bulkhead pass-through.



B230604739

Figure 29. Battery Feed Cable Installation.

11. Install new cable lock straps (Figure 29, Item 1) to secure battery feed cable (Figure 29, Item 2) to bundle.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

12. Under left side of IP, install IP harness bulkhead connector (Figure 30, Item 2) through bulkhead, ensure two snaps (Figure 30, Item 1) lock bulkhead connector (Figure 30, Item 2) in place.

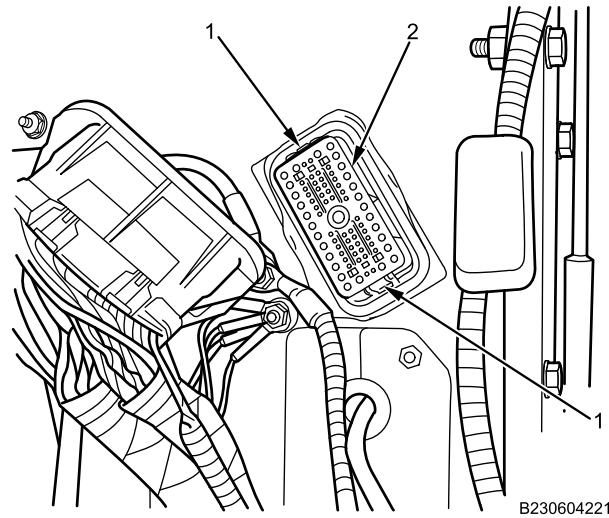


Figure 30. IP Harness Bulkhead Connector.

13. Connect PDC harness connector (Figure 31, Item 2) on bulkhead (Figure 31, Item 3) with screw (Figure 31, Item 1). Tighten screw securely.

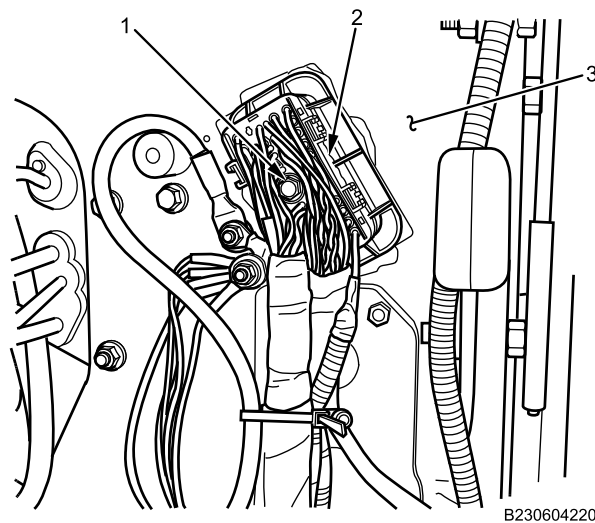


Figure 31. Front of Dash Pass-Through Connector.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

14. Install cover (Figure 32, Item 1) on pass-through connector, and ensure four tabs (Figure 32, Item 2) engage connector.

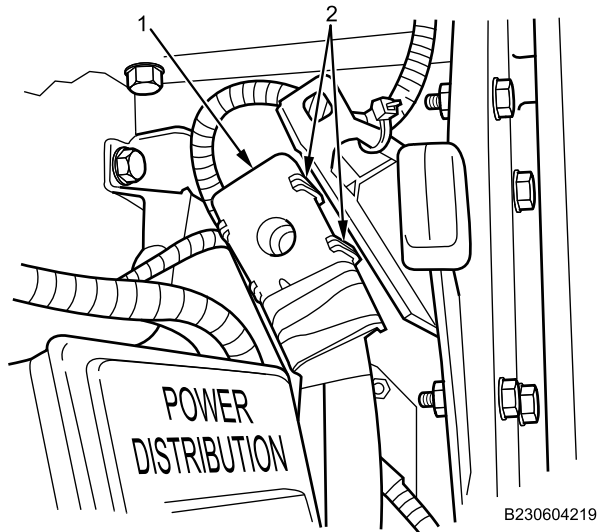


Figure 32. Front of Dash Pass-Through.

15. Secure battery feed cable (Figure 33, Item 4) on mega-fuse stud (Figure 33, Item 3) with new locknut (Figure 33, Item 2). Tighten locknut securely.

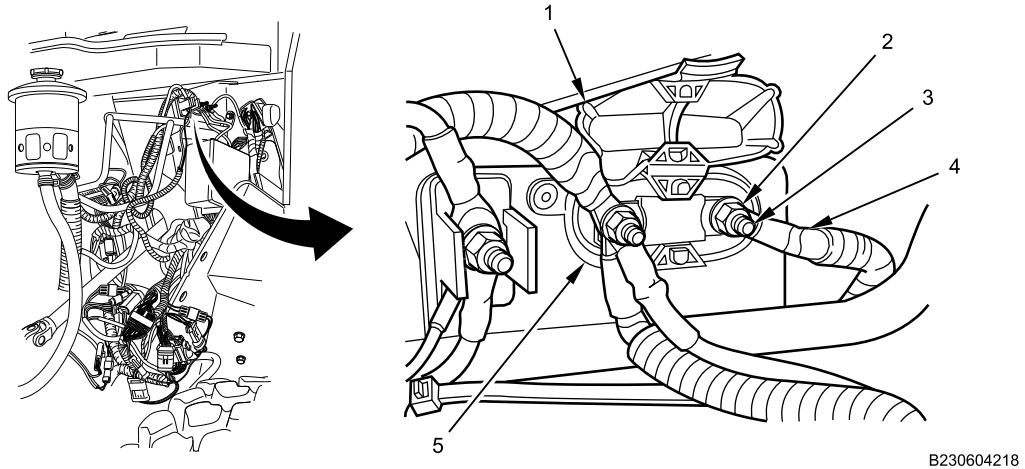
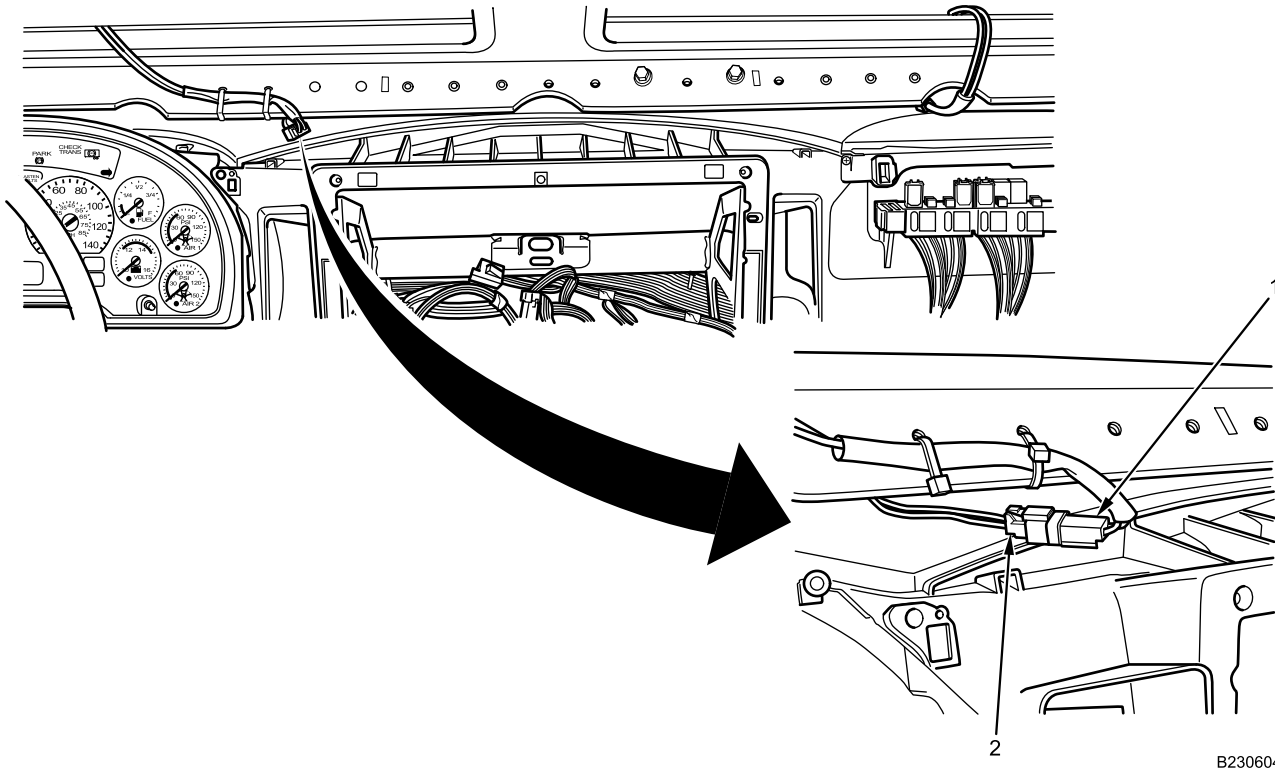


Figure 33. Mega-Fuse Ring Connector.

16. Close and secure cover (Figure 33, Item 1) on mega-fuse block (Figure 33, Item 5).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

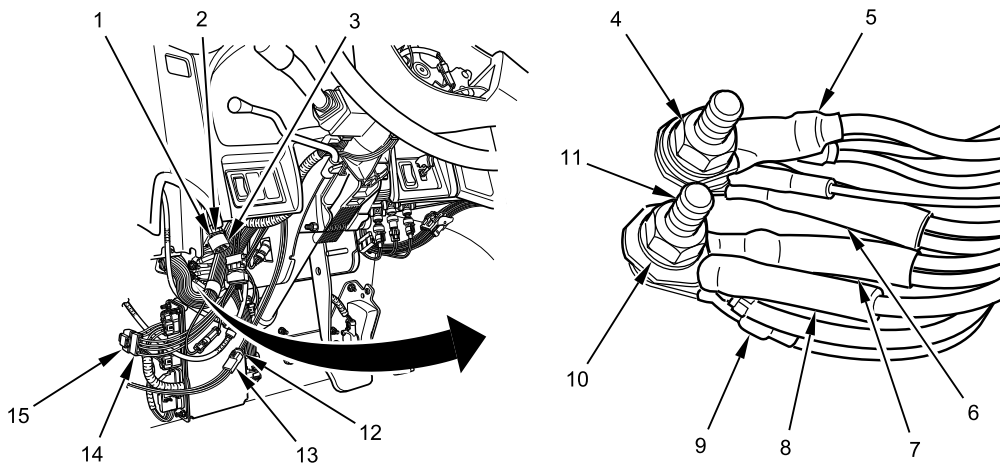
17. Connect IP harness left heated windshield connector (Figure 34, Item 1) to heated windshield harness connector (Figure 34, Item 2).



B230604217

Figure 34. Left Heated Windshield Harness.

18. Connect IP harness stop/turn light connector (Figure 35, Item 14) to ESC module harness (Figure 35, Item 15).



B230604738

Figure 35. Left Side IP In-Line Connectors.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

19. Connect IP harness left door in-line connector (Figure 35, Item 12) to left door harness connector (Figure 35, Item 13).
20. Install diagnostic link connector (Figure 35, Item 3) on bracket (Figure 35, Item 2) with four screws (Figure 35, Item 1). Tighten screws securely.
21. Secure five ground wires (Figure 35, Item 5, 6, 7, 8 and 9) on ground studs (Figure 35, Item 11) with two new lockwashers (Figure 35, Item 10) and nuts (Figure 35, Item 4). Tighten nuts securely.
22. Connect IP harness booster connector (Figure 36, Item 1) to ESC module (Figure 36, Item 3).

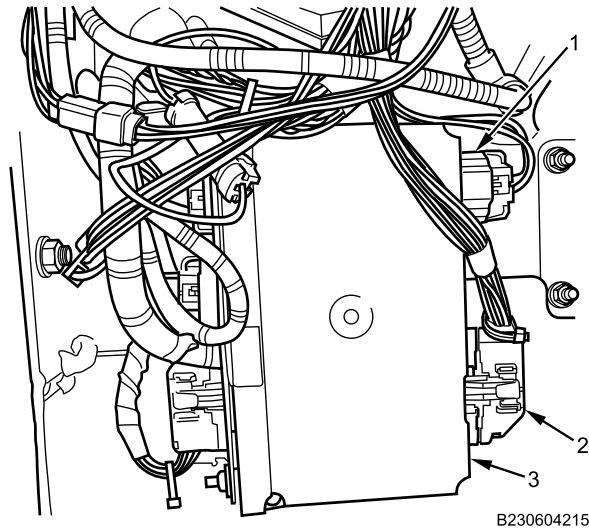
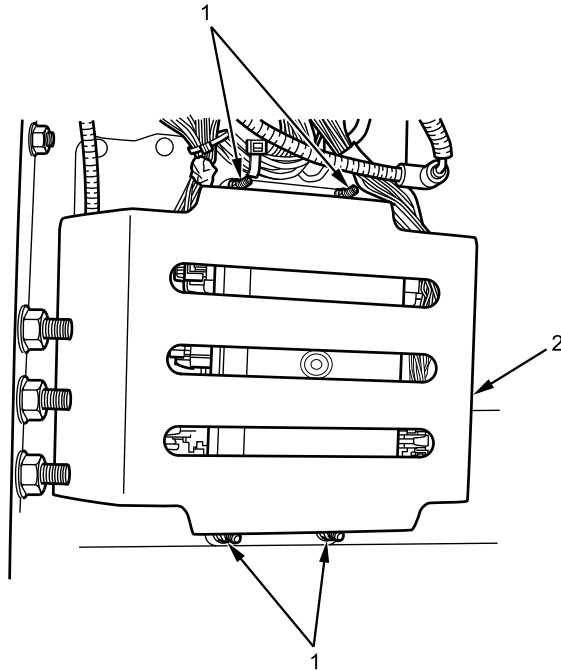


Figure 36. ESC Module Connectors.

23. Connect IP harness ESC connector (Figure 36, Item 2) to ESC module (Figure 36, Item 3).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

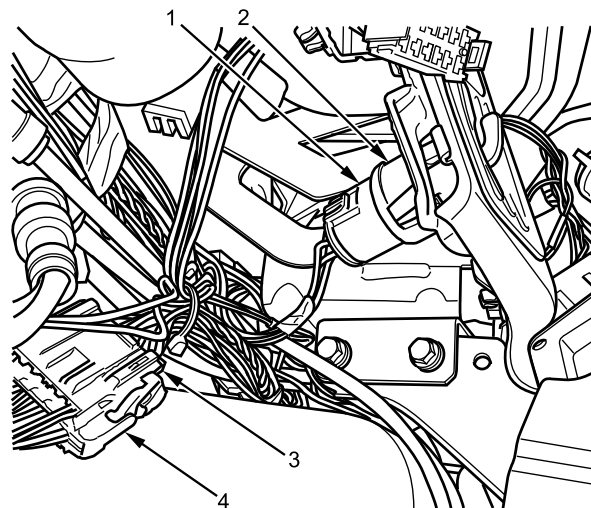
24. Install ESC module cover (Figure 37, Item 2) on bulkhead with four nuts (Figure 37, Item 1). Tighten nuts securely.



B230604278

Figure 37. ESC Module Cover Installation.

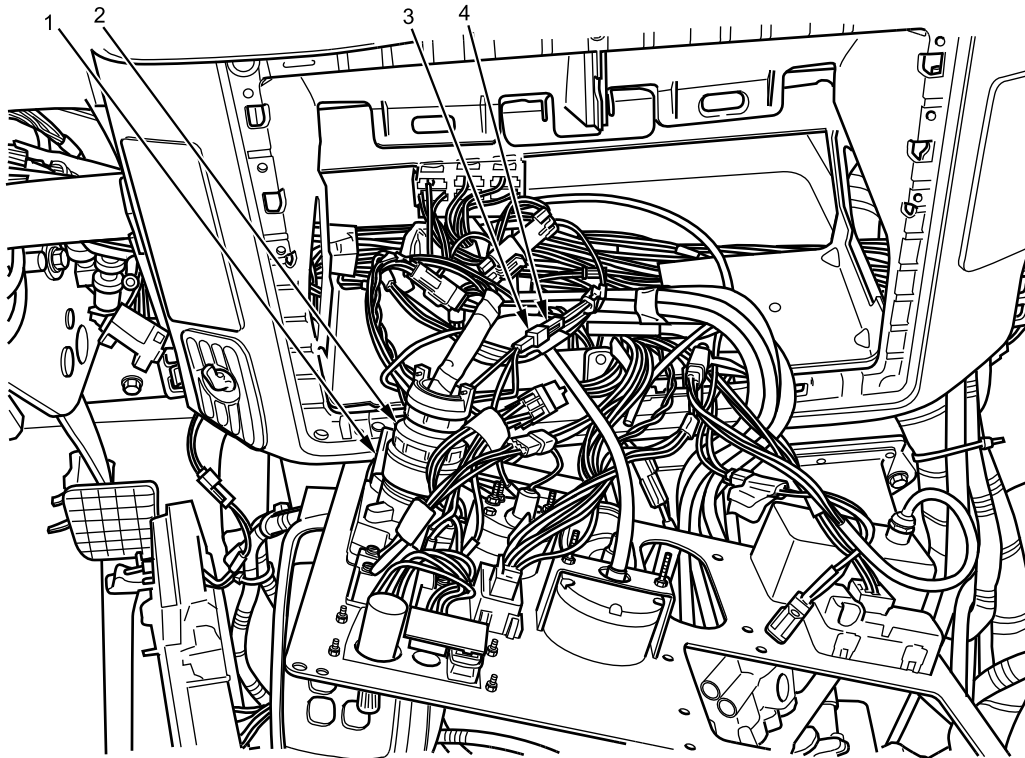
25. Connect keyless switch IP harness connector (Figure 38, Item 1) on keyless switch (Figure 38, Item 2).



B230604213

Figure 38. Keyless Switch Connector.

26. Connect 40-way in-line steering column harness connector (Figure 38, Item 4) to IP harness connector (Figure 38, Item 3).
27. Connect 24V meter IP harness connector (Figure 39, Item 4) to 24V meter pigtail connector (Figure 39, Item 3).

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

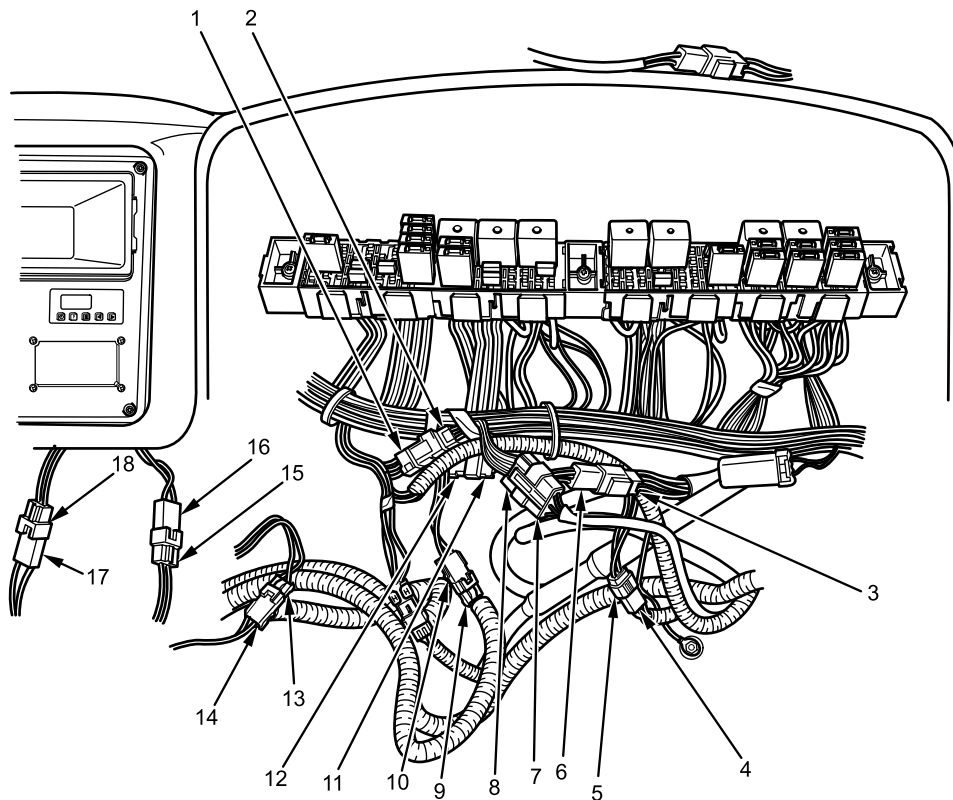
B230604212

Figure 39. Center IP Harness Connector Installation.

28. Connect MVLS harness connector (Figure 39, Item 2) to MVLS (Figure 39, Item 1) by turning collar clockwise.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

29. Connect ramp control harness connector (Figure 40, Item 1) to IP harness connector (Figure 40, Item 2).

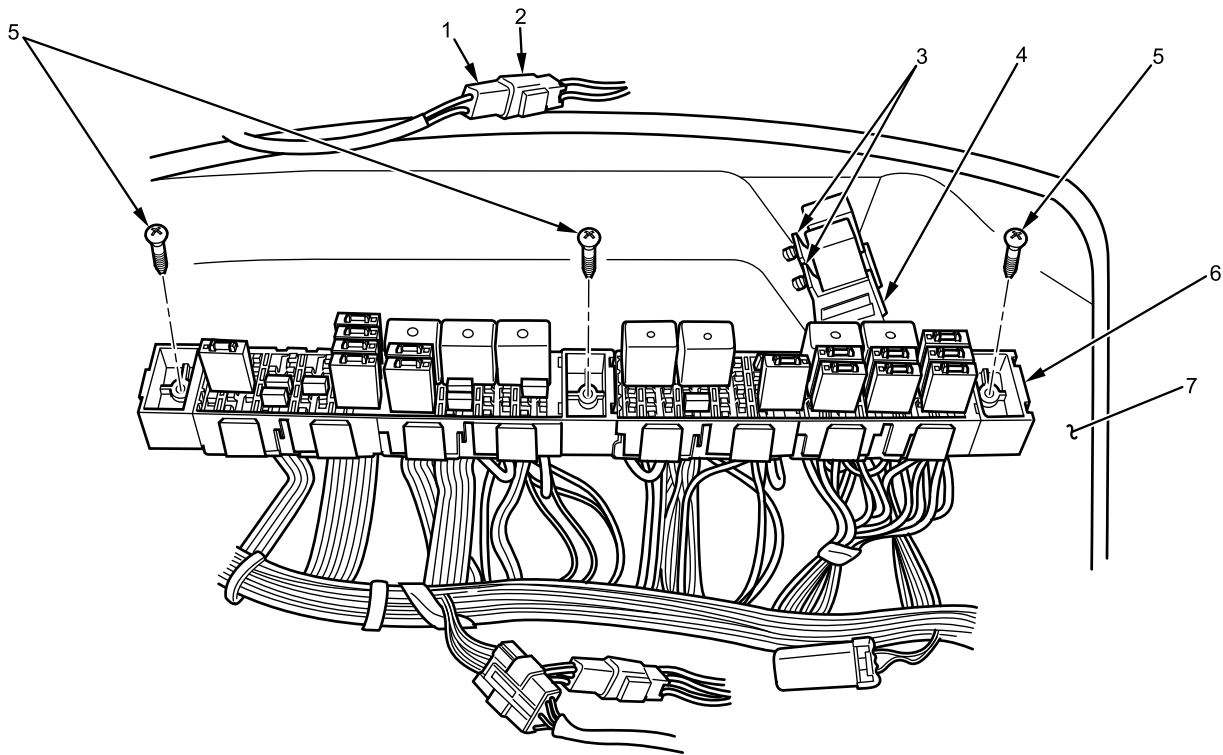


B230604211

Figure 40. Right Side IP Harness Connector Installation.

30. Connect roof marker lamp harness connector (Figure 40, Item 12) to IP harness connector (Figure 40, Item 11).
31. Connect 24V power input harness connector (Figure 40, Item 9) to IP harness connector (Figure 40, Item 10).
32. Connect dome lamp harness connector (Figure 40, Item 6) to IP harness connector (Figure 40, Item 3).
33. Connect spot light harness connector (Figure 40, Item 14) to IP harness connector (Figure 40, Item 13).
34. Connect HVAC harness connector (Figure 40, Item 7) to IP harness connector (Figure 40, Item 8).
35. Connect passenger door harness connector (Figure 40, Item 4) to IP harness connector (Figure 40, Item 5).
36. Connect right side power socket connector (Figure 40, Item 15) to IP harness connector (Figure 40, Item 16).
37. Connect left side power socket connector (Figure 40, Item 17) to IP harness connector (Figure 40, Item 18).
38. Install fuse/relay center (Figure 41, Item 6) on instrument panel (Figure 41, Item 7) with three screws (Figure 41, Item 5). Tighten screws securely.

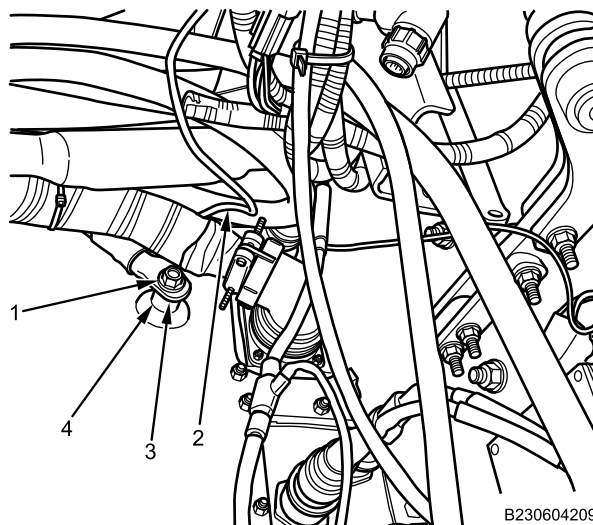
INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604210

Figure 41. IP Circuit Breaker, Fuse, and Relay Center Installation.

39. Connect right heated windshield harness connector (Figure 41, Item 1) to IP harness connector (Figure 41, Item 2).
40. Install relay panel (Figure 41, Item 4) on IP (Figure 41, Item 7) with two push-in fasteners (Figure 41, Item 3).
41. From under right side of IP, install ground cables (Figure 42, Item 2 and 3) on mounting boss (Figure 42, Item 4) with bolt (Figure 42, Item 1). Tighten bolt securely.

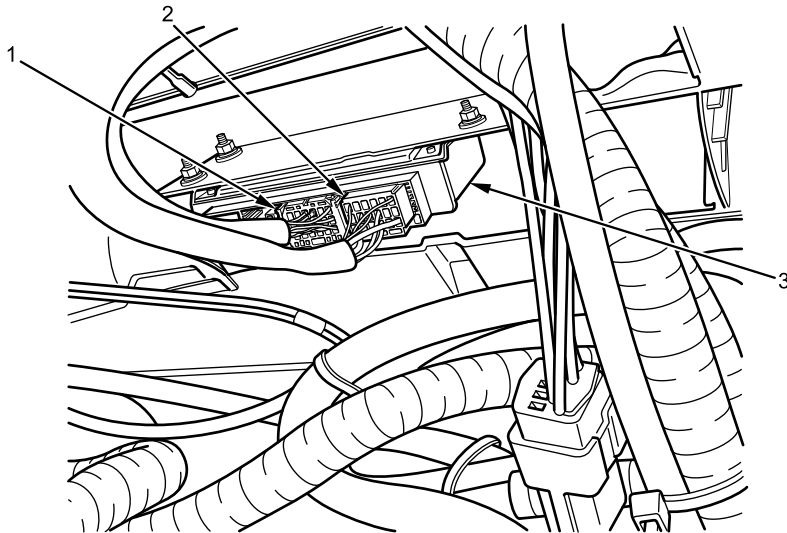


B230604209

Figure 42. Ground Cable Installation.

INSTRUMENT PANEL (IP) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

42. Connect outboard instrument panel harness BLACK connector (Figure 43, Item 2) and inboard IP harness GRAY connector (Figure 43, Item 1) to ABS control module (Figure 43, Item 3).



B230604208

Figure 43. ABS Control Module Connectors.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install steering column wiring harness (WP 0324).
2. Install driver control mounting bracket assembly exterior armor (WP 0646).
3. Install air cleaner support (WP 0258).
4. Install transmission auto shift control module (WP 0452).
5. Install instrument panel right side closeout (WP 0580).
6. Install instrument panel (IP) center trim panel (WP 0581).
7. Install instrument panel cluster (WP 0297).
8. Turn MAIN POWER switch on (TM 9-2355-106-10).
9. Start engine. Ensure all systems and gauges operate correctly (TM 9-2355-106-10).
10. Turn engine off (TM 9-2355-106-10).
11. Turn MAIN POWER switch off (TM 9-2355-106-10).
12. Install left inner wheel deflector plate body armor (WP 0601).
13. Install left engine armor plate bracket (WP 0598).
14. Install left side cowl body armor panel (WP 0644).
15. Close hood (TM 9-2355-106-10).
16. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INSTRUMENT PANEL (IP) HARNESS TERMINATING RESISTOR REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

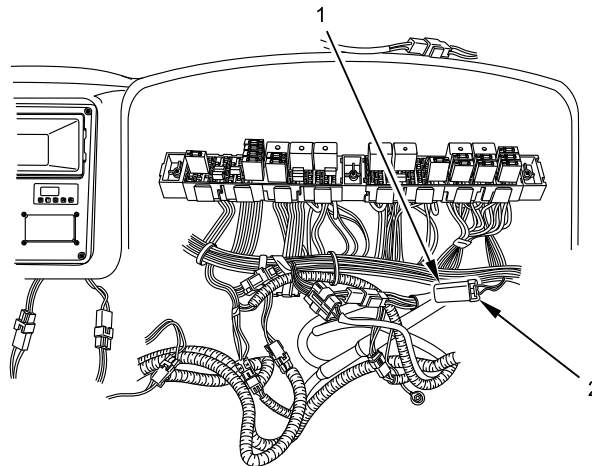
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel right side closeout removed
(WP 0580)

REMOVAL

1. Disconnect IP harness terminating resistor (Figure 1, Item 1) from IP harness connector (Figure 1, Item 2).



B230610126

Figure 1. IP Harness Terminating Resistor Removal.

END OF TASK

INSTRUMENT PANEL (IP) HARNESS TERMINATING RESISTOR REMOVAL AND INSTALLATION - (CONTINUED)

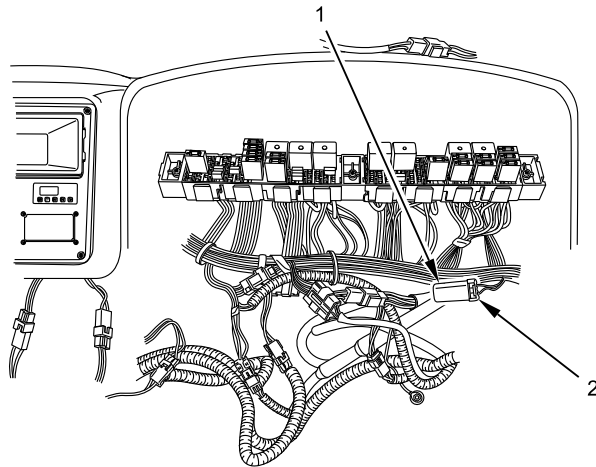
INSTALLATION

WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to IP harness connector.



B230610126

Figure 2. IP Harness Terminating Resistor Installation.

2. Connect IP harness terminating resistor (Figure 2, Item 1) on IP harness connector (Figure 2, Item 2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument panel right side closeout (WP 0580).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine, run to operating temperature (TM 9-2355-106-10).
4. Check instrument panel cluster to ensure no warning lamps are illuminated (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 40-200 lb-in, 3/8-inch drive
(WP 0795, Item 142)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Lockwashers - (2) (WP 0796, Item 24)

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

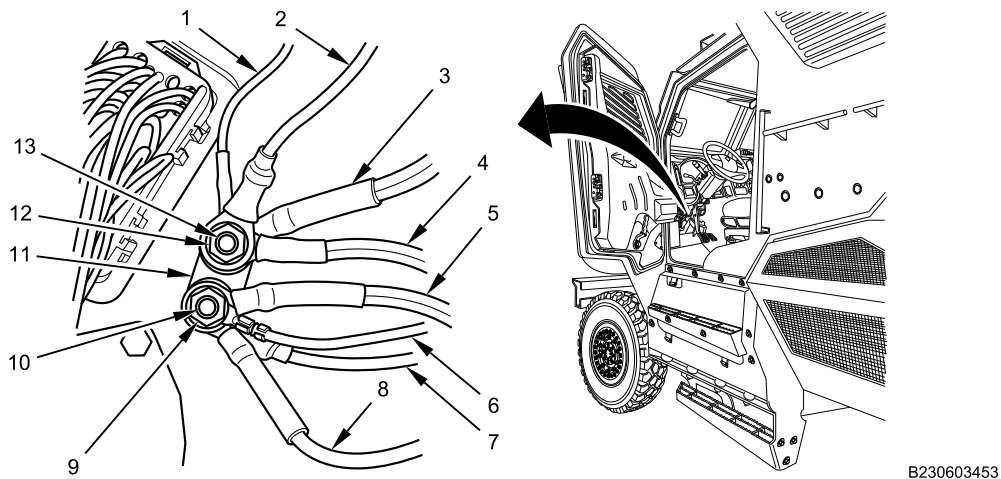


Figure 1. Cabin Interior Instrument Panel (IP) Harness Ground Connections.

NOTE

Make certain to tag and label all wires before disassembly in order to facilitate installation.

1. Remove two ground stud plate nuts (Figure 1, Item 9 and 12) and lockwashers from ground studs (Figure 1, Item 10 and 13) on cabin electrical ground stud plate (Figure 1, Item 11).
2. Remove IP harness ground connections (Figure 1, Item 1 through 4) from ground stud (Figure 1, Item 13).
3. Remove IP harness ground connections (Figure 1, Item 5 through 8) from ground stud (Figure 1, Item 10).

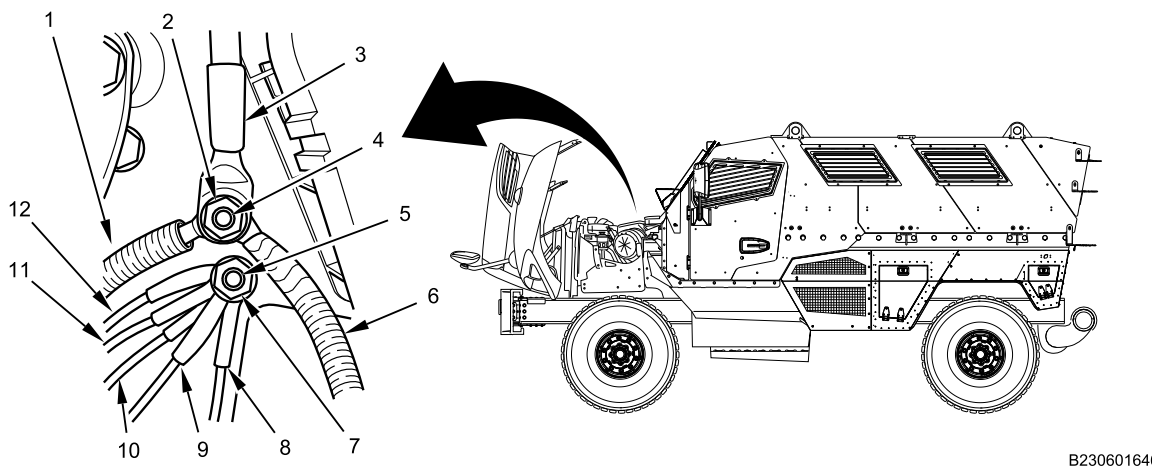
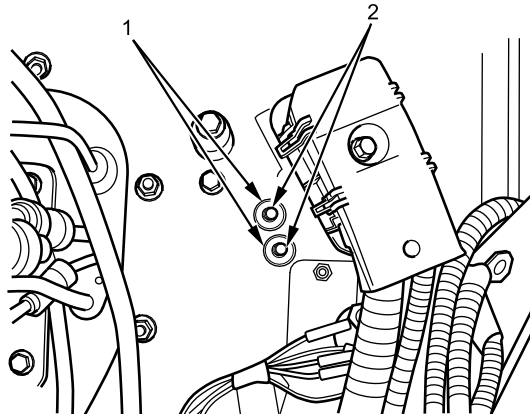


Figure 2. Cabin Exterior Harness Ground Connections.

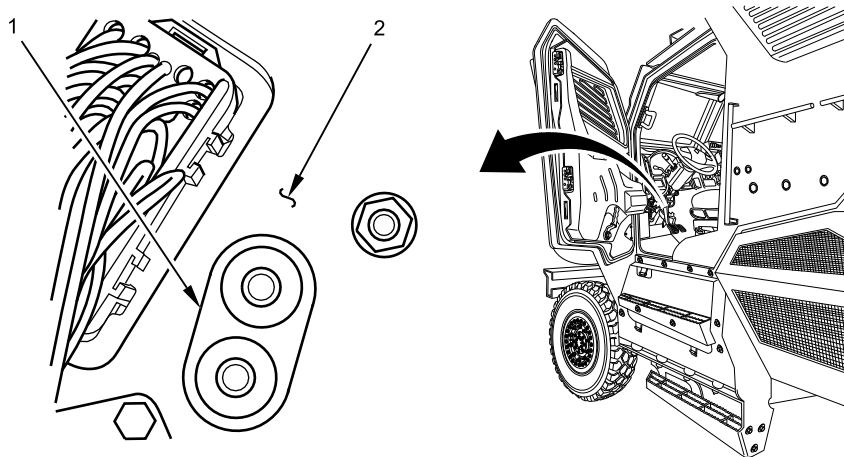
4. Remove two ground stud plate nuts (Figure 2, Item 2 and 7) from ground studs (Figure 2, Item 4 and 5).
5. Remove cabin harness ground connections (Figure 2, Item 1, 3, and 6) from ground stud (Figure 2, Item 4).
6. Remove cabin harness ground connections (Figure 2, Item 8 through 12) from ground stud (Figure 2, Item 5).

CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION - (CONTINUED)


B230603454

Figure 3. Exterior Ground Studs And Washers.

7. Remove two washers (Figure 3, Item 1) from ground studs (Figure 3, Item 2).



B230603452

Figure 4. Cabin Interior Electrical Ground Stud Plate.

NOTE

Note the orientation and mounting of electrical ground stud plate to ensure proper installation.

8. Remove cabin electrical ground stud plate (Figure 4, Item 1) from bulkhead (Figure 4, Item 2).

END OF TASK

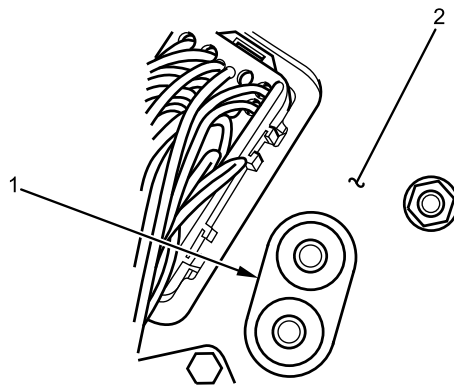
CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



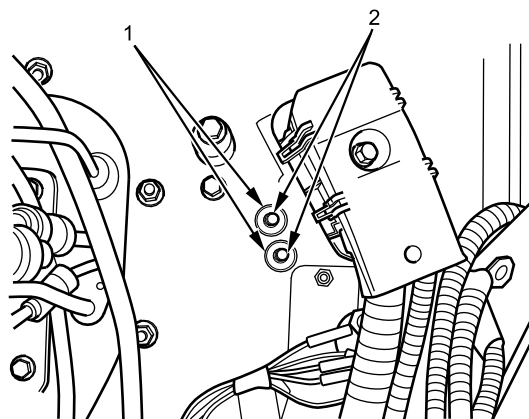
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.



B230610001

Figure 5. Cabin Interior Electrical Ground Stud Plate.

1. Apply dielectric grease to cabin electrical ground stud plate (Figure 5, Item 1).
2. Install ground stud plate (Figure 5, Item 1) on bulkhead (Figure 5, Item 2).

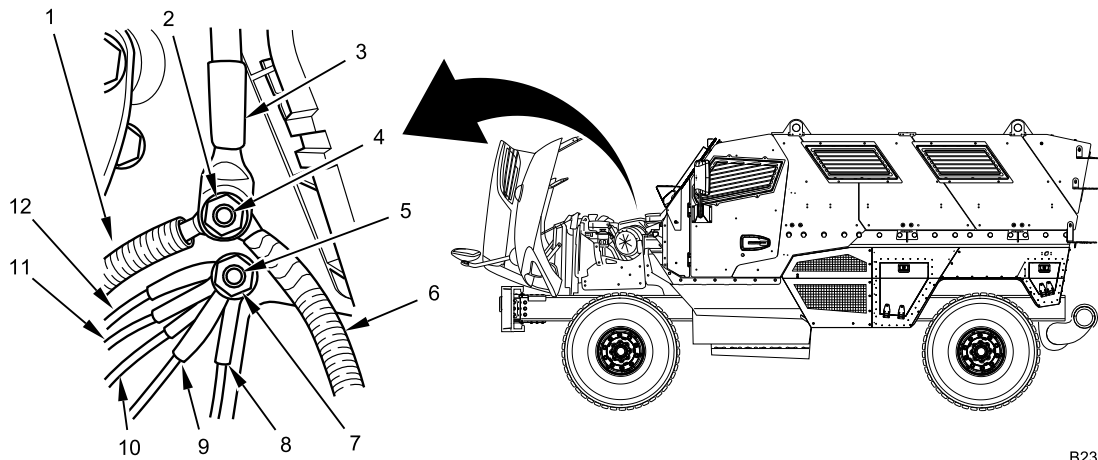


B230603454

Figure 6. Exterior Ground Studs And Washers.

3. Install two washers (Figure 6, Item 1) on ground studs (Figure 6, Item 2).

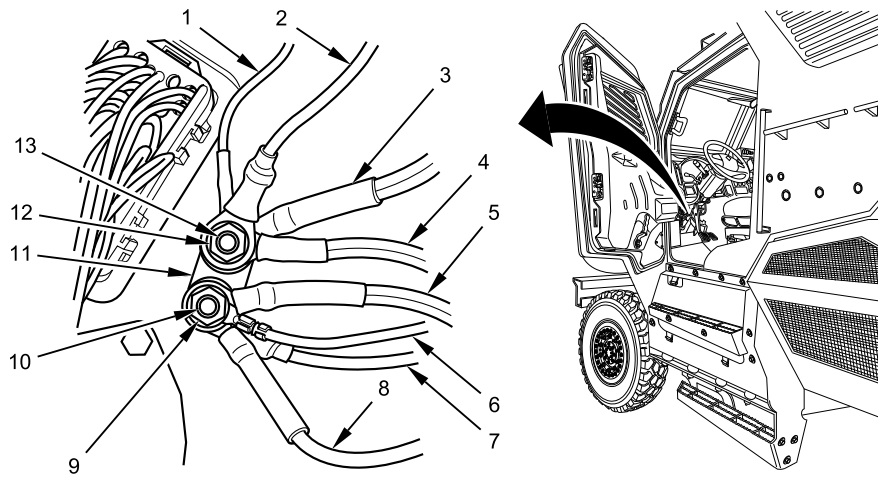
CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION - (CONTINUED)



B230601646

Figure 7. Cabin Exterior Harness Ground Connections.

4. Install cabin harness ground connections (Figure 7, Item 8 through 12) on ground stud (Figure 7, Item 5).
5. Install cabin harness ground connections (Figure 7, Item 1, 3, and 6) on ground stud (Figure 7, Item 4).
6. Install ground stud plate nuts (Figure 7, Item 2 and 7) and torque to 155 lb-in. (18 N•m).



B230603453

Figure 8. Cabin Interior IP Harness Ground Connections.

7. Install IP harness ground connections (Figure 8, Item 5 through 8) on ground stud (Figure 8, Item 10).
8. Install IP harness ground connections (Figure 8, Item 1 through 4) on ground stud (Figure 8, Item 13).
9. Install two new lockwashers and two ground stud plate nuts (Figure 8, Item 9 and 12) on ground stud plate (Figure 8, Item 11) and torque to 155 lb-in. (18 N•m).

END OF TASK

CABIN ELECTRICAL GROUND STUD PLATE REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Close engine hood (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify electrical operation of all circuits.
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
AIR GAUGE TRANSDUCER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Air pressure drained from all air brake reservoirs (TM 9-2355-106-10)
Cabin door secured safely open (WP 0608)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

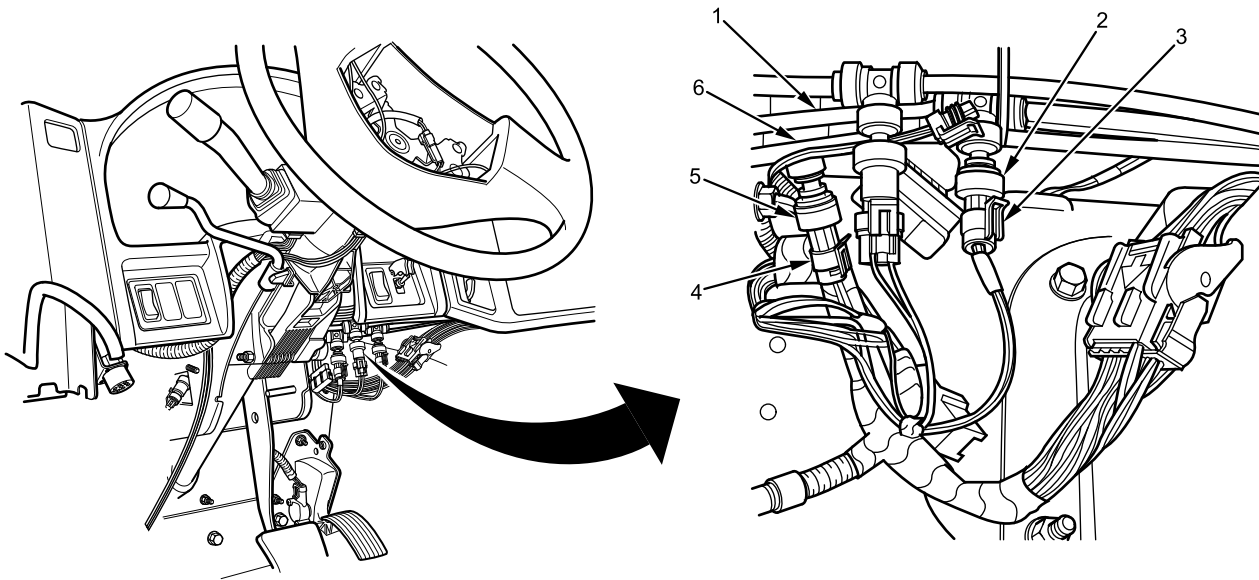
Cabin door must be secured in the open position by using heavy duty straps to prevent accidental closure during vehicle maintenance. Pull check link retaining pin prior to securing door open. Failure to comply may result in serious injury or death to personnel.

Do not operate vehicle with air pressure system loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Let air pressure build in both tanks to 100 psi (689 kPa) before releasing the parking brake. Low air pressure may affect vehicle braking capability. Failure to comply may result in injury or death to personnel.

AIR GAUGE TRANSDUCER REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect wiring harness connector (Figure 1, Item 3) from Air 2/Secondary gauge transducer (Figure 1, Item 2), located right of steering column inside cabin.



P236013510

Figure 1. Air Gauge Transducers.

2. Disconnect Air 2/Secondary gauge transducer (Figure 1, Item 2) from air line union connector attached to ORANGE air supply line (Figure 1, Item 1).
3. Disconnect wiring harness connector (Figure 1, Item 4) from Air 1/Primary gauge transducer (Figure 1, Item 5).
4. Disconnect Air 1/Primary gauge transducer (Figure 1, Item 5) from air line union connector attached to GREEN air supply line (Figure 1, Item 6).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

AIR GAUGE TRANSDUCER REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Apply dielectric grease on all wiring harness electrical connections.

1. Connect Air 1/Primary gauge transducer (Figure 2, Item 5) on air line union connector attached to GREEN air supply line (Figure 2, Item 6).

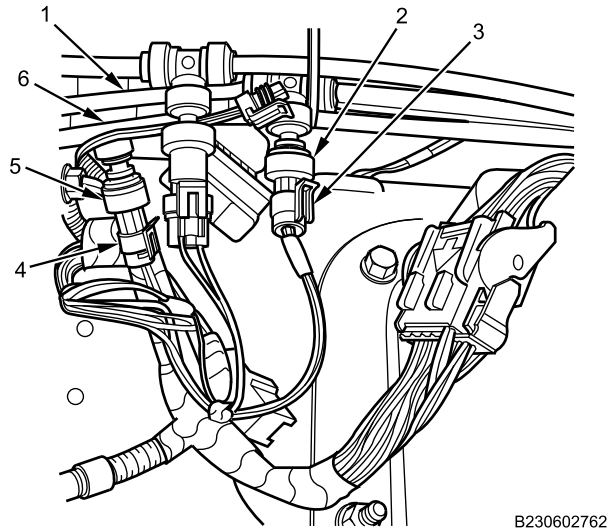


Figure 2. Air Gauge Transducers.

2. Connect wiring harness connector (Figure 2, Item 4) on Air 1/Primary gauge transducer (Figure 2, Item 5).
3. Connect Air 2/Secondary gauge transducer (Figure 2, Item 2) on air line union connector attached to ORANGE air supply line (Figure 2, Item 1).
4. Connect wiring harness connector (Figure 2, Item 3) on Air 2/Secondary gauge transducer (Figure 2, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Remove cabin door securing chain hoists and lifting strap (WP 0608).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and let air pressure build to normal operating range (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify air brake system operation (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**MULTIFUNCTION TURN SIGNAL SWITCH ASSEMBLY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

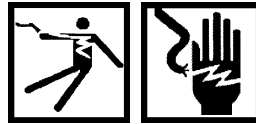
References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)
Steering column cover removed (WP 0565)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

MULTIFUNCTION TURN SIGNAL SWITCH ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect multifunction turn signal switch connector (Figure 1, Item 4) from multifunction turn signal switch assembly (Figure 1, Item 1).

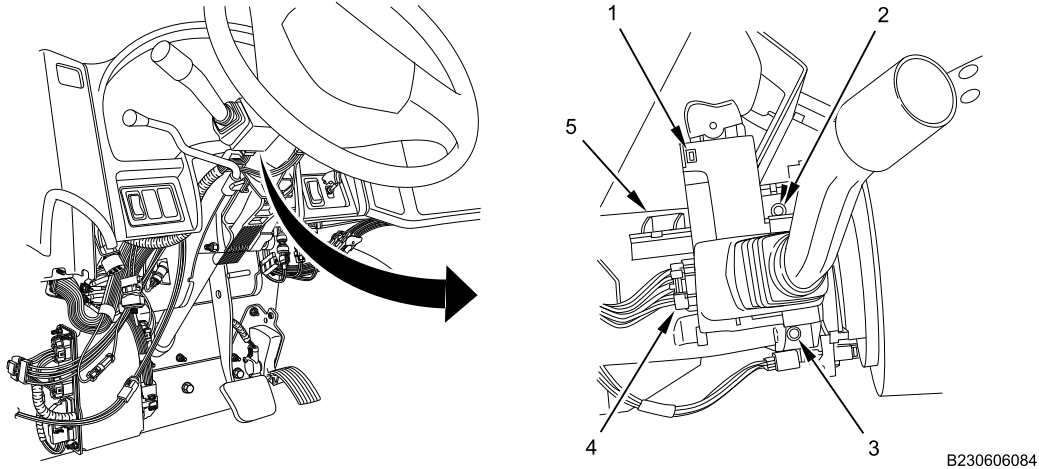


Figure 1. Multifunction Turn Signal Switch Assembly.

2. Remove screws (Figure 1, Item 2 and 3) from multifunction turn signal switch assembly (Figure 1, Item 1).
3. Remove multifunction turn signal switch assembly (Figure 1, Item 1) from steering wheel column (Figure 1, Item 5).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install multifunction turn signal switch assembly (Figure 2, Item 1) on steering wheel column (Figure 2, Item 5) with screws (Figure 2, Item 2 and 3). Tighten screws securely.

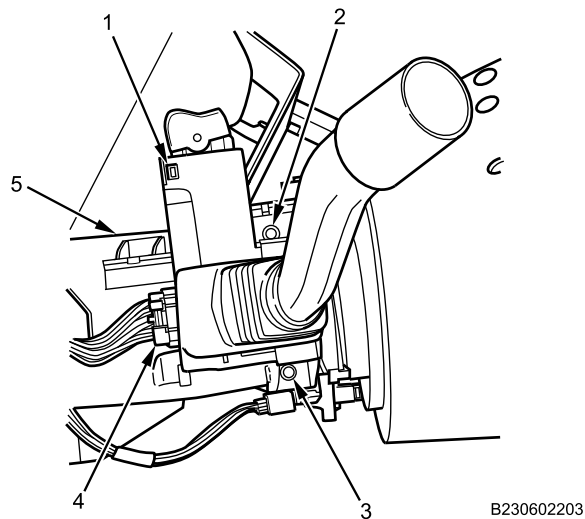
MULTIFUNCTION TURN SIGNAL SWITCH ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Multifunction Turn Signal Switch Assembly.

2. Connect multifunction turn signal switch connector (Figure 2, Item 4) on multifunction turn signal switch assembly (Figure 2, Item 1).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install steering column cover (WP 0565).
2. Connect battery cables (WP 0404).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify multifunction turn signal switch circuit operations (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Steering column cover removed (WP 0565)

Instrument panel (IP) cluster removed (WP 0297)

Materials/Parts

Grease (WP 0794, Item 22)

Cable lock strap - (2) (WP 0796, Item 124)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

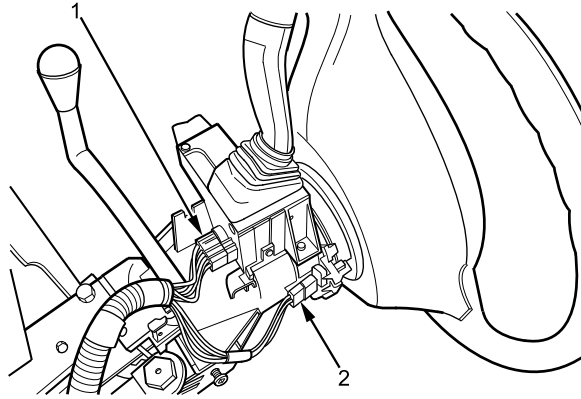
NOTE

Note location of cable lock straps prior to removal, to aid in installation.

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

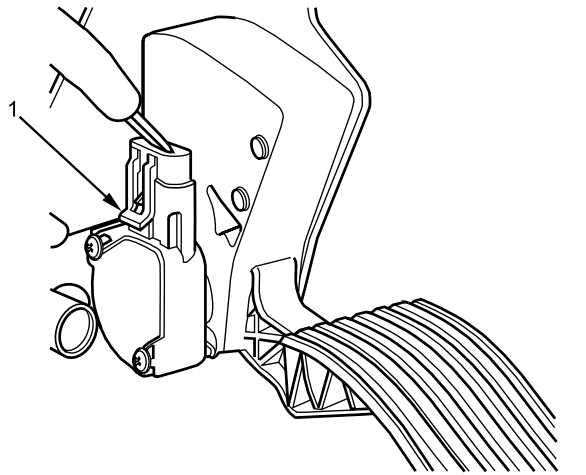
1. Disconnect steering column harness (Figure 1, Item 1) from multifunction turn signal switch.



B230601506

Figure 1. Steering Column Connectors.

2. Disconnect steering column harness (Figure 1, Item 2) from clock spring connector.
3. Disconnect steering column harness (Figure 2, Item 1) from accelerator pedal.



B230601504

Figure 2. Accelerator Pedal Connector.

4. Disconnect steering column harness (Figure 3, Item 2) from stop light switch (Figure 3, Item 1) attached to BLUE air line.

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

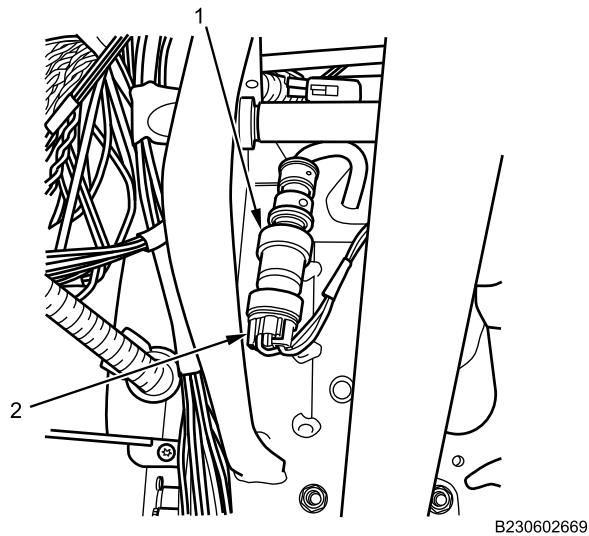


Figure 3. Stop Light Switch Connector.

5. Disconnect steering column harness (Figure 4, Item 2) from transducer (Figure 4, Item 1) attached to YELLOW air line.

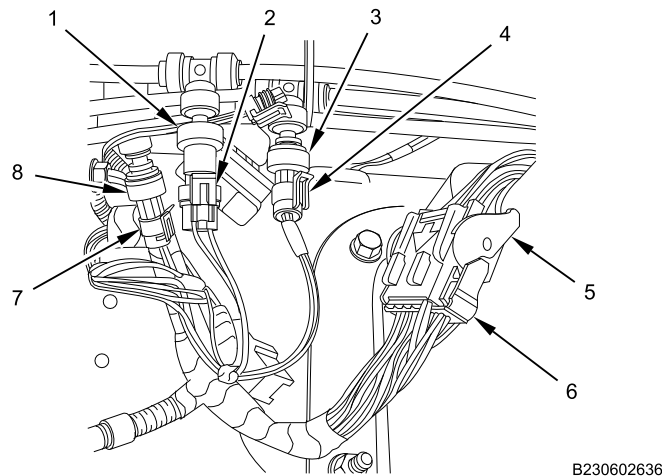
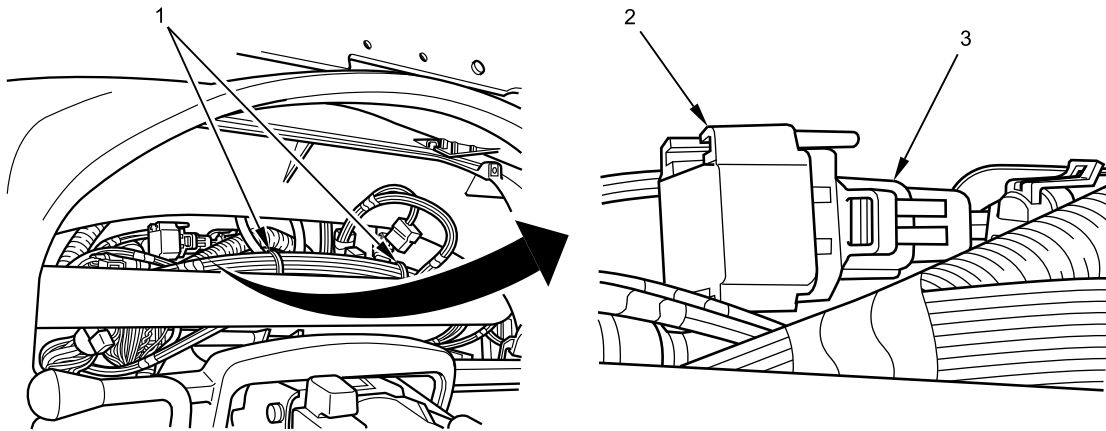


Figure 4. Transducers and IP Harness Connectors.

6. Disconnect steering column harness (Figure 4, Item 4) from transducer (Figure 4, Item 3) attached to ORANGE air line.
7. Disconnect steering column harness (Figure 4, Item 7) from transducer (Figure 4, Item 8) attached to GREEN air line.
8. Disconnect steering column harness (Figure 4, Item 6) from IP harness (Figure 4, Item 5).

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

9. Disconnect steering column harness (Figure 5, Item 3) from BAP sensor (Figure 5, Item 2).



B230604414

Figure 5. Barometric Pressure Sensor (BAP) Connector.

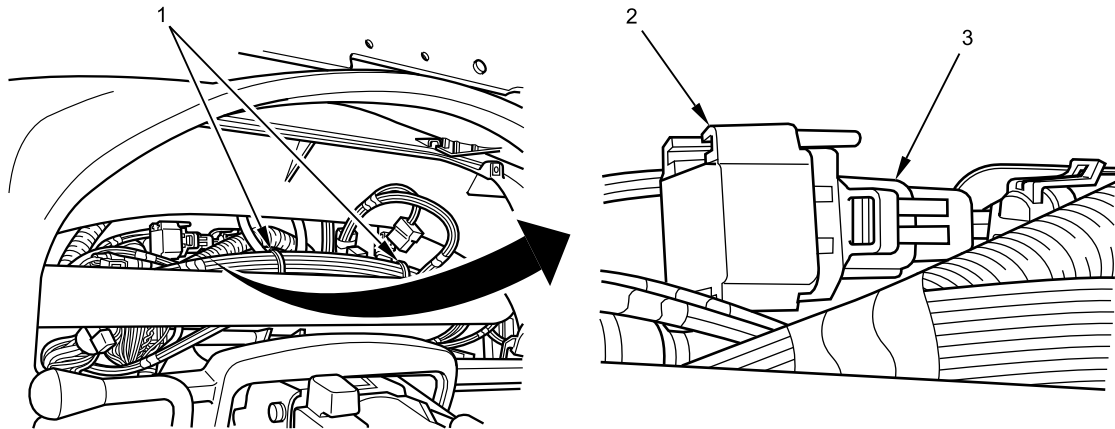
10. Remove two steering column harness cable lock straps (Figure 5, Item 1) from IP harness. Discard cable lock straps (Figure 5, Item 1).
11. Remove steering column harness (Figure 5, Item 3) from IP.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease in steering column harness connectors and position harness on IP.
2. Connect steering column harness (Figure 6, Item 3) on BAP sensor (Figure 6, Item 2). Install two new cable lock straps (Figure 6, Item 1).

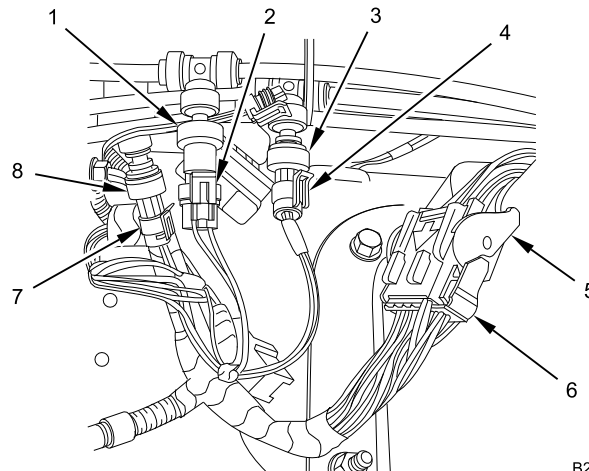
STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604414

Figure 6. BAP Connector.

3. Connect steering column harness (Figure 7, Item 2) on transducer (Figure 7, Item 1) attached to YELLOW air line.



B230602636

Figure 7. Transducers and IP Harness Connectors.

4. Connect steering column harness (Figure 7, Item 4) on transducer (Figure 7, Item 3) attached to ORANGE air line.
5. Connect steering column harness (Figure 7, Item 7) on transducer (Figure 7, Item 8) attached to GREEN air line.
6. Connect steering column harness (Figure 7, Item 6) on IP harness (Figure 7, Item 5).

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

7. Connect steering column harness (Figure 8, Item 2) on stop light switch (Figure 8, Item 1) attached to BLUE air line.

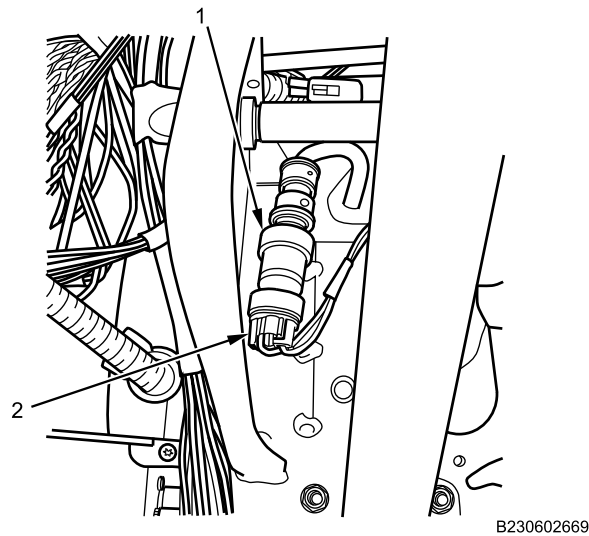


Figure 8. Stop Light Switch Connector.

8. Connect steering column harness (Figure 9, Item 1) on accelerator pedal.

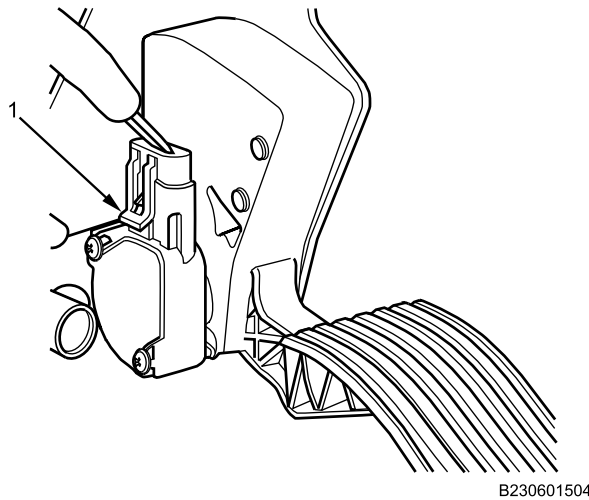
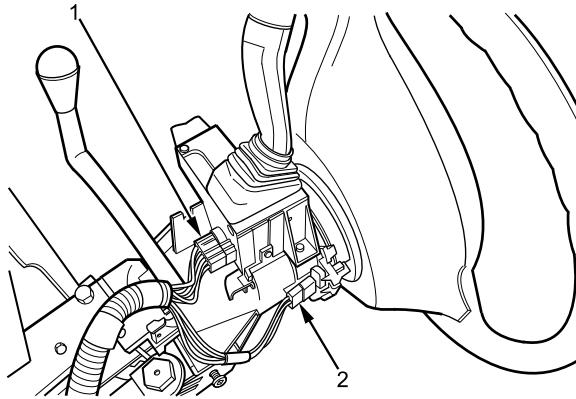


Figure 9. Accelerator Pedal Connector.

9. Connect steering column harness (Figure 10, Item 1) on multifunction turn signal switch.

STEERING COLUMN WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230601506

Figure 10. Steering Column Connectors.

10. Connect steering column harness (Figure 10, Item 2) on clock spring connector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install IP cluster (WP 0297).
2. Install steering column cover (WP 0565).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify operation of the following:
 - a. Brake system
 - b. Stop lights
 - c. Accelerator pedal
 - d. Air gauges
 - e. BAP sensor
 - f. Multifunction switch
 - g. Steering wheel controls
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**STEERING WHEEL WIRE HARNESS REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Horn button assembly removed (WP 0403)

Materials/Parts

Grease (WP 0794, Item 23)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

STEERING WHEEL WIRE HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect wiring harness connector (Figure 1, Item 3) from steering wheel harness connector (Figure 1, Item 2).

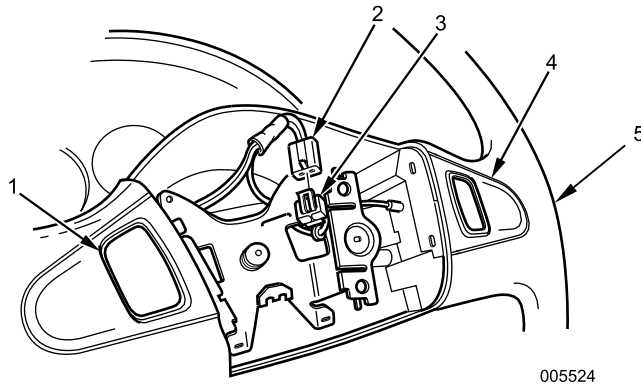


Figure 1. Wiring Harness.

2. Remove two steering wheel switches (Figure 1, Item 1 and 4) from steering wheel (Figure 1, Item 5).
3. Disconnect two wiring harness connectors (Figure 2, Item 2 and 3) from back of steering wheel switch and remove wiring harness (Figure 2, Item 1).

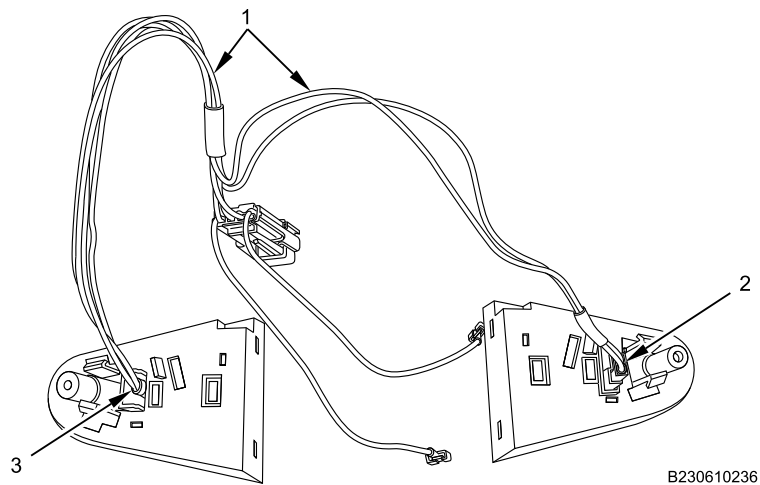


Figure 2. Steering Wheel Switches and Wiring Harness.

END OF TASK

STEERING WHEEL WIRE HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections.

1. Connect two wiring harness (Figure 3, Item 1) connectors (Figure 3, Item 2 and 3) on steering wheel switches.

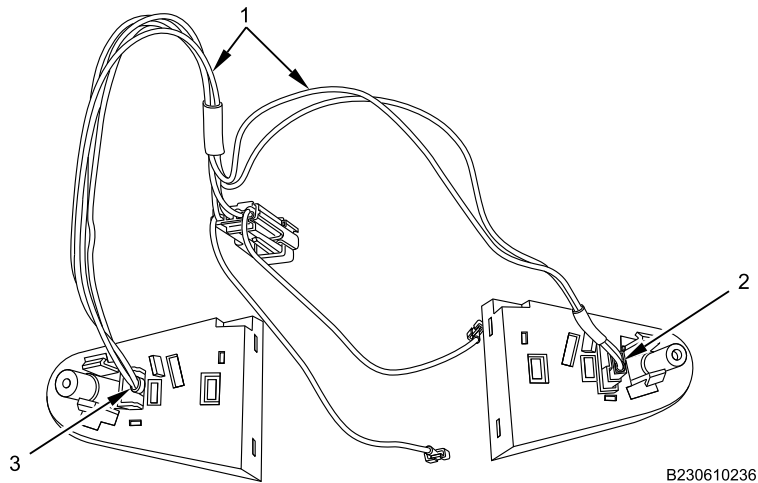
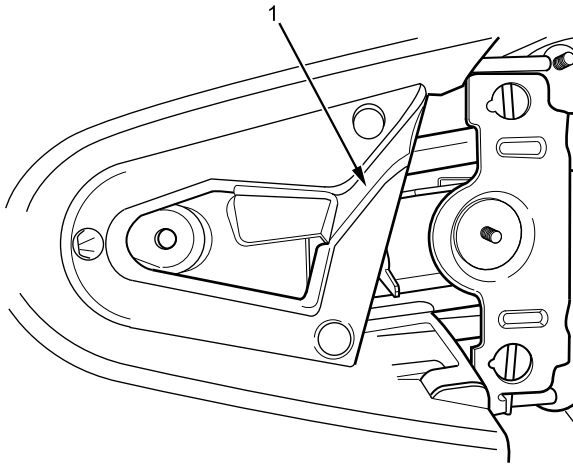


Figure 3. Steering Wheel Switches and Wiring Harness.

STEERING WHEEL WIRE HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

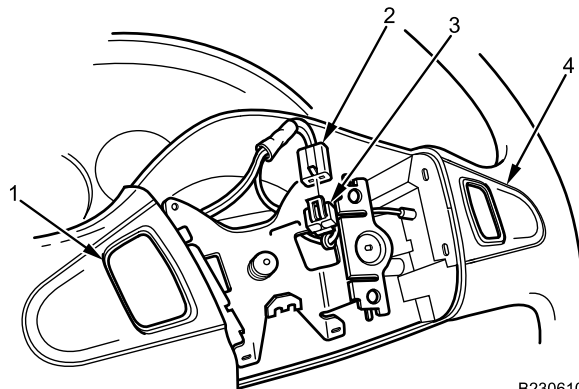
2. Ensure wiring harness is pushed into slot (Figure 4, Item 1) in steering wheel on both sides.



B230601250

Figure 4. Cruise Control Switch Wire Routing.

3. Install two steering wheel switches (Figure 5, Item 1 and 4) firmly on steering wheel to secure.



B230610235

Figure 5. Cruise Control Switch Module Installation.

4. Connect wiring harness connector (Figure 5, Item 3) on steering wheel harness connector (Figure 5, Item 2).

END OF TASK

STEERING WHEEL WIRE HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install horn button assembly (WP 0403).
2. Remove wheel chocks (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine (TM 9-2355-106-10).
5. Test-drive vehicle to verify cruise control operation (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**BRAKE STOPLIGHT SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Air pressure drained from all air brake reservoirs (TM
9-2355-106-10)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

BRAKE STOPLIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect wiring harness connector (Figure 1, Item 4) from stoplight switch (Figure 1, Item 5), next to steering column (Figure 1, Item 3).

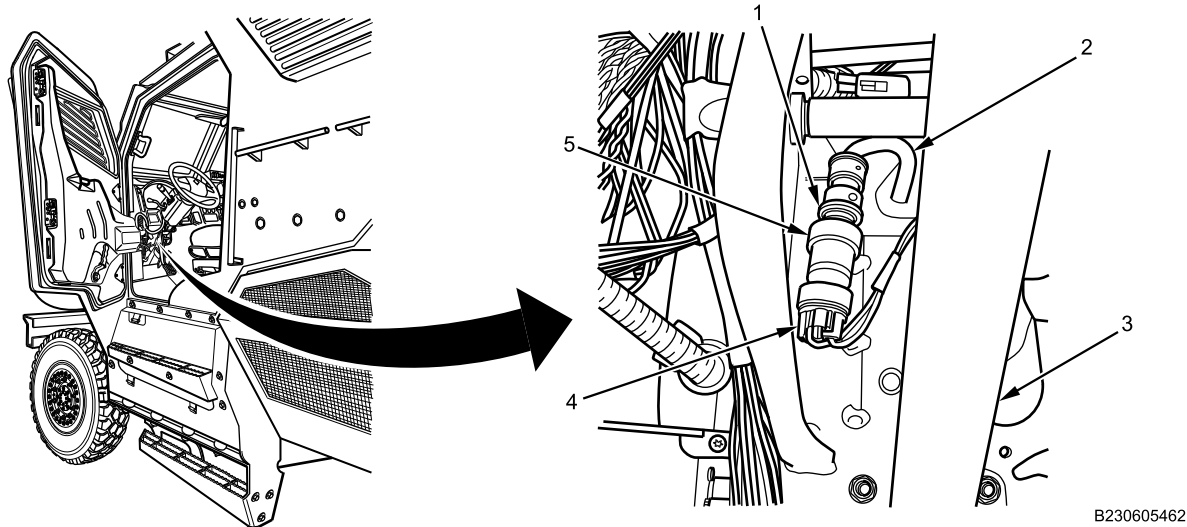


Figure 1. Stoplight Switch.

2. Disconnect stoplight switch (Figure 1, Item 5) from air line union connector (Figure 1, Item 1) attached to BLUE air supply line (Figure 1, Item 2).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Connect stoplight switch (Figure 2, Item 3) to air line union connector (Figure 2, Item 1).

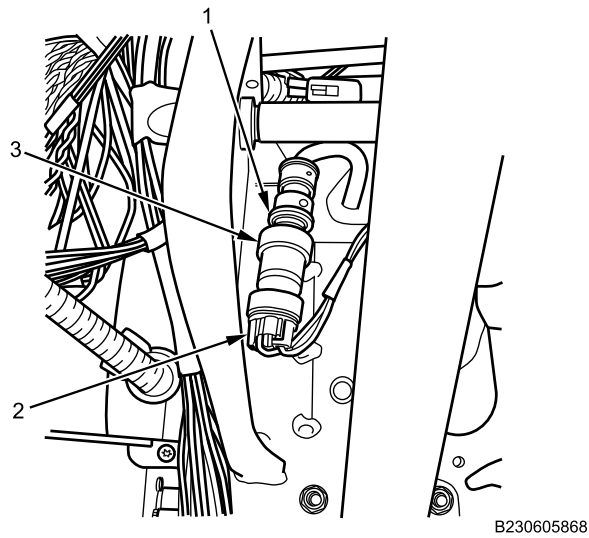
BRAKE STOPLIGHT SWITCH REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Stoplight Switch.

2. Connect wiring harness connector (Figure 2, Item 2) to stoplight switch (Figure 2, Item 3).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine, allow adequate time for air brake reservoirs to fill to a safe level.
3. Turn engine off (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
PARKING BRAKE LAMP TRANSDUCER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Air pressure drained from all air brake reservoirs (TM 9-2355-106-10)
Cabin door open and secured (WP 0608)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Cabin door must be secured in the open position by using heavy duty straps to prevent accidental closure during vehicle maintenance. Pull check link retaining pin prior to securing door open. Failure to comply may result in serious injury or death to personnel.

Do not operate vehicle with air pressure system loss. Vehicle has reduced or no braking capability and may not stop. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Let air pressure build in both tanks to 100 psi (689 kPa) before releasing the parking brake. Low air pressure may affect vehicle braking capability. Failure to comply may result in injury or death to personnel.

PARKING BRAKE LAMP TRANSDUCER REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect wiring harness connector (Figure 1, Item 3) from parking brake lamp transducer (Figure 1, Item 1) attached to air line union (Figure 1, Item 2) of YELLOW air supply line (Figure 1, Item 4), located to right of steering column inside cabin.

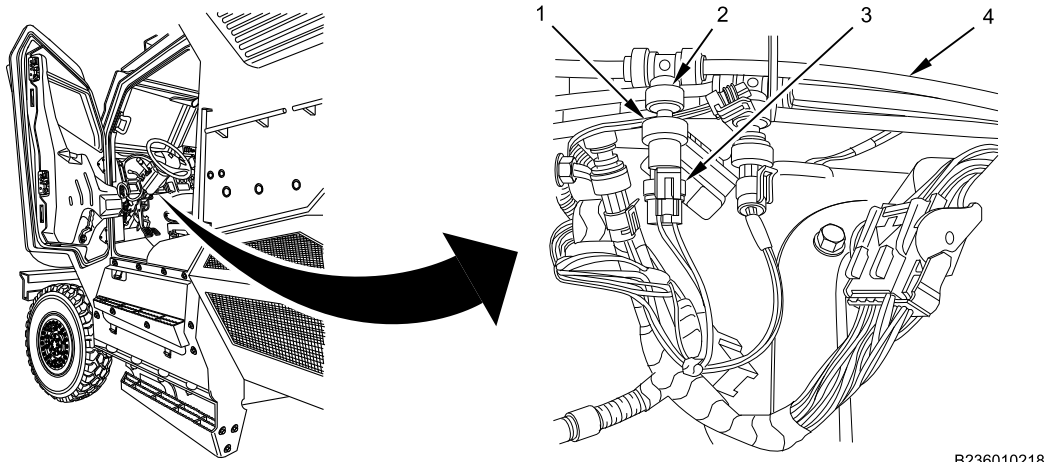


Figure 1. Parking Brake Lamp Transducer.

2. Remove parking brake lamp transducer (Figure 1, Item 1) from air line union connector (Figure 1, Item 2) attached to YELLOW air supply line (Figure 1, Item 4).

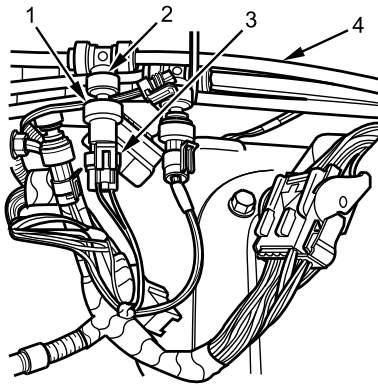
END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease on all wiring harness electrical connections.

1. Connect parking brake lamp transducer (Figure 2, Item 1) on air line union connector (Figure 2, Item 2) attached to YELLOW air supply line (Figure 2, Item 4).

PARKING BRAKE LAMP TRANSDUCER REMOVAL AND INSTALLATION - (CONTINUED)

B236010219

Figure 2. Stoplight Switch.

2. Connect wiring harness connector (Figure 2, Item 3) to parking brake lamp transducer (Figure 2, Item 1).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Remove cabin door securing chain hoists and lifting strap (WP 0608).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine and let air pressure build to normal operating range (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify parking brake system operation (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Tape (WP 0794, Item 52)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

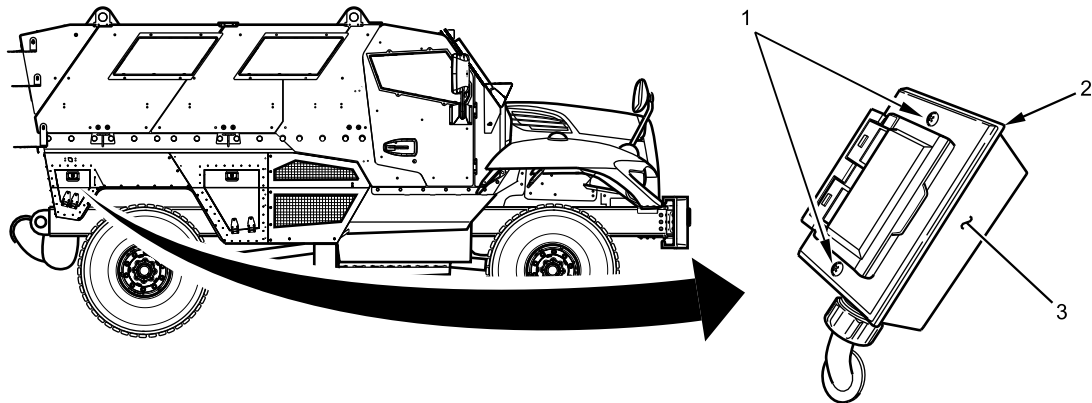
TM 9-2355-106-10
TM 9-2355-106-23P

REMOVAL

NOTE

110V outlet is located in right rear stowage box.

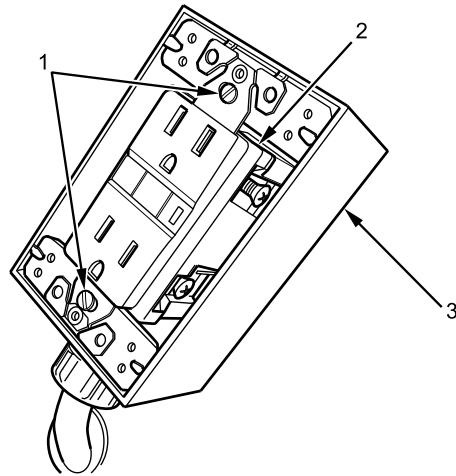
1. Remove two screws (Figure 1, Item 1) securing outlet cover (Figure 1, Item 2) and gasket to outlet box (Figure 1, Item 3).



B230612264

Figure 1. 110V Outlet Cover.

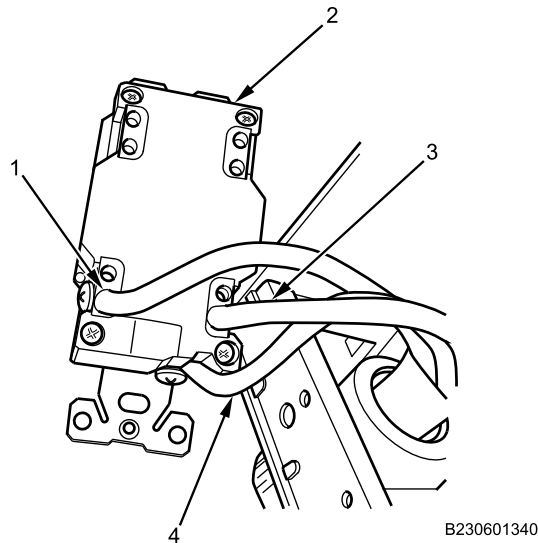
110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION - (CONTINUED)



B230601339

Figure 2. 110V Outlet.

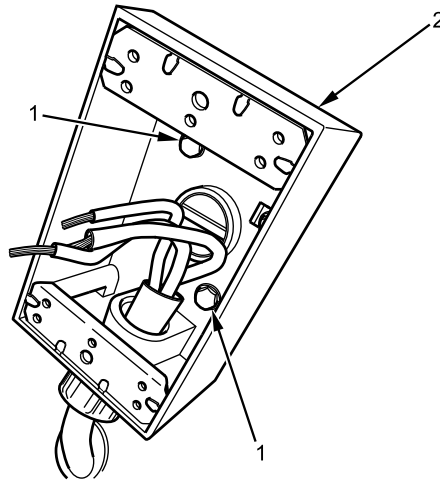
2. Remove two screws (Figure 2, Item 1) securing outlet (Figure 2, Item 2) to outlet box (Figure 2, Item 3).



B230601340

Figure 3. 110V Outlet Wiring.

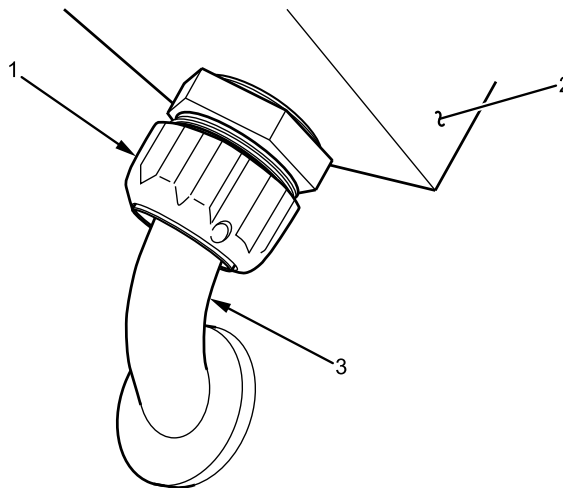
3. Loosen screws securing wires (Figure 3, Item 1, 3, and 4) to outlet (Figure 3, Item 2) and remove wires.
4. Apply electrical tape to end of each wire (Figure 3, Item 1, 3, and 4).

110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION - (CONTINUED)

B230601341

Figure 4. 110V Outlet Box.

5. Remove two screws (Figure 4, Item 1) securing outlet box (Figure 4, Item 2) to vehicle.



B230601342

Figure 5. 110V Outlet Wire Retainer.

6. Remove nut (Figure 5, Item 1) from bottom of outlet box (Figure 5, Item 2) and pull wiring harness (Figure 5, Item 3) out of outlet box.

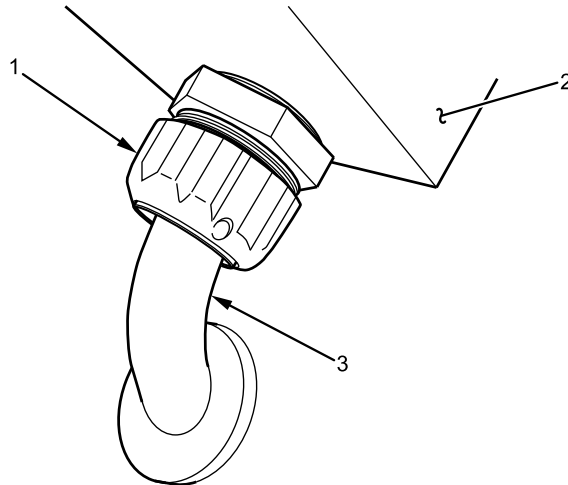
END OF TASK

110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

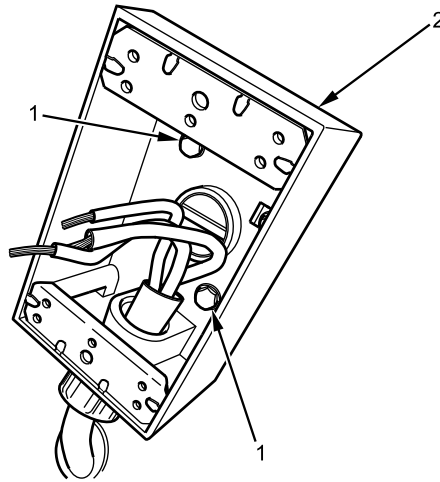


B230601342

Figure 6. 110V Outlet Wire Retainer.

1. Insert wiring harness (Figure 6, Item 3) into outlet box (Figure 6, Item 2) and tighten nut (Figure 6, Item 1) securely.

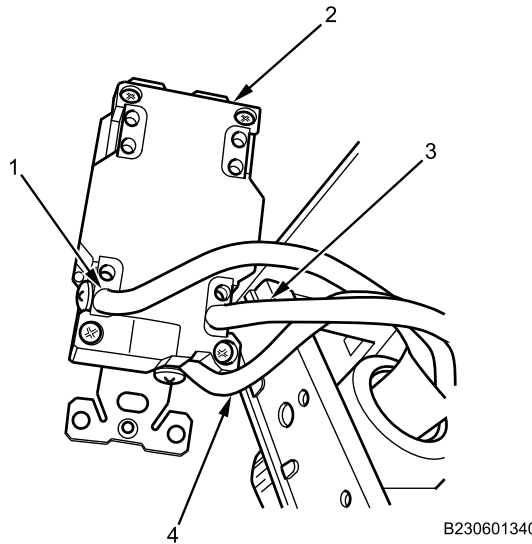
110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION - (CONTINUED)



B230601341

Figure 7. 110V Outlet Box.

2. Position outlet box (Figure 7, Item 2) to vehicle and install two screws (Figure 7, Item 1) and tighten securely.

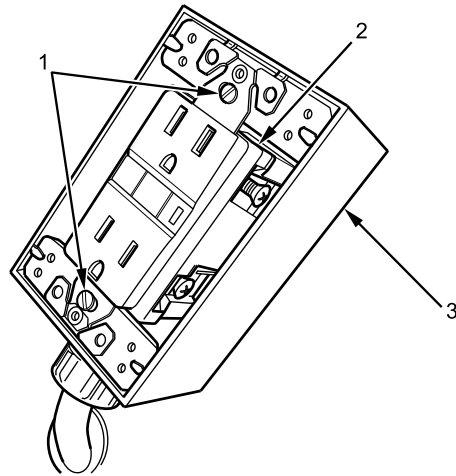


B230601340

Figure 8. 110V Outlet Wiring.

3. Remove electrical tape from end of each wire (Figure 8, Item 1, 3, and 4).
4. Insert wires (Figure 8, Item 1, 3, and 4) into outlet (Figure 8, Item 2): WHITE wire to SILVER screw, BLACK wire to BRASS screw and GREEN wire to GREEN screw. Tighten screws securely.

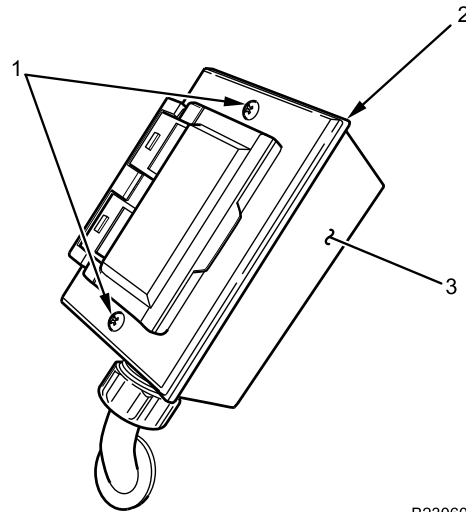
110V COVER, OUTLET, AND BOX REMOVAL AND INSTALLATION - (CONTINUED)



B230601339

Figure 9. 110V Outlet.

5. Position outlet (Figure 9, Item 2) to box (Figure 9, Item 3) and install two screws (Figure 9, Item 1) and tighten securely.



B230601338

Figure 10. 110V Outlet Cover.

6. Position outlet cover (Figure 10, Item 2) and gasket on outlet box (Figure 10, Item 3), install two screws (Figure 10, Item 1) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify 110V outlet operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE CONTROL MODULE (ECM) REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch drive (WP 0795, Item 145)
Wrench, torque, dial, 300 lb-in., 3/8-inch drive (WP 0795, Item 147)
Adapter, socket, wrench drive, 1/4-inch male - 3/8-inch female (WP 0795, Item 3)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap - (2) (WP 0796, Item 124)
Wire tags (WP 0794, Item 33)

References

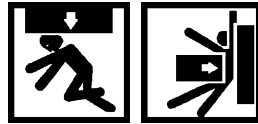
TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Batteries cables disconnected (WP 0404)
Belly armor removed (WP 0606)
Starter motor removed (WP 0292)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

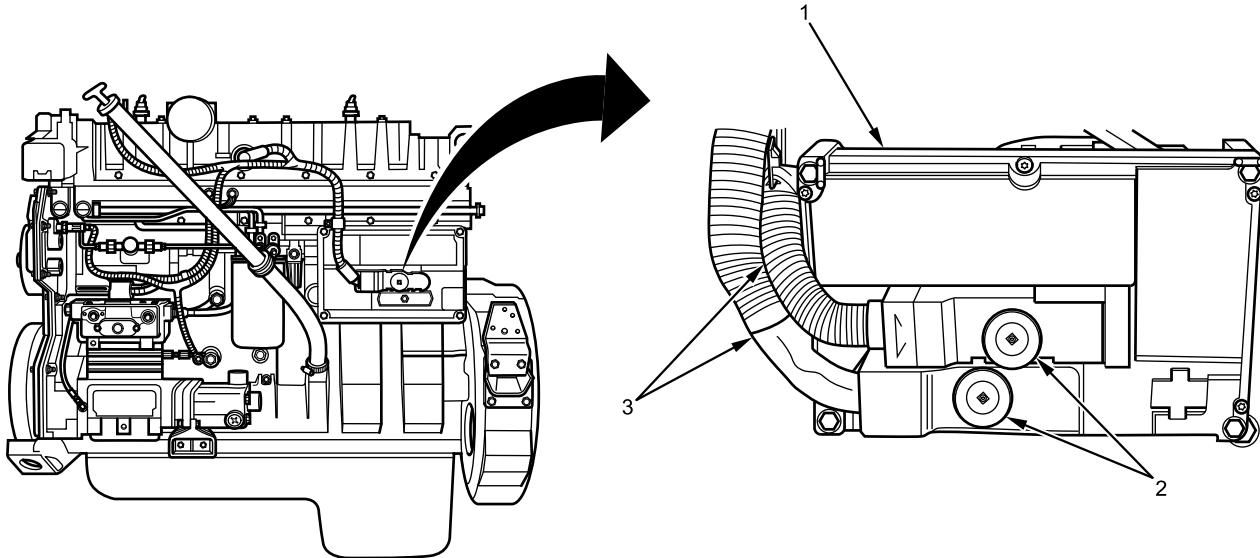
Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid in installation.

Note the location of both wiring harness electrical connectors attached to ECM for later installation.

ENGINE CONTROL MODULE (ECM) REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

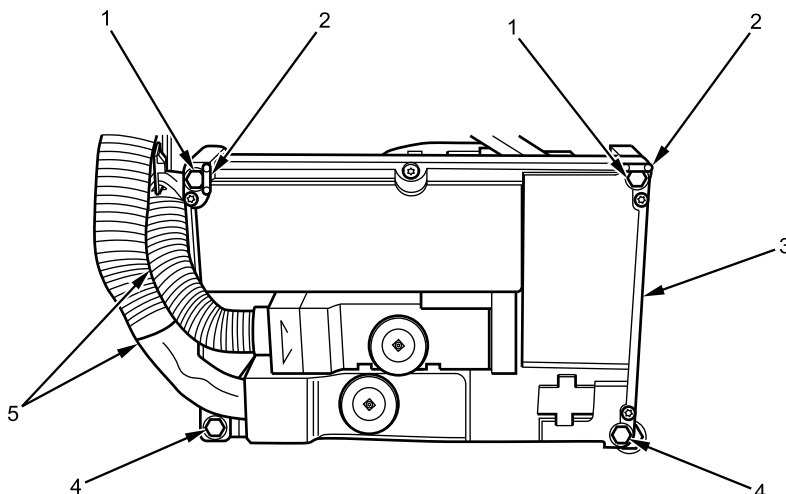
1. Turn electrical connector knob (Figure 1, Item 2) counterclockwise to release harness connector (Figure 1, Item 3) from ECM (Figure 1, Item 1).



B230610144

Figure 1. Electrical Connector Cover Removal.

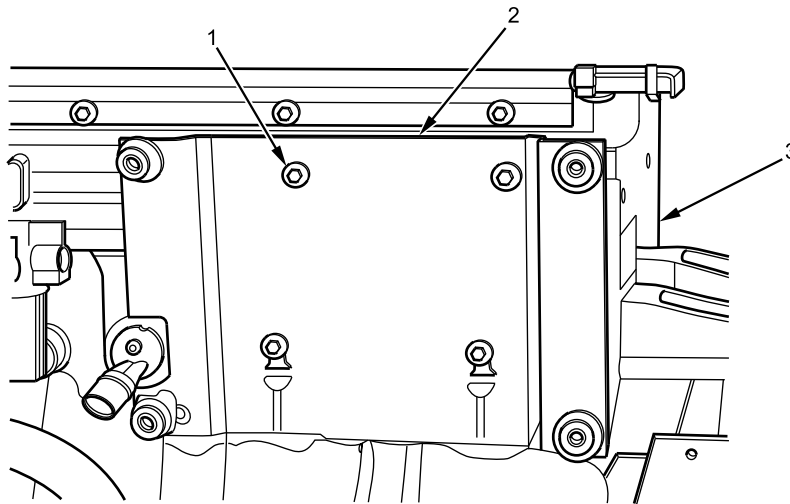
2. Remove two wiring harness electrical connectors (Figure 2, Item 5) from ECM (Figure 2, Item 3).



B231103094

Figure 2. Wiring Harness Electrical Connector Removal.

3. Remove and discard cable lock straps. Reposition wiring harnesses aside as necessary.
4. Remove two upper mounting bolts (Figure 2, Item 1), two upper wiring harness mounting brackets (Figure 2, Item 2), two lower mounting bolts (Figure 2, Item 4), and ECM (Figure 2, Item 3) from ECM bracket.
5. Remove four bolts (Figure 3, Item 1) and ECM bracket (Figure 3, Item 2) from engine (Figure 3, Item 3).

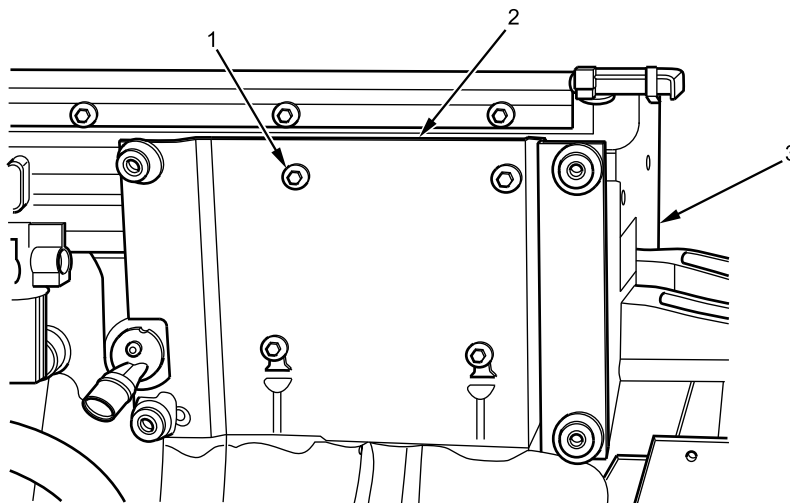
ENGINE CONTROL MODULE (ECM) REMOVAL AND INSTALLATION - (CONTINUED)

B230100053

Figure 3. ECM Bracket Removal.

END OF TASK**INSTALLATION**

1. Install ECM bracket (Figure 4, Item 2) on engine (Figure 4, Item 3) with four bolts (Figure 4, Item 1). Torque bolts to 20 lb-ft (27 N•m).



B230100053

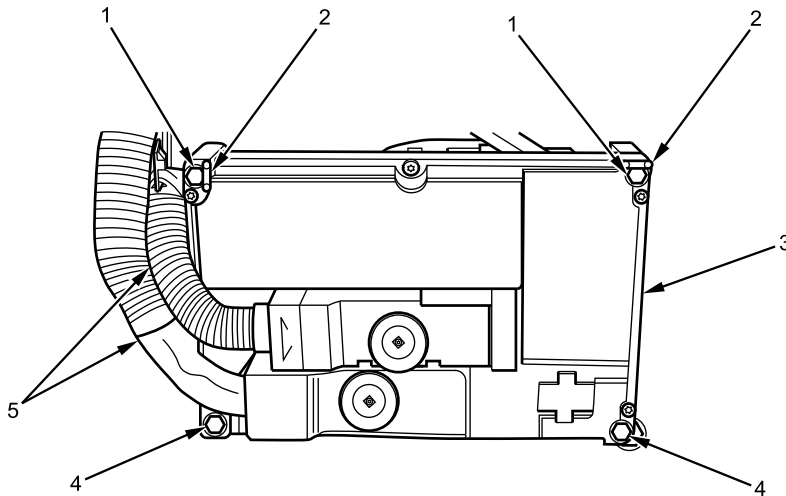
Figure 4. ECM Bracket Installation.

ENGINE CONTROL MODULE (ECM) REMOVAL AND INSTALLATION - (CONTINUED)

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

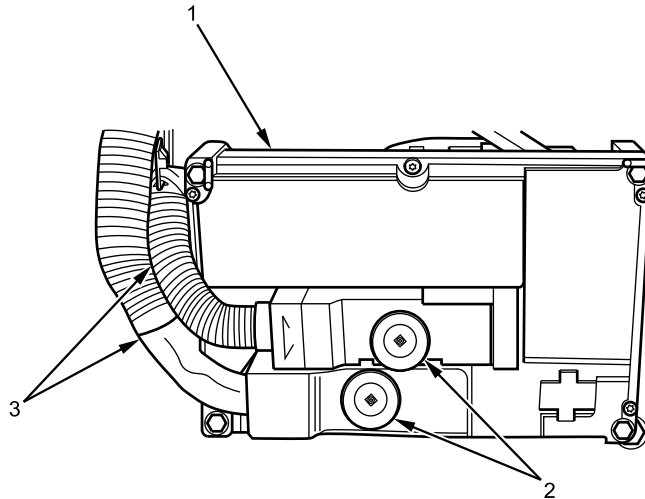
2. Apply dielectric grease on ECM electrical contacts.



B231103094

Figure 5. Wiring Harness Electrical Connector Installation.

3. Install ECM (Figure 5, Item 3) on ECM bracket with two lower mounting bolts (Figure 5, Item 4).
4. Install two upper wiring harness mounting brackets (Figure 5, Item 2) on to the ECM (Figure 5, Item 3) with two ECM upper mounting bolts (Figure 5, Item 1). Torque four bolts to 20 lb-ft (27 N•m).
5. Connect two wiring harness electrical connectors (Figure 5, Item 5) onto ECM.
6. Turn electrical connector knobs (Figure 6, Item 2) clockwise until finger tight on to the ECM (Figure 6, Item 1) .

ENGINE CONTROL MODULE (ECM) REMOVAL AND INSTALLATION - (CONTINUED)

B231103093

Figure 6. Electrical Connector Installation.

7. Using socket adapter, torque to 50 lb-in. (6 N•m).
8. Reposition wiring harness (Figure 6, Item 3) and install new cable lock straps as necessary.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install starter motor (WP 0292).
2. Connect battery cables (WP 0404).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine; run to operating temperature (TM 9-2355-106-10).
5. Check instrument panel cluster to ensure no engine lights are illuminated (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install belly armor (WP 0606).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock straps - (5) (WP 0796, Item 120)
Cable lock straps - (5) (WP 0796, Item 124)
Wire tags (WP 0794, Item 49)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Left side engine armor plate removed (WP 0597)
Air cleaner assembly removed (WP 0257)
Alternator bracket removed (WP 0290)
Starter motor removed (WP 0292)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

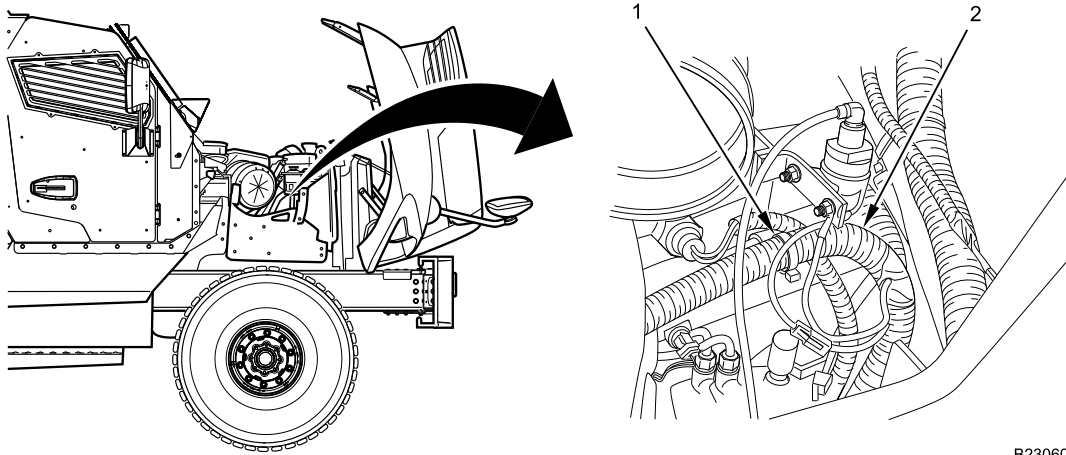
NOTE

Note the orientation and routing of engine sensor wiring harness to ensure proper installation.

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

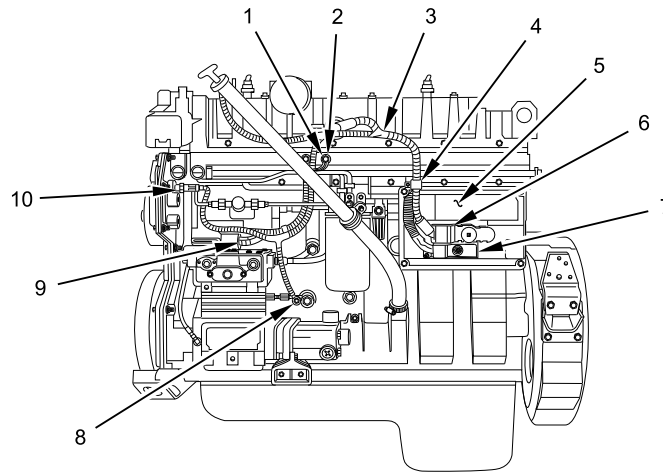
1. Remove all cable lock straps (Figure 1, Item 1) as necessary and position engine wiring harness (Figure 1, Item 2) as needed to access engine sensor wiring harness electrical connectors. Discard all cable lock straps.



B230604984

Figure 1. Engine Wiring Harness.

2. Disconnect engine wiring harness electrical connector (Figure 2, Item 7) from engine control module (ECM) (Figure 2, Item 5).



B230603637

Figure 2. Left Side View of Engine.

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

3. Disconnect engine sensor wiring harness (Figure 2, Item 3) from wiring harness mounting brackets (Figure 2, Item 4).
4. Disconnect engine sensor wiring harness electrical connector (Figure 2, Item 6) from Engine Control Module (ECM) (Figure 2, Item 5).
5. Disconnect engine sensor wiring harness (Figure 2, Item 3) from injector harness in valve cover (Figure 2, Item 2).
6. Disconnect engine sensor wiring harness (Figure 2, Item 3) from Injection Control Pressure (ICP) sensor (Figure 2, Item 1).
7. Disconnect engine sensor wiring harness (Figure 2, Item 3) from Engine Oil Pressure (EOP) sensor (Figure 2, Item 8).
8. Disconnect engine sensor wiring harness (Figure 2, Item 3) from Injection Pressure Regulator (IPR) (Figure 2, Item 9).
9. Disconnect engine sensor wiring harness (Figure 2, Item 3) from Engine Oil Temperature (EOT) sensor (Figure 2, Item 10).
10. Disconnect electrical connector (Figure 3, Item 2) from engine harness (Figure 3, Item 1).

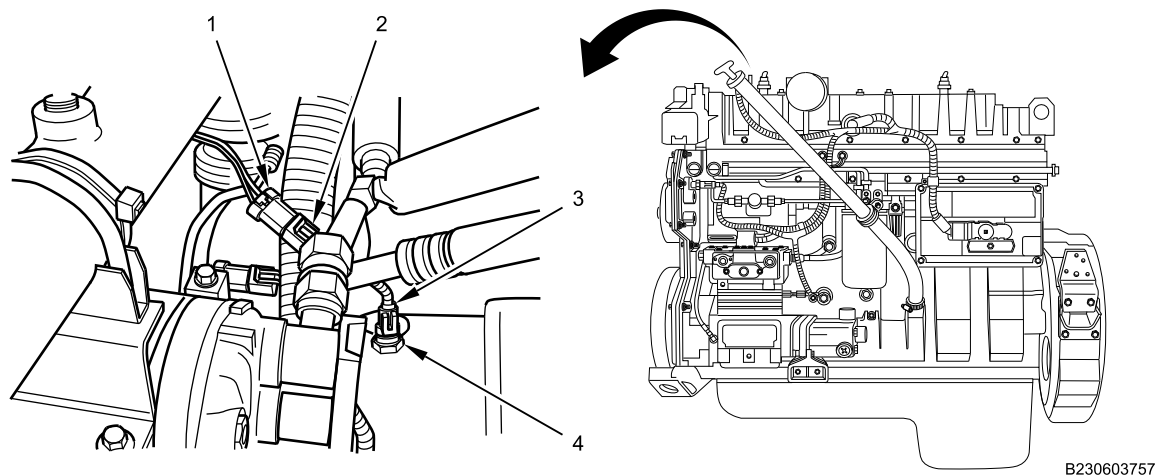
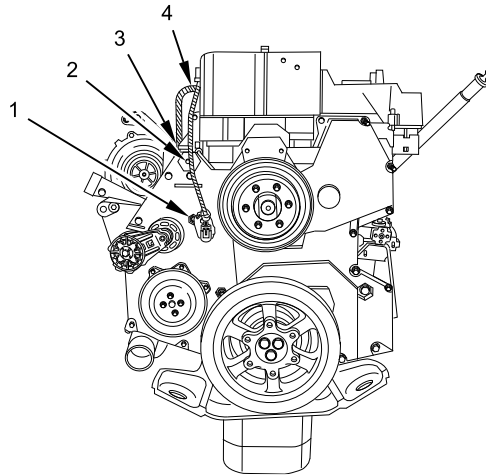


Figure 3. Top View of Engine.

11. Disconnect engine sensor wiring harness (Figure 3, Item 3) from Manifold Absolute Pressure (MAP) sensor (Figure 3, Item 4).

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

12. Disconnect engine sensor wiring harness (Figure 4, Item 4) from Camshaft Position (CMP) sensor (Figure 4, Item 1).



B230603758

Figure 4. Front View of Engine.

13. Disconnect cam sensor harness clip (Figure 4, Item 2).
14. Disconnect engine sensor wiring harness (Figure 4, Item 4) from Engine Coolant Temperature (ECT) sensor (Figure 4, Item 3).
15. Remove engine sensor wiring harness (Figure 4, Item 4) from engine.

END OF TASK

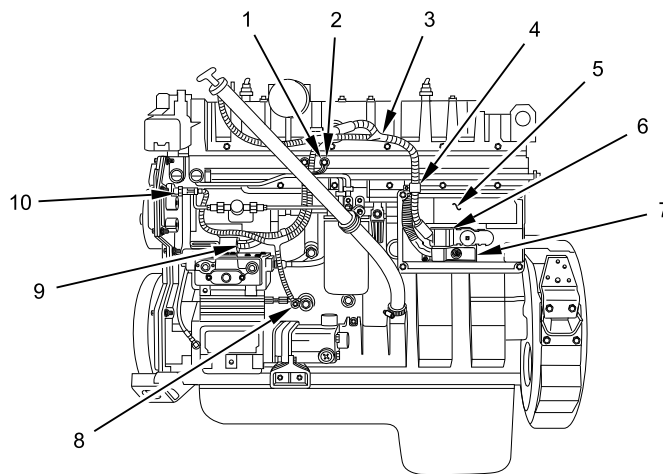
ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease in all electrical connections.
2. Position engine sensor wiring harness (Figure 5, Item 3) on engine.



B230603637

Figure 5. Left Side View of Engine.

3. Connect engine sensor wiring harness electrical connector (Figure 5, Item 6) onto ECM (Figure 5, Item 5).
4. Connect engine harness electrical connector (Figure 5, Item 7) onto ECM (Figure 5, Item 5).
5. Connect engine sensor wiring harness (Figure 5, Item 3) onto injector harness in valve cover (Figure 5, Item 2).
6. Connect engine sensor wiring harness (Figure 5, Item 3) onto ICP sensor (Figure 5, Item 1).
7. Connect engine sensor wiring harness (Figure 5, Item 3) onto EOP sensor (Figure 5, Item 8).
8. Connect engine sensor wiring harness (Figure 5, Item 3) onto IPR (Figure 5, Item 9).
9. Connect engine sensor wiring harness (Figure 5, Item 3) onto EOT sensor (Figure 5, Item 10).
10. Connect engine sensor wiring harness (Figure 5, Item 3) onto wiring harness mounting brackets (Figure 5, Item 4).

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

11. Connect electrical connector (Figure 6, Item 2) onto engine harness (Figure 6, Item 1).

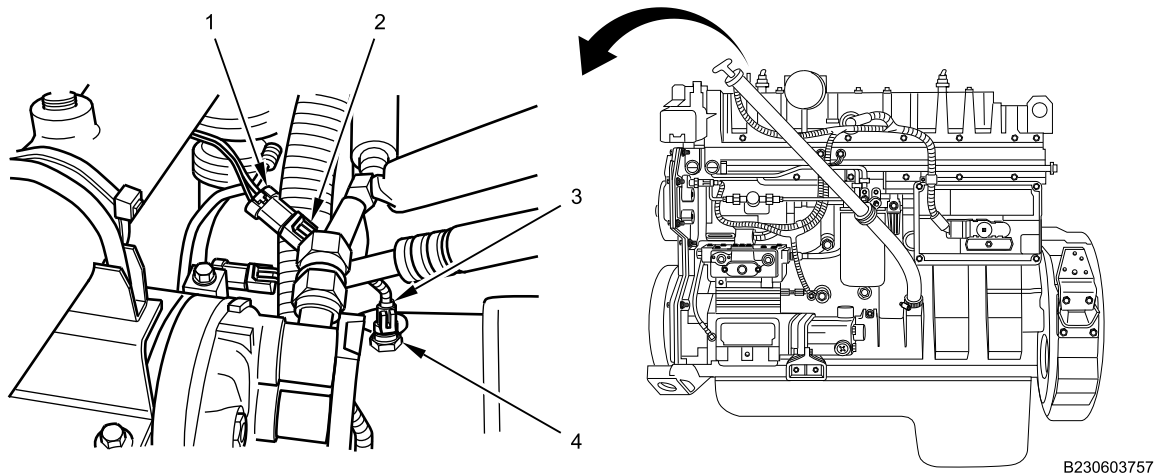


Figure 6. Top View of Engine.

12. Connect engine sensor wiring harness (Figure 6, Item 3) onto MAP sensor (Figure 6, Item 4).
 13. Connect engine sensor wiring harness (Figure 7, Item 4) onto ECT sensor (Figure 7, Item 3).

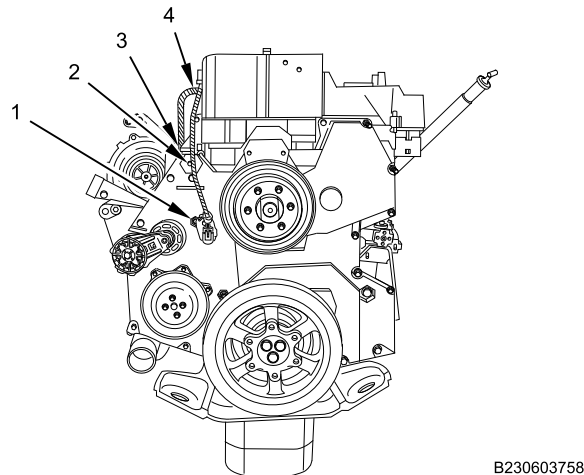
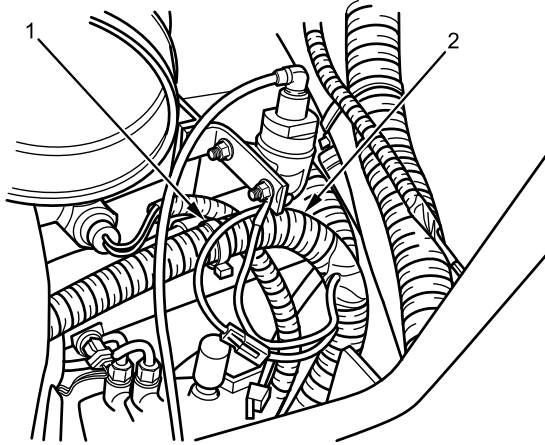


Figure 7. Front View of Engine.

14. Connect engine sensor wiring harness (Figure 7, Item 4) onto CMP sensor (Figure 7, Item 1).
 15. Connect cam sensor harness to harness clip (Figure 7, Item 2).

ENGINE SENSOR WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

16. Reposition engine wiring harness (Figure 8, Item 2) and install new cable lock straps (Figure 8, Item 1) as necessary to secure engine sensor harness on engine harness.



B235201436

Figure 8. Engine Wiring Harness.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install starter motor (WP 0292).
2. Install alternator bracket (WP 0290).
3. Install air cleaner assembly (WP 0257).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine; run to operating temperature (TM 9-2355-106-10).
6. Check instrument panel cluster to ensure no engine lights are illuminated (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Install left side engine armor plate (WP 0597).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FUEL INJECTOR HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM-9-2355-106-10)
Transmission set in NEUTRAL (N)
(TM-9-2355-106-10)
Engine off (TM-9-2355-106-10)
MAIN POWER switch off (TM-9-2355-106-10)
Wheels chocked (TM-9-2355-106-10)
Hood opened and secured (TM-9-2355-106-10)
Valve cover removed (WP 0228)

WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine components become extremely hot during normal operation. Allow engine to cool completely prior to performing maintenance. Use extreme care when working in close quarters in engine compartment. Stay clear of rotating parts. Wear safety goggles, work gloves, and long sleeves or shop coat. Failure to comply may result in serious injury or death to personnel.

FUEL INJECTOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Single injector and harness shown. Repeat steps 1 and 2 for remaining injector harness connectors to remove entire harness assembly.

1. Release wire bail (Figure 1, Item 4) on injector harness connector (Figure 1, Item 5) and remove harness connector from fuel injector (Figure 1, Item 1).

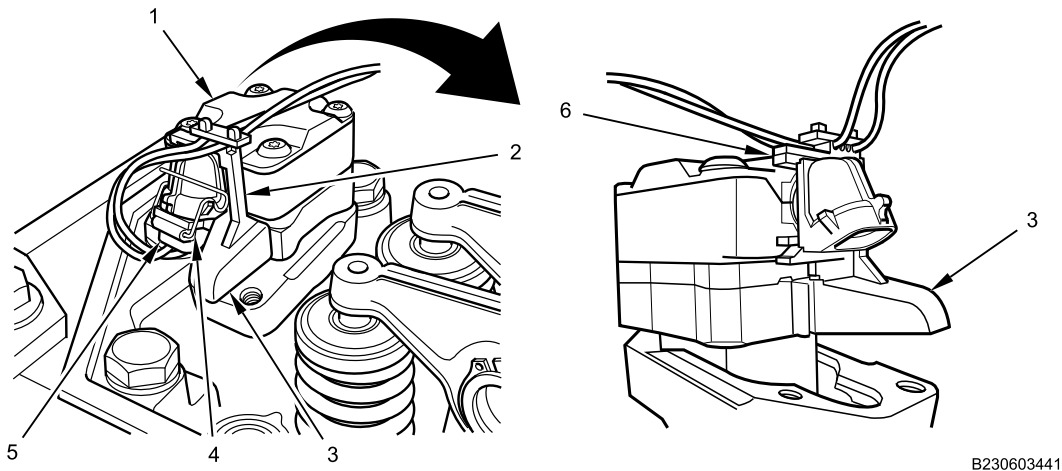


Figure 1. Fuel Injector Connector.

2. Lift upper clip (Figure 1, Item 6) while pushing thumb tab (Figure 1, Item 3) rearward and slide fuel injector harness clip (Figure 1, Item 2) off injector.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position fuel injector harness on cylinder head.
2. Install injector harness clip (Figure 2, Item 2) on fuel injector (Figure 2, Item 1) by sliding thumb tab forward (Figure 2, Item 3) until upper clip (Figure 2, Item 6) is locked into position.

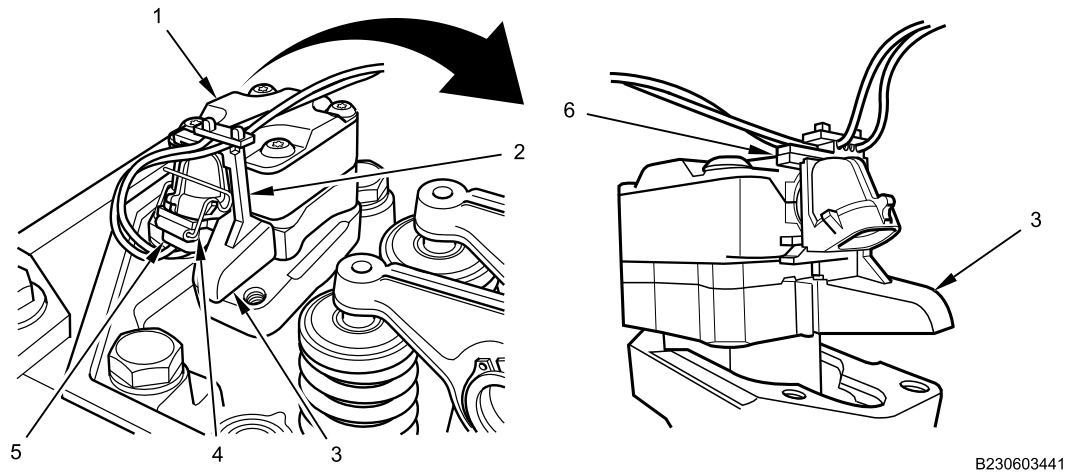
FUEL INJECTOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Fuel Injector Connector.

3. Install fuel injector harness connector (Figure 2, Item 5) into position on fuel injector (Figure 2, Item 1) and close bail (Figure 2, Item 4) onto injector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install valve cover (WP 0228).
2. Turn MAIN POWER switch on (TM-9-2355-106-10).
3. Start engine (TM-9-2355-106-10).
4. Turn engine off (TM-9-2355-106-10).
5. Turn MAIN POWER switch off (TM-9-2355-106-10).
6. Close hood (TM-9-2355-106-10).
7. Remove wheel chocks (TM-9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**AIR CONDITIONING (A/C) CONDENSER FAN MOTOR RELAY REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel right side closeout removed
(WP 0580)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

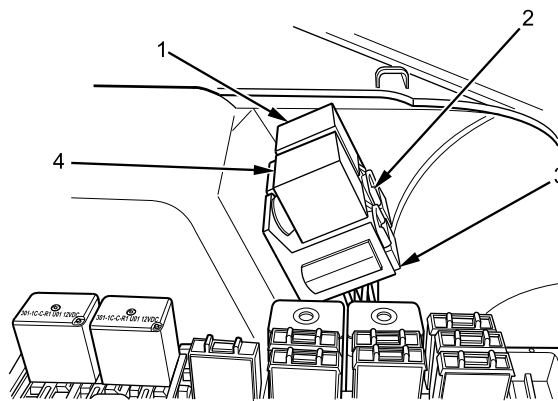
AIR CONDITIONING (A/C) CONDENSER FAN MOTOR RELAY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove right A/C condenser fan motor relay (Figure 1, Item 1) and/or left A/C condenser fan motor relay (Figure 1, Item 4) from A/C harness connector (Figure 1, Item 2 and/or 3). Refer to Table 1 for proper relay position identification.

Table 1. A/C Condenser Fan Motor Relay Location.

ITEM NUMBER	RELAY DESCRIPTION	ITEM NUMBER	A/C HARNESS SCHEMATIC RELAY BLOCK AND WIRING CIRCUIT NUMBER
1	Right A/C condenser fan motor relay	2	1019 Relay block - A75 Wiring circuit
4	Left A/C condenser fan motor relay	3	1018 Relay block - A75 Wiring circuit



B230601559

Figure 1. A/C Condenser Fan Motor Relays.

END OF TASK

INSTALLATION

WARNING



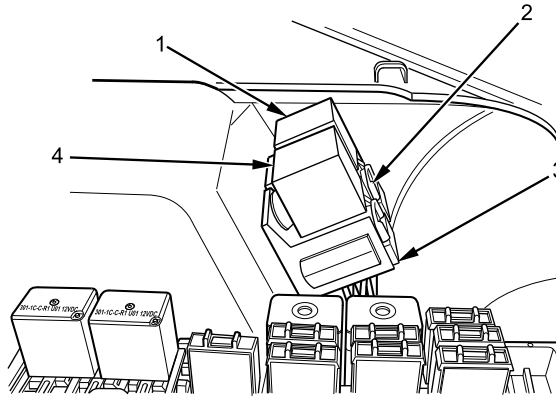
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

AIR CONDITIONING (A/C) CONDENSER FAN MOTOR RELAY REMOVAL AND INSTALLATION - (CONTINUED)

1. Install right A/C condenser fan motor relay (Figure 2, Item 1) and/or left A/C condenser fan motor relay (Figure 2, Item 4) on A/C harness connector (Figure 2, Item 2 and/or 3). Refer to Table 1 for proper relay position identification.



B230601559

Figure 2. A/C Condenser Fan Motor Relays.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument panel right side closeout (WP 0580).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify A/C condenser fan motor relay operation (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap (WP 0796, Item 82)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

WARNING

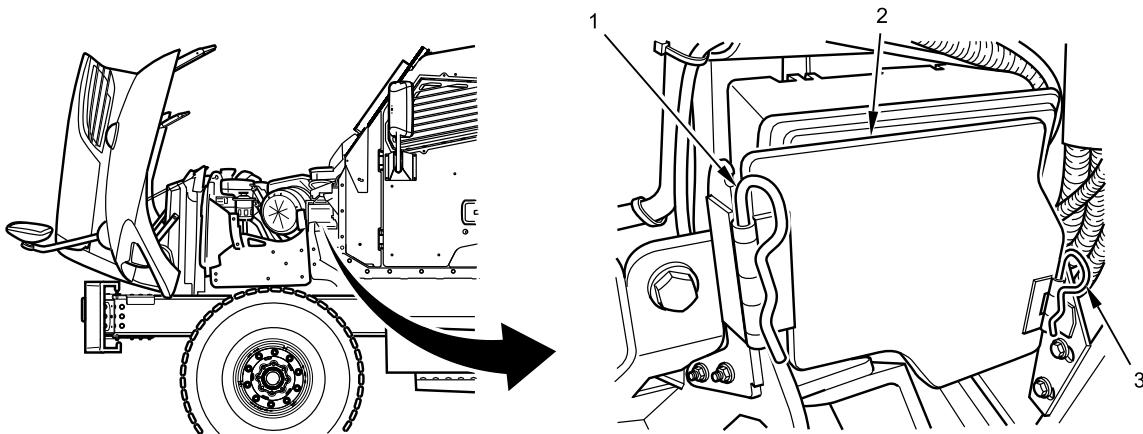


Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)

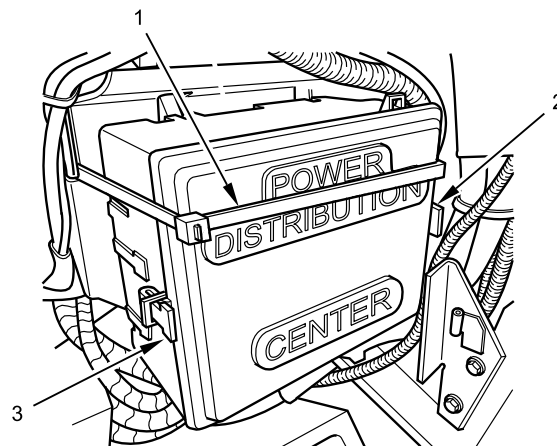
REMOVAL



B230601937

Figure 1. PDC Armor Plate.

1. Remove two PDC armor clips (Figure 1, Item 1 and 3) and armor plate (Figure 1, Item 2).

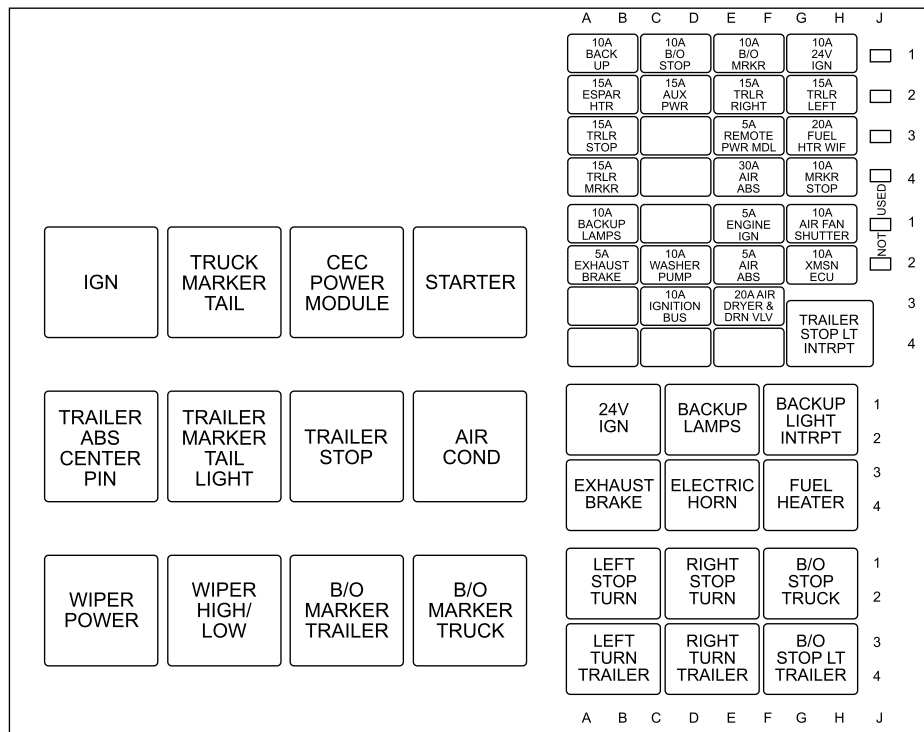


B230603288

Figure 2. PDC Cover Cable Lock Strap.

2. Remove and discard PDC cover cable lock strap (Figure 2, Item 1).
3. Depress PDC cover latches (Figure 2, Item 2 and 3) and remove PDC cover.

POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)



B230602304

Figure 3. PDC Fuses and Relays.

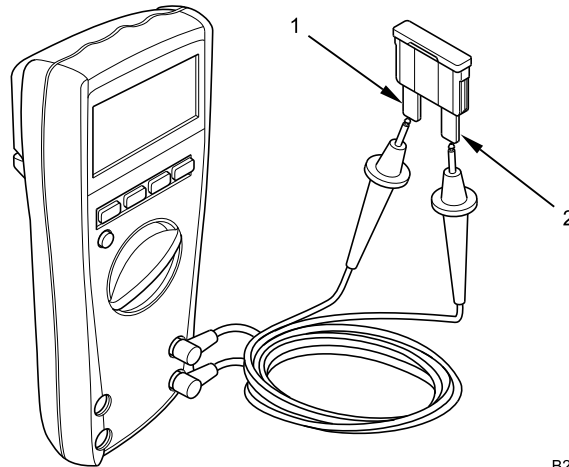
- Remove fuse and/or relay from PDC fuse block.

END OF TASK

POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)**TEST AND INSPECTION****NOTE**

Multimeter will read OL for a faulty fuse.

1. With fuse removed, measure resistance between both terminals (Figure 4, Item 1 and 2) of fuse with multimeter.



B230606065

Figure 4. Testing for Faulty Fuse.

END OF TASK**INSTALLATION****WARNING**

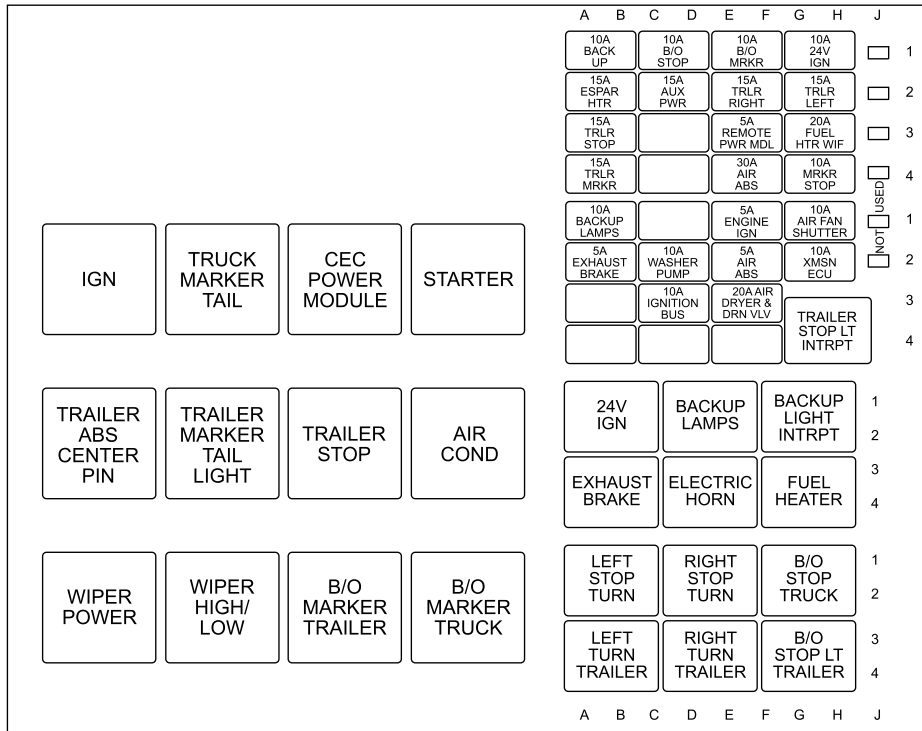
Do not use a circuit breaker, fuse, or relay with higher amperage rating than listed for a particular application. Using higher amperage will overheat the electrical circuit, causing melted components and possible fire. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

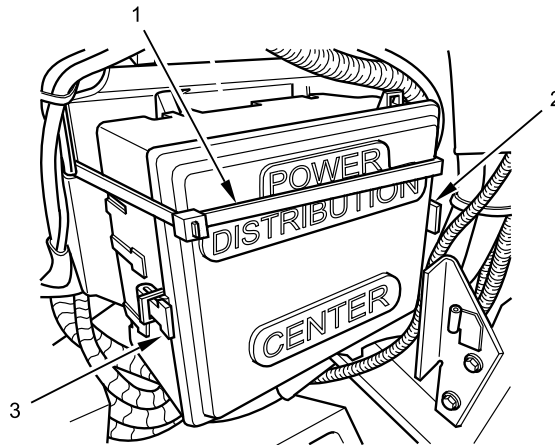
POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)



B230602304

Figure 5. PDC Fuses and Relays.

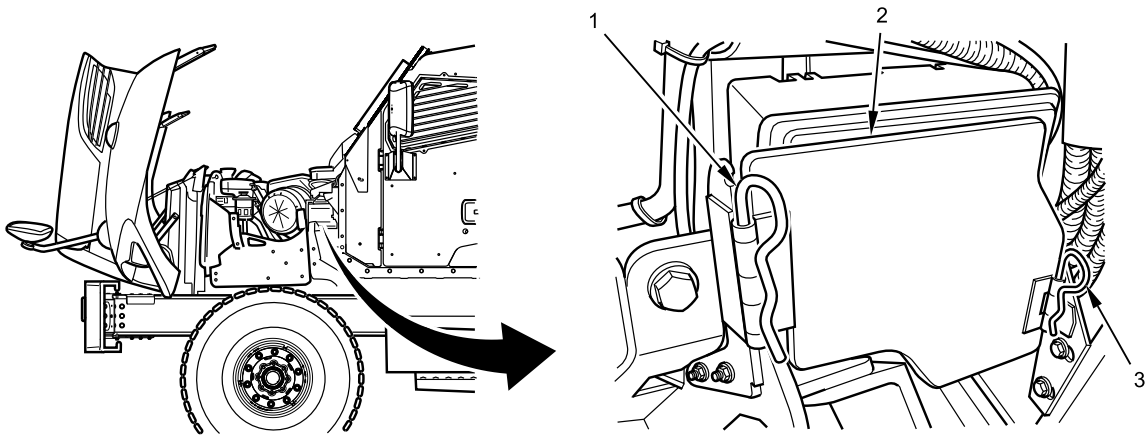
1. Install fuse and/or relay in PDC fuse block.



B230603288

Figure 6. PDC Cover.

2. Install PDC cover and ensure two PDC cover clips (Figure 6, Item 2 and 3) lock into place.
3. Install new PDC cover cable lock strap (Figure 6, Item 1).

POWER DISTRIBUTION CENTER (PDC) FUSE AND RELAY REMOVAL AND INSTALLATION - (CONTINUED)

B230601937

Figure 7. PDC Armor Plate.

4. Place PDC armor plate (Figure 7, Item 2) into position and install two clips (Figure 7, Item 1 and 3).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Close engine hood (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify circuit operation (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Cable lock strap (WP 0796, Item 104)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secure (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

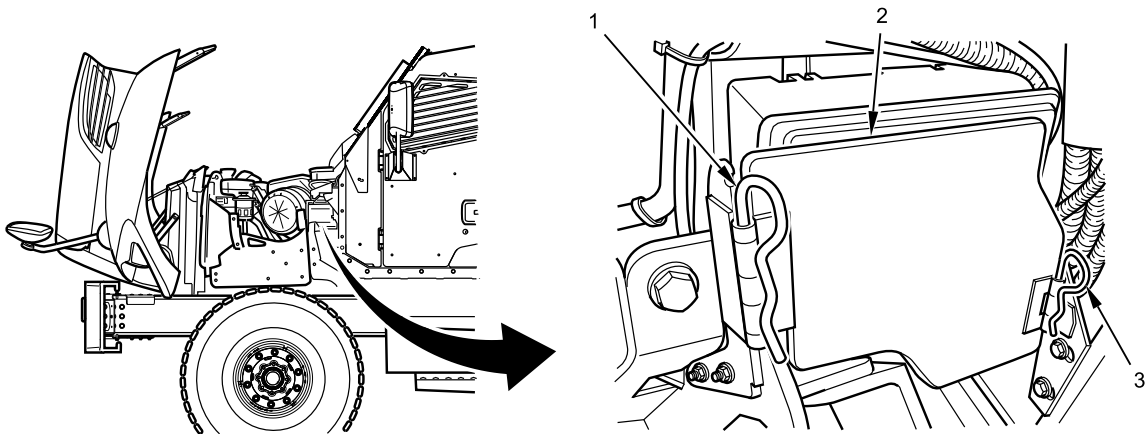
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION - (CONTINUED)

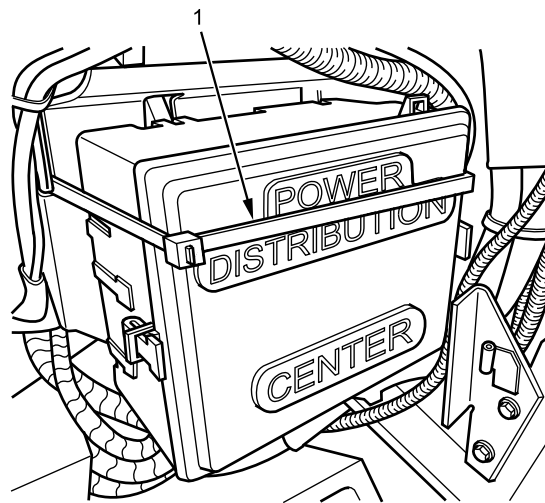
REMOVAL



B230601937

Figure 1. PDC Armor Plate.

1. Remove PDC armor clips (Figure 1, Item 1 and 3) and armor plate (Figure 1, Item 2).

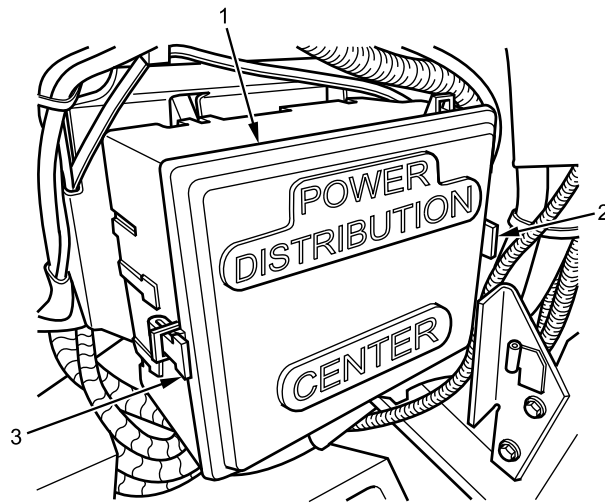


B230602760

Figure 2. PDC Cover Cable Lock Strap.

2. Remove and discard PDC cover cable lock strap (Figure 2, Item 1).

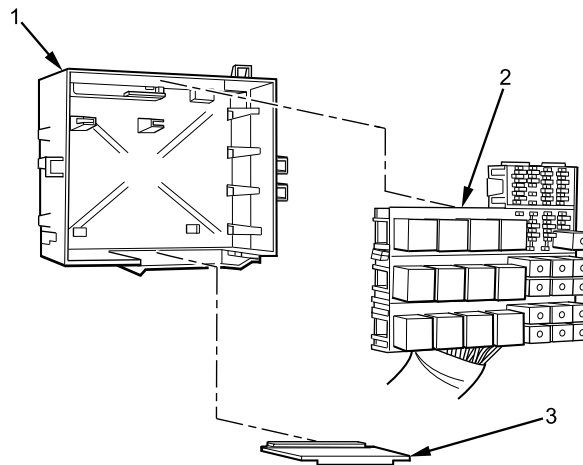
POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION - (CONTINUED)



B230601938

Figure 3. PDC Cover.

3. Depress PDC cover latches (Figure 3, Item 2 and 3) and remove PDC cover (Figure 3, Item 1).



B230601992

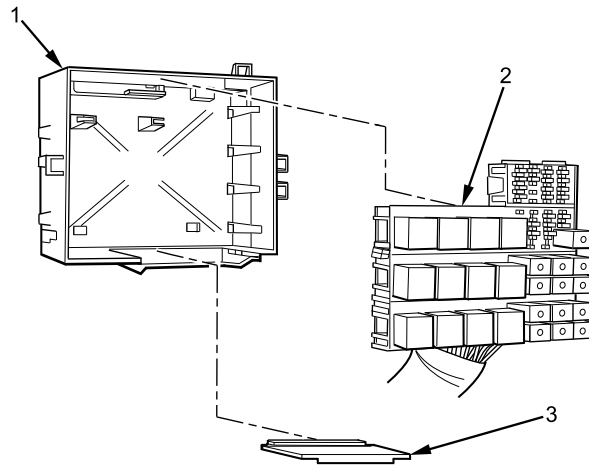
Figure 4. PDC Junction Door and Junction Box.

4. Remove PDC junction box door (Figure 4, Item 3) from PDC junction box (Figure 4, Item 1).
5. Remove PDC fuse blocks and harness (Figure 4, Item 2) from PDC junction box (Figure 4, Item 1) and remove PDC junction box (Figure 4, Item 1).

END OF TASK

POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION - (CONTINUED)

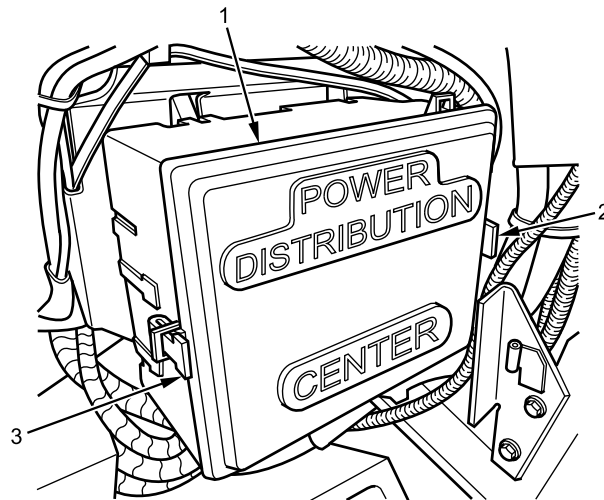
INSTALLATION



B230601992

Figure 5. PDC Junction Box and Junction Door.

1. Install PDC fuse blocks and harness (Figure 5, Item 2) on PDC junction box (Figure 5, Item 1).
2. Install PDC junction box door (Figure 5, Item 3) on PDC junction box (Figure 5, Item 1).

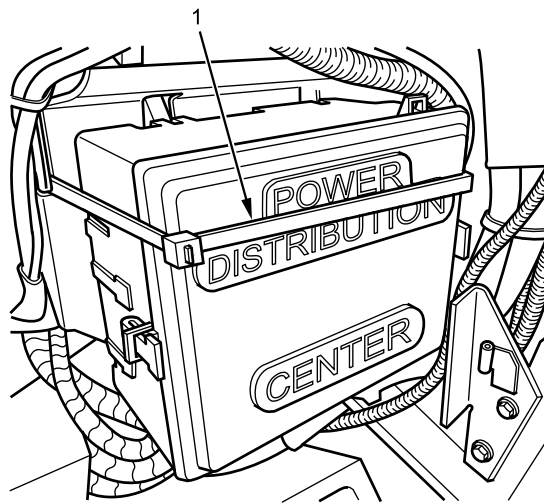


B230601938

Figure 6. PDC Cover.

3. Install PDC cover (Figure 6, Item 1) and ensure PDC cover clips (Figure 6, Item 2 and 3) lock in place.

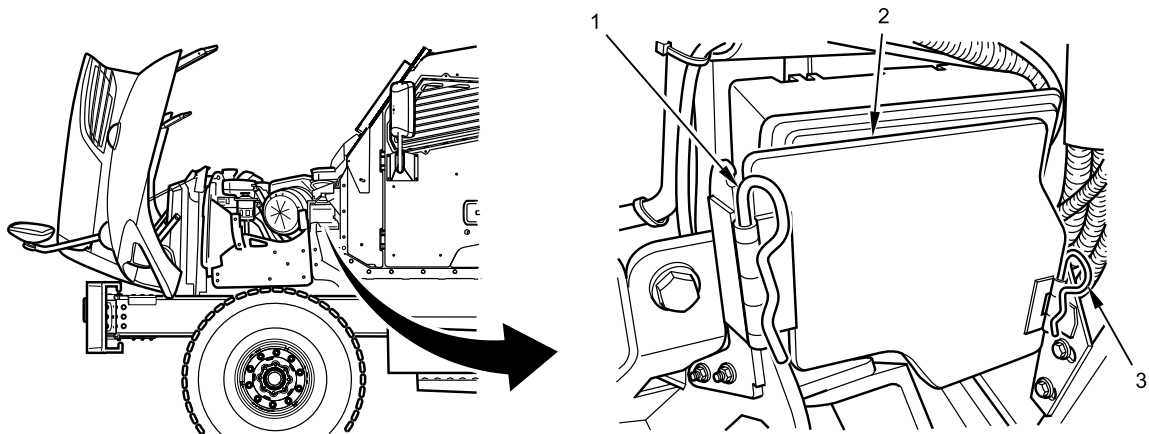
POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION - (CONTINUED)



B230602760

Figure 7. PDC Cover Cable Lock Strap.

4. Install new PDC cover cable lock strap (Figure 7, Item 1).



B230601937

Figure 8. PDC Armor Plate.

5. Place PDC armor plate (Figure 8, Item 2) into position and install clips (Figure 8, Item 1 and 3).

END OF TASK

POWER DISTRIBUTION CENTER (PDC) JUNCTION BOX REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Close engine hood (TM 9-2355-106-10).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).
5. Test-drive vehicle to verify fuse and relay operation (TM 9-2355-106-10).
6. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
7. Set vehicle parking brake (TM 9-2355-106-10).
8. Turn engine off (TM 9-2355-106-10).
9. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Gloves (WP 0794, Item 18)
Compound, sealing (WP 0794, Item 47)
Dispenser, sealant (WP 0794, Item 14)
Cable lock straps - (2) (WP 0796, Item 124)
Cable lock straps - (6) (WP 0796, Item 121)
Cable lock straps - (2) (WP 0796, Item 136)
Cable lock straps - (3) (WP 0796, Item 151)
Nut, lock (WP 0796, Item 143)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Hood opened and secured (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Air cleaner support removed (WP 0258)
Left engine armor plate removed (WP 0597)
Left engine armor plate bracket removed (WP 0598)
Right engine armor plate removed (WP 0599)
Right engine armor plate bracket removed (WP 0600)
Right and left inner wheel deflector armor plate removed (WP 0601)
PDC junction box removed (WP 0334)

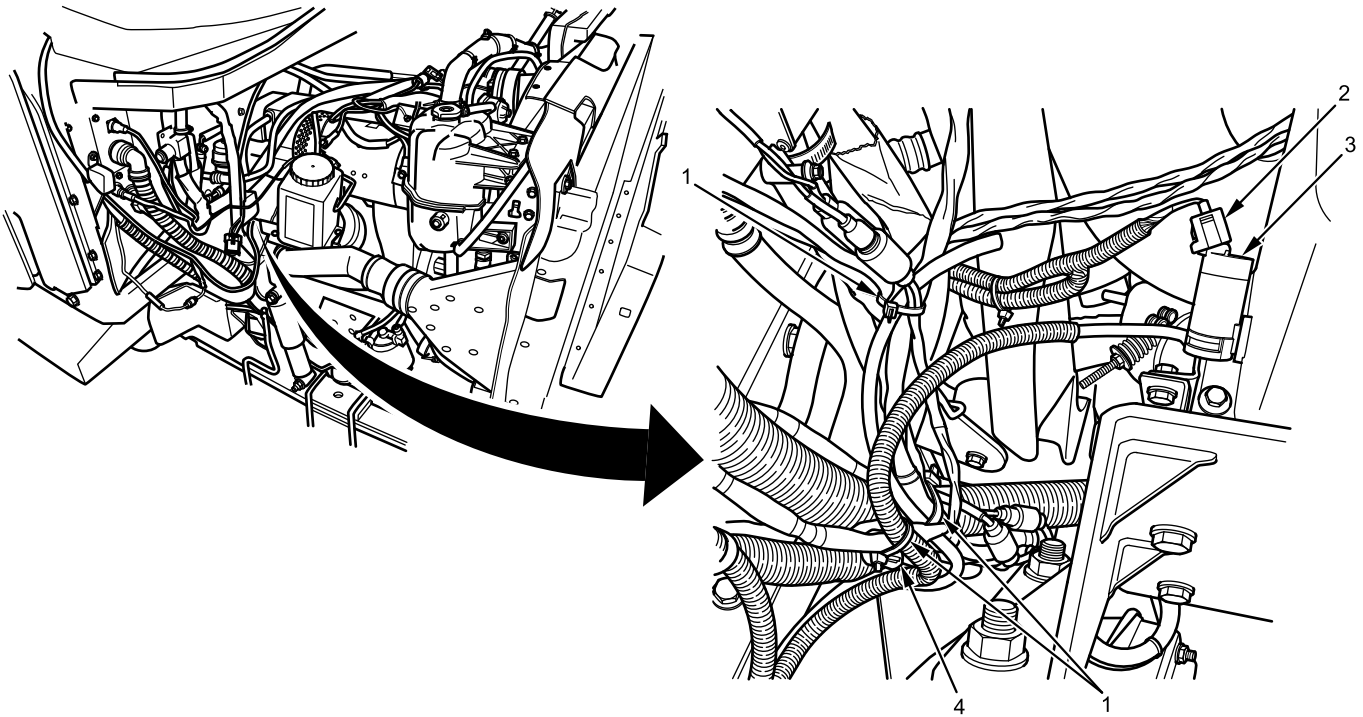
WARNING

Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Label all harness connectors and note location of cable lock straps to ensure proper installation.



B230604752

Figure 1. Washer Bottle Connector and A/C Harness Removal.

1. Disconnect PDC harness washer pump connector (Figure 1, Item 2) from washer pump (Figure 1, Item 3).
2. Remove and discard cable lock straps (Figure 1, Item 1) from PDC harness (Figure 1, Item 4).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

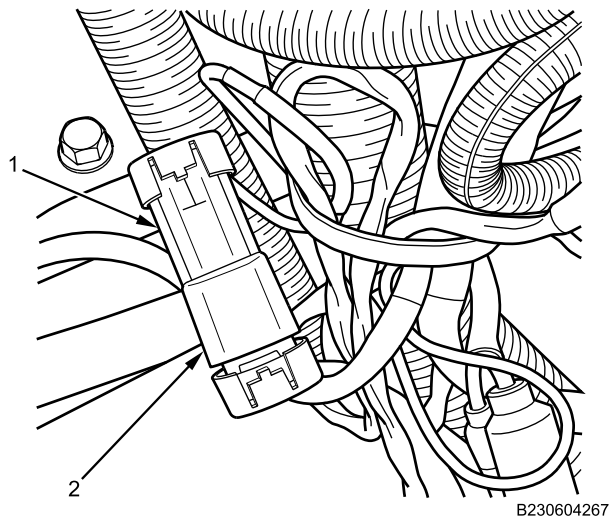


Figure 2. A/C Harness Connector Removal.

3. Disconnect PDC harness A/C idle speed request connector (Figure 2, Item 1) from HVAC control harness connector (Figure 2, Item 2).

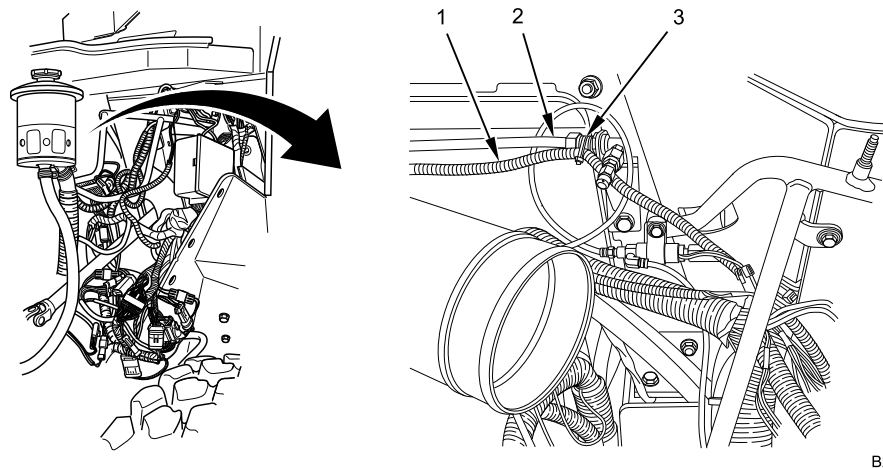


Figure 3. PDC Harness Breakout Cable Lock Strap Removal.

4. Remove cable lock straps (Figure 3, Item 3) from PDC harness breakout (Figure 3, Item 1) and Fire Suppression System (FSS) engine discharge pipe (Figure 3, Item 2). Discard cable lock straps.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

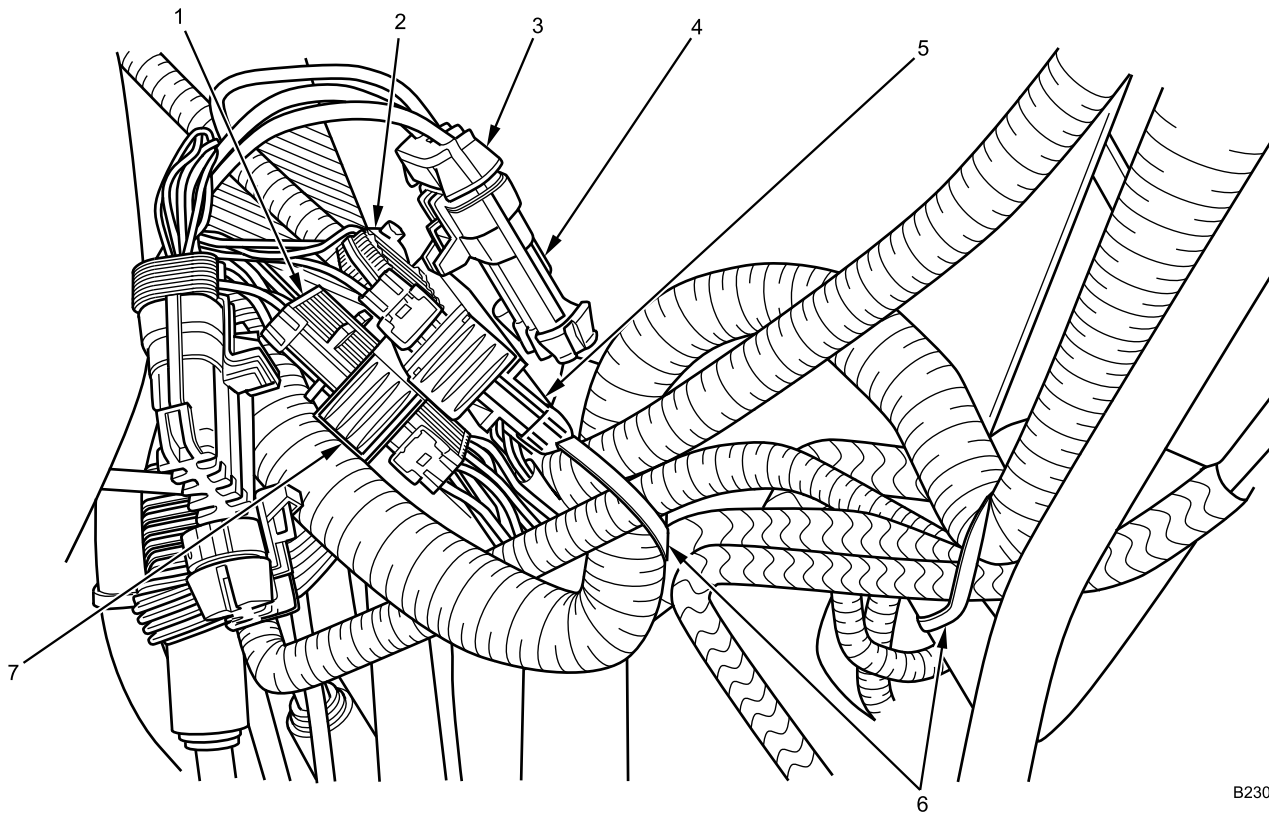
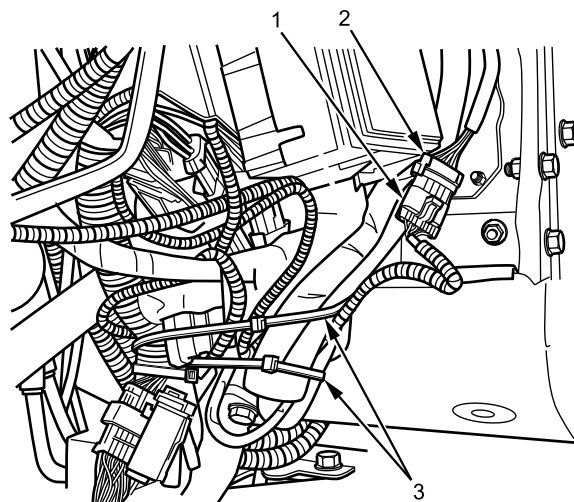


Figure 4. PDC Harness to Engine Harness Connectors.

5. Remove and discard cable lock straps (Figure 4, Item 6) from harness assembly.
6. Disconnect PDC harness Consolidated Engine Controller (CEC) connector (Figure 4, Item 4) from engine harness connector (Figure 4, Item 3).
7. Disconnect PDC harness engine connector (Figure 4, Item 1) from engine harness connector (Figure 4, Item 7).
8. Disconnect PDC harness transmission connector (Figure 4, Item 2) from engine harness connector (Figure 4, Item 5).

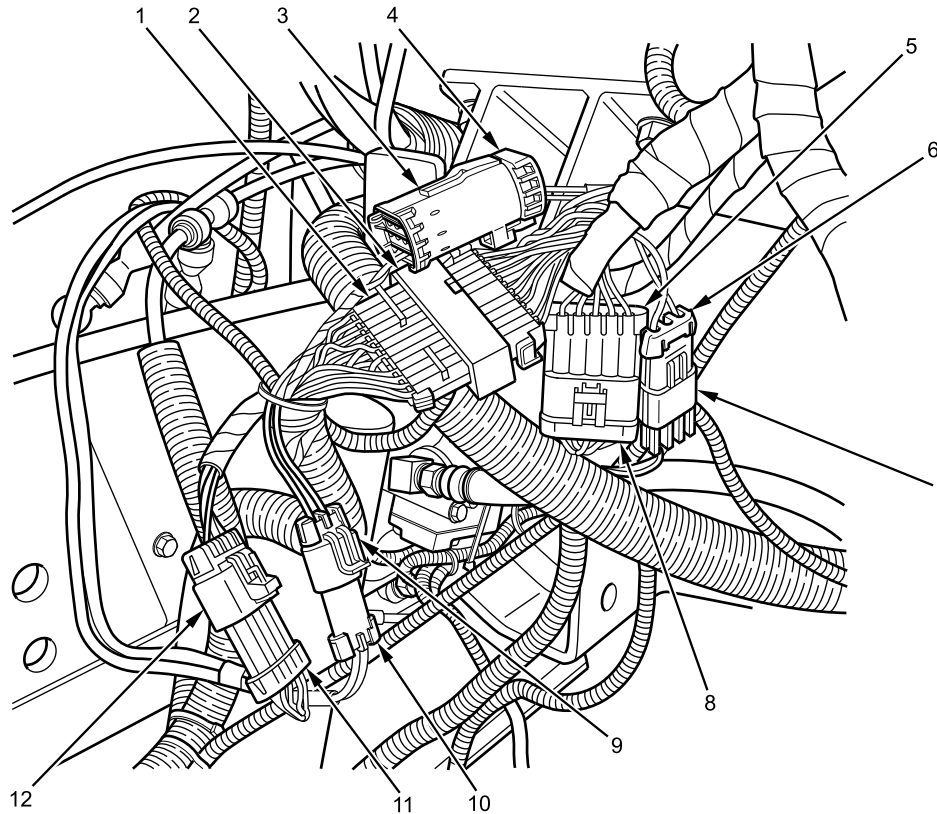


B230604270

Figure 5. PDC Harness Cable Lock Straps and Wiper Motor Harness.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

9. Remove and discard cable lock straps (Figure 5, Item 3) from harness assembly.
10. Disconnect PDC harness wiper motor connector (Figure 5, Item 1) from wiper motor harness connector (Figure 5, Item 2).

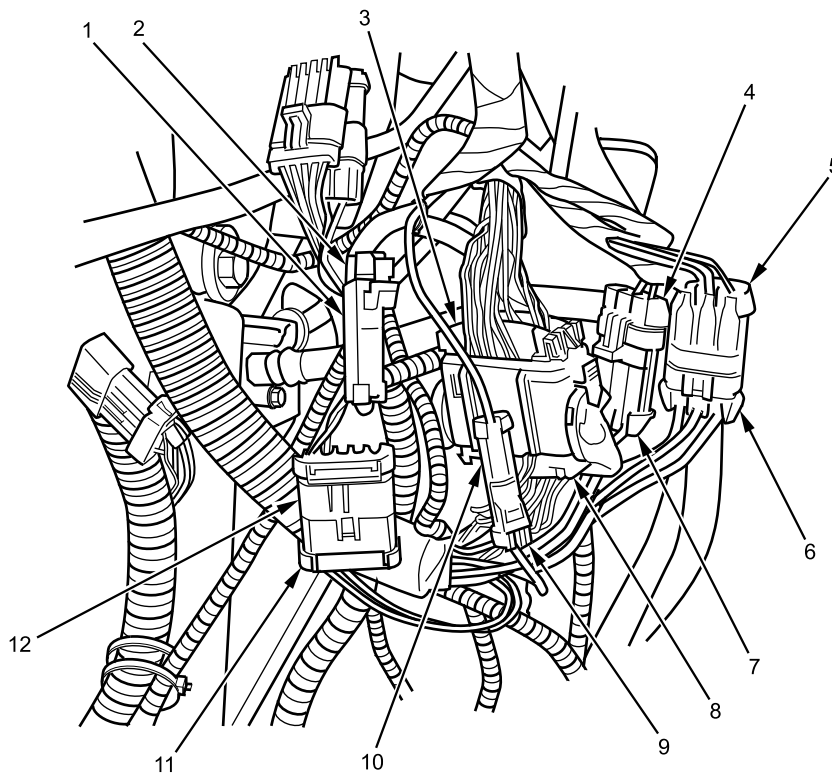


B230604271

Figure 6. PDC Harness to Front Chassis Harness Connectors.

11. Disconnect PDC harness in-line connector (Figure 6, Item 2) from chassis harness connector (Figure 6, Item 1).
12. Disconnect PDC harness in-line connector (Figure 6, Item 4) from chassis harness connector (Figure 6, Item 3).
13. Disconnect PDC harness in-line connector (Figure 6, Item 5) from front trailer harness connector (Figure 6, Item 8).
14. Disconnect PDC harness in-line connector (Figure 6, Item 6) from front trailer harness connector (Figure 6, Item 7).
15. Disconnect PDC harness in-line connector (Figure 6, Item 9) from fuel fired heater harness connector (Figure 6, Item 10).
16. Disconnect PDC harness in-line connector (Figure 6, Item 11) from fuel fired heater harness connector (Figure 6, Item 12).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

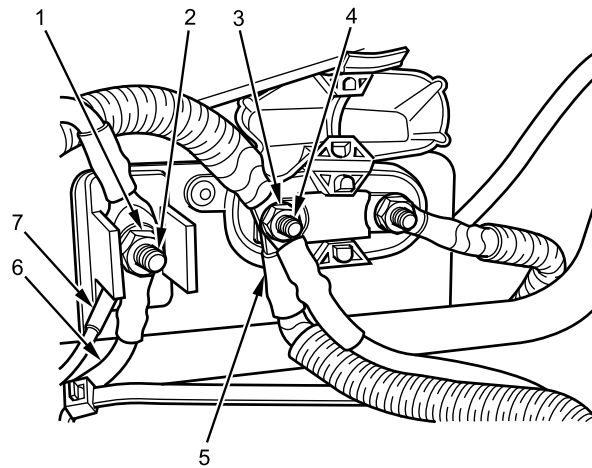


B230604272

Figure 7. PDC Harness to Center Chassis Harness Connectors.

17. Disconnect PDC harness in-line connector (Figure 7, Item 3) from center chassis harness connector (Figure 7, Item 8).
18. Disconnect PDC harness in-line connector (Figure 7, Item 4) from center chassis harness connector (Figure 7, Item 7).
19. Disconnect PDC harness in-line connector (Figure 7, Item 5) from center chassis harness connector (Figure 7, Item 6).
20. Disconnect PDC harness in-line connector (Figure 7, Item 10) from center chassis harness connector (Figure 7, Item 9).
21. Disconnect PDC harness in-line connector (Figure 7, Item 12) from center chassis harness connector (Figure 7, Item 11).
22. Disconnect PDC harness in-line connector (Figure 7, Item 2) from master disconnect harness connector (Figure 7, Item 1).

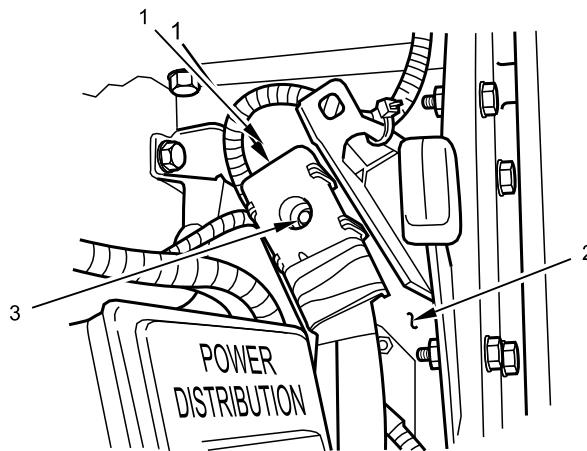
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604273

Figure 8. PDC Harness 12/24V Cable Removal.

23. Remove nut (Figure 8, Item 1) and two 24V cables (Figure 8, Item 6 and 7) from stud (Figure 8, Item 2).
24. Remove nut (Figure 8, Item 3) and 12V cable (Figure 8, Item 5) from stud (Figure 8, Item 4).



B230604274

Figure 9. Front of Dash Pass-Through Connector.

25. Remove screw (Figure 9, Item 3) and PDC harness connector (Figure 9, Item 1) from bulkhead (Figure 9, Item 2).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

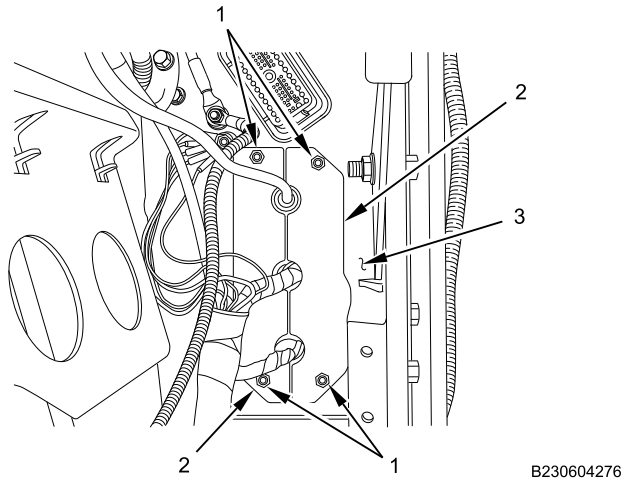


Figure 10. Pass-Through Armor Removal.

NOTE

Sealer on cabin side of armor may stick to access panels.

- 26. Remove four nuts (Figure 10, Item 1) and two armor panels (Figure 10, Item 2) from bulkhead (Figure 10, Item 3).

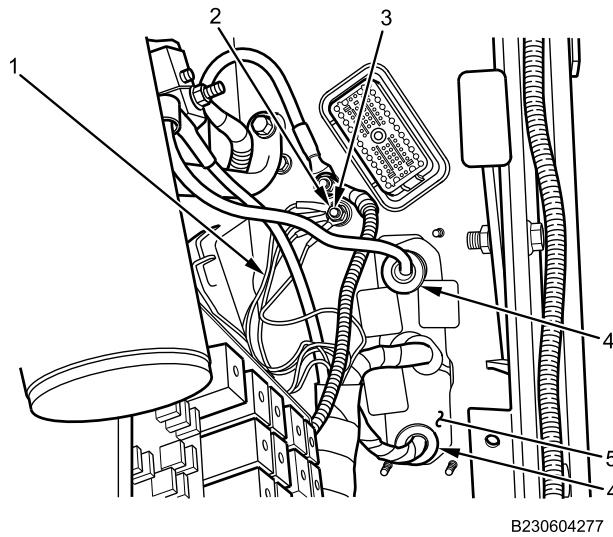


Figure 11. Ground Wire and Electronic System Controller (ESC) Connector Access Panel.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

27. Remove nut (Figure 11, Item 2) and five ground wires (Figure 11, Item 1) from stud (Figure 11, Item 3).
28. Use a knife to remove sealer (Figure 11, Item 5) around harness grommets (Figure 11, Item 4) and pass-through.

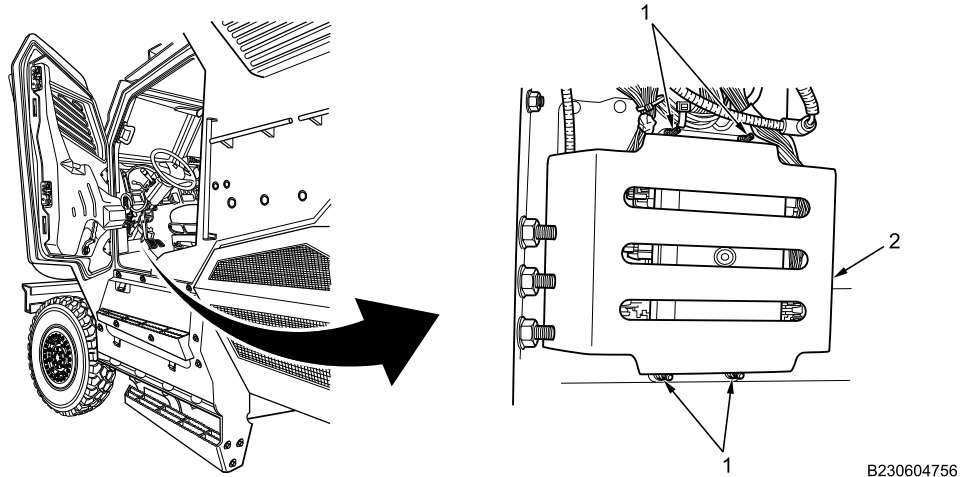


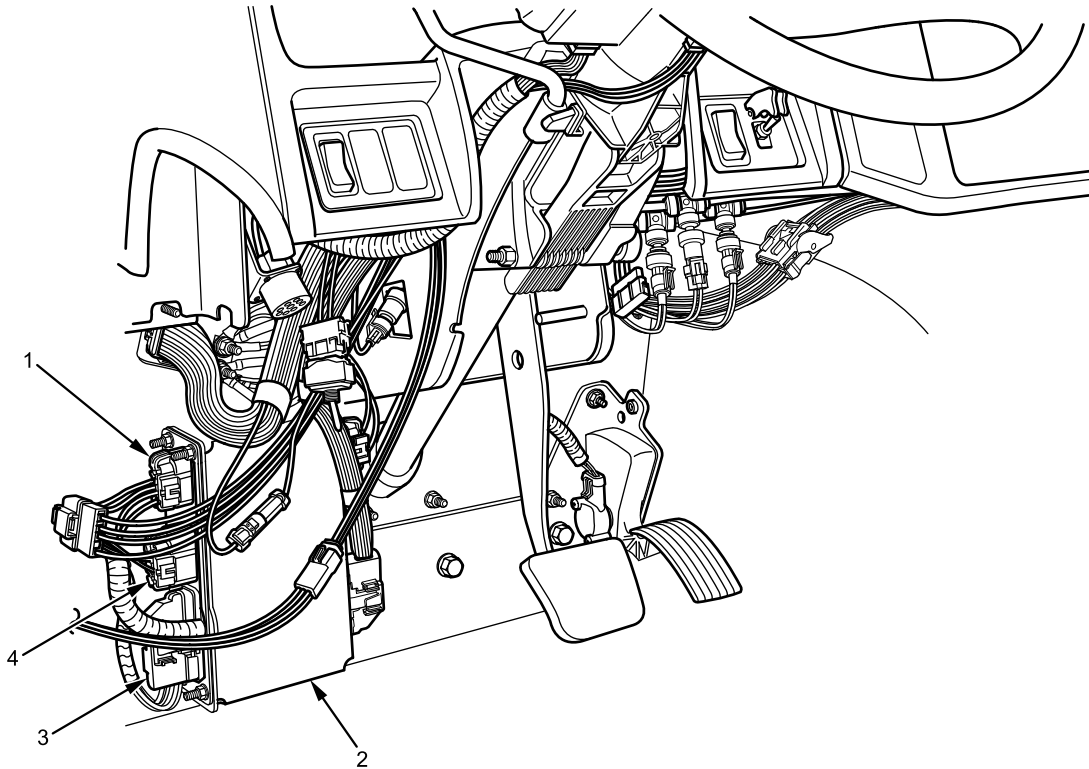
Figure 12. ESC Cover Removal.

NOTE

Not all models use the ESC cover.

29. Remove four nuts (Figure 12, Item 1) and cover (Figure 12, Item 2) from bulkhead.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



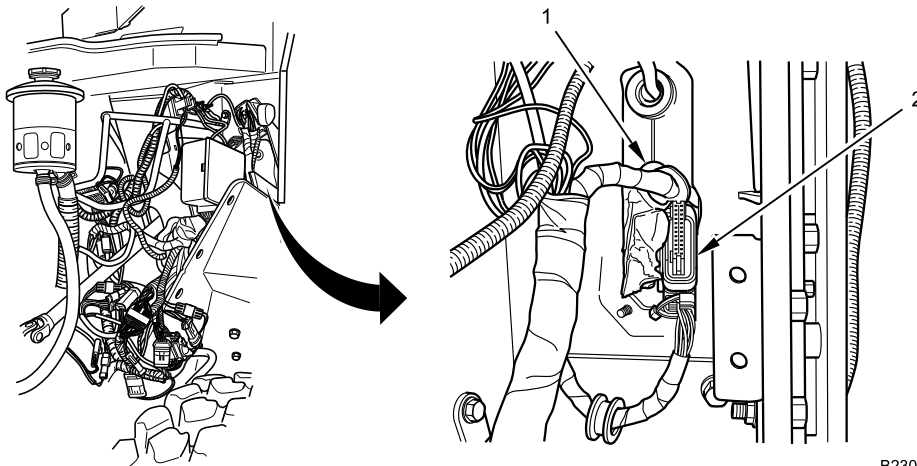
B230604757

Figure 13. ESC Connector Removal.

NOTE

First design uses four connectors at the ESC module. Replacement harnesses use only three connectors.

30. Disconnect PDC harness connector (BLUE) (Figure 13, Item 1), (BROWN) (Figure 13, Item 4), and (GRAY) (Figure 13, Item 3), from ESC (Figure 13, Item 2).



B230604758

Figure 14. ESC Connector Removal at Bulkhead.

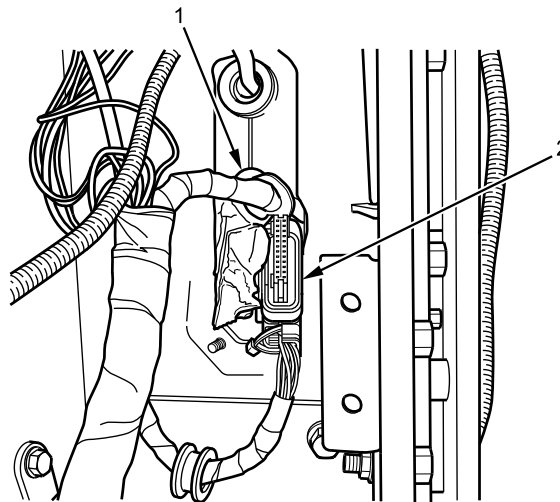
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

31. Pull three ESC connectors (Figure 14, Item 2) through bulkhead pass-through (Figure 14, Item 1).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

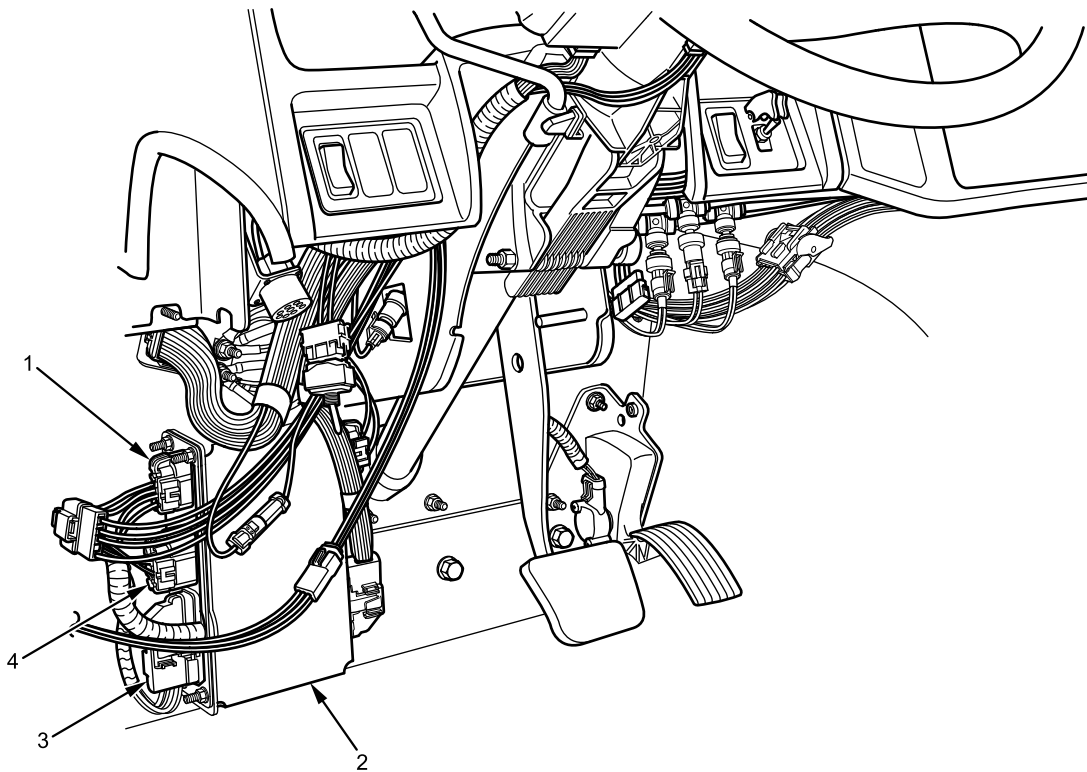
1. Apply dielectric grease to all harness connectors and position PDC wiring harness on vehicle.



B230604280

Figure 15. ESC Connector Installation at Bulkhead.

2. Push three ESC connectors (Figure 15, Item 2) through bulkhead pass-through (Figure 15, Item 1).

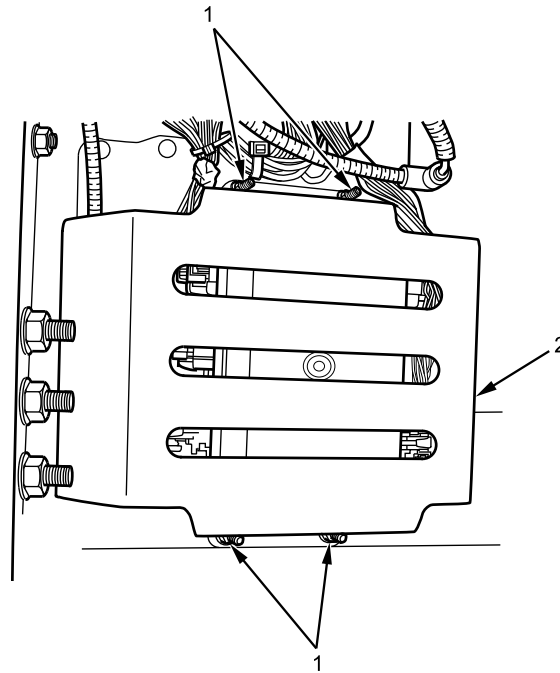
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604757

Figure 16. ESC Connector Installation.

3. Connect PDC harness connector (BLUE) (Figure 16, Item 1), (BROWN) (Figure 16, Item 4), and (GRAY) (Figure 16, Item 3) to ESC (Figure 16, Item 2).

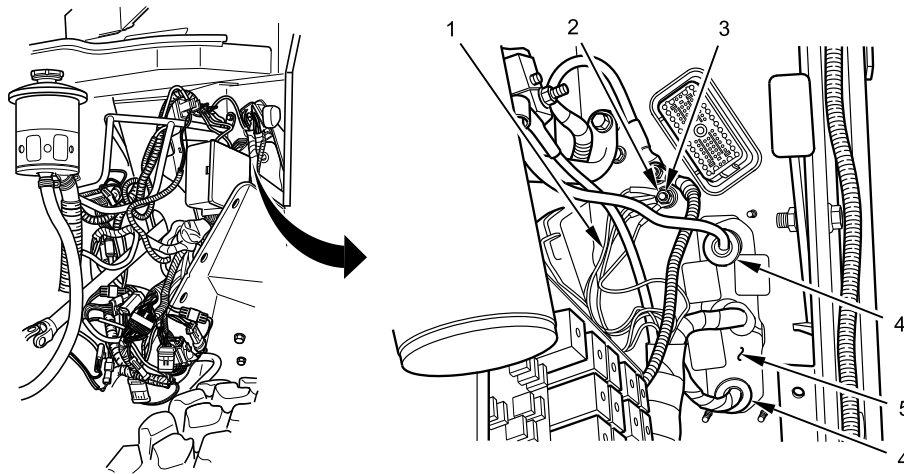
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604278

Figure 17. ESC Cover Installation.

4. Secure ESC cover (Figure 17, Item 2) on bulkhead with four nuts (Figure 17, Item 1). Tighten nuts securely.



B230604755

Figure 18. Ground Wire and ESC Connector Access Panel.

5. Install five ground wires (Figure 18, Item 1) on stud (Figure 18, Item 3) with nut (Figure 18, Item 2). Tighten nut securely.
6. Position harness grommets (Figure 18, Item 4) in pass-through (Figure 18, Item 5).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

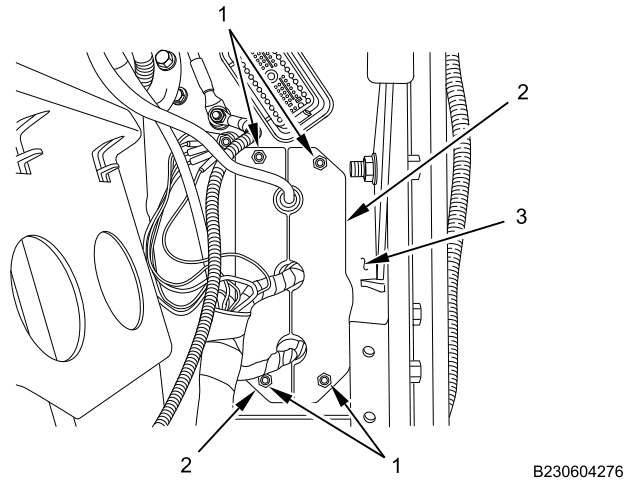


Figure 19. Pass-Through Armor Installation.

7. Install two armor panels (Figure 19, Item 2) on bulkhead (Figure 19, Item 3) with four nuts (Figure 19, Item 1). Tighten nuts securely.

WARNING

Silicone gasket material emits a small amount of acid vapor. Ensure work area is well ventilated. Read and carefully follow manufacturer's instructions before use. If silicone gasket material contacts eyes, follow manufacturer's emergency procedures. Seek medical assistance as soon as possible. Failure to comply may result in serious injury to personnel.

8. Apply sealing compound adhesive (Figure 20, Item 3) to front of dash pass-through armor (Figure 20, Item 1) to seal wire harnesses (Figure 20, Item 2) and grommets (Figure 20, Item 4) to armor.

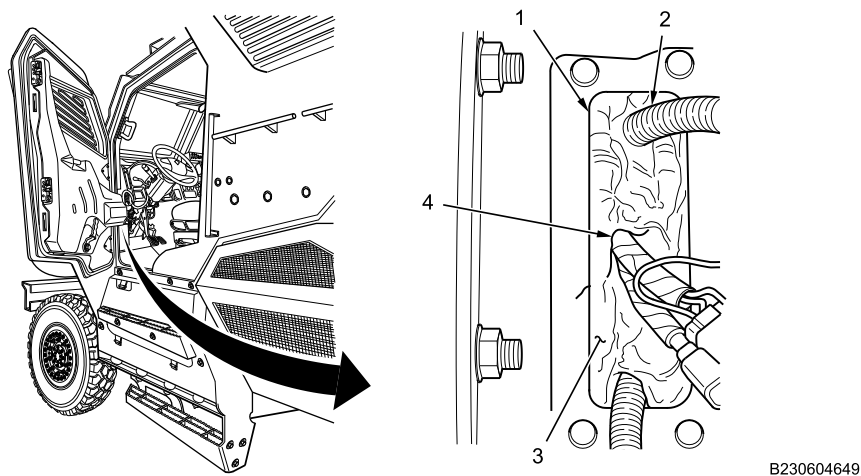
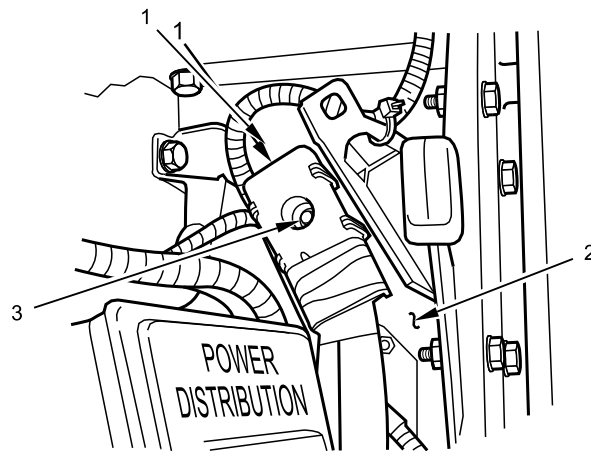


Figure 20. Front of Dash Sealer Application.

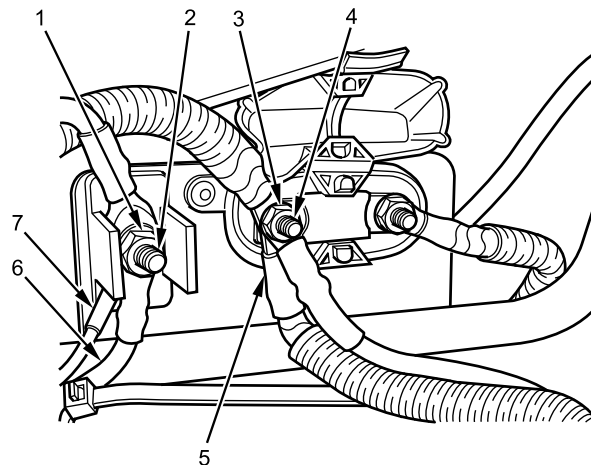
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604274

Figure 21. Front of Dash Pass-Through Connector.

9. Secure PDC harness connector (Figure 21, Item 1) on bulkhead (Figure 21, Item 2) with screw (Figure 21, Item 3). Tighten screw securely.



B230604273

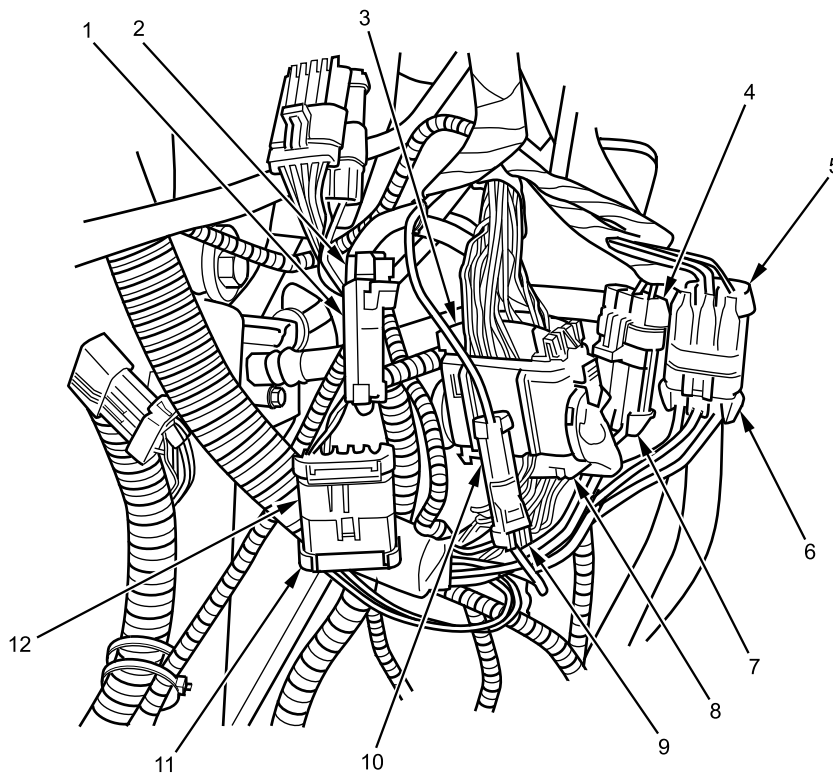
Figure 22. PDC Harness 12/24V Cable Installation.

NOTE

The two 24V cables are taped together in a dedicated harness breakout. The 12V cable is contained in a separate breakout.

10. Secure 12V cable (Figure 22, Item 5) on stud (Figure 22, Item 4) with nut (Figure 22, Item 3). Tighten nut securely.
11. Secure two 24V cables (Figure 22, Item 6 and 7) on stud (Figure 22, Item 2) with nut (Figure 22, Item 1). Tighten nut securely.

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

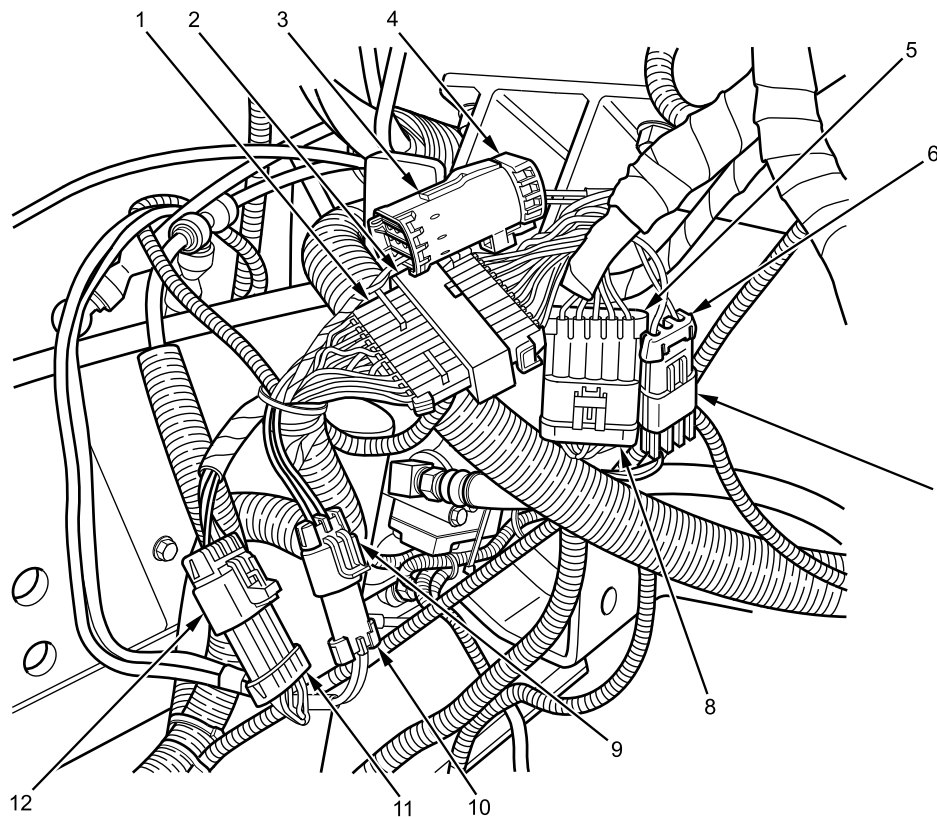


B230604272

Figure 23. PDC Harness to Center Chassis Harness Connectors.

12. Connect PDC harness in-line connector (Figure 23, Item 3) to center chassis harness connector (Figure 23, Item 8).
13. Connect PDC harness in-line connector (Figure 23, Item 4) to center chassis harness connector (Figure 23, Item 7).
14. Connect PDC harness in-line connector (Figure 23, Item 5) to center chassis harness connector (Figure 23, Item 6).
15. Connect PDC harness in-line connector (Figure 23, Item 10) to center chassis harness connector (Figure 23, Item 9).
16. Connect PDC harness in-line connector (Figure 23, Item 12) to center chassis harness connector (Figure 23, Item 11).
17. Connect PDC harness in-line connector (Figure 23, Item 2) to master disconnect harness connector (Figure 23, Item 1).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

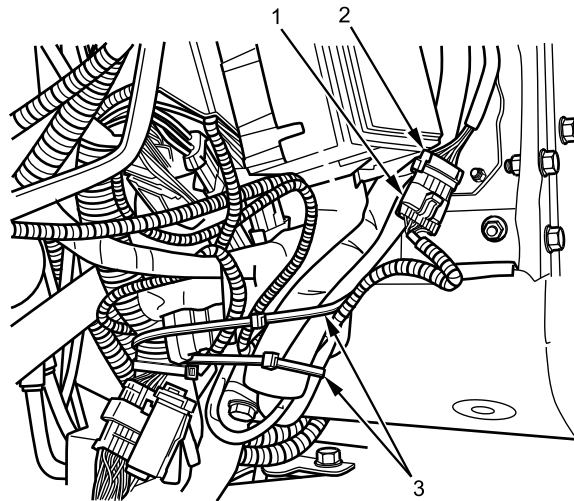


B230604271

Figure 24. PDC Harness to Front Chassis Harness Connectors.

18. Connect PDC harness in-line connector (Figure 24, Item 2) to chassis harness connector (Figure 24, Item 1).
19. Connect PDC harness in-line connector (Figure 24, Item 4) to chassis harness connector (Figure 24, Item 3).
20. Connect PDC harness in-line connector (Figure 24, Item 5) to front trailer harness connector (Figure 24, Item 8).
21. Connect PDC harness in-line connector (Figure 24, Item 6) to front trailer harness connector (Figure 24, Item 7).
22. Connect PDC harness in-line connector (Figure 24, Item 9) to fuel fired heater harness connector (Figure 24, Item 10).
23. Connect PDC harness in-line connector (Figure 24, Item 11) to fuel fired heater harness connector (Figure 24, Item 12).

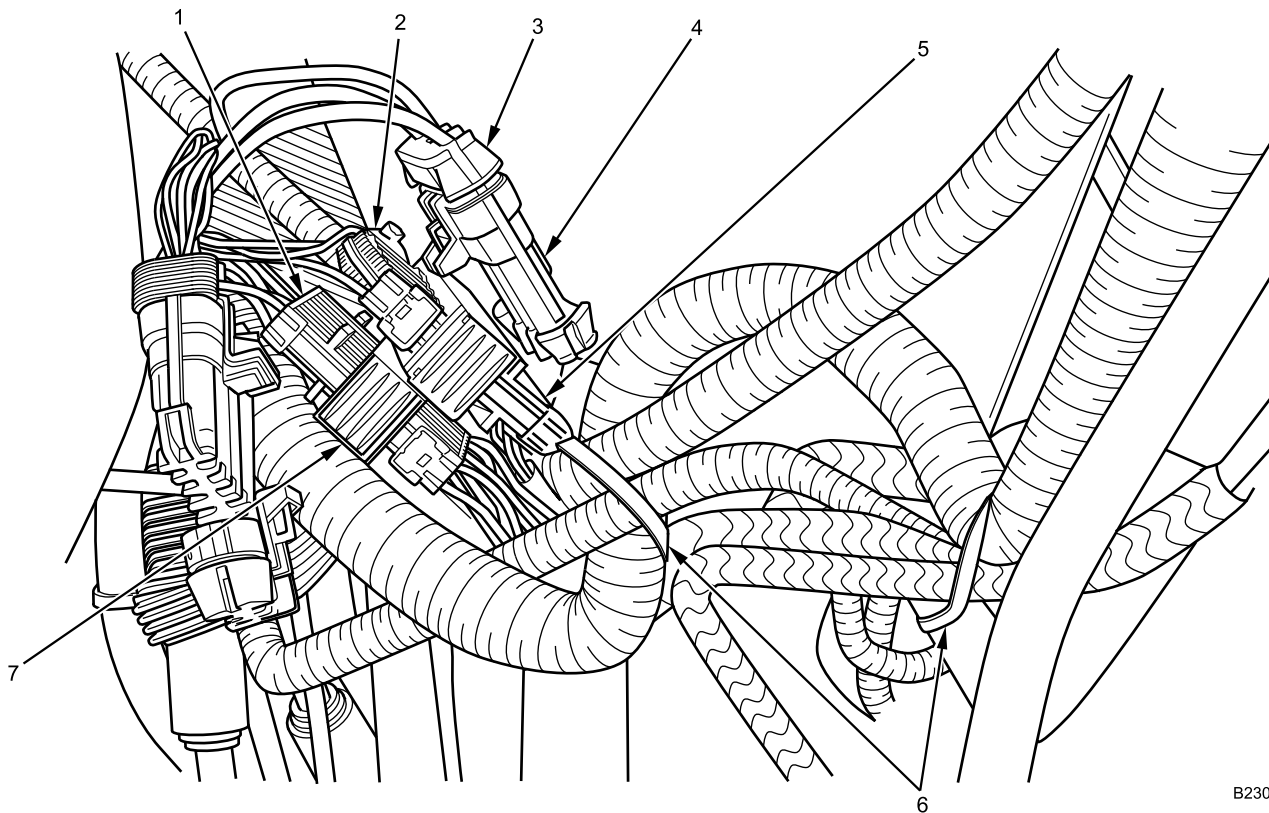
POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604270

Figure 25. PDC Harness Cable Lock Straps and Wiper Motor Harness.

24. Connect PDC harness wiper motor connector (Figure 25, Item 1) to wiper motor harness connector (Figure 25, Item 2).
25. Install new cable lock straps (Figure 25, Item 3) on harness assembly. Ensure harness is properly supported on vehicle.



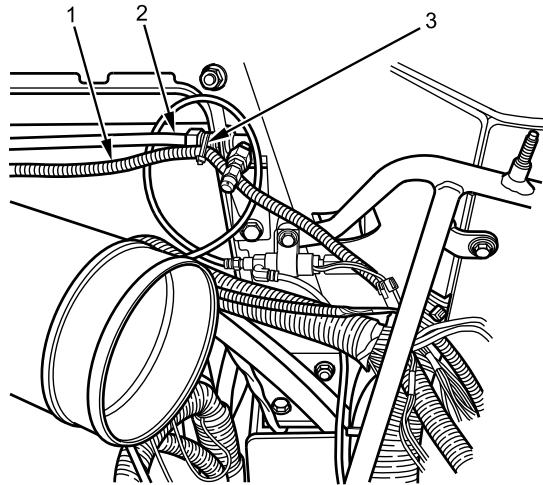
B230604269

Figure 26. PDC Harness to Engine Harness Connectors.

26. Connect PDC harness CEC connector (Figure 26, Item 4) to engine harness connector (Figure 26, Item 3).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

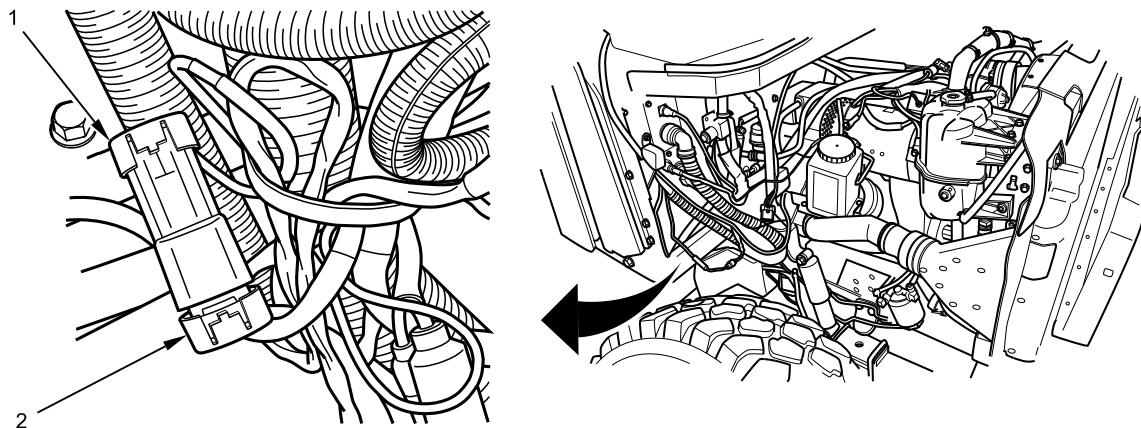
27. Connect PDC harness engine connector (Figure 26, Item 1) to engine harness connector (Figure 26, Item 7).
28. Connect PDC harness transmission connector (Figure 26, Item 2) to engine harness connector (Figure 26, Item 5).
29. Install new cable lock straps (Figure 26, Item 6) on harness assembly. Ensure harness is properly supported on vehicle.



B230604268

Figure 27. PDC Harness Breakout Cable Lock Strap Installation.

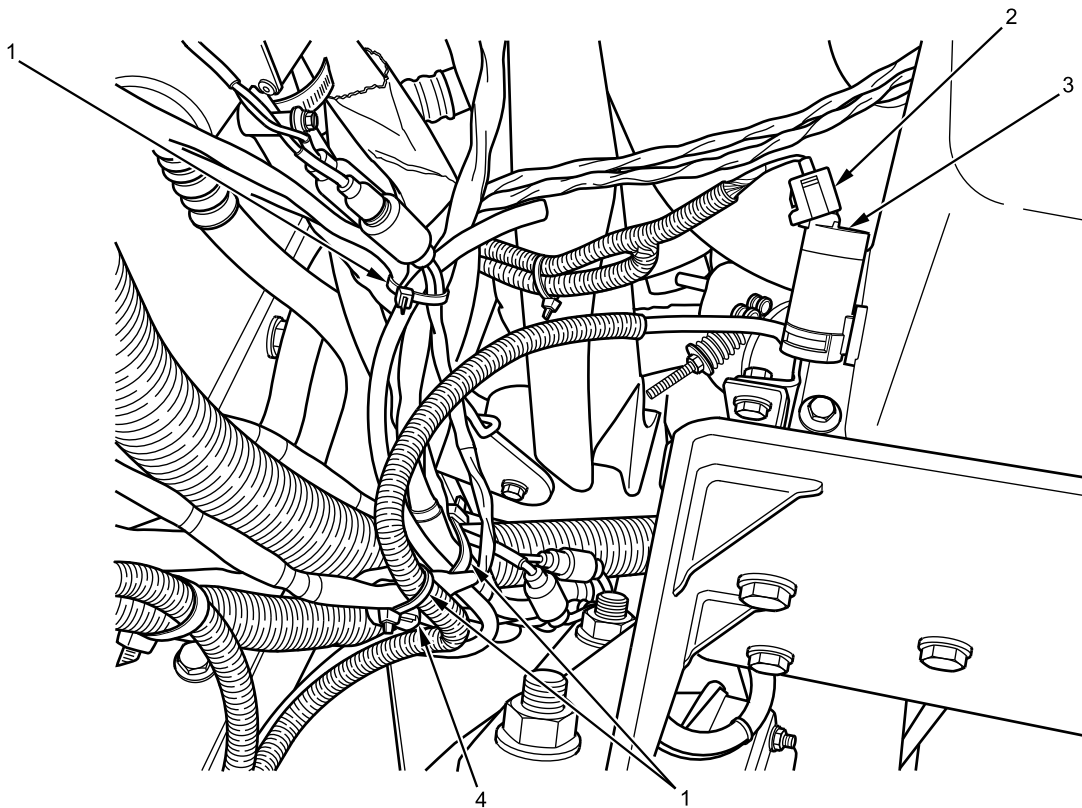
30. Install new cable lock straps (Figure 27, Item 3) on PDC harness breakout (Figure 27, Item 1) and FSS engine discharge pipe (Figure 27, Item 2).



B230604753

Figure 28. A/C Harness Connector Installation.

31. Connect PDC harness A/C idle speed request connector (Figure 28, Item 1) to HVAC control harness connector (Figure 28, Item 2).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604266

Figure 29. Washer Bottle Connector and A/C Harness Installation.

32. Connect PDC harness washer pump connector (Figure 29, Item 2) to washer pump (Figure 29, Item 3).
33. Install new cable lock straps (Figure 29, Item 1) on PDC harness (Figure 29, Item 4) to secure harness to bundle.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install PDC junction box (WP 0334).
2. Install air cleaner support bracket (WP 0258).
3. Connect batteries (WP 0404).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine. Ensure all systems function properly (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Install right and left inner wheel deflector armor plate (WP 0601).
9. Install left engine armor plate bracket (WP 0598).
10. Install left engine plate armor (WP 0597).
11. Install right engine armor plate bracket (WP 0600).
12. Install right engine armor plate (WP 0599).
13. Close hood (TM 9-2355-106-10).

POWER DISTRIBUTION CENTER (PDC) HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

14. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 40-200 lb-in., 3/8-inch drive
(WP 0795, Item 142)

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Cable lock strap (WP 0796, Item 120)
Cable lock strap - (11) (WP 0796, Item 134)
Cable lock strap - (4) (WP 0796, Item 136)
Lockwasher - (2) (WP 0796, Item 10)
Lockwasher - (2) (WP 0796, Item 9)
Lockwasher (WP 0796, Item 167)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Hood opened and secured (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)
Air cleaner removed (WP 0257)
Air cleaner support removed (WP 0258)
Left side engine armor plate removed (WP 0597)
Belly armor removed (WP 0606)
Starter motor assembly removed (WP 0292)
Engine cover removed (WP 0649)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

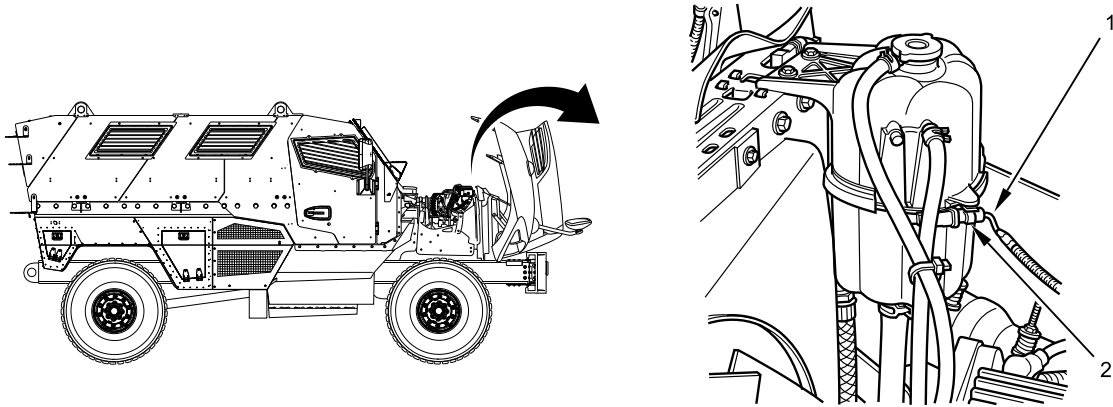
Tag all electrical connectors before removal. Note routing of harness to aid in assembly.

Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid installation.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

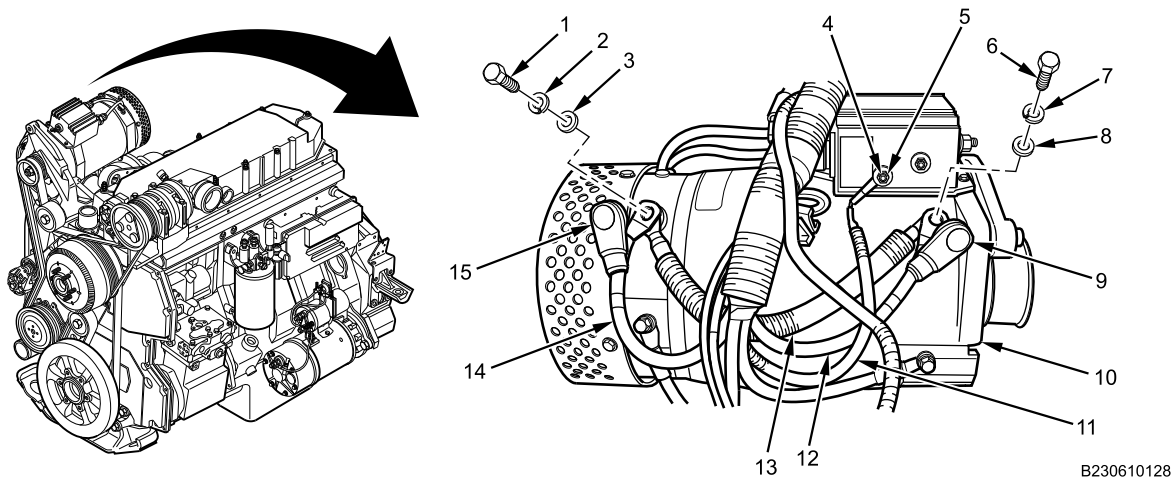
1. Disconnect engine wiring harness connector (Figure 1, Item 1) from deaeration tank low coolant sensor (Figure 1, Item 2).



B230605000

Figure 1. Deaeration Tank Low Coolant Sensor.

2. Slide insulator boots (Figure 2, Item 9 and 15) back on alternator positive cables (Figure 2, Item 12 and 14).



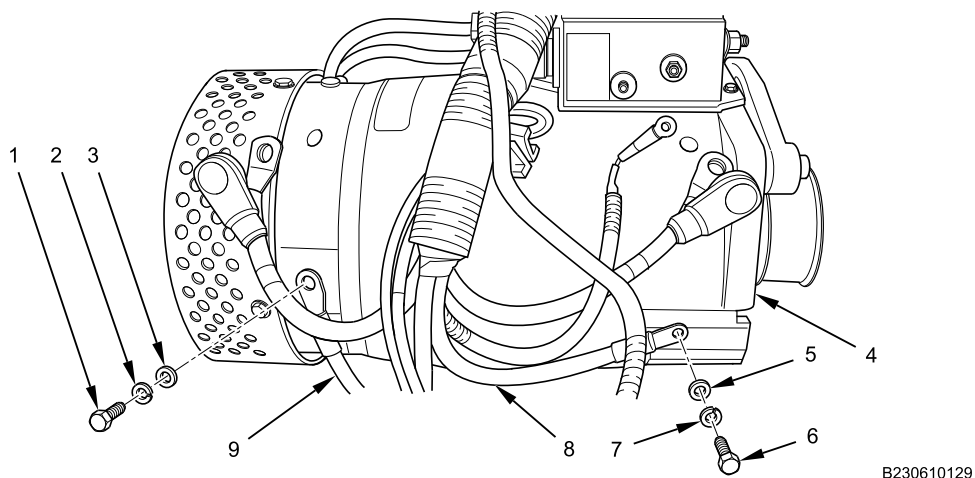
B230610128

Figure 2. Alternator and Regulator Positive Cable Connections.

3. Remove bolts (Figure 2, Item 1 and 6), lockwashers (Figure 2, Item 2 and 7), flat washers (Figure 2, Item 3 and 8), and positive cable connections (Figure 2, Item 12, 13 and 14) from alternator (Figure 2, Item 10). Discard lockwashers.
4. Remove nut (Figure 2, Item 5) and regulator harness connector (Figure 2, Item 11) from IGN terminal (Figure 2, Item 4) on regulator.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

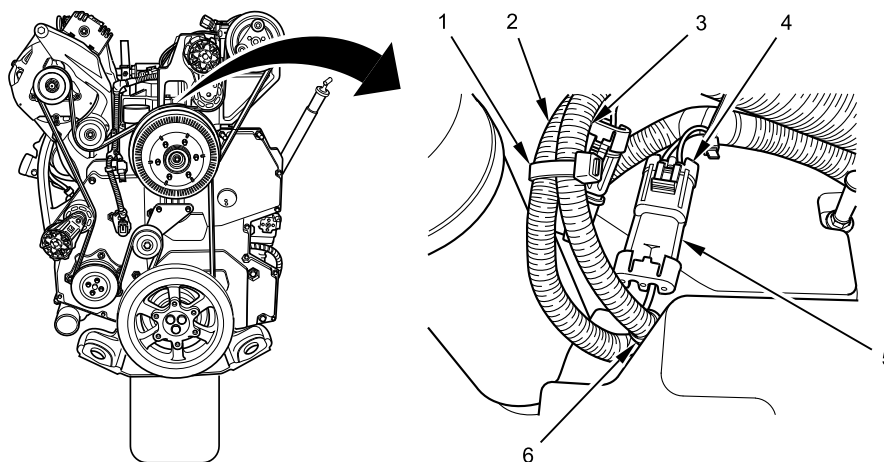
- Remove bolts (Figure 3, Item 1 and 6), lockwashers (Figure 3, Item 2 and 7), flat washers (Figure 3, Item 3 and 5), and negative cable connections (Figure 3, Item 8 and 9) from alternator (Figure 3, Item 4).



B230610129

Figure 3. Alternator Negative Cable Connections.

- Disconnect engine wiring harness connector (Figure 4, Item 5) from engine sensor harness connector (Figure 4, Item 4).



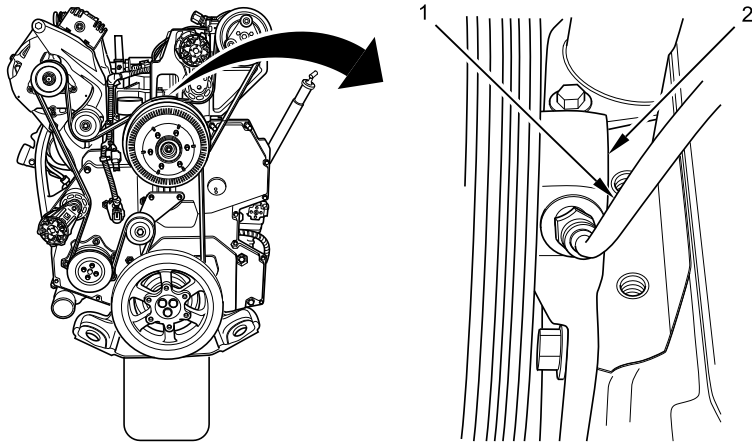
B230605001

Figure 4. Engine Wiring Harness-to-Engine Sensor Harness Connection.

- Remove cable lock straps (Figure 4, Item 1 and 6) from engine wiring harness (Figure 4, Item 2) and cooling fan solenoid hose harness (Figure 4, Item 3). Discard cable lock straps.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

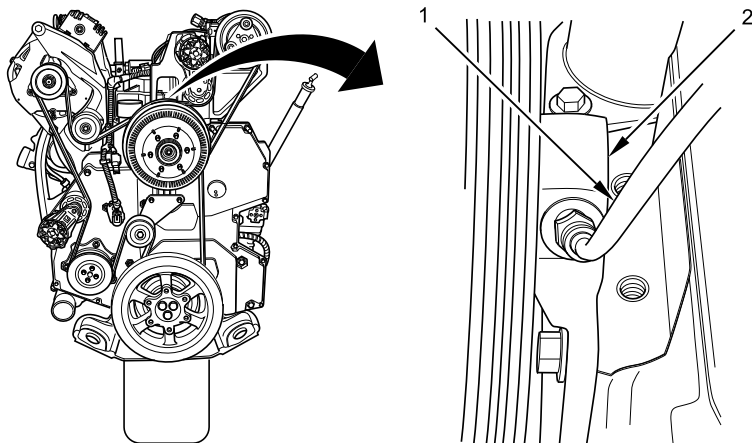
8. Remove air line (Figure 5, Item 1) from cooling fan drive clutch (Figure 5, Item 2) by pushing air line into fitting, pushing in collar, and pulling hose from fitting.



B230605002

Figure 5. Fan Drive Clutch Air Line Removal.

9. Remove exhaust brake solenoid nut (Figure 6, Item 5) and engine wiring harness ground wire (Figure 6, Item 4) from exhaust brake solenoid mounting bracket stud (Figure 6, Item 1).



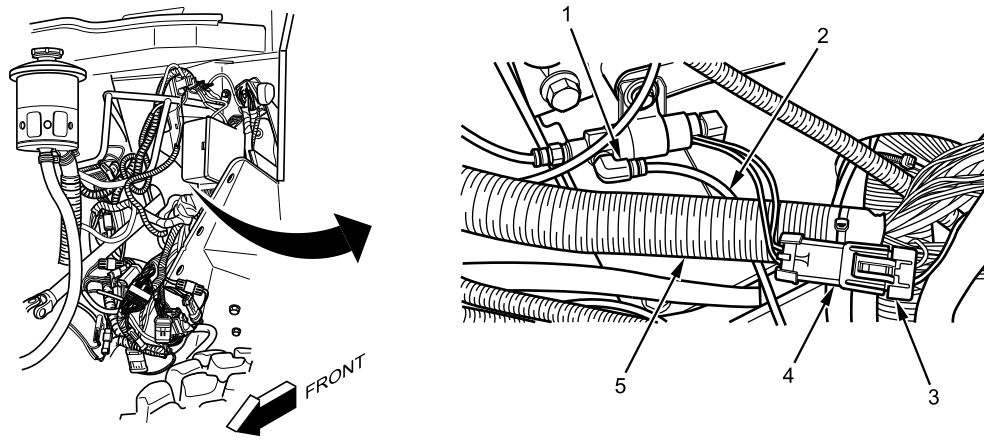
B230605002

Figure 6. Exhaust Brake Solenoid.

10. Disconnect engine wiring harness connector (Figure 6, Item 3) from exhaust brake solenoid harness connector (Figure 6, Item 2).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

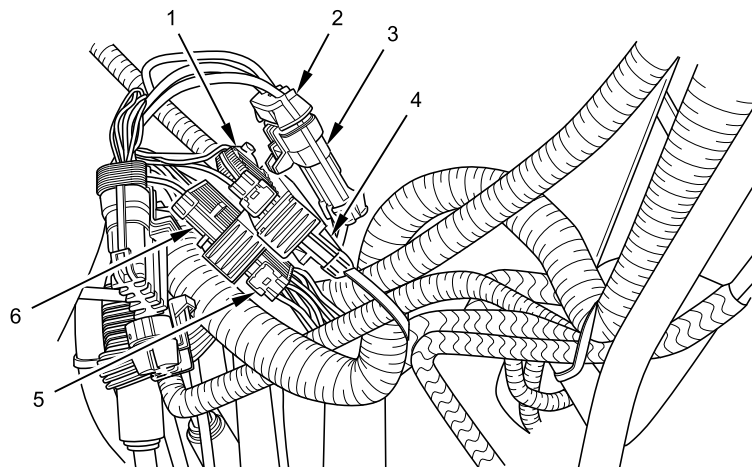
11. Disconnect cooling fan solenoid air line (Figure 7, Item 2) from cooling fan solenoid (Figure 7, Item 1) by pushing air line into fitting, pushing in collar, and pulling hose from fitting.



B230610131

Figure 7. Cooling Fan Solenoid.

12. Disconnect engine wiring harness connector (Figure 7, Item 3) on engine wiring harness (Figure 7, Item 5) from cooling fan solenoid harness connector (Figure 7, Item 4).
13. Disconnect starter Engine Control Module/Computer Electronic Control (ECM/CEC) power connector (Figure 8, Item 2) from engine wiring harness connector (Figure 8, Item 3).



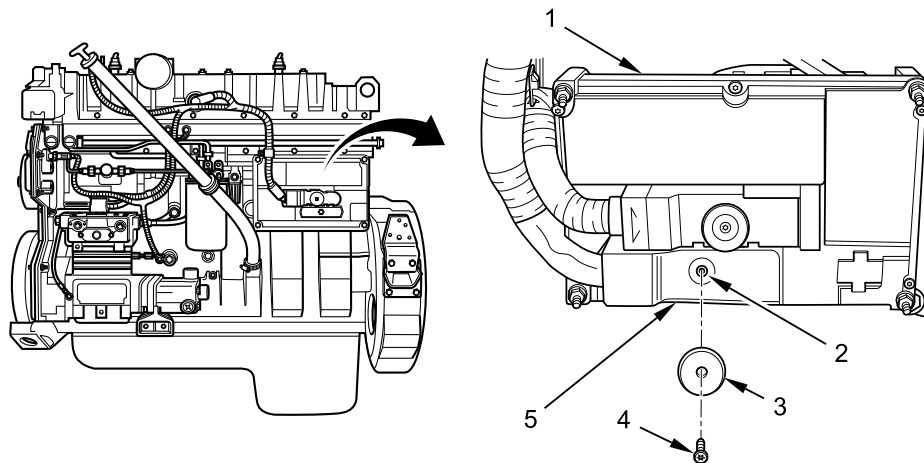
B230610132

Figure 8. Dash and Vehicle Interface Connectors.

14. Disconnect transmission/dash connector (Figure 8, Item 1) from engine wiring harness connector (Figure 8, Item 4).
15. Disconnect dash connector (Figure 8, Item 6) from engine wiring harness connector (Figure 8, Item 5).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

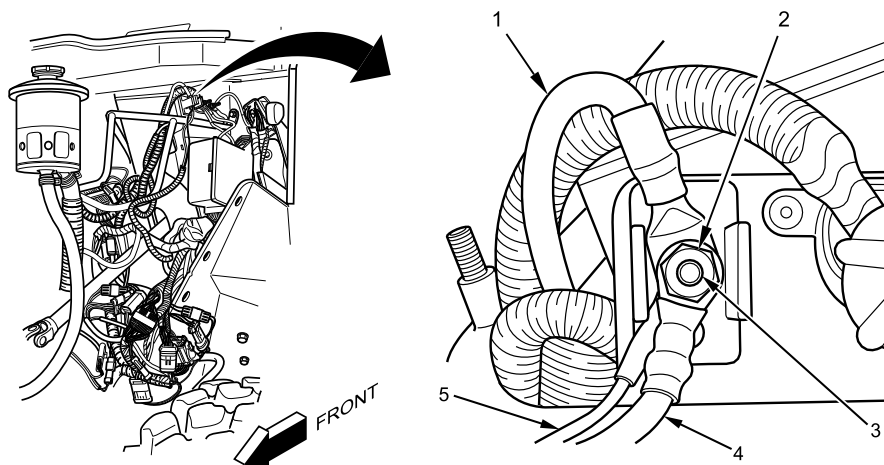
16. Remove screw (Figure 9, Item 4) and cover (Figure 9, Item 3) from engine wiring harness connector (Figure 9, Item 5).



B230603721

Figure 9. ECM/CEC Connector Cover.

17. Remove retaining bolt (Figure 9, Item 2) from engine wiring harness connector (Figure 9, Item 5) and ECM/CEC (Figure 9, Item 1).
18. Disconnect engine wiring harness connector (Figure 9, Item 5) from ECM/CEC (Figure 9, Item 1).
19. Remove underhood junction block nut (Figure 10, Item 2) from underhood junction block stud (Figure 10, Item 3).



B230610133

Figure 10. 24V Underhood Junction Block.

20. Remove engine wiring harness cable (Figure 10, Item 1), underhood junction block electrical harness cable (Figure 10, Item 4), and underhood junction block electrical harness wire connectors (Figure 10, Item 5) from underhood junction block stud (Figure 10, Item 3).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

21. Remove nut (Figure 11, Item 2), engine wiring harness ground cable (Figure 11, Item 3), and cabin harness ground wires (Figure 11, Item 1 and 5), from cabin exterior ground stud (Figure 11, Item 4).

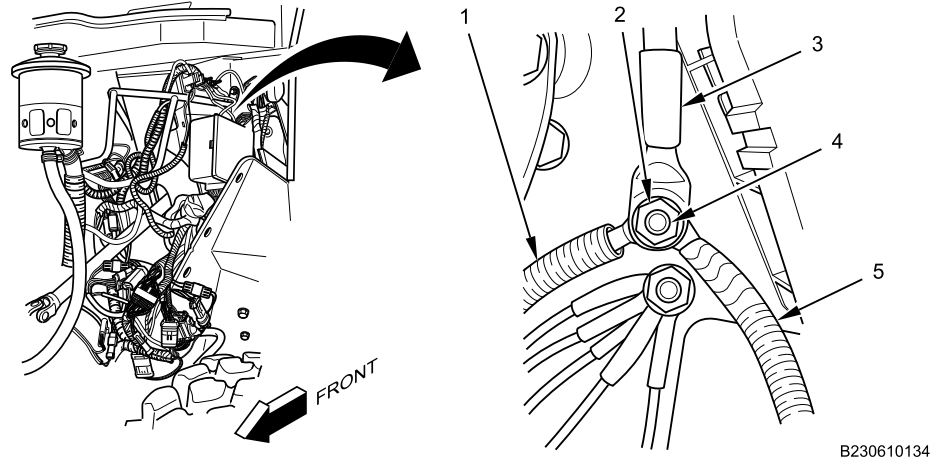


Figure 11. Cabin Electrical Ground Plate Stud.

22. Disconnect engine wiring harness connector (Figure 12, Item 1) from ECM/CEC clean power and ground harness connector (Figure 12, Item 2).

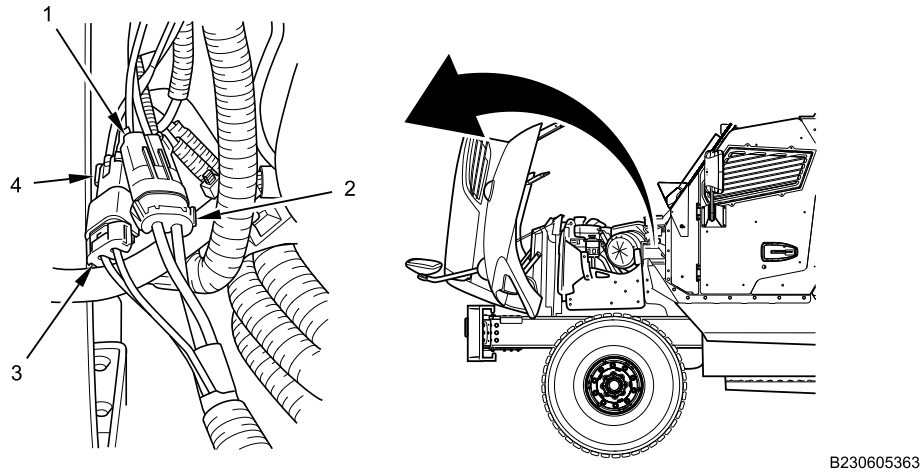


Figure 12. Clean Battery Feed and ECM/CEC Clean Power and Ground.

23. Disconnect engine wiring harness connector (Figure 12, Item 4) from clean battery feed connector (Figure 12, Item 3).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

24. Remove nut (Figure 8, Item 1), lockwasher (Figure 8, Item 6), engine wiring harness ground cable (Figure 8, Item 7) and engine wiring harness ground cables (Figure 8, Item 2, 3, 4, and 8) from engine block ground stud (Figure 8, Item 5). Discard lockwasher (Figure 8, Item 5).

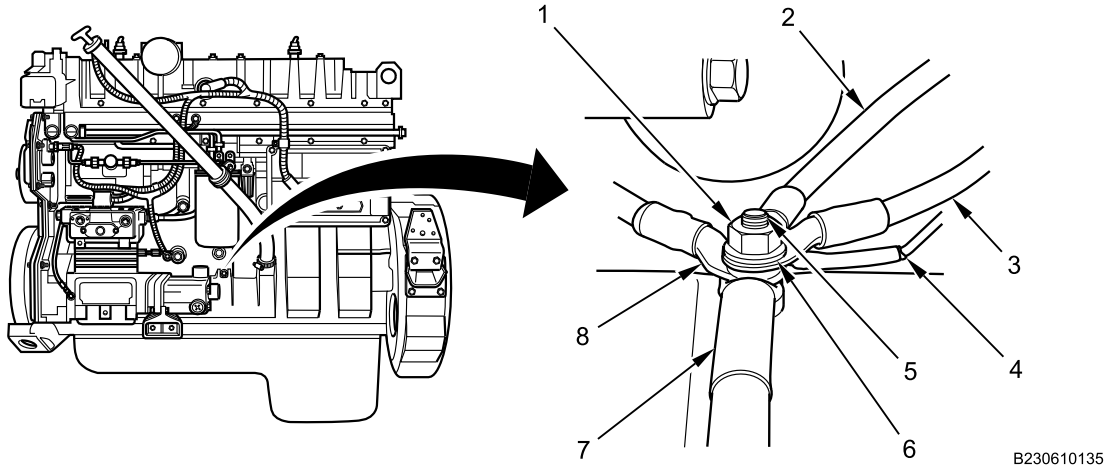


Figure 13. Engine Block Grounds.

25. Disconnect engine wiring harness connector (Figure 14, Item 1) from transfer case jumper harness connector (Figure 14, Item 3) at side of transmission (Figure 14, Item 2).

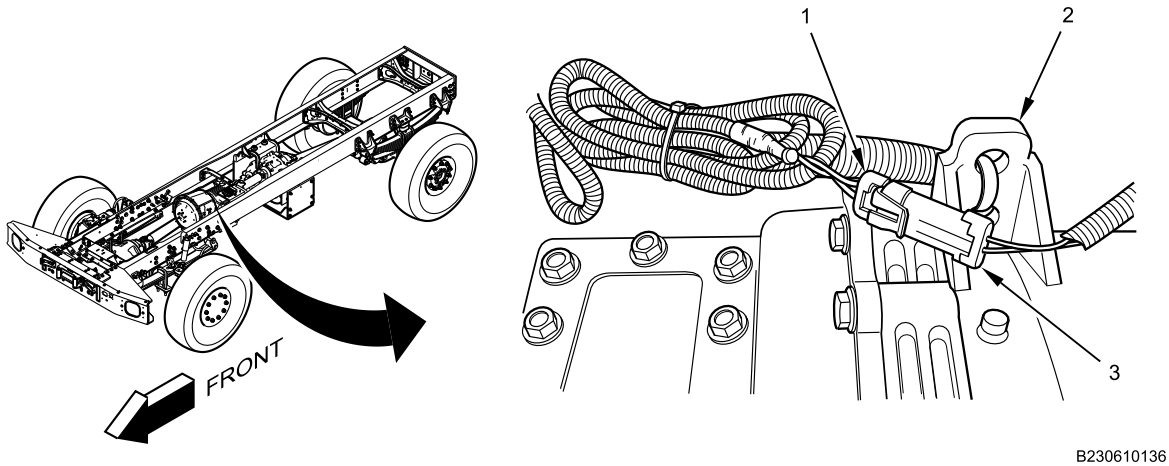
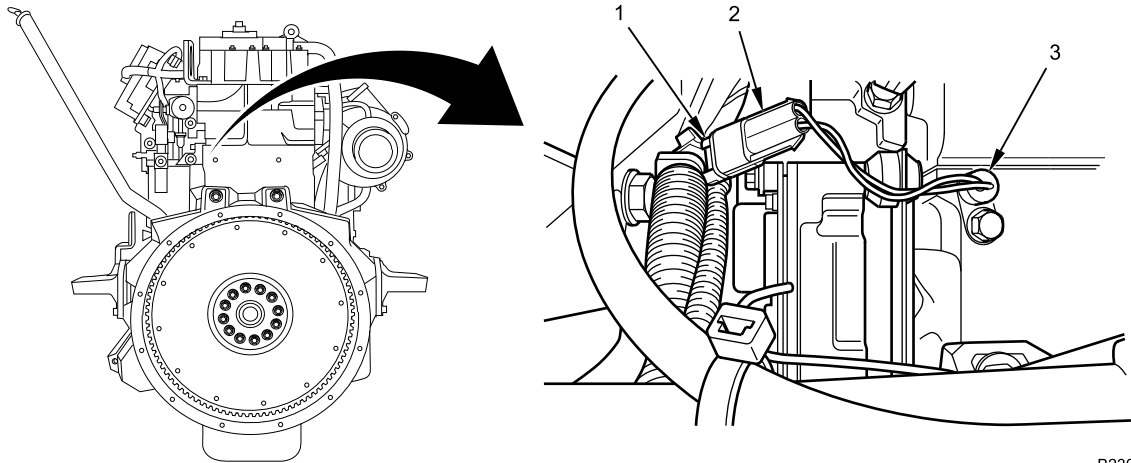


Figure 14. Transfer Case Jumper Harness.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

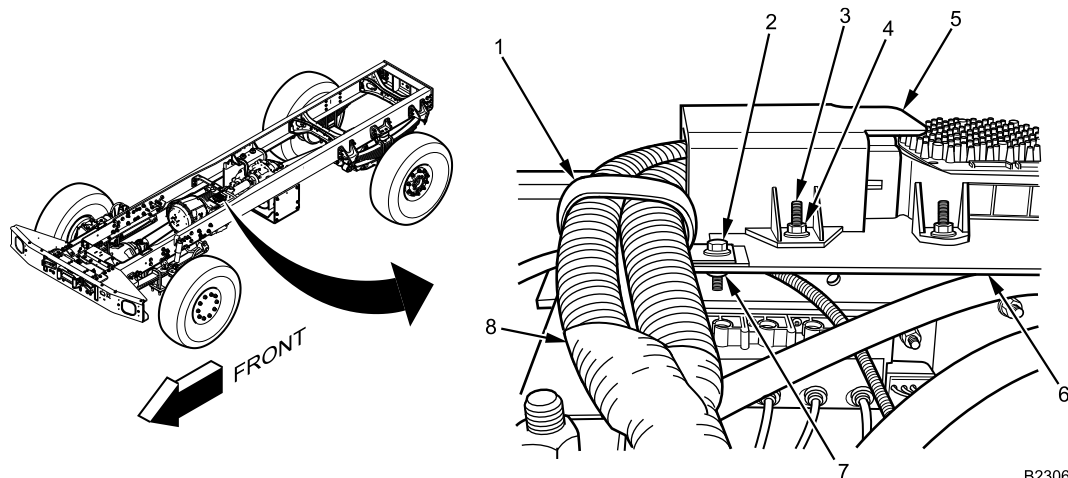
26. Working through engine access cover, disconnect engine wiring harness connector (Figure 15, Item 1) from ether start thermostat sensor harness connector (Figure 15, Item 2) on ether start thermostat sensor (Figure 15, Item 3).



B230605013

Figure 15. Ether Start Thermostat Sensor.

27. Remove bolt (Figure 16, Item 2), nut (Figure 16, Item 7), and clamp loop (Figure 16, Item 1), from TCM brace (Figure 16, Item 6).



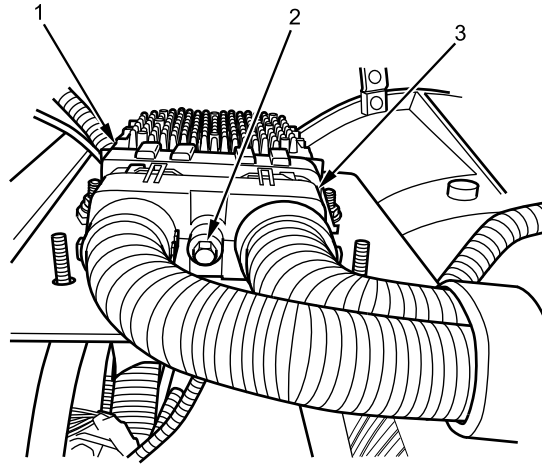
B230610137

Figure 16. Transmission Control Module (TCM) Cover.

28. Remove clamp loop (Figure 16, Item 1) from engine wiring harness (Figure 16, Item 8).
29. Remove two nuts (Figure 16, Item 4) and TCM cover (Figure 16, Item 5) from stud (Figure 16, Item 3) mounted to TCM brace (Figure 16, Item 6).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

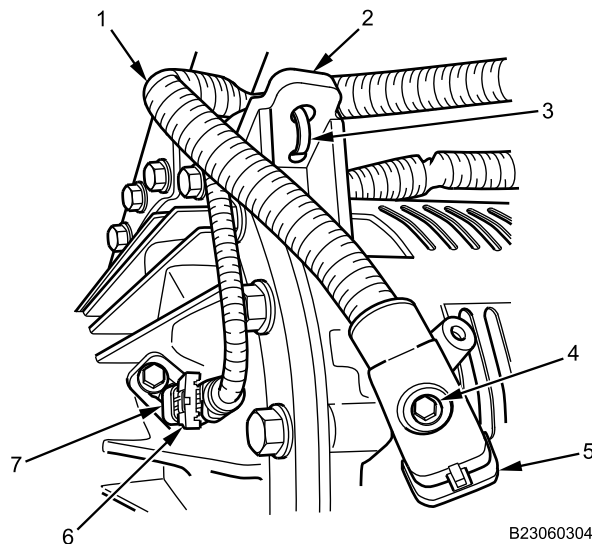
30. Remove engine wiring harness connector retaining bolt (Figure 17, Item 2), and harness connector (Figure 17, Item 3), from TCM (Figure 17, Item 1)



B230702467

Figure 17. TCM Harness Removal.

31. Remove cable lock strap (Figure 18, Item 3) from engine wiring harness (Figure 18, Item 1) and transmission (Figure 18, Item 2). Discard cable lock strap.



B230603049

Figure 18. Transmission Output Speed Sensor and Transmission Bulkhead Connector.

32. Remove transmission bulkhead connector retaining bolt (Figure 18, Item 4) and engine wiring harness transmission bulkhead connector (Figure 18, Item 5) from transmission (Figure 18, Item 2).
33. Disconnect engine wiring harness connector (Figure 18, Item 6) from transmission output speed sensor (Figure 18, Item 7).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

34. Remove cable lock strap (Figure 19, Item 4) from clip extension (Figure 19, Item 5) and engine wiring harness insulator (Figure 19, Item 1) on engine wiring harness. Discard cable lock strap.

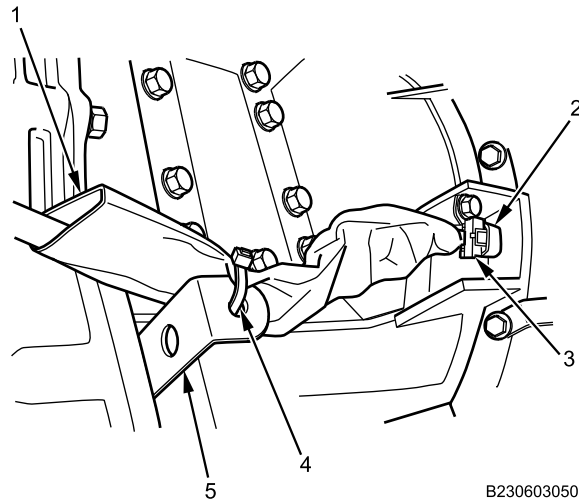


Figure 19. Transmission Input Speed Sensor.

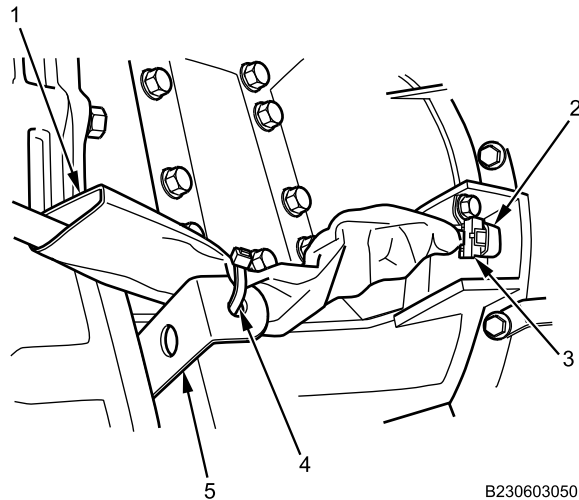
35. Disconnect engine wiring harness connector (Figure 19, Item 3) from transmission input speed sensor (Figure 19, Item 2).
36. Remove engine wiring harness from vehicle.

END OF TASK

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all engine harness connectors and cable ends.
2. Position engine wiring harness on vehicle.
3. Connect engine wiring harness connector (Figure 20, Item 3) to transmission input speed sensor (Figure 20, Item 2).



B230603050

Figure 20. Transmission Input Speed Sensor.

4. Install new cable lock strap (Figure 20, Item 4) on clip extension (Figure 20, Item 5) and install engine wiring harness insulator (Figure 20, Item 1) on engine wiring harness.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Connect engine wiring harness transmission bulkhead connector (Figure 21, Item 5) to transmission (Figure 21, Item 2) with bolt (Figure 21, Item 4). Torque bolt to 28 lb-in. (3.2 N•m).

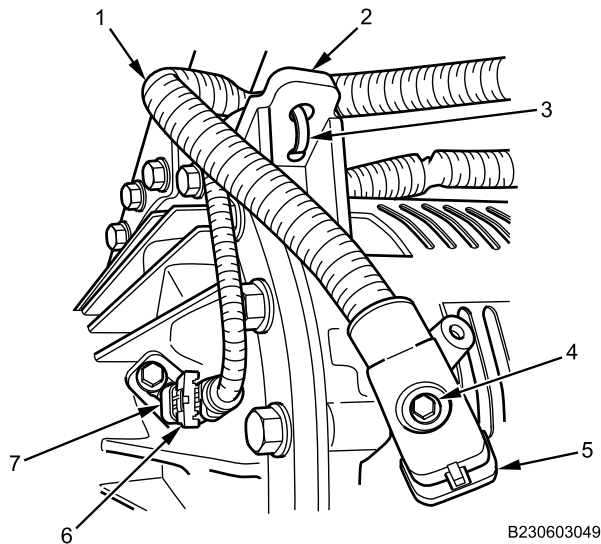


Figure 21. Transmission Output Speed Sensor and Transmission Bulkhead Connector.

6. Connect engine wiring harness connector (Figure 21, Item 6) to transmission output speed sensor (Figure 21, Item 7).
7. Install new cable lock strap (Figure 21, Item 3) to secure engine wiring harness (Figure 21, Item 1) to transmission (Figure 21, Item 2).
8. Connect engine wiring harness connector (Figure 22, Item 3) to TCM (Figure 22, Item 1) with bolt (Figure 22, Item 2). Torque bolt to 28 lb-in. (3.2 N•m).

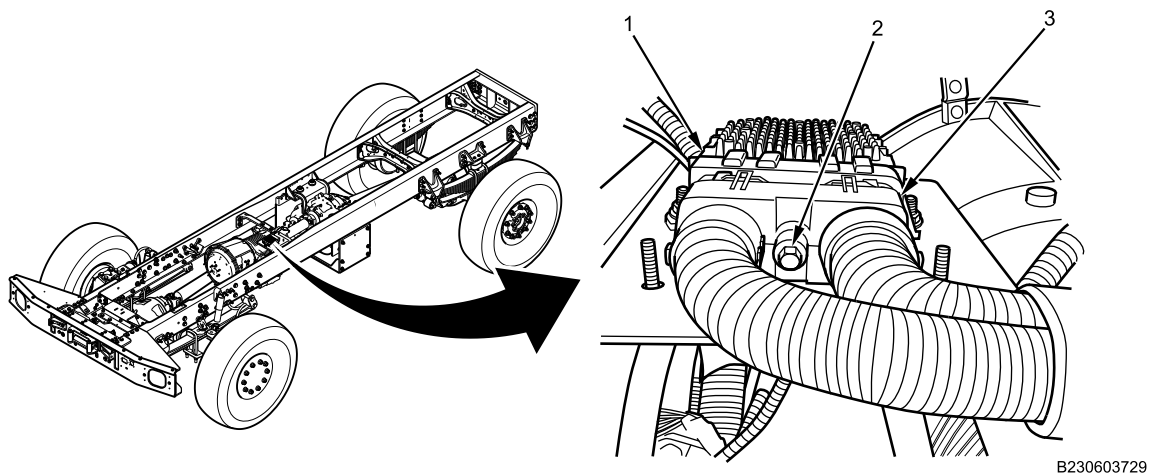


Figure 22. TCM Harness.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

WARNING

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

9. Apply corrosion preventive compound to bolt (Figure 23, Item 2) and nuts (Figure 23, Item 4 and 7).

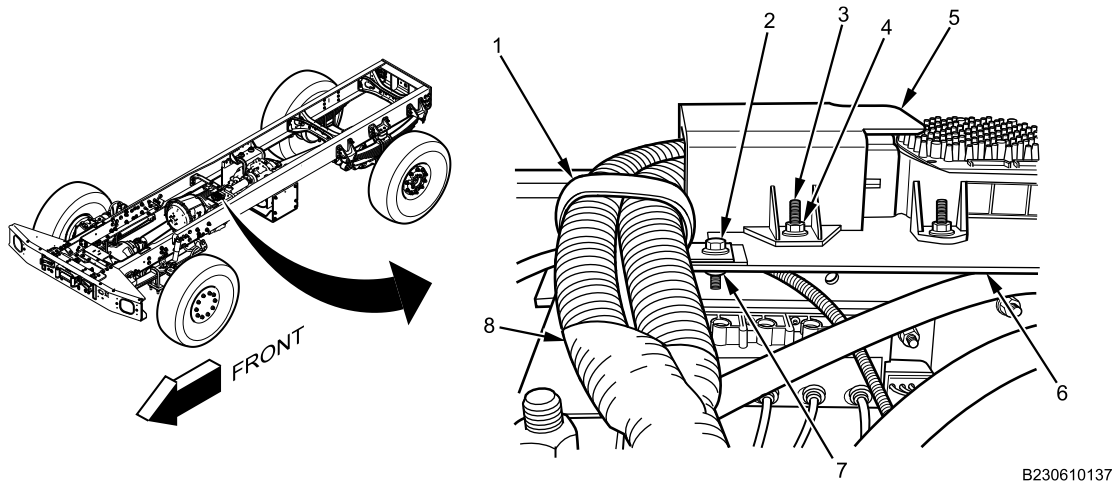
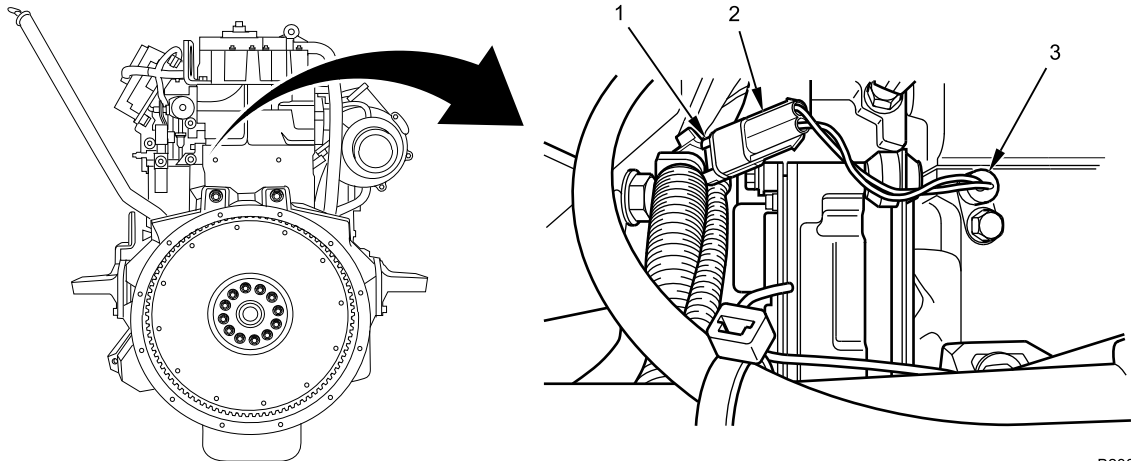


Figure 23. TCM Cover.

10. Install clamp loop (Figure 23, Item 1) on engine wiring harness (Figure 23, Item 8).
11. Install bolt (Figure 23, Item 2), nut (Figure 23, Item 7), and clamp loop (Figure 23, Item 1) on TCM brace (Figure 23, Item 5). Tighten nut securely.
12. Install TCM cover (Figure 23, Item 5) on studs (Figure 23, Item 3) mounted to TCM brace (Figure 23, Item 6) with two nuts (Figure 23, Item 4). Tighten nuts securely.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

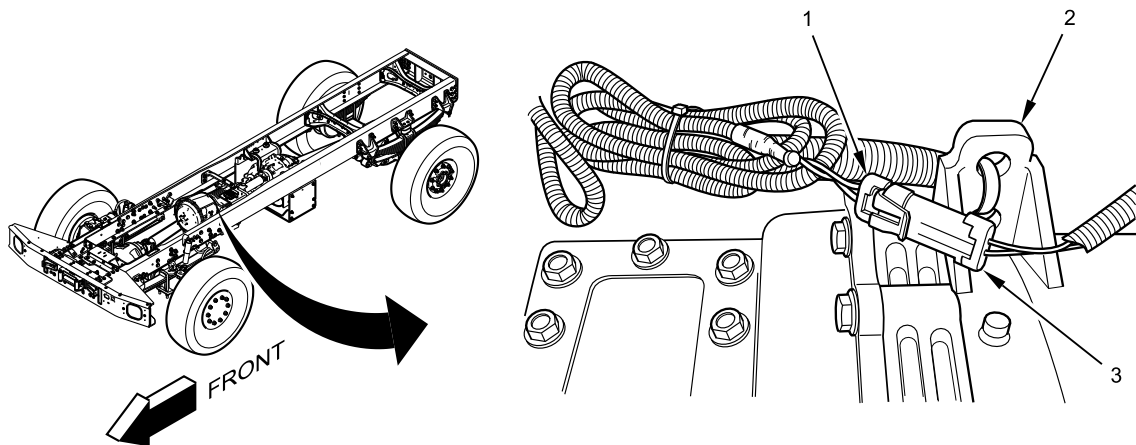
13. Working through engine access cover, connect engine wiring harness connector (Figure 24, Item 1) to ether start thermostat sensor harness connector (Figure 24, Item 2) on ether start thermostat sensor (Figure 24, Item 3).



B230605013

Figure 24. Ether Start Thermostat Sensor.

14. Connect engine wiring harness connector (Figure 25, Item 1) to transfer case jumper harness connector (Figure 25, Item 3) on left side of transmission (Figure 25, Item 2).



B230610136

Figure 25. Transfer Case Jumper Harness.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

15. Install starter ground cable (Figure 26, Item 7) and engine wiring harness ground cables (Figure 26, Item 2, 3, 4, and 8) on engine block ground stud (Figure 26, Item 6) with new lockwasher (Figure 26, Item 5) and nut (Figure 26, Item 1). Tighten nut securely.

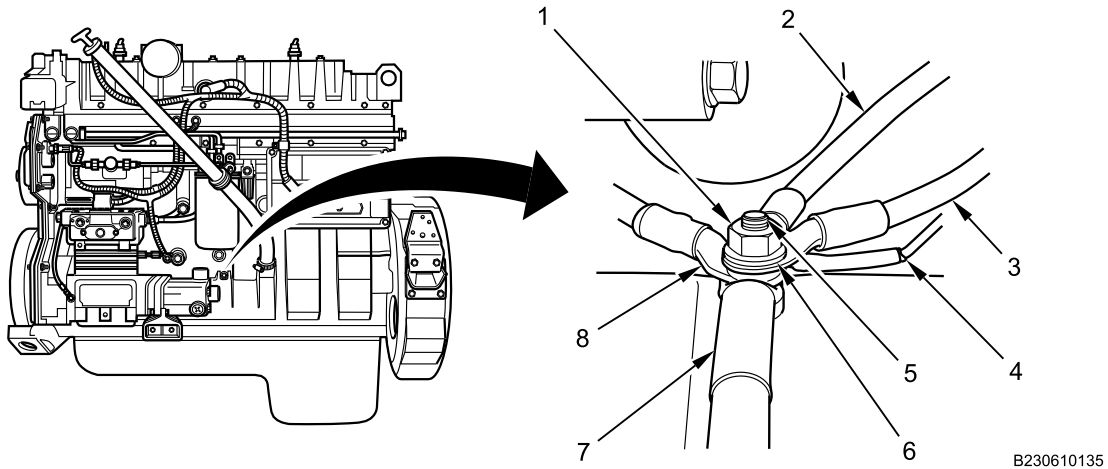


Figure 26. Engine Block Grounds.

16. Connect engine wiring harness connector (Figure 27, Item 1) to ECM/CEC clean power and ground harness connector (Figure 27, Item 2).

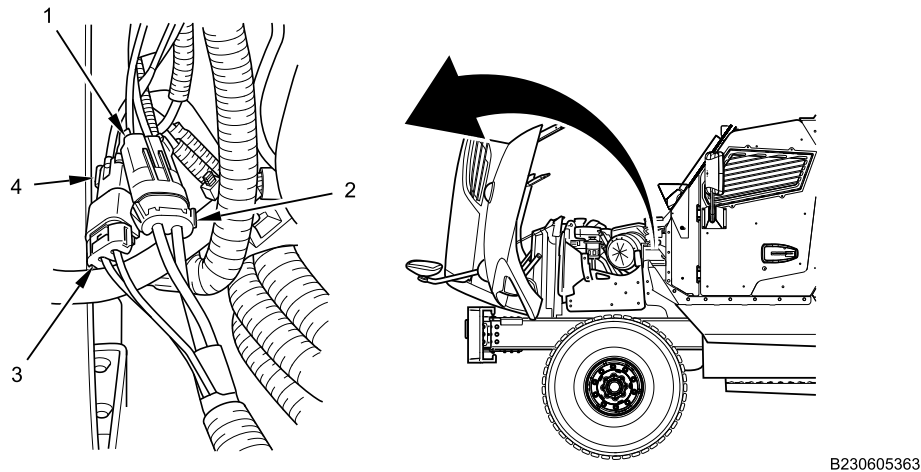


Figure 27. Clean Battery Feed and ECM/CEC Clean Power and Ground.

17. Connect engine wiring harness connector (Figure 27, Item 4) to clean battery feed connector (Figure 27, Item 3).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

18. Install engine wiring harness cable (Figure 28, Item 3) and cabin harness ground cables (Figure 28, Item 1 and 5) on cabin ground plate stud (Figure 28, Item 4) with nut (Figure 28, Item 2). Tighten nut securely.

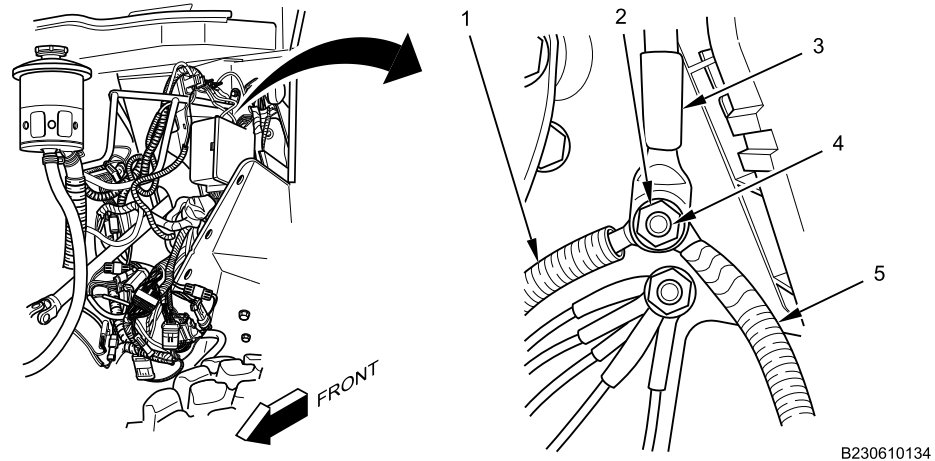


Figure 28. Cabin Electrical Ground Plate Stud.

19. Install engine wiring harness cable (Figure 29, Item 1), underhood junction block electrical harness cable (Figure 29, Item 4), and underhood junction block electrical harness wire (Figure 29, Item 5) connectors on underhood junction block stud (Figure 29, Item 3) with nut (Figure 29, Item 2). Torque nut to 155-190 lb-in. (18-22 N•m).

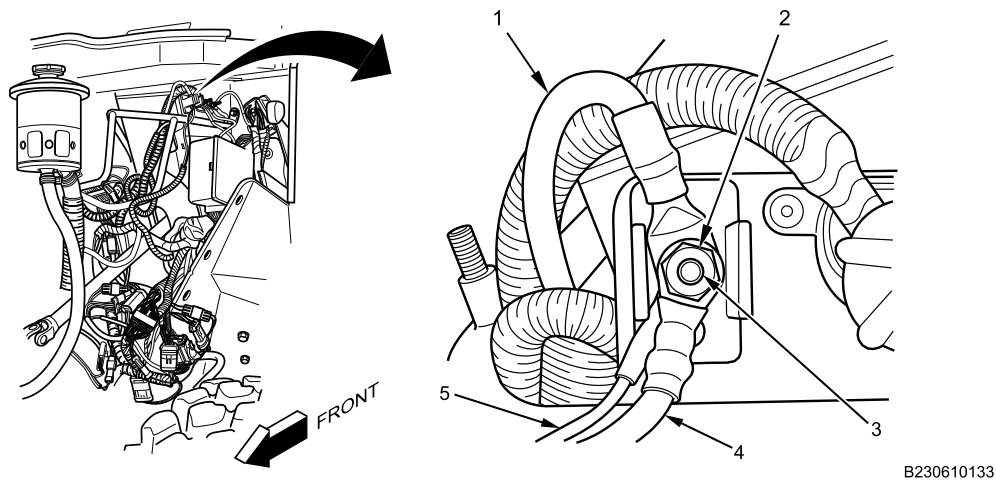
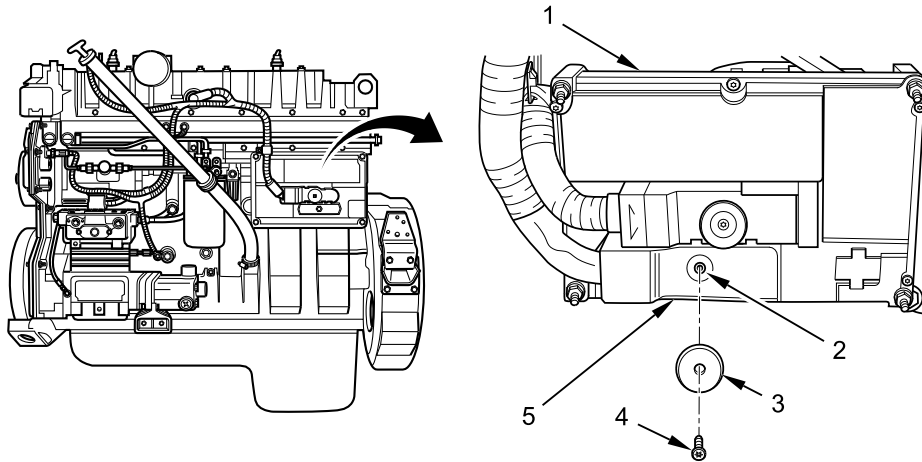


Figure 29. 24V Underhood Junction Block.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

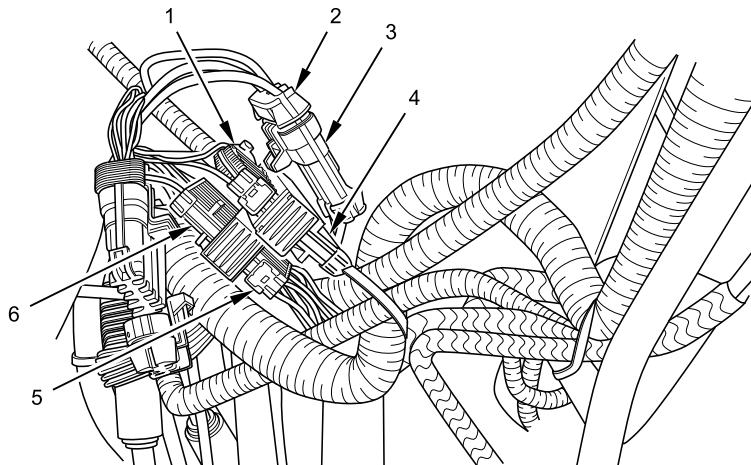
20. Connect engine wiring harness connector (Figure 30, Item 5) to ECM/CEC (Figure 30, Item 1) with bolt (Figure 30, Item 2). Torque bolt to 50 lb-in (6 N•m).



B230603721

Figure 30. ECM/CEC Connector.

21. Install cover (Figure 30, Item 3) and screw (Figure 30, Item 4) on engine wiring harness connector (Figure 30, Item 5). Tighten screw securely.
22. Connect starter ECM/CEC power/dash connector (Figure 31, Item 2) to engine wiring harness connector (Figure 31, Item 3).



B230610132

Figure 31. Dash and Vehicle Interface Connectors.

23. Connect transmission/dash connector (Figure 31, Item 1) to engine wiring harness connector (Figure 31, Item 4).
24. Connect dash connector (Figure 31, Item 6) to engine wiring harness connector (Figure 31, Item 5).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

25. Connect engine wiring harness connector (Figure 32, Item 3) on engine wiring harness (Figure 32, Item 5) to cooling fan solenoid harness connector (Figure 32, Item 4).

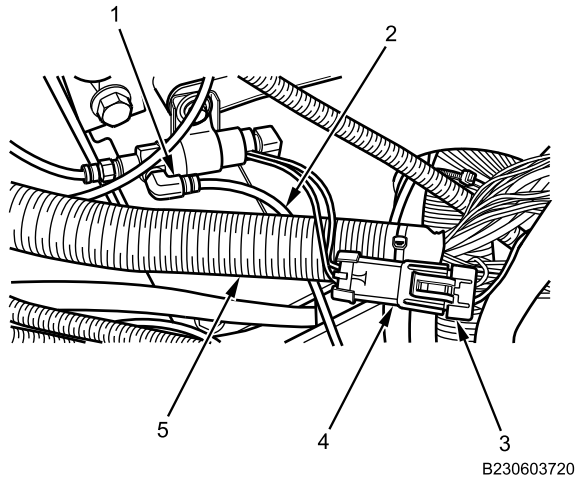


Figure 32. Cooling Fan Solenoid.

26. Connect cooling fan solenoid air hose (Figure 32, Item 2) to cooling fan solenoid (Figure 32, Item 1).
 27. Connect engine wiring harness connector (Figure 33, Item 3) to exhaust brake solenoid harness connector (Figure 33, Item 2).

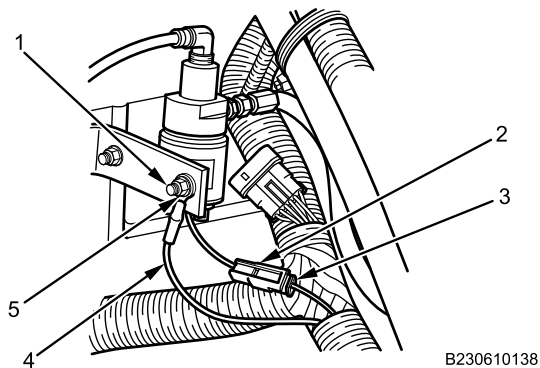


Figure 33. Exhaust Brake Solenoid.

28. Install engine wiring harness ground wire (Figure 33, Item 4) on exhaust brake solenoid mounting bracket stud (Figure 33, Item 1) with nut (Figure 33, Item 5). Tighten nut securely.

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

29. Install air line (Figure 34, Item 1) on cooling fan drive clutch (Figure 34, Item 2).

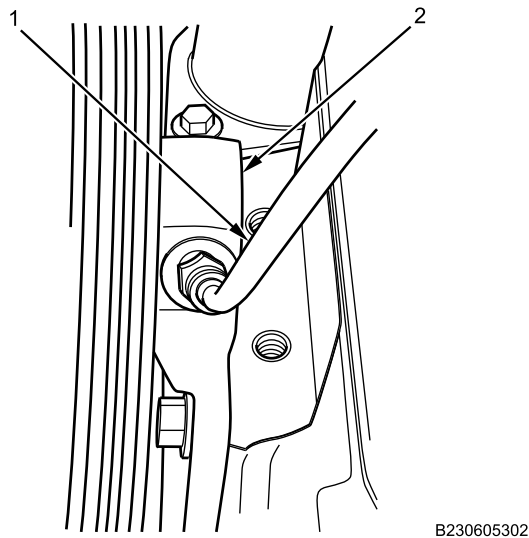


Figure 34. Fan Drive Clutch Air Line Installation.

30. Connect engine sensor harness connector (Figure 35, Item 4) to engine wiring harness connector (Figure 35, Item 5).

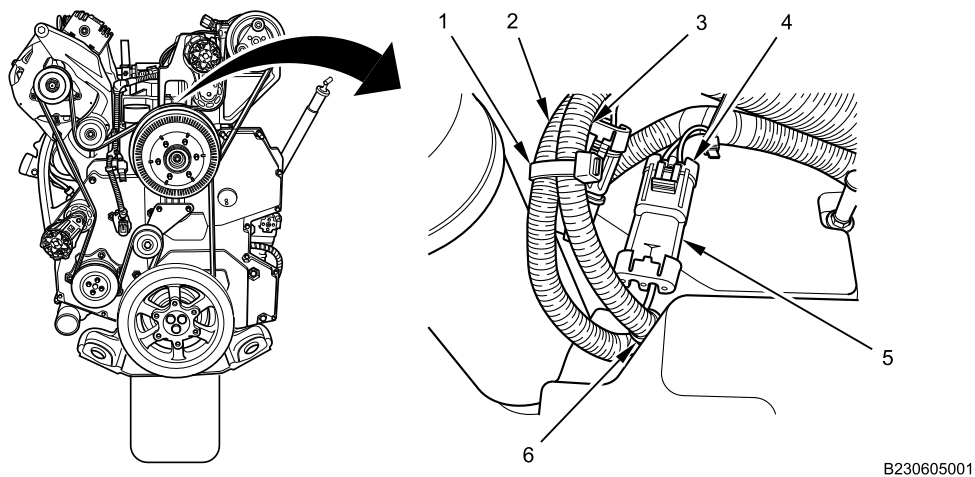
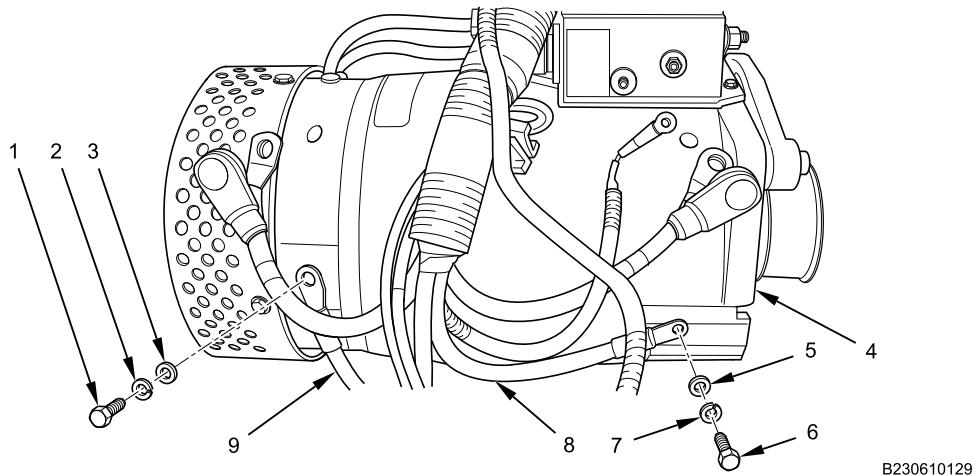


Figure 35. Engine Wiring Harness-to-Engine Sensor Harness Connection.

31. Install new cable lock straps (Figure 35, Item 1 and 6) on engine wiring harness (Figure 35, Item 2) and cooling fan solenoid hose harness (Figure 35, Item 3).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

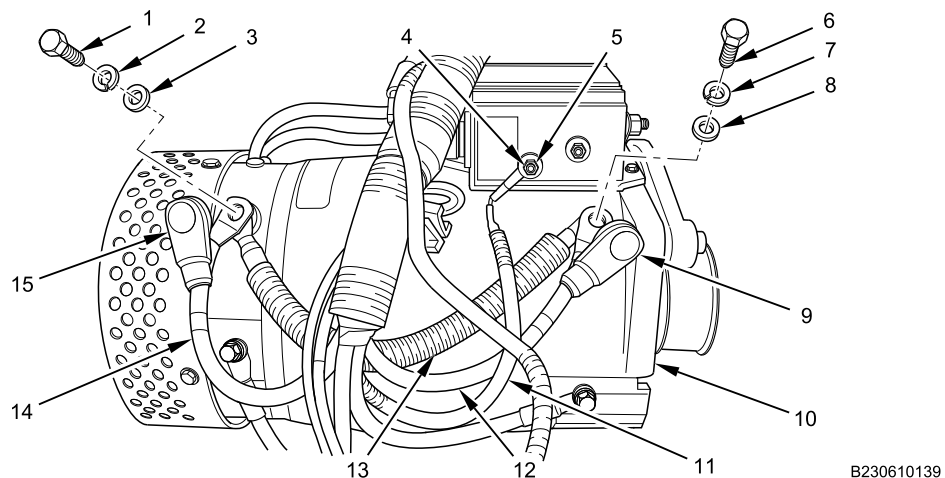
32. Install ground cable (Figure 36, Item 9) on alternator (Figure 36, Item 4) with flat washer (Figure 36, Item 3), new lockwasher (Figure 36, Item 2), and bolt (Figure 36, Item 1). Torque bolt to 80 lb-in. (9 N•m).



B230610129

Figure 36. Alternator Negative Cable Connections.

33. Install ground cable (Figure 36, Item 8) on alternator (Figure 36, Item 4) with flat washer (Figure 36, Item 5), new lockwasher (Figure 36, Item 7), and bolt (Figure 36, Item 6). Torque bolt to 80 lb-in. (9 N•m).
34. Install positive cable (Figure 37, Item 14) and alternator interconnect cable (Figure 37, Item 13) on alternator (Figure 37, Item 10) with flat washer (Figure 37, Item 3), new lockwasher (Figure 37, Item 2), and bolt (Figure 37, Item 1). Torque bolt to 177 lb-in. (20 N•m).



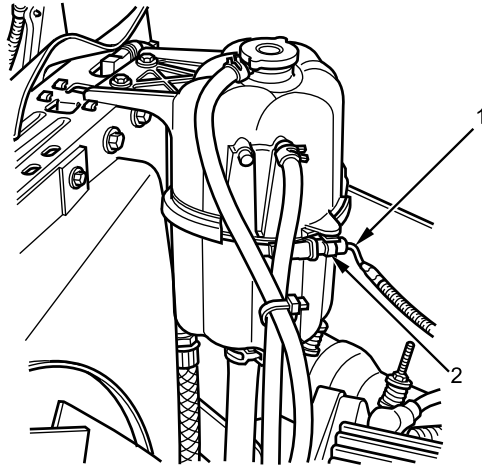
B230610139

Figure 37. Alternator and Regulator Positive Cable Connections.

35. Install positive cable (Figure 37, Item 11) and alternator interconnect cable (Figure 37, Item 13) on alternator (Figure 37, Item 10) with flat washer (Figure 37, Item 8), new lockwasher (Figure 37, Item 7), and bolt (Figure 37, Item 6). Torque bolt to 177 lb-in. (20 N•m).
36. Install regulator harness connector (Figure 37, Item 11) on IGN terminal (Figure 37, Item 4) of regulator with nut (Figure 37, Item 5). Tighten nut securely.
37. Slide insulator boots (Figure 37, Item 9 and 15) over positive cable ends (Figure 37, Item 12 and 14).

ENGINE WIRING HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

38. Connect engine wiring harness connector (Figure 38, Item 1) to deaeration tank low coolant sensor (Figure 38, Item 2).



B230603716

Figure 38. Deaeration Tank Low Coolant Sensor.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install engine cover (WP 0649).
2. Install starter motor assembly (WP 0292).
3. Install air cleaner support (WP 0258).
4. Install air cleaner (WP 0257).
5. Connect battery cables (WP 0404).
6. Close engine hood (TM 9-2355-106-10).
7. Turn MAIN POWER switch on (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).
9. Test-drive vehicle to verify electrical operation of all circuits.
10. Set vehicle parking brake (TM 9-2355-106-10).
11. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
12. Turn engine off (TM 9-2355-106-10).
13. Turn MAIN POWER switch off (TM 9-2355-106-10).
14. Chock wheels (TM 9-2355-106-10).
15. Install belly armor (WP 0606).
16. Install left side engine armor plate (WP 0597).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ENGINE WIRING HARNESS TERMINATING RESISTOR REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

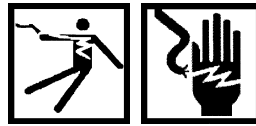
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Belly armor removed (WP 0606)

Materials/Parts

Grease (WP 0794, Item 22)

References

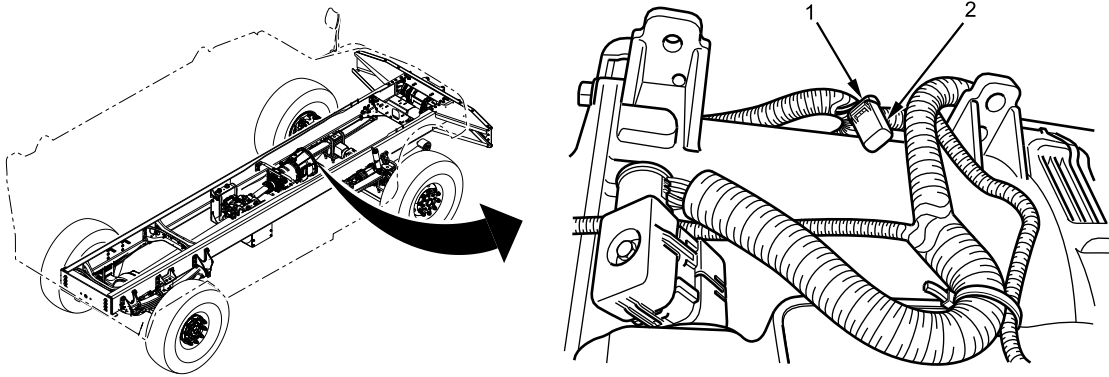
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ENGINE WIRING HARNESS TERMINATING RESISTOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect engine wiring harness terminating resistor (Figure 1, Item 2) from engine wiring harness (Figure 1, Item 1).



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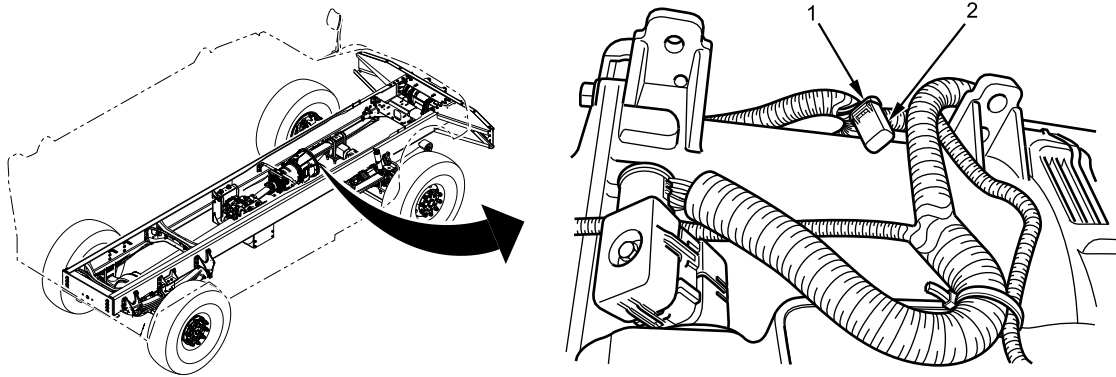
Figure 1. Engine Wiring Harness Terminating Resistor Removal.

END OF TASK

ENGINE WIRING HARNESS TERMINATING RESISTOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to engine harness connector.



B230610127

Figure 2. Engine Wiring Harness Terminating Resistor Installation.

2. Connect engine wiring harness terminating resistor (Figure 2, Item 2) on engine wiring harness (Figure 2, Item 1).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine, run to operating temperature (TM 9-2355-106-10).
3. Check instrument panel cluster to ensure no warning lamps are illuminated (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Install belly armor (WP 0606).
7. Remove wheel chocks (TM-9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
STARTER MOTOR-TO-ENGINE GROUND JUMPER CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Lockwasher (WP 0796, Item 22)
Lockwasher (WP 0796, Item 167)

Equipment Condition

Vehicle parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Belly armor removed (WP 0606)

References

TM 9-2355-106-10
TM 9-2355-106-23P

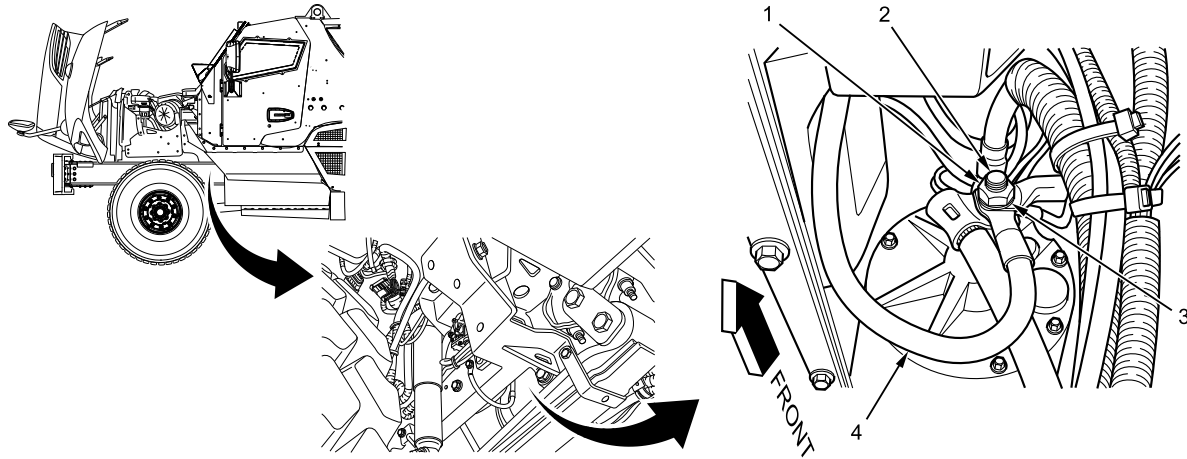
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

STARTER MOTOR-TO-ENGINE GROUND JUMPER CABLE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

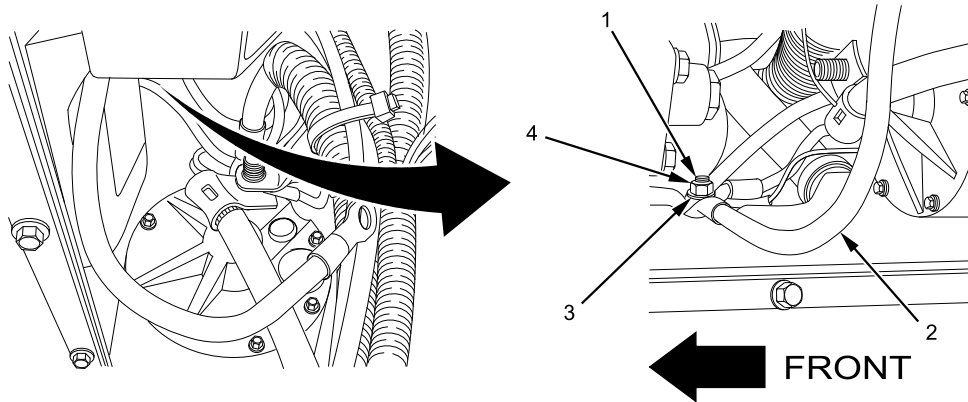
1. Remove nut (Figure 1, Item 1), lockwasher (Figure 1, Item 3), and starter motor-to-engine ground jumper cable (Figure 1, Item 4) from starter motor ground stud (Figure 1, Item 2). Discard lockwasher.



B230610021

Figure 1. Starter Motor-to-Engine Ground Jumper Cable.

2. Remove nut (Figure 2, Item 4), lockwasher (Figure 2, Item 3) and starter motor-to-engine ground jumper cable (Figure 2, Item 2) from engine block ground stud (Figure 2, Item 1). Discard lockwasher.



B230610022

Figure 2. Starter Motor-to-Engine Ground Jumper Cable.

END OF TASK

STARTER MOTOR-TO-ENGINE GROUND JUMPER CABLE REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to engine block ground stud (Figure 3, Item 1).

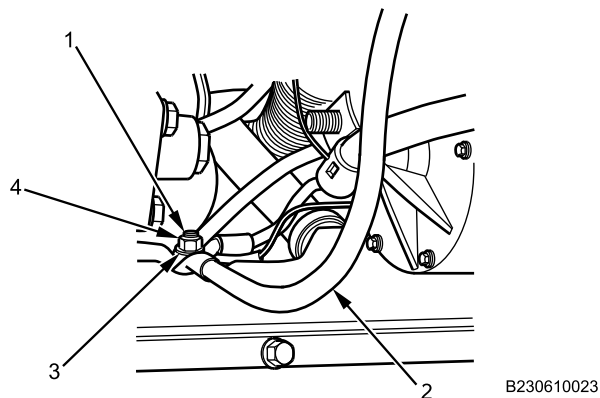


Figure 3. Starter Motor-to-Engine Ground Jumper Cable.

2. Install starter motor-to-engine ground jumper cable (Figure 3, Item 2) on engine block ground stud (Figure 3, Item 1).
3. Loosely install new lockwasher (Figure 3, Item 3) and nut (Figure 3, Item 4) on engine block ground stud (Figure 3, Item 1).

STARTER MOTOR-TO-ENGINE GROUND JUMPER CABLE REMOVAL AND INSTALLATION - (CONTINUED)

4. Apply dielectric grease to starter motor ground stud (Figure 4, Item 2).

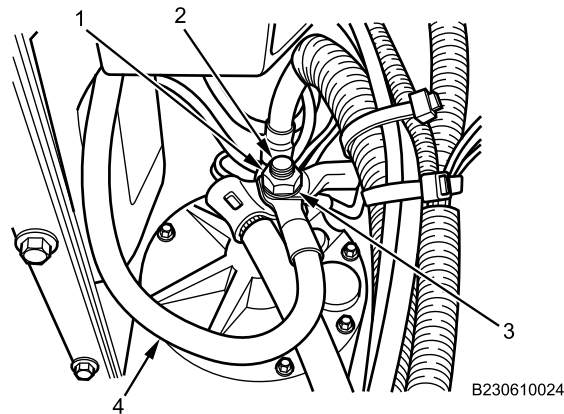


Figure 4. Starter Motor-to-Engine Ground Jumper Cable.

5. Install starter motor-to-engine ground jumper cable (Figure 4, Item 4) on starter motor ground stud (Figure 4, Item 2).
6. Loosely install new lockwasher (Figure 4, Item 3) and nut (Figure 4, Item 1) on starter motor ground stud (Figure 4, Item 2).
7. Tighten all nuts securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect batteries (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify electrical operation of all circuits (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Chock wheels (TM 9-2355-106-10).
10. Install belly armor (WP 0606).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

STARTER MOTOR-TO-FRAME GROUND JUMPER CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Lockwasher (WP 0796, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

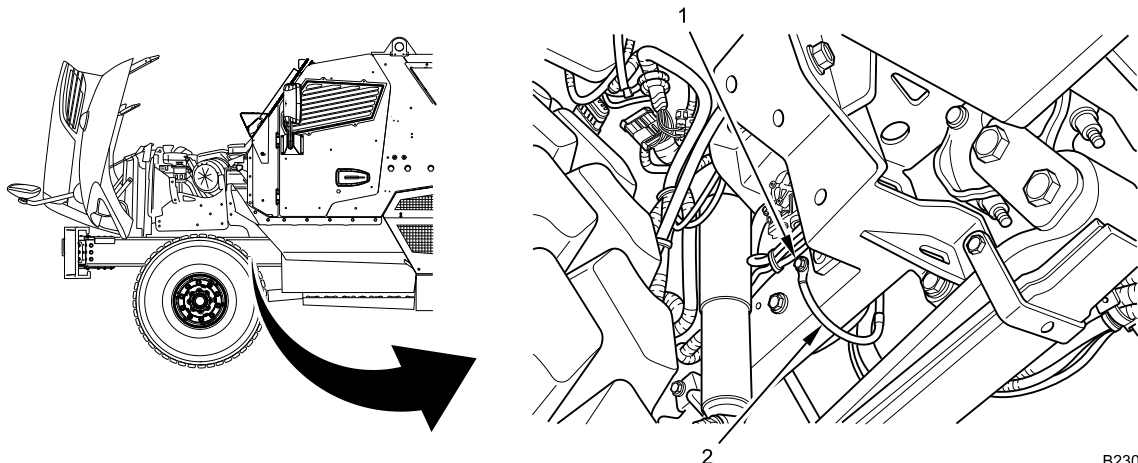
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Belly armor removed (WP 0606)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove nut and bolt (Figure 1, Item 1) from starter motor-to-frame ground cable (Figure 1, Item 2) and frame.

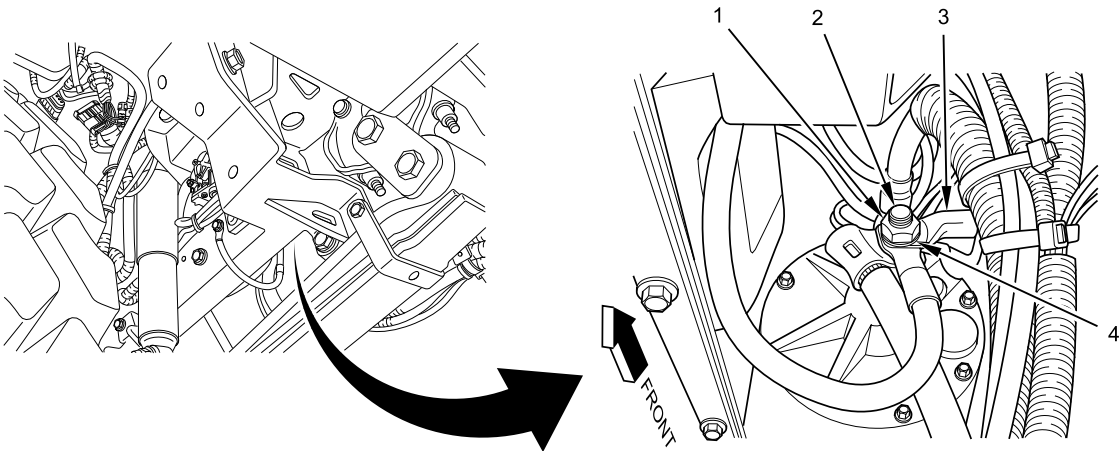


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Figure 1. Starter Motor-to-Frame Ground Jumper Cable.

STARTER MOTOR-TO-FRAME GROUND JUMPER CABLE REMOVAL AND INSTALLATION - (CONTINUED)

2. Remove nut (Figure 2, Item 1), lockwasher (Figure 2, Item 4), and starter motor-to-frame ground cable (Figure 2, Item 3) from starter motor ground stud (Figure 2, Item 2). Discard lockwasher.

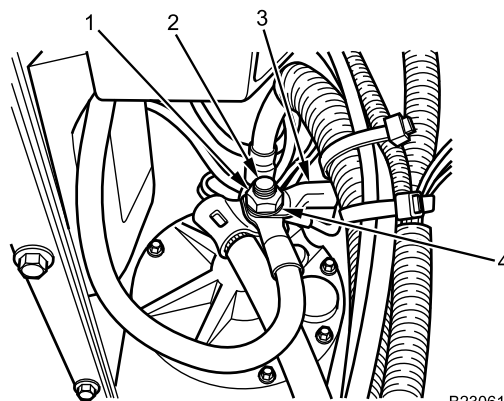


B230610018

Figure 2. Starter Motor-to-Frame Ground Jumper Cable.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.



B230610019

Figure 3. Starter Motor-to-Frame Ground Jumper Cable.

1. Apply dielectric grease to starter motor ground stud (Figure 3, Item 2).
2. Install starter motor-to-frame ground jumper cable (Figure 3, Item 3) on starter motor ground stud (Figure 3, Item 2).

STARTER MOTOR-TO-FRAME GROUND JUMPER CABLE REMOVAL AND INSTALLATION - (CONTINUED)

3. Loosely install new lockwasher (Figure 3, Item 4) and nut (Figure 3, Item 1) on starter motor ground stud (Figure 3, Item 2).

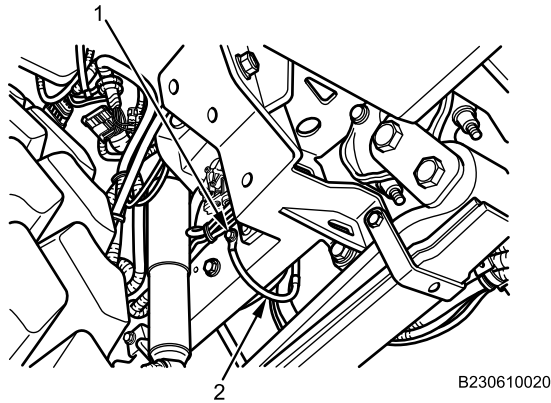


Figure 4. Starter Motor-to-Frame Ground Jumper Cable.

4. Apply dielectric grease to frame ground bolt (Figure 4, Item 1).
5. Loosely install nut, bolt (Figure 4, Item 1), and starter motor-to-frame ground jumper cable (Figure 4, Item 2) on frame.
6. Tighten all nuts securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect batteries (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).
4. Test-drive vehicle to verify electrical operation of all circuits (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Set vehicle parking brake (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Chock wheels (TM 9-2355-106-10).
10. Install belly armor (WP 0606).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ALTERNATOR INTERCONNECT POSITIVE CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Wrench, torque, 40-200 lb-in. 3/8-inch drive
(WP 0795, Item 142)

Materials/Parts

Grease (WP 0794, Item 22)
Gloves (WP 0794, Item 18)
Cable lock strap (WP 0796, Item 124)
Lockwasher - (2) (WP 0796, Item 10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

WARNING



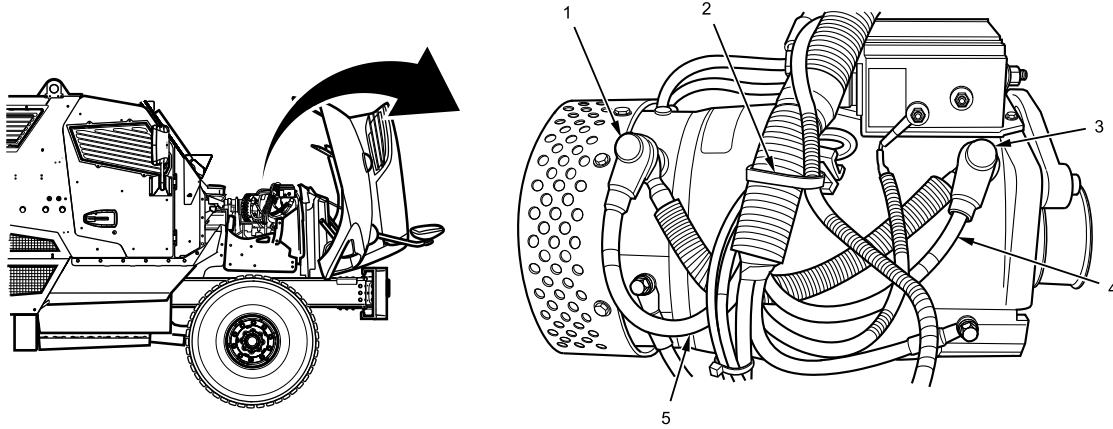
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ALTERNATOR INTERCONNECT POSITIVE CABLE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

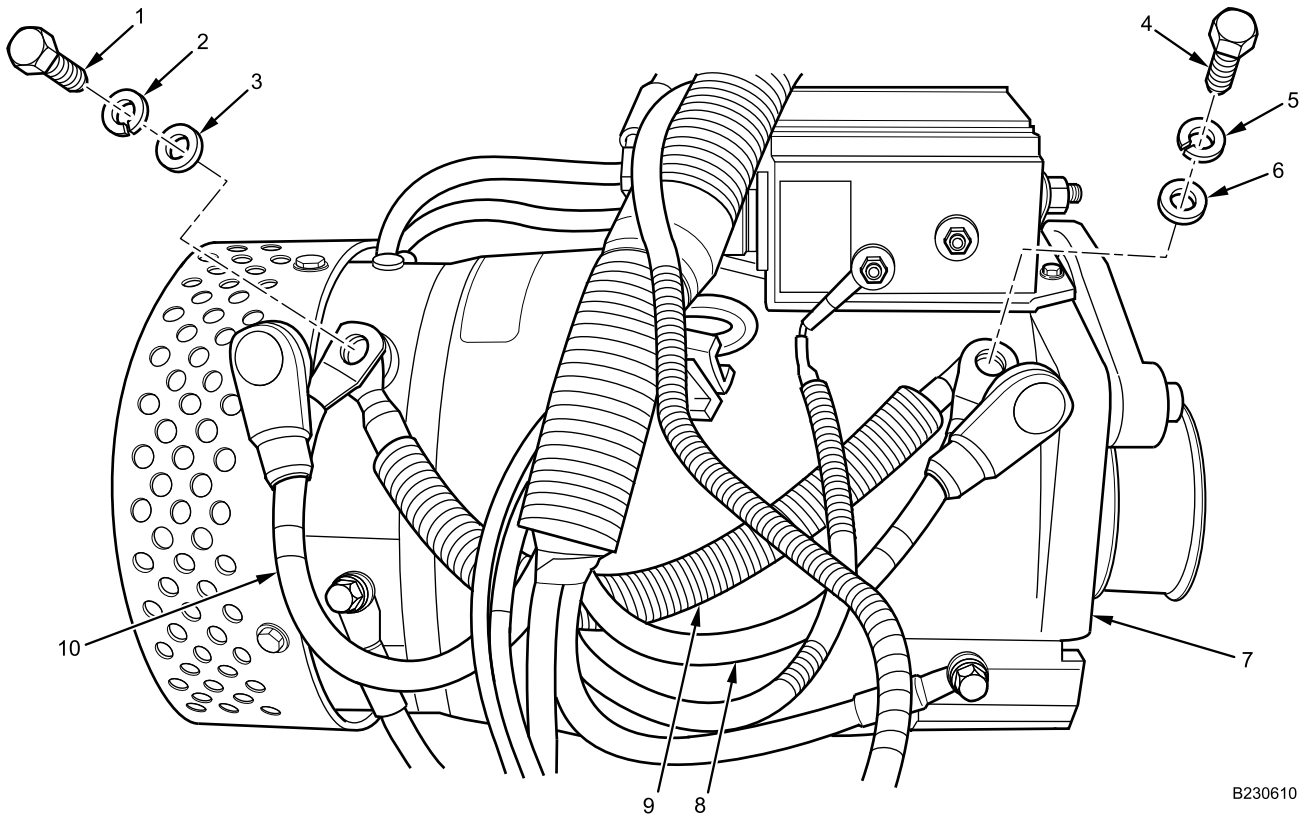
1. Move two insulators (Figure 1, Item 1 and 3) aside from end of cables (Figure 1, Item 4 and 5).



B230610117

Figure 1. Harness Removal.

2. Cut and discard cable lock strap (Figure 1, Item 2) from harness.



B230610114

Figure 2. Alternator Cable Removal.

3. Remove two bolts (Figure 2, Item 1 and 4), lockwashers (Figure 2, Item 2 and 5), flat washers (Figure 2, Item 3 and 6), and positive cables (Figure 2, Item 8 and 10) from alternator (Figure 2, Item 7). Discard lockwashers.

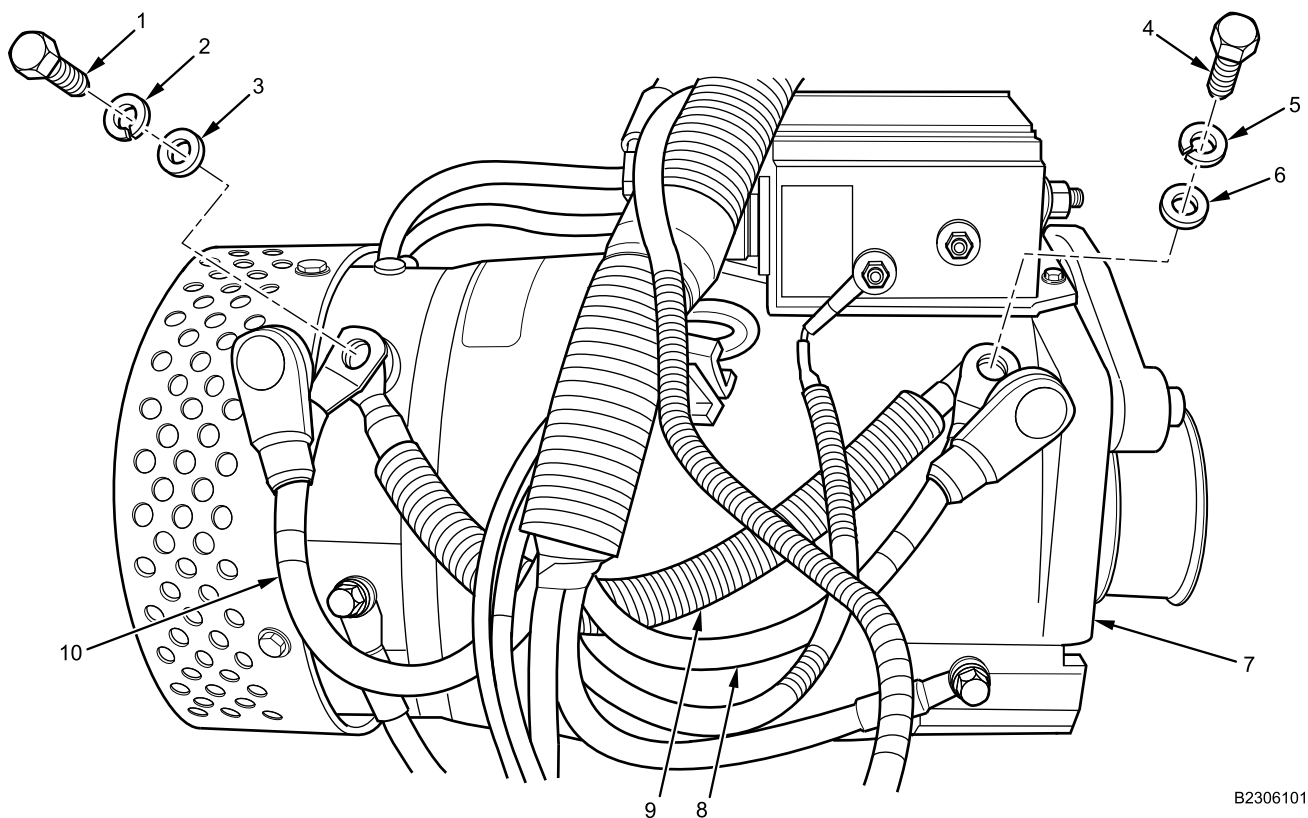
ALTERNATOR INTERCONNECT POSITIVE CABLE REMOVAL AND INSTALLATION - (CONTINUED)

4. Remove alternator interconnect positive cable (Figure 2, Item 9) from alternator (Figure 2, Item 7).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all cable ends.



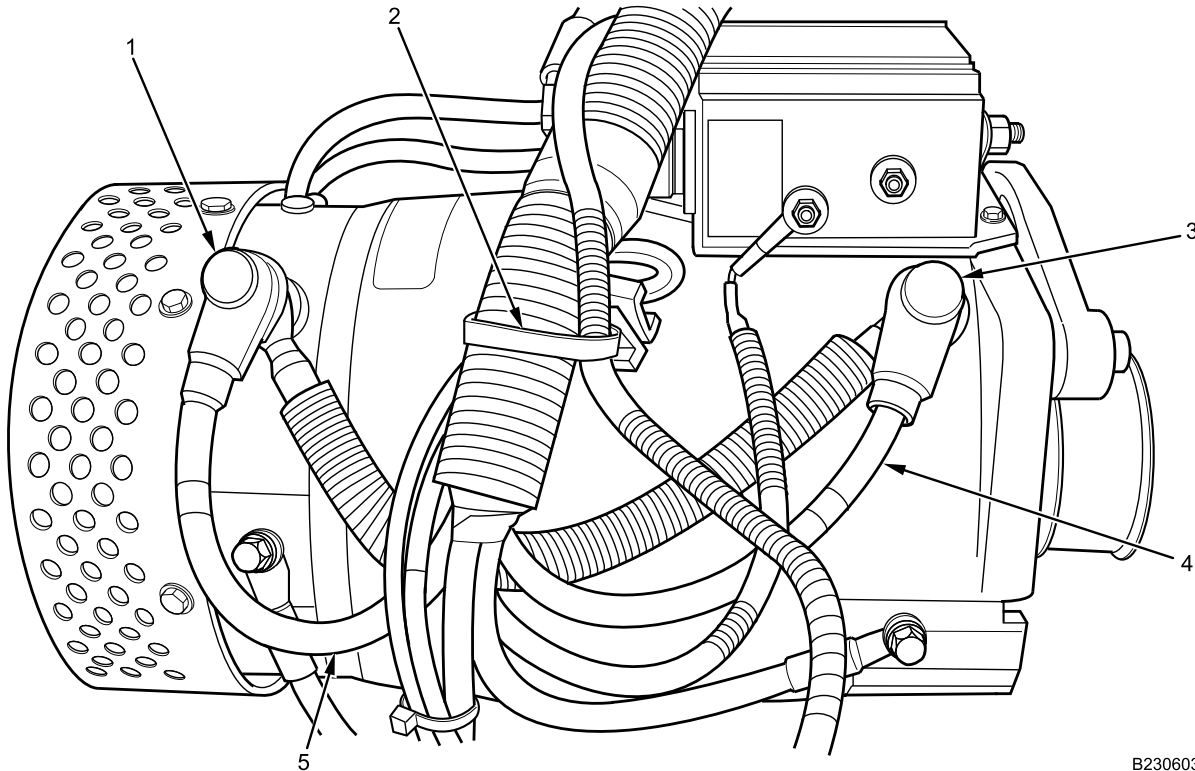
B230610114

Figure 3. Alternator Cable Installation.

2. Install alternator interconnect cable (Figure 3, Item 9) and positive cable (Figure 3, Item 10) on alternator (Figure 3, Item 7) with flat washer (Figure 3, Item 3), new lock washer (Figure 3, Item 2), and bolt (Figure 3, Item 1). Tighten bolt to 177 lb-in (20 N•m).

ALTERNATOR INTERCONNECT POSITIVE CABLE REMOVAL AND INSTALLATION - (CONTINUED)

3. Install alternator interconnect cable (Figure 3, Item 9) and positive cable (Figure 3, Item 8) on alternator (Figure 3, Item 7) with flat washer (Figure 3, Item 6), new lock washer (Figure 3, Item 5), and bolt (Figure 3, Item 4). Tighten bolt to 177 lb-in (20 N•m).
4. Install two insulators (Figure 4, Item 1 and 3) on positive cable ends (Figure 4, Item 4 and 5).



B230603903

Figure 4. Harness Installation.

5. Secure wire harness on alternator lift ring with new cable lock strap (Figure 4, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Verify charging system output on voltage gauge (TM 9-2355-106-10).
5. Turn off engine (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Close and secure hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Gloves (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Wire tags (WP 0794, Item 49)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Batteries disconnected (WP 0404)

References

TM 9-2355-106-10

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

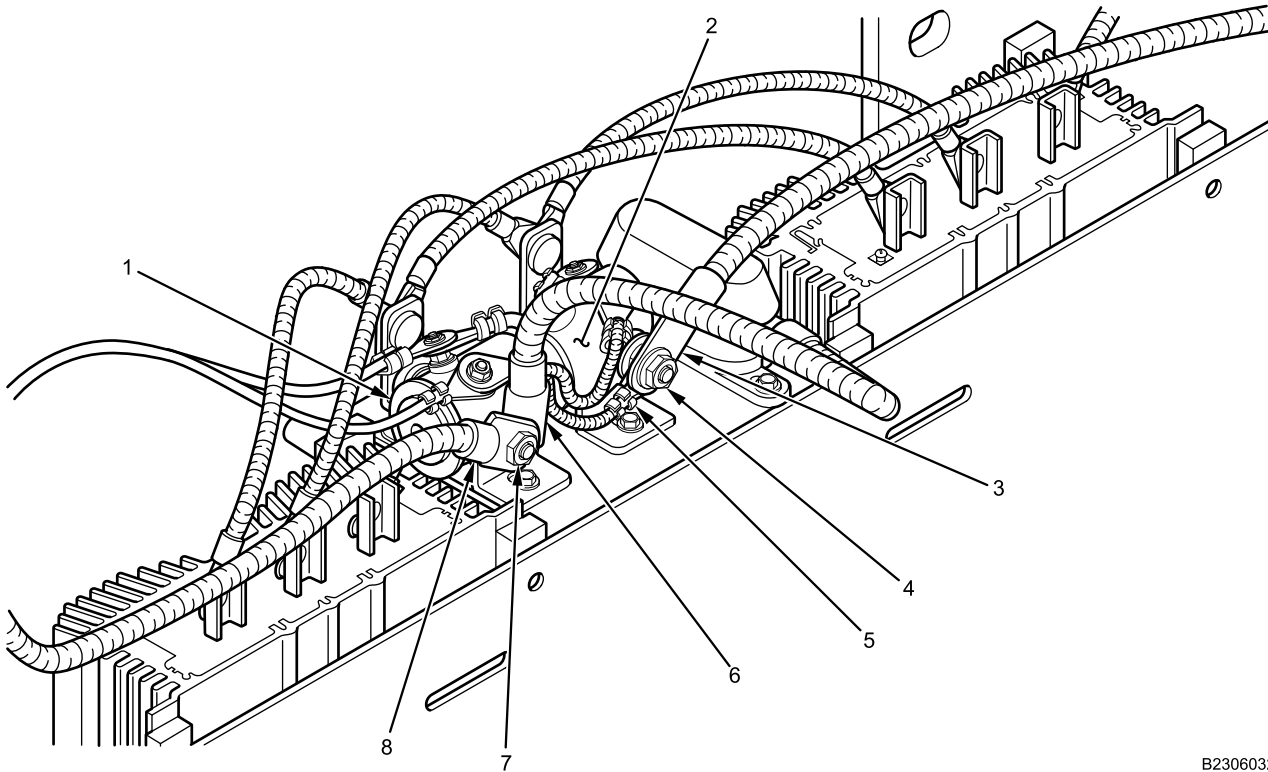
NOTE

Label all wires before removal.

12V and 24V battery disconnect switch solenoids are located inboard and above batteries. 12V battery disconnect switch solenoid is mounted in front of the 24V battery disconnect switch solenoid.

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove nut (Figure 1, Item 7) and two cables (Figure 1, Item 6 and 8) from 24V battery disconnect switch solenoid (Figure 1, Item 1).



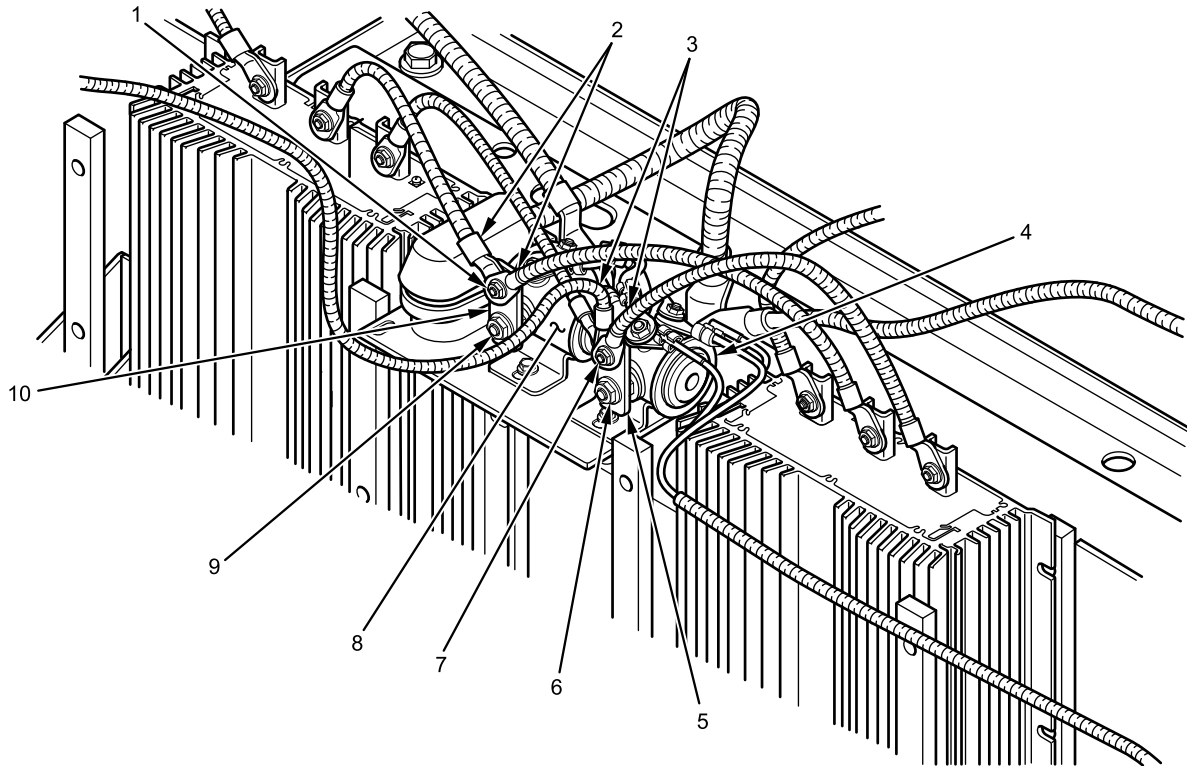
B230603200

Figure 1. 12V and 24V Battery Disconnect Switch Solenoids (Outboard View) Removal.

2. Remove nut (Figure 1, Item 4) and two cables (Figure 1, Item 3 and 5) from 12V battery disconnect switch solenoid (Figure 1, Item 2).

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)

3. Remove nut (Figure 2, Item 1) and two cables (Figure 2, Item 2) from 12V battery disconnect switch solenoid (Figure 2, Item 8).



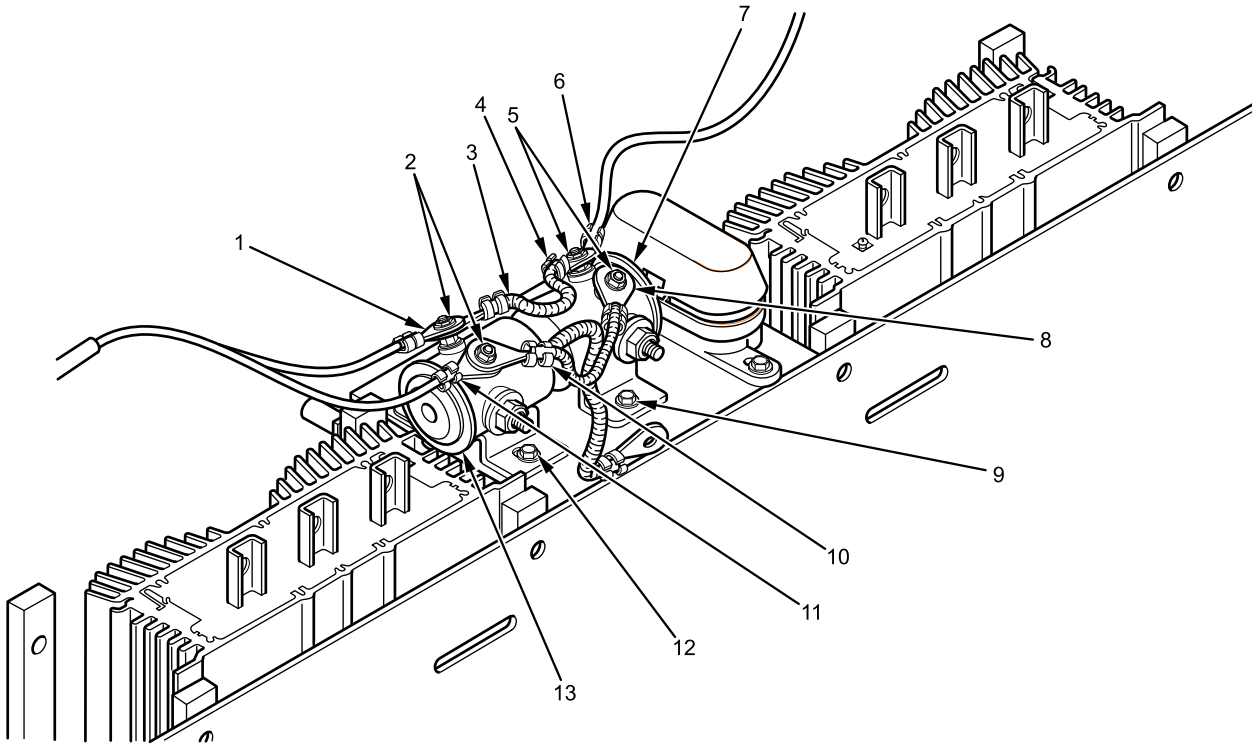
B230603201

Figure 2. 12V and 24V Battery Disconnect Switch Solenoids (Inboard View) Removal.

4. Remove nut (Figure 2, Item 9) and bus bar (Figure 2, Item 10) from 12V battery disconnect switch solenoid (Figure 2, Item 8).
5. Remove nut (Figure 2, Item 7) and two cables (Figure 2, Item 3) from 24V battery disconnect switch solenoid (Figure 2, Item 4).
6. Remove nut (Figure 2, Item 6) and bus bar (Figure 2, Item 5) from 24V battery disconnect switch solenoid (Figure 2, Item 4).

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove two nuts (Figure 3, Item 2) and four wires (Figure 3, Item 1, 3, 10, and 11) from 24V battery disconnect switch solenoid (Figure 3, Item 13).



B230603202

Figure 3. 12V and 24V Battery Disconnect Switch Solenoids (Top View) Removal.

8. Remove two bolts (Figure 3, Item 12) (one hidden) from 24V battery disconnect switch solenoid (Figure 3, Item 13). Remove 24V battery disconnect switch solenoid.
9. Remove two nuts (Figure 3, Item 5) and three wires (Figure 3, Item 4, 6 and 8) from 12V battery disconnect switch solenoid (Figure 3, Item 7).
10. Remove two bolts (Figure 3, Item 9) (one hidden) and 12V battery disconnect switch solenoid (Figure 3, Item 7) from vehicle.

END OF TASK

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

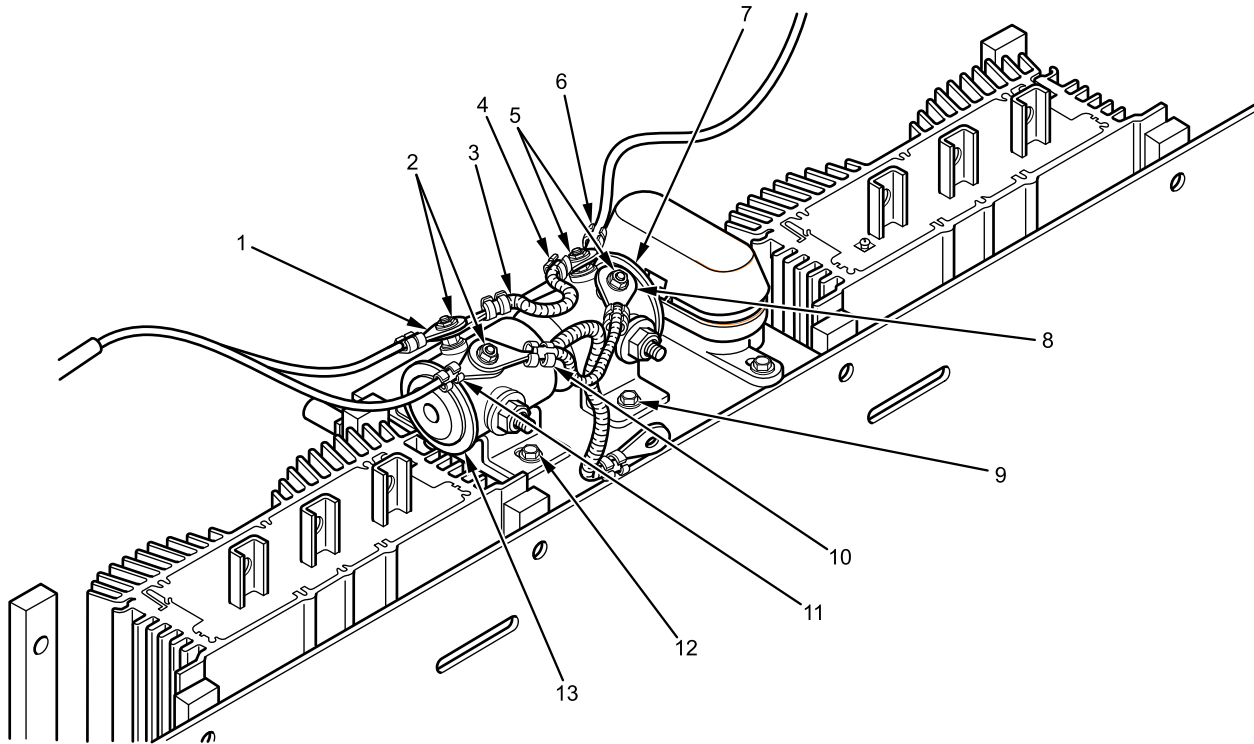
12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Apply dielectric grease to all electrical connections.

Apply corrosion preventive compound to mounting bolts for both solenoids.

1. Install 12V battery disconnect switch solenoid (Figure 4, Item 7) with two bolts (Figure 4, Item 9) (one hidden). Tighten bolts securely.

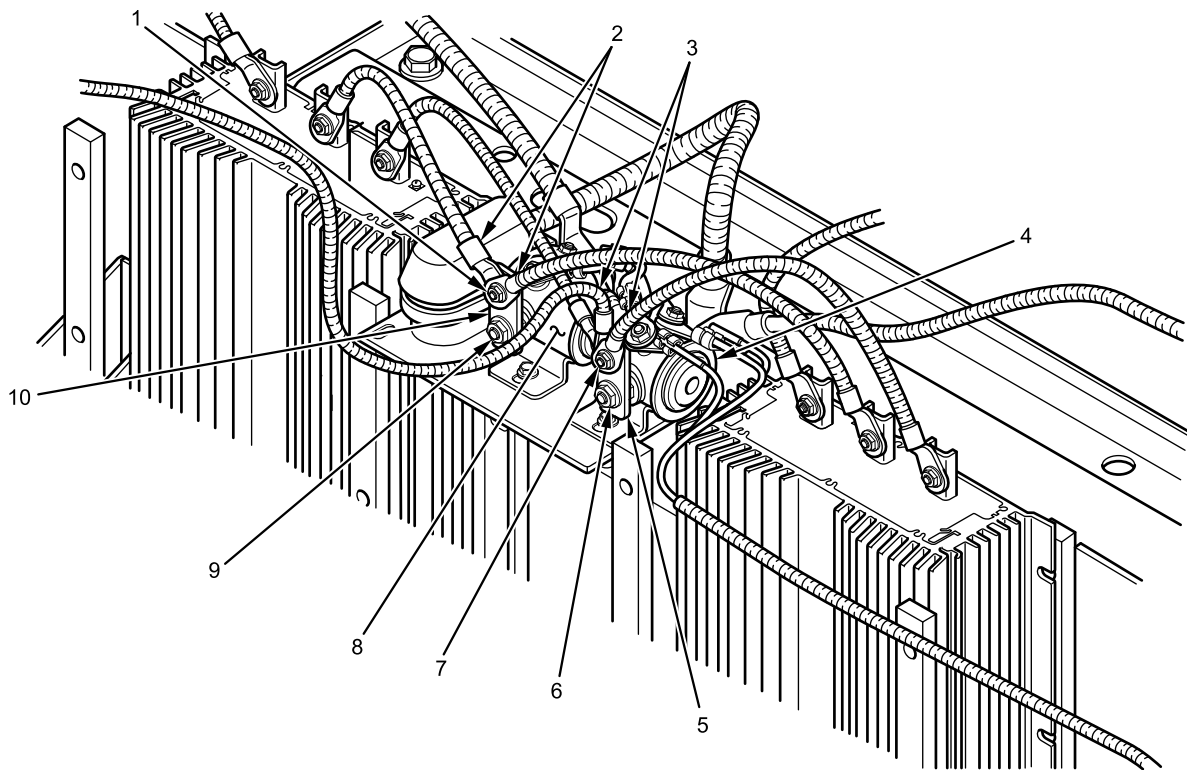


B230603202

Figure 4. 12V and 24V Battery Disconnect Switch Solenoids (Top View) Installation.

2. Connect three wires (Figure 4, Item 4, 6, and 8) and install two nuts (Figure 4, Item 5) on 12V battery disconnect switch solenoid (Figure 4, Item 7). Tighten nuts securely.
3. Install 24V battery disconnect switch solenoid (Figure 4, Item 13) with two bolts (Figure 4, Item 12) (one hidden). Tighten bolts securely.
4. Connect four wires (Figure 4, Item 1, 3, 10, and 11) and install two nuts (Figure 4, Item 2) on 24V battery disconnect switch solenoid (Figure 4, Item 13). Tighten nuts securely.
5. Install bus bar (Figure 5, Item 5) on 24V battery disconnect switch solenoid (Figure 5, Item 4) with nut (Figure 5, Item 6). Tighten nut securely.

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)



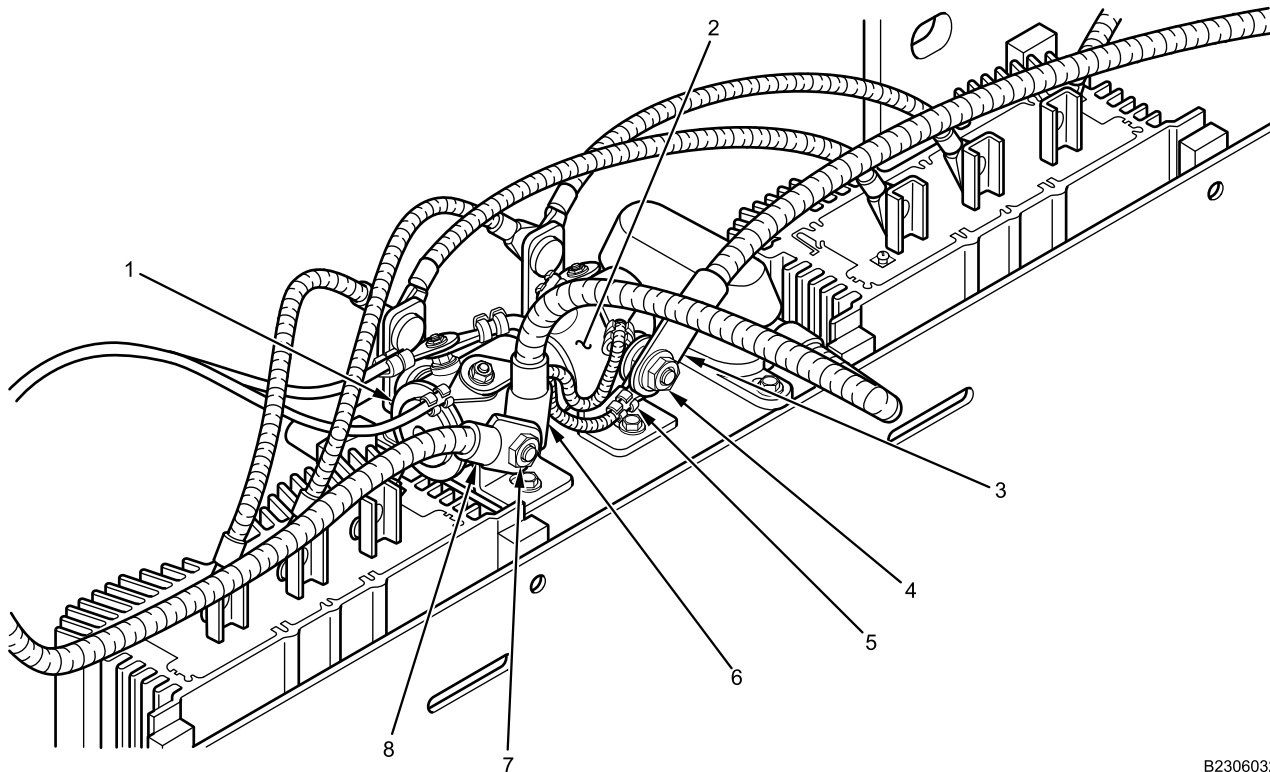
B230603201

Figure 5. 12V and 24V Battery Disconnect Switch Solenoids (Inboard View) Installation.

6. Connect two cables (Figure 5, Item 3) on bus bar (Figure 5, Item 5) with nut (Figure 5, Item 7). Tighten nut securely.
7. Install bus bar (Figure 5, Item 10) on 12V battery disconnect switch solenoid (Figure 5, Item 8) with nut (Figure 5, Item 9). Tighten nut securely.
8. Connect two cables (Figure 5, Item 2) on bus bar (Figure 5, Item 10) with nut (Figure 5, Item 1). Tighten nut securely.

12V AND 24V BATTERY DISCONNECT SWITCH SOLENOID REMOVAL AND INSTALLATION - (CONTINUED)

9. Install two cables (Figure 6, Item 3 and 5) on 12V battery disconnect switch solenoid (Figure 6, Item 2) with nut (Figure 6, Item 4). Tighten nut securely.



B230603200

Figure 6. 12V and 24V Battery Disconnect Switch Solenoids (Outboard View) Installation.

10. Install two cables (Figure 6, Item 6 and 8) on 24V battery disconnect switch solenoid (Figure 6, Item 1) with nut (Figure 6, Item 7). Tighten nut securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect batteries (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine; check voltage gauge on instrument panel cluster (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
12V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

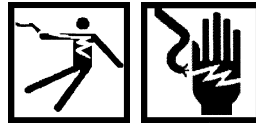
Grease (WP 0794, Item 22)
Lockwasher (WP 0796, Item 9)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P

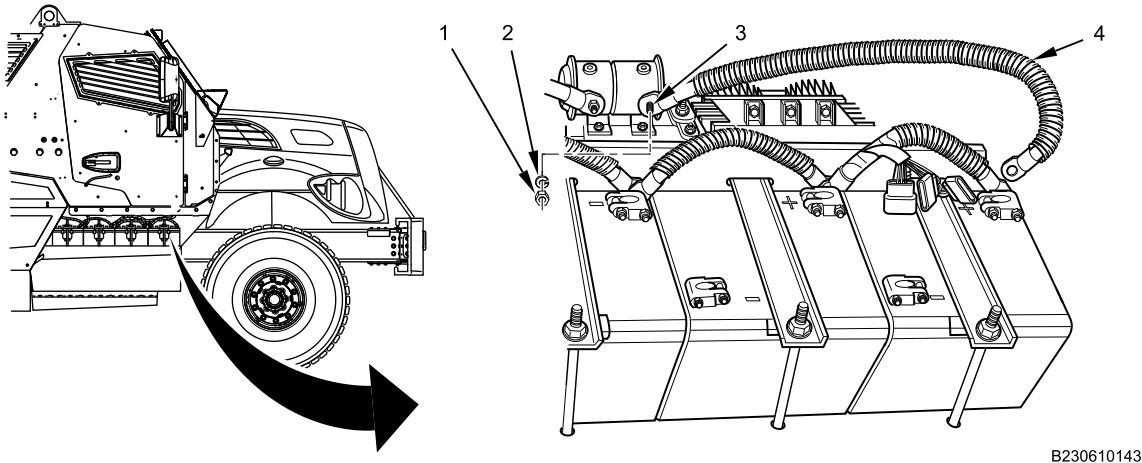
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

12V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove nut (Figure 1, Item 1), lockwasher (Figure 1, Item 2), and 12V battery disconnect switch solenoid feed cable (Figure 1, Item 4) from 12V solenoid stud (Figure 1, Item 3). Discard lockwasher.



B230610143

Figure 1. 12V Battery Disconnect Switch Solenoid Feed Cable Removal.

END OF TASK

INSTALLATION

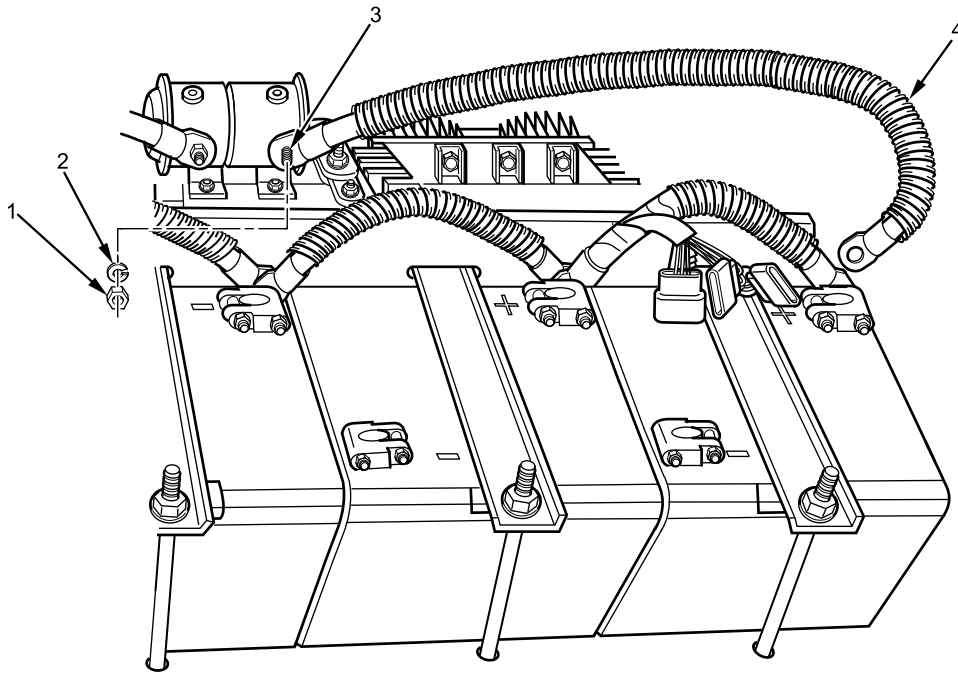
WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all cable ends.

12V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)



B230610140

Figure 2. 12V Battery Disconnect Switch Solenoid Feed Cable Installation.

2. Install 12V battery disconnect switch solenoid feed cable (Figure 2, Item 4) on 12V solenoid stud (Figure 2, Item 3) with new lockwasher (Figure 2, Item 2) and nut (Figure 2, Item 1). Tighten nut securely.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
24V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Lockwasher (WP 0796, Item 9)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P

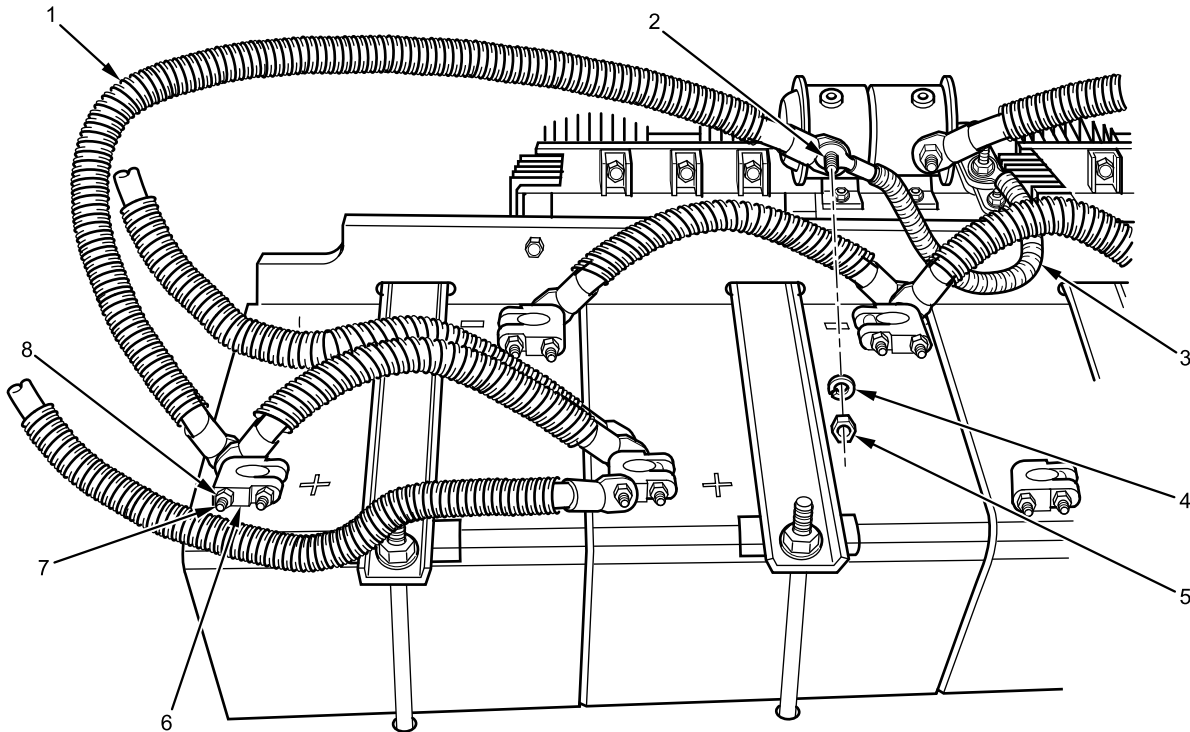
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

24V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Remove nut (Figure 1, Item 8), bolt (Figure 1, Item 7), and 24V battery disconnect switch solenoid feed cable (Figure 1, Item 1) from positive adapter (Figure 1, Item 6).



B230610141

Figure 1. 24V Battery Disconnect Switch Solenoid Feed Cable Removal.

2. Remove nut (Figure 1, Item 5), lockwasher (Figure 1, Item 4), mega-fuse cable (Figure 1, Item 3), and 24V battery disconnect switch solenoid feed cable (Figure 1, Item 1) from 24V solenoid stud (Figure 1, Item 2). Discard lockwasher.

END OF TASK

INSTALLATION

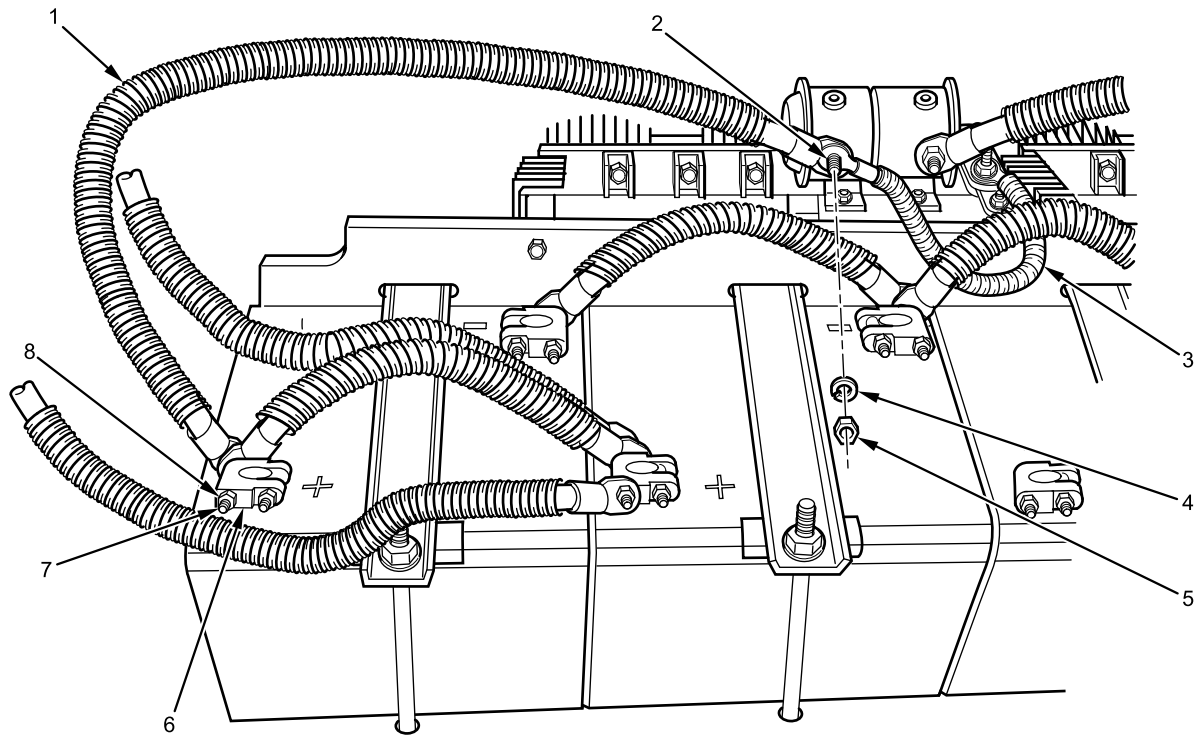
WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all cable ends.

24V BATTERY DISCONNECT SWITCH SOLENOID FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)



B230610141

Figure 2. 24V Battery Disconnect Switch Solenoid Feed Cable Installation.

2. Install 24V battery disconnect switch solenoid feed cable (Figure 2, Item 1) and mega-fuse cable (Figure 2, Item 3) on 24V solenoid stud (Figure 2, Item 2) with new lockwasher (Figure 2, Item 4) and nut (Figure 2, Item 5). Tighten nut securely.
3. Install 24V battery disconnect switch solenoid feed cable (Figure 2, Item 1) on positive adapter (Figure 2, Item 6) with bolt (Figure 2, Item 7) and nut (Figure 2, Item 8). Tighten nut securely.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WINCH MEGAFUSE FEED CABLE REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

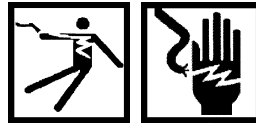
Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

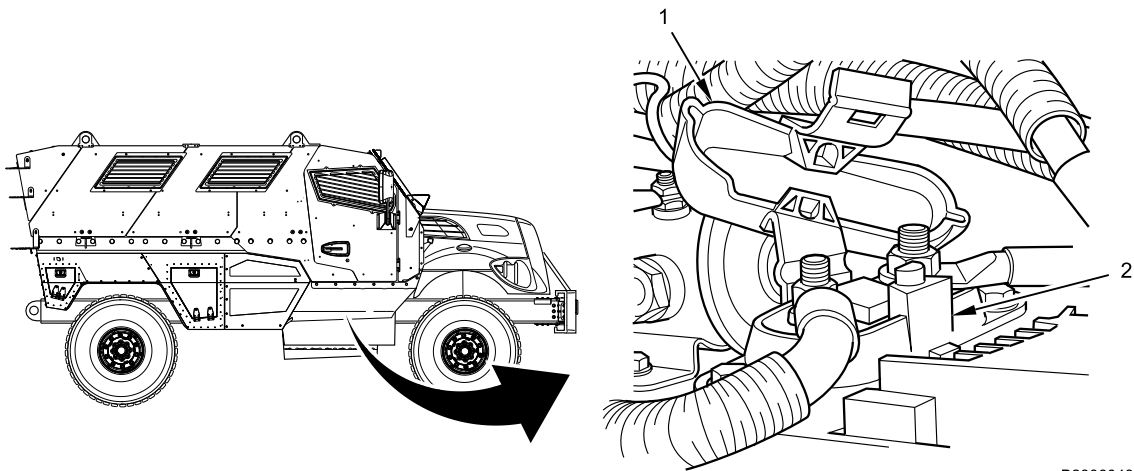
TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

WINCH MEGAFUSE FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)

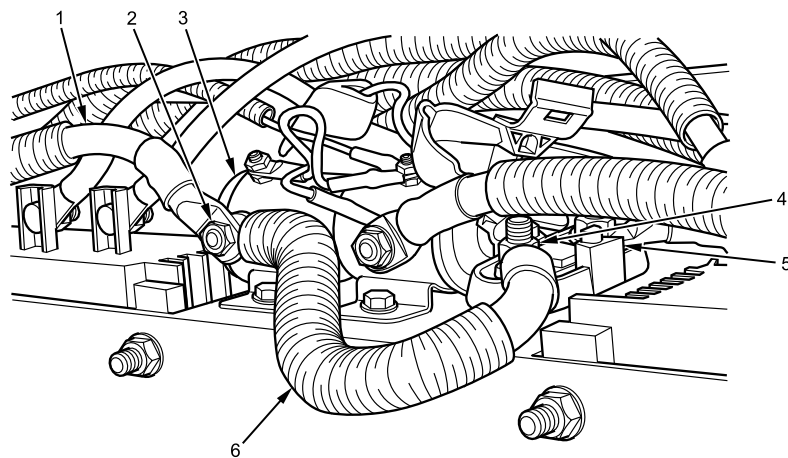
REMOVAL



B230604388

Figure 1. 300A Megafuse and Holder.

1. Remove megafuse cover (Figure 1, Item 1) from megafuse holder (Figure 1, Item 2).
2. Remove nut (Figure 2, Item 2), battery cable (Figure 2, Item 1), and megafuse feed cable (Figure 2, Item 6) from 24V battery disconnect solenoid switch (Figure 2, Item 3).



B230604386

Figure 2. Megafuse Feed Cable.

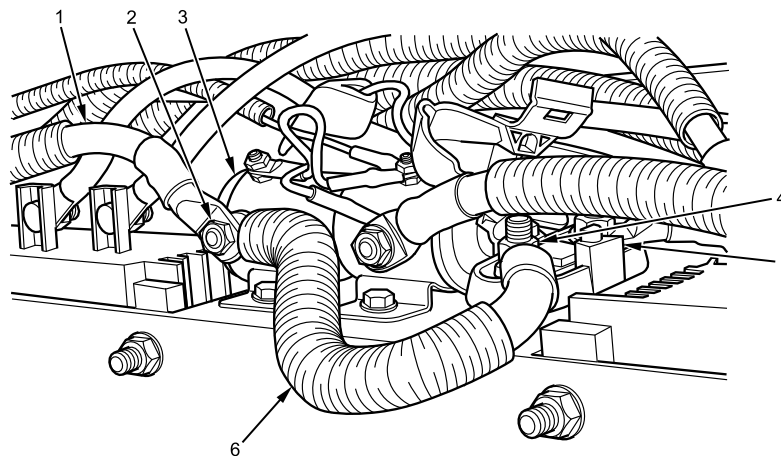
3. Remove nut (Figure 2, Item 4) and megafuse feed cable (Figure 2, Item 6) from megafuse holder (Figure 2, Item 5).

END OF TASK

WINCH MEGAFUSE FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all cable connections.



B230604386

Figure 3. Megafuse Feed Cable.

2. Install megafuse feed cable (Figure 3, Item 6) and battery cable (Figure 3, Item 1) on 24V battery disconnect solenoid switch (Figure 3, Item 3) with nut (Figure 3, Item 2). Tighten nut securely.
3. Install megafuse feed cable (Figure 3, Item 6) and nut (Figure 3, Item 4) on megafuse holder (Figure 3, Item 5). Tighten nut securely.

WINCH MEGAFUSE FEED CABLE REMOVAL AND INSTALLATION - (CONTINUED)

4. Install megafuse cover (Figure 4, Item 1) on megafuse holder (Figure 4, Item 2).

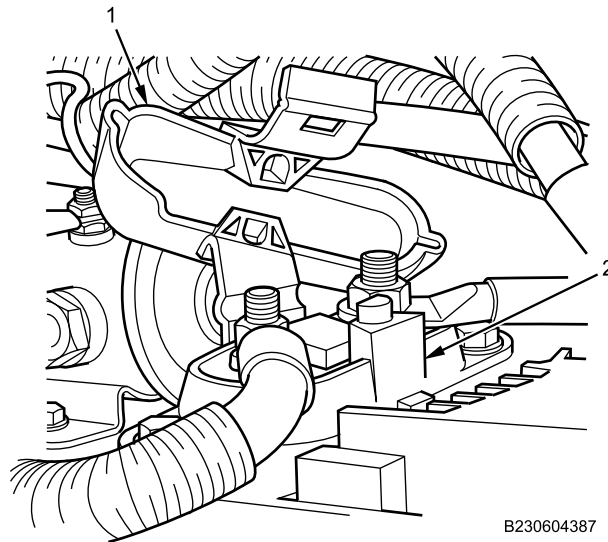


Figure 4. 300A Megafuse and Holder.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify winch system operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
INVERTER DISCONNECT BATTERY SWITCH SOLENOID HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Cable lock strap - (8) (WP 0796, Item 124)
Lockwasher - (4) (WP 0796, Item 182)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Air conditioning (A/C) condenser panel removed (WP 0672)
Battery box armor door removed (WP 0604)
Batteries disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

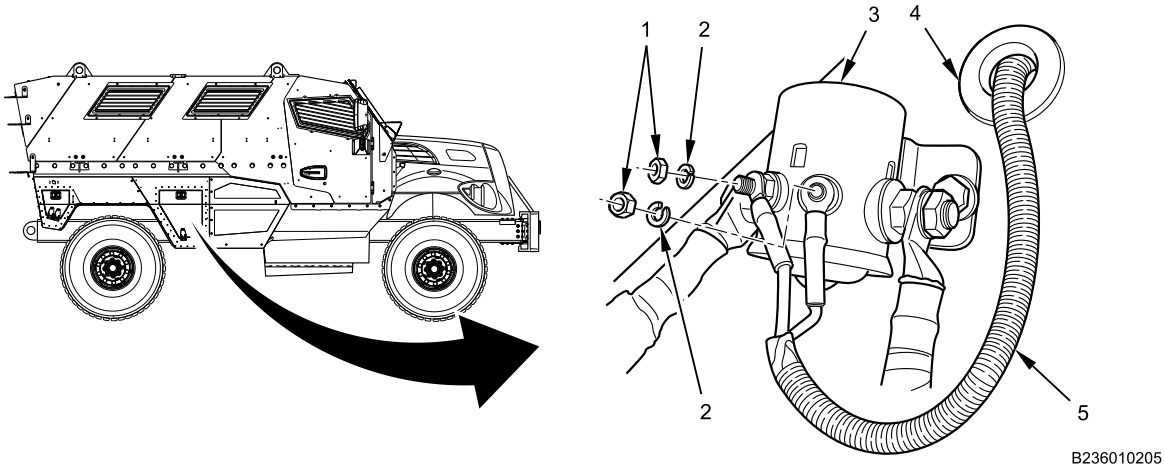
INVERTER DISCONNECT BATTERY SWITCH SOLENOID HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

Note location of cable lock straps and label all wires prior to removal to aid installation.

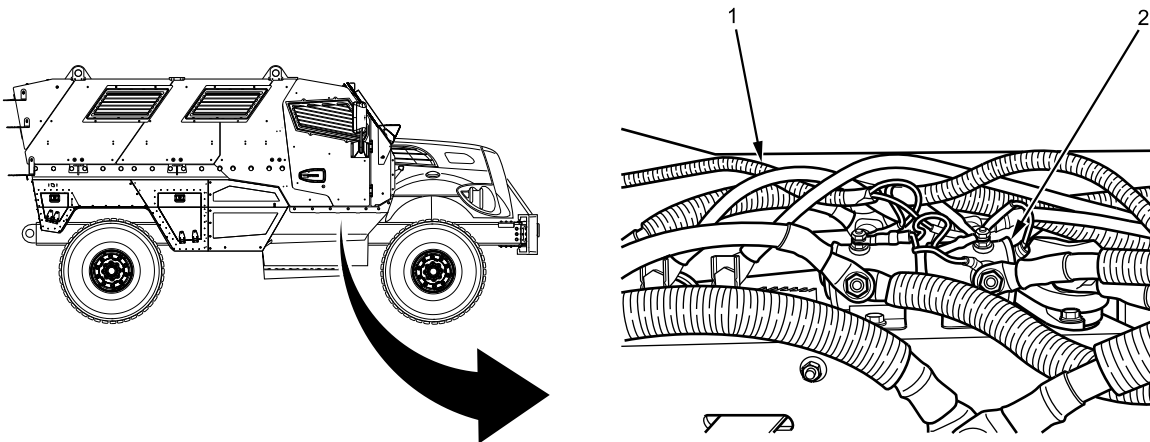
1. Remove two nuts (Figure 1, Item 1) and two lockwashers (Figure 1, Item 2) securing harness (Figure 1, Item 5) to inverter switch solenoid (Figure 1, Item 3). Discard lockwashers.



B236010205

Figure 1. Inverter Switch Solenoid Wiring.

2. Pull harness (Figure 1, Item 5) through grommet (Figure 1, Item 4) to other side of panel.
3. Remove cable lock straps along harness (Figure 2, Item 1) to battery switch solenoid (Figure 2, Item 2). Discard cable lock straps.



B230604383

Figure 2. Inverter Harness.

INVERTER DISCONNECT BATTERY SWITCH SOLENOID HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

4. Remove two nuts (Figure 3, Item 2) and two lockwashers (Figure 3, Item 3) from battery switch solenoid (Figure 3, Item 4) and remove harness (Figure 3, Item 1). Discard lockwashers.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connections.

1. Install harness (Figure 3, Item 1) on battery switch solenoid (Figure 3, Item 4) with two nuts (Figure 3, Item 2) and two new lockwashers (Figure 3, Item 3). Tighten nuts securely.

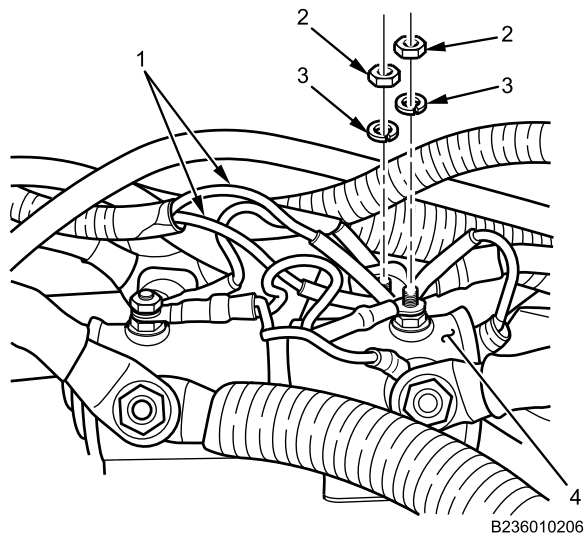
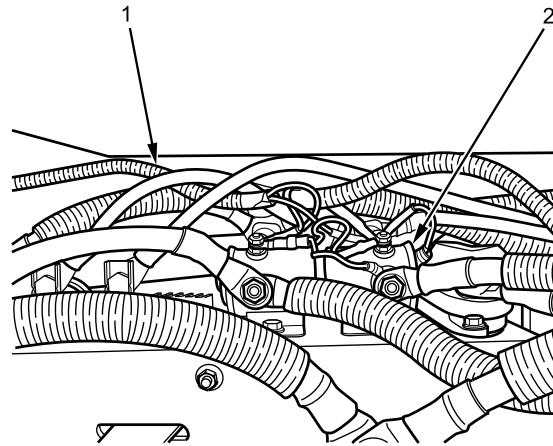


Figure 3. Battery Switch Solenoid.

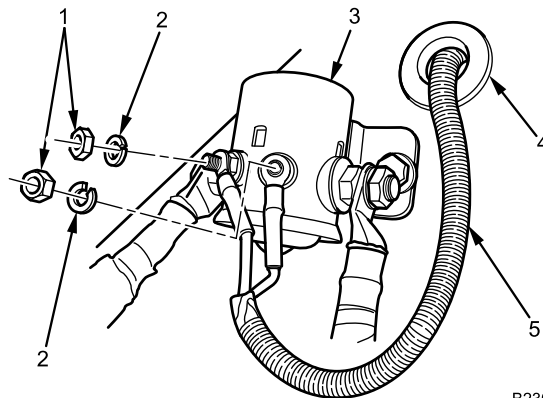
INVERTER DISCONNECT BATTERY SWITCH SOLENOID HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604295

Figure 4. Inverter Harness.

2. Route harness (Figure 4, Item 1) along outside frame rail from battery switch solenoid (Figure 4, Item 2) to inverter switch solenoid. Install new cable lock straps on harness as noted.



B230610222

Figure 5. Inverter Switch Solenoid Wiring.

3. Pull harness (Figure 5, Item 5) through grommet (Figure 5, Item 4) of panel.
4. Install two nuts (Figure 5, Item 1) and two new lockwashers (Figure 5, Item 2) securing harness to inverter switch solenoid (Figure 5, Item 3). Tighten nuts securely.

END OF TASK

**INVERTER DISCONNECT BATTERY SWITCH SOLENOID HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****FOLLOW-ON MAINTENANCE**

1. Connect batteries (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify inverter operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Install battery box armor door (WP 0604).
6. Install A/C condenser panel (WP 0672).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID FEED HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Lockwasher (WP 0796, Item 9)
Lockwasher - (2) (WP 0796, Item 182)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

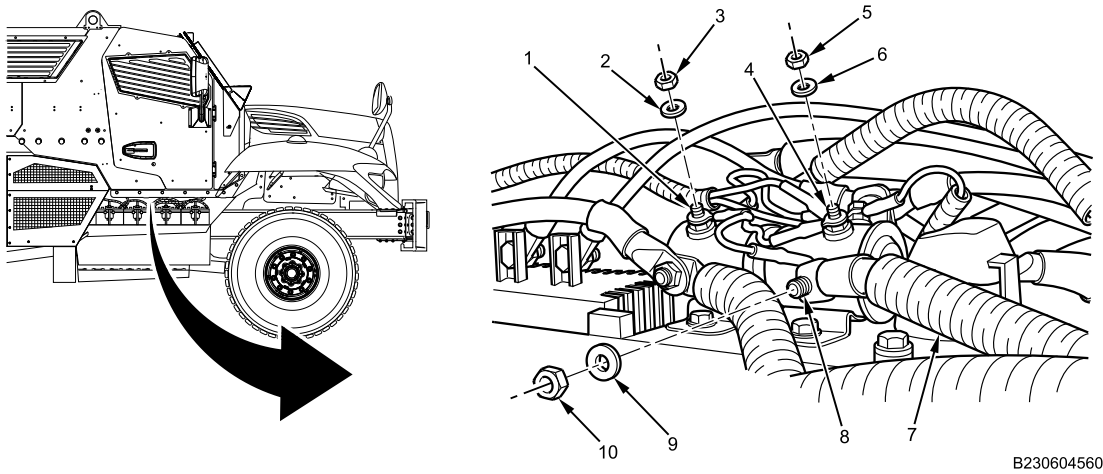


Figure 1. 12V to 24V Disconnect Battery Switch Solenoid Feed Harness Fastener Removal.

1. Remove nut (Figure 1, Item 3) and lockwasher (Figure 1, Item 2) from 24V solenoid stud (Figure 1, Item 1). Discard lockwasher.
2. Remove nut (Figure 1, Item 5) and lockwasher (Figure 1, Item 6) from 12V solenoid stud (Figure 1, Item 4). Discard lockwasher.
3. Remove nut (Figure 1, Item 10), lockwasher (Figure 1, Item 9), and cable (Figure 1, Item 7) from 12V solenoid large stud (Figure 1, Item 8). Discard lockwasher.
4. Remove 12V to 24V disconnect battery switch harness connector (Figure 2, Item 4) and inverter battery disconnect switch solenoid harness connector (Figure 2, Item 3) from 12V solenoid stud (Figure 2, Item 5).
5. Remove 12V to 24V disconnect battery switch harness connector (Figure 2, Item 2) from 24V solenoid stud (Figure 2, Item 1).
6. Remove 12V to 24V disconnect battery switch harness connector (Figure 2, Item 7) from large stud of 12V solenoid stud (Figure 2, Item 6).

END OF TASK

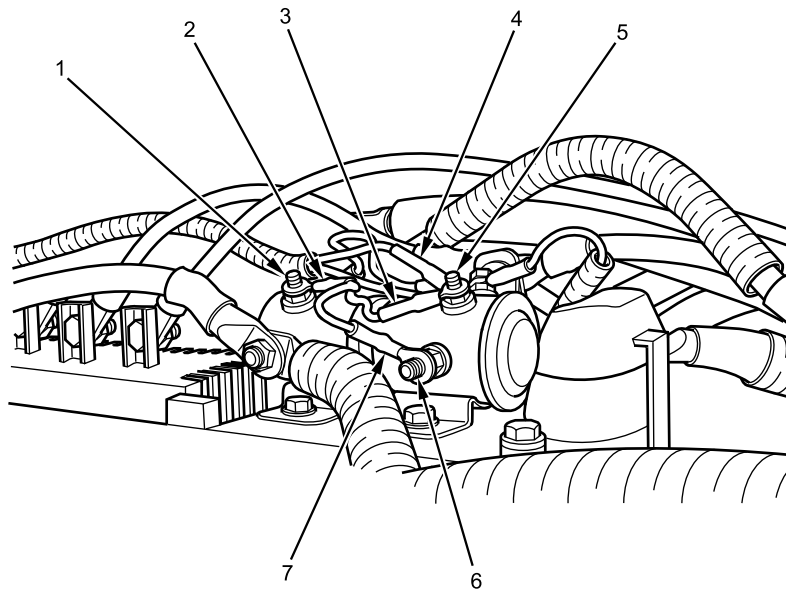
INSTALLATION

WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all harness connector ends.

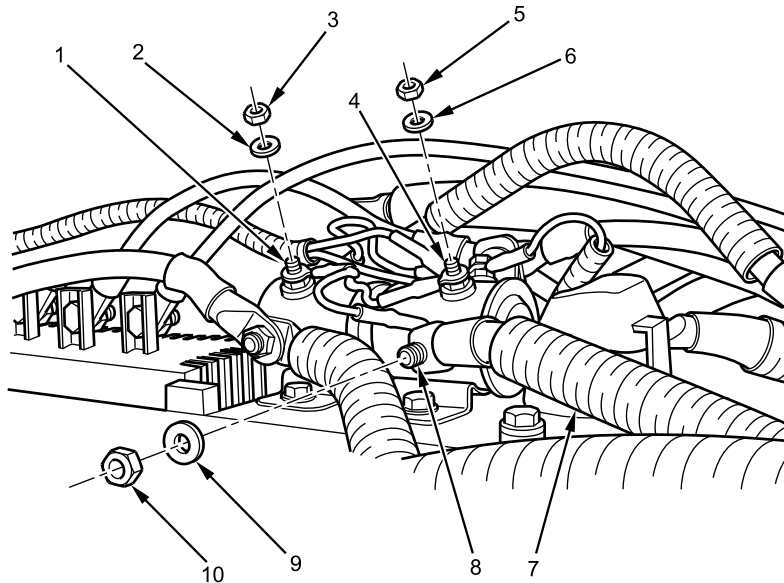
**12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID FEED HARNESS REMOVAL AND INSTALLATION
- (CONTINUED)**

B230610115

Figure 2. 12V to 24V Disconnect Battery Switch Solenoid Feed Harness Installation.

2. Install 12V to 24V disconnect battery switch harness connector (Figure 2, Item 7) on large stud of 12V solenoid stud (Figure 2, Item 6).
3. Install 12V to 24V disconnect battery switch harness connector (Figure 2, Item 2) on 24V solenoid stud (Figure 2, Item 1).
4. Install 12V to 24V disconnect battery switch harness connector (Figure 2, Item 4) and inverter battery disconnect switch solenoid harness connector (Figure 2, Item 3) on 12V solenoid stud (Figure 2, Item 5).

12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230610116

Figure 3. 12V to 24V Disconnect Battery Switch Solenoid Feed Harness Fastener Installation.

5. Install new lockwasher (Figure 3, Item 2) and nut (Figure 3, Item 3) on 24V solenoid stud (Figure 3, Item 1). Tighten nut securely.
6. Install new lockwasher (Figure 3, Item 6) and nut (Figure 3, Item 5) on 12V solenoid stud (Figure 3, Item 4). Tighten nut securely.
7. Install cable (Figure 3, Item 7) on 12V solenoid large stud (Figure 3, Item 8) with new lockwasher (Figure 3, Item 9) and nut (Figure 3, Item 10). Tighten nut securely.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn off engine (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID GROUND HARNESS REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Lockwasher - (2) (WP 0796, Item 182)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID GROUND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

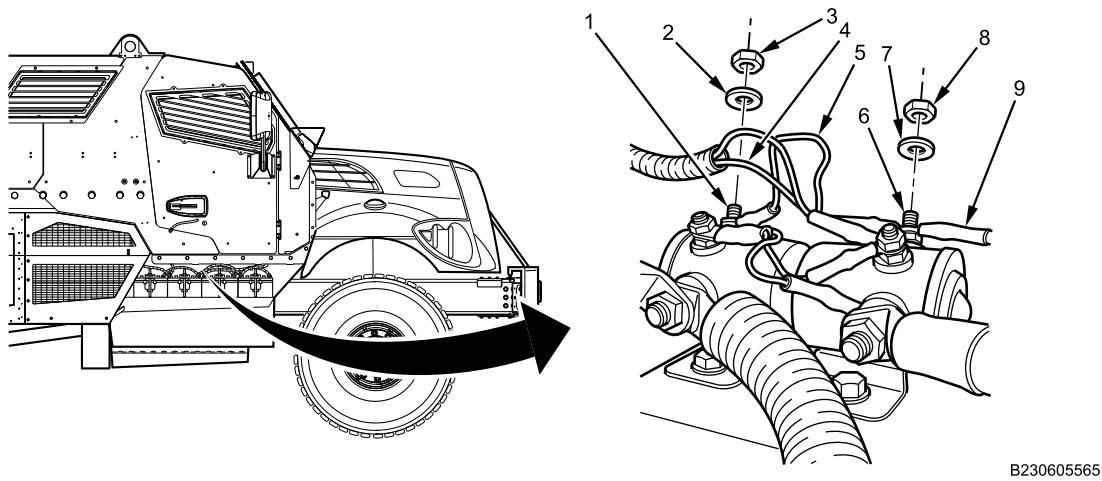


Figure 1. 12V to 24V Disconnect Battery Switch Solenoid Ground Harness Removal.

1. Remove nut (Figure 1, Item 3), lockwasher (Figure 1, Item 2), and battery switch ground harness (Figure 1, Item 5) from 24V solenoid stud (Figure 1, Item 1). Discard lockwasher.
2. Remove nut (Figure 1, Item 8), lockwasher (Figure 1, Item 7), master disconnect harness (Figure 1, Item 9), inverter disconnect switch harness (Figure 1, Item 4), and battery switch ground harness (Figure 1, Item 5) from 12V solenoid stud (Figure 1, Item 6). Discard lockwasher.
3. Remove battery switch ground harness (Figure 1, Item 5) from vehicle.

END OF TASK

INSTALLATION

WARNING



Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all harness connector ends.

12V TO 24V DISCONNECT BATTERY SWITCH SOLENOID GROUND HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

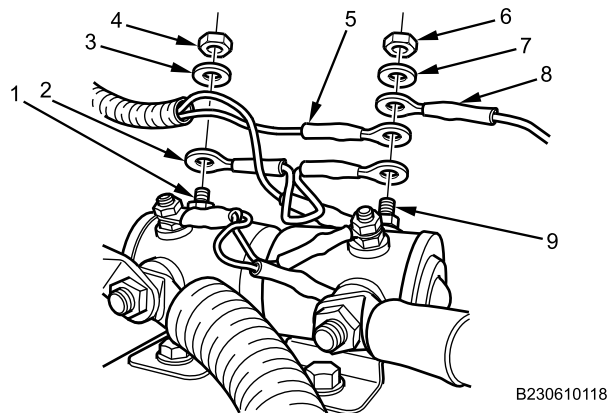


Figure 2. 12V to 24V Disconnect Battery Switch Solenoid Ground Harness Installation.

2. Install battery switch ground harness (Figure 2, Item 2) on 24V solenoid stud (Figure 2, Item 1) with new lockwasher (Figure 2, Item 3) and nut (Figure 2, Item 4). Tighten nut securely.
3. Install master disconnect harness (Figure 2, Item 8), inverter disconnect switch harness (Figure 2, Item 5), and battery switch ground harness (Figure 2, Item 2), on 12V solenoid stud (Figure 2, Item 9) with new lockwasher (Figure 2, Item 7) and nut (Figure 2, Item 6). Tighten nut securely.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn off engine (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

24V BODY FEED HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 49)
Cable lock straps - (3) (WP 0796, Item 124)
Lockwasher (WP 0796, Item 168)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Right engine armor plate removed (WP 0599)
Right engine armor plate bracket removed (WP 0600)

REMOVAL

WARNING



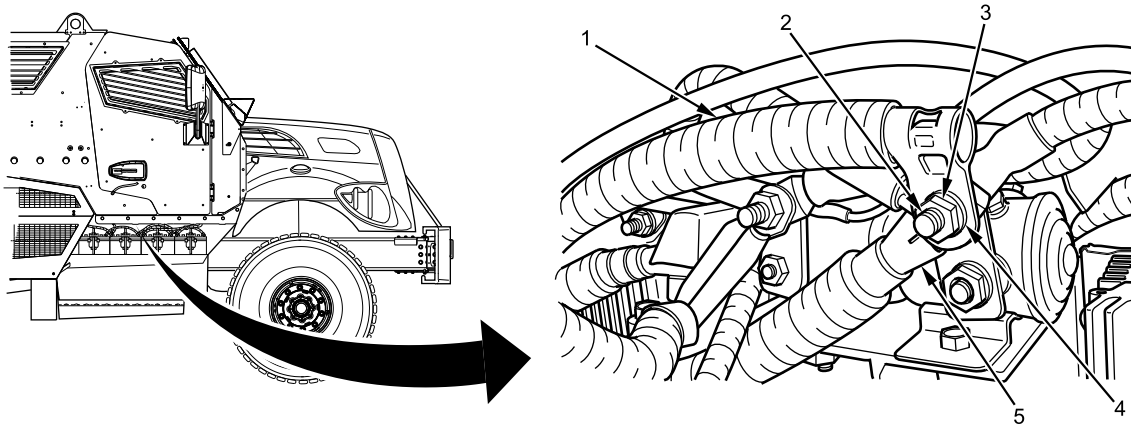
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

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24V BODY FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Label all electrical connectors before removal.

1. Remove nut (Figure 1, Item 3), lockwasher (Figure 1, Item 4), and two harness cables (Figure 1, Item 1 and 5) from solenoid stud (Figure 1, Item 2).



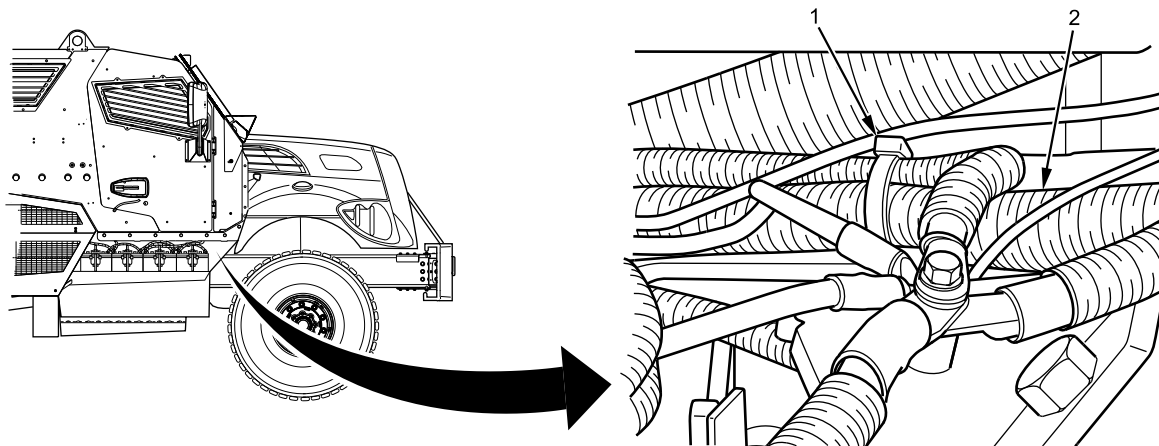
B230604364

Figure 1. 24V Body Feed Harness Connections at Solenoid.

NOTE

The number of cable lock straps may vary from illustration. Note quantity and location of cable lock straps for assembly.

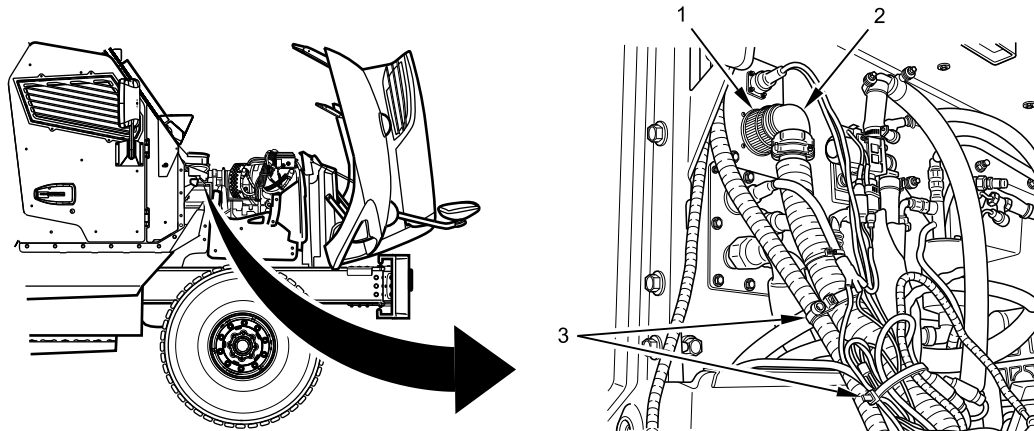
2. Remove and discard cable lock straps (Figure 2, Item 1) from harness (Figure 2, Item 2).



B230604365

Figure 2. Harness Routing and Cable Lock Straps.

3. Disconnect 24V body feed harness connector (Figure 3, Item 2) from 24V front of dash pass through connector by turning metal collar on connector (Figure 3, Item 1) counterclockwise.

24V BODY FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604788

Figure 3. 24V Body Feed Harness Removal.

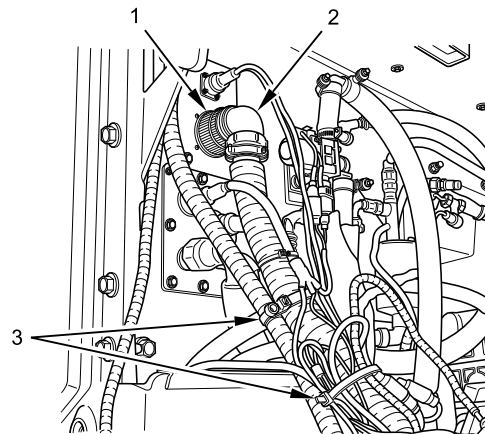
4. Remove cable lock straps (Figure 3, Item 3) from 24V body feed harness (Figure 3, Item 2) as required to remove harness from bundle. Discard cable lock straps.
5. Remove 24V body feed harness (Figure 3, Item 2) from vehicle.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all harness connector ends.

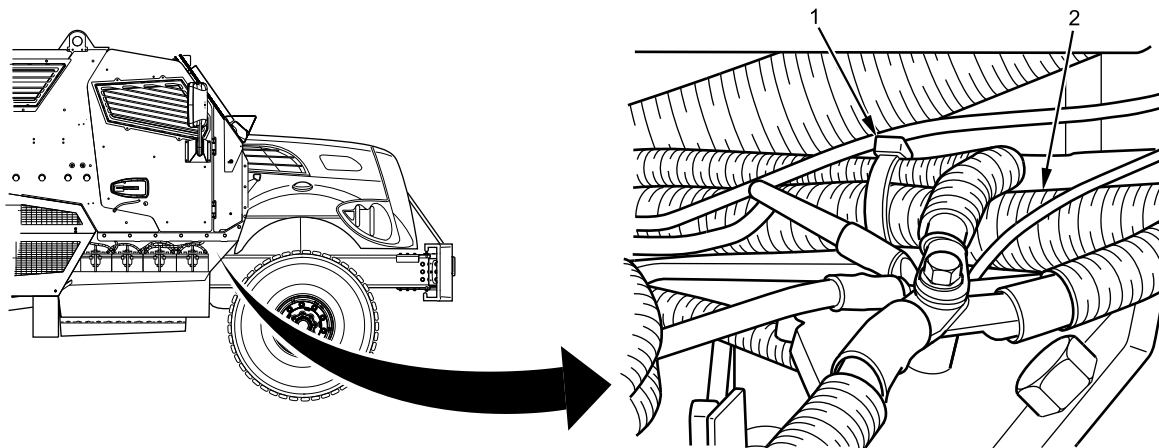
24V BODY FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604366

Figure 4. 24V Body Feed Harness Installation.

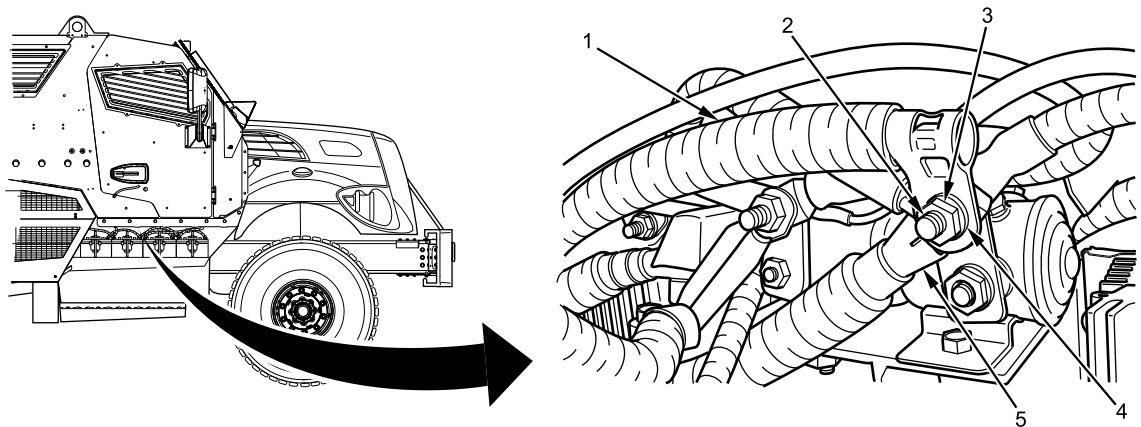
2. Position 24V body feed harness (Figure 4, Item 2) on vehicle.
3. Connect 24V body feed harness (Figure 4, Item 2) to 24V front of dash pass through connector by turning metal collar on connector (Figure 4, Item 1) clockwise.
4. Install new cable lock straps (Figure 4, Item 3) on 24V body feed harness (Figure 4, Item 2) as required to secure harness to bundle.
5. Route harness (Figure 5, Item 2) along frame rail and secure to bundle with new cable lock straps (Figure 5, Item 1).



B230604365

Figure 5. Harness Routing and Cable Lock Straps.

6. Install two 24V harness cables (Figure 6, Item 1 and 5) on solenoid stud (Figure 6, Item 2) with new lockwasher (Figure 6, Item 4) and nut (Figure 6, Item 3). Tighten nut securely.

24V BODY FEED HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604364

Figure 6. 24V Body Feed Harness Connections at Solenoid.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Install right engine armor plate bracket (WP 0600).
7. Install right engine armor plate (WP 0599).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

EQUALIZER CABLES REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Lockwasher - (8) (WP 0796, Item 168)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Battery cables disconnected (WP 0404)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

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NOTE

Label all cables and connections to ensure proper assembly.

EQUALIZER CABLES REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

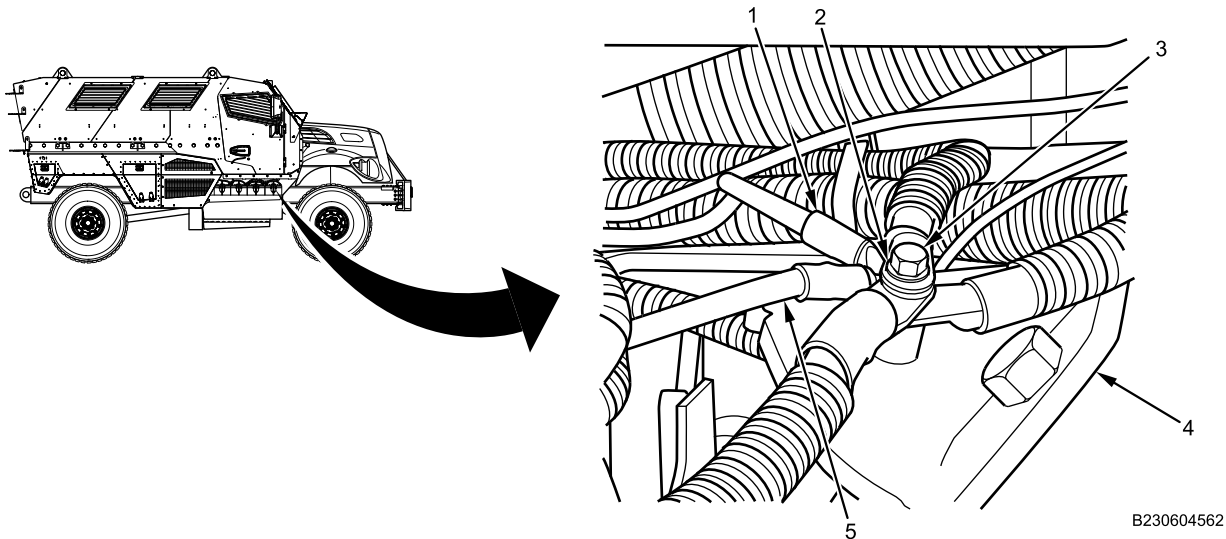


Figure 1. Equalizer Negative Cable Removal.

1. Remove bolt (Figure 1, Item 3), flat washer (Figure 1, Item 2), and negative cables (Figure 1, Item 1 and 5) from inner wheel deflector bracket (Figure 1, Item 4).

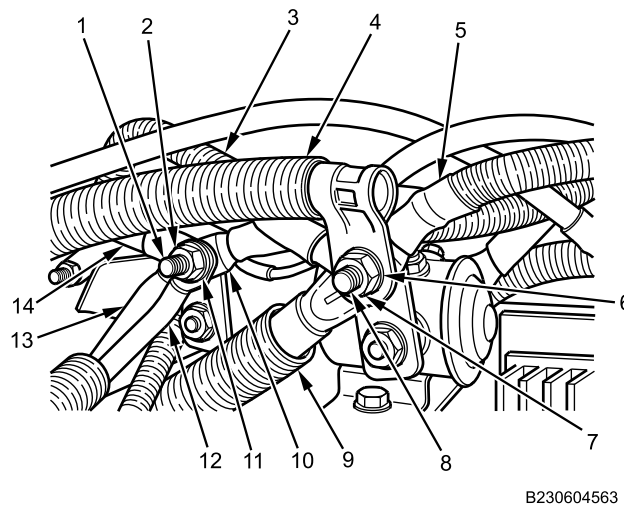
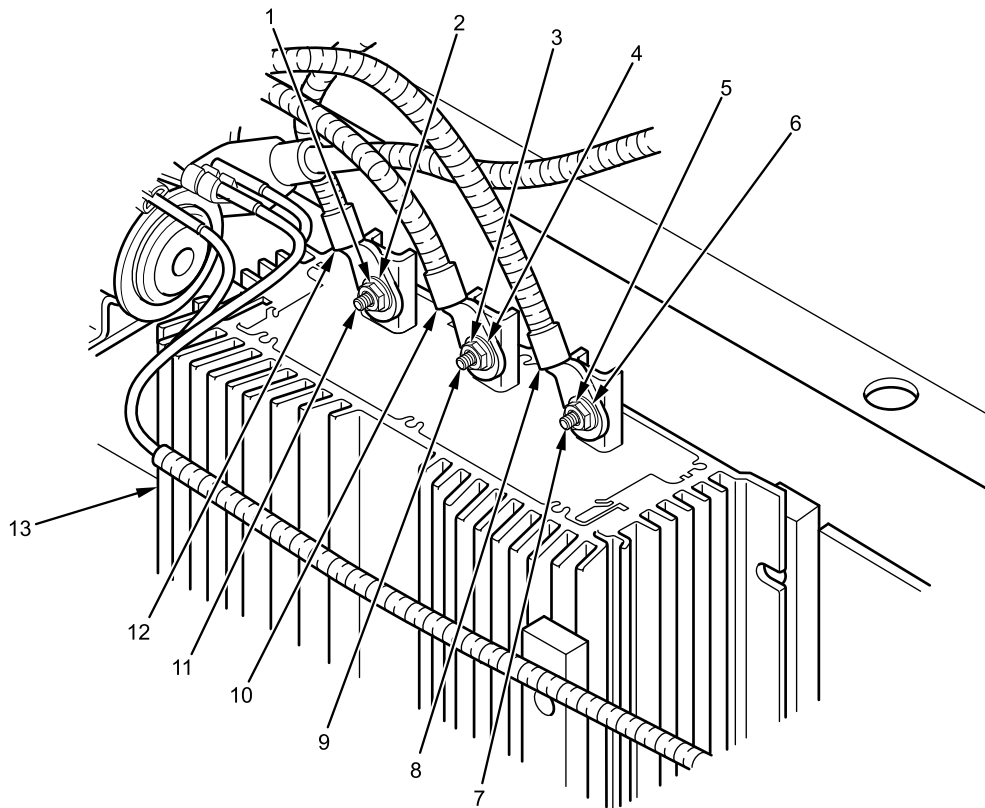


Figure 2. Equalizer Positive Cable Removal at 12/24V Solenoids.

2. Remove nut (Figure 2, Item 7) and lockwasher (Figure 2, Item 6) from 24V solenoid stud (Figure 2, Item 8). Discard lockwasher.
3. Remove 24V body feed harness cables (Figure 2, Item 4 and 9) and front and rear equalizer cable assemblies (Figure 2, Item 3 and 5) from 24V solenoid stud (Figure 2, Item 8).
4. Remove nut (Figure 2, Item 2) and lockwasher (Figure 2, Item 11) from 12V solenoid stud (Figure 2, Item 1). Discard lockwasher.
5. Remove two instrument panel feed harness cables (Figure 2, Item 12 and 13) and front and rear equalizer cable assemblies (Figure 2, Item 10 and 14) from 12V solenoid stud (Figure 2, Item 1).

EQUALIZER CABLES REMOVAL AND INSTALLATION - (CONTINUED)

B230604564

Figure 3. Equalizer Cable Removal.

NOTE

The front and rear equalizers are wired similar. Rear equalizer is shown.

6. Remove nut (Figure 3, Item 1), bolt (Figure 3, Item 11), lockwasher (Figure 3, Item 2), and ground cable (Figure 3, Item 12) from equalizer (Figure 3, Item 13).
7. Remove nut (Figure 3, Item 3), bolt (Figure 3, Item 9), lockwasher (Figure 3, Item 4), and 12V feed cable (Figure 3, Item 10) from equalizer (Figure 3, Item 13).
8. Remove nut (Figure 3, Item 5), bolt (Figure 3, Item 7), lockwasher (Figure 3, Item 6) and 24V feed cable (Figure 3, Item 8) from equalizer (Figure 3, Item 13).

END OF TASK

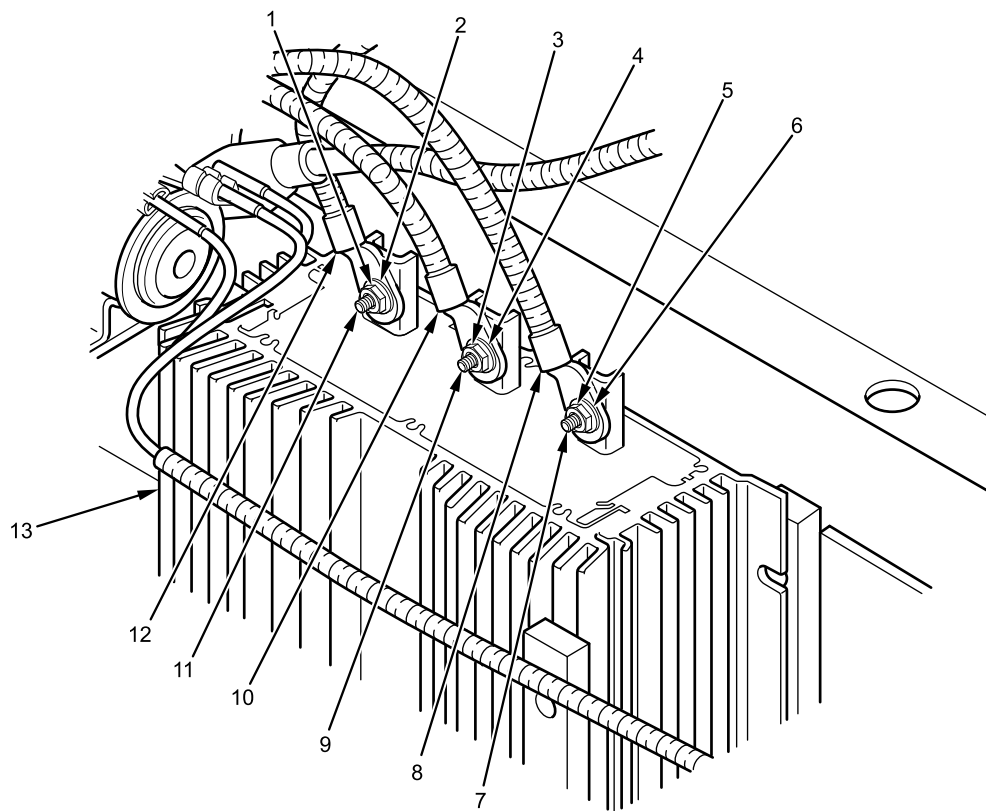
EQUALIZER CABLES REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



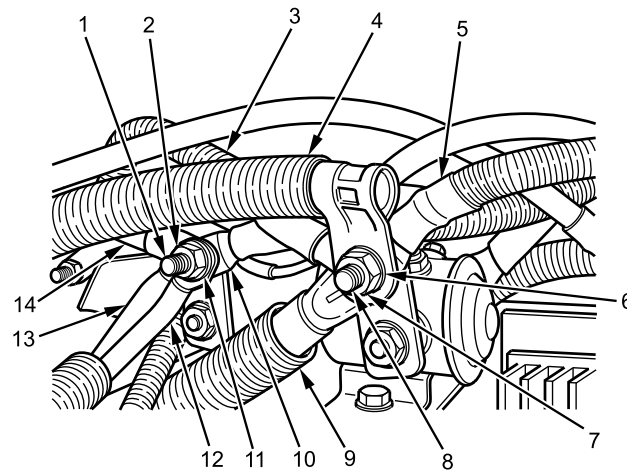
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.



B230604564

Figure 4. Equalizer Cable Installation.

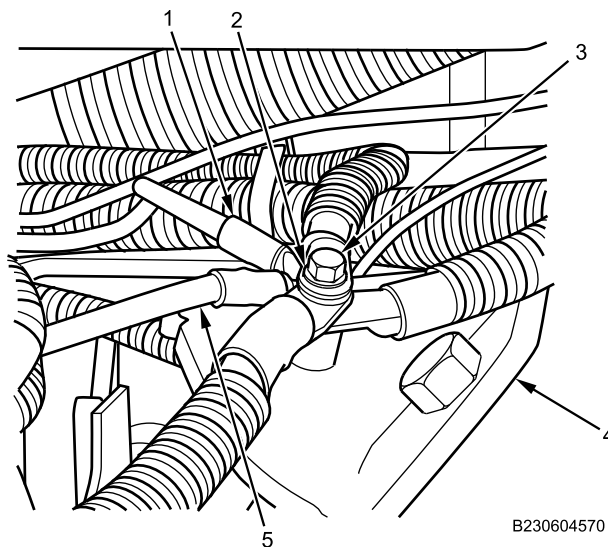
1. Apply dielectric grease to all cable ends (Figure 4, Item 8, 10, and 12).
2. Install 24V feed cable (Figure 4, Item 8) on equalizer (Figure 4, Item 13) with bolt (Figure 4, Item 7), new lockwasher (Figure 4, Item 6), and nut (Figure 4, Item 5). Tighten nut securely.
3. Install 12V feed cable (Figure 4, Item 10) on equalizer (Figure 4, Item 13) with bolt (Figure 4, Item 9), new lockwasher (Figure 4, Item 4), and nut (Figure 4, Item 3). Tighten nut securely.
4. Install ground cable (Figure 4, Item 12) on equalizer (Figure 4, Item 13) with bolt (Figure 4, Item 11), new lockwasher (Figure 4, Item 2), and nut (Figure 4, Item 1). Tighten nut securely.

EQUALIZER CABLES REMOVAL AND INSTALLATION - (CONTINUED)

B230604563

Figure 5. Equalizer Positive Cable Installation at 12/24V Solenoids.

5. Install two instrument panel feed harness cables (Figure 5, Item 12 and 13), and front and rear equalizer cable assemblies (Figure 5, Item 10 and 14) on 12V solenoid stud (Figure 5, Item 1) with new lockwasher (Figure 5, Item 11) and nut (Figure 5, Item 2). Tighten nut securely.
6. Install 24V body feed harness cables (Figure 5, Item 4 and 9) and front and rear equalizer cable assemblies (Figure 5, Item 3 and 5) on 24V solenoid stud (Figure 5, Item 8) with new lockwasher (Figure 5, Item 6) and nut (Figure 5, Item 7). Tighten nut securely.



B230604570

Figure 6. Equalizer Negative Cable Installation.

7. Install negative cables (Figure 6, Item 1 and 5) on inner wheel deflector bracket (Figure 6, Item 4) with flat washer (Figure 6, Item 2) and bolt (Figure 6, Item 3). Tighten bolt securely.

END OF TASK

EQUALIZER CABLES REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn off engine (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

BATTERY EQUALIZER REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Lockwasher - (3) (WP 0796, Item 176)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Belly armor removed (WP 0606)
Batteries removed (WP 0418)
Inboard air tank removed (WP 0499)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

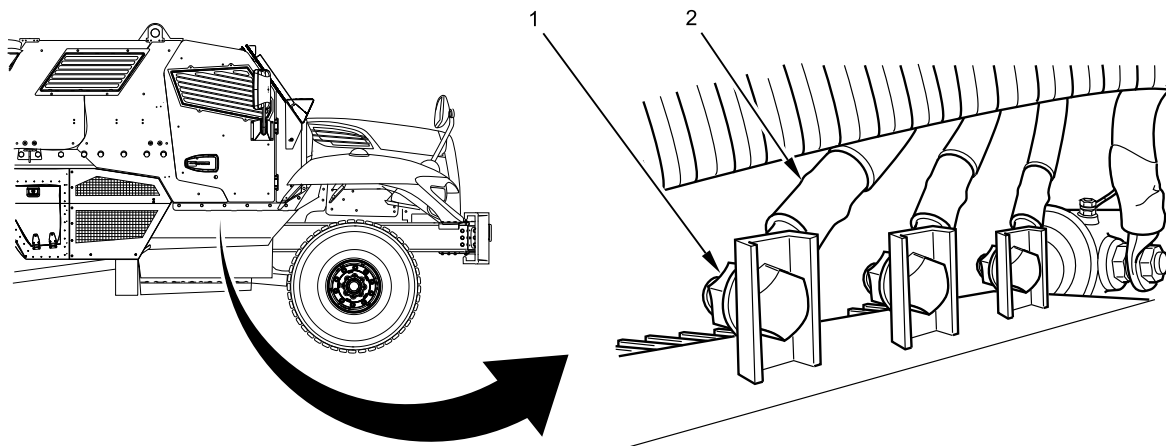
BATTERY EQUALIZER REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

This procedure applies to both equalizers. One equalizer shown.

Label all wires before removal to aid in installation.

REMOVAL

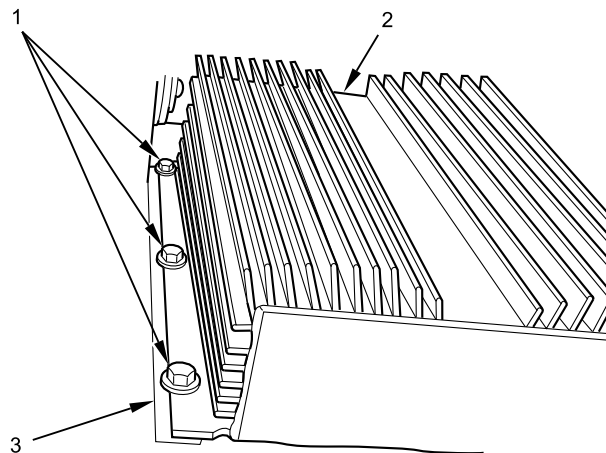
1. Remove three nuts, lockwashers, and bolts (Figure 1, Item 1) securing cables (Figure 1, Item 2) to equalizer. Discard lockwashers.



B230610145

Figure 1. Battery Equalizer Wiring.

2. Remove six nuts and flat washers from bolts (Figure 2, Item 1) securing equalizer (Figure 2, Item 2) and equalizer support bracket (Figure 2, Item 3) to battery box.



B230602112

Figure 2. Equalizer Removal.

3. Remove equalizer (Figure 2, Item 2) and equalizer support bracket (Figure 2, Item 3) from vehicle.
4. Remove bolts (Figure 2, Item 1) and flat washers from battery equalizer (Figure 2, Item 2) and separate equalizer from support bracket (Figure 2, Item 3).

END OF TASK

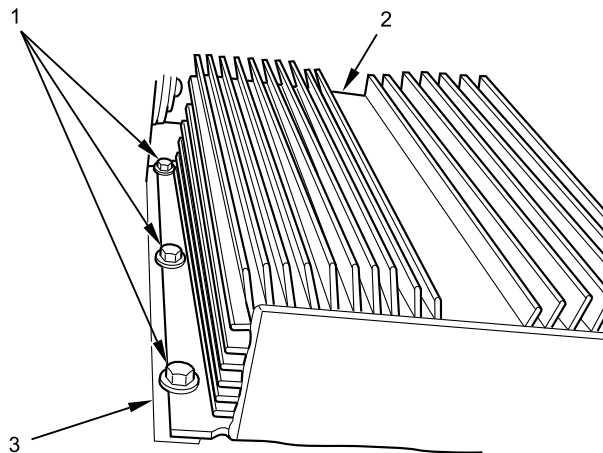
BATTERY EQUALIZER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position equalizer (Figure 3, Item 2) on support bracket (Figure 3, Item 3).



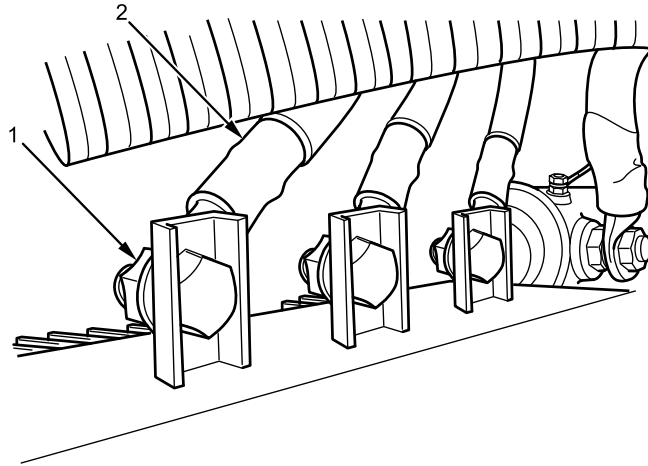
B230602112

Figure 3. Battery Equalizer Installation.

2. Install six bolts (Figure 3, Item 1) and flat washers through holes in equalizer (Figure 3, Item 2) and support bracket (Figure 3, Item 3).
3. Position equalizer (Figure 3, Item 2) and support bracket (Figure 3, Item 3) on battery box.
4. Install six nuts and flat washers on bolts (Figure 3, Item 1). Tighten bolts securely.

BATTERY EQUALIZER REMOVAL AND INSTALLATION - (CONTINUED)

5. Install cables (Figure 4, Item 2) on equalizer with three nuts, bolts (Figure 4, Item 1) and new lockwashers. Tighten nuts securely.



B230601483

Figure 4. Equalizer Wiring.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install inboard air tank (WP 0499).
2. Install batteries (WP 0418).
3. Install belly armor (WP 0606).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Start engine (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Tape (WP 0794, Item 52)
Cable lock straps - (8) (WP 0796, Item 100)
Cable lock straps - (3) (WP 0796, Item 151)
Lockwasher (WP 0796, Item 182)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
Belly armor removed (WP 0606)
Left side engine armor plate removed (WP 0597)
Left engine armor plate bracket removed (WP 0598)
Left inner wheel deflector armor plate removed (WP 0602)
Air cleaner assembly removed (WP 0257)

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Hood is extremely heavy. Ensure there is adequate space to open hood completely without pinning personnel between hood and another structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

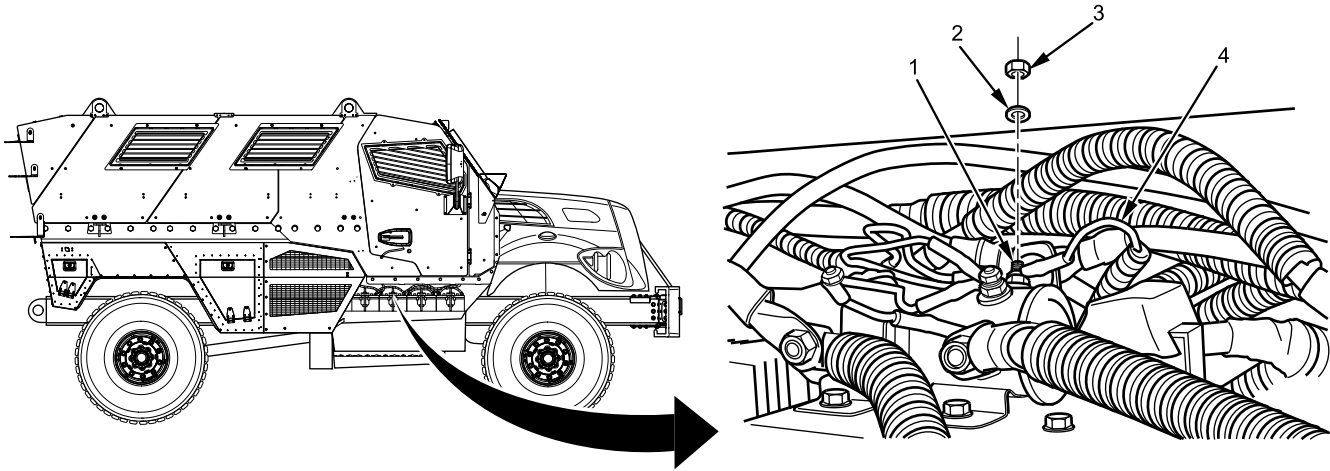
MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

Note location of cable lock straps and electrical tape to aid in installation.

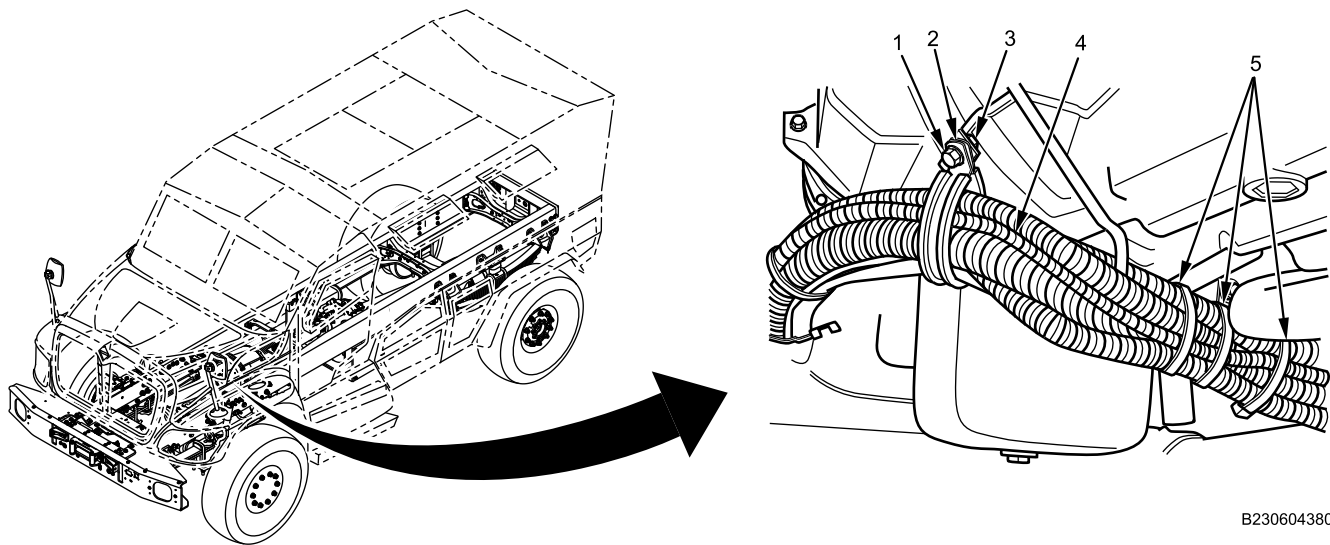
1. Remove nut (Figure 1, Item 3), lockwasher (Figure 1, Item 2), and master disconnect harness connector (Figure 1, Item 4) from 12V solenoid terminal (Figure 1, Item 1). Discard lockwasher.



B230604379

Figure 1. Master Disconnect Harness Removal at Solenoid.

2. Remove nut (Figure 2, Item 3) and bolt (Figure 2, Item 1) from harness strap (Figure 2, Item 2) at transmission housing.



B230604380

Figure 2. Master Disconnect Harness Removal at Transmission.

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

3. Open harness strap (Figure 2, Item 2) and remove master disconnect harness (Figure 2, Item 4).
4. Remove and discard cable lock straps (Figure 2, Item 5) from master disconnect harness (Figure 2, Item 4) as required to remove harness from bundle.
5. Remove and discard cable lock straps (Figure 3, Item 2) from PDC harness assembly (Figure 3, Item 1).

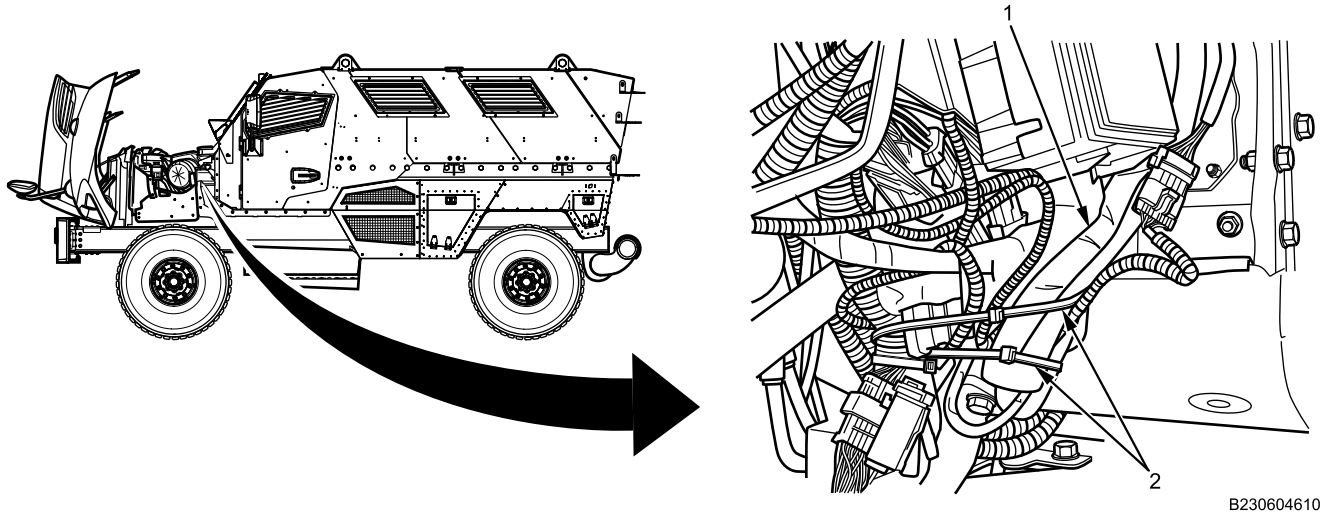
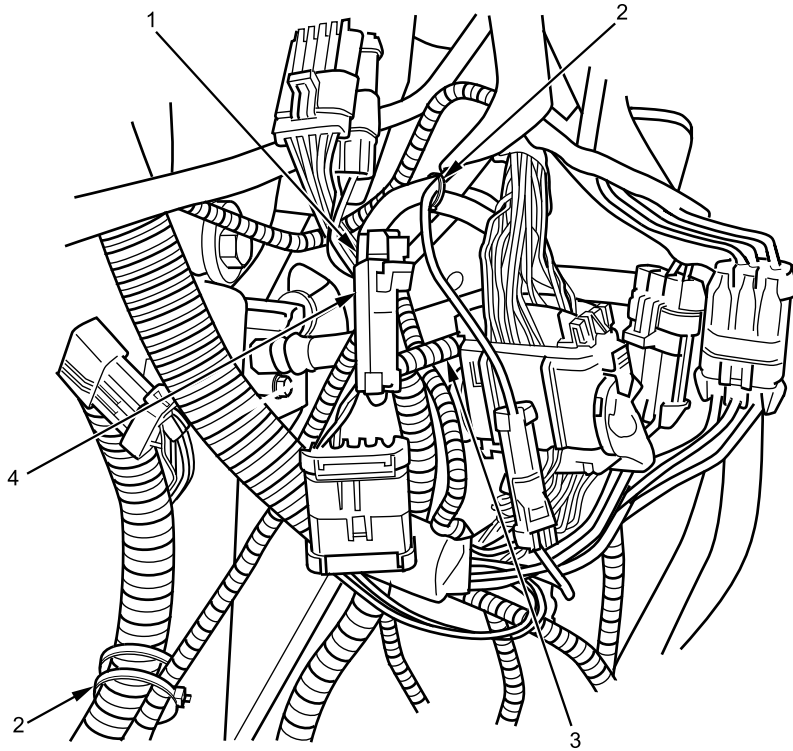


Figure 3. Master Disconnect Harness at PDC Harness.

6. Unfold harness assembly (Figure 3, Item 1) to access connectors.

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

7. Disconnect master disconnect harness connector (Figure 4, Item 4) from PDC harness in-line connector (Figure 4, Item 1).



B230604382

Figure 4. Master Disconnect Harness at PDC Harness.

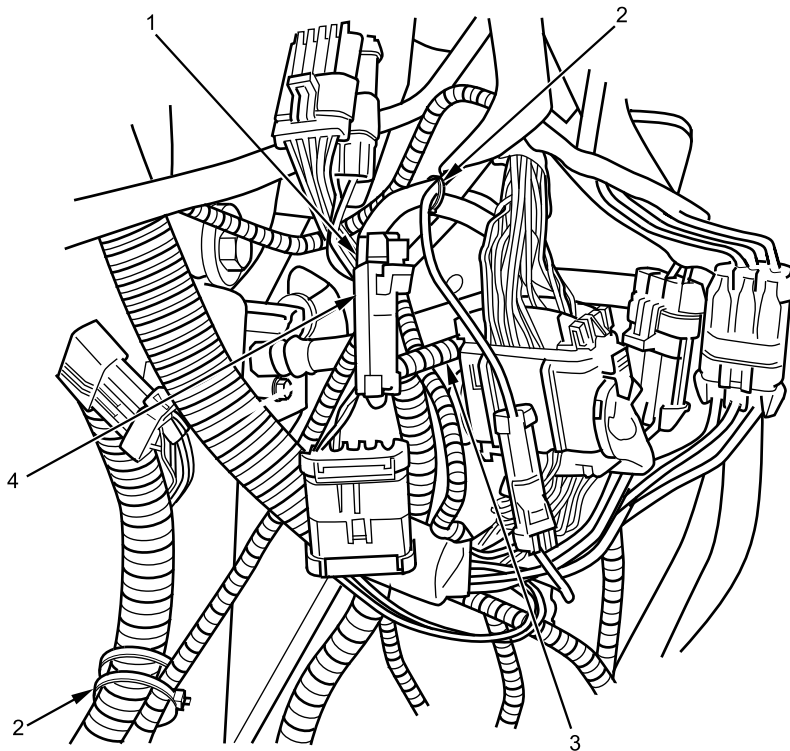
8. Remove cable lock straps (Figure 4, Item 2) from master disconnect harness (Figure 4, Item 3) as required to remove harness from bundle. Discard cable lock straps (Figure 4, Item 2).
9. Remove electrical tape from harness as required to facilitate removal process. Discard old tape.
10. Remove master disconnect harness (Figure 4, Item 3) from vehicle.

END OF TASK

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to all harness connector ends.



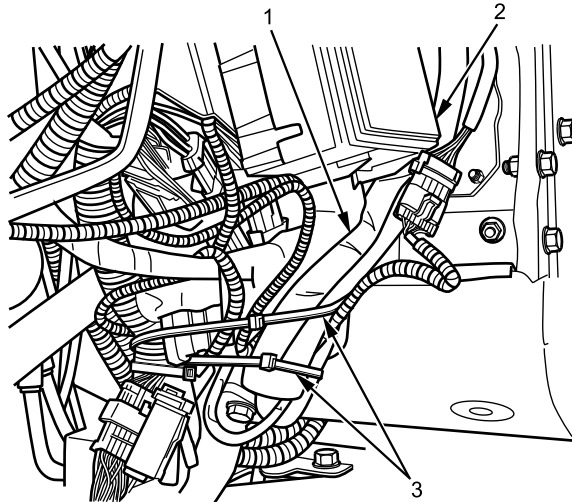
B230604382

Figure 5. Master Disconnect Harness Connectors at PDC Harness.

2. Position master disconnect harness (Figure 5, Item 3) on vehicle.
3. Connect master disconnect harness connector (Figure 5, Item 4) to PDC harness in-line connector (Figure 5, Item 1).
4. Install new cable lock straps (Figure 5, Item 2) and electrical tape on master disconnect harness (Figure 5, Item 3) as required to secure harness to bundle.

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

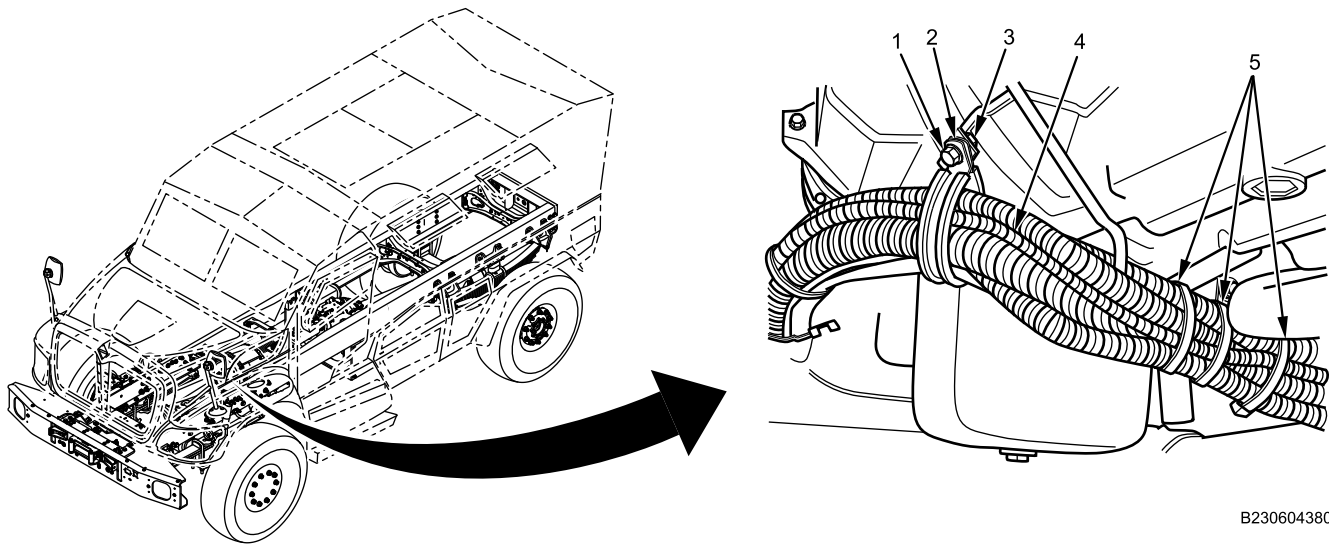
5. Tuck PDC harness (Figure 6, Item 1) under PDC (Figure 6, Item 2). Secure with new cable lock straps and electrical tape (Figure 6, Item 3).



B230604381

Figure 6. Master Disconnect Harness Installation at PDC Harness.

6. Slide master disconnect harness (Figure 7, Item 4) through harness strap (Figure 7, Item 2).



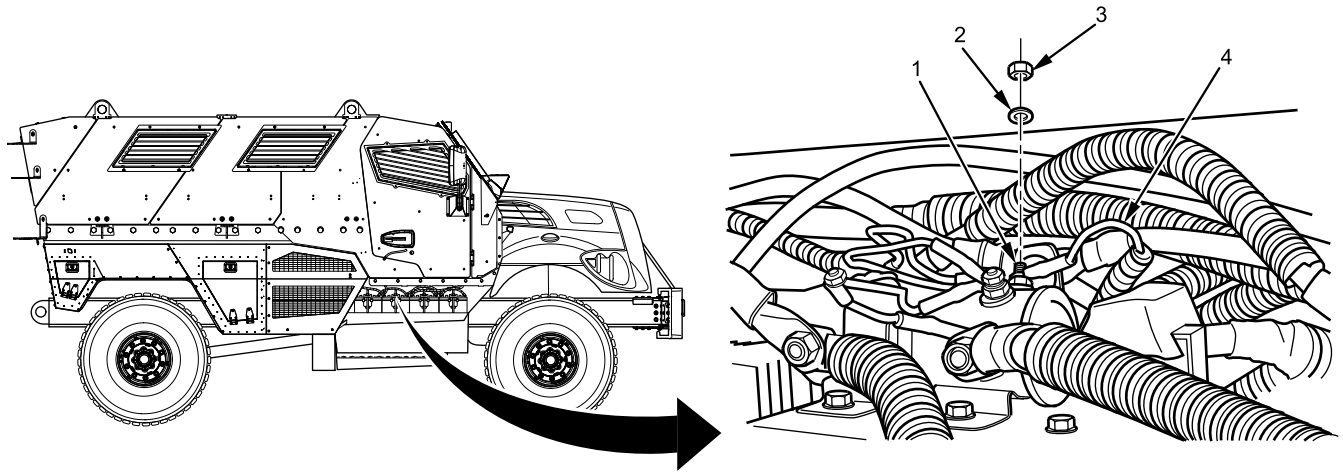
B230604380

Figure 7. Master Disconnect Harness Installation at Transmission.

7. Secure harness strap (Figure 7, Item 2) on transmission housing with nut (Figure 7, Item 3) and bolt (Figure 7, Item 1). Tighten securely.
8. Install new cable lock straps (Figure 7, Item 5) on master disconnect harness (Figure 7, Item 4) as required to secure harness to bundle.

MASTER DISCONNECT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

9. Install master disconnect harness connector (Figure 8, Item 4) on 12V solenoid terminal stud (Figure 8, Item 1) with new lockwasher (Figure 8, Item 2) and nut (Figure 8, Item 3). Tighten securely.



B230604379

Figure 8. Master Disconnect Harness Installation at Solenoid.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Start engine (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Install air cleaner assembly (WP 0257).
7. Install left inner wheel deflector armor plate (WP 0602).
8. Install left engine armor plate bracket (WP 0598).
9. Install left side engine armor plate (WP 0597).
10. Install belly armor (WP 0606).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
110V INVERTER REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

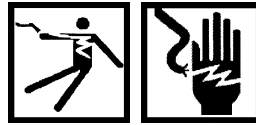
Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 49)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

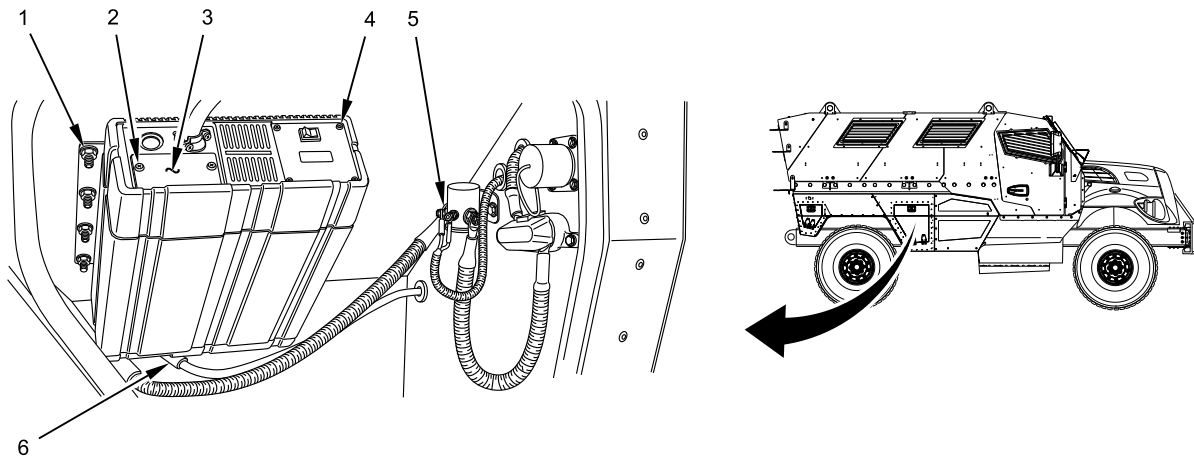
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Label all wires before removal to aid installation.

110V INVERTER REMOVAL AND INSTALLATION - (CONTINUED)

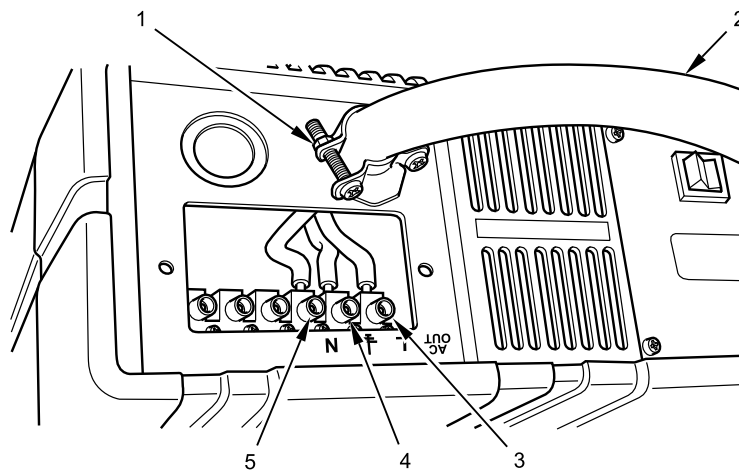
REMOVAL



B230612263

Figure 1. 110V Inverter Wiring.

1. Remove two screws (Figure 1, Item 2) securing cover (Figure 1, Item 3) to inverter (Figure 1, Item 4) and remove cover.

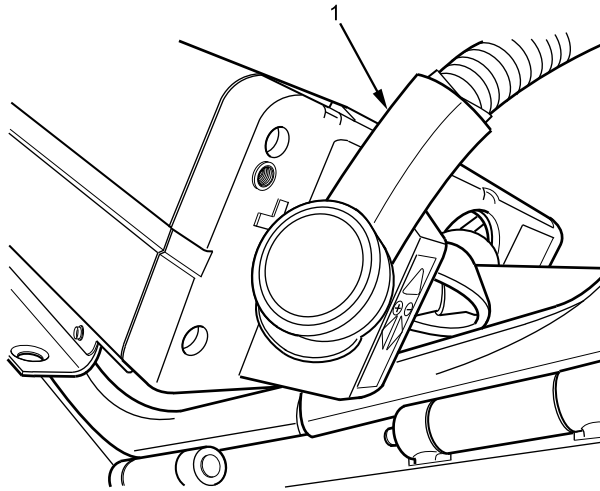


B230600290

Figure 2. Inverter Circuit Connections.

2. Loosen terminals (Figure 2, Item 3, 4, and 5) securing wires to inverter (Figure 1, Item 4).
3. Loosen nut and screw (Figure 2, Item 1) on harness retainer and pull harness (Figure 2, Item 2) out of inverter (Figure 1, Item 4).
4. Remove nut (Figure 1, Item 5) and lock washer securing positive cable to 110V battery disconnect switch. Discard old lock washer.
5. Remove nut and lock washer securing ground cable (Figure 1, Item 6) to inverter (Figure 1, Item 4). Discard old lock washer.
6. Remove eight lock flanged nuts (Figure 1, Item 1) securing inverter (Figure 1, Item 4) to stowage bin and remove inverter.
7. Set inverter (Figure 1, Item 4) on floor of stowage box.

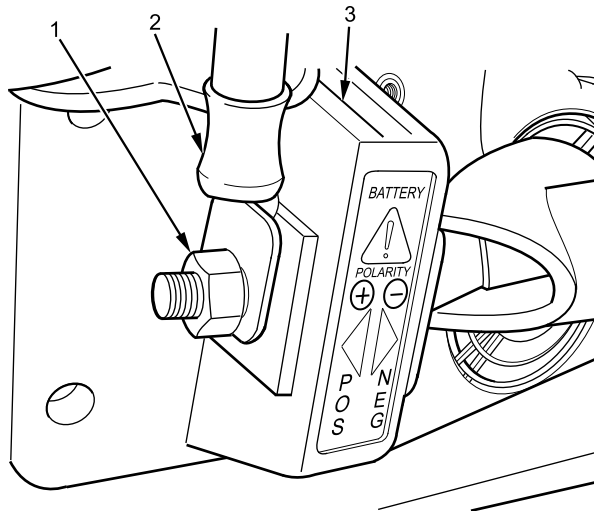
110V INVERTER REMOVAL AND INSTALLATION - (CONTINUED)



B230601438

Figure 3. Positive Cable Cover.

8. Slide positive cable cover (Figure 3, Item 1) up on harness.



B230601439

Figure 4. Inverter Positive Cable.

9. Remove nut and lock washer (Figure 4, Item 1) securing positive cable (Figure 4, Item 2) to inverter (Figure 4, Item 3) and remove cable. Discard old lock washers.

END OF TASK

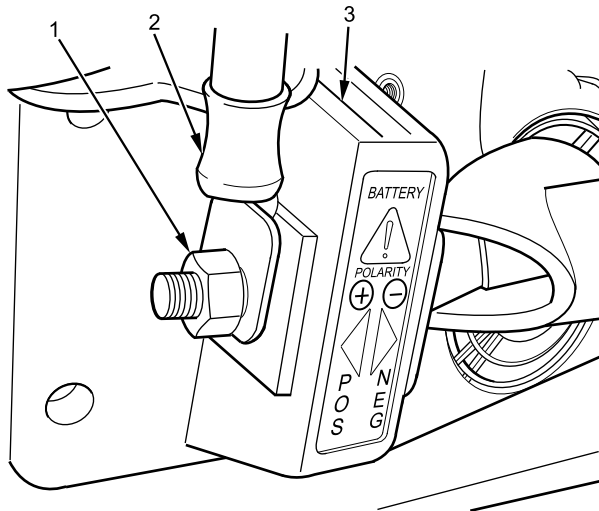
110V INVERTER REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

Ensure cable covers are installed to protect cables.

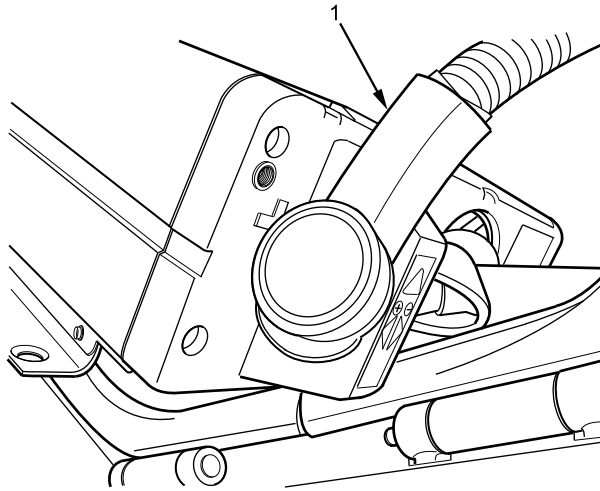


B230601439

Figure 5. 110V Inverter Positive Cable Installation.

1. Position positive cable (Figure 5, Item 2) to inverter (Figure 5, Item 3) and install nut with new lock washer. (Figure 5, Item 1) Tighten securely.

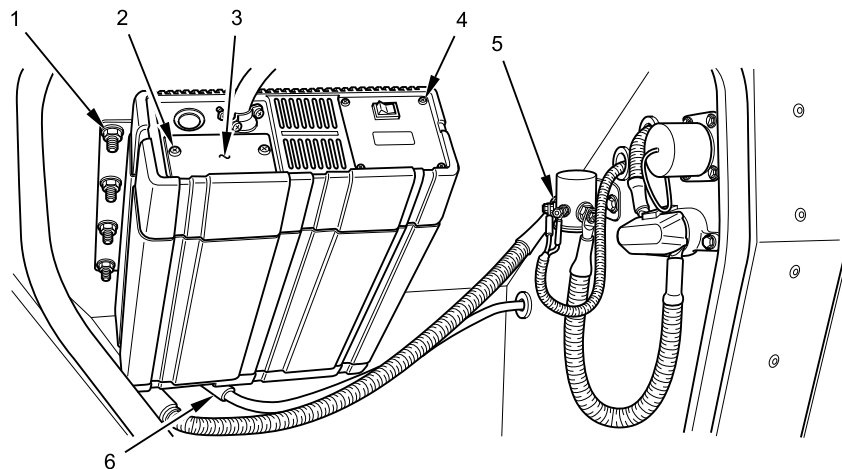
110V INVERTER REMOVAL AND INSTALLATION - (CONTINUED)



B230601438

Figure 6. Positive Cable Cover.

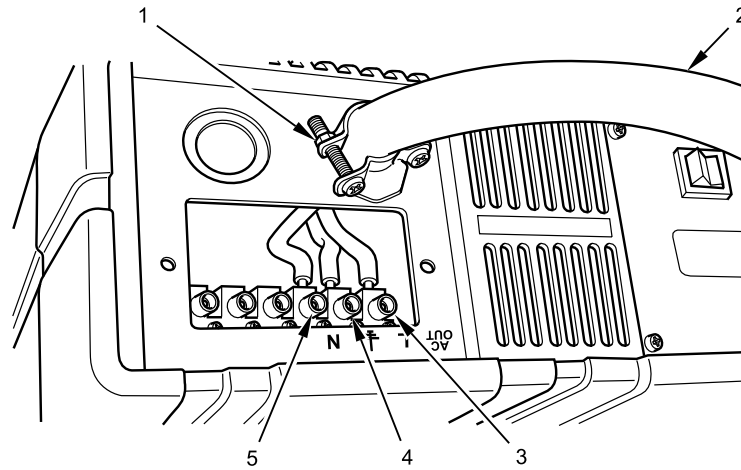
2. Slide positive cable cover (Figure 6, Item 1) down on harness to cover cable end.



B230600289

Figure 7. 110V Inverter Installation

3. Position inverter (Figure 7, Item 4) to stowage bin and install eight flanged nuts (Figure 7, Item 1). Tighten securely.
4. Position ground cable (Figure 7, Item 6) to inverter (Figure 7, Item 4) and install new lock washer with nut. Tighten securely.
5. Position positive cable (Figure 7, Item 5) on 110V battery disconnect switch and install new lock washer with nut. Tighten securely.

110V INVERTER REMOVAL AND INSTALLATION - (CONTINUED)

B230600290

Figure 8. 110V Inverter Connections.

6. Insert cable (Figure 8, Item 2) through retainer on inverter and tighten screw and nut (Figure 8, Item 1) securely.
7. Connect wires to inverter terminals as follows and tighten securely:
 - a. GREEN wire to center ground terminal (Figure 8, Item 4).
 - b. WHITE wire to N terminal (Figure 8, Item 5).
 - c. BLACK wire to L terminal (Figure 8, Item 3).
8. Install wiring cover (Figure 7, Item 3) with two screws (Figure 7, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify inverter operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Sealing compound (WP 0794, Item 43)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Batteries disconnected (WP 0404)
ESC cover removed (WP 0354)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

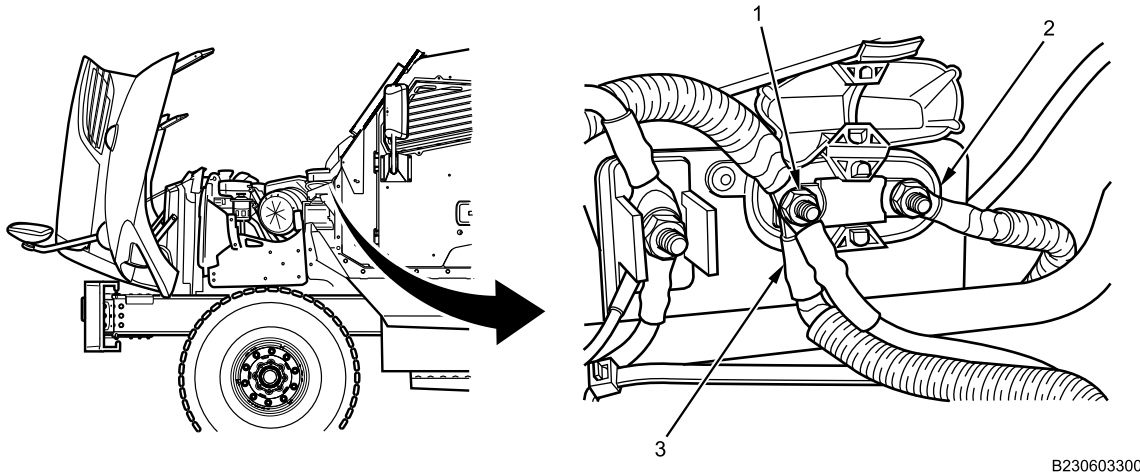
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Label all wires before removal.

REMOVAL

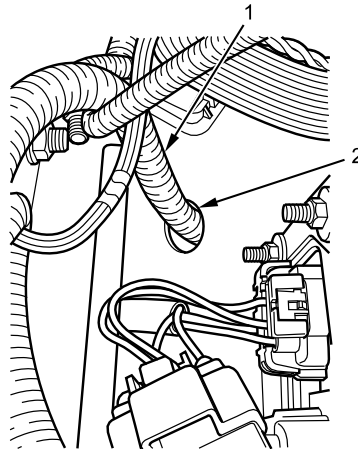
1. Remove nut (Figure 1, Item 1) securing positive cable (Figure 1, Item 3) to underhood fuse holder (Figure 1, Item 2).



B230603300

Figure 1. ESC Wiring.

2. Pull wire (Figure 2, Item 1) from underhood fuse holder (Figure 1, Item 2) through opening (Figure 2, Item 2) in dash and cut sealing compound as necessary.



B230601426

Figure 2. Power Wire.

ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION - (CONTINUED)

3. Disconnect five ESC connectors (Figure 3, Item 1).

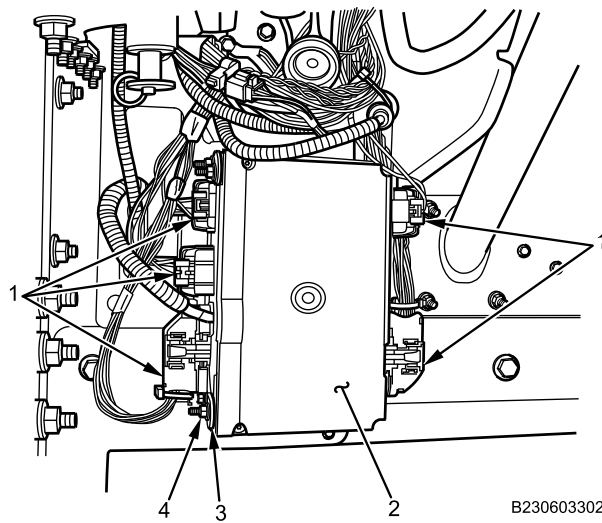


Figure 3. ESC Removal.

4. Remove four nuts (Figure 3, Item 4) securing ESC (Figure 3, Item 2) to bracket (Figure 3, Item 3).

END OF TASK

ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position ESC (Figure 4, Item 2) on bracket (Figure 4, Item 3) and install four nuts (Figure 4, Item 4) and tighten securely.

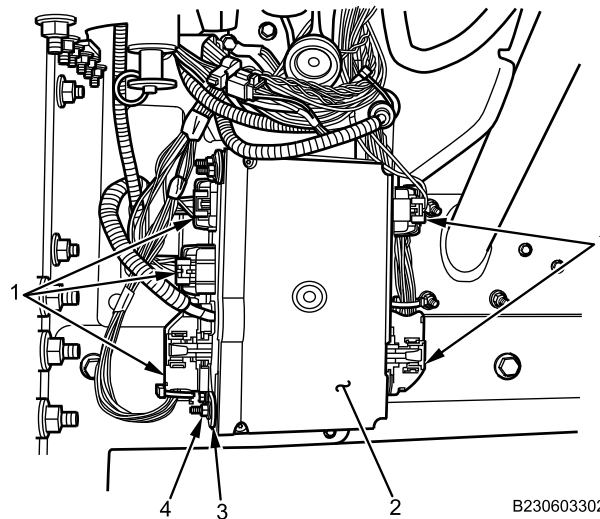
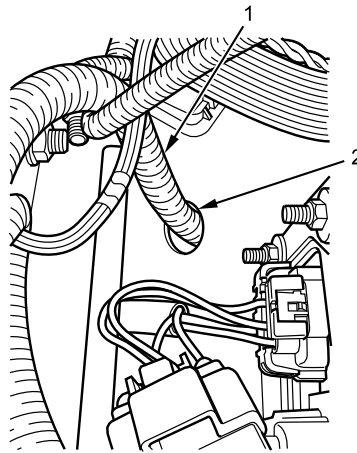


Figure 4. ESC Installation.

2. Connect five electrical connectors (Figure 4, Item 1) on ESC (Figure 4, Item 2).

ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION - (CONTINUED)

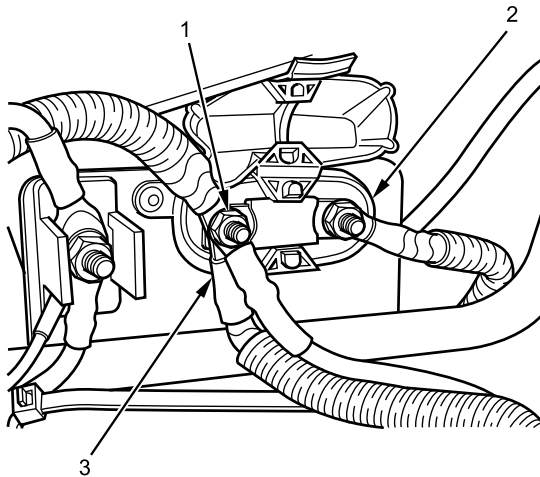
3. Feed power wire (Figure 5, Item 1) through opening (Figure 5, Item 2) in dash.



B230601426

Figure 5. ESC Power Wire.

4. Apply sealing compound to casing on power wire (Figure 5, Item 1) and around pass-thru opening (Figure 5, Item 2) to seal.
5. Position wire (Figure 6, Item 3) to underhood fuse holder (Figure 6, Item 2).



B230603301

Figure 6. Positive Cable to Fuse Holder.

6. Install nut (Figure 6, Item 1) and tighten securely.

END OF TASK

ELECTRONIC SYSTEM CONTROLLER (ESC) REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Connect batteries (WP 0404).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Install ESC cover (WP 0354).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Gloves, rubber (WP 0795, Item 38)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Sealing compound (WP 0794, Item 43)
Cable lock strap (WP 0796, Item 124)

Equipment Condition

Engine off (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Parking brake set (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
ESC removed (WP 0353)

References

TM 9-2355-106-10

WARNING

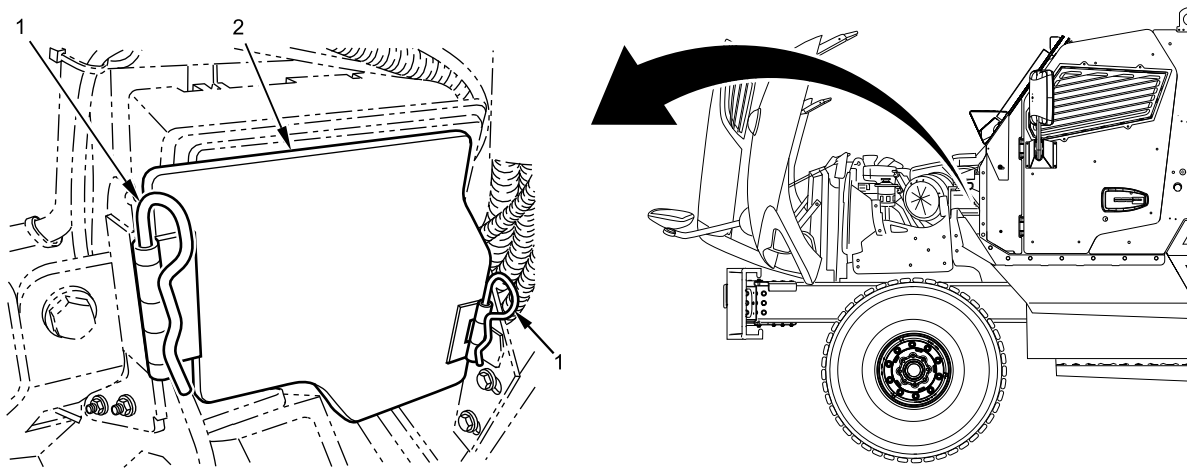


Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION - (CONTINUED)

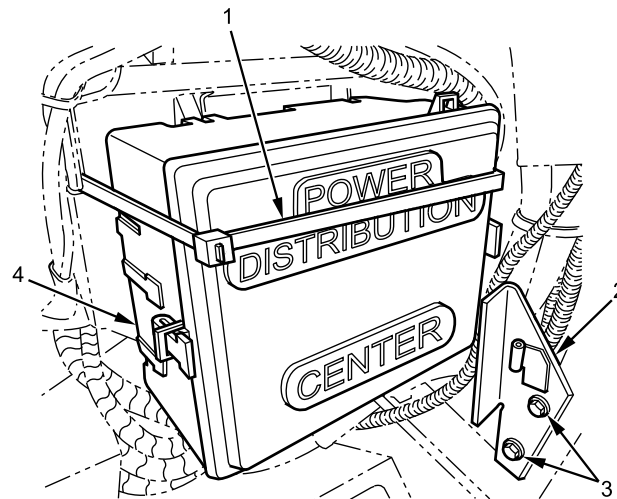
REMOVAL



B230604435

Figure 1. Power Distribution Center (PDC) Armor.

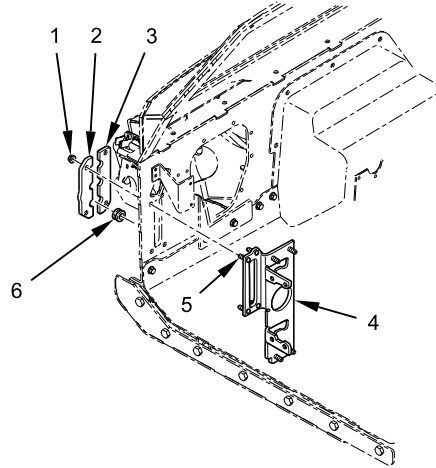
1. Remove two locking pins (Figure 1, Item 1) and PDC armor plate (Figure 1, Item 2).



B230604436

Figure 2. PDC.

2. Remove and discard PDC cover cable lock strap (Figure 2, Item 1). Push PDC (Figure 2, Item 4) aside as necessary for access.
3. Remove two bolts (Figure 2, Item 3) and nuts from PDC armor plate cover bracket (Figure 2, Item 2).

ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION - (CONTINUED)

B230610223

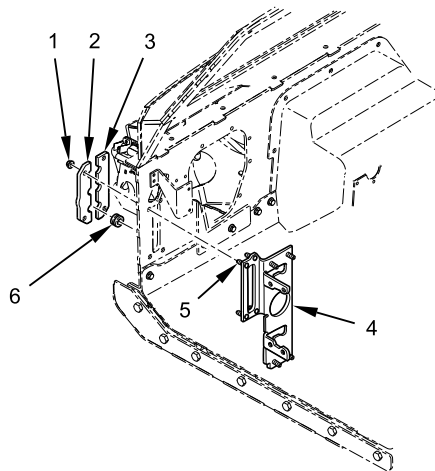
Figure 3. ESC Brace and Pass-Through.

4. Remove four nuts (Figure 3, Item 1) from ESC brace studs (Figure 3, Item 5).
5. Remove left and right covers (Figure 3, Item 2 and 3) and three grommets (Figure 3, Item 6).
6. Remove sealing compound as necessary and remove ESC brace (Figure 3, Item 4).
7. Remove remaining loose sealing compound.

END OF TASK

ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION



B230610223

Figure 4. ESC Brace and Pass-Through.

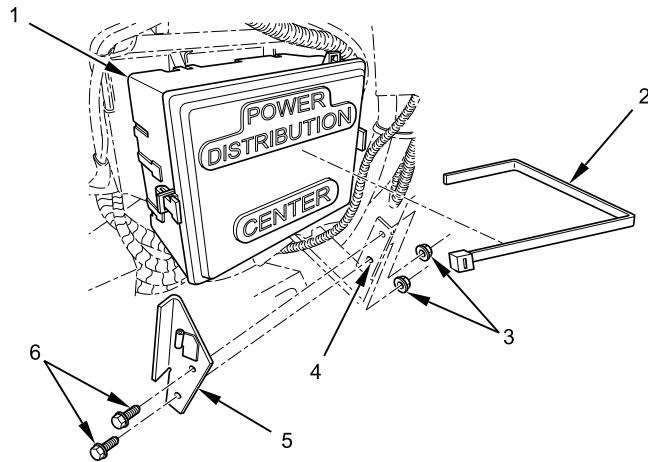
1. Install ESC brace (Figure 4, Item 4) by aligning four studs (Figure 4, Item 5) to four holes in firewall.
2. Install three grommets (Figure 4, Item 6) with left and right covers (Figure 4, Item 2 and 3) on ESC brace studs (Figure 4, Item 5).

WARNING

Sealing compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

3. Apply sealing compound around grommets (Figure 4, Item 6) from inside of cabin to fill gaps.
4. Install four nuts (Figure 4, Item 1) on ESC bracket studs (Figure 4, Item 4) and tighten securely.

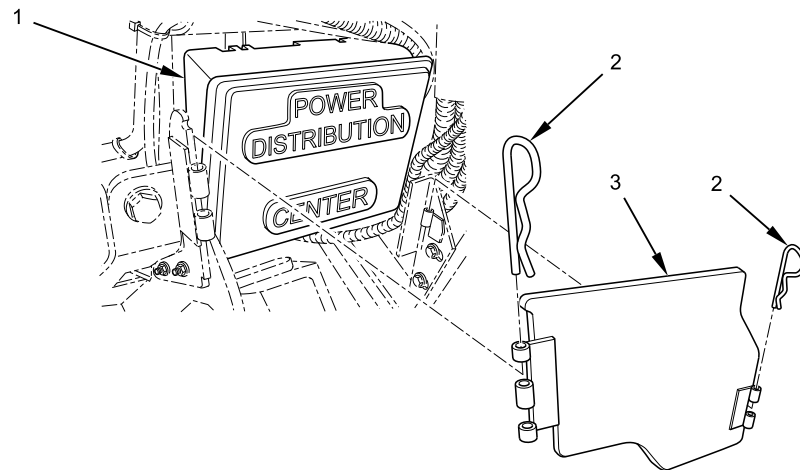
ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION - (CONTINUED)



B230604439

Figure 5. PDC.

5. Align holes in PDC armor plate cover bracket (Figure 5, Item 5) with holes (Figure 5, Item 4) on firewall. Install two bolts (Figure 5, Item 6) and nuts (Figure 5, Item 3) and tighten securely.
6. Secure PDC (Figure 5, Item 1) to mounting bracket with new cable lock strap (Figure 5, Item 2). Cut off excess strap and discard.



B230604440

Figure 6. PDC Armor.

7. Install armor plate (Figure 6, Item 3) on PDC (Figure 6, Item 1) and secure with clips (Figure 6, Item 2).

END OF TASK

ELECTRONIC SYSTEM CONTROLLER (ESC) BRACE REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install ESC (WP 0353).
2. Close engine hood (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**ANTILOCK BRAKE SYSTEM (ABS) CONTROL MODULE REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Battery cables disconnected (WP 0404)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

WARNING

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ANTILOCK BRAKE SYSTEM (ABS) CONTROL MODULE REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect outboard instrument panel harness BLACK connector 4953 (Figure 1, Item 4) and inboard instrument panel harness GRAY connector 4954 (Figure 1, Item 5) from ABS control module (Figure 1, Item 2).

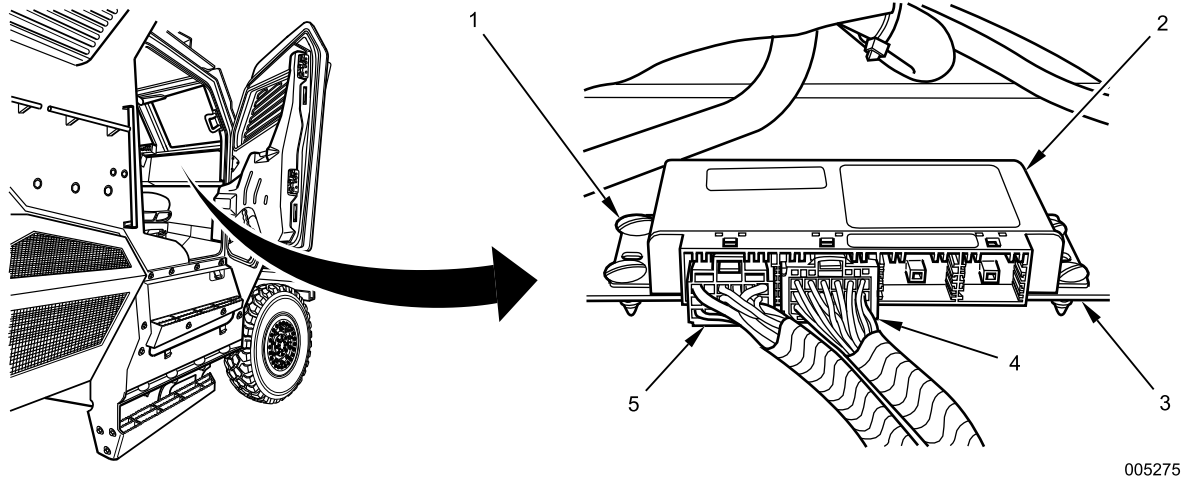


Figure 1. ABS Control Module.

2. Remove four fasteners (Figure 1, Item 1) and remove ABS control module (Figure 1, Item 2).

END OF TASK**INSTALLATION**

1. Install ABS control module (Figure 1, Item 2) under passenger side of instrument panel (Figure 1, Item 3), with four fasteners (Figure 1, Item 1).
2. Connect outboard instrument panel harness BLACK connector 4953 (Figure 1, Item 4) and inboard instrument panel harness GRAY connector 4954 (Figure 1, Item 5) on ABS control module (Figure 1, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Connect battery cables (WP 0404).
2. Remove wheel chocks (TM 9-2355-106-10).
3. Test-drive vehicle to verify ABS control module operation.
4. Set parking brake (TM 9-2355-106-10).
5. Set transmission in NEUTRAL (N) (TM 9-2355-106-10).
6. Turn engine off (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT CREW LIGHT REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

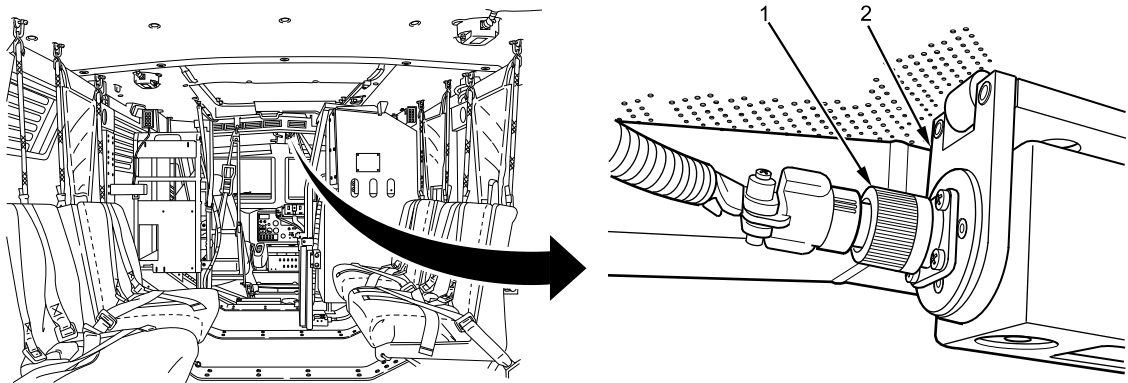
TM 9-2355-106-23P

WARNING

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REMOVAL

1. Twist connector (Figure 1, Item 1) and remove from front crew light (Figure 1, Item 2).

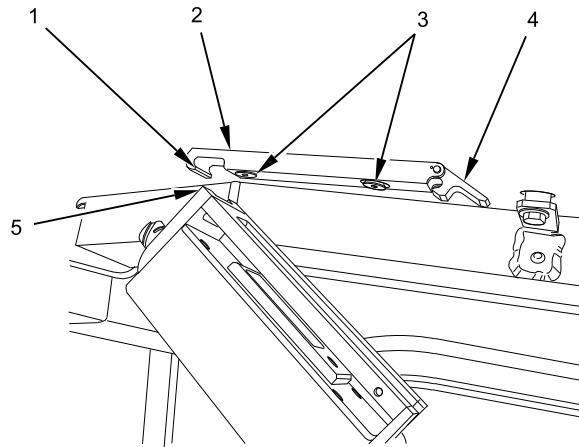


D230613418

Figure 1. Front Crew Light Wiring.

FRONT CREW LIGHT REMOVAL AND INSTALLATION - (CONTINUED)

2. Press release lever (Figure 2, Item 4) up to disengage front crew light from bracket (Figure 2, Item 2).



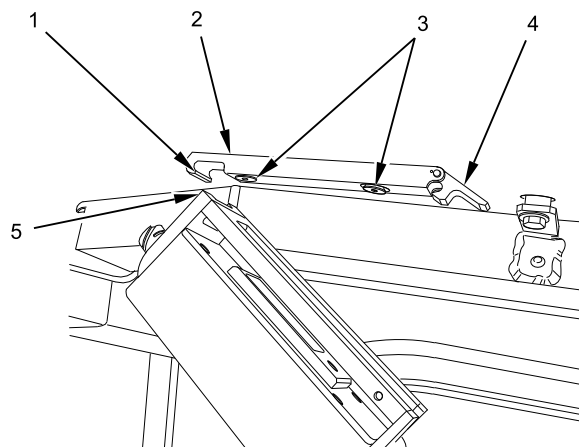
B230601375

Figure 2. Front Crew Light Removal.

3. Tilt front crew light down and pull forward to disengage rear tab (Figure 2, Item 5) from bracket notch (Figure 2, Item 1).
4. Remove two screws (Figure 2, Item 3) securing bracket (Figure 2, Item 2) to roof and remove bracket.

END OF TASK**INSTALLATION**

1. Position bracket (Figure 3, Item 2) on roof and install two screws (Figure 3, Item 3) and tighten securely.



B230601375

Figure 3. Front Crew Light Installation.

2. Engage rear tab (Figure 3, Item 5) into bracket notch (Figure 3, Item 1).
3. Push front crew light upward to engage front release lever (Figure 3, Item 4).

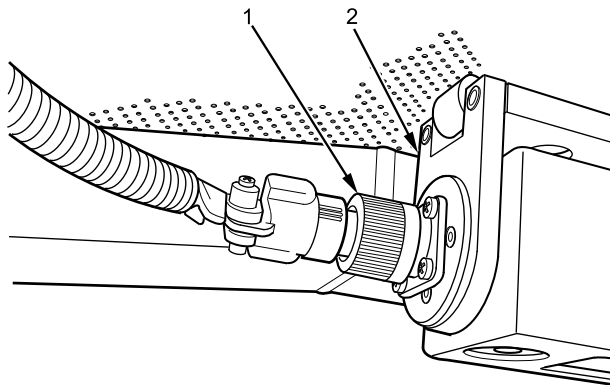
FRONT CREW LIGHT REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

4. Position front crew light connector (Figure 4, Item 1) on front crew light (Figure 4, Item 2) and twist to lock.



B230601373

Figure 4. Front Crew Light Wiring.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify crew light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**REAR CREW LIGHT REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

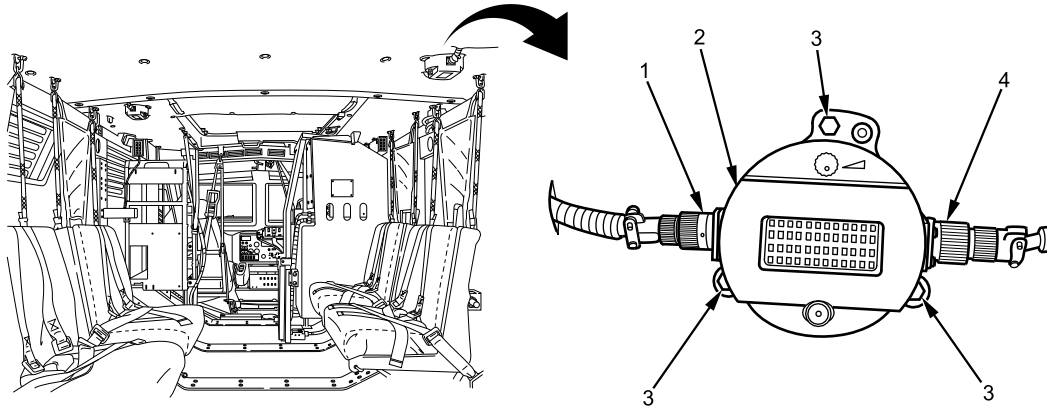
TM 9-2355-106-23P

WARNING

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REAR CREW LIGHT REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove two connectors (Figure 1, Item 1 and 4) from rear crew light (Figure 1, Item 2).



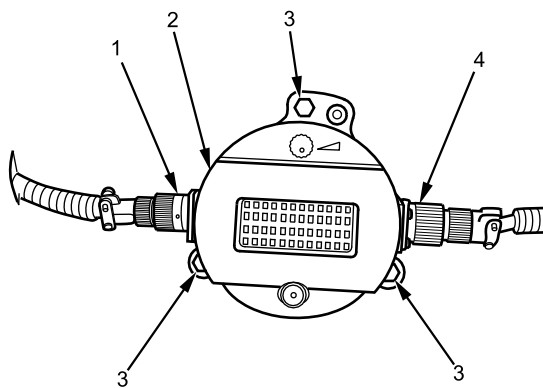
B230612265

Figure 1. Rear Crew Light Wiring.

2. Remove screws (Figure 1, Item 3) securing rear crew light to roof and remove rear crew light (Figure 1, Item 2).

END OF TASK**INSTALLATION**

1. Position rear crew light (Figure 2, Item 2) to roof.



B230610151

Figure 2. Rear Crew Light Installation.

2. Install screws (Figure 2, Item 3) and tighten securely.

REAR CREW LIGHT REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease to electrical connections.
4. Install two connectors (Figure 2, Item 1 and 4) on rear crew light (Figure 2, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify crew light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 49)
Cable lock strap - 4 (WP 0796, Item 134)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Rear door/ramp open (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Record location of cable lock straps before removing to aid in installation.

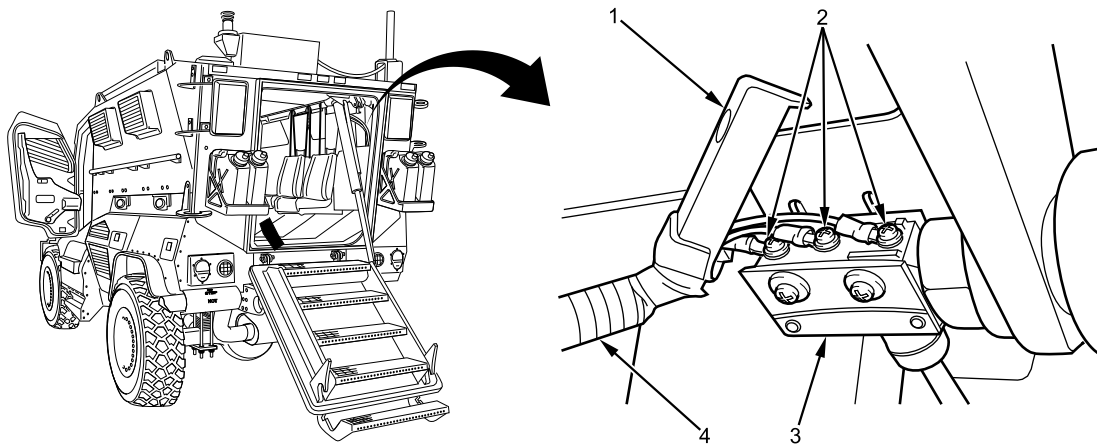
INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

CAUTION

Identify and label all crew light limit switch wires with wire tags to aid in installation. Failure to comply may result in damage to electrical system.

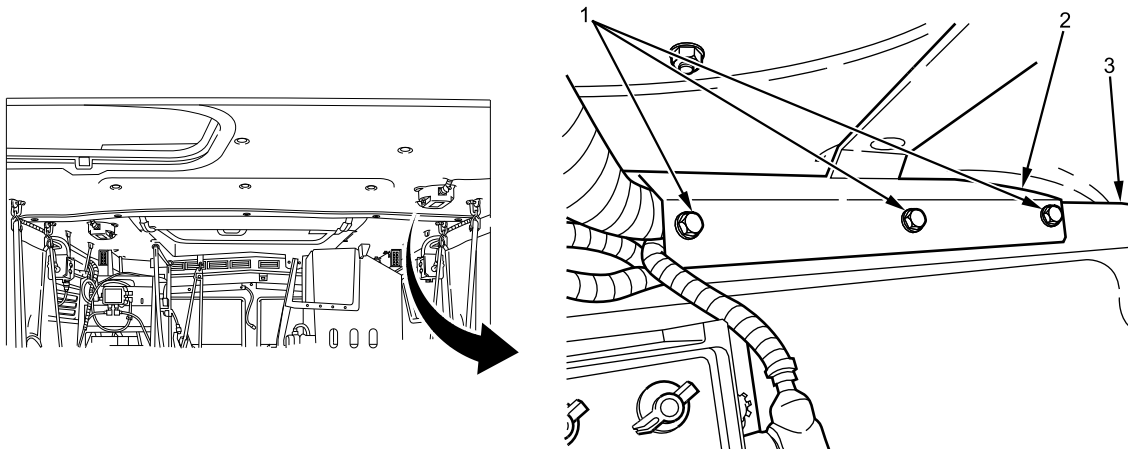
1. Lift crew light limit switch cover (Figure 1, Item 1) and remove three screws (Figure 1, Item 2) connecting crew light limit switch jumper harness (Figure 1, Item 4) to crew light limit switch (Figure 1, Item 3).



B230610182

Figure 1. Crew Light Limit Switch Connections.

2. Remove three bolts (Figure 2, Item 1), flat washers, and right rear cabin molding (Figure 2, Item 2) from right rear molding channel (Figure 2, Item 3).



B230604078

Figure 2. Right Rear Cabin Molding.

INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Crew light limit switch jumper harness connector is located in the right rear cabin molding channel.

3. Disconnect crew light limit switch jumper harness connector (Figure 3, Item 2) from front and right rear crew lights harness connector (Figure 3, Item 1). Remove and discard cable lock straps. Remove crew light limit switch jumper harness (Figure 3, Item 3).

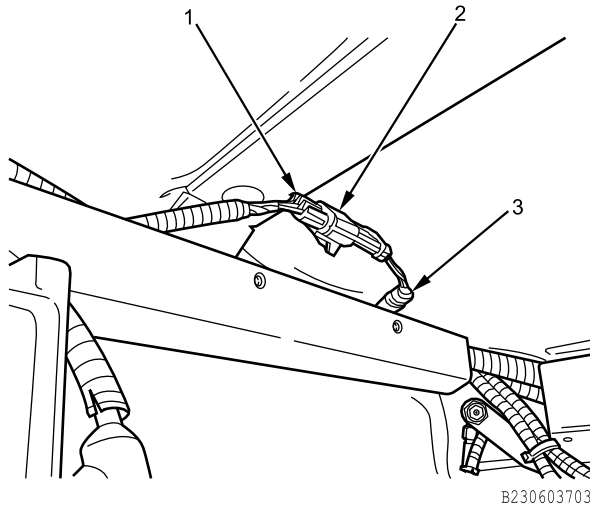


Figure 3. Crew Light Limit Switch Jumper Harness Connector.

END OF TASK

INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all interior lights harness electrical connections.

1. Connect crew light limit switch jumper harness connector (Figure 4, Item 2) to front and right rear crew lights harness connector (Figure 4, Item 1). Position crew light limit switch jumper harness (Figure 4, Item 3) along right rear cabin molding channel.

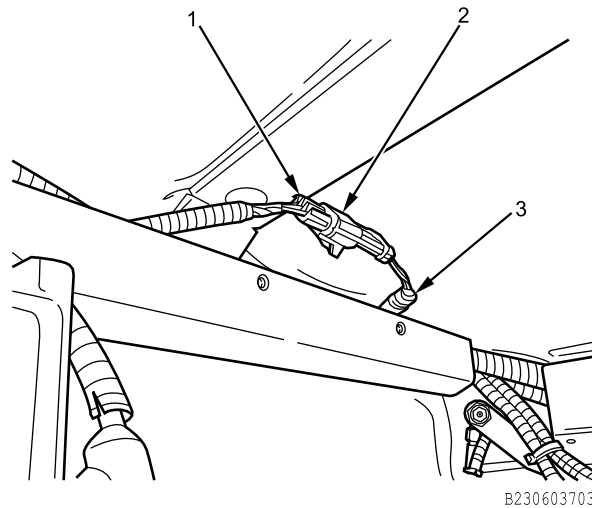
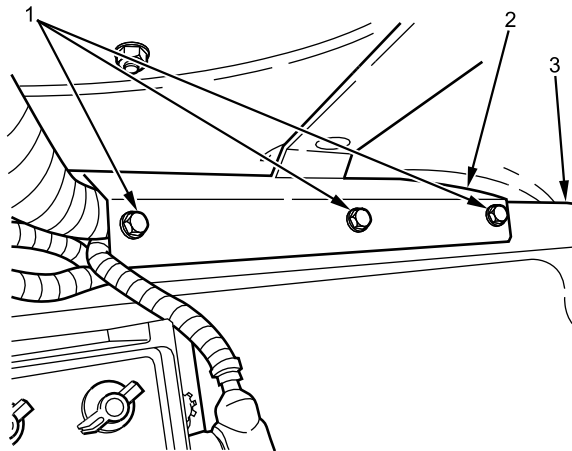


Figure 4. Crew Light Limit Switch Jumper Harness Connector.

INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

2. Install three flat washers and three bolts (Figure 5, Item 1) securing right rear cabin molding (Figure 5, Item 2) to right rear cabin molding channel (Figure 5, Item 3). Tighten bolts securely.



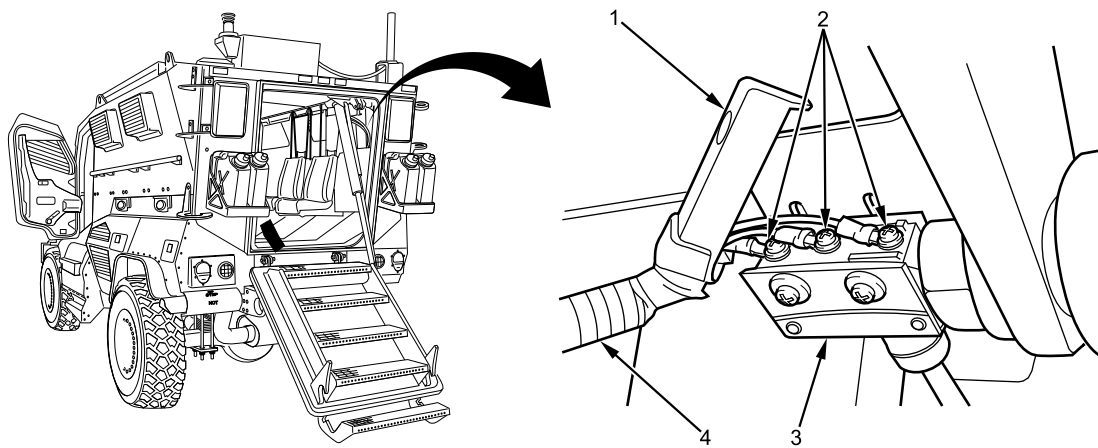
B230603702

Figure 5. Right Rear Cabin Molding.

CAUTION

Install crew light limit wires according to wire tag labeling. Failure to comply may result in damage to electrical system.

3. Install three screws (Figure 6, Item 2) connecting crew light limit switch jumper harness (Figure 6, Item 4) to crew light limit switch (Figure 6, Item 3). Tighten screws securely.



B230610182

Figure 6. Crew Light Limit Switch Connections.

4. Close and secure crew light limit switch cover (Figure 6, Item 1).
5. Install new cable lock straps.

END OF TASK

**INTERIOR LIGHTS CREW LIGHT LIMIT SWITCH AND JUMPER HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Close rear door/ramp (TM 9-2355-106-10).
3. Verify crew light operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Fastener - (5) (WP 0796, Item 159)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

Personnel Required

Maintainer - (2)

References

TM 9-2355-106-10

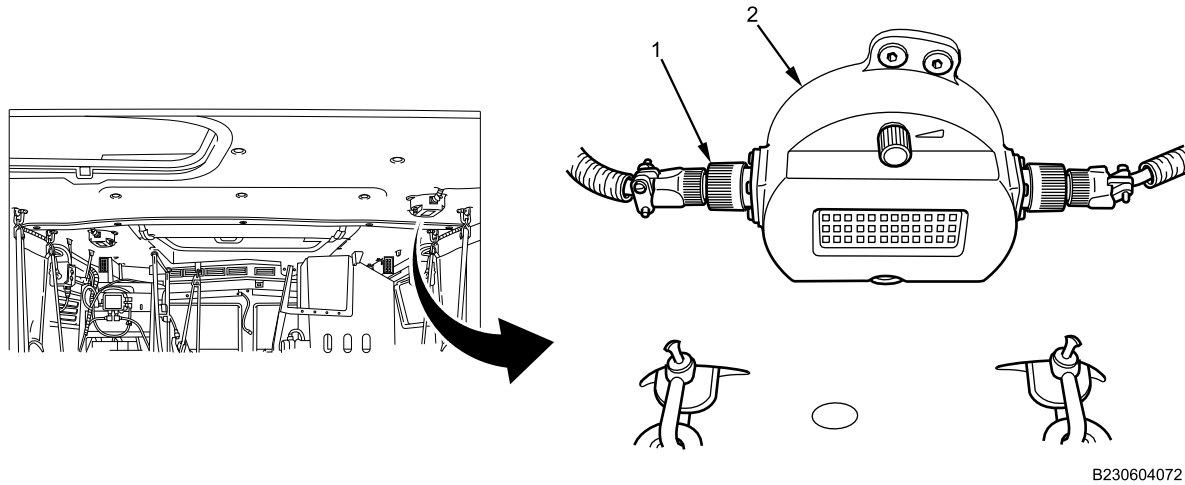
WARNING

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INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

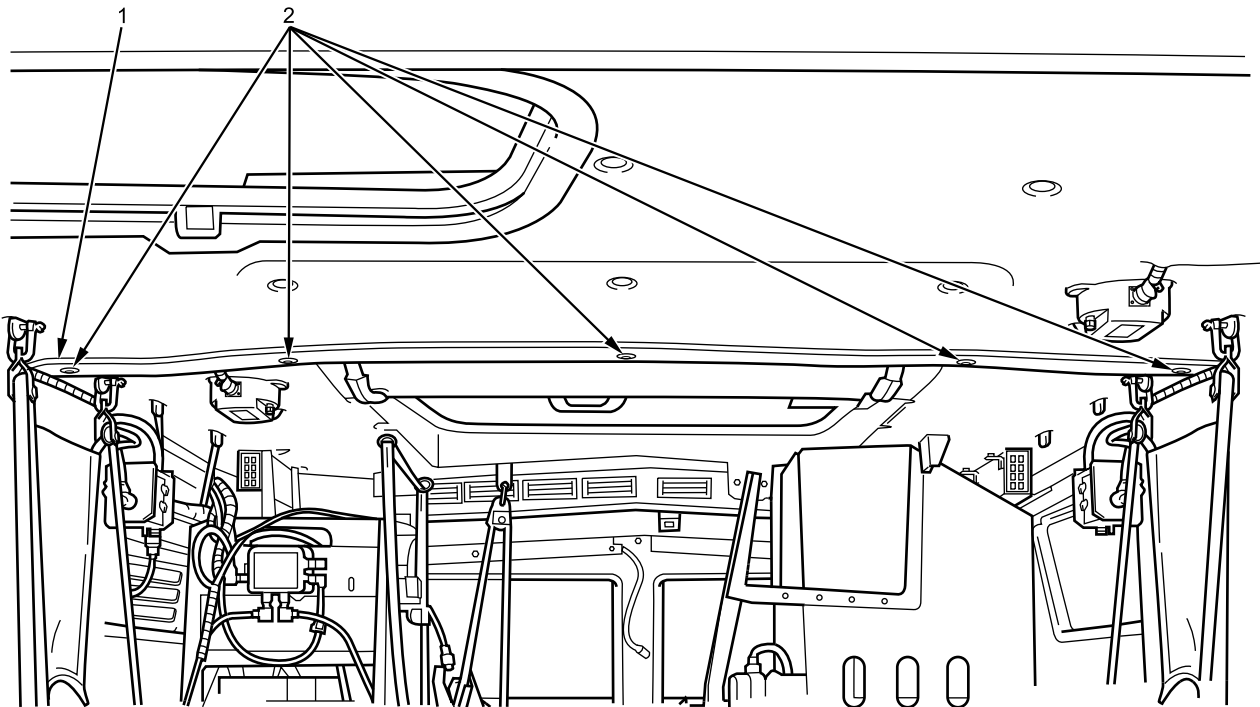
1. Disconnect left rear crew light connector (Figure 1, Item 1) from right rear crew light (Figure 1, Item 2).



B230604072

Figure 1. Left Rear Crew Light Harness Connector.

2. With assistant holding center headliner bracket (Figure 2, Item 1), remove and discard five fasteners (Figure 2, Item 2) and remove center headliner bracket from headliner.



B230603706

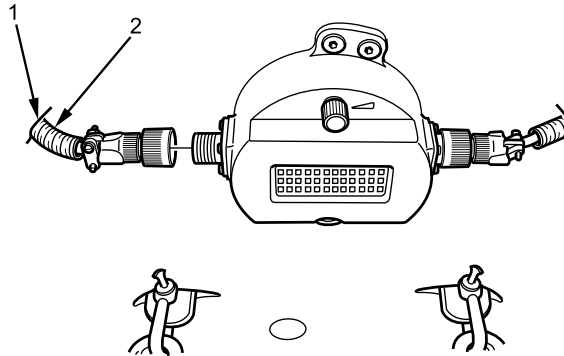
Figure 2. Center Headliner Bracket.

INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

CAUTION

Use care when removing left rear crew light harness from hole in headliner. Failure to comply may result in damage to headliner.

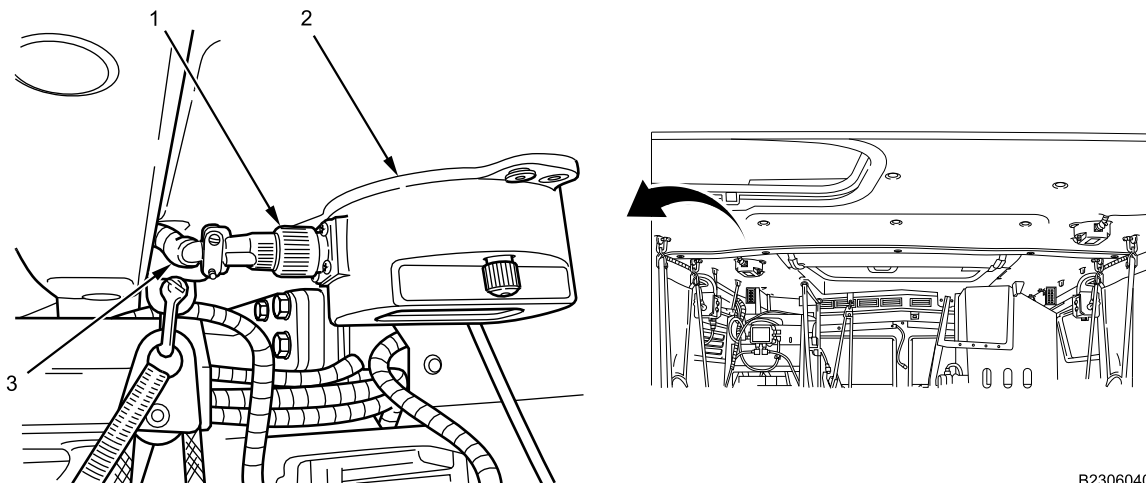
3. Remove left rear crew light harness (Figure 3, Item 2) from hole in headliner (Figure 3, Item 1).



B230610171

Figure 3. Left Rear Crew Light Harness.

4. Disconnect left rear crew light harness connector (Figure 4, Item 1) from left rear crew light (Figure 4, Item 2). Remove left rear crew light harness (Figure 4, Item 3).



B230604073

Figure 4. Left Rear Crew Light Harness Connector.

END OF TASK

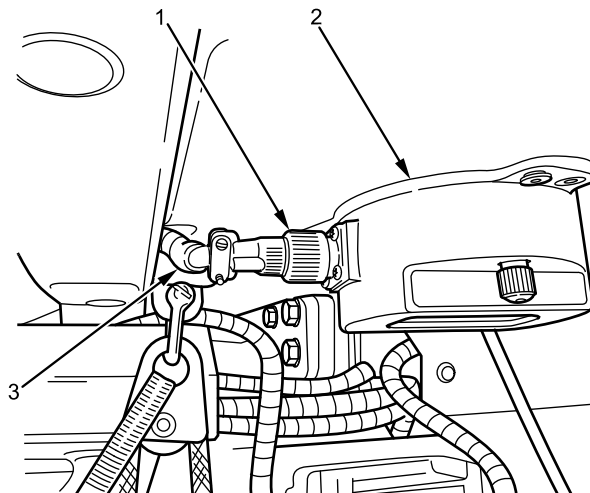
INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all interior lights harness electrical connections.

1. Connect left rear crew light harness connector (Figure 5, Item 1) to left rear crew light (Figure 5, Item 2). Position left rear crew light harness (Figure 5, Item 3) in headliner cavity.



B230603705

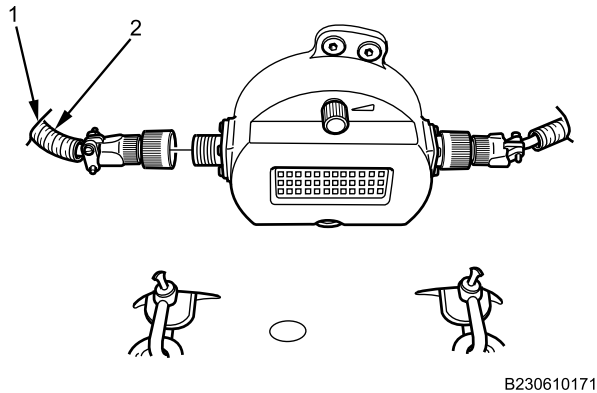
Figure 5. Left Rear Crew Light Harness Connector.

INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

CAUTION

Use care when installing left rear crew light harness in hole in headliner. Failure to comply may result in damage to headliner.

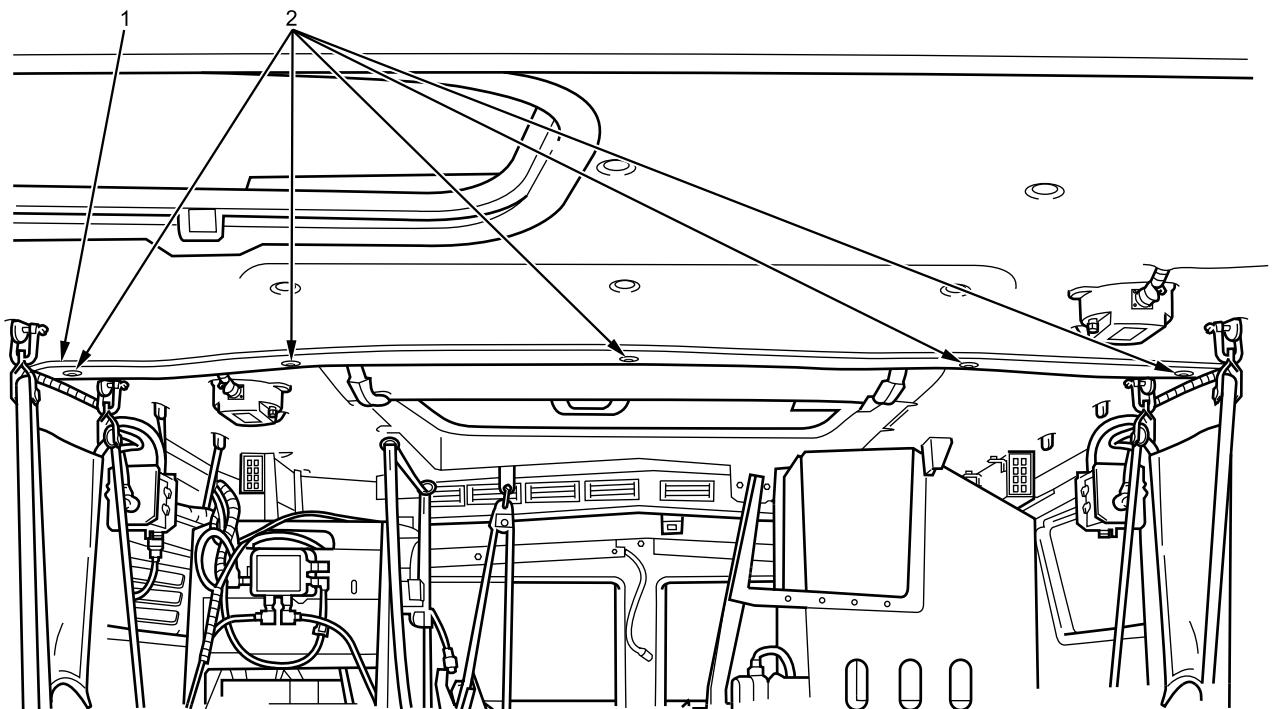
2. Install left rear crew light harness (Figure 6, Item 2) in hole in headliner (Figure 6, Item 1).



B230610171

Figure 6. Left Rear Crew Light Harness.

3. With assistant holding center headliner bracket (Figure 7, Item 1), install five new fasteners (Figure 7, Item 2) to secure center headliner bracket to headliner.



B230603706

Figure 7. Center Headliner Bracket.

INTERIOR LIGHTS LEFT REAR CREW LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

4. Connect left rear crew light connector (Figure 8, Item 1) to right rear crew light (Figure 8, Item 2).

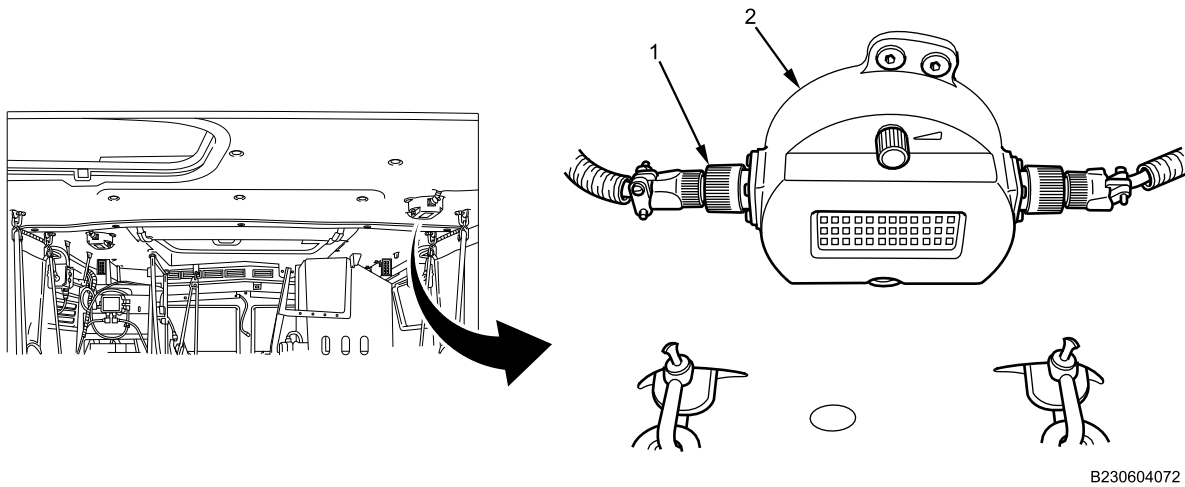


Figure 8. Left Rear Crew Light Harness Connector.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Verify crew light operation (TM 9-2355-106-10).
2. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Cable lock strap - (8) (WP 0796, Item 120)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
Rear ramp/door open (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Right cabin door secured safely open (WP 0608)
Cabin roof molding removed (WP 0583)
A-pillar cover trim removed (WP 0642)
Instrument Panel (IP) right side closeout removed (WP 0580)

WARNING


Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Cabin door must be secured in the open position by using heavy duty straps to prevent accidental closure during vehicle maintenance. Pull door hinge pin prior to securing door open. Failure to comply may result in serious injury or death to personnel.

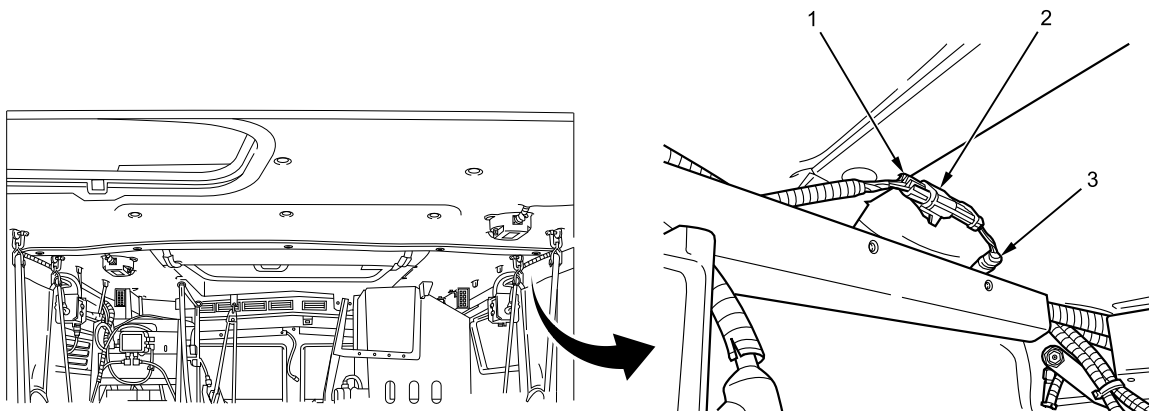
Use the appropriate lifting strap sling or chain hoist for the type of load. Always clean and inspect lifting strap slings and chain hoists prior to use. Inspect for damage such as wear, corrosion, elongation, tears, or punctures. Replace lifting strap slings or chain hoists that are damaged. Failure to comply may result in component damage and death or injury to personnel.

**INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****REMOVAL****NOTE**

Record location of cable lock straps before removing to aid installation.

Ramp limit switch jumper harness connector is located in right rear cabin molding channel.

1. Disconnect right rear and front crew lights harness connector (Figure 1, Item 1) from ramp limit switch jumper harness connector (Figure 1, Item 2) and ramp limit switch jumper harness (Figure 1, Item 3).



B230604077

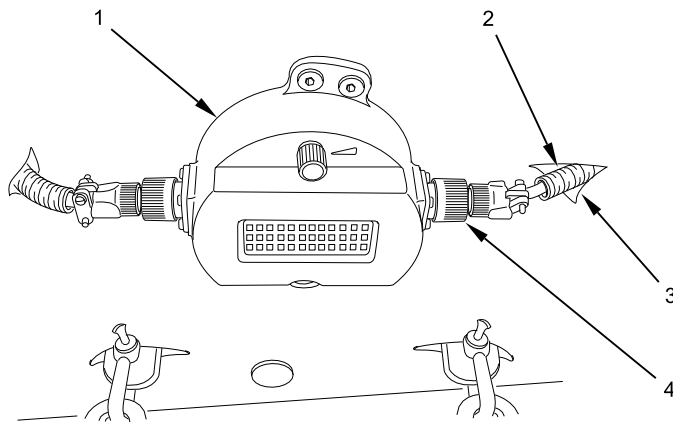
Figure 1. Ramp Limit Switch Jumper Harness Connector.

INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

CAUTION

Use care when removing right rear crew light harness from hole in headliner. Failure to comply may result in damage to headliner.

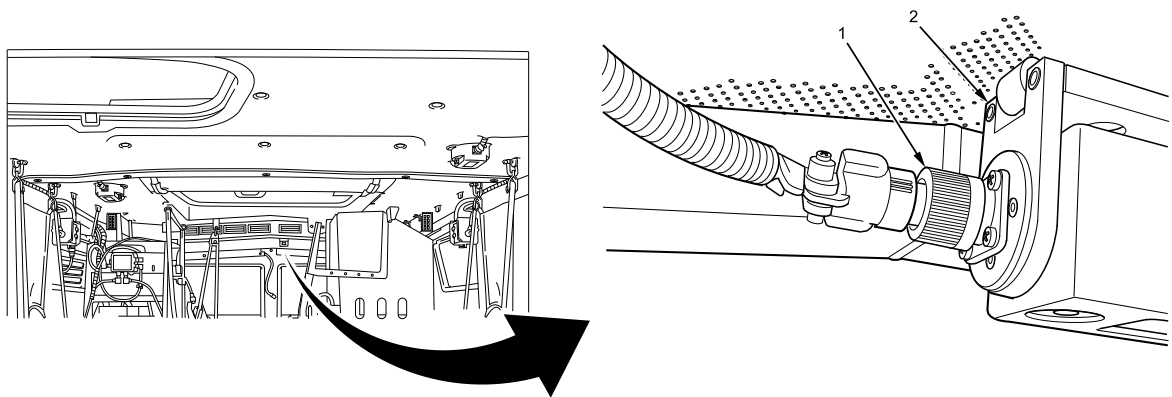
2. Disconnect right rear crew light harness connector (Figure 2, Item 4) from right rear crew light (Figure 2, Item 1). Remove right rear crew light harness (Figure 2, Item 2) from hole in headliner (Figure 2, Item 3).



B230603710

Figure 2. Right Rear Crew Light Harness.

3. Disconnect front crew light connector (Figure 3, Item 1) from front crew light (Figure 3, Item 2).



B230604074

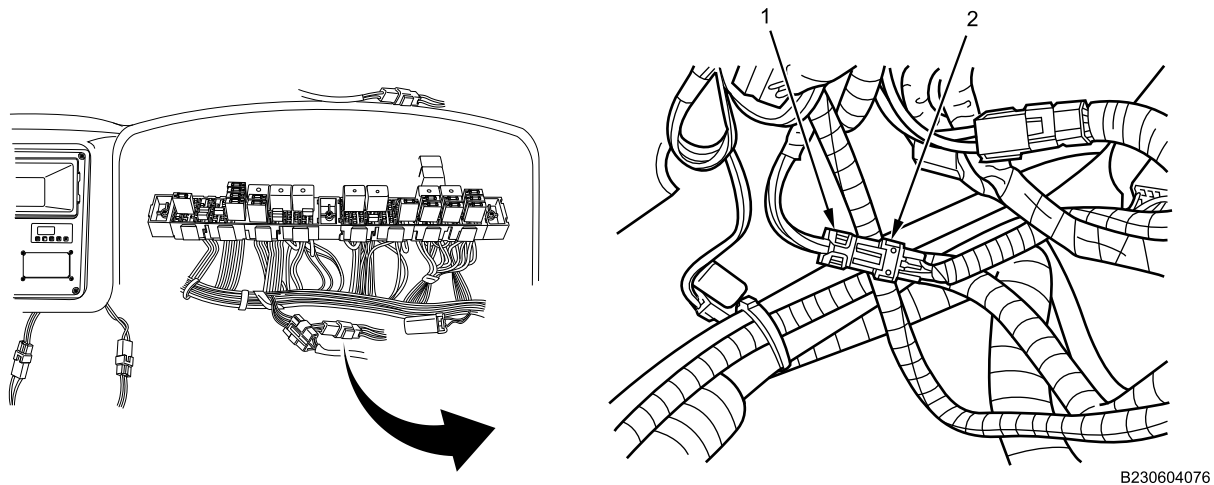
Figure 3. Front Crew Light Connector.

INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Right rear and front crew lights harness connector is a 6-cavity connector that contains four wires: BLACK, WHITE, RED, and GRAY.

4. Disconnect right rear and front crew lights harness connector (Figure 4, Item 2) from instrument panel connector (Figure 4, Item 1). Remove and discard cable lock straps.



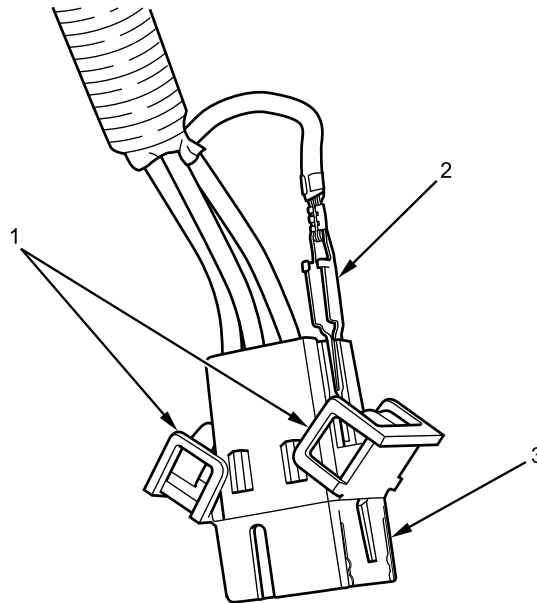
B230604076

Figure 4. Right Rear and Front Crew Lights Harness Connector.

CAUTION

Identify and label all connector wire terminals with wire tags to aid in installation. Failure to comply may result in damage to electrical system.

5. Remove four right rear and front crew lights harness wires (Figure 5, Item 2) from connector body (Figure 5, Item 3) by releasing wire terminal retaining tabs (Figure 5, Item 1). Remove right rear and front crew lights harness.

**INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)**

B230604402

Figure 5. Right Rear and Front Crew Lights Harness Connector Removal.

END OF TASK

INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

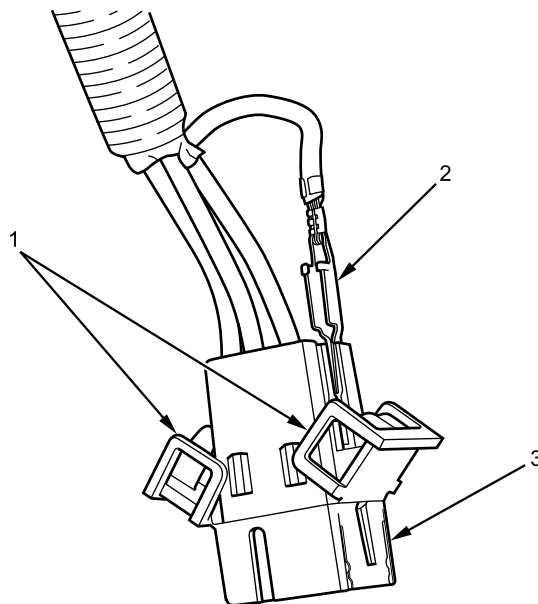
NOTE

Apply dielectric grease to all interior lights harness electrical connections before installation.

CAUTION

Install connector wire terminals according to wire tag labeling. Failure to comply may result in damage to electrical system.

1. Install four right rear and front crew lights harness wires (Figure 6, Item 2) in connector body (Figure 6, Item 3) and secure with terminal retaining clips (Figure 6, Item 1).



B230604402

Figure 6. Right Rear and Front Crew Lights Harness Connector Installation.

INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

2. Position right rear and front crew lights harness along right harness channel. Connect right rear and front crew lights harness connector (Figure 7, Item 2) to instrument panel connector (Figure 7, Item 1).

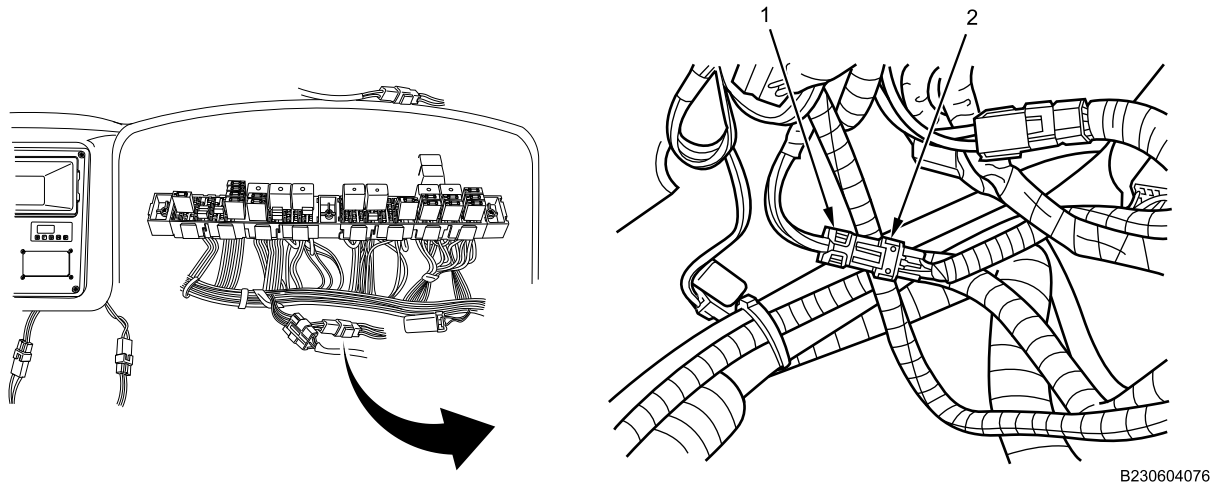


Figure 7. Right Rear and Front Crew Lights Harness Connector.

3. Connect front crew light connector (Figure 8, Item 1) to front crew light (Figure 8, Item 2).

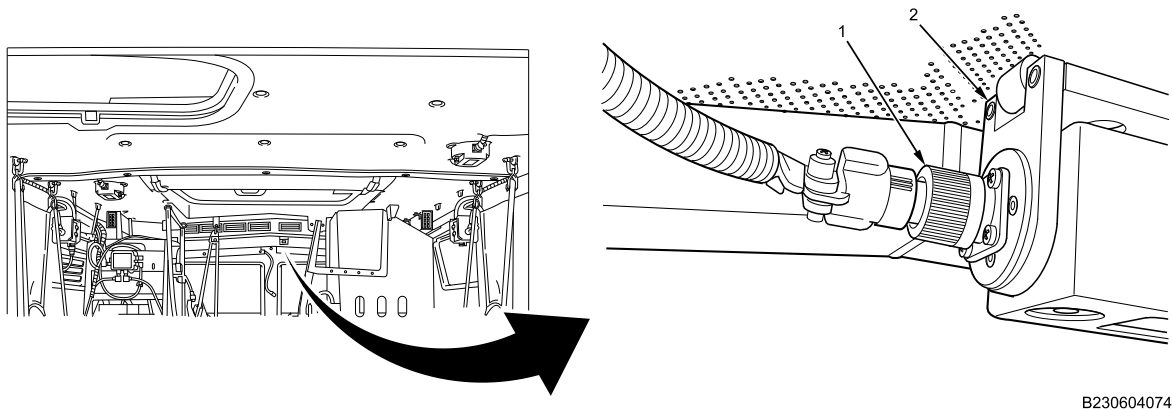


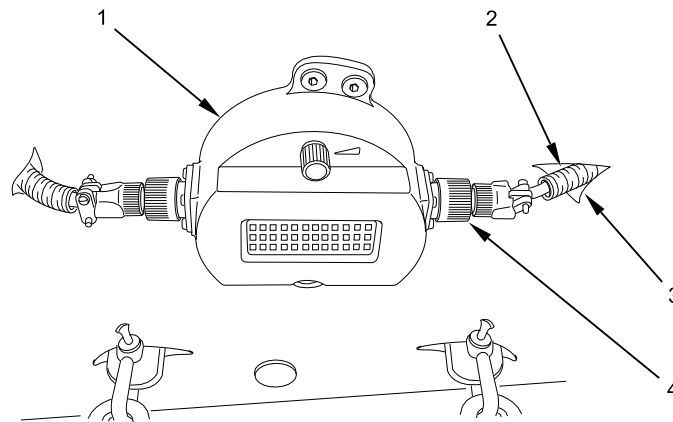
Figure 8. Front Crew Light Connector.

INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

CAUTION

Use care when installing left rear crew harness in hole in headliner. Failure to comply may result in damage to headliner.

4. Insert right rear crew light harness (Figure 9, Item 2) in hole in headliner (Figure 9, Item 3). Connect right rear crew light harness connector (Figure 9, Item 4) to right rear crew light (Figure 9, Item 1).



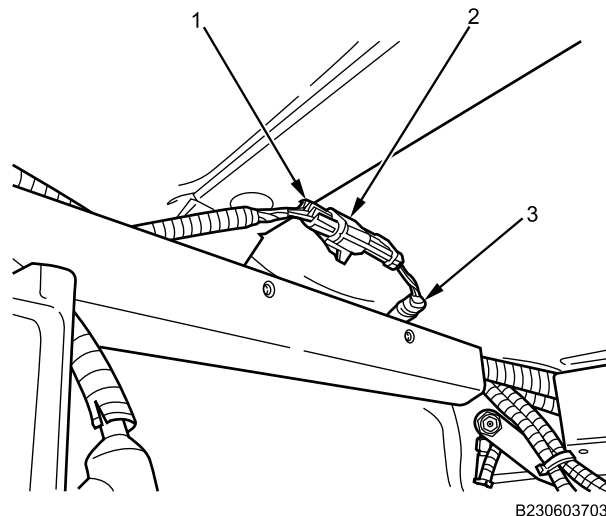
B230603710

Figure 9. Right Rear Crew Light Harness.

NOTE

Ramp limit switch jumper harness connector is located in right rear cabin molding channel.

5. Connect right rear and front crew lights harness connector (Figure 10, Item 1) to ramp limit switch jumper harness connector (Figure 10, Item 2). Position ramp limit switch jumper harness (Figure 10, Item 3) in right rear cabin molding channel.



B230603703

Figure 10. Ramp Limit Switch Jumper Harness Connector.

END OF TASK

**INTERIOR LIGHTS RIGHT REAR AND FRONT CREW LIGHTS HARNESS REMOVAL AND INSTALLATION -
(CONTINUED)****FOLLOW-ON MAINTENANCE**

1. Install IP right side closeout (WP 0580).
2. Install cabin roof molding (WP 0583).
3. Install A-pillar cover trim (WP 0642).
4. Turn MAIN POWER switch on (TM 9-2355-106-10).
5. Verify crew light operation (TM 9-2355-106-10).
6. Close right cabin door (WP 0608).
7. Close rear door/ramp (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FRONT BUMPER TURN SIGNAL AND PARKING LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Gloves (WP 0794, Item 18)
Cable lock strap (WP 0796, Item 134)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

WARNING

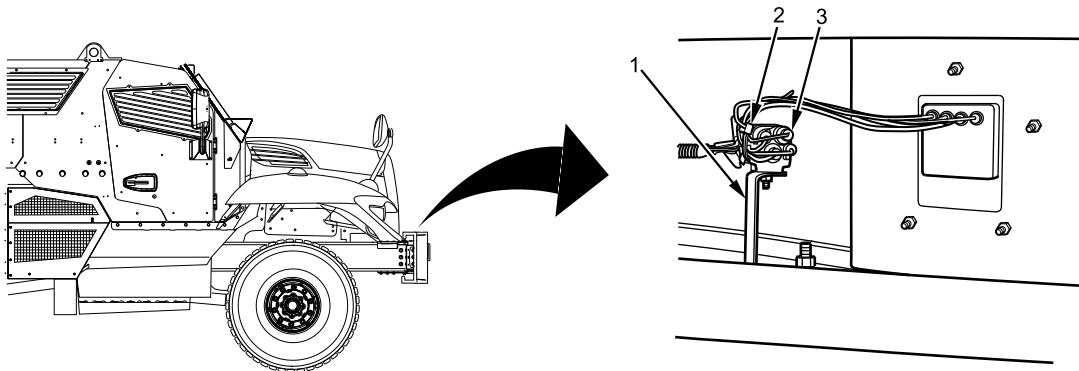
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

FRONT BUMPER TURN SIGNAL AND PARKING LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

NOTE

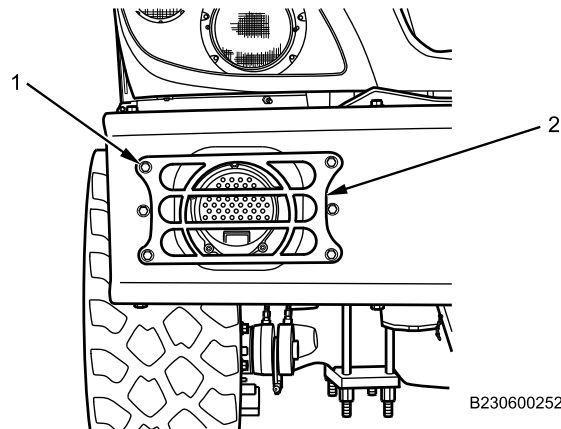
Right side shown; left side similar.



B230610057

Figure 1. Bumper Light Connector.

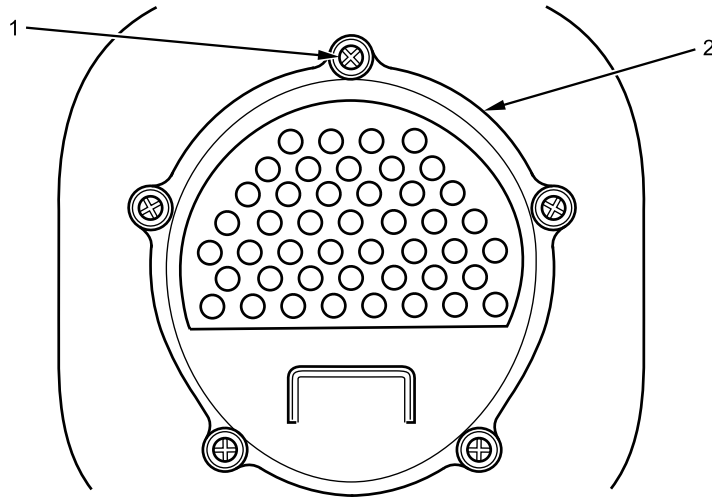
1. Cut and discard cable lock strap (Figure 1, Item 2) securing bumper light connector (Figure 1, Item 3) to bracket (Figure 1, Item 1).
2. Disconnect bumper light connector (Figure 1, Item 3).



B230600252

Figure 2. Front Light Guard.

3. Remove bolts (Figure 2, Item 1) securing light guard (Figure 2, Item 2) to bumper.

**FRONT BUMPER TURN SIGNAL AND PARKING LIGHT ASSEMBLY REMOVAL AND INSTALLATION -
(CONTINUED)**

B230601209

Figure 3. Front Bumper Light Removal.

4. Remove nuts and bolts (Figure 3, Item 1) securing front bumper light (Figure 3, Item 2) to bumper.
5. Remove front bumper light (Figure 3, Item 2) from bumper.

END OF TASK

FRONT BUMPER TURN SIGNAL AND PARKING LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING



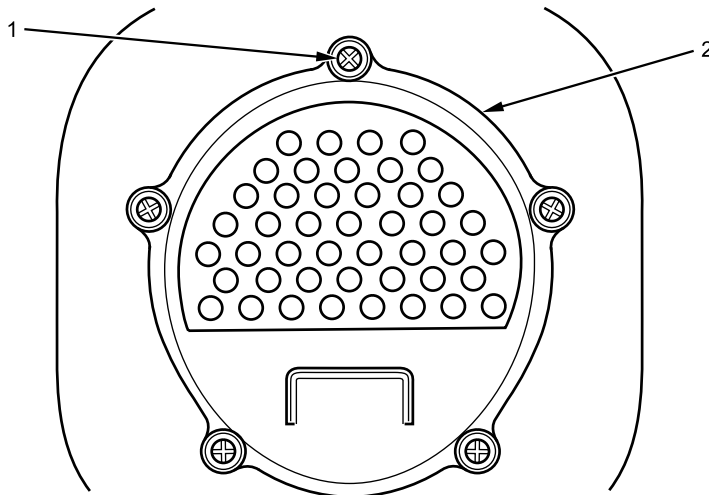
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

Corrosion preventive compound is toxic. Use only in well-ventilated area. Use approved respirator with dual organic vapor/mist and particulate cartridge. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

NOTE

Apply dielectric grease to all electrical connections.

Apply corrosion preventive compound on all nuts and bolts.



B230601209

Figure 4. Front Bumper Light Installation.

1. Position front bumper light (Figure 4, Item 2) on bumper.
2. Install nuts and bolts (Figure 4, Item 1) securing front bumper light (Figure 4, Item 2) to bumper and tighten securely.

FRONT BUMPER TURN SIGNAL AND PARKING LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

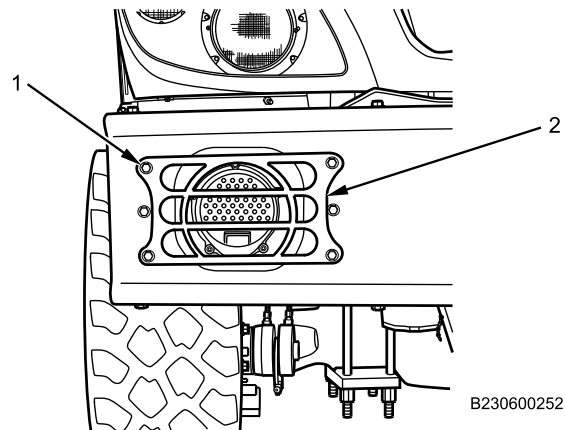


Figure 5. Front Light Guard.

3. Install bolts (Figure 5, Item 1) securing light guard (Figure 5, Item 2) to bumper and tighten securely.

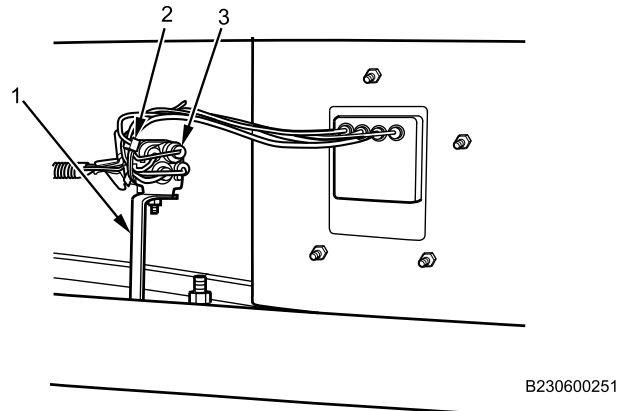


Figure 6. Bumper Light Connector.

4. Connect bumper light connector (Figure 6, Item 3).
5. Install new cable lock strap (Figure 6, Item 2) to secure connector to bracket (Figure 6, Item 1).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

SPOTLIGHT LIGHT BULB REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Rag (WP 0794, Item 39)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

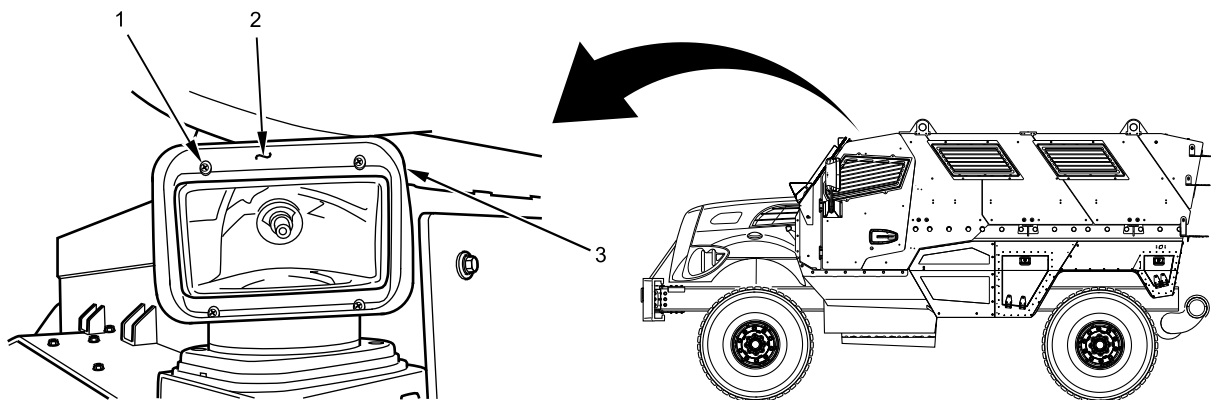
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove four screws (Figure 1, Item 1) securing spotlight bezel (Figure 1, Item 2) to spotlight housing (Figure 1, Item 3).

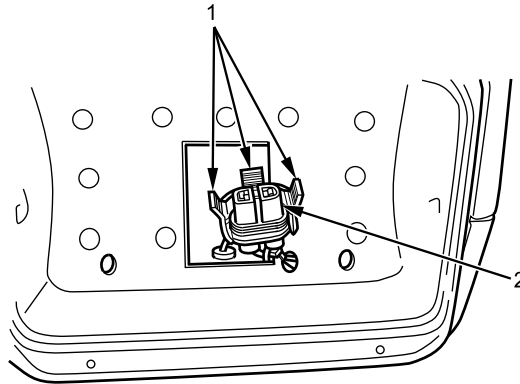


P230613218

Figure 1. Spotlight Bezel Removal.

SPOTLIGHT LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

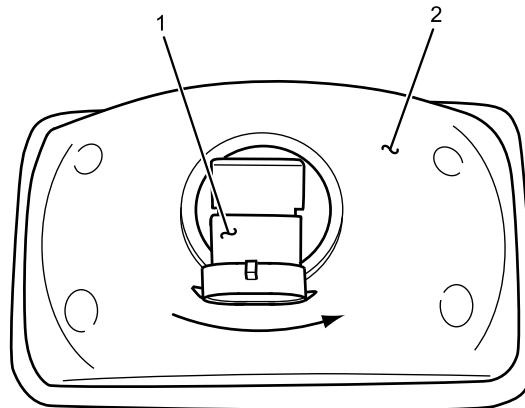
2. Release three locking tabs (Figure 2, Item 1) and disconnect connector (Figure 2, Item 2) from spotlight bulb connection at rear of spotlight lens assembly. Remove lens assembly from spotlight housing.



B230603243

Figure 2. Spotlight Connector.

3. With spotlight lens assembly (Figure 3, Item 2) placed face down on a clean rag, rotate spotlight bulb (Figure 3, Item 1) counterclockwise 1/8 turn and remove bulb from lens assembly.



B230603244

Figure 3. Spotlight Lens Assembly.

END OF TASK

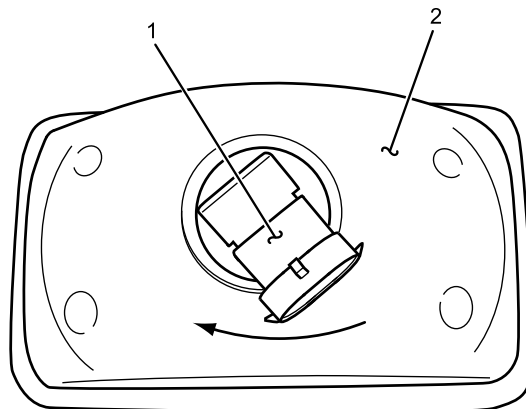
SPOTLIGHT LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. With spotlight lens assembly (Figure 4, Item 2) placed face down on a clean rag, insert spotlight bulb (Figure 4, Item 1) into lens assembly and rotate spotlight bulb clockwise one/eighth turn.

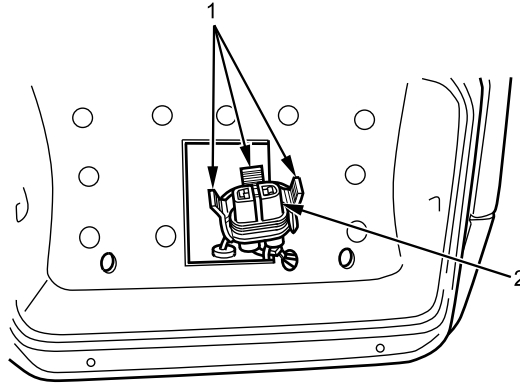


B230603245

Figure 4. Spotlight Lens Assembly.

SPOTLIGHT LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

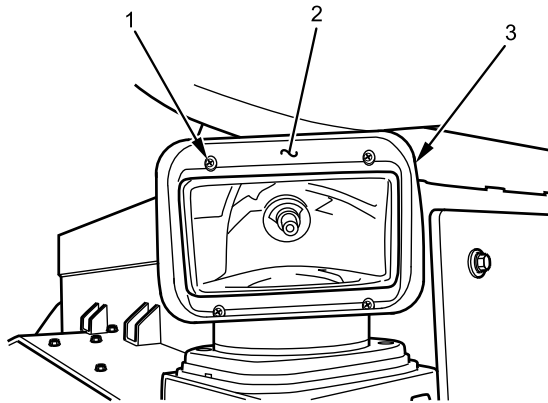
2. Position spotlight lens assembly and push connector (Figure 5, Item 2) up into the bulb connection at rear of spotlight lens assembly until connector locking tabs (Figure 5, Item 1) click securely into place. Push spotlight lens assembly into spotlight housing.



B230603243

Figure 5. Spotlight Connector.

3. Position spotlight lens assembly bezel (Figure 6, Item 2) and secure to spotlight housing (Figure 6, Item 3) with four screws (Figure 6, Item 1).



B230603242

Figure 6. Spotlight Bezel Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify spotlight operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
SPOTLIGHT REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap - (2) (WP 0796, Item 134)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

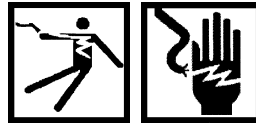
MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WARNING

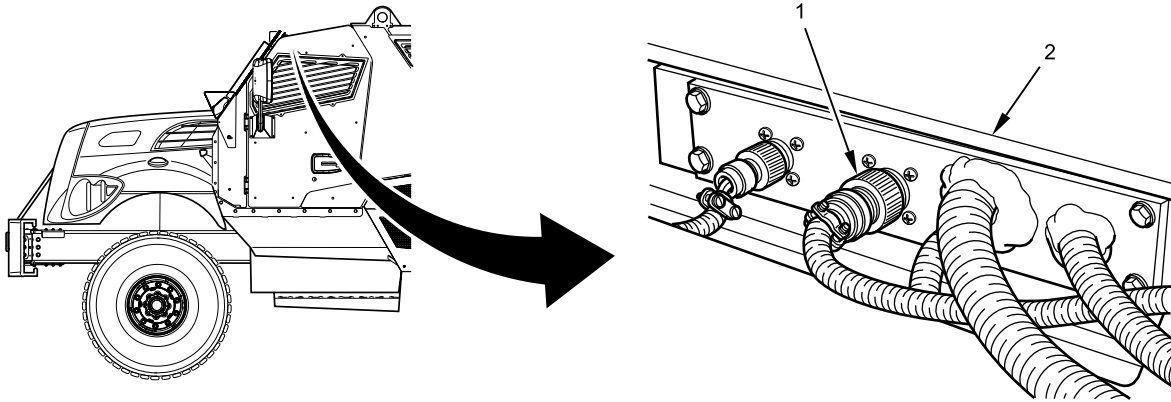
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid installation.

SPOTLIGHT REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

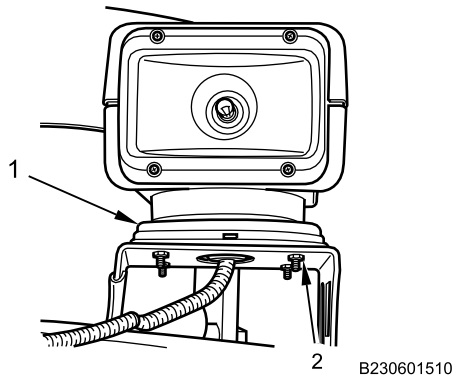
1. Disconnect spotlight electrical connector (Figure 1, Item 1) from roof panel (Figure 1, Item 2).



B230613219

Figure 1. Spotlight Connector.

2. Remove four screws and nuts (Figure 2, Item 2) securing spotlight (Figure 2, Item 1) to bracket and remove spotlight.



B230601510

Figure 2. Spotlight Removal.

END OF TASK

SPOTLIGHT REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position spotlight (Figure 3, Item 1) on bracket and install with four screws and nuts (Figure 3, Item 2) and tighten securely.

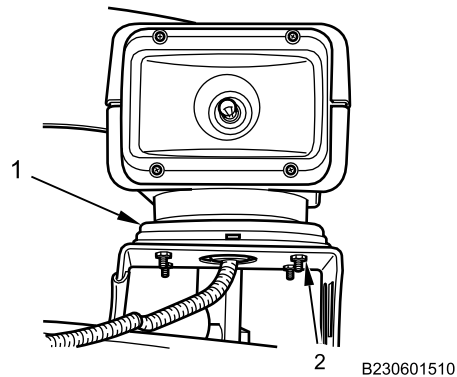
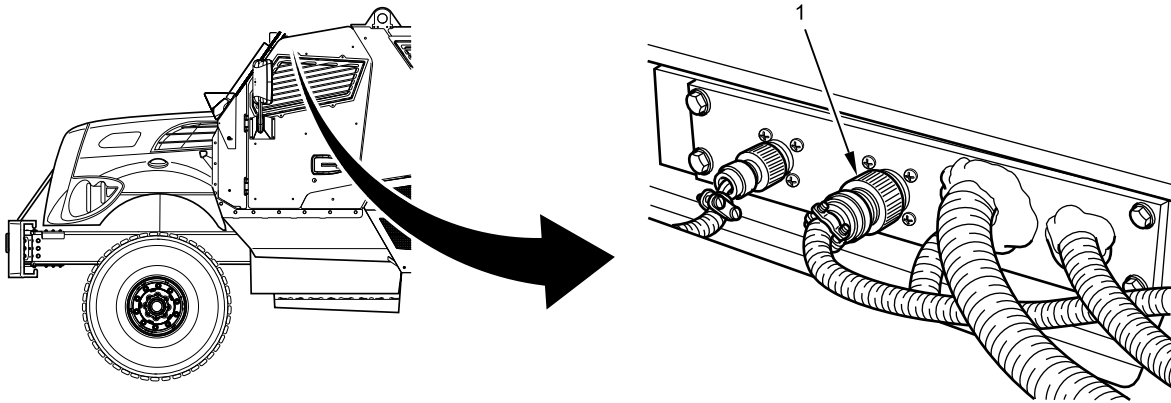


Figure 3. Spotlight Installation.

SPOTLIGHT REMOVAL AND INSTALLATION - (CONTINUED)

2. Connect spotlight electrical connector (Figure 4, Item 1) to roof panel.



005396

Figure 4. Spotlight Connector.

3. Install new cable lock straps and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify spotlight operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P
WP 0782

Equipment Condition

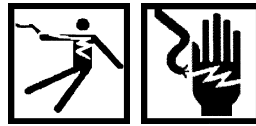
Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap - (2) (WP 0796, Item 134)

References

TM 9-2355-106-10

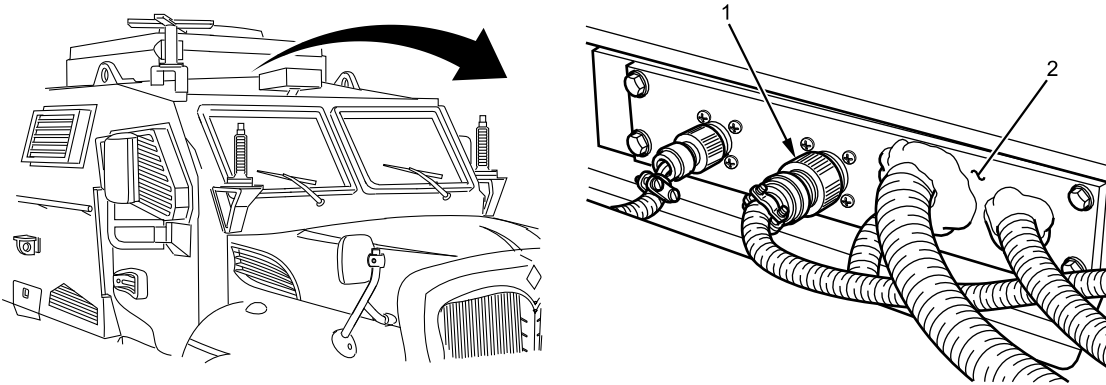
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Disconnect spotlight external harness connector (Figure 1, Item 1) from roof pass-through panel (Figure 1, Item 2).



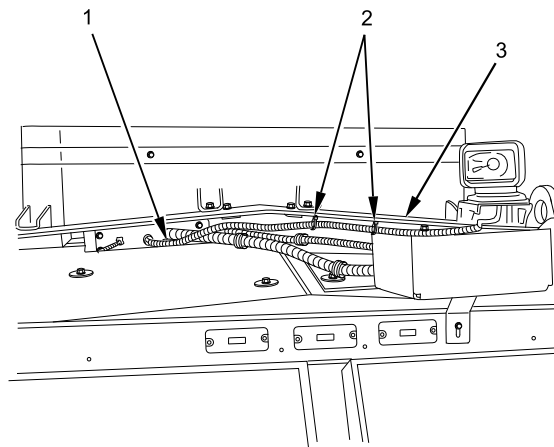
B230604623

Figure 1. Spotlight Harness.

NOTE

Note position and size of cable lock straps prior to removal to aid installation.

2. Remove and discard two cable lock straps (Figure 2, Item 2) securing external spotlight harness (Figure 2, Item 1) to roof panel (Figure 2, Item 3).

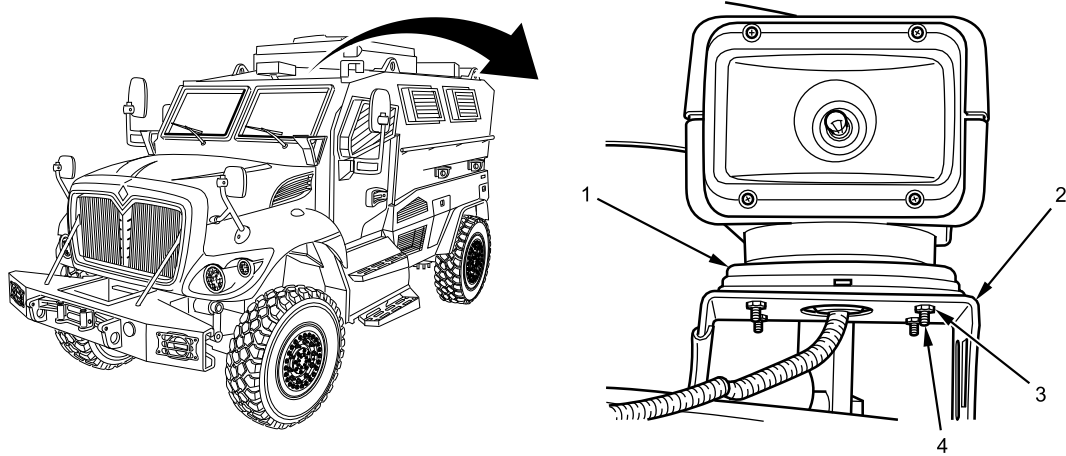


B230604625

Figure 2. Cable Lock Straps.

SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

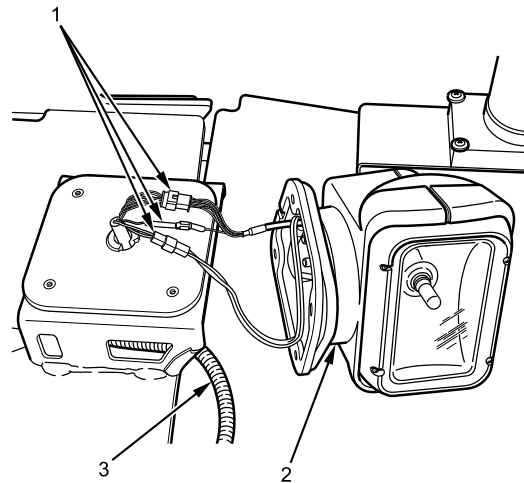
3. Remove four screws (Figure 3, Item 4) and nuts (Figure 3, Item 3) securing spotlight (Figure 3, Item 1) to bracket (Figure 3, Item 2).



B230610060

Figure 3. Spotlight Removal.

4. Disconnect three harness connectors (Figure 4, Item 1) from spotlight (Figure 4, Item 2).



B230604235

Figure 4. Spotlight Harness Connectors.

5. Remove spotlight external harness (Figure 4, Item 3) from roof.

END OF TASK

SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connectors before installation.

1. Position wire harness (Figure 5, Item 3) through spotlight bracket (Figure 5, Item 4).

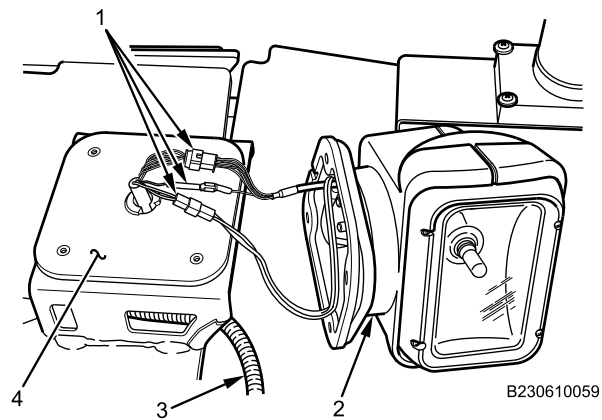
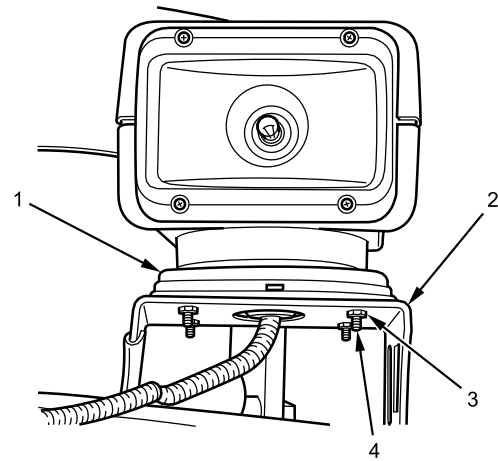
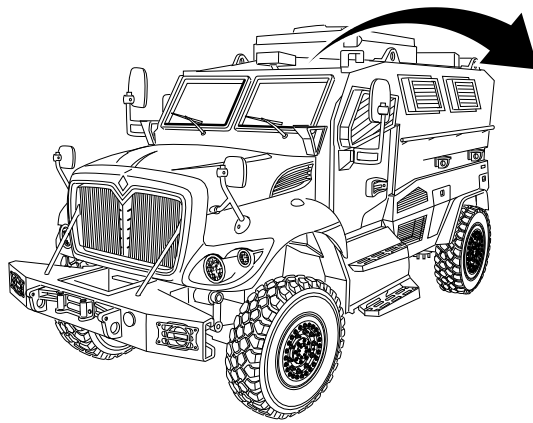


Figure 5. Spotlight Harness Connectors.

2. Connect three wire harness connectors (Figure 5, Item 1) on spotlight (Figure 5, Item 2).

SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

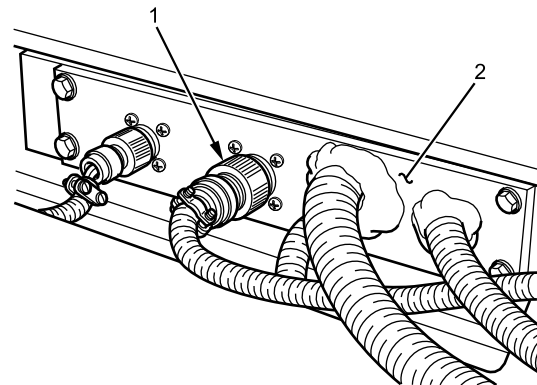
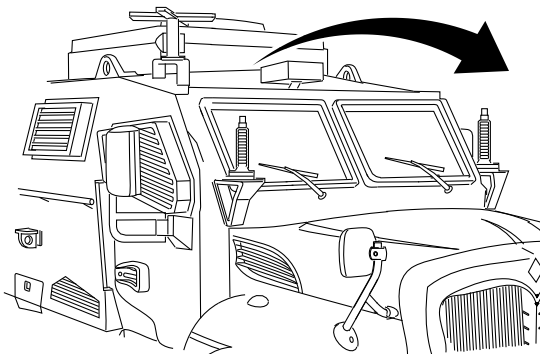
3. Install spotlight (Figure 6, Item 1) on bracket (Figure 6, Item 2) with four screws (Figure 6, Item 4) and nuts (Figure 6, Item 3). Tighten securely.



B230610060

Figure 6. Spotlight Installation.

4. Install spotlight external harness connector (Figure 7, Item 1) on roof pass-through panel (Figure 7, Item 2).

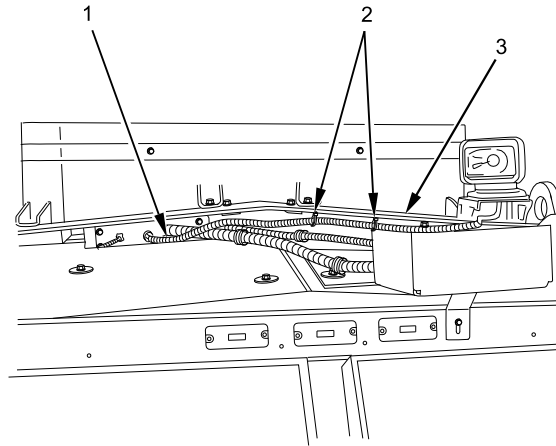


B230604623

Figure 7. Spotlight Harness.

SPOTLIGHT EXTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Install two new cable lock straps (Figure 8, Item 2) securing external spotlight harness (Figure 8, Item 1) on roof panel (Figure 8, Item 3).



B230604625

Figure 8. Cable Lock Straps.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER on (TM 9-2355-106-10).
2. Verify spotlight operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Electrical Contact Tool Kit (WP 0795, Item 30)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Sealing compound (WP 0794, Item 43)
Gloves (WP 0794, Item 19)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)
Cable lock strap - (8) (WP 0796, Item 136)
Locknuts - (4) (WP 0796, Item 15)
Fasteners - (3) (WP 0796, Item 159)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Instrument panel cluster closeout removed (WP 0578)
Right front A-pillar cover trim removed (WP 0642)

References

TM 9-2355-106-10

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

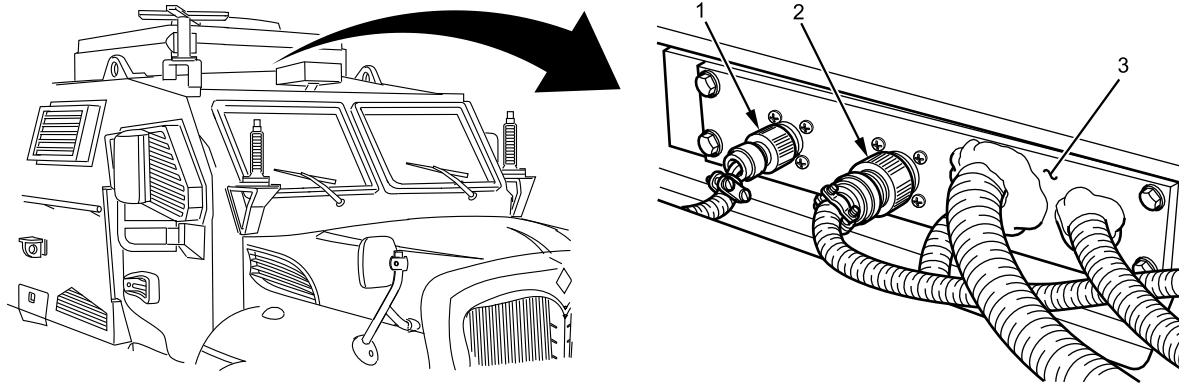
NOTE

Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid installation.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

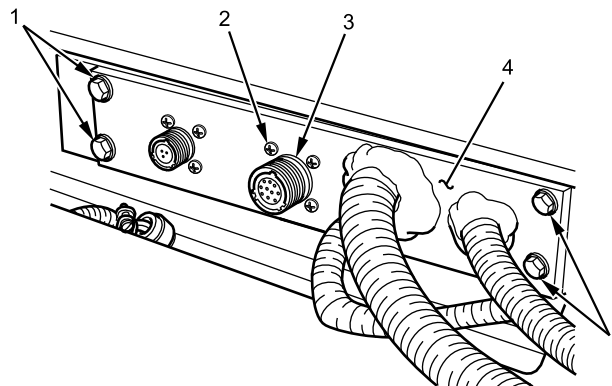
1. Disconnect spotlight exterior harness connector (Figure 1, Item 2) from roof pass-through cover plate (Figure 1, Item 3).



B230610076

Figure 1. Spotlight Harness.

2. Disconnect clearance lights harness connector (Figure 1, Item 1) from roof pass-through cover plate (Figure 1, Item 3).
3. Remove four bolts (Figure 2, Item 1) from roof pass-through cover plate (Figure 2, Item 4) and pull cover plate away to expose locknuts on back side of connector (Figure 2, Item 3).



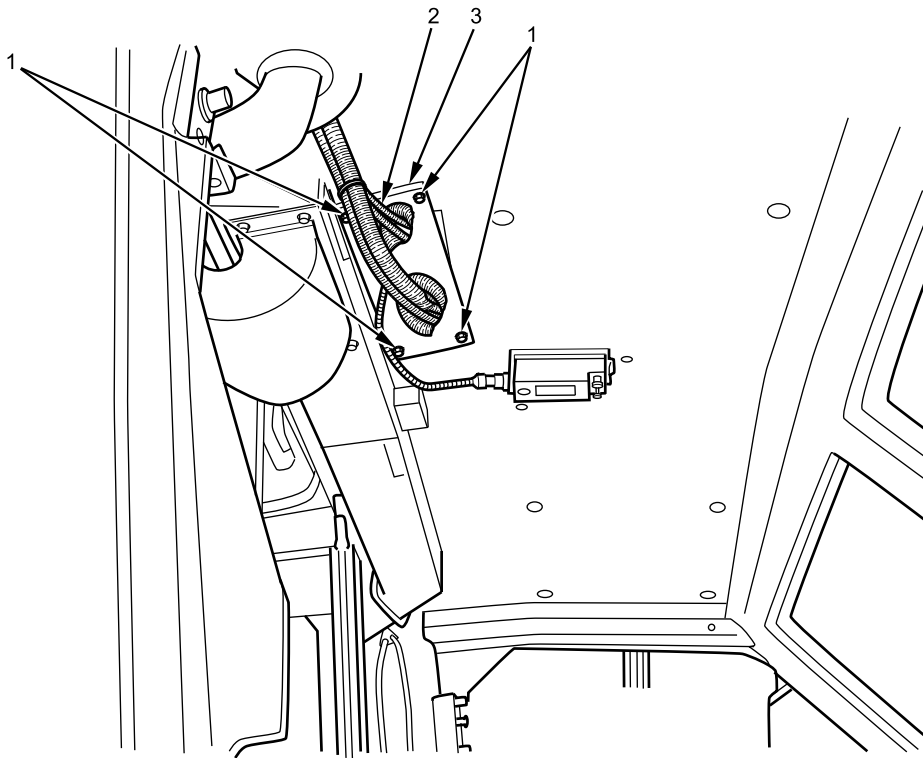
B230610077

Figure 2. Roof Pass-Through Cover Plate.

4. Remove four screws (Figure 2, Item 2) and locknuts (hidden from view) from pass-through connector (Figure 2, Item 3). Discard locknuts.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove four screws (Figure 3, Item 1) and washers securing cabin roof cover plate (Figure 3, Item 3) to cabin roof.



B230610078

Figure 3. Cabin Roof Cover Plate.

6. Pull spotlight interior harness (Figure 3, Item 2) down through cabin roof cover plate (Figure 3, Item 3).

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

7. Remove and discard three fasteners (Figure 4, Item 1) from right front door molding (Figure 4, Item 2). Remove molding.

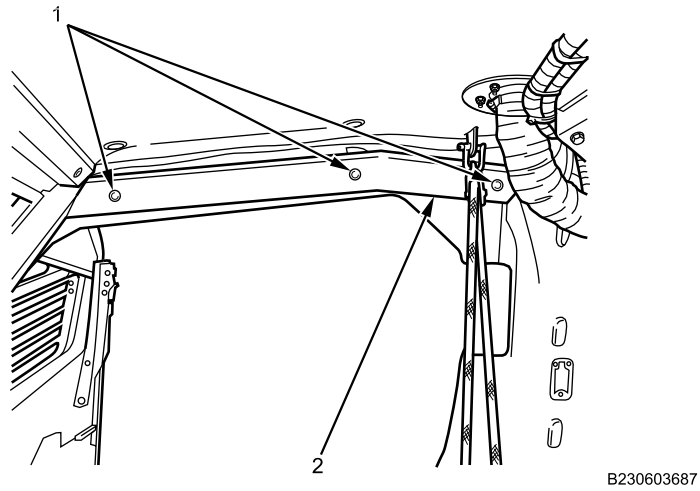


Figure 4. Right Front Door Molding.

8. Disconnect spotlight connector (Figure 5, Item 1) from instrument panel (IP) harness connector (Figure 5, Item 2).

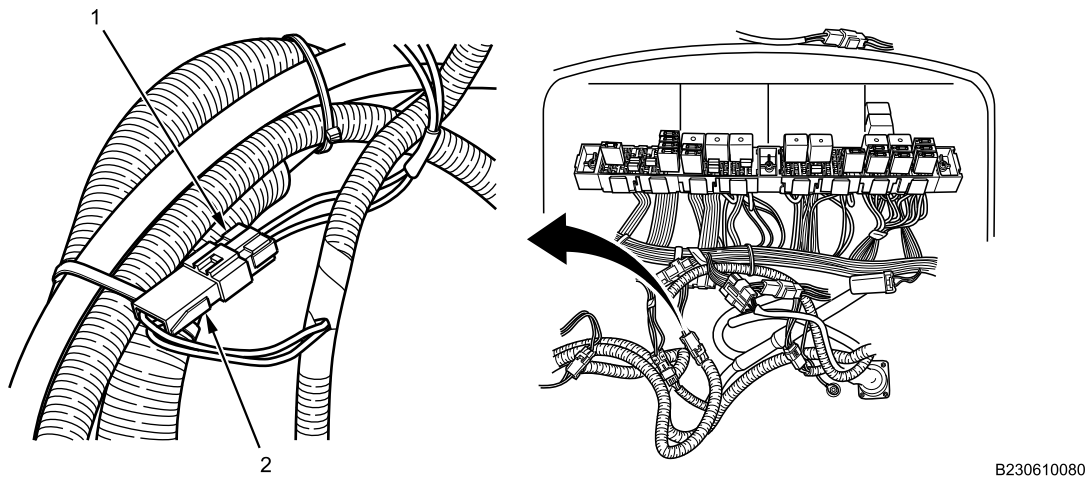
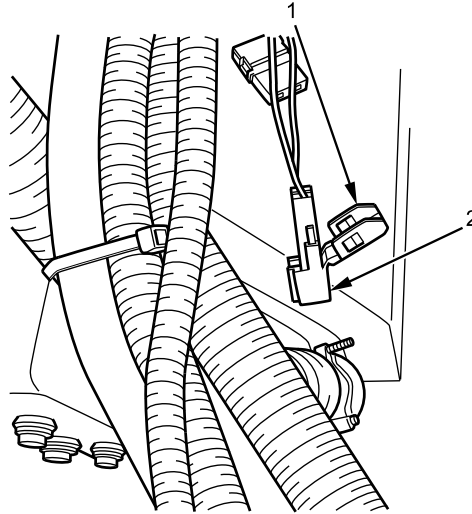


Figure 5. Fuse Panel.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Removing wires from spotlight connector allows removal of harness through bracket above right front door.

9. Open wire lock (Figure 6, Item 1) from spotlight connector body (Figure 6, Item 2).



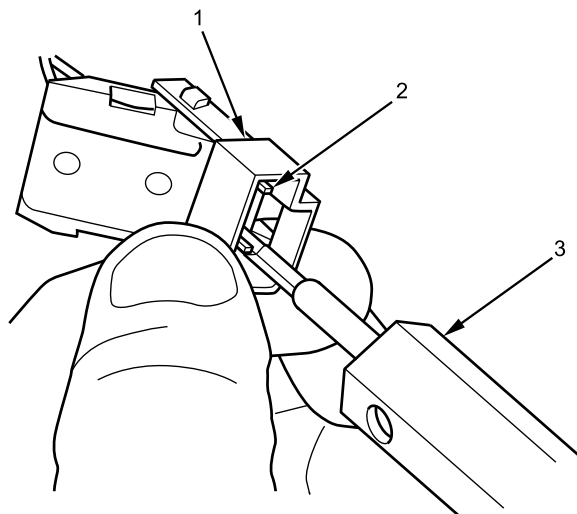
B230604615

Figure 6. Connector Wire Removal.

NOTE

Note position of wire terminals in connector body prior to removal to aid installation.

10. Using contact removal tool (Figure 7, Item 3), remove wiring terminals (Figure 7, Item 2) from connector body (Figure 7, Item 1) by unlocking wire terminal retaining tabs and releasing terminal locking tabs.

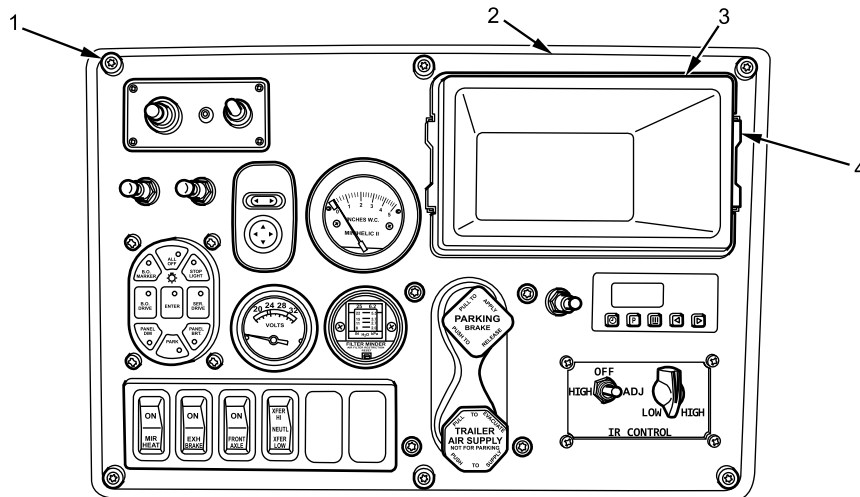


B230604614

Figure 7. Contact Tool.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

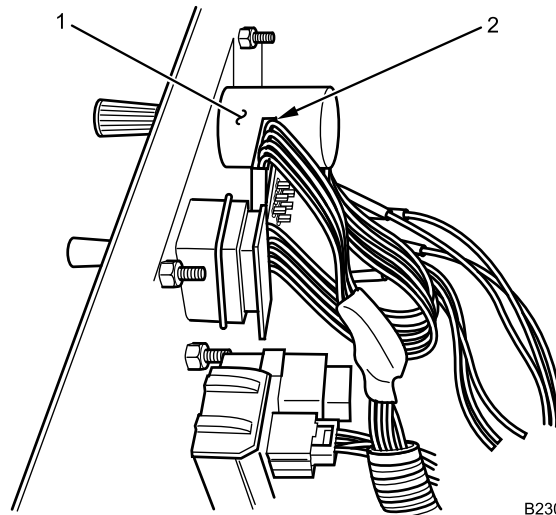
11. Push in on storage bin retainers (Figure 8, Item 4) and pull storage bin (Figure 8, Item 3) from IP center trim panel (Figure 8, Item 2).



B230601238

Figure 8. IP Center Trim Panel.

12. Remove six screws (Figure 8, Item 1) securing IP center trim panel (Figure 8, Item 2) to IP.



B230601240

Figure 9. Spotlight Switch Connector.

13. Disconnect interior spotlight harness (Figure 9, Item 2) from spotlight switch (Figure 9, Item 1). Remove spotlight interior harness.

END OF TASK

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

NOTE

Apply dielectric grease to all electrical contacts before installation.

Apply corrosion preventive compound on all nuts, screws and bolts before installation.

Install any necessary cable lock straps before covering up harness with interior trim components.

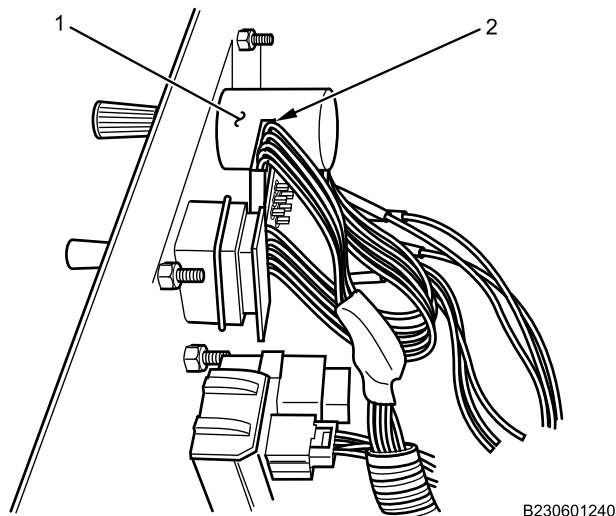
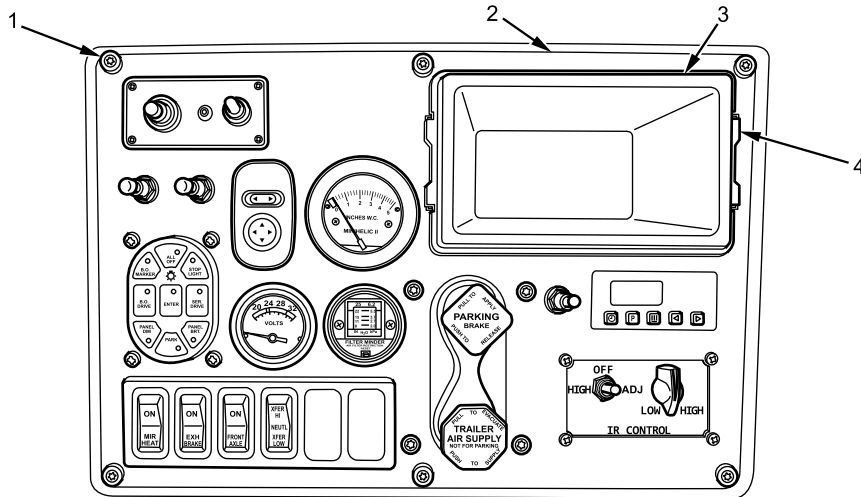


Figure 10. Spotlight Switch Connector.

1. Position spotlight interior harness (Figure 10, Item 2) in vehicle.
2. Install spotlight interior harness (Figure 10, Item 2) on spotlight switch (Figure 10, Item 1).

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

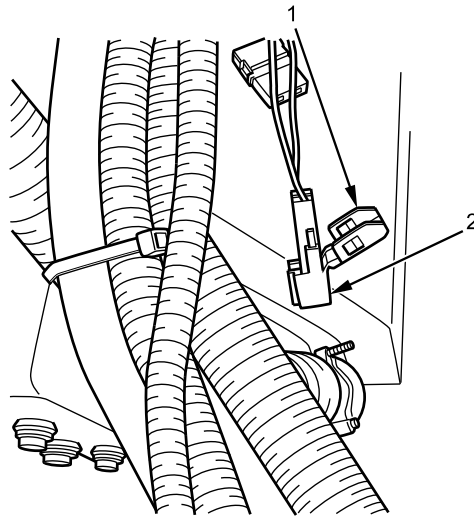
3. Push in on storage bin retainers (Figure 11, Item 4) and push storage bin (Figure 11, Item 3) onto IP center trim panel (Figure 11, Item 2).



B230601238

Figure 11. IP Center Trim Panel.

4. Install six screws (Figure 11, Item 1) securing IP center trim panel (Figure 11, Item 2) to IP.



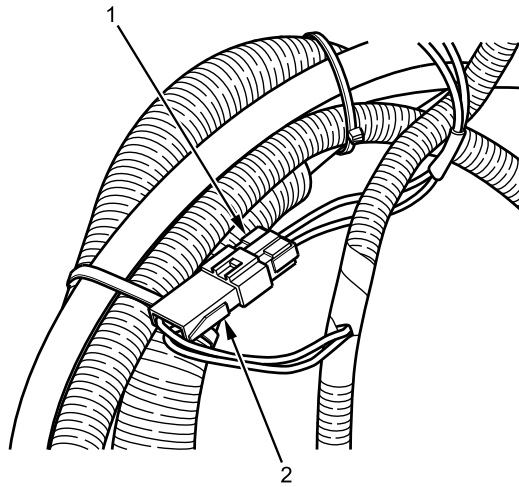
B230604615

Figure 12. Connector Body.

5. Install spotlight feed wires into connector body (Figure 12, Item 2) as noted during removal and lock down connector body wire lock (Figure 12, Item 1).

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

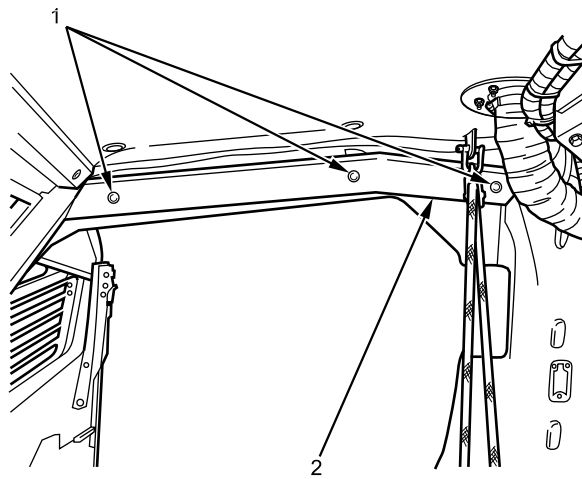
6. Connect spotlight connector (Figure 13, Item 1) to IP harness connector (Figure 13, Item 2).



B230604242

Figure 13. Harness Connector.

7. Install right front door molding (Figure 14, Item 2) with three new fasteners (Figure 14, Item 1).

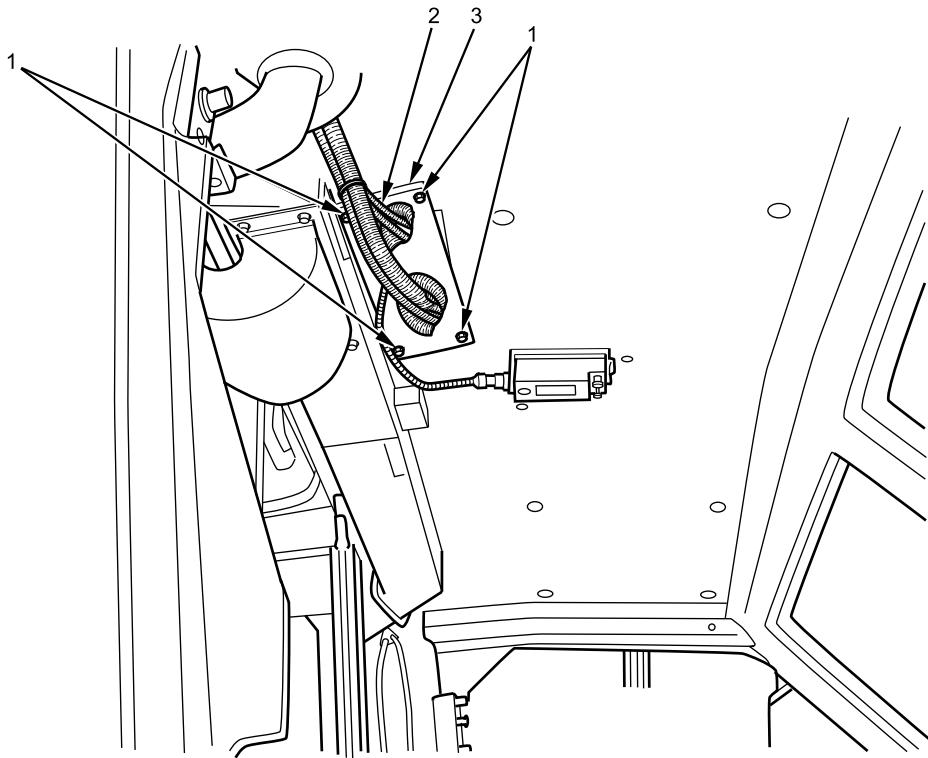


B230603687

Figure 14. Right Front Door Molding.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

8. Push spotlight interior harness (Figure 15, Item 2) through cabin roof cover plate (Figure 15, Item 3).



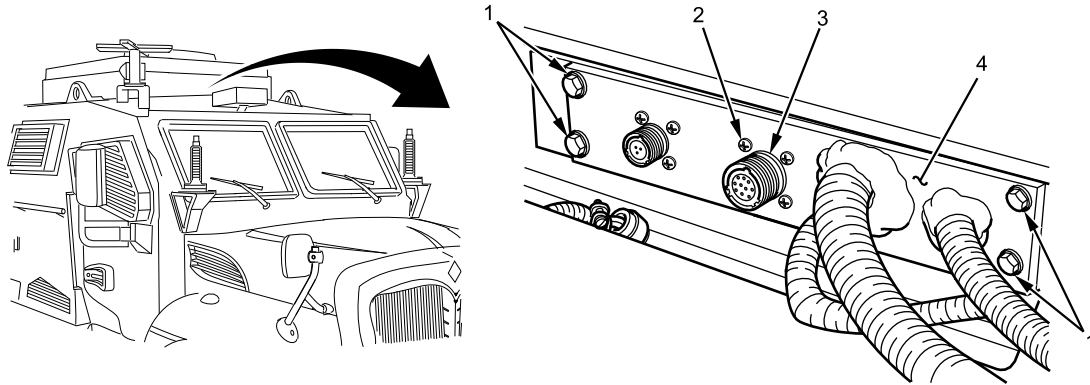
B230610078

Figure 15. Cabin Roof Cover Plate.

9. Install cover plate (Figure 15, Item 3) to cabin roof with four screws (Figure 15, Item 1). Tighten screws securely.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

10. Install spotlight connector (Figure 16, Item 3) on pass-through cover plate (Figure 16, Item 4) with four screws (Figure 16, Item 2) and new locknuts (hidden from view). Tighten locknuts securely.



B230610081

Figure 16. Roof Pass-Through Cover Plate.

WARNING

Sealing compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

11. Apply sealing compound on cover plate (Figure 16, Item 4).
 12. Install four bolts (Figure 16, Item 1) on pass-through cover plate (Figure 16, Item 4) and tighten securely.

SPOTLIGHT INTERIOR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

13. Install spotlight exterior harness connector (Figure 17, Item 2) on roof pass-through cover plate (Figure 17, Item 3).

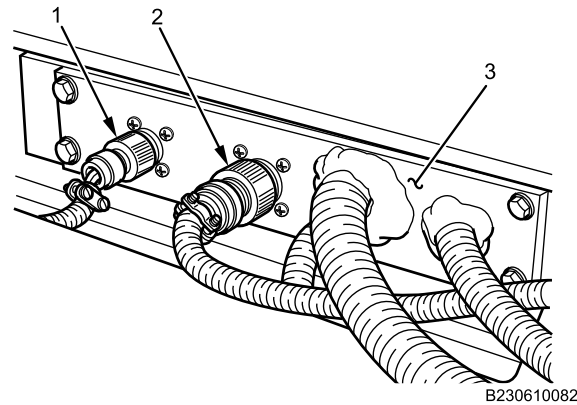


Figure 17. Spotlight Harness.

14. Connect clearance lights harness connector (Figure 17, Item 1) to roof pass-through cover plate (Figure 17, Item 3).
15. Install all cable lock straps and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install instrument panel cluster closeout (WP 0578).
2. Install right front A-pillar cover trim (WP 0642).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify spotlight operation (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

BLACKOUT DRIVE LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

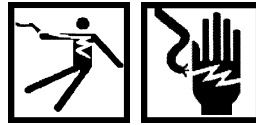
MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

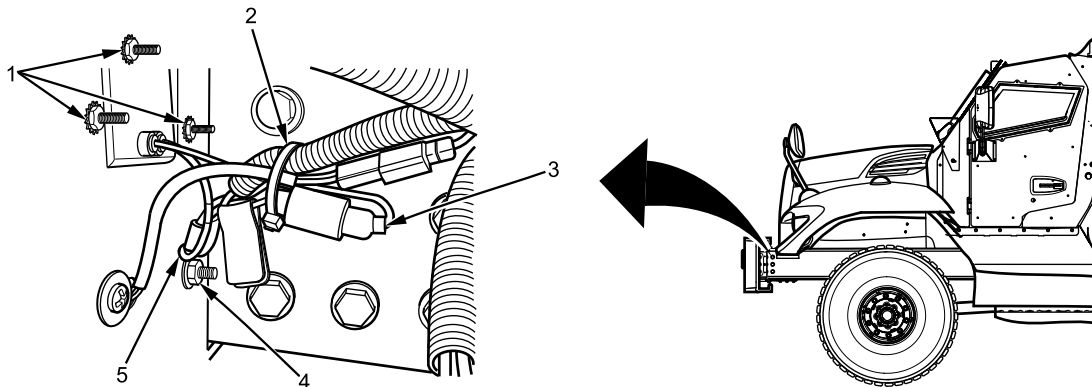
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

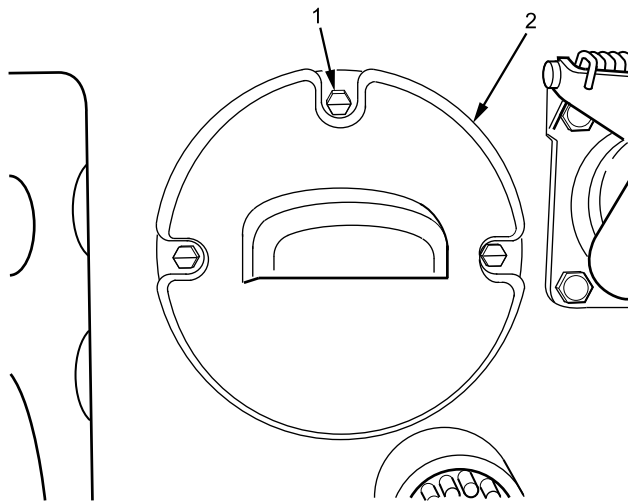
Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid installation.

BLACKOUT DRIVE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

P230613217

Figure 1. Blackout Light Wiring.

1. Cut and discard cable lock strap (Figure 1, Item 2).
2. Disconnect blackout light connector (Figure 1, Item 3).
3. Remove nut (Figure 1, Item 4) securing ground wire (Figure 1, Item 5) to rear of bumper.
4. Remove nuts (Figure 1, Item 1) from rear of blackout light.



B230601213

Figure 2. Blackout Light.

5. Remove bolts (Figure 2, Item 1) from front of blackout light (Figure 2, Item 2) and remove blackout light from bumper.

END OF TASK

BLACKOUT DRIVE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

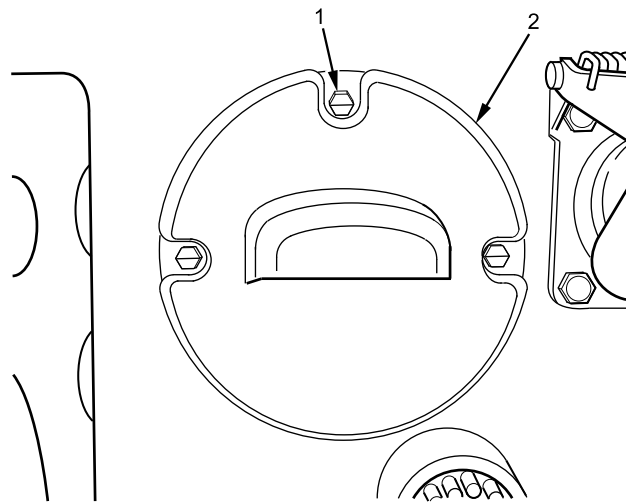
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

NOTE

Apply dielectric grease to all electrical connections.

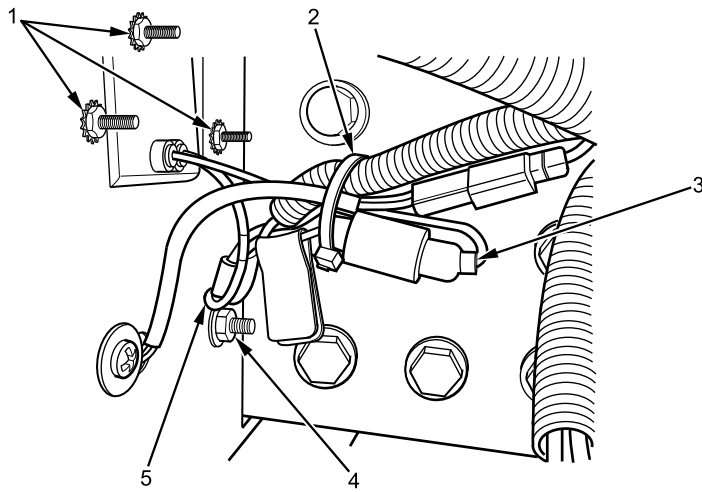
Apply corrosion preventive compound on all bolts and nuts.



B230601213

Figure 3. Blackout Light.

1. Position blackout light (Figure 3, Item 2) to bumper.
2. Install bolts (Figure 3, Item 1).

BLACKOUT DRIVE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230601214

Figure 4. Blackout Light Wiring.

3. Install nuts (Figure 4, Item 1) and tighten securely.
4. Install nut (Figure 4, Item 4) securing ground wire (Figure 4, Item 5) to rear of bumper and tighten securely.
5. Connect blackout light connector (Figure 4, Item 3).
6. Install all new cable lock straps (Figure 4, Item 2) and tighten securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify blackout light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**CLEARANCE AND MARKER LIGHT HARNESS REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

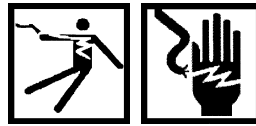
References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

WARNING

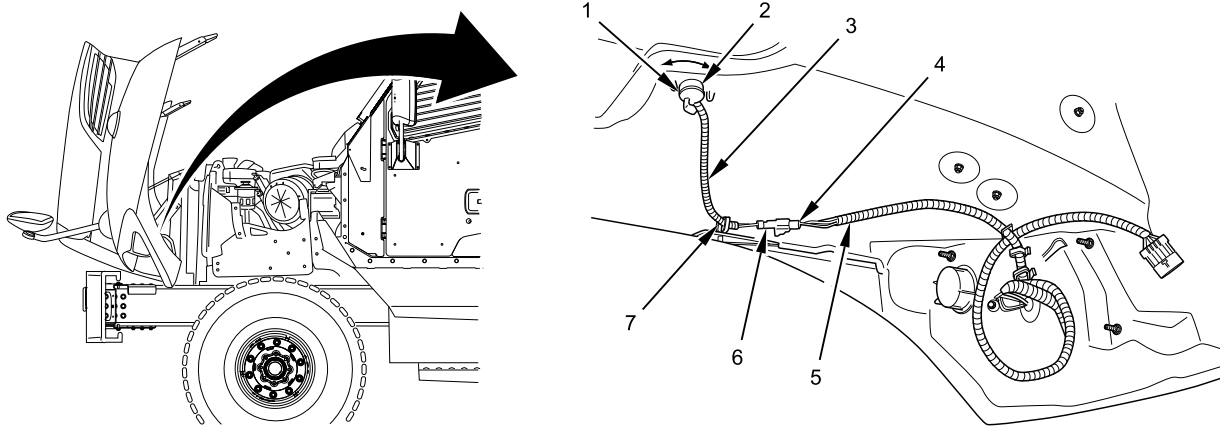
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

This procedure is for the left side clearance and marker light harness. The right side clearance and marker light harness procedure is similar.

CLEARANCE AND MARKER LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect clearance and marker light harness (Figure 1, Item 3) in-line connector (Figure 1, Item 6) to headlamp harness (Figure 1, Item 5) in-line connector (Figure 1, Item 4).



B230604818

Figure 1. Clearance and Marker Light Harness.

2. Open clearance and marker light harness loop (Figure 1, Item 7).
3. Turn clearance and marker light socket (Figure 1, Item 1) counterclockwise and remove from lens assembly (Figure 1, Item 2).
4. Remove clearance and marker light harness (Figure 1, Item 3) from vehicle.

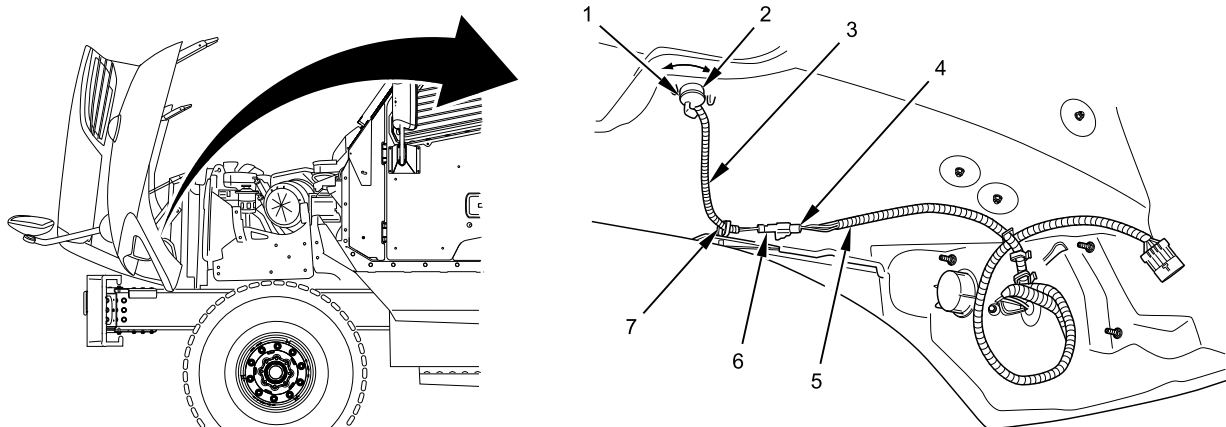
END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If lubricant contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Install clearance and marker light socket (Figure 2, Item 1) to lens assembly (Figure 2, Item 2) by turning socket clockwise.

CLEARANCE AND MARKER LIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604818

Figure 2. Clearance and Marker Light Harness.

2. Position clearance and marker light harness (Figure 2, Item 3) in harness loop (Figure 2, Item 7) and close loop.
3. Connect clearance and marker light harness (Figure 2, Item 3) in-line connector (Figure 2, Item 6) to headlamp harness (Figure 2, Item 5) in-line connector (Figure 2, Item 4).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Engine hood closed and secured (TM 9-2355-106-10).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify light operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

INFRARED (IR) LIGHT REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Compound (WP 0794, Item 13)
Grease (WP 0794, Item 22)
Cable lock strap - (1) (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

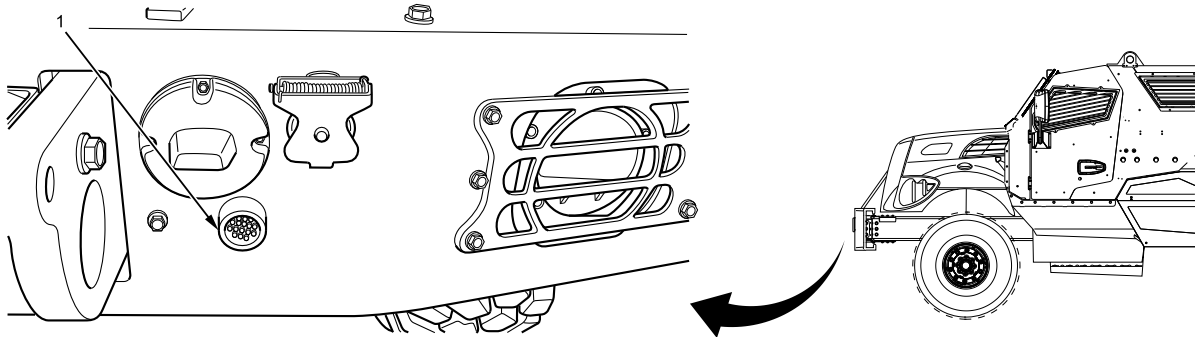
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Cabin door must be secured in the open position by using heavy duty straps to prevent accidental closure during vehicle maintenance. Pull check link retaining pin prior to securing door open. Failure to comply may result in serious injury or death to personnel.

INFRARED (IR) LIGHT REMOVAL AND INSTALLATION - (CONTINUED)

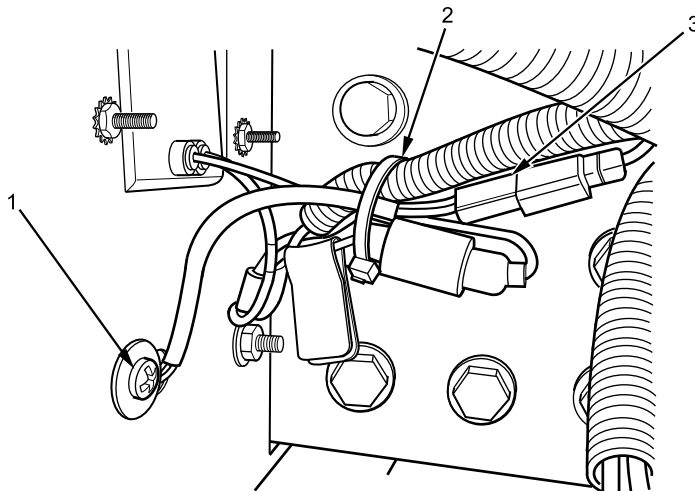
REMOVAL



B230603253

Figure 1. IR Light Location.

1. Locate IR light (Figure 1, Item 1) on left front bumper.



B230601215

Figure 2. IR Light.

2. Remove and discard cable lock strap (Figure 2, Item 2) securing IR light connector (Figure 2, Item 3) to wire harnesses behind bumper.
3. Disconnect IR light connector (Figure 2, Item 3).
4. Remove screw (Figure 2, Item 1) from rear of IR light.
5. Remove IR light from bumper.

END OF TASK

INFRARED (IR) LIGHT REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

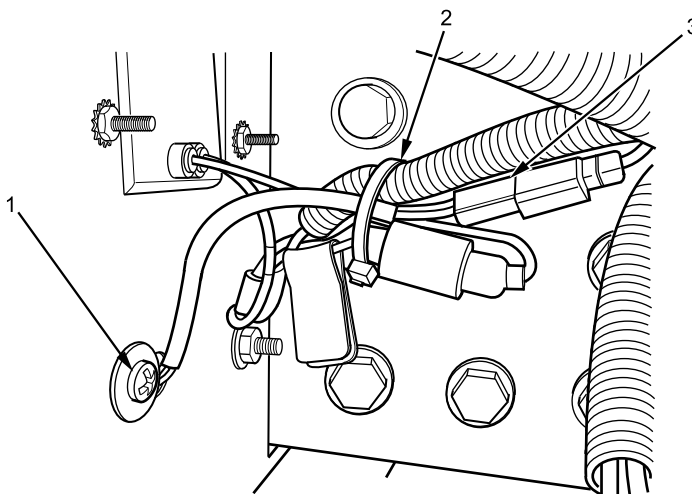
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

NOTE

Apply dielectric grease to all electrical connections and corrosion preventive compound on all nuts and screws.

1. Position IR light on bumper.



B230601215

Figure 3. IR Light Installation.

2. Install screw (Figure 3, Item 1) securing IR light on bumper and tighten securely.
3. Connect IR light connector (Figure 3, Item 3).
4. Install new cable lock strap (Figure 3, Item 2).

END OF TASK

INFRARED (IR) LIGHT REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify IR light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

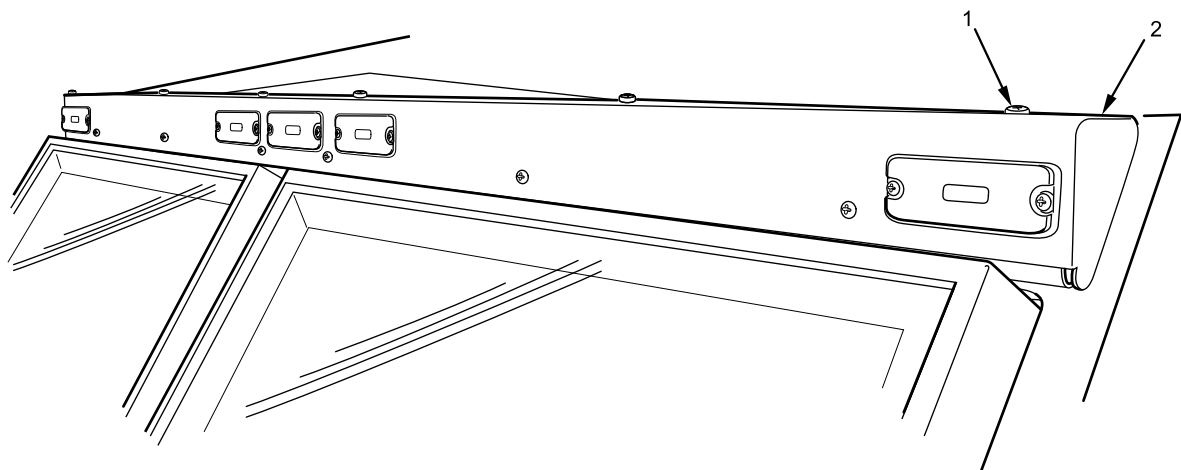
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove 12 screws (Figure 1, Item 1) securing front clearance light panel (Figure 1, Item 2) to cab.

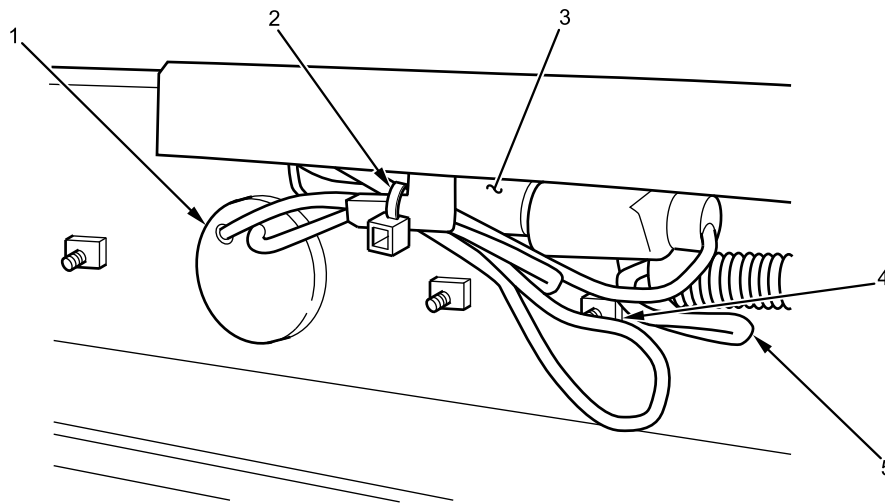


B230601276

Figure 1. Front Light Panel Removal.

FRONT CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

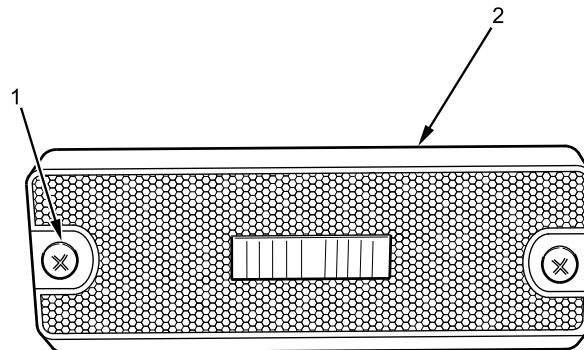
2. Cut cable lock strap (Figure 2, Item 2) and discard.



B230601220

Figure 2. Front Clearance Light Wiring.

3. Remove nut (Figure 2, Item 4) securing ground wire (Figure 2, Item 5).
4. Disconnect power connector (Figure 2, Item 3) from clearance light (Figure 2, Item 1).
5. Remove screws (Figure 3, Item 1) from clearance light (Figure 3, Item 2).



B230601221

Figure 3. Front Clearance Light.

END OF TASK**INSTALLATION****WARNING**

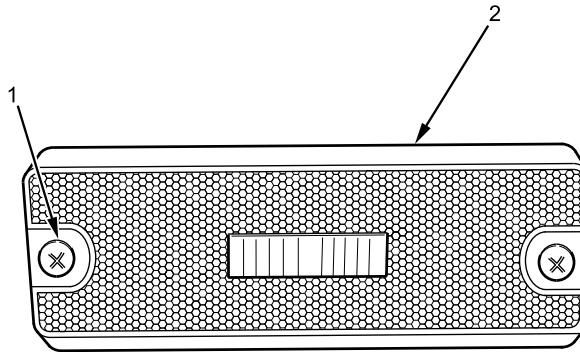
Dielectric grease is harmful to skin and eyes. If lubricant contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

FRONT CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Apply dielectric grease to all electrical connections.

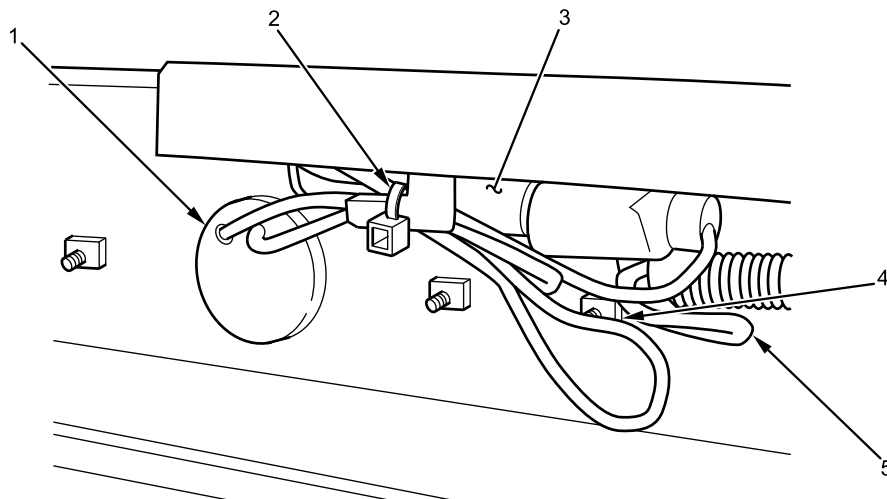
1. Install front clearance light (Figure 4, Item 2) on light panel and tighten screws (Figure 4, Item 1) securely.



B230601221

Figure 4. Front Light.

2. Connect power connector (Figure 5, Item 3) to clearance light (Figure 5, Item 1).



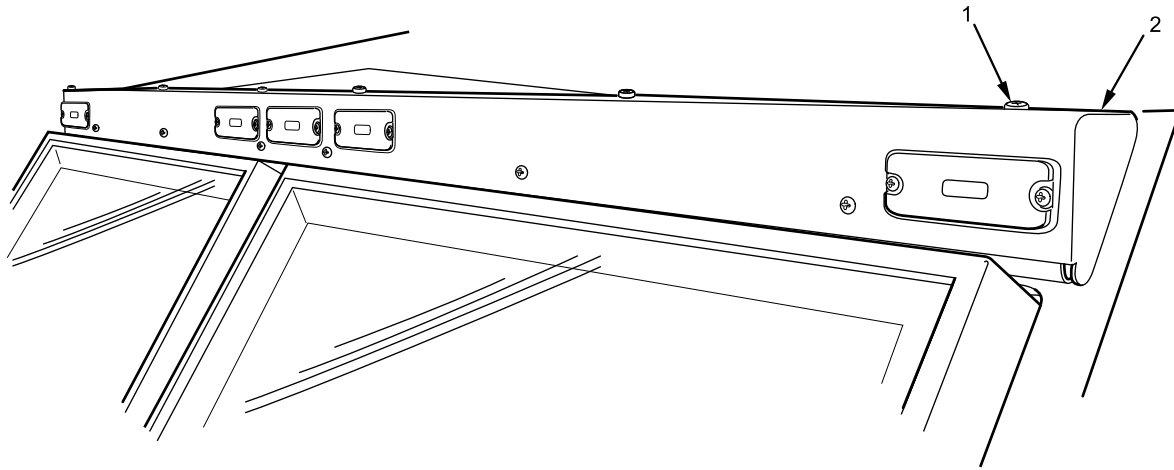
B230601220

Figure 5. Front Clearance Light Wiring.

3. Position ground wire (Figure 5, Item 5) and secure with nut (Figure 5, Item 4) and tighten securely.
4. Install new cable lock strap (Figure 5, Item 2) to secure wiring to light panel.

FRONT CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

5. Install 12 screws (Figure 6, Item 1) securing front clearance light panel (Figure 6, Item 2) to cab. Tighten screws securely.



B230601276

Figure 6. Front Light Panel Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0786

WP 0782

Materials/Parts

Faceshield, industrial (WP 0794, Item 16)
Gloves, nitrile (WP 0794, Item 18)
Goggles, industrial (WP 0794, Item 20)
Grease (WP 0794, Item 22)
Cable lock straps - (10) (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

WARNING



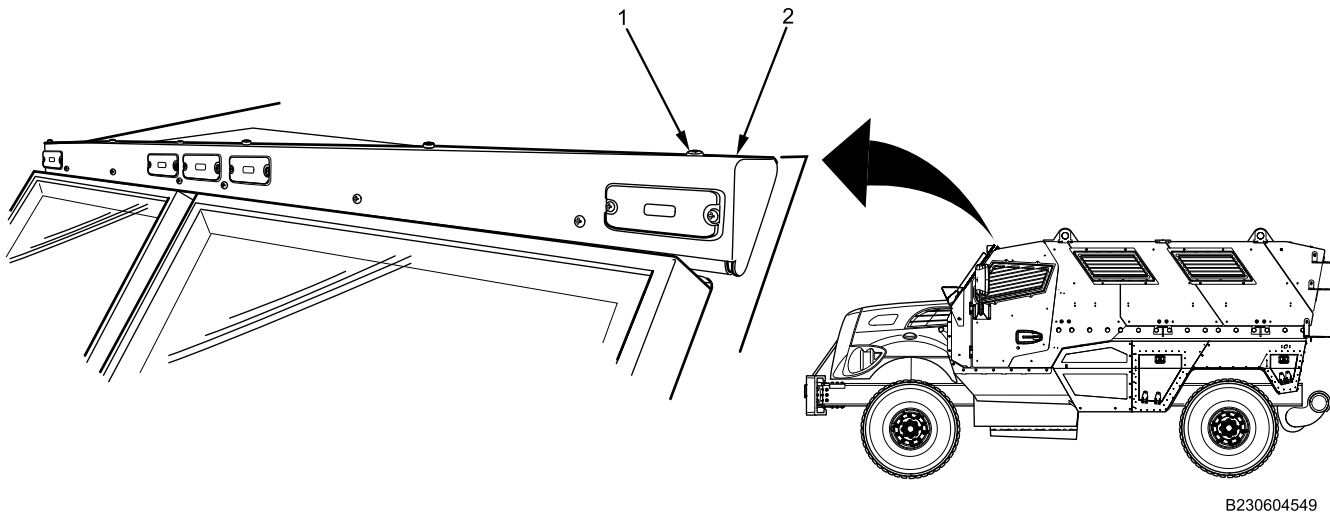
Maintain balance and footing while working on roof of vehicle. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

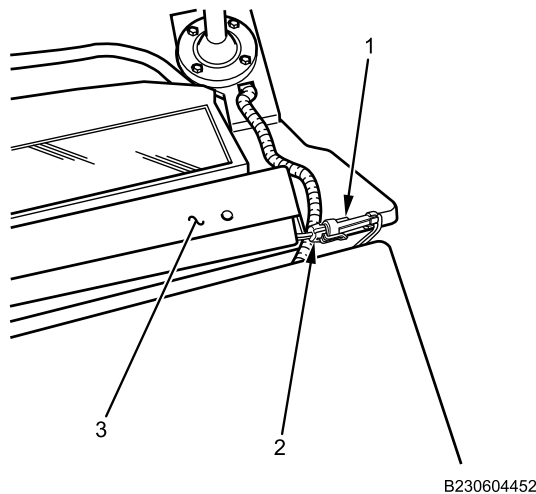
1. Remove 12 screws (Figure 1, Item 1) securing front clearance light bar (Figure 1, Item 2) to cab.



B230604549

Figure 1. Front Clearance Light Bar Screws Removal.

2. Disconnect power connector (Figure 2, Item 1) from front clearance light bar connector (Figure 2, Item 2) and remove front clearance light bar (Figure 2, Item 3) from vehicle.

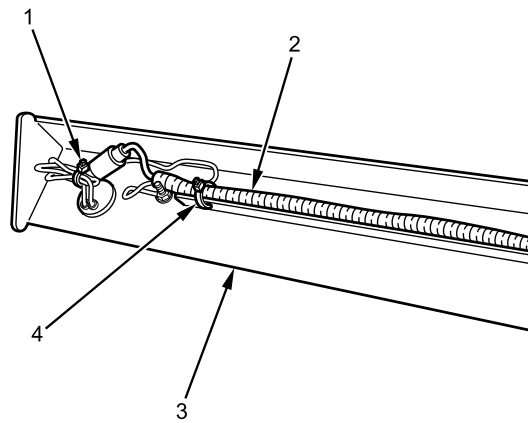


B230604452

Figure 2. Front Clearance Light Bar Removal.

3. Remove and discard two cable lock straps (Figure 3, Item 1 and 4) securing light bar harness (Figure 3, Item 2) to light bar (Figure 3, Item 3).

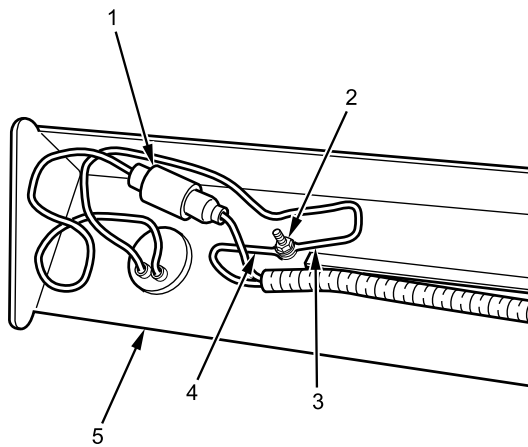
FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604453

Figure 3. Left Side of Light Bar Lock Straps.

4. Disconnect bullet connector (Figure 4, Item 1), remove nut (Figure 4, Item 2) and two ground wires (Figure 4, Item 3 and 4) from front clearance light bar (Figure 4, Item 5).



B230604454

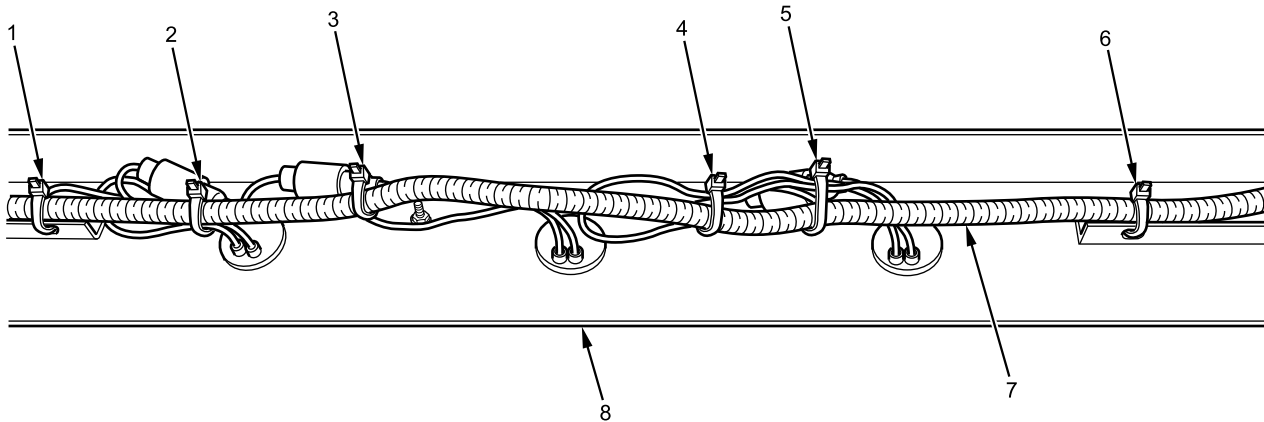
Figure 4. Left Side of Light Bar Circuitry.

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Note location of cable lock straps to aid in installation.

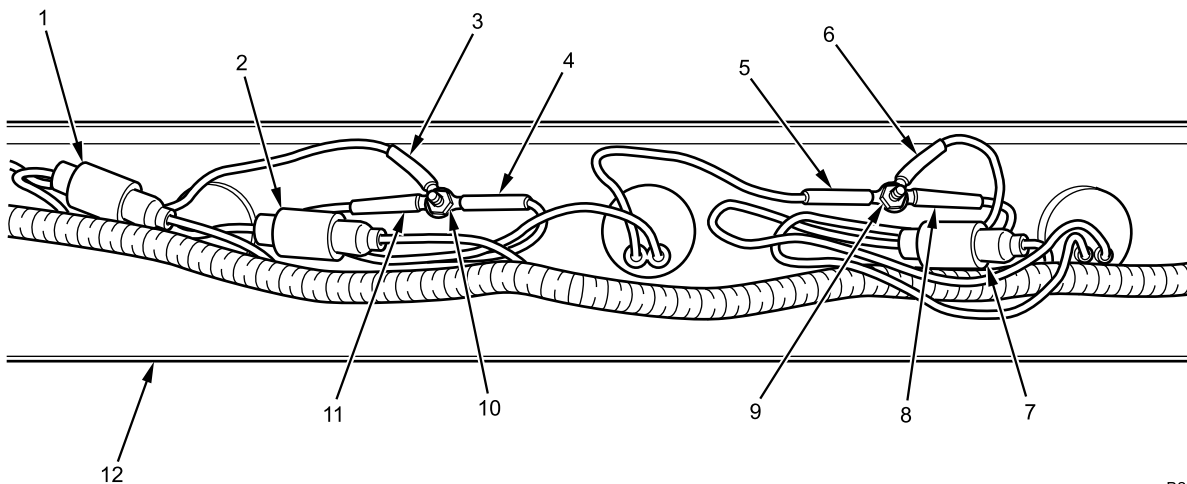
5. Remove and discard six cable lock straps (Figure 5, Item 1, 2, 3, 4, 5 and 6), securing front clearance light bar harness (Figure 5, Item 7) to front clearance light bar (Figure 5, Item 8).



B230604455

Figure 5. Center of Light Bar Lock Straps.

6. Disconnect three bullet connectors (Figure 6, Item 1, 2 and 7).

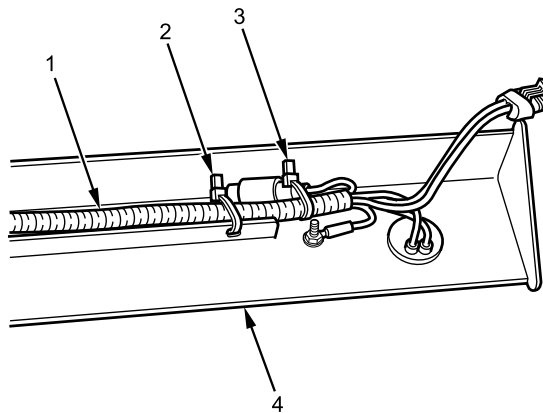


B230604456

Figure 6. Center of Light Bar Circuitry.

7. Remove two nuts (Figure 6, Item 9 and 10) and six ground wires (Figure 6, Item 3, 4, 5, 6, 8 and 11) from front clearance light bar (Figure 6, Item 12).
8. Remove and discard two cable lock straps (Figure 7, Item 2 and 3), securing front clearance light bar harness (Figure 7, Item 1) to front clearance light bar (Figure 7, Item 4).

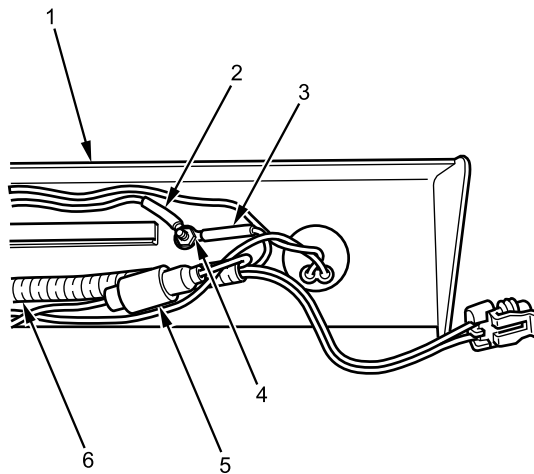
FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604457

Figure 7. Right Side of Light Bar Lock Straps.

9. Disconnect bullet connector (Figure 8, Item 5), remove nut (Figure 8, Item 4) and two ground wires (Figure 8, Item 2 and 3) from front clearance light bar (Figure 8, Item 1).



B230604458

Figure 8. Right Side of Light Bar Circuitry.

10. Remove front clearance light bar harness (Figure 8, Item 6) from front clearance light bar (Figure 8, Item 1).

END OF TASK

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

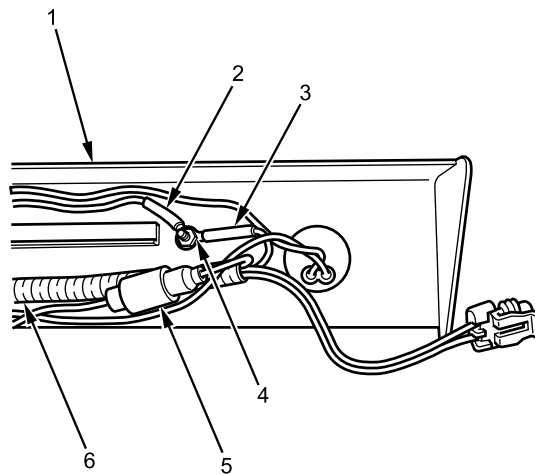
WARNING

Dielectric grease is harmful to skin and eyes. If lubricant contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

1. Position front clearance light bar harness (Figure 9, Item 6) on front clearance light bar (Figure 9, Item 1).



B230604458

Figure 9. Right Side of Light Bar Circuitry.

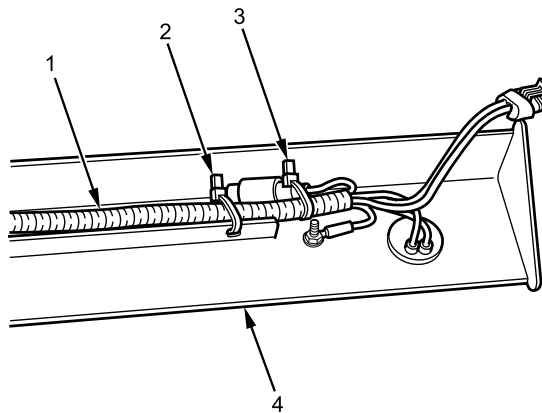
2. Connect bullet connector (Figure 9, Item 5), position two ground wires (Figure 9, Item 2 and 3) and install nut (Figure 9, Item 4). Tighten nut securely.

CAUTION

Make sure to position wiring harness above steel rib of light bar as shown or damage to harness may occur.

3. Install two new cable lock straps (Figure 10, Item 2 and 3), securing front clearance light bar harness (Figure 10, Item 1) to front clearance light bar (Figure 10, Item 4).

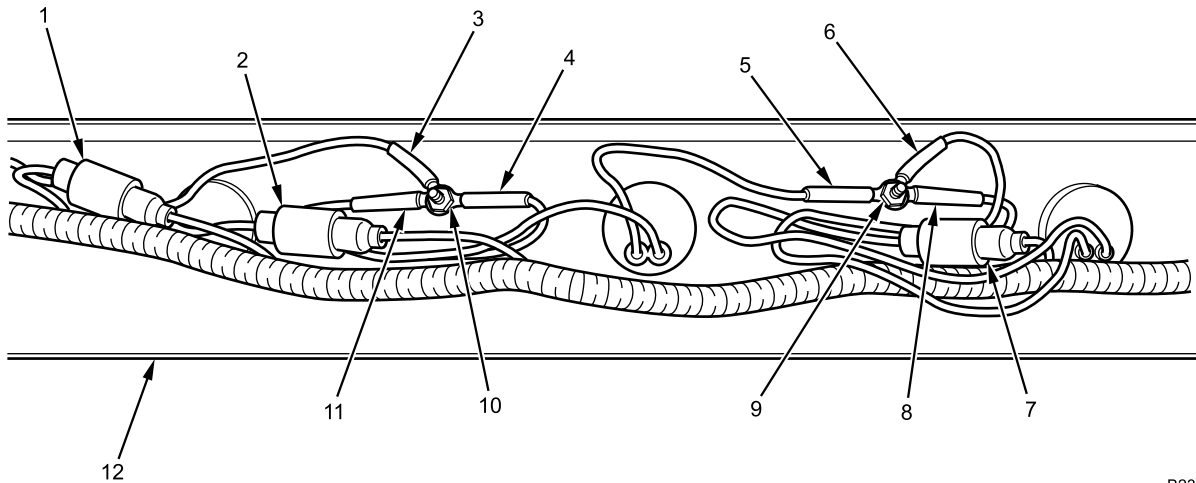
FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604457

Figure 10. Right Side of Light Bar Lock Straps.

4. Connect three bullet connectors (Figure 11, Item 1, 2 and 7), position six ground wires (Figure 11, Item 3, 4, 5, 6, 8 and 11) and install two nuts (Figure 11, Item 9 and 10), from front clearance light bar (Figure 11, Item 12). Tighten nuts securely.

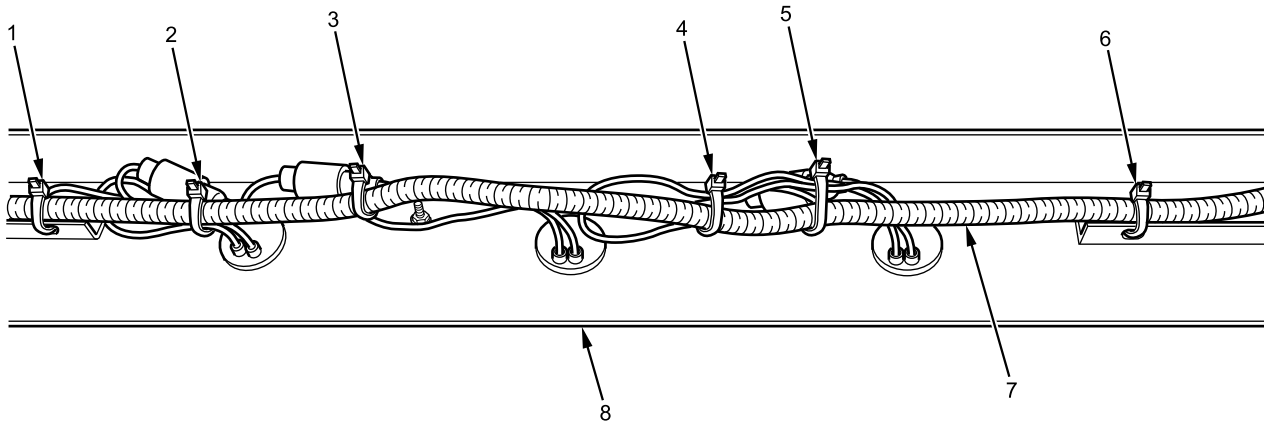


B230604456

Figure 11. Center of Light Bar Circuitry.

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

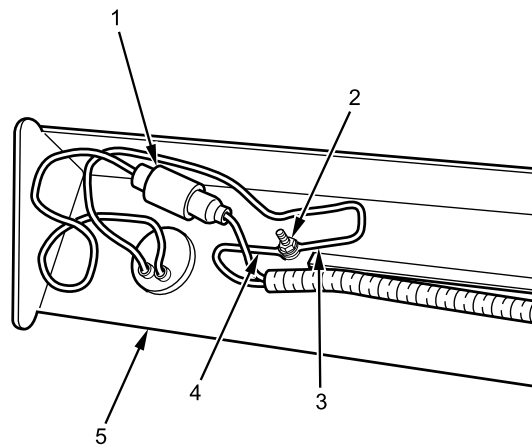
5. Install six new cable lock straps (Figure 12, Item 1, 2, 3, 4, 5 and 6), securing front clearance light bar harness (Figure 12, Item 7) to front clearance light bar (Figure 12, Item 8).



B230604455

Figure 12. Center of Light Bar Lock Straps.

6. Connect bullet connector (Figure 13, Item 1), position two ground wires (Figure 13, Item 3 and 4) and install nut (Figure 13, Item 2) on front clearance light bar (Figure 13, Item 5). Tighten nut securely.

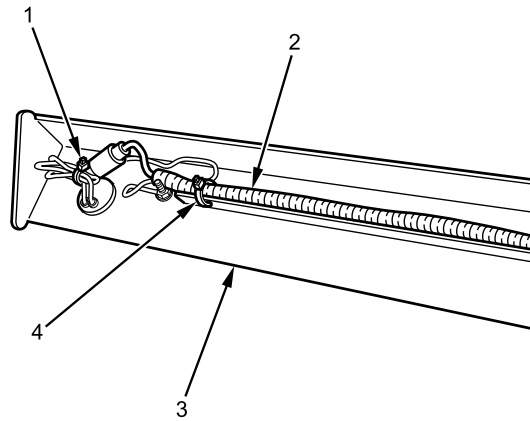


B230604454

Figure 13. Left Side of Light Bar Circuitry.

7. Install two new cable lock straps (Figure 14, Item 1 and 4) securing light bar harness (Figure 14, Item 2) to light bar (Figure 14, Item 3).

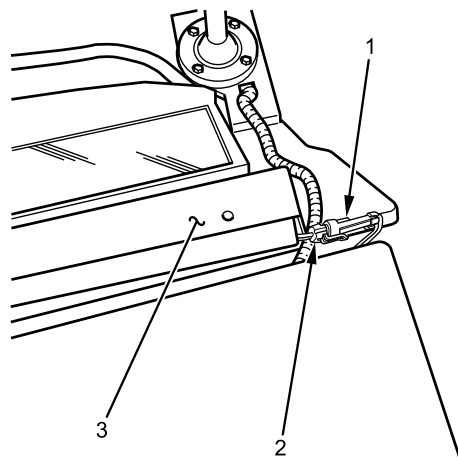
FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230604453

Figure 14. Left Side of Light Bar Lock Straps.

8. Position front clearance light bar (Figure 15, Item 3) on vehicle and connect power connector (Figure 15, Item 1) to front clearance light bar connector (Figure 15, Item 2).

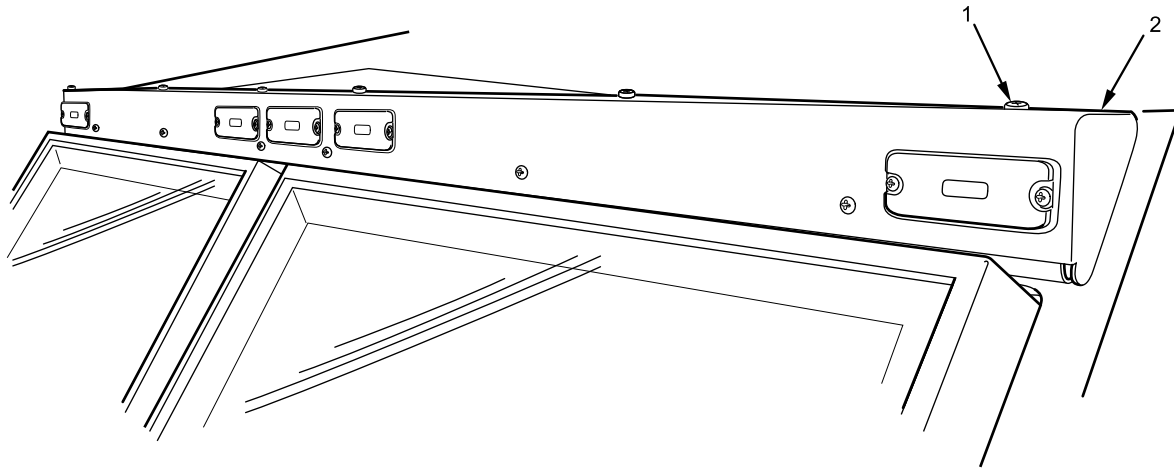


B230604452

Figure 15. Front Clearance Light Bar Installation.

FRONT CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

9. Install 12 screws (Figure 16, Item 1) securing front clearance light bar (Figure 16, Item 2) to cab. Tighten screws securely.



B230601276

Figure 16. Front Clearance Light Bar Screws Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify clearance light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT FENDER LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

REMOVAL

WARNING



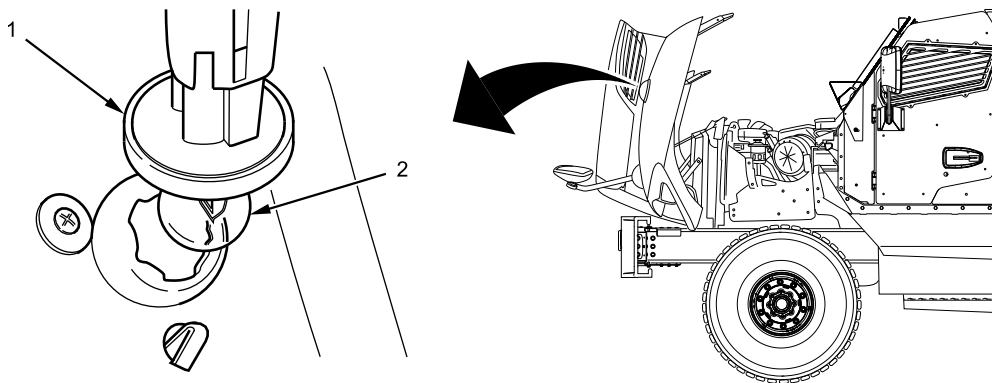
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

Left side shown; right side similar.

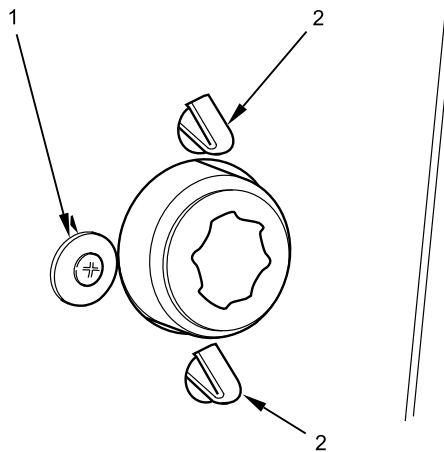
FRONT FENDER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)



P230613215

Figure 1. Socket Removal.

1. Twist socket (Figure 1, Item 1) counterclockwise to remove.
2. Pull bulb (Figure 1, Item 2) out of socket (Figure 1, Item 1) so bulb does not get damaged.



B230601180

Figure 2. Light Assembly Removal.

3. Remove screw (Figure 2, Item 1) securing light to fender.
4. Squeeze retainers (Figure 2, Item 2) and push upward on light housing to remove light.

END OF TASK

FRONT FENDER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

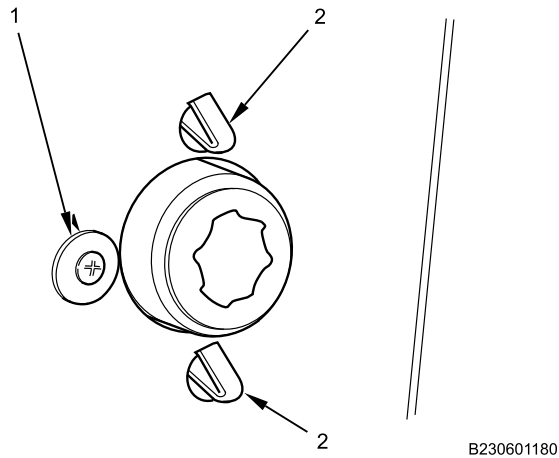


Figure 3. Light Assembly Installation.

1. Align light assembly to fender opening and press down to engage retainers (Figure 3, Item 2).
2. Install screw (Figure 3, Item 1) to secure light to fender. Tighten screw securely.
3. Apply dielectric grease to bulb contacts.

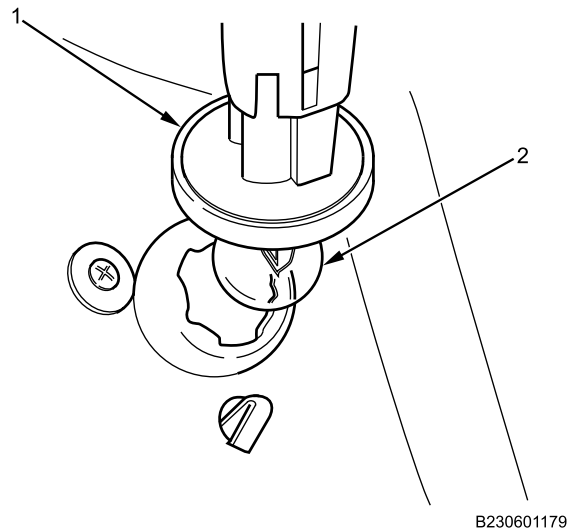
FRONT FENDER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 4. Bulb Installation.

4. Push bulb (Figure 4, Item 2) into socket (Figure 4, Item 1).
5. Align socket and lamp housing notches and twist socket clockwise to secure.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Close and secure hood (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
FRONT FENDER LIGHT BULB REMOVAL AND INSTALLATION

INITIAL SETUP:**Materials/Parts**

Grease (WP 0794, Item 22)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)

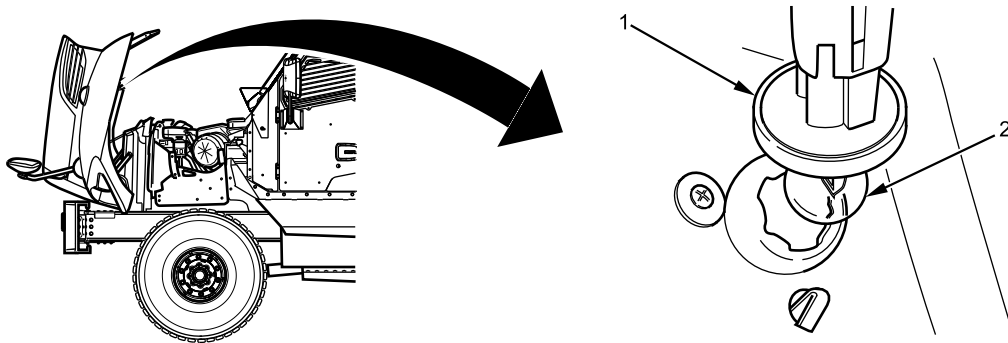
REMOVAL
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

Left side shown; right side similar.

FRONT FENDER LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

B230610056

Figure 1. Bulb Removal.

1. Twist socket (Figure 1, Item 1) counterclockwise to remove.
2. Pull bulb (Figure 1, Item 2) out of socket (Figure 1, Item 1).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical contacts.

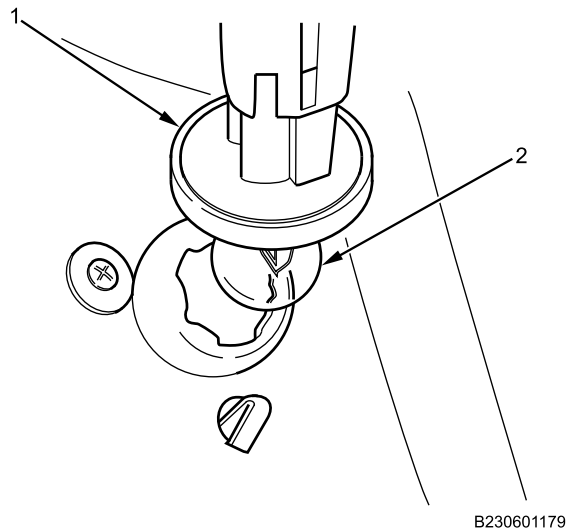
FRONT FENDER LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

Figure 2. Bulb Installation.

1. Push bulb (Figure 2, Item 2) into socket (Figure 2, Item 1).
2. Align socket (Figure 2, Item 1) and lamp housing notches and twist socket clockwise to secure.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Close and secure hood (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FRONT TURN SIGNAL AND PARKING LIGHT BULB REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

Materials/Parts

Grease (WP 0794, Item 22)

References

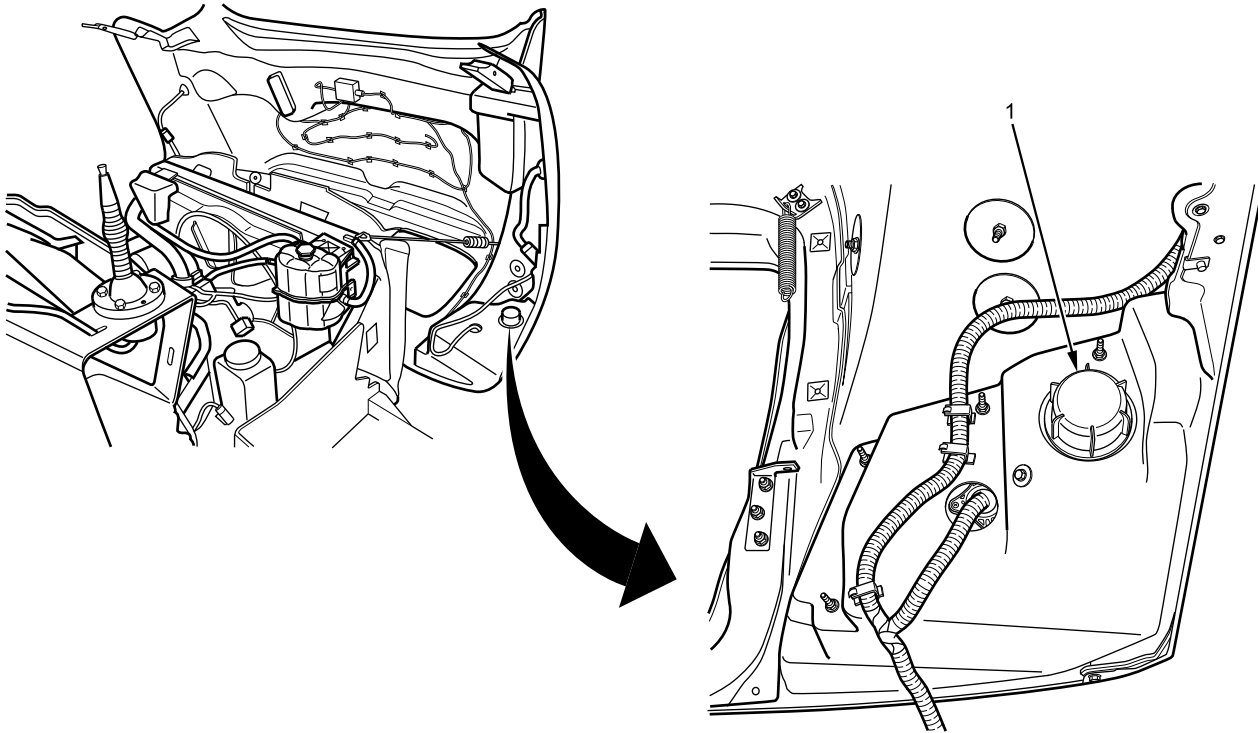
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

FRONT TURN SIGNAL AND PARKING LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

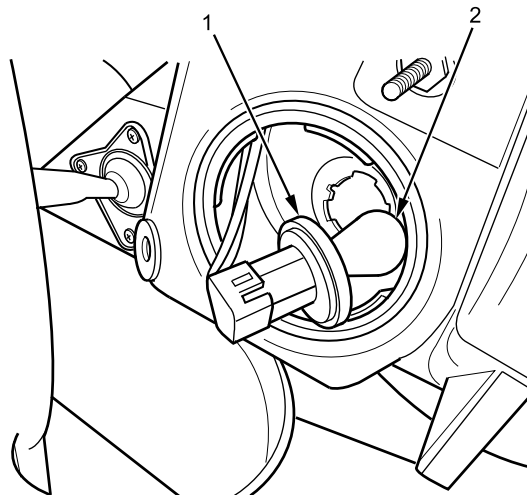
1. Twist cover (Figure 1, Item 1) counterclockwise to remove.



B230610051

Figure 1. Socket Cover.

2. Twist bulb socket (Figure 2, Item 1) counterclockwise to remove.



B230601173

Figure 2. Bulb Removal and Installation.

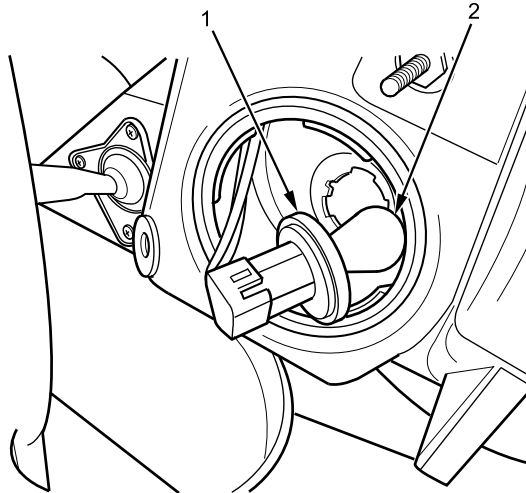
3. Pull bulb (Figure 2, Item 2) out of socket.

END OF TASK

FRONT TURN SIGNAL AND PARKING LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply dielectric grease to bulb contacts.
2. Push bulb (Figure 3, Item 2) into socket (Figure 3, Item 1).



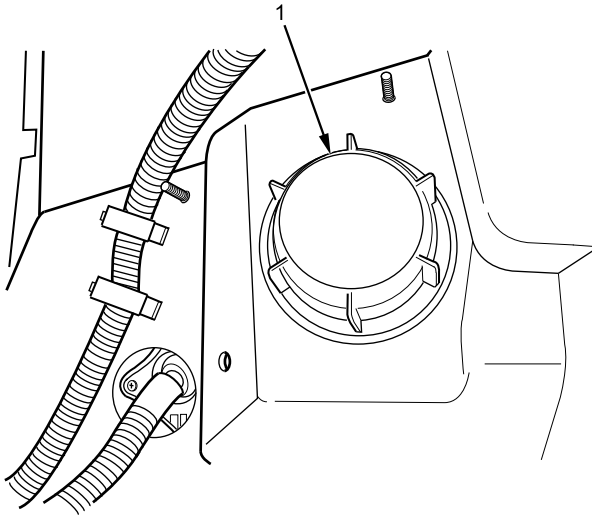
B230601173

Figure 3. Bulb Removal and Installation.

3. Align socket (Figure 3, Item 1) and lamp housing notches and twist socket clockwise to secure.

FRONT TURN SIGNAL AND PARKING LIGHT BULB REMOVAL AND INSTALLATION - (CONTINUED)

4. Align cover (Figure 4, Item 1) to opening and twist clockwise to secure.



B230601172

Figure 4. Socket Cover Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 33)
Cable lock strap - (4) (WP 0796, Item 124)

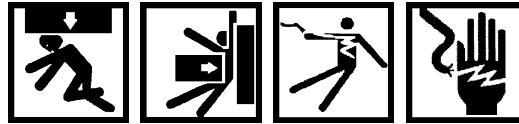
Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Label all connectors before removal to aid in correct installation.

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Remove and discard three cable lock straps (Figure 1, Item 1, 2, and 3) from front bumper left harness (Figure 1, Item 4).

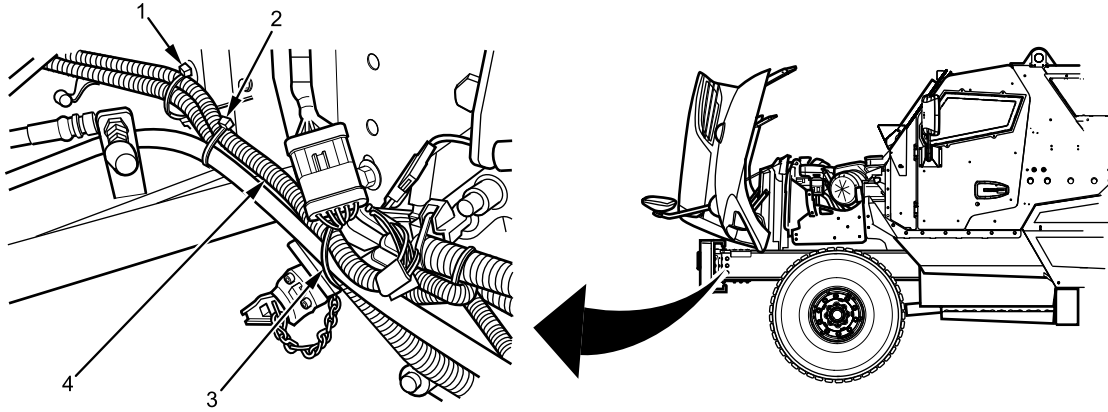


Figure 1. Front Bumper Left Harness Lock Straps.

2. Disconnect three connectors (Figure 2, Item 1, 3, and 4) from front bumper left harness (Figure 2, Item 2).

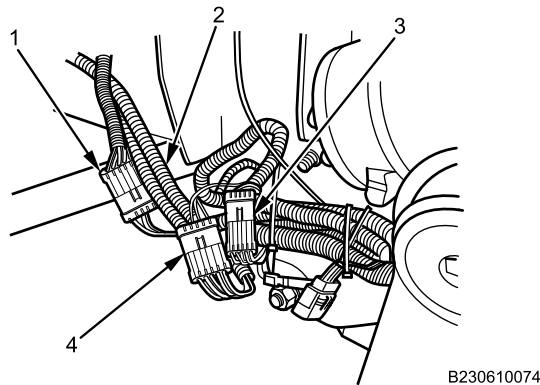


Figure 2. Front Bumper Left Harness Connectors.

3. Disconnect bullet connector (Figure 3, Item 1) and 2-pin connector (Figure 3, Item 2).

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

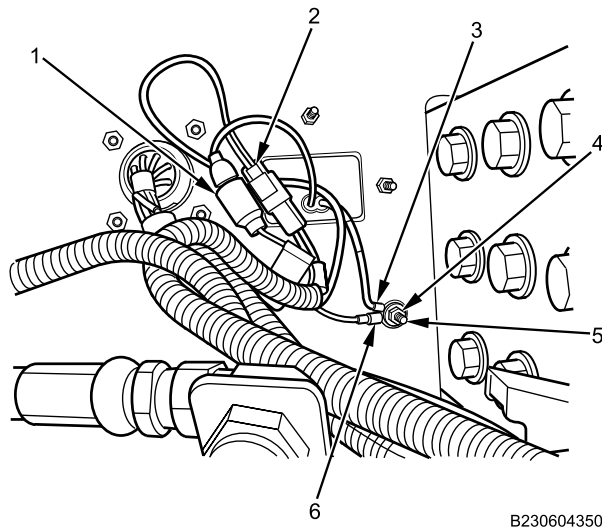


Figure 3. Front Bumper Left Harness Connectors and Ground.

4. Remove nut (Figure 3, Item 4) from stud (Figure 3, Item 5) and disconnect two ground eyelets (Figure 3, Item 3 and 6).
5. Remove and discard cable lock strap (Figure 4, Item 1).

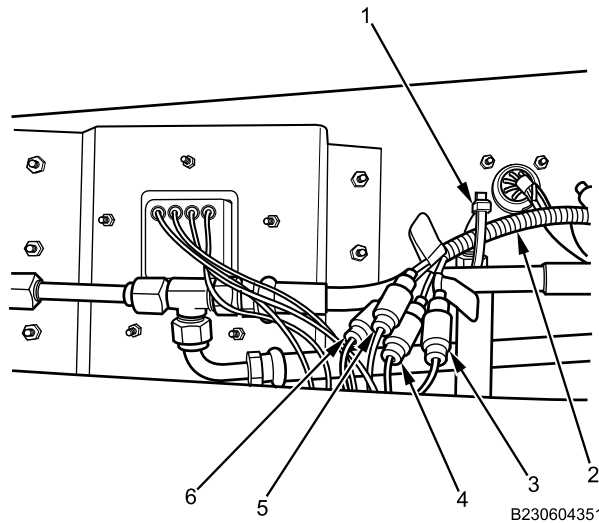


Figure 4. Front Bumper Bullet Connectors.

6. Disconnect four bullet connectors (Figure 4, Item 3, 4, 5, and 6) and remove front bumper left harness (Figure 4, Item 2).

END OF TASK

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical contacts before installation.

1. Position front bumper left harness (Figure 5, Item 2) and connect four bullet connectors (Figure 5, Item 3, 4, 5 and 6).

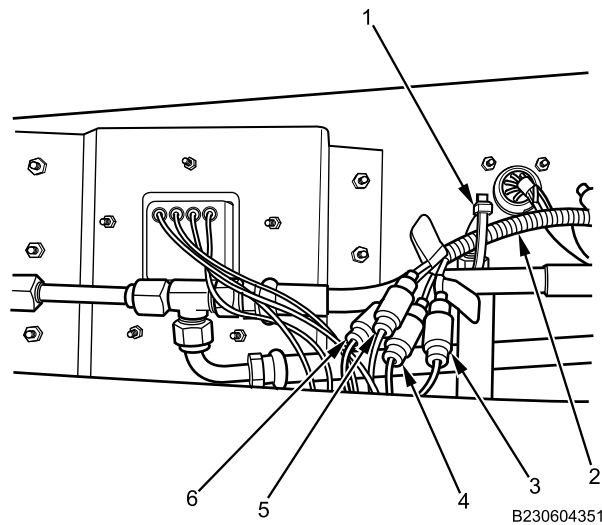


Figure 5. Front Bumper Bullet Connectors.

2. Install new cable lock strap (Figure 5, Item 1).
3. Position two ground eyelets (Figure 6, Item 3 and 6) on stud (Figure 6, Item 5) and install nut (Figure 6, Item 4). Tighten nut securely.

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

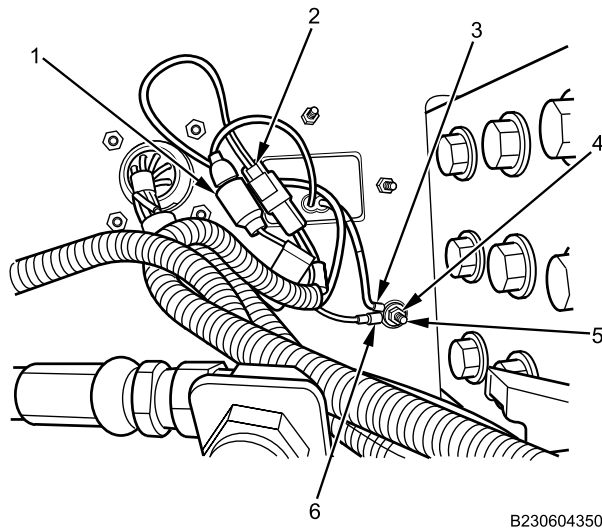


Figure 6. Front Bumper Left Harness Connectors and Ground.

4. Connect bullet connector (Figure 6, Item 1) and 2-pin connector (Figure 6, Item 2).
5. Connect three connectors (Figure 7, Item 1, 2 and 3).

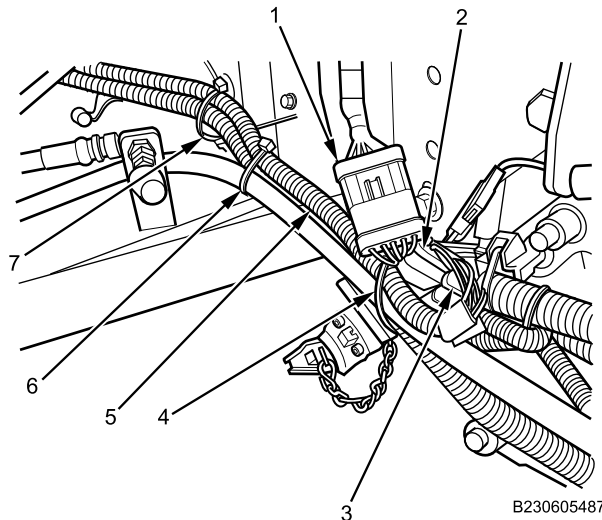


Figure 7. Front Bumper Left Harness Connectors.

6. Install three new cable lock straps (Figure 7, Item 4, 6, and 7) to secure front bumper left harness (Figure 7, Item 5) to forward chassis harness.

END OF TASK

FRONT BUMPER LEFT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Close engine hood (TM 9-2355-106-10).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify light operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Wire tags (WP 0794, Item 49)
Cable lock strap - (4) (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

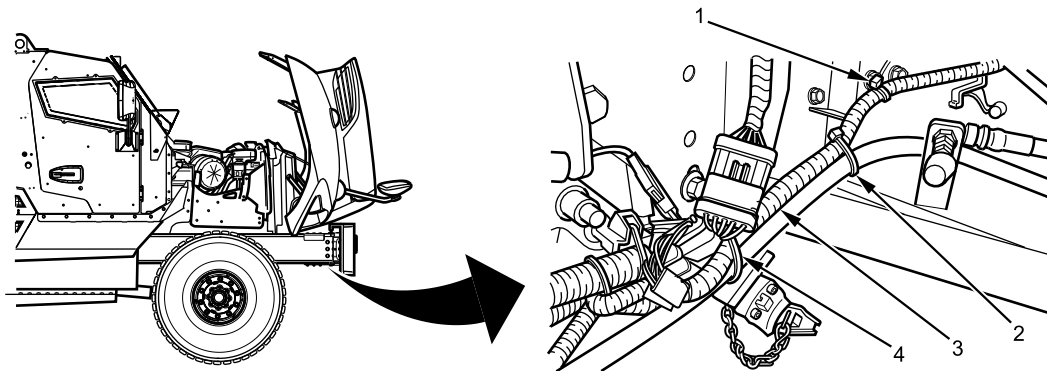
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Label all connectors before removal to aid installation.

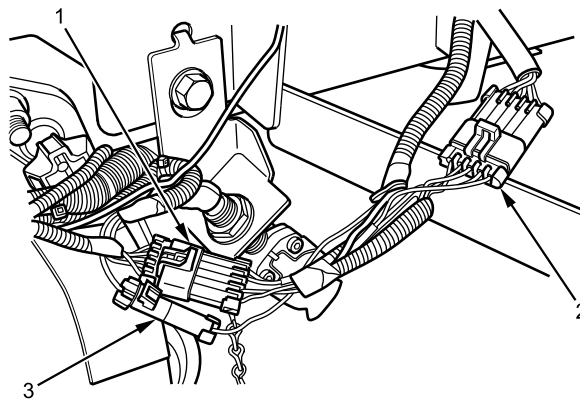
Remove cable lock straps as necessary to perform procedure. Note position and size of cable lock straps to aid installation.

REMOVAL

B230610072

Figure 1. Front Bumper Harness Lock Straps.

1. Remove three cable lock straps (Figure 1, Item 1, 2 and 4) from front bumper harness (Figure 1, Item 3). Discard cable lock straps.



B230610073

Figure 2. Front Bumper Harness Connectors.

2. Disconnect three connectors (Figure 2, Item 1, 2 and 3) from front bumper harness.

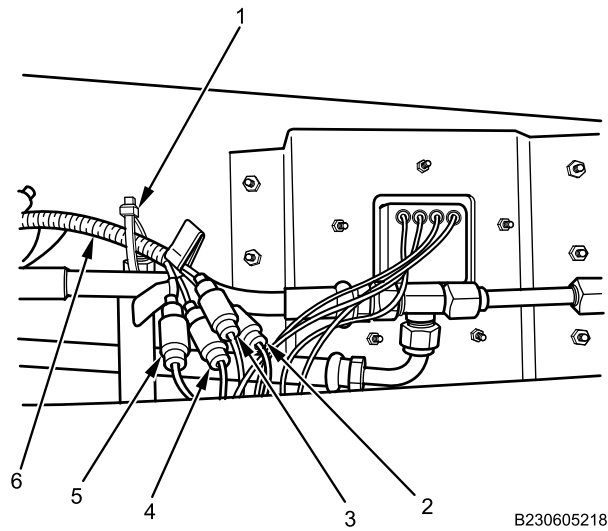
FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

Figure 3. Front Bumper Bullet Connectors.

3. Remove and discard cable lock strap (Figure 3, Item 1).
4. Disconnect four bullet connectors (Figure 3, Item 2, 3, 4 and 5) and remove front bumper harness (Figure 3, Item 6).

END OF TASK

FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical contacts before installation.

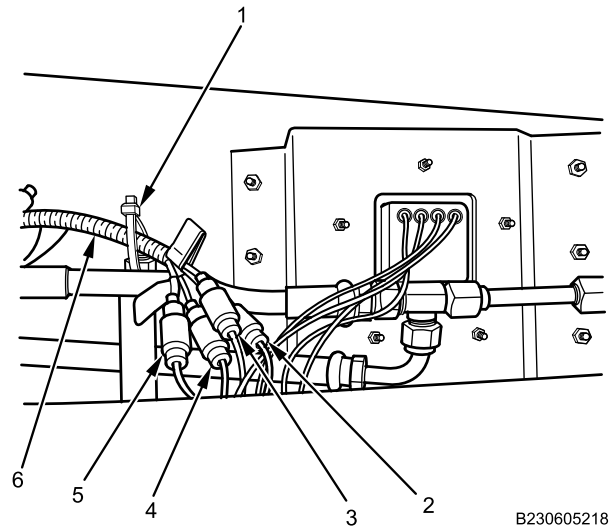
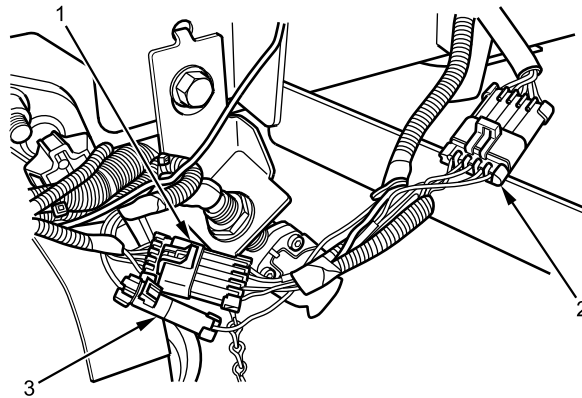


Figure 4. Front Bumper Bullet Connectors.

1. Position front bumper harness (Figure 4, Item 6) and connect four bullet connectors (Figure 4, Item 2, 3, 4 and 5).
2. Install new cable lock strap (Figure 4, Item 1).

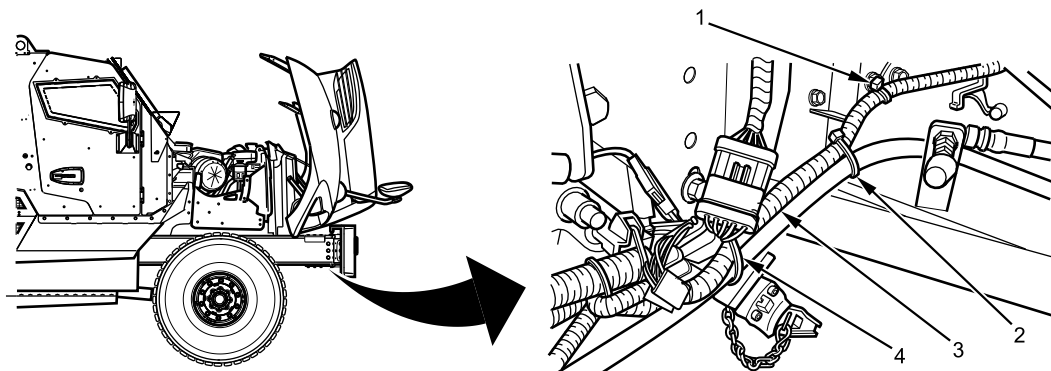
FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)



B230610073

Figure 5. Front Bumper Harness Connectors.

3. Connect three connectors (Figure 5, Item 1, 2 and 3) to front bumper harness (Figure 4, Item 4).



B230610072

Figure 6. Front Bumper Harness Lock Straps.

4. Install three new cable lock straps (Figure 6, Item 1, 2 and 4) to front bumper harness (Figure 6, Item 3).
5. Install all cable lock straps and tighten securely.

END OF TASK

FRONT BUMPER RIGHT HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Close engine hood (TM 9-2355-106-10).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify light operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
HEADLAMP REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

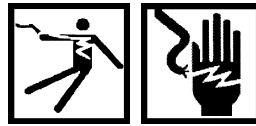
MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

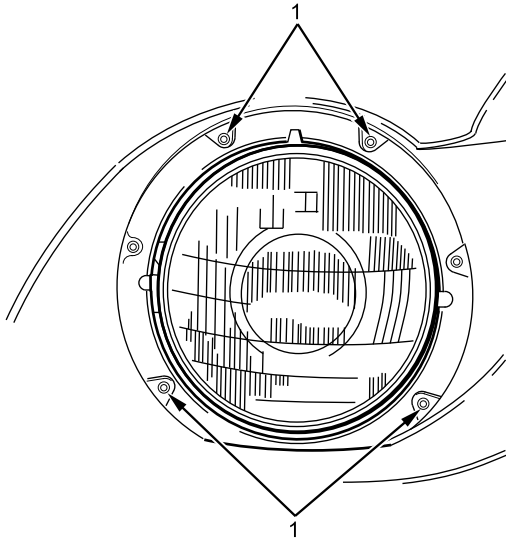
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

HEADLAMP REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

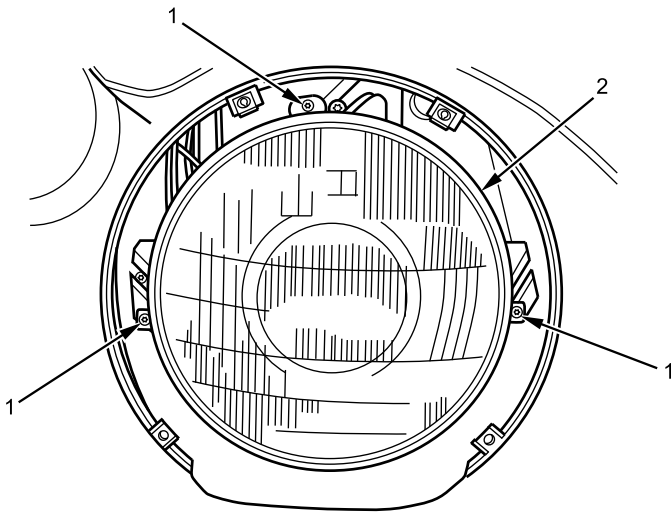
1. Remove four screws (Figure 1, Item 1) securing bezel to headlamp housing.



B230601168

Figure 1. Headlamp Bezel Removal.

2. Remove three screws (Figure 2, Item 1) securing headlamp retainer (Figure 2, Item 2) to headlamp bucket.

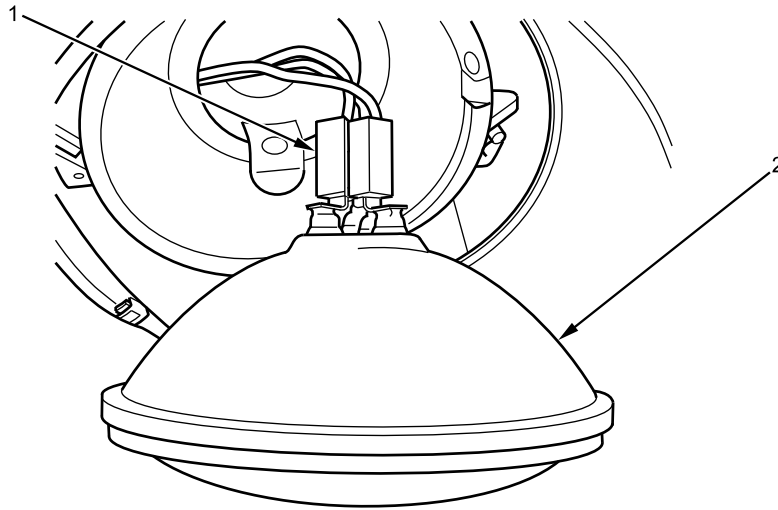


B230603247

Figure 2. Headlamp Retainer Removal.

HEADLAMP REMOVAL AND INSTALLATION - (CONTINUED)

3. Disconnect headlamp connector (Figure 3, Item 1) from headlamp (Figure 3, Item 2).



B230601170

Figure 3. Headlamp Connector.

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

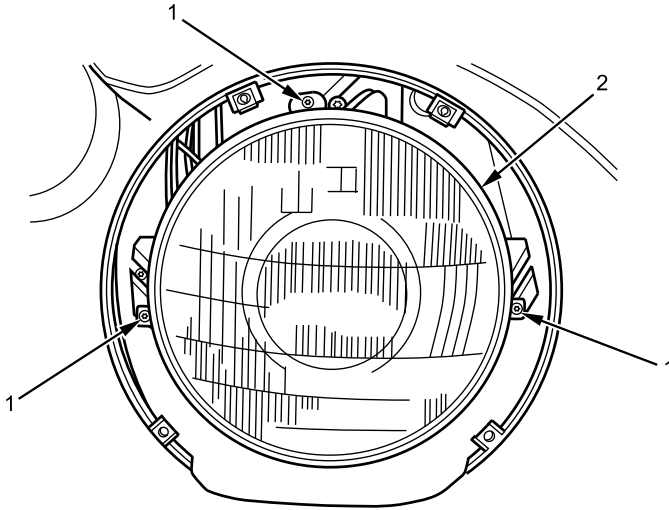
NOTE

Apply dielectric grease to all electrical connections.

1. Connect headlamp connector (Figure 3, Item 1) to headlamp (Figure 3, Item 2).

HEADLAMP REMOVAL AND INSTALLATION - (CONTINUED)

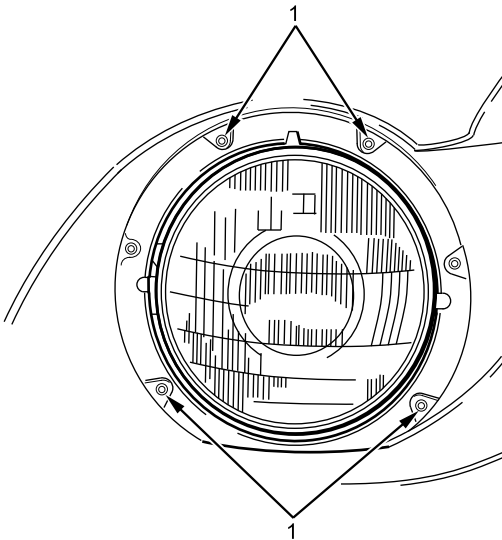
2. Install three screws (Figure 4, Item 1) securing headlamp retainer (Figure 4, Item 2) to headlamp bucket. Tighten screws securely.



B230603247

Figure 4. Headlamp Retainer Installation.

3. Install four screws (Figure 5, Item 1) securing bezel to headlamp housing. Tighten screws securely.



B230601168

Figure 5. Headlamp Bezel Installation.

END OF TASK

HEADLAMP REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify headlamp operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

HEADLAMP ALIGNMENT PROCEDURE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

Tape (WP 0794, Item 53)

Equipment Condition

Engine off (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

References

TM 9-2355-106-10

Vehicle parking brake set (TM 9-2355-106-10)

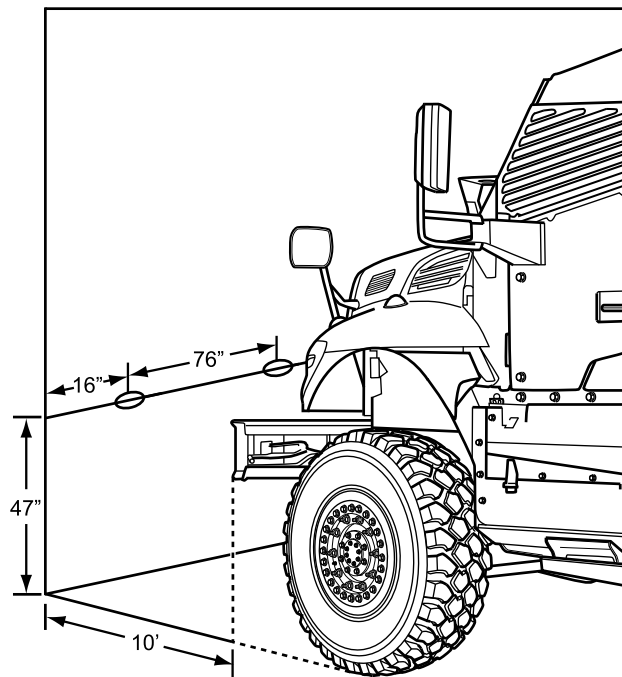
Wheels chocked (TM 9-2355-106-10)

ALIGNMENT

NOTE

Ensure vehicle is parked on a flat surface and perpendicular to wall.

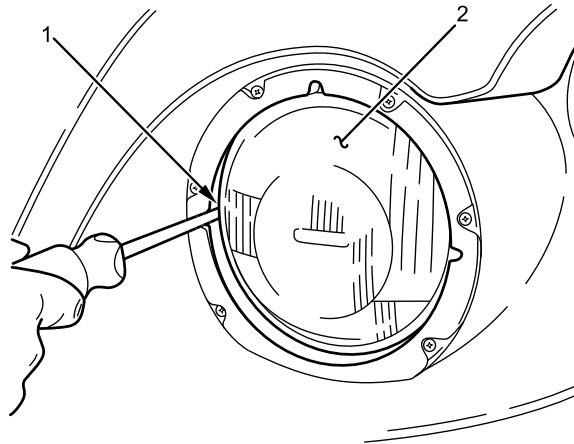
1. Park vehicle so front bumper is 10 feet from wall. Place tape from outside edge of tire to wall.



B230602608

Figure 1. Headlamp Alignment Dimensions.

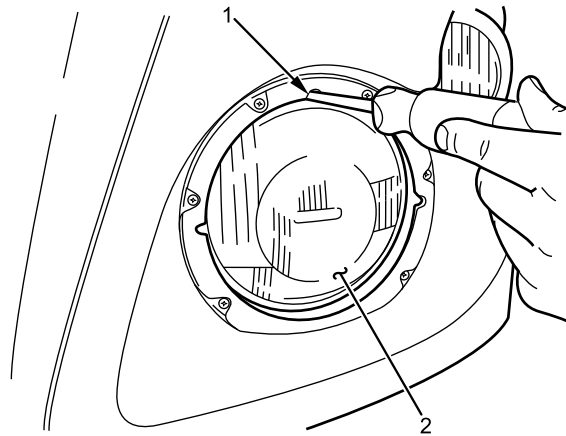
2. Measure up from ground 47 inches and apply tape to wall.
3. From top of 47-inch high tape, apply tape on wall parallel to floor for the width of vehicle.
4. On tape line parallel to floor, measure inboard 16 inches and mark an 8-inch oval with tape.
5. From center of left 8-inch oval, measure 76 inches to right and mark 8-inch oval.
6. Turn on low beam headlamps (TM 9-2355-106-10).

HEADLAMP ALIGNMENT PROCEDURE - (CONTINUED)

B230603543

Figure 2. Headlamp Adjusting Screw Side.

7. Turn inside adjusting screw (Figure 2, Item 1) clockwise or counterclockwise to aim headlamp (Figure 2, Item 2) right or left to center in oval on wall.



B230603544

Figure 3. Headlamp Adjusting Screw Top.

8. Turn top adjusting screw (Figure 3, Item 1) clockwise or counterclockwise to aim headlamp (Figure 3, Item 2) up or down to center in oval on wall.
9. Adjust headlamps until beams are centered in ovals.
10. Turn off headlamps.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock straps - (3) (WP 0796, Item 124)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Left headlamp removed (WP 0376)
Engine hood open and secured (TM 9-2355-106-10)

WARNING



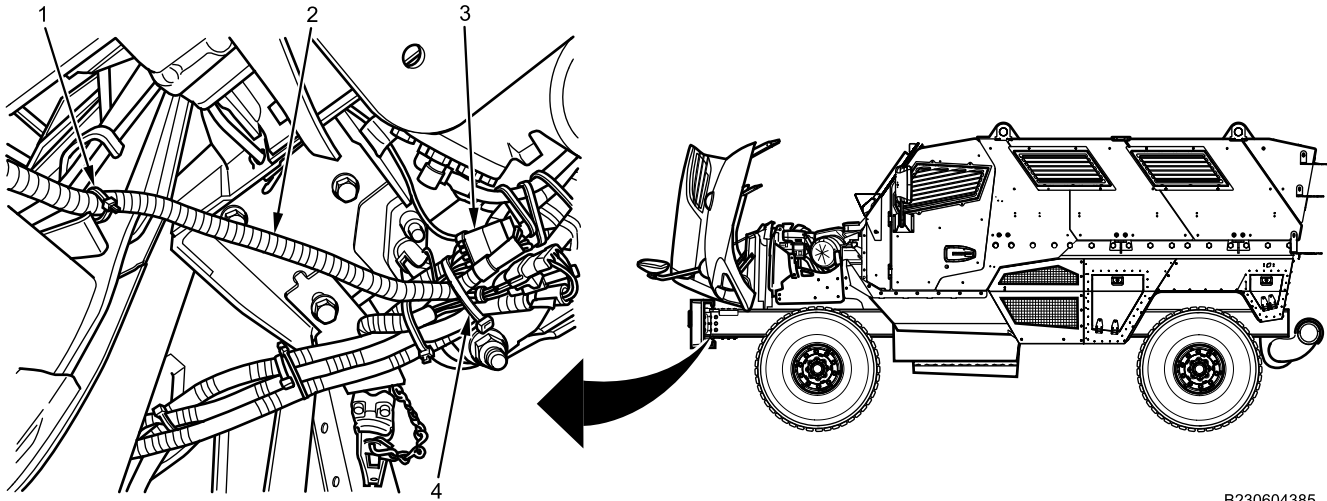
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

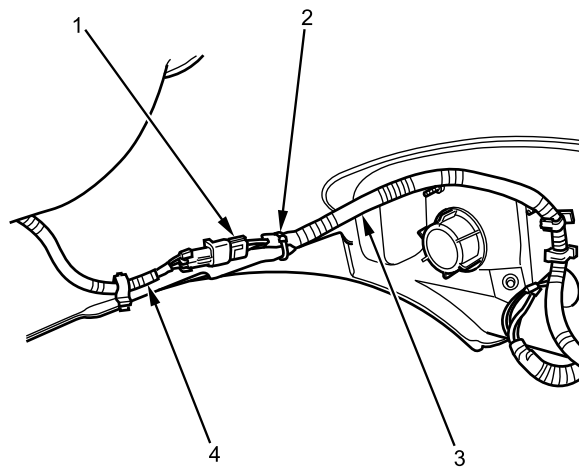
1. Remove two cable lock straps (Figure 1, Item 1 and 4), and disconnect 5-pin connector (Figure 1, Item 3) from left headlamp harness (Figure 1, Item 2). Discard cable lock straps.



B230604385

Figure 1. Left Headlamp Harness Main Connector.

2. Remove cable lock strap (Figure 2, Item 2) from left headlamp harness (Figure 2, Item 3), and disconnect 3-pin connector (Figure 2, Item 1) from side marker light harness (Figure 2, Item 4). Discard cable lock strap.



B230603751

Figure 2. Side Marker Light Harness Connector.

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

3. Open three harness clips (Figure 3, Item 2, 3, and 6) and remove left headlamp harness (Figure 3, Item 7).

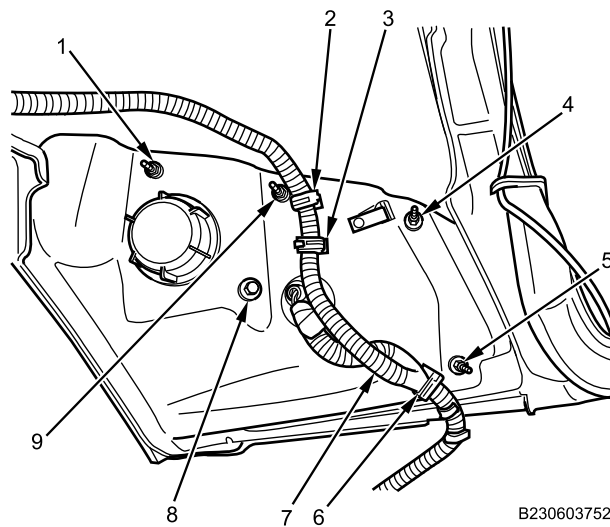


Figure 3. Headlamp Harness Clips.

CAUTION

Ensure headlamp assembly does not fall out of hood when removing final fastener. Failure to comply may cause damage to assembly.

4. Remove four nuts (Figure 3, Item 1, 4, 5, and 9) and one bolt (Figure 3, Item 8) fastening headlamp assembly to hood.

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Remove left headlamp assembly (Figure 4, Item 1) from engine hood (Figure 4, Item 2), and pull left headlamp harness (Figure 4, Item 3) through hole in hood.

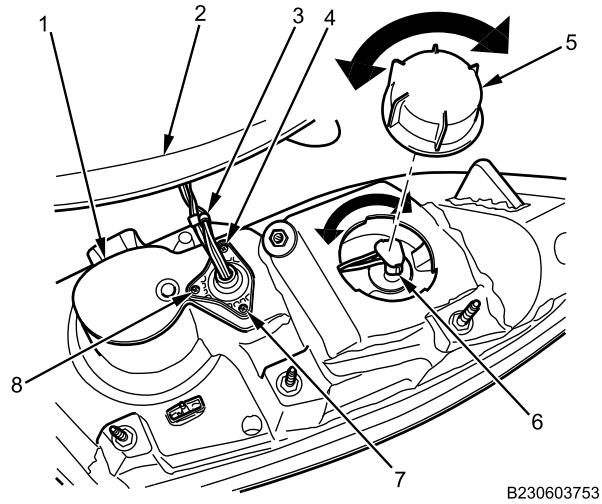


Figure 4. Left Headlamp Assembly Removal.

6. Remove park light cover (Figure 4, Item 5) from left headlamp assembly by turning counterclockwise.
7. Remove park light socket (Figure 4, Item 6) from left headlamp assembly (Figure 4, Item 1) by turning counterclockwise.
8. Remove park light bulb from park light socket (Figure 4, Item 6) to facilitate removal of left headlamp harness (Figure 4, Item 3) from headlamp assembly (Figure 4, Item 1).
9. Remove three screws (Figure 4, Item 4, 7, and 8) and left headlamp harness (Figure 4, Item 3) from headlamp assembly (Figure 4, Item 1).

END OF TASK

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

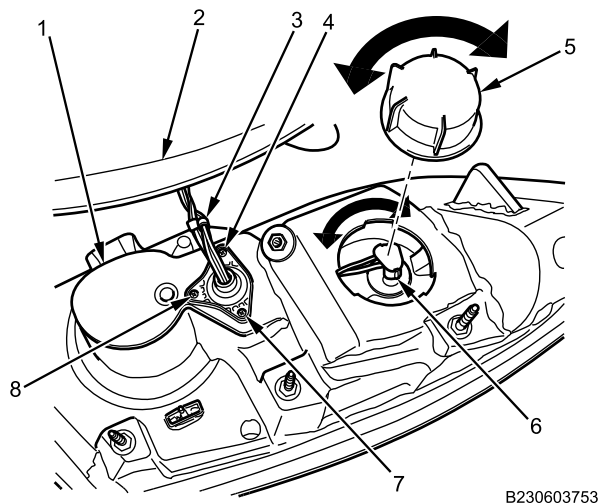
WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors before installation.

1. Install left headlamp harness (Figure 5, Item 3) on left headlamp assembly (Figure 5, Item 1) with three screws (Figure 5, Item 4, 7, and 8).



B230603753

Figure 5. Left Headlamp Assembly Installation.

2. Insert park light bulb in park light socket by turning clockwise.
3. Install park light socket (Figure 5, Item 6) by turning clockwise.
4. Install park light cover (Figure 5, Item 5) by turning clockwise.
5. Pull left headlamp harness (Figure 5, Item 3) through hole in engine hood (Figure 5, Item 2), and install left headlamp assembly (Figure 5, Item 1) in engine hood.

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

6. Install four nuts (Figure 6, Item 1, 4, 5, and 9) and one bolt (Figure 6, Item 8) into headlamp assembly.

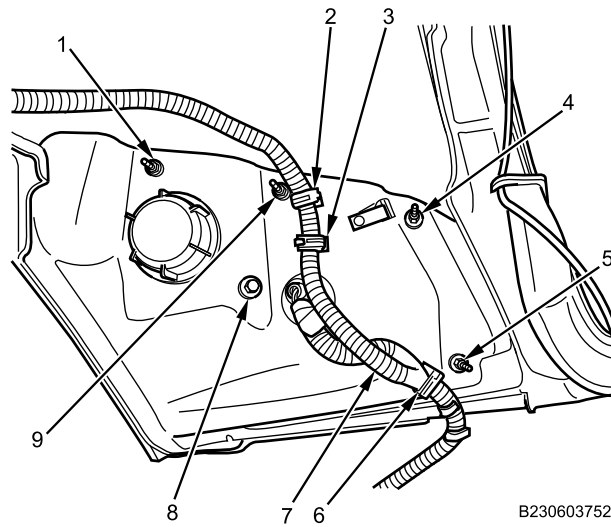


Figure 6. Left Light Housing Installation.

7. Position left headlamp harness (Figure 6, Item 7) in three harness clips (Figure 6, Item 2, 3, and 6) and close clips.
8. Connect 3-pin connector (Figure 7, Item 1) to side marker light harness (Figure 7, Item 4), and install new cable lock strap (Figure 7, Item 2) on left headlamp harness (Figure 7, Item 3).

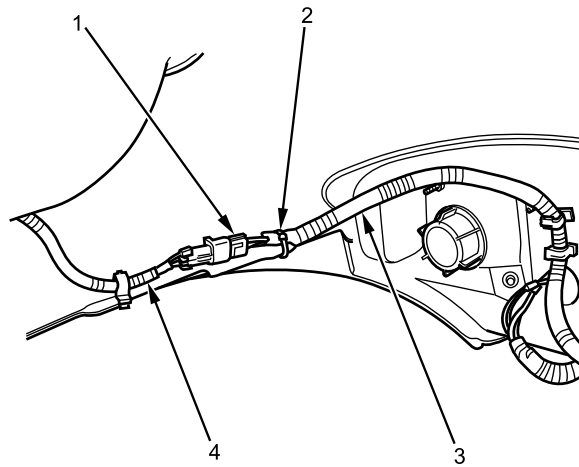


Figure 7. Side Marker Light Harness Connector Connection.

LEFT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

9. Connect 5-pin connector (Figure 8, Item 3) to left headlamp harness (Figure 8, Item 2), and install two new cable lock straps (Figure 8, Item 1 and 4).

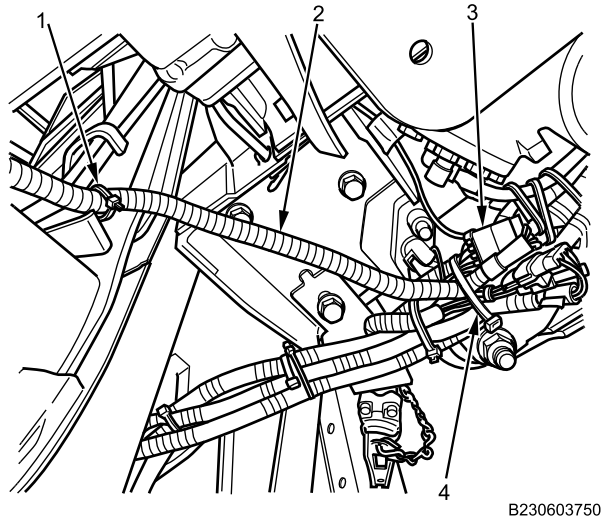


Figure 8. Left Headlamp Harness Main Connector Connection.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Close engine hood (TM 9-2355-106-10).
2. Install left headlamp (WP 0376).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify left headlamp and park light operation (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock straps - (4) (WP 0796, Item 124)

References

TM 9-2355-106-10
TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Right headlamp removed (WP 0376)
Engine hood open and secured (TM 9-2355-106-10)

WARNING

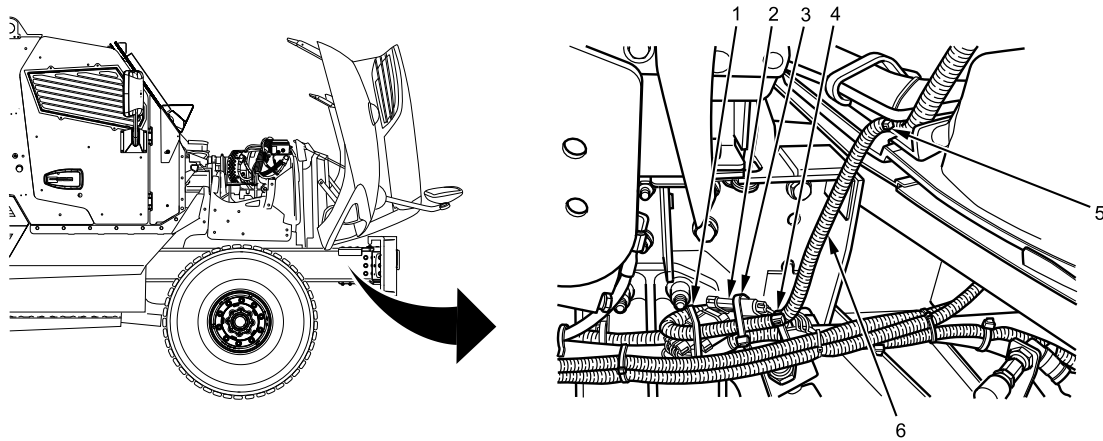


Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

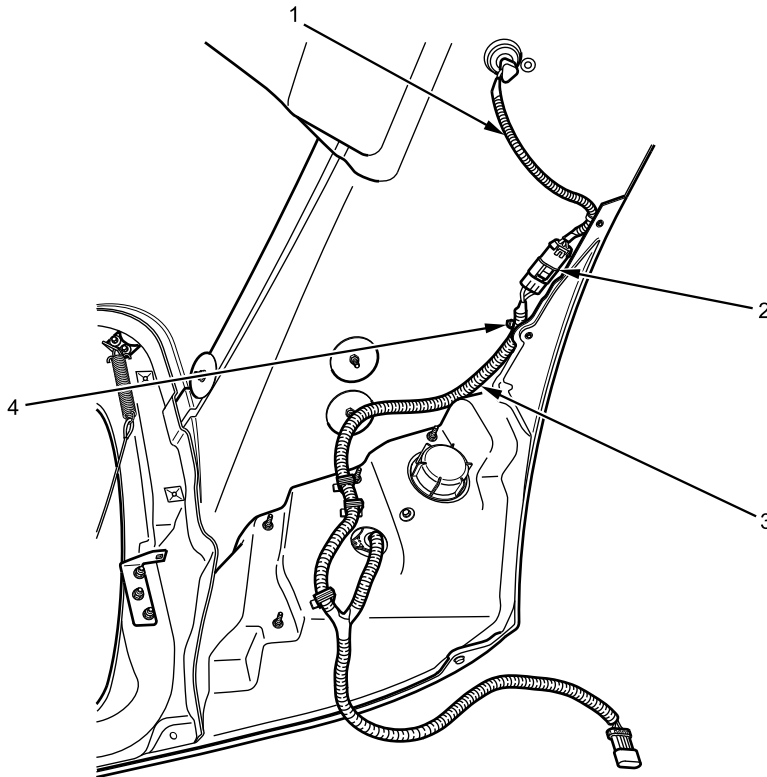
REMOVAL



B230603997

Figure 1. Right Headlamp Harness Main Connector.

1. Remove four cable lock straps (Figure 1, Item 1, 3, 4, and 5), and disconnect 5-pin connector (Figure 1, Item 2) from right headlamp harness (Figure 1, Item 6). Discard cable lock straps (Figure 1, Item 1, 3, 4, and 5).



B230603998

Figure 2. Side Marker Light Harness Connector.

2. Release harness clip (Figure 2, Item 4) from right headlamp harness (Figure 2, Item 3).
3. Disconnect 3-pin headlamp harness connector (Figure 2, Item 2) from side marker light harness (Figure 2, Item 1).

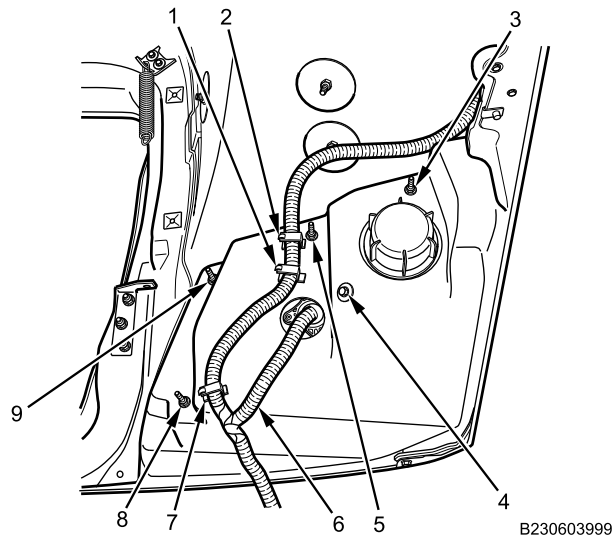
RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

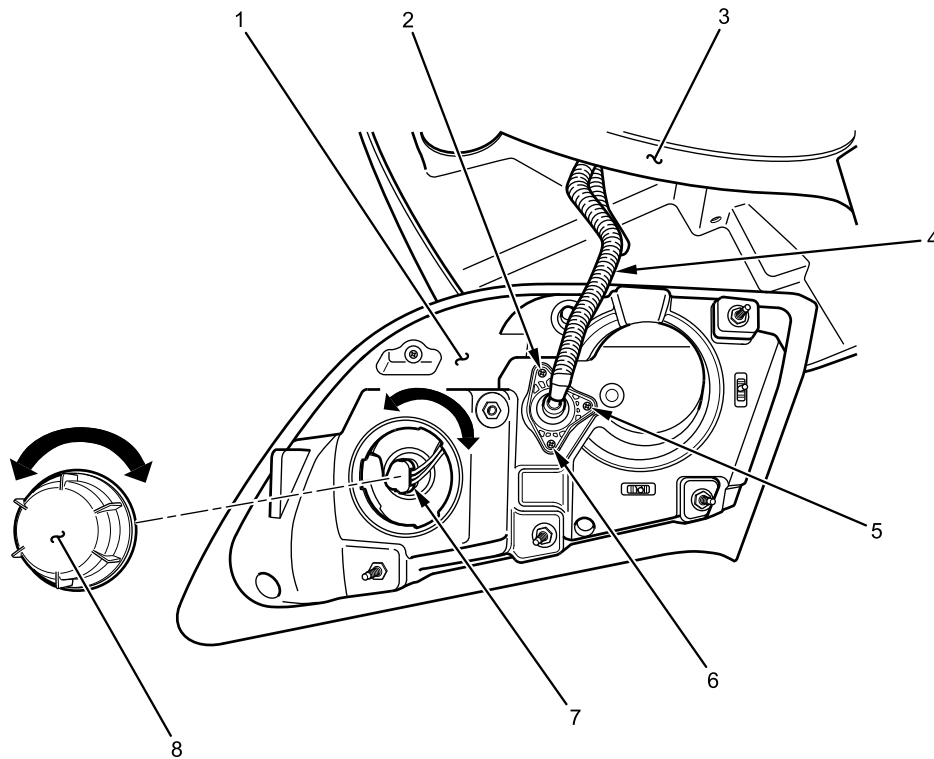
Figure 3. Headlamp Harness Clips.

4. Release three harness clips (Figure 3, Item 1, 2, and 7) from right headlamp harness (Figure 3, Item 6).

CAUTION

Ensure headlamp assembly does not fall out of hood when removing final fastener. Failure to comply may result in damage to headlamp assembly.

5. Remove four nuts (Figure 3, Item 3, 5, 8, and 9) and one bolt (Figure 3, Item 4).

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230604000

Figure 4. Right Headlamp Assembly Removal.

6. Remove right headlamp assembly (Figure 4, Item 1) from engine hood (Figure 4, Item 3), and pull right headlamp harness (Figure 4, Item 4) through hole in hood.
7. Remove park light cover (Figure 4, Item 8) from right headlamp assembly (Figure 4, Item 1) by turning counterclockwise.
8. Remove park light socket (Figure 4, Item 7) from right headlamp assembly (Figure 4, Item 1) by turning counterclockwise.
9. Remove park light bulb from park light socket (Figure 4, Item 7) to facilitate removal of right headlamp harness (Figure 4, Item 4) from right headlamp assembly (Figure 4, Item 1).
10. Remove three screws (Figure 4, Item 2, 5, and 6) and right headlamp harness (Figure 4, Item 4) from right headlamp assembly (Figure 4, Item 1).

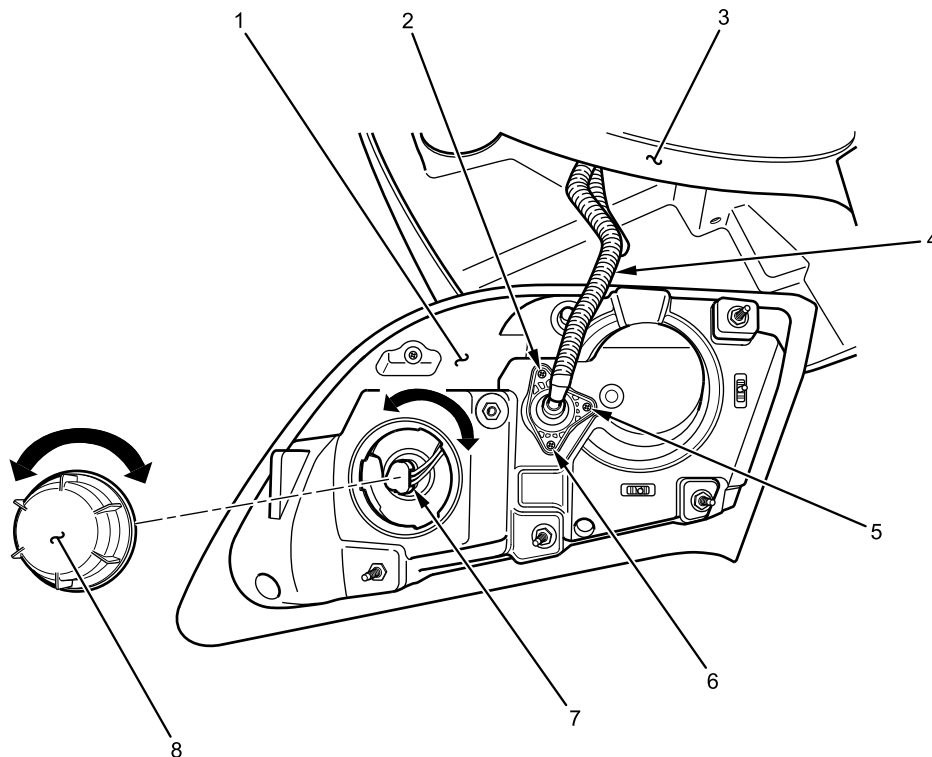
END OF TASK

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors before installation.



B230604000

Figure 5. Right Headlamp Assembly Assembly.

1. Install right headlamp harness (Figure 5, Item 4) on right headlamp assembly (Figure 5, Item 1) with three screws (Figure 5, Item 2, 5, and 6). Tighten screws securely.
2. Insert park light bulb in park light socket.
3. Install park light socket (Figure 5, Item 7) by turning clockwise.
4. Install park light cover (Figure 5, Item 8) by turning clockwise.
5. Pull right headlamp harness (Figure 5, Item 4) through hole in engine hood (Figure 5, Item 3), and position right headlamp assembly (Figure 5, Item 1) into engine hood.

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

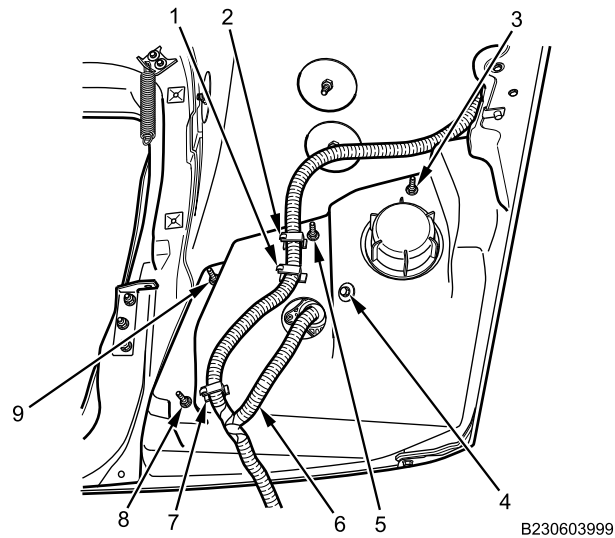


Figure 6. Right Headlamp Assembly Installation.

6. Install four nuts (Figure 6, Item 3, 5, 8, and 9) and one bolt (Figure 6, Item 4) into right headlamp assembly. Tighten nuts securely.
7. Position right headlamp harness (Figure 6, Item 6) in three harness clips (Figure 6, Item 1, 2, and 7) and close clips.

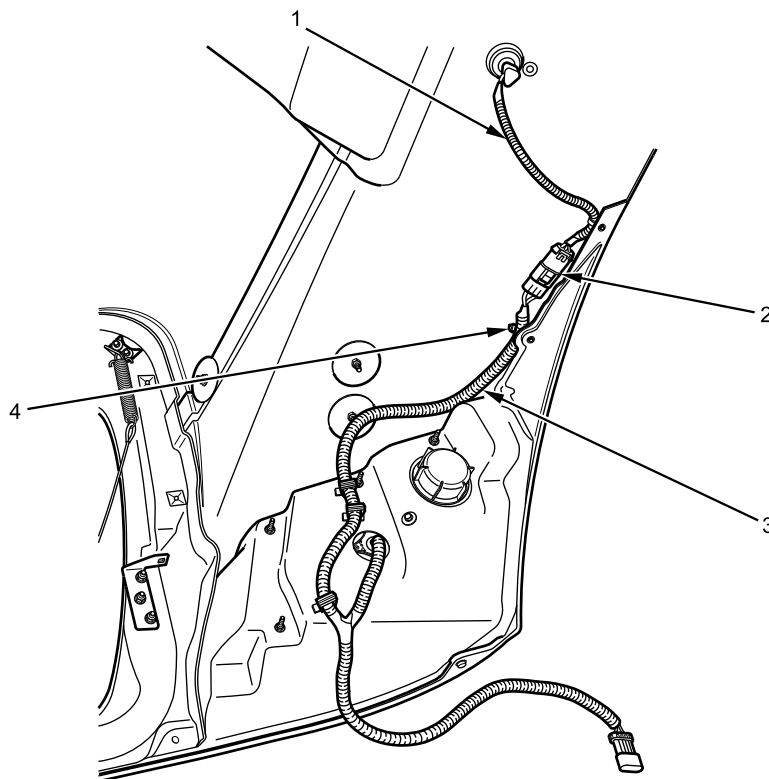
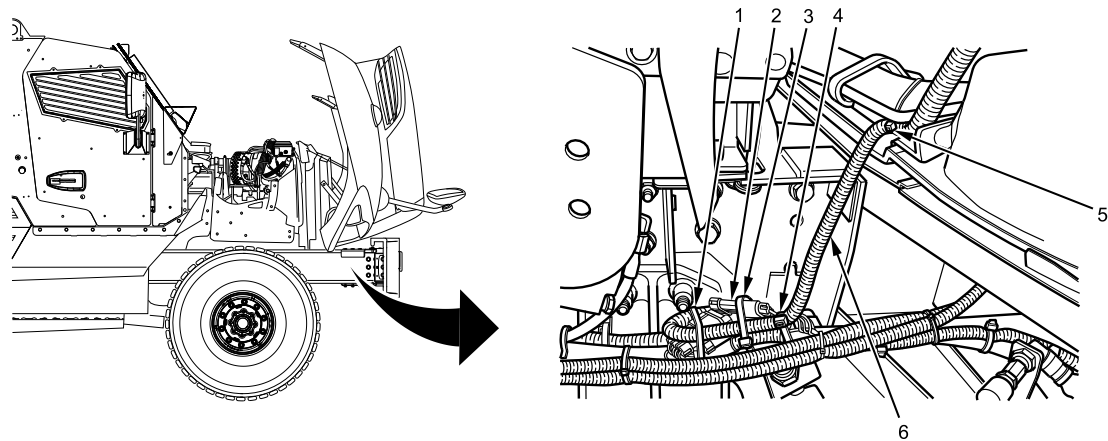


Figure 7. Side Marker Light Harness Connector.

8. Connect 3-pin connector (Figure 7, Item 2) to side marker light harness (Figure 7, Item 1), and secure right headlamp harness (Figure 7, Item 3) in harness clip (Figure 7, Item 4). Close clip.

RIGHT HEADLAMP AND TURN SIGNAL HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

B230603997

Figure 8. Right Headlamp Harness Main Connector.

9. Connect 5-pin connector (Figure 8, Item 2) to right headlamp harness (Figure 8, Item 6), and install four new cable lock straps (Figure 8, Item 1, 3, 4, and 5).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Close engine hood (TM 9-2355-106-10).
2. Install right headlamp (WP 0376).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify left headlamp and park light operation (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

HEADLAMP ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

Materials/Parts

Grease (WP 0794, Item 22)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM 9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Headlamp removed (WP 0376)

WARNING



Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

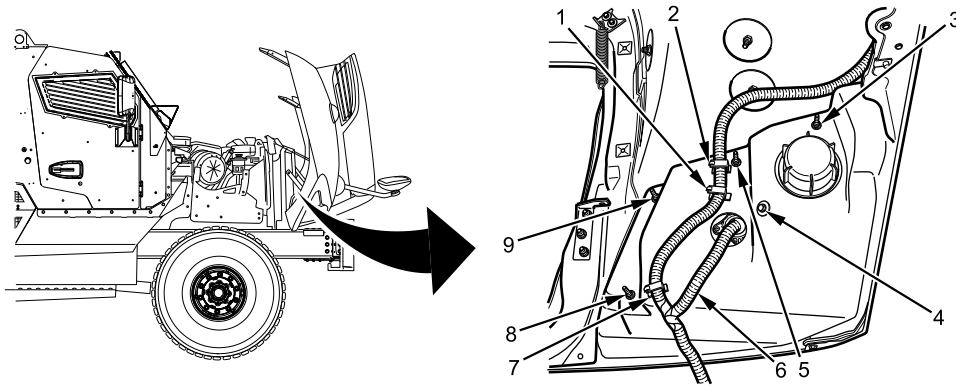
Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

NOTE

Right headlamp assembly shown; left headlamp assembly similar.

HEADLAMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL



B230610200

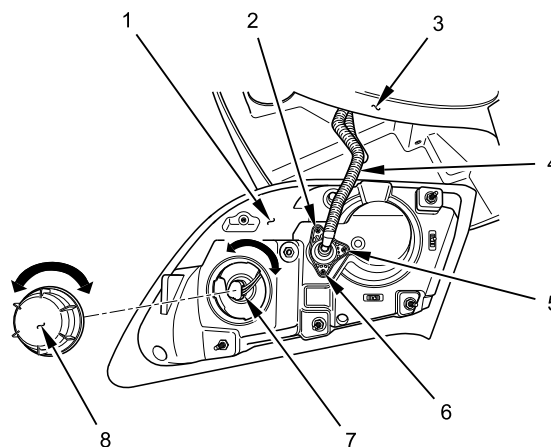
Figure 1. Headlamp Harness Clips.

1. Open three harness clips (Figure 1, Item 1, 2, and 7) from headlamp harness (Figure 1, Item 6).

CAUTION

Ensure headlamp assembly does not fall out of hood when removing final fastener. Failure to comply may result in damage to headlamp assembly.

2. Remove four nuts (Figure 1, Item 3, 5, 8, and 9) and one bolt (Figure 1, Item 4).



B230604000

Figure 2. Headlamp Assembly Removal.

3. Remove headlamp assembly (Figure 2, Item 1) from engine hood (Figure 2, Item 3).
4. Remove park light cover (Figure 2, Item 8) from headlamp assembly (Figure 2, Item 1) by turning counterclockwise.
5. Remove park light socket (Figure 2, Item 7) from headlamp assembly (Figure 2, Item 1) by turning counterclockwise.
6. Remove park light bulb from park light socket (Figure 2, Item 7) to ease removal of park light socket from headlamp assembly (Figure 2, Item 1).

HEADLAMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

- Remove three screws (Figure 2, Item 2, 5 and 6) and harness (Figure 2, Item 4) from headlamp assembly (Figure 2, Item 1).

END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors.

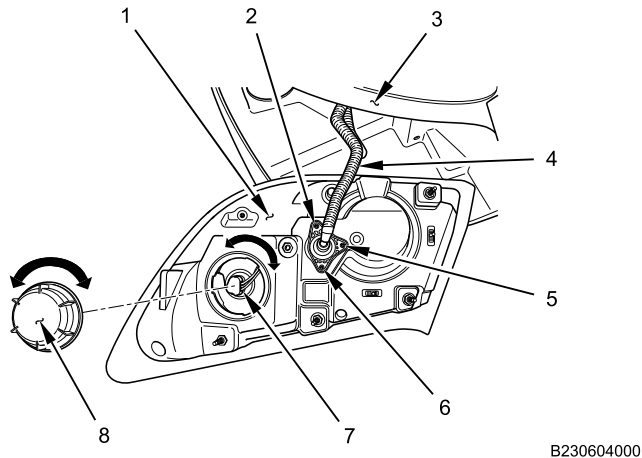


Figure 3. Headlamp Harness Installation.

- Install headlamp harness (Figure 3, Item 4) to headlamp assembly (Figure 3, Item 1) with three screws (Figure 3, Item 2, 5 and 6). Tighten screws securely.
- Install park light bulb in park light socket (Figure 3, Item 7).
- Install park light socket (Figure 3, Item 7) to headlamp assembly (Figure 3, Item 1) by turning clockwise.
- Install park light cover (Figure 3, Item 8) to headlamp assembly (Figure 3, Item 1) clockwise to install.
- Position right headlamp assembly (Figure 3, Item 1) in engine hood (Figure 3, Item 3).

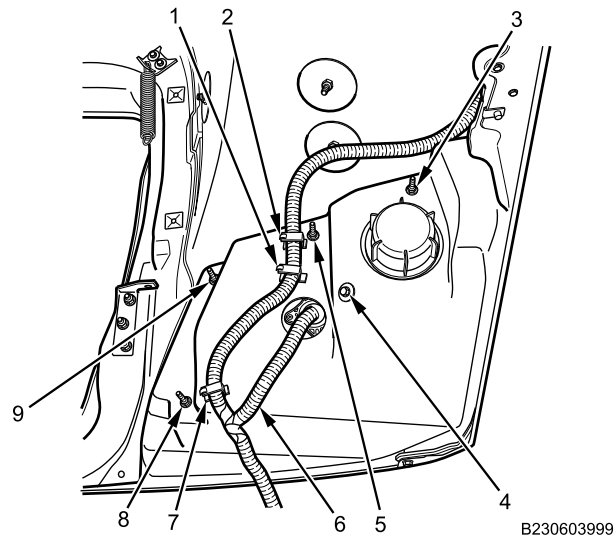
HEADLAMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

Figure 4. Headlamp Assembly Installation.

6. Install four nuts (Figure 4, Item 3, 5, 8 and 9) and one bolt (Figure 4, Item 4). Tighten nuts securely.
7. Position headlamp harness (Figure 4, Item 6) in three harness clips (Figure 4, Item 1, 2 and 7) and close clips.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Close engine hood (TM 9-2355-106-10).
2. Install headlamp (WP 0376).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Verify light operation (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

HEADLAMP BEZEL REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

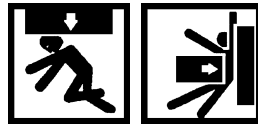
References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0786
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Headlamp assembly removed (WP 0380)

WARNING



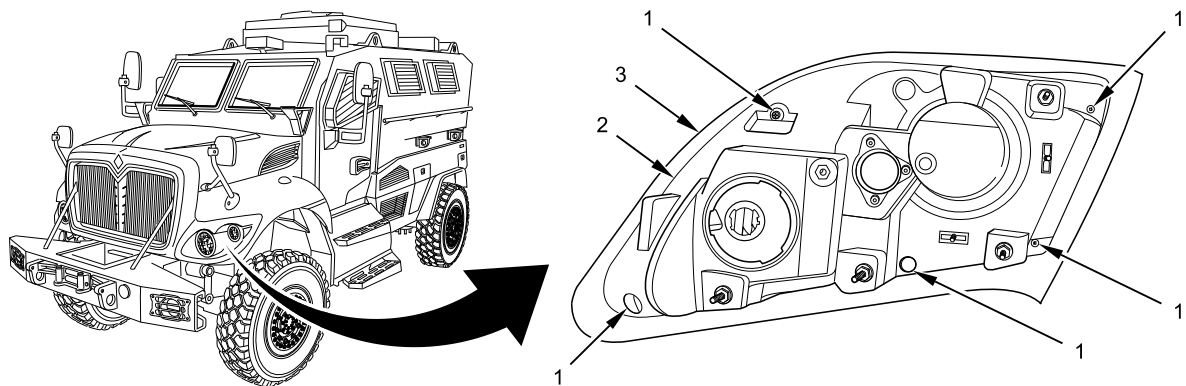
Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

NOTE

Right headlamp assembly shown; left headlamp assembly similar.

REMOVAL

1. Remove five screws (Figure 1, Item 1) and headlamp assembly (Figure 1, Item 2) from headlamp bezel (Figure 1, Item 3).



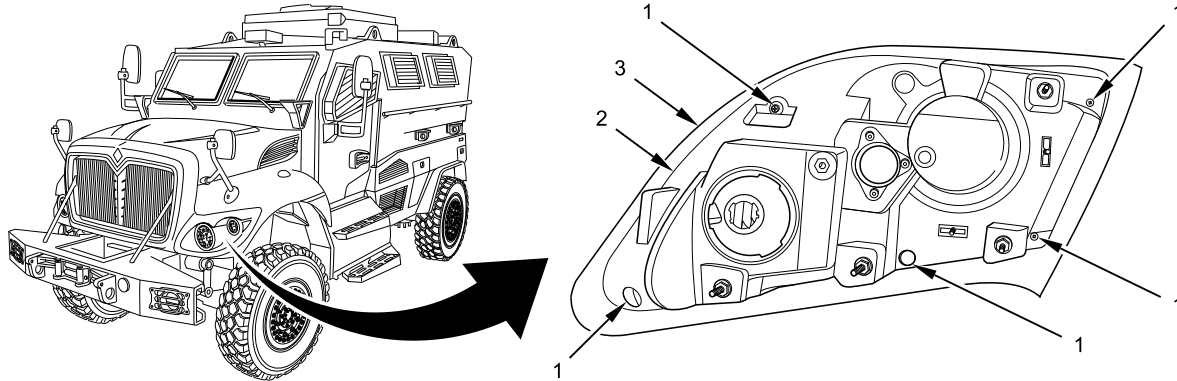
B230612261

Figure 1. Headlamp Bezel Removal.

END OF TASK

HEADLAMP BEZEL REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Install headlamp bezel (Figure 2, Item 3) to headlamp assembly (Figure 2, Item 2) with five screws (Figure 2, Item 1). Tighten screws securely.



B230612261

Figure 2. Headlamp Bezel Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install headlamp assembly (WP 0380).
2. Turn MAIN POWER switch off (TM 9-2355-106-10).
3. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

BACKUP LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

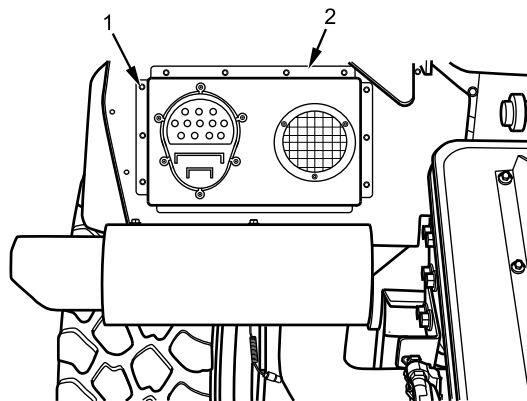
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove screws (Figure 1, Item 1) securing rear light housing (Figure 1, Item 2) to body.

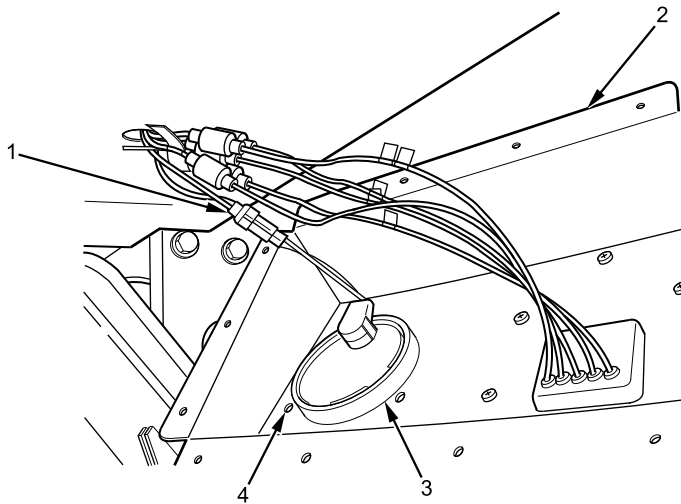


B230400178

Figure 1. Rear Light Housing Removal.

BACKUP LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

2. Disconnect backup light connector (Figure 2, Item 1) from body harness.



B230601205

Figure 2. Backup Light Assembly Removal.

3. Remove nuts and screws (Figure 2, Item 4) securing backup light (Figure 2, Item 3) to housing (Figure 2, Item 2).
4. Remove backup light (Figure 2, Item 3).

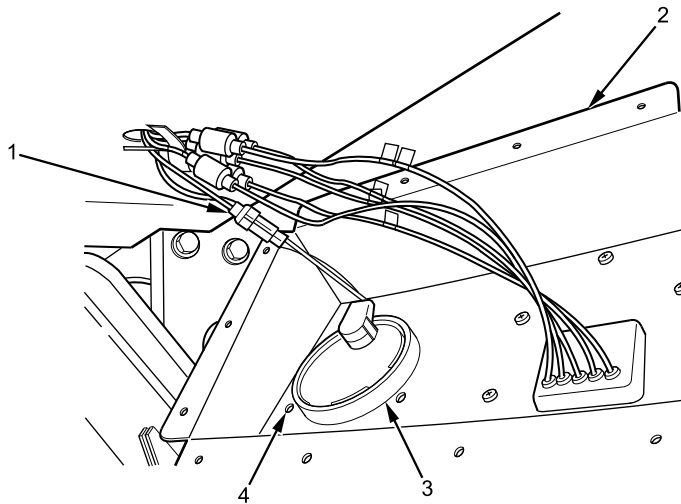
END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connections.

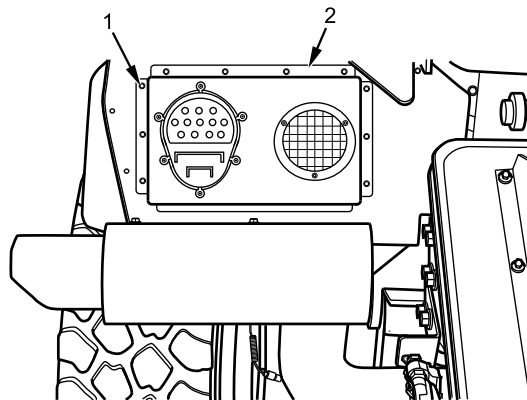
1. Connect backup light connector (Figure 3, Item 1) to body harness.

BACKUP LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230601205

Figure 3. Backup Light Assembly Installation.

2. Install screws and nuts (Figure 3, Item 4) securing backup light (Figure 3, Item 3) to housing (Figure 3, Item 2) and tighten securely.
3. Install screws (Figure 4, Item 1) securing rear light housing (Figure 4, Item 2) to body and tighten securely.



B230400178

Figure 4. Rear Light Housing Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

COMPOSITE TAILLAMP ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Tape (WP 0794, Item 53)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10
TM 9-2355-106-23P

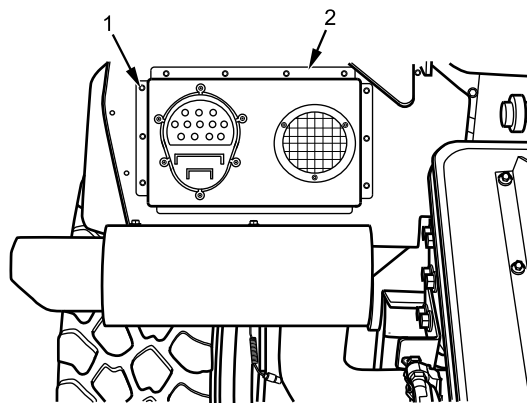
WARNING



Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REMOVAL

1. Remove screws (Figure 1, Item 1) securing rear light housing (Figure 1, Item 2) to body.



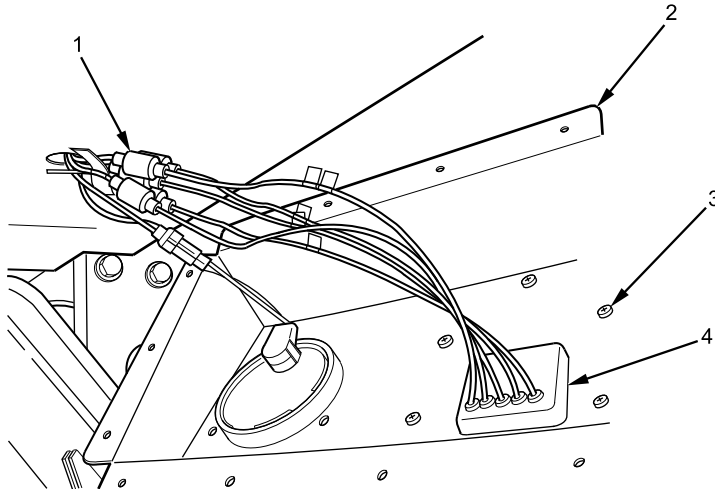
B230400178

Figure 1. Rear Light Housing Removal.

COMPOSITE TAILLAMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Label all wires before removal.

2. Disconnect taillamp connectors (Figure 2, Item 1) from body harness.



B230601206

Figure 2. Taillamp Assembly Removal.

3. Remove nuts and screws (Figure 2, Item 3) securing taillamp (Figure 2, Item 4) to housing (Figure 2, Item 2).
4. Remove taillamp (Figure 2, Item 4).

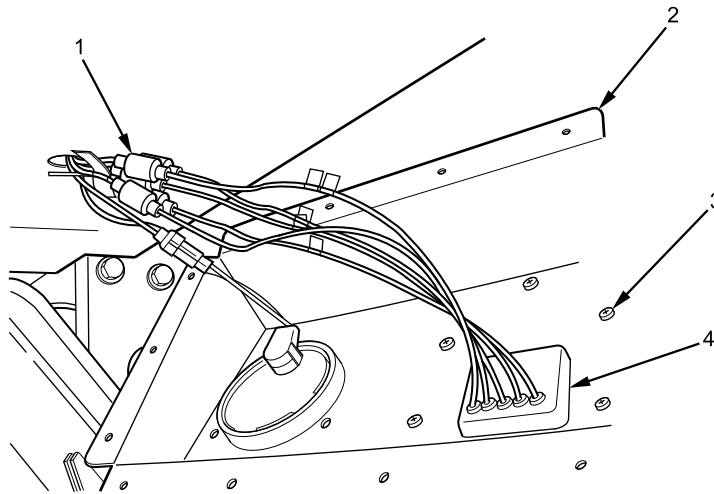
END OF TASK**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors.

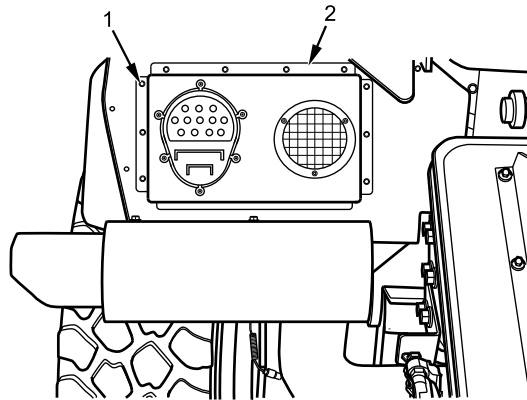
1. Connect taillamp connectors (Figure 3, Item 1) to body harness.

COMPOSITE TAILLAMP ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

B230601206

Figure 3. Taillamp Assembly Installation.

2. Install screws and nuts (Figure 3, Item 3) securing taillamp (Figure 3, Item 4) to housing (Figure 3, Item 2) and tighten securely.
3. Install screws (Figure 4, Item 1) securing rear light housing (Figure 4, Item 2) to body and tighten securely.



B230400178

Figure 4. Rear Light Housing Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**TAILLAMP HARNESS REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

TM 9-2355-106-23P

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap - (4) (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)

ReferencesTM 9-2355-106-10

WARNING

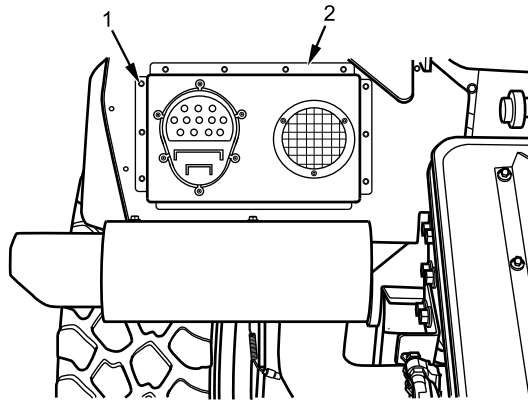
Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL****NOTE**

Steps 1 and 2 apply to both left and right side taillamp assemblies.

Left side shown, right side similar.

1. Remove screws (Figure 1, Item 1) securing rear taillamp box (Figure 1, Item 2) to body.



B230400178

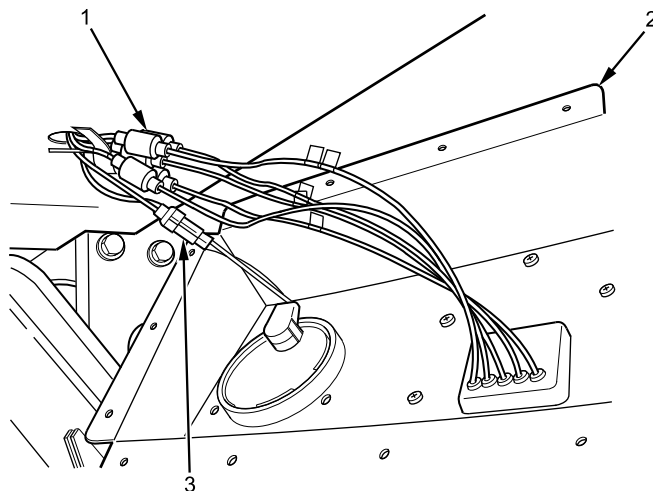
Figure 1. rear taillamp box Removal.

NOTE

Label all wires before removal to facilitate installation.

Right side shown, left side similar.

2. Disconnect five taillamp bullet connectors (Figure 2, Item 1) and one backup lamp two-pin connector (Figure 2, Item 3) from rear taillamp box (Figure 2, Item 2).



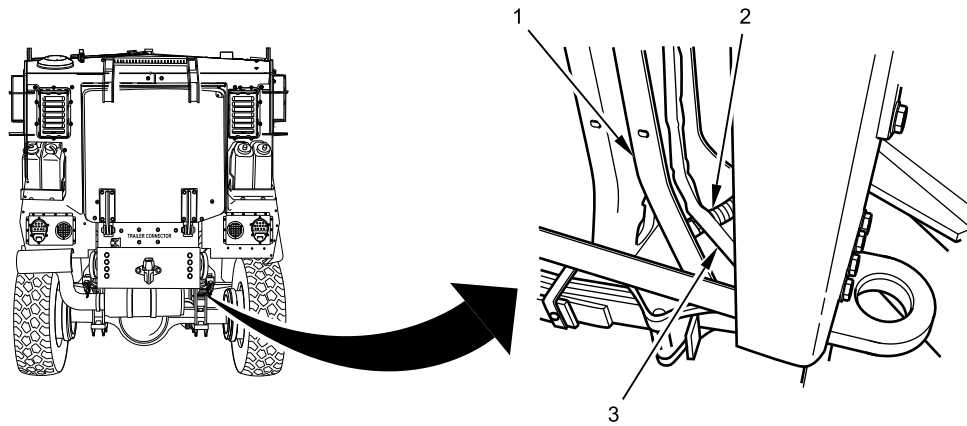
B230603652

Figure 2. Taillamp Assembly Removal.

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Muffler and bracket removed for clarity.

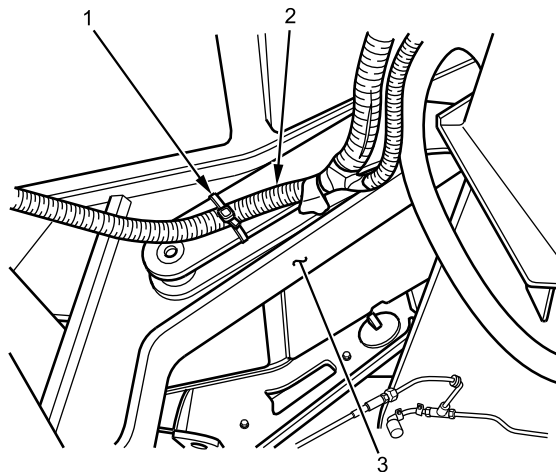
3. Remove and discard cable lock strap (Figure 3, Item 3) fastening taillamp harness (Figure 3, Item 2) to right rear of rear crossmember (Figure 3, Item 1).



B230610063

Figure 3. Right Rear of Rear Crossmember.

4. Directly in front of right taillamp housing assembly, remove and discard cable lock strap (Figure 4, Item 1) fastening taillamp harness (Figure 4, Item 2) to body (Figure 4, Item 3).



B230604565

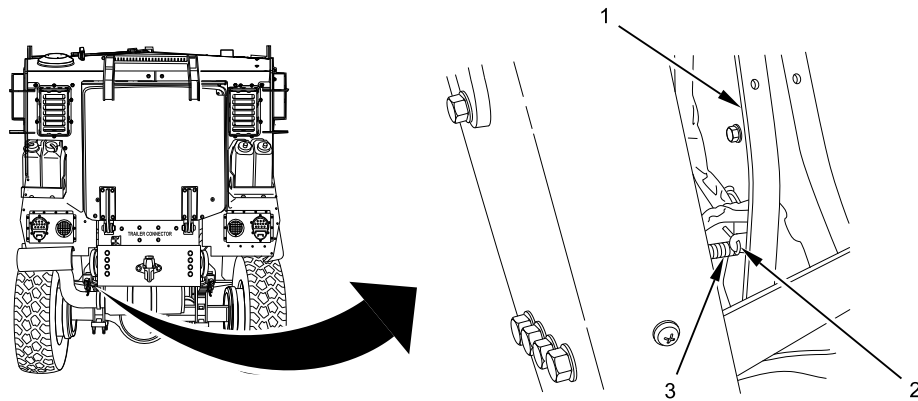
Figure 4. Right Rear of Body in Front of Taillamp Housing.

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Muffler and bracket removed for clarity.

- Remove and discard cable lock strap (Figure 5, Item 2) fastening taillamp harness (Figure 5, Item 3) to left rear of rear crossmember (Figure 5, Item 1).



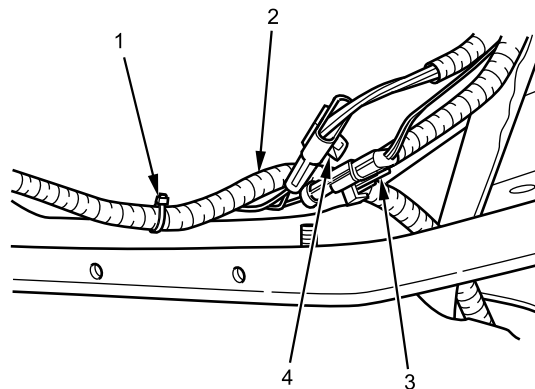
B230610064

Figure 5. Left Rear of Rear Crossmember.

NOTE

Muffler and bracket removed for clarity.

- Remove and discard cable lock strap (Figure 6, Item 1) and disconnect five-pin connector (Figure 6, Item 4) and three-pin connector (Figure 6, Item 3).



B230603542

Figure 6. Front of Taillamp Harness.

- From in front of muffler, pull taillamp harness (Figure 6, Item 2) forward and remove harness from vehicle.

END OF TASK

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

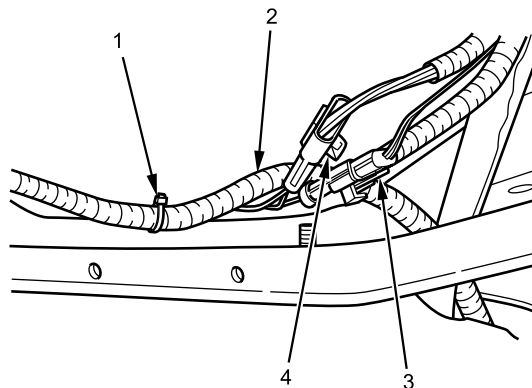
Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors before installation.

Muffler and bracket removed for clarity.

1. From in front of muffler, install taillamp harness (Figure 7, Item 2) to vehicle by feeding it through rear crossmember on each side.



B230603542

Figure 7. Front of Taillamp Harness.

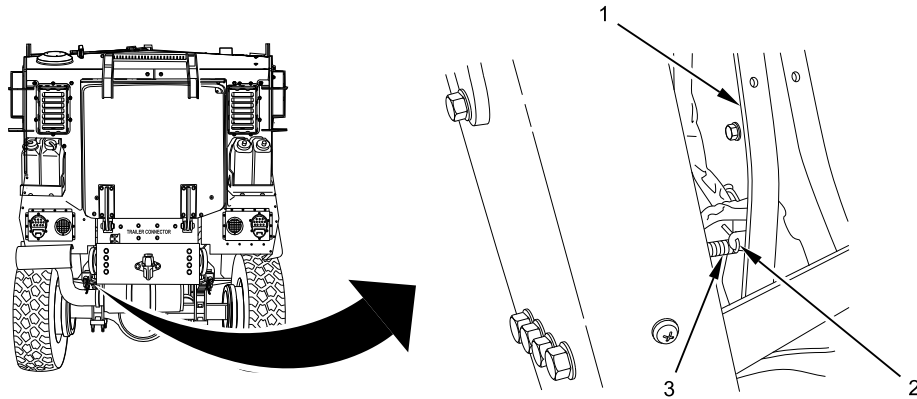
2. Connect five-pin connector (Figure 7, Item 4) and three-pin connector (Figure 7, Item 3). Install new cable lock strap (Figure 7, Item 1).

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

NOTE

Muffler and bracket removed for clarity.

3. Install new cable lock strap (Figure 8, Item 2) fastening taillamp harness (Figure 8, Item 3) to left rear of rear crossmember (Figure 8, Item 1).



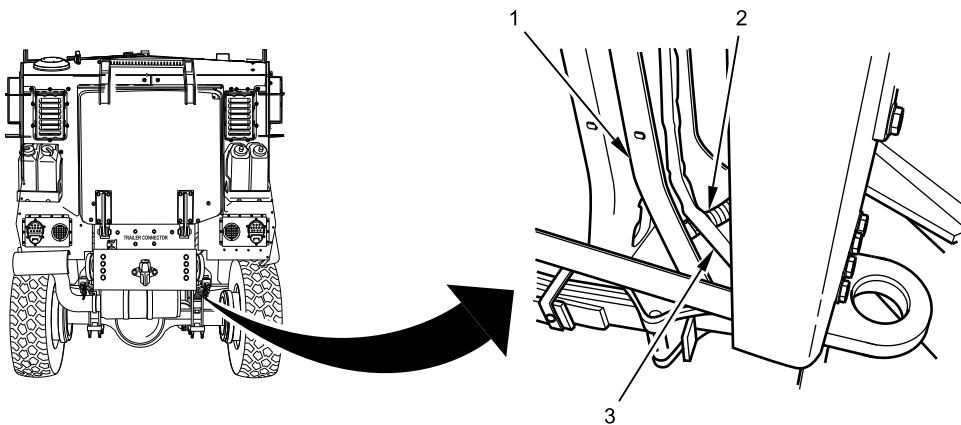
B230610064

Figure 8. Left Rear of Rear Crossmember.

NOTE

Muffler and bracket removed for clarity.

4. Install new cable lock strap (Figure 9, Item 3) fastening taillamp harness (Figure 9, Item 2) to right rear of rear crossmember (Figure 9, Item 1).

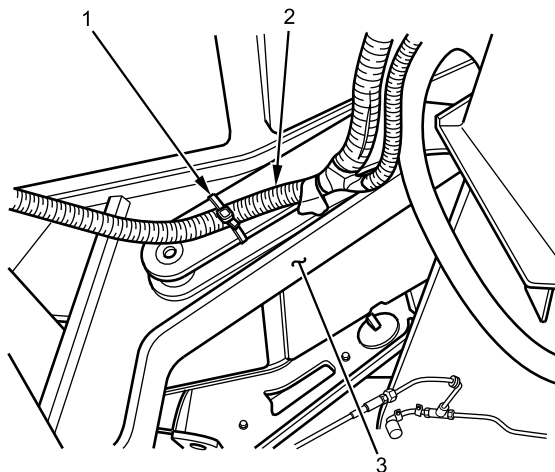


B230610063

Figure 9. Right Rear of Rear Crossmember.

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

5. Directly in front of right taillamp housing assembly, install cable lock strap (Figure 10, Item 1) fastening taillamp harness (Figure 10, Item 2) to body (Figure 10, Item 3).



B230604565

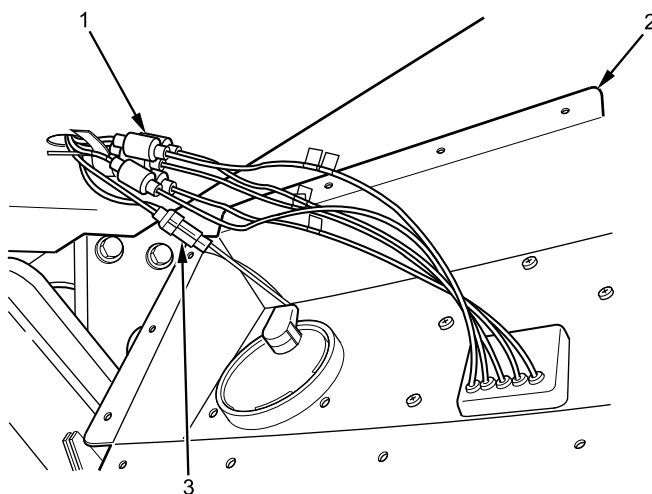
Figure 10. Right Rear of Body in Front of Taillamp Housing.

NOTE

The following two steps apply to both left and right side taillamp assemblies.

Right side shown, left side similar.

6. Connect five taillamp harness bullet connectors (Figure 11, Item 1) and one backup light two-pin connector (Figure 11, Item 3) to rear taillamp box (Figure 11, Item 2).



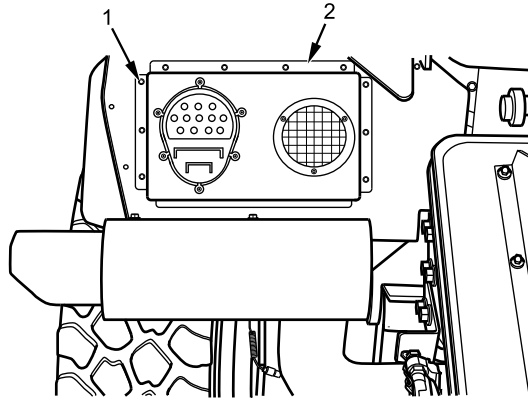
B230603652

Figure 11. Taillamp Assembly Installation.

TAILLAMP HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**NOTE**

Left side shown, right side similar.

7. Install screws (Figure 12, Item 1) to secure rear taillamp box (Figure 12, Item 2) to body and tighten securely.



B230400178

Figure 12. rear taillamp box Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify taillamp operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock strap (WP 0794, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

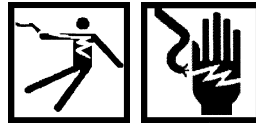
MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

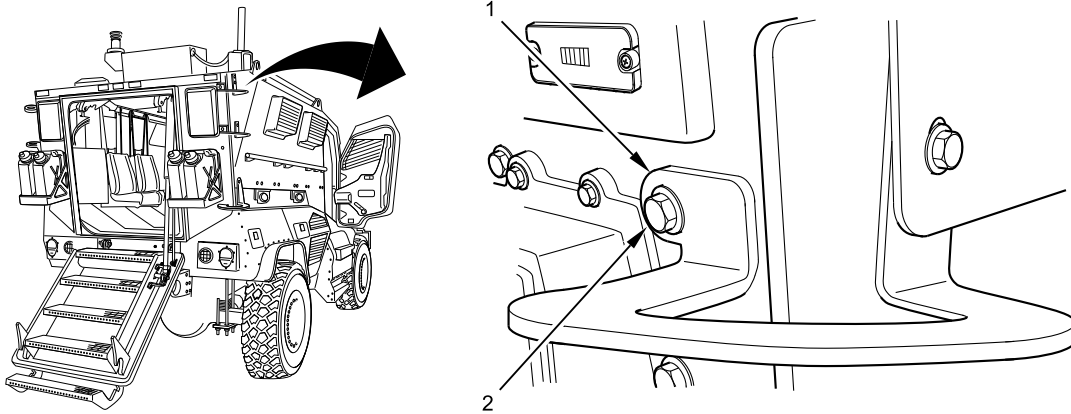
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

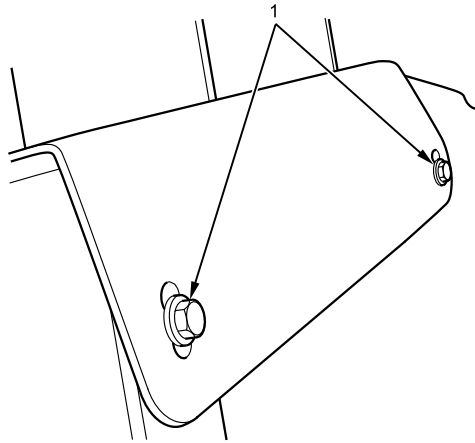
1. Remove right rear top step rear bolt (Figure 1, Item 2) from top step (Figure 1, Item 1).



B230610233

Figure 1. Antenna Support Side.

2. Loosen side bolts (Figure 2, Item 1) for right rear antenna support.

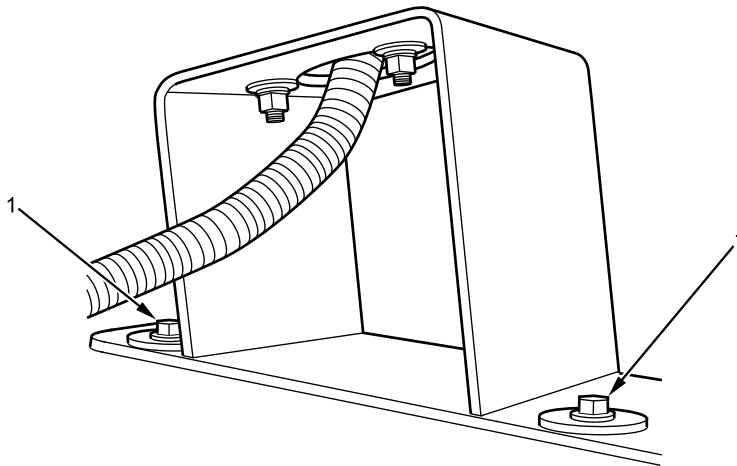


B230601218

Figure 2. Antenna Support Side.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

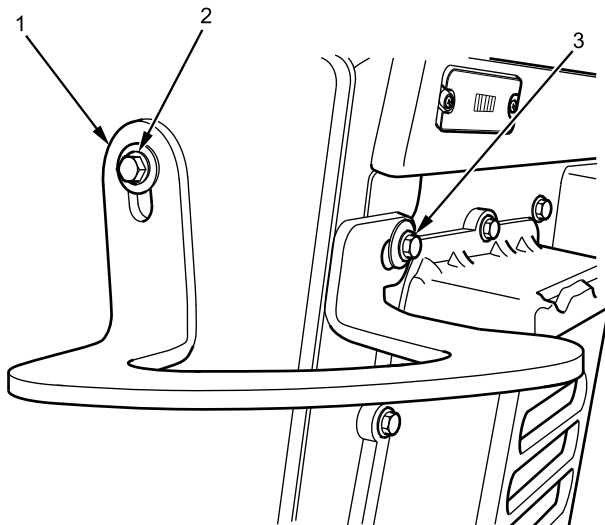
3. Loosen upper bolts (Figure 3, Item 1) for right rear antenna support.



B230601217

Figure 3. Antenna Support Upper.

4. Remove left rear top step rear bolt (Figure 4, Item 3) securing left rear top step (Figure 4, Item 1) to body.



B230601223

Figure 4. Left Top Step.

5. Loosen left rear step side bolt (Figure 4, Item 2).

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

6. Remove top center light panel bolt (Figure 5, Item 1) from roof.

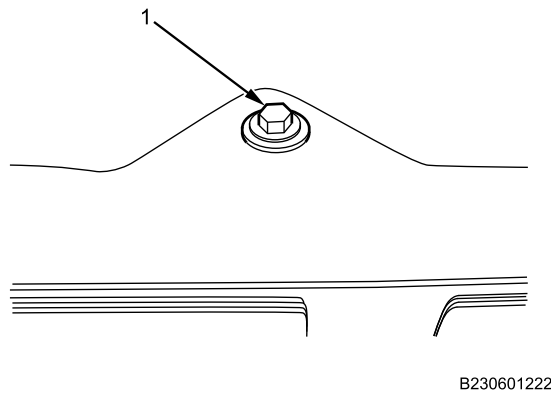


Figure 5. Top Center Bolt.

7. Use a prybar (Figure 6, Item 1) to pry right upper step (Figure 6, Item 3) away from body slightly.

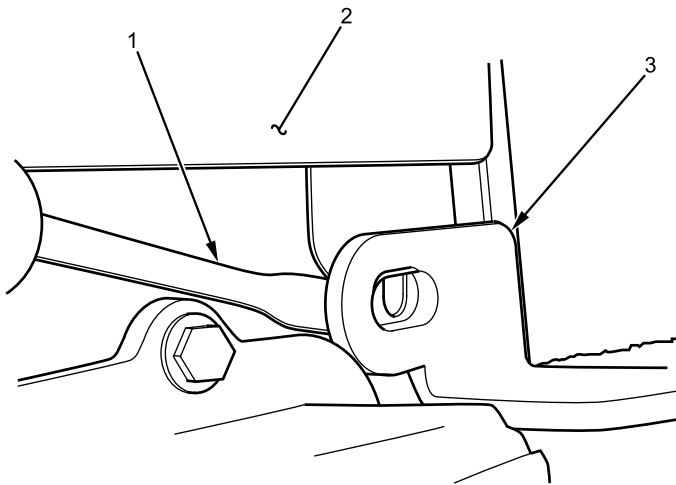
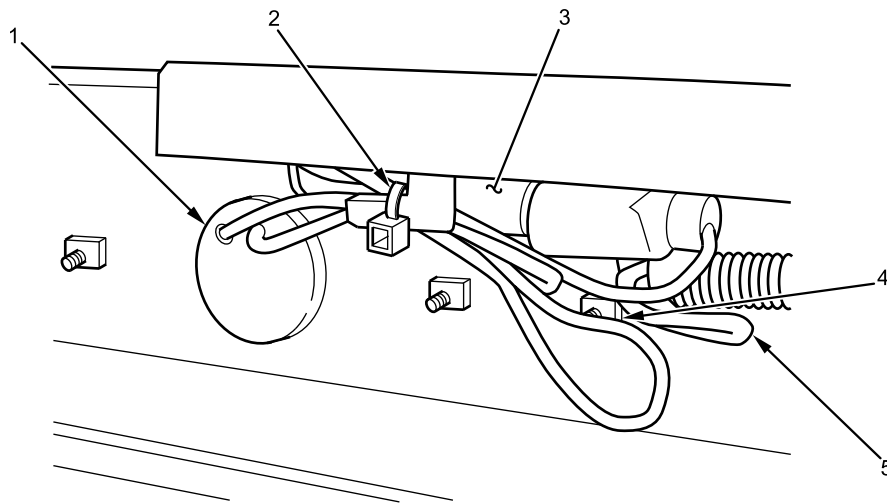


Figure 6. Right Top Step Repositioned.

8. While prying out step, lift light panel upward (Figure 6, Item 2). Lay panel on roof surface.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

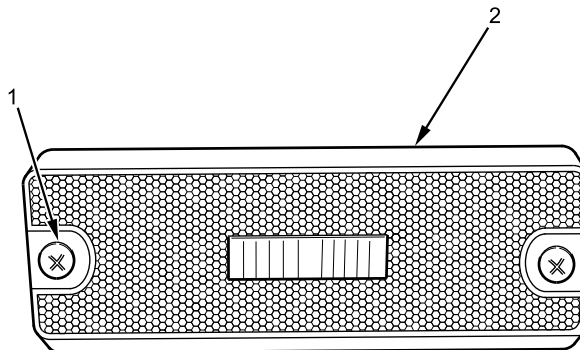
9. Cut and discard cable lock strap (Figure 7, Item 2) for light being serviced.



B230601220

Figure 7. Rear Clearance Light Wiring.

10. Remove nut (Figure 7, Item 4) securing ground wire (Figure 7, Item 5).
 11. Unplug power connector (Figure 7, Item 3) from clearance light (Figure 7, Item 1).
 12. Remove screws (Figure 8, Item 1) from clearance light (Figure 8, Item 2).



B230601221

Figure 8. Rear Light.

END OF TASK

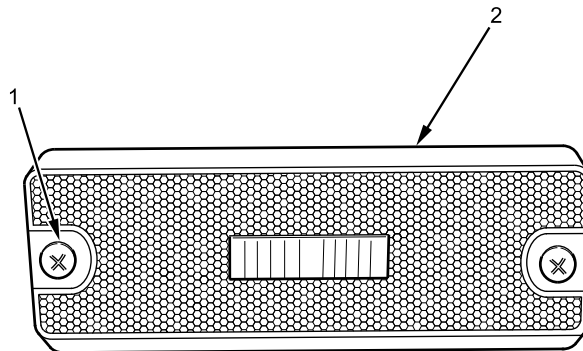
REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all connectors.

1. Install rear clearance light (Figure 9, Item 2) on light panel and tighten screws (Figure 9, Item 1) securely.

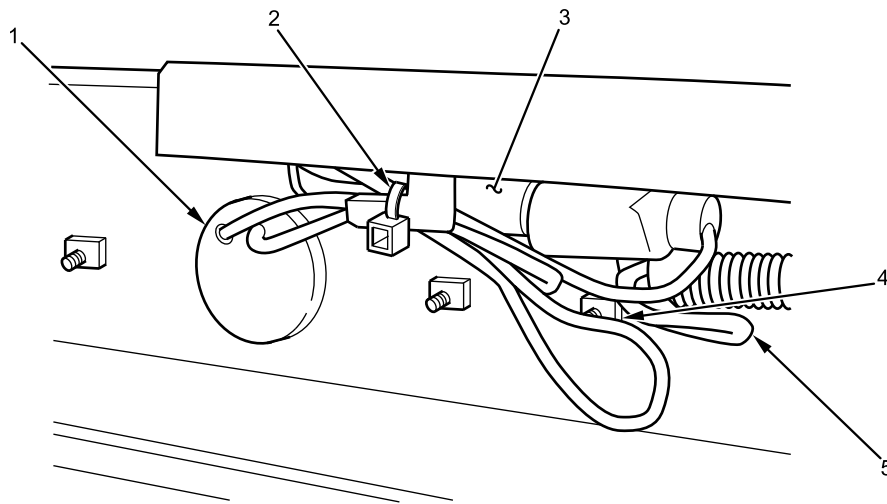


B230601221

Figure 9. Rear Light.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

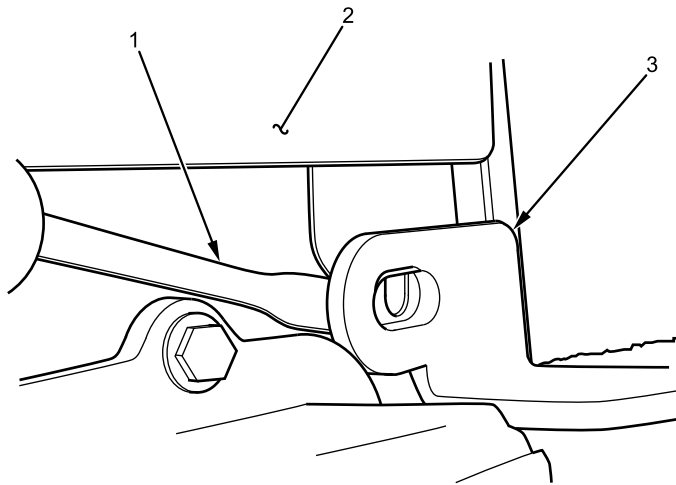
2. Connect power connector (Figure 10, Item 3) from clearance light (Figure 10, Item 1) to light panel harness.



B230601220

Figure 10. Rear Clearance Light Wiring.

3. Install ground wire (Figure 10, Item 5) and secure with nut (Figure 10, Item 4) and tighten securely.
4. Install new cable lock strap (Figure 10, Item 2) to secure wiring to light panel.
5. Use a prybar (Figure 11, Item 1) to pry right upper step (Figure 11, Item 3) away from body.



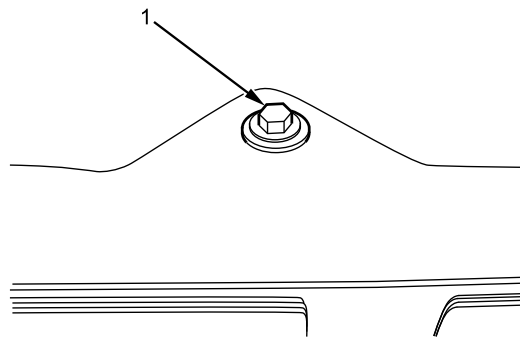
B230601219

Figure 11. Right Top Step Repositioned.

6. While prying out on step, slide light panel (Figure 11, Item 2) between body and step and align mount holes.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

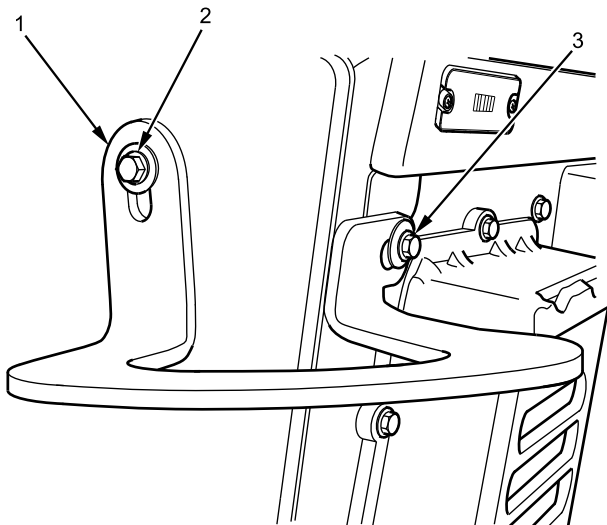
7. Install top center light panel bolt (Figure 12, Item 1) on roof and tighten securely.



B230601222

Figure 12. Top Center Bolt.

8. Install bolt (Figure 13, Item 3) securing left rear top step (Figure 13, Item 1) to body and tighten securely.



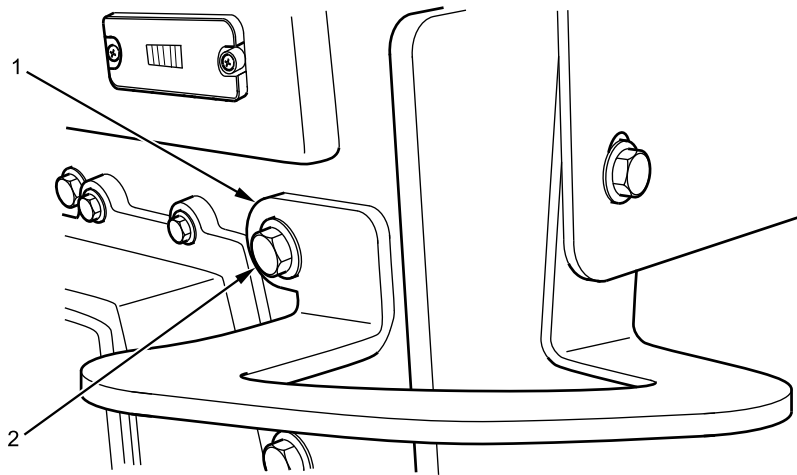
B230601223

Figure 13. Left Top Step.

9. Tighten side bolt (Figure 13, Item 2) on left rear top step (Figure 13, Item 1) securely.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

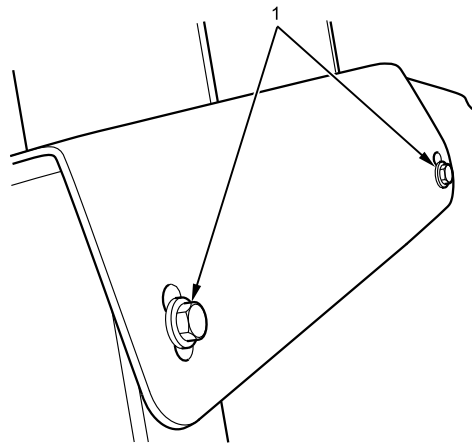
10. Install right rear top step rear bolt (Figure 14, Item 2) on top step (Figure 14, Item 1) and tighten securely.



B230601224

Figure 14. Right Top Step.

11. Tighten side bolts (Figure 15, Item 1) for right rear antenna support securely.

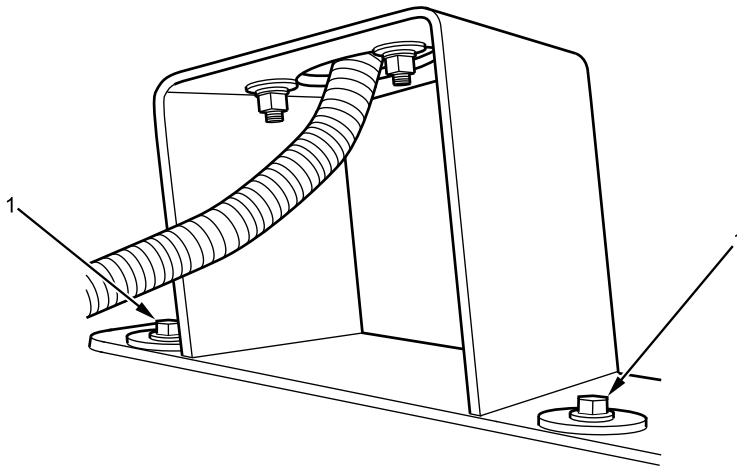


B230601218

Figure 15. Antenna Support Side.

REAR CLEARANCE LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

12. Tighten upper bolts (Figure 16, Item 1) for right rear antenna support securely.



B230601217

Figure 16. Antenna Support Upper Bolts.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Cable lock straps - (10) (WP 0796, Item 124)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Rear door/ramp open (TM 9-2355-106-10)

References

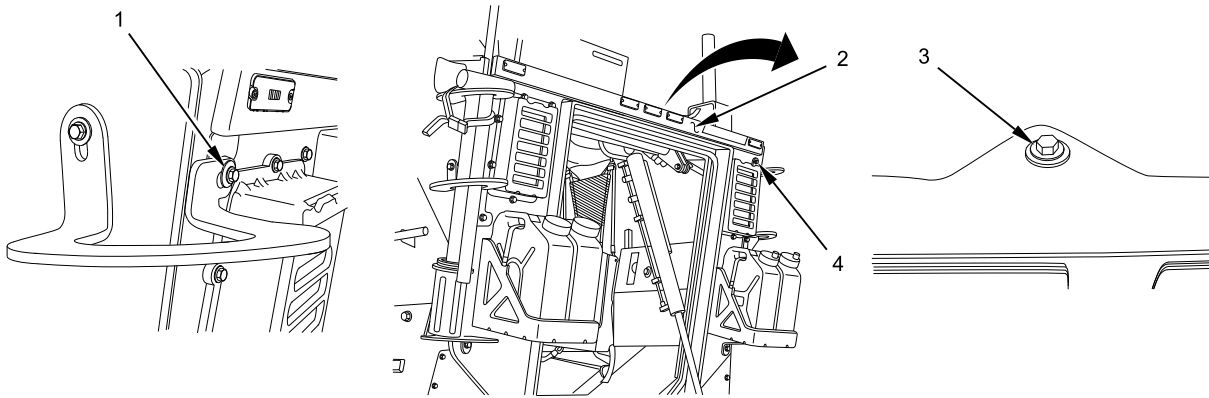
TM 9-2355-106-10
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

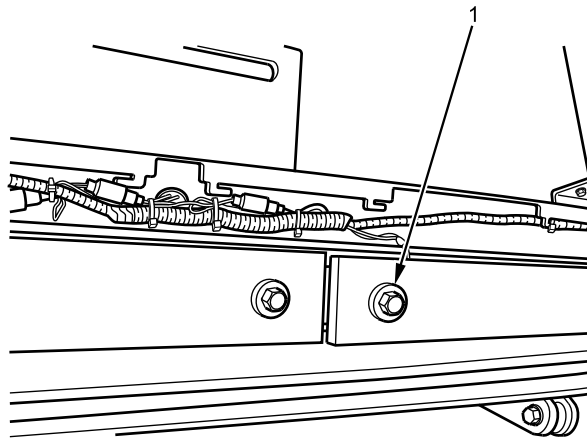
1. Remove three bolts and washers (Figure 1, Item 1, 3 and 4) and lift rear clearance light bar (Figure 1, Item 2) upward. Place light bar upside down on roof.



B230604574

Figure 1. Rear Clearance Light Bar Removal.

2. Remove bolt and washer (Figure 2, Item 1) from right rear armor plate.

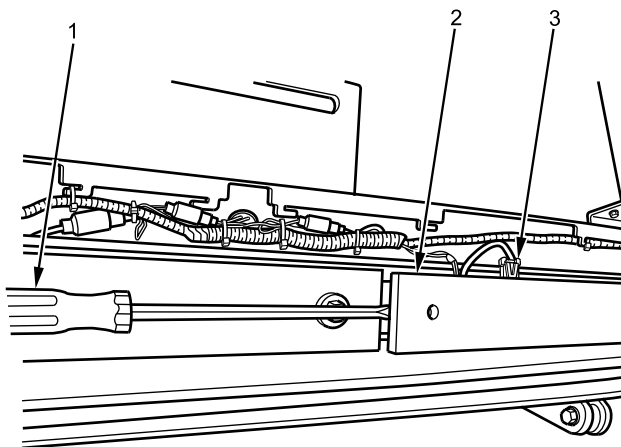


B230603579

Figure 2. Rear Armor Plate Bolt Removal.

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

- Using suitable prybar or large screwdriver (Figure 3, Item 1), gently pry armor (Figure 3, Item 2) to allow access to two-pin connector (Figure 3, Item 3). Disconnect connector.



B230603580

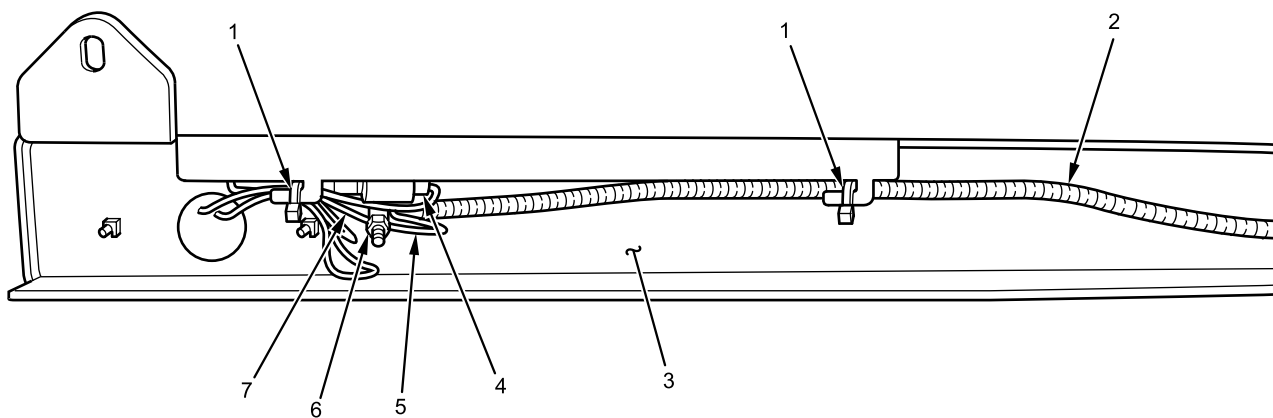
Figure 3. Light Bar Connector Removal.

- Place light bar on bench or suitable fixture.

NOTE

Note location of cable lock straps to aid installation.

- Remove cable lock straps (Figure 4, Item 1) from light bar harness (Figure 4, Item 2). Discard cable lock straps.



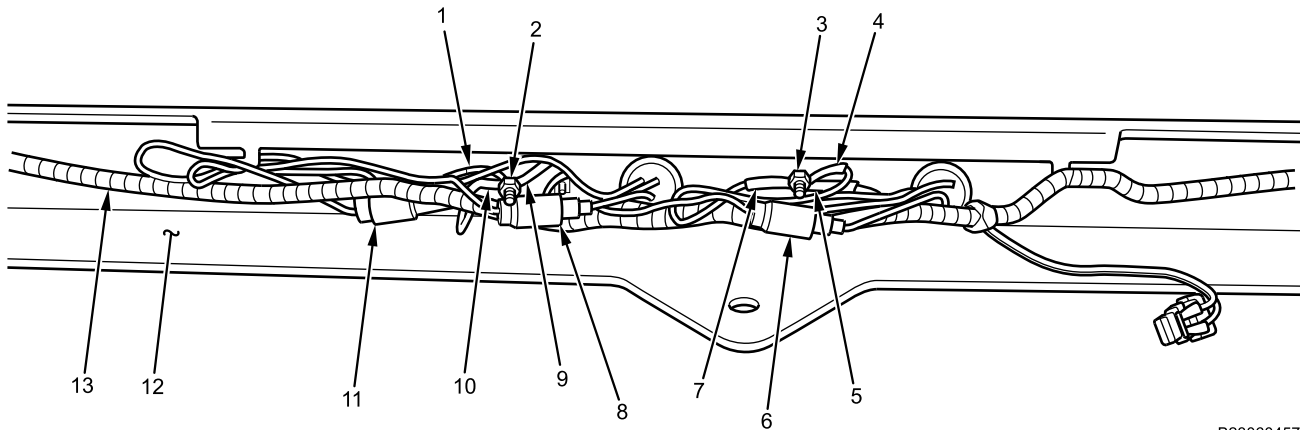
B230604577

Figure 4. Left Side of Light Bar.

- Remove nut (Figure 4, Item 6) and two ground wires (Figure 4, Item 5 and 7).

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

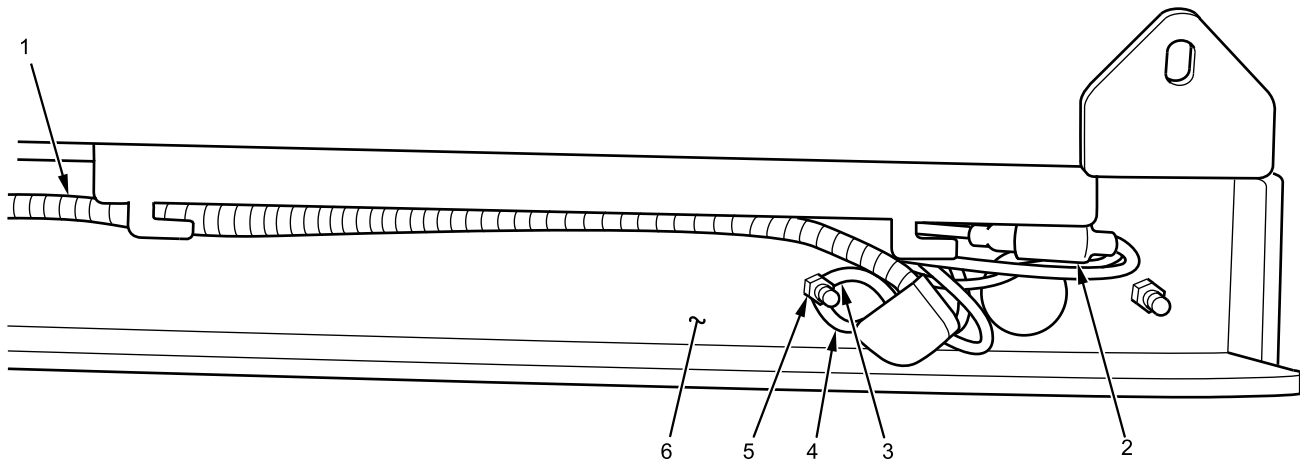
7. Disconnect bullet terminal (Figure 4, Item 4).
8. Remove two nuts (Figure 5, Item 2 and 3) and six ground wires (Figure 5, Item 1, 4, 5, 7, 9 and 10).



B230604578

Figure 5. Center of Light Bar.

9. Disconnect three bullet terminals (Figure 5, Item 6, 8 and 11).
10. Remove nut (Figure 6, Item 5) and two ground wires (Figure 6, Item 3 and 4).



B230604579

Figure 6. Right Side of Light Bar.

11. Disconnect bullet terminal (Figure 6, Item 2).
12. Remove light bar harness (Figure 6, Item 1) from light bar (Figure 6, Item 6).

END OF TASK

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

INSTALLATION

WARNING

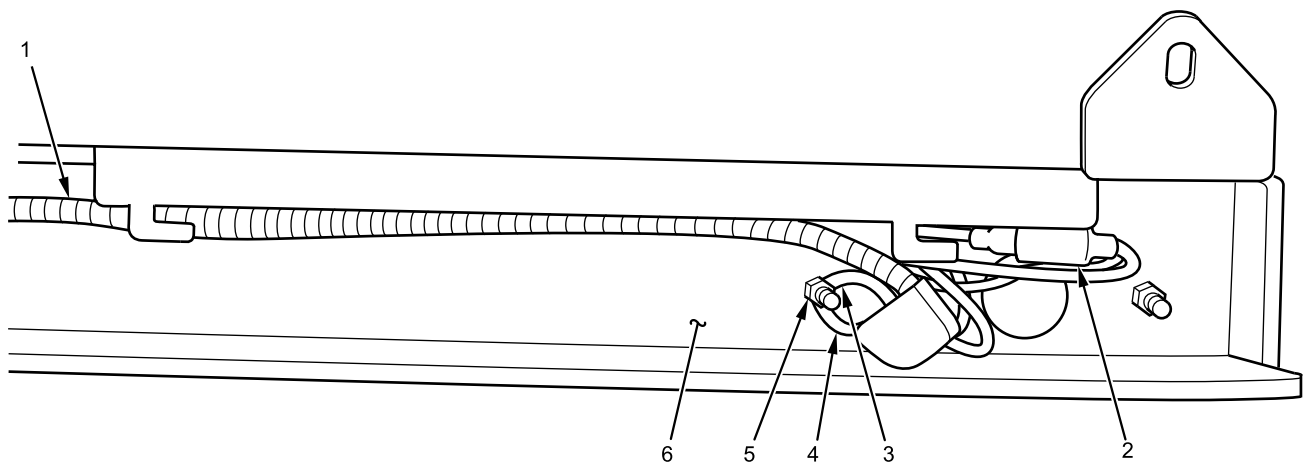


Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

NOTE

Apply dielectric grease to all electrical connectors.

1. Install light bar harness (Figure 7, Item 1) to light bar (Figure 7, Item 6).



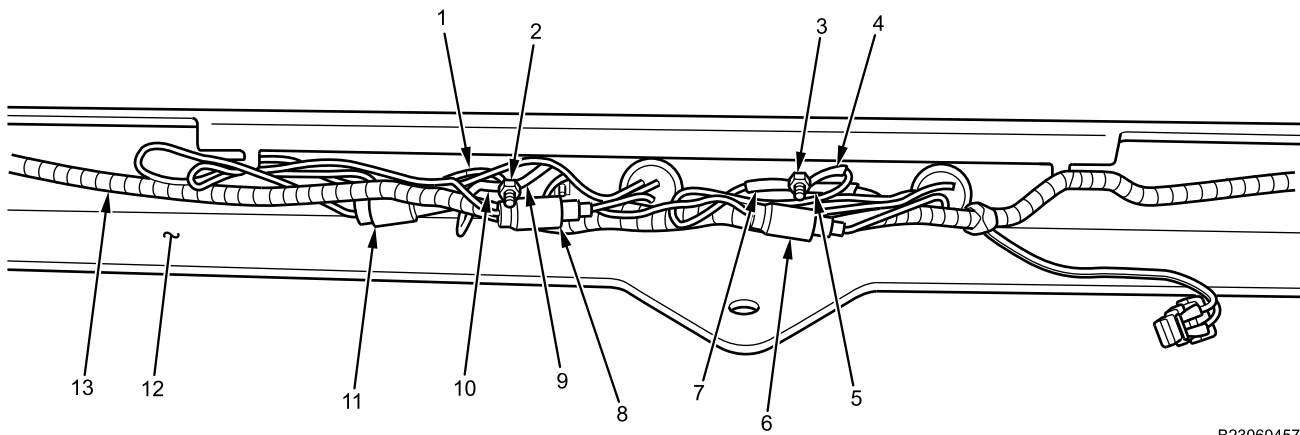
B230604579

Figure 7. Right Side of Light Bar.

2. Connect bullet terminal (Figure 7, Item 2).
3. Install two ground wires (Figure 7, Item 3 and 4) and nut (Figure 7, Item 5). Tighten nut securely.

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

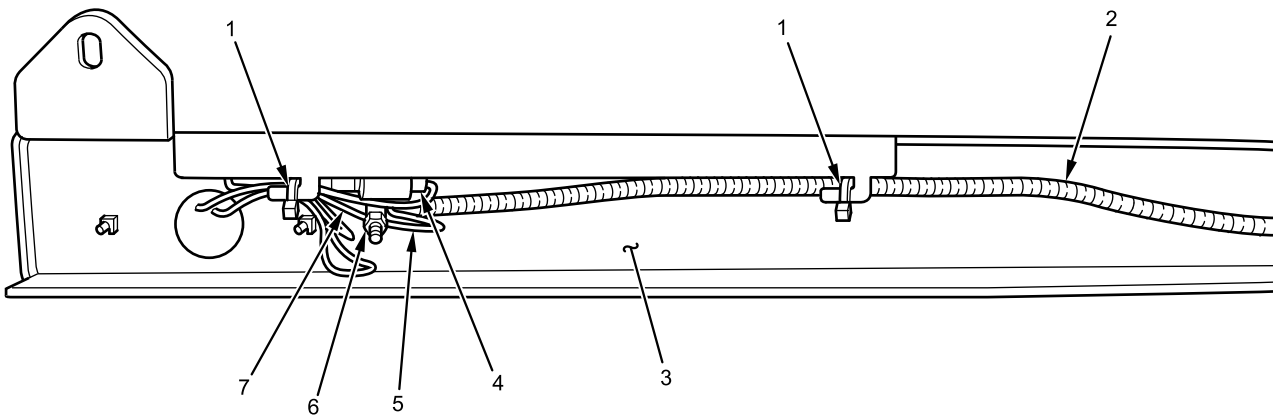
4. Connect three bullet terminals (Figure 8, Item 6, 8 and 11).



B230604578

Figure 8. Center of Light Bar.

5. Install six ground wires (Figure 8, Item 1, 4, 5, 7, 9 and 10) and two nuts (Figure 8, Item 2 and 3). Tighten nuts securely.
6. Connect bullet terminal (Figure 9, Item 4).



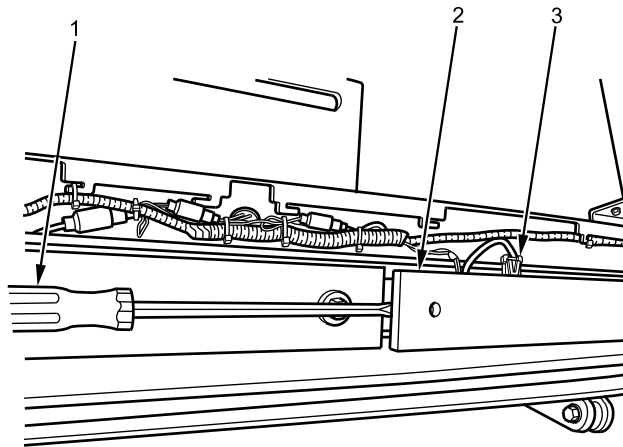
B230604577

Figure 9. Left Side of Light Bar.

7. Install two ground wires (Figure 9, Item 5 and 7) and nut (Figure 9, Item 6). Tighten nut securely.
8. Install new cable lock straps where previously removed.
9. Place light bar upside down on the roof of vehicle.

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

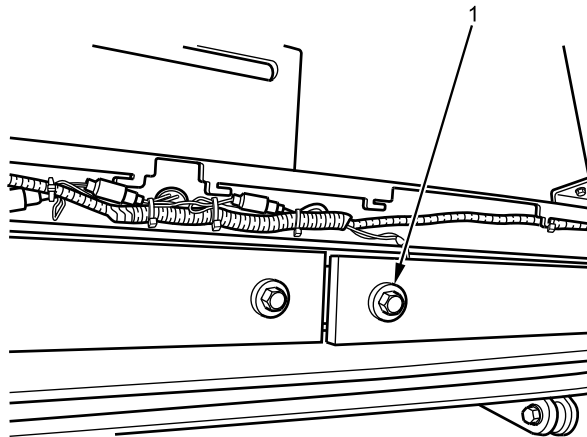
10. Connect light bar two-pin connector (Figure 10, Item 3).



B230603580

Figure 10. Light Bar Connector Installation.

11. Using a suitable prybar or large screwdriver (Figure 10, Item 1), gently pry armor (Figure 10, Item 2) to allow two-pin connector (Figure 10, Item 3) to be inserted into cavity behind armor plate.
12. Install bolt and washer (Figure 11, Item 1). Tighten bolt securely.

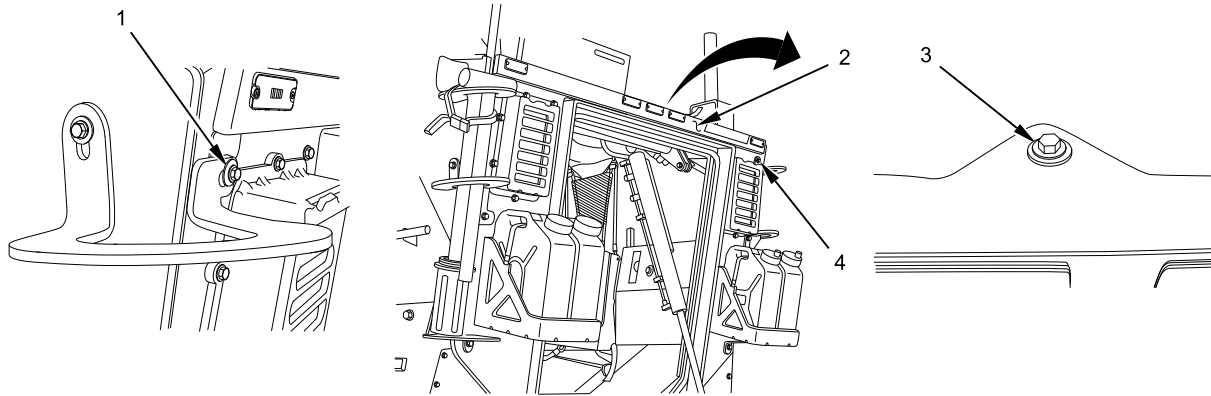


B230603579

Figure 11. Rear Armor Plate Bolt Installation.

REAR CLEARANCE LIGHT BAR HARNESS REMOVAL AND INSTALLATION - (CONTINUED)

13. Position light bar (Figure 12, Item 2), making sure right and left bolt hole tabs slide between body and steps. Pressing firmly downward, install light bar, three bolts, and washers (Figure 12, Item 1, 3 and 4). Tighten bolts securely.



B230604574

Figure 12. Rear Clearance Light Bar Installation.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify clearance light operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Close rear door/ramp securely (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
REAR SIDEMARKER LIGHT ASSEMBLY REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Gloves (WP 0794, Item 18)
Compound (WP 0794, Item 41)
Goggles, industrial (WP 0794, Item 20)
Faceshield, industrial (WP 0794, Item 16)

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Right side rear stowage box removed (WP 0673) or
left rear stowage box removed (WP 0676)

References

TM 9-2355-106-10
TM 9-2355-106-23P

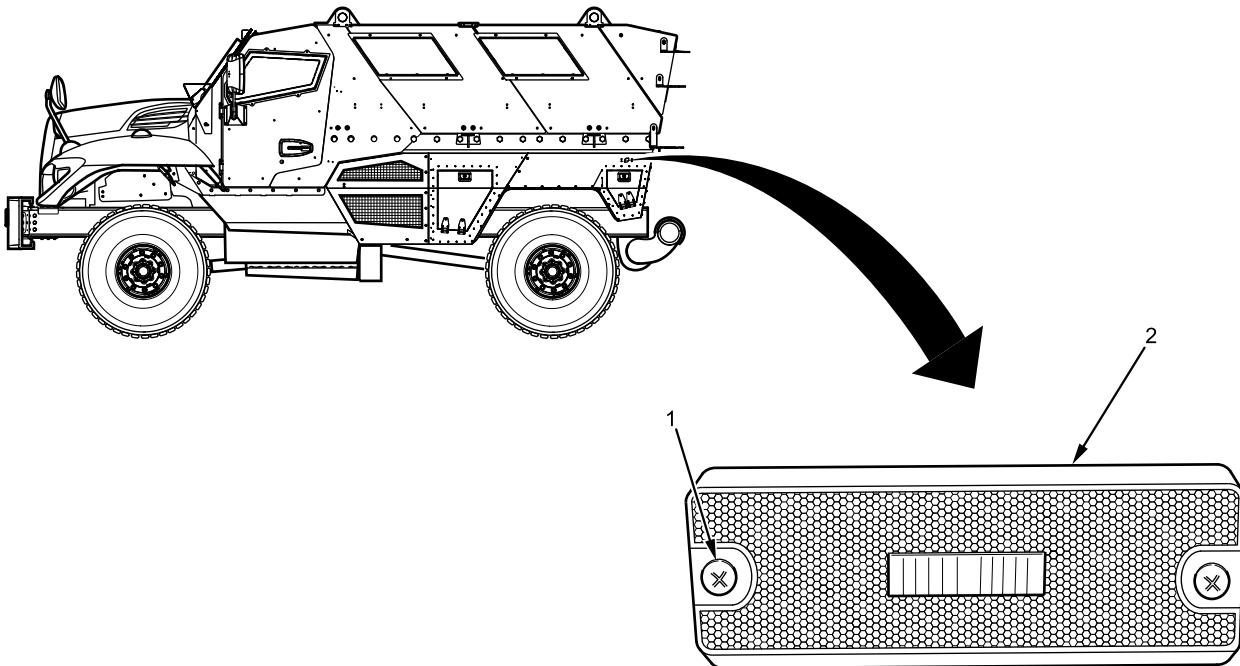
WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

REAR SIDEMARKER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

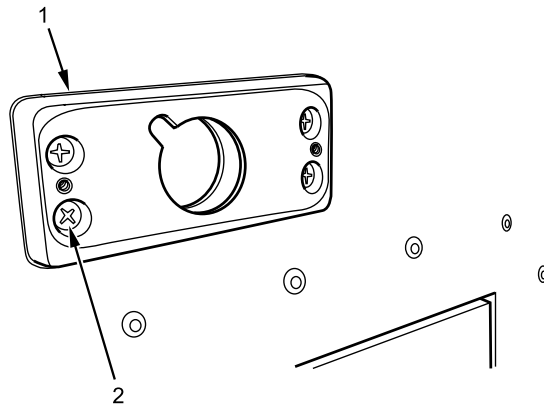
1. Remove two screws (Figure 1, Item 1) from sidemarker light lens (Figure 1, Item 2) and remove light lens cover.



B230610234

Figure 1. Sidemarker Light.

2. Remove four screws (Figure 2, Item 2) and nuts from sidemarker light housing (Figure 2, Item 1) and remove housing.



P230600768

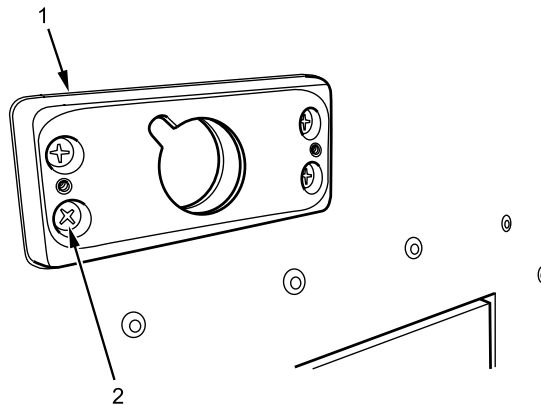
Figure 2. Sidemarker Light Housing.

END OF TASK

REAR SIDEMARKER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION****WARNING**

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

1. Install four screws (Figure 3, Item 2) and nuts on sidemarker light housing (Figure 3, Item 1). Tighten securely.

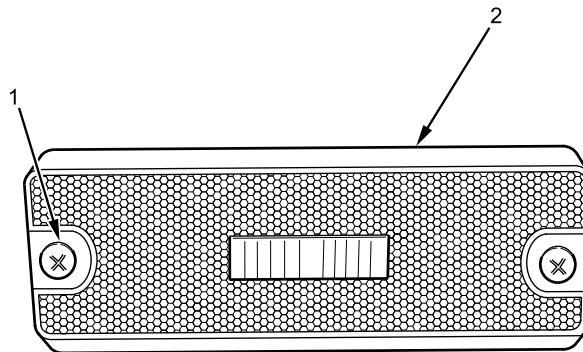


P230600768

Figure 3. Sidemarker Light Housing.

REAR SIDEMARKER LIGHT ASSEMBLY REMOVAL AND INSTALLATION - (CONTINUED)

2. Install sidemarker light (Figure 4, Item 2) and tighten two screws (Figure 4, Item 1) securely.



B230601221

Figure 4. Sidemarker Light.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Install right side rear stowage box (WP 0673) or left rear stowage box (WP 0676).
2. Turn MAIN POWER switch on (TM 9-2355-106-10).
3. Verify light operation (TM 9-2355-106-10).
4. Turn MAIN POWER switch off (TM 9-2355-106-10).
5. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Wrench, torque, dial, 300 lb-in., 3/8-inch drive
(WP 0795, Item 147)

Materials/Parts

Grease (WP 0794, Item 22)
Sealing compound (WP 0794, Item 44)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Coolant system drained (WP 0277)
Alternator bracket removed (WP 0290)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

NOTE

ECT sensor is located on right side of engine behind the alternator bracket.

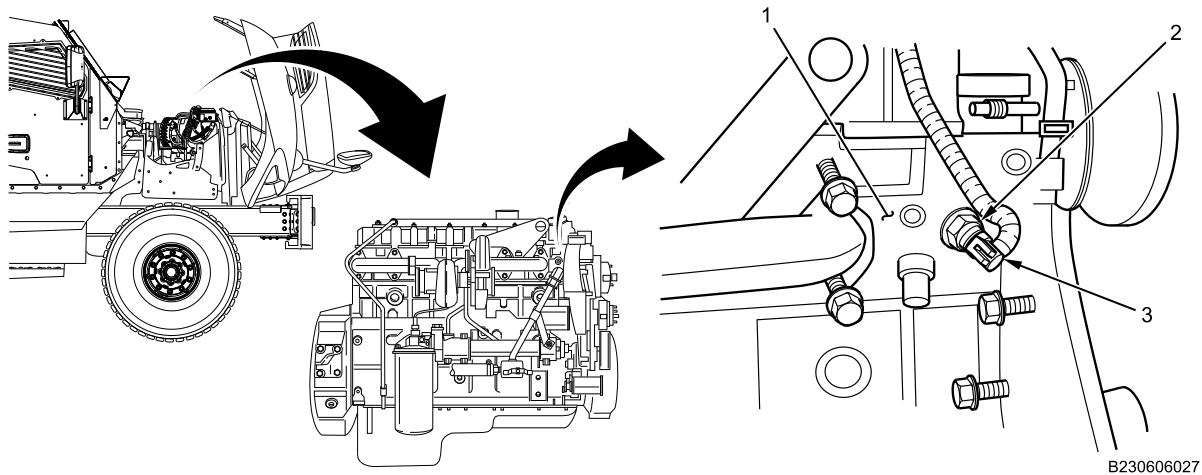
ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

Figure 1. ECT Sensor.

1. Position drain pan under engine block.
2. Disconnect electrical connector (Figure 1, Item 3) from ECT sensor (Figure 1, Item 2).
3. Remove ECT sensor (Figure 1, Item 2) from engine block (Figure 1, Item 1).
4. Remove old thread sealing compound from ECT threads.

END OF TASK**INSTALLATION****WARNING**

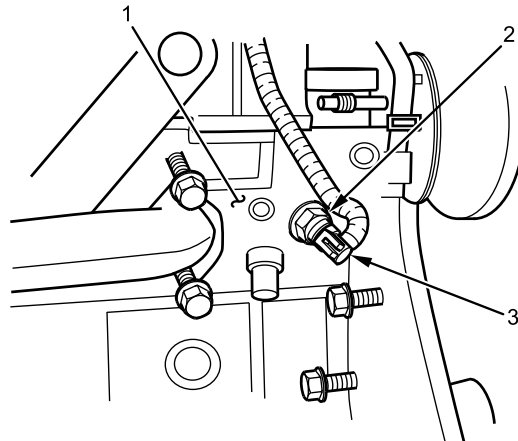
Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply thread sealing compound on ECT sensor threads.

CAUTION

To avoid damage to vehicle, ECT sensor must be tightened to correct torque.

2. Install ECT sensor (Figure 2, Item 2) into engine block (Figure 2, Item 1). Torque sensor to 120 lb-in. (13.6 N•m).

ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)

B230601544

Figure 2. ECT Sensor.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease in electrical connector (Figure 2, Item 3) and connect onto ECT sensor (Figure 2, Item 2).
4. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Refill coolant system (WP 0277).
2. Install alternator and bracket (WP 0290).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine; run to operating temperature (TM 9-2355-106-10).
5. Checks for leaks (TM 9-2355-106-10).
6. Check dash to make sure no engine lights are illuminated (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Close engine hood (TM 9-2355-106-10).
10. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL TEMPERATURE (EOT) SENSOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Pan, drain, 5-gal. capacity (WP 0795, Item 75)

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)

Materials/Parts

Sealing compound (WP 0794, Item 44)
 Grease (WP 0794, Item 22)

References

TM 9-2355-106-10

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

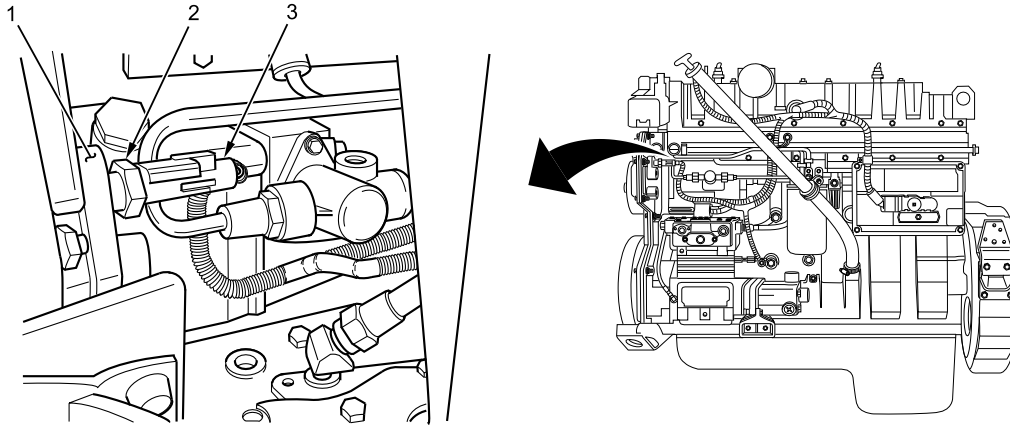
Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

NOTE

EOT sensor is located on left side of engine and near the high pressure oil pump.

ENGINE OIL TEMPERATURE (EOT) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Position drain pan under EOT sensor (Figure 1, Item 1).



B230610101

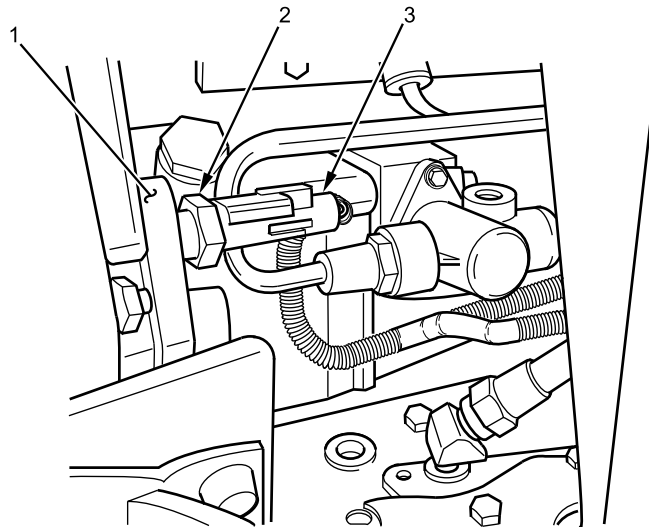
Figure 1. EOT Sensor.

2. Disconnect electrical connector (Figure 1, Item 3) from EOT sensor (Figure 1, Item 2).
3. Remove EOT sensor (Figure 1, Item 2) from engine front cover (Figure 1, Item 1).

END OF TASK**INSTALLATION****WARNING**

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply thread sealing compound on EOT sensor threads.
2. Install EOT sensor (Figure 2, Item 2) into engine front cover (Figure 2, Item 1). Tighten sensor securely.

ENGINE OIL TEMPERATURE (EOT) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)

B230100069

Figure 2. EOT Sensor.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease in electrical connector (Figure 2, Item 3) and connect on EOT sensor (Figure 2, Item 2).
4. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine; run to operating temperature (TM 9-2355-106-10).
3. Checks for leaks (TM 9-2355-106-10).
4. Check instrument panel (IP) cluster, ensure no engine lights are illuminated (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Check engine oil level and fill as needed (TM 9-2355-106-10).
7. Turn MAIN POWER switch off (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 22)
Sealing compound (WP 0794, Item 44)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM 9-2355-106-10)

Engine off (TM 9-2355-106-10)

MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

Engine hood open and secured (TM 9-2355-106-10)

References

TM 9-2355-106-10

TM 9-2355-106-23P

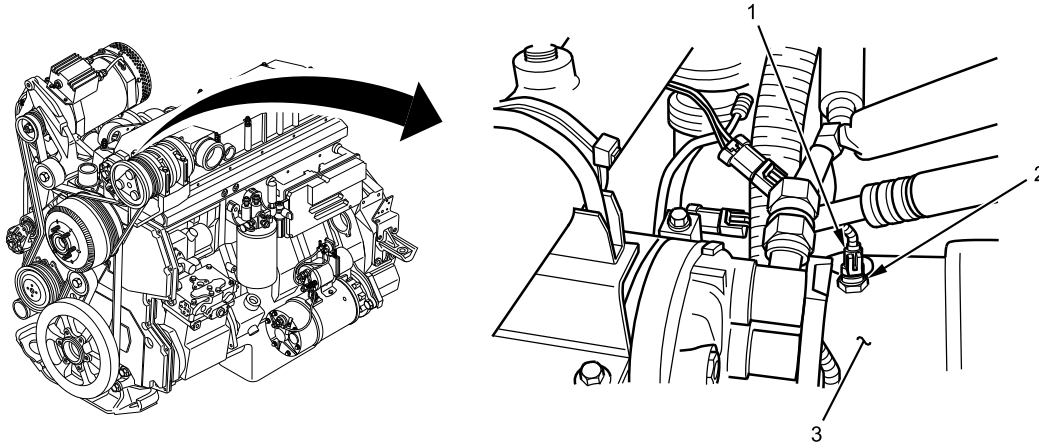
WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect electrical connector (Figure 1, Item 1) from MAP sensor (Figure 1, Item 2).



B230610146

Figure 1. MAP Sensor.

2. Remove MAP sensor (Figure 1, Item 2) from valve cover (Figure 1, Item 3).

END OF TASK**INSTALLATION****WARNING**

Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply thread sealing compound on MAP sensor threads.

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)

2. Install MAP sensor (Figure 2, Item 2) into valve cover (Figure 2, Item 3). Tighten and secure.

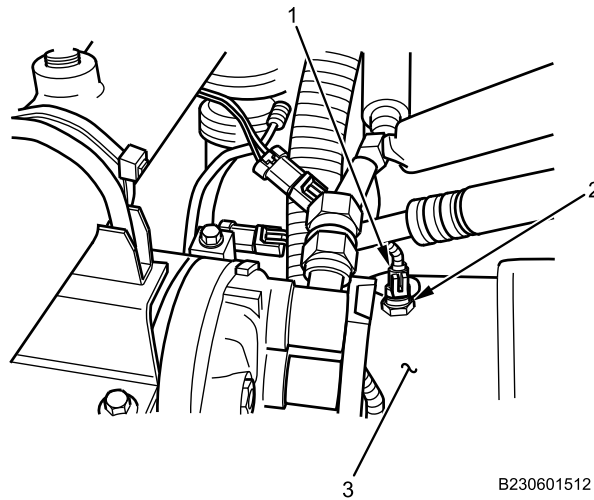


Figure 2. MAP Sensor.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease in electrical connector (Figure 2, Item 1) and connect onto MAP sensor (Figure 2, Item 2).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine; run to operating temperature (TM 9-2355-106-10).
3. Check instrument panel cluster to ensure no engine lights are illuminated (TM 9-2355-106-10).
4. Turn engine off (TM 9-2355-106-10).
5. Turn MAIN POWER switch off (TM 9-2355-106-10).
6. Close engine hood (TM 9-2355-106-10).
7. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**INJECTION CONTROL PRESSURE (ICP) SENSOR REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Wrench, torque, click, ratcheting, 15-75 lb-ft, 3/8-inch
drive (WP 0795, Item 145)
Adapter, socket wrench, 3/8-inch drive female -
1/2-inch male (WP 0795, Item 2)
Socket, socket wrench, 1/2-inch drive, 6 pt, deep,
1-1/16-inch (WP 0795, Item 106)

Materials/Parts

Grease (WP 0794, Item 22)
Lubricating oil (WP 0794, Item 27)

O-ring (WP 0796, Item 53)

References

TM 9-2355-106-10
TM 9-2355-106-23P
WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)

INJECTION CONTROL PRESSURE (ICP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased thread wear. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Fuel is flammable and can explode. Keep all open flames, flammable materials, ignition sources, and sparks away from diesel fuel and keep fire extinguisher nearby. Do not smoke when working with fuel. Do not work on fuel system. Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel. When engine is hot, fuel can be ignited by hot engine. Failure to comply may result in serious injury or death to personnel.

Be alert at all times for the smell of fuel. Hot engines and components can ignite fuel. If fuel smell is detected while operating vehicle, shut down vehicle immediately. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Store diesel fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly. Dispose of fuel in an approved container clearly marked DIESEL FUEL or JP-8, accordingly, in accordance with standard operating procedures.

Never use diesel fuel or JP-8 to clean parts. Fuel is highly flammable. Failure to comply may result in damage to equipment and serious injury or death to personnel.

Dispose of used parts, rags, containers, and engine fluids in accordance with standard operating procedures. Failure to comply may result in serious injury to personnel.

NOTE

ICP sensor is located on left side of engine on the supply manifold.

INJECTION CONTROL PRESSURE (ICP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)

REMOVAL

1. Position drain pan under engine block.

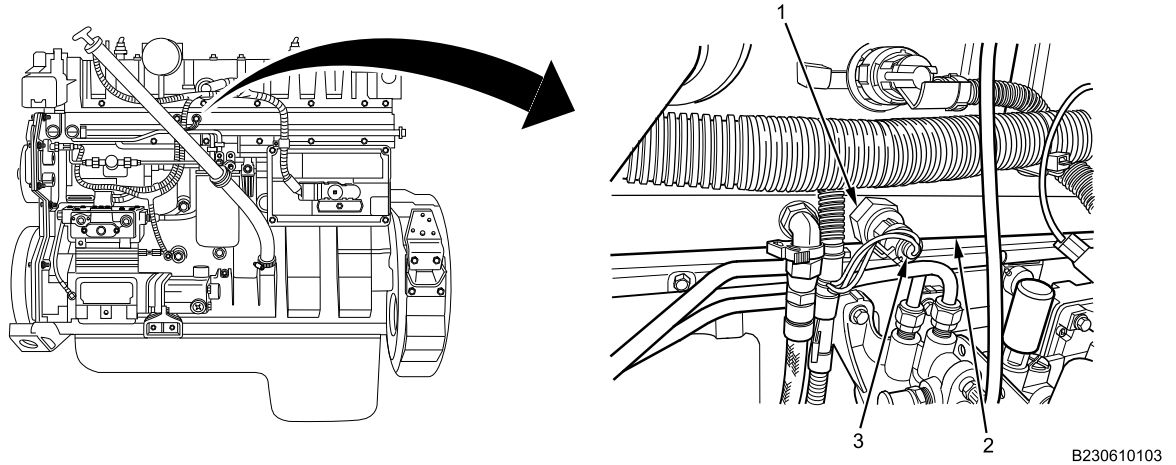


Figure 1. ICP Sensor.

2. Disconnect electrical connector (Figure 1, Item 3) from ICP sensor (Figure 1, Item 1).
3. Remove ICP sensor (Figure 1, Item 1) from supply manifold (Figure 1, Item 2).
4. Remove and discard O-Ring (Figure 2, Item 2) from ICP sensor (Figure 2, Item 1).

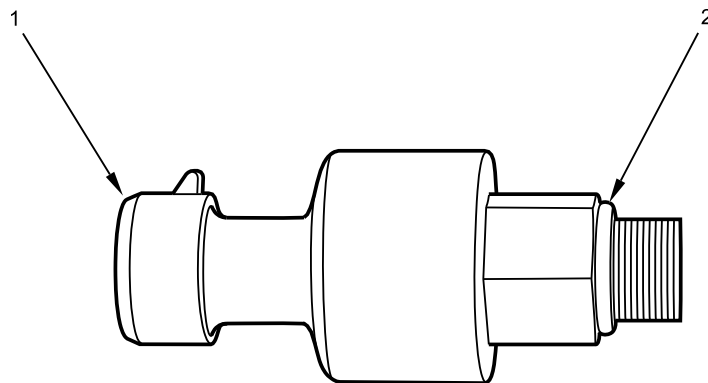
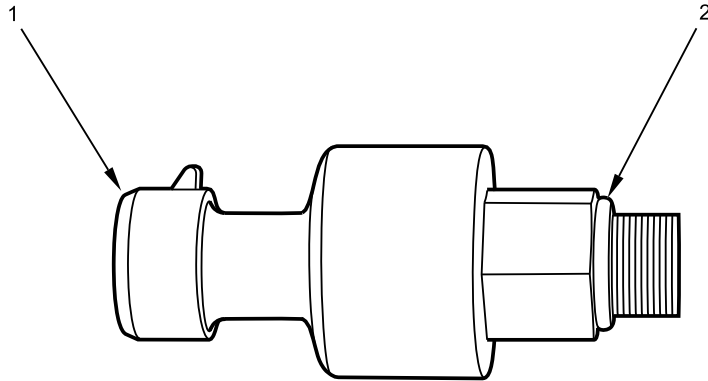


Figure 2. ICP Sensor and O-Ring.

END OF TASK

INJECTION CONTROL PRESSURE (ICP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

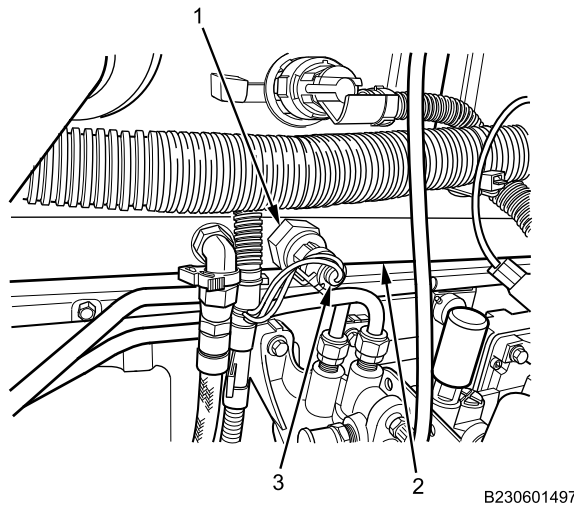
1. Lubricate new O-ring (Figure 3, Item 2) with clean engine oil.



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Figure 3. ICP Sensor and O-Ring.

2. Install O-ring (Figure 3, Item 2) on ICP sensor (Figure 3, Item 1).
3. Install ICP sensor (Figure 4, Item 1) on supply manifold (Figure 4, Item 2). Torque to 19 lb-ft (26 N•m).



B230601497

Figure 4. ICP Sensor.

INJECTION CONTROL PRESSURE (ICP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

4. Apply dielectric grease in electrical connector (Figure 4, Item 3) and connect on ICP sensor (Figure 4, Item 1).
5. Remove drain pan.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine; run to operating temperature (TM 9-2355-106-10).
3. Checks for leaks (TM 9-2355-106-10).
4. Check instrument panel (IP) cluster to ensure no engine lights are illuminated (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Check engine oil level and fill as needed (TM 9-2355-106-10).
8. Close engine hood (TM 9-2355-106-10).
9. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
ENGINE OIL PRESSURE (EOP) SENSOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)
Pan, drain, 5-gal. capacity (WP 0795, Item 75)
Wrench, torque, dial, 300 lb-in., 3/8-inch drive
(WP 0795, Item 147)
Socket, deep, 3/8-inch drive, 6 pt, 1-inch, chrome
(WP 0795, Item 101)

Materials/Parts

Grease (WP 0794, Item 22)
Sealing compound (WP 0794, Item 44)

References

TM 9-2355-106-10

TM 9-2355-106-23P

WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
Transmission set in NEUTRAL (N) (TM
9-2355-106-10)
Engine off (TM 9-2355-106-10)
MAIN POWER switch off (TM 9-2355-106-10)
Wheels chocked (TM 9-2355-106-10)
Engine hood open and secured (TM 9-2355-106-10)
Air cleaner assembly removed (WP 0257)
Charge Air Cooler (CAC) hose removed (WP 0264)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

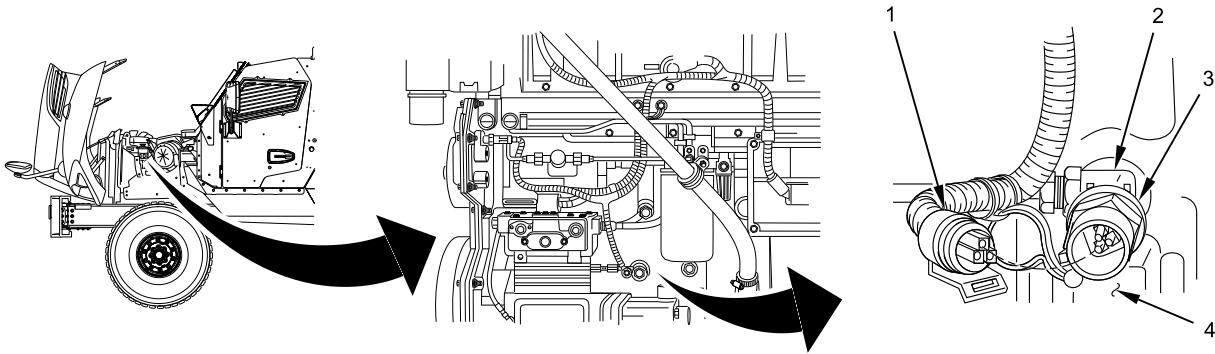
Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

NOTE

EOP sensor is located on left side of engine.

ENGINE OIL PRESSURE (EOP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Position drain pan under engine block (Figure 1, Item 4).



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Figure 1. EOP Sensor.

2. Disconnect electrical connector (Figure 1, Item 1) from EOP sensor (Figure 1, Item 3).
3. Remove EOP sensor (Figure 1, Item 3) from engine block (Figure 1, Item 4) while holding tee fitting (Figure 1, Item 2).
4. Remove old thread sealing compound from EOP threads.

END OF TASK**INSTALLATION****WARNING**

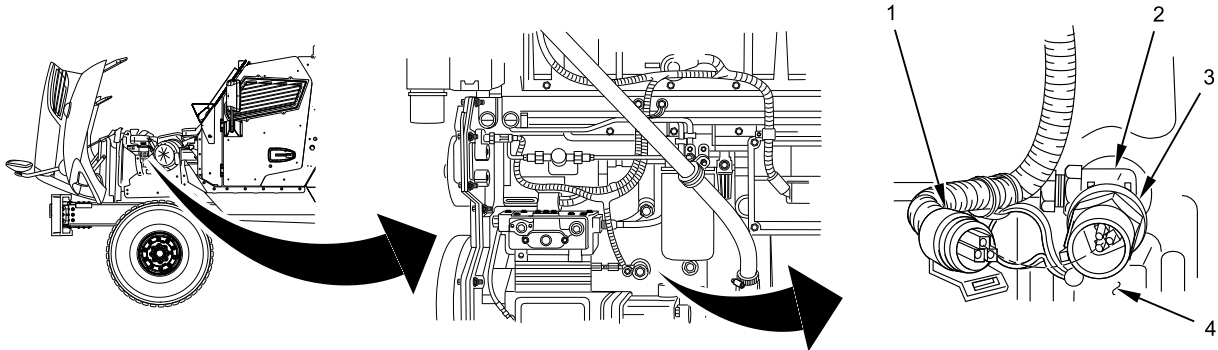
Thread sealing compound is harmful to skin and eyes. If thread sealing compound contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

1. Apply thread sealing compound on EOP sensor threads.

ENGINE OIL PRESSURE (EOP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**CAUTION**

To avoid damage to vehicle, EOP sensor must be tightened to correct torque.

2. While holding tee fitting (Figure 2, Item 2), install EOP sensor (Figure 2, Item 3) into engine block (Figure 2, Item 4). Torque sensor to 120 lb-in. (13.6 N•m).



B230605847

Figure 2. EOP Sensor.

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

3. Apply dielectric grease in electrical connector (Figure 2, Item 1) and connect onto EOP sensor (Figure 2, Item 3).
4. Remove drain pan.

END OF TASK

ENGINE OIL PRESSURE (EOP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**FOLLOW-ON MAINTENANCE**

1. Install CAC hose (WP 0264).
2. Install air cleaner assembly (WP 0257).
3. Turn MAIN POWER switch on (TM 9-2355-106-10).
4. Start engine; run to operating temperature (TM 9-2355-106-10).
5. Checks for leaks (TM 9-2355-106-10).
6. Check dash to make sure no engine lights are illuminated (TM 9-2355-106-10).
7. Turn engine off (TM 9-2355-106-10).
8. Turn MAIN POWER switch off (TM 9-2355-106-10).
9. Check engine oil level and fill as needed (TM 9-2355-106-10).
10. Close engine hood (TM 9-2355-106-10).
11. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE
CAMSHAFT POSITION (CMP) SENSOR REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
 (WP 0795, Item 37)
 Wrench, torque, dial, 300 lb-in., 3/8-inch drive
 (WP 0795, Item 147)

Materials/Parts

Compound (WP 0794, Item 13)
 Grease (WP 0794, Item 22)
 Lubricating oil (WP 0794, Item 27)
 Gloves (WP 0794, Item 18)
 Goggles, industrial (WP 0794, Item 20)
 Faceshield, industrial (WP 0794, Item 16)
 O-Ring (WP 0796, Item 82)

References

TM 9-2355-106-10
 TM 9-2355-106-23P
 WP 0782

Equipment Condition

Parking brake set (TM 9-2355-106-10)
 Transmission set in NEUTRAL (N) (TM
 9-2355-106-10)
 Engine off (TM 9-2355-106-10)
 MAIN POWER switch off (TM 9-2355-106-10)
 Wheels chocked (TM 9-2355-106-10)
 Engine hood open and secured (TM 9-2355-106-10)

WARNING

Engine hood is extremely heavy and requires two-person lift. Ensure that there is adequate space in front of the vehicle to open hood completely without pinning or pinching personnel between hood and any other structure. Use extreme care when working under hood and make sure it is properly supported. Failure to comply may result in serious injury or death to personnel.

Do not replace sensors while engine is hot. Removing sensors while engine is hot may damage internal threads on engine block and cause sensor to break or crack in engine block, engine block to crack, or hot coolant or oil to spill out. Allow engine to cool before performing maintenance. Failure to comply may result in damage to equipment and serious injury or death to personnel.

CAMSHAFT POSITION (CMP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect electrical connector (Figure 1, Item 6) from CMP sensor (Figure 1, Item 5).

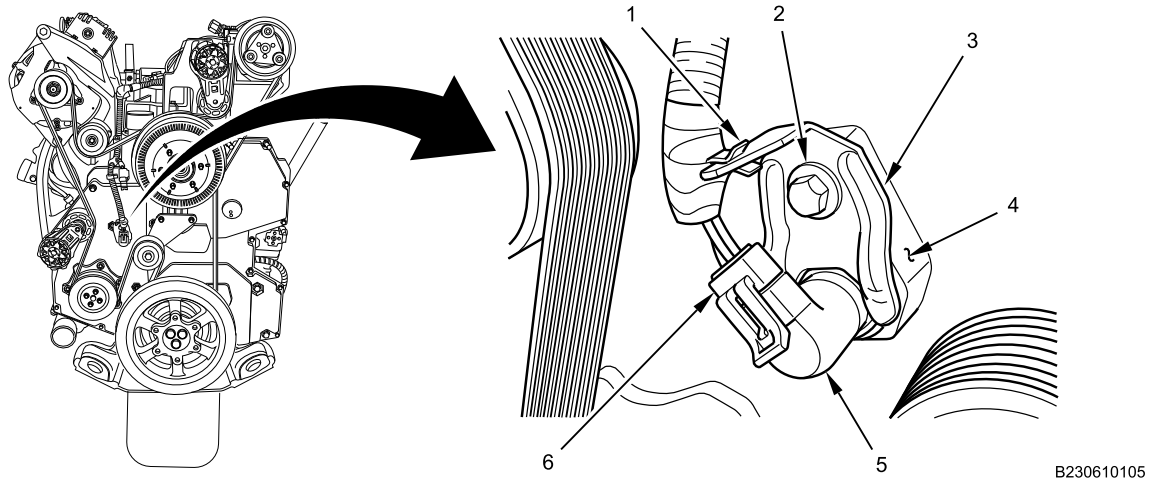


Figure 1. Front View of CMP Sensor.

2. Remove harness clip (Figure 1, Item 1) from CMP sensor bracket (Figure 1, Item 3).
3. Remove bolt (Figure 1, Item 2) and CMP sensor bracket (Figure 1, Item 3) from front cover (Figure 1, Item 4).
4. Remove CMP sensor (Figure 2, Item 1) from engine front cover (Figure 2, Item 2).

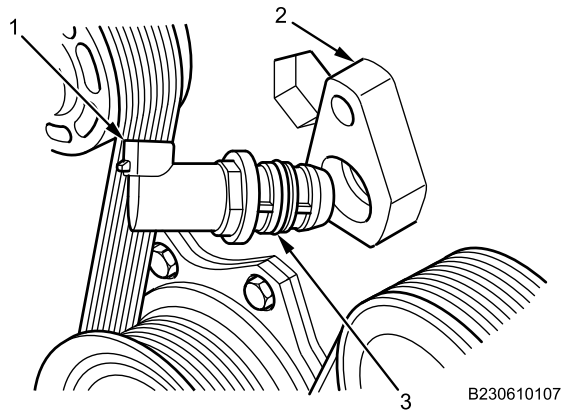


Figure 2. CMP Sensor and Engine Front Cover.

5. Remove and discard O-ring (Figure 2, Item 3) from CMP sensor (Figure 2, Item 1).

END OF TASK

CAMSHAFT POSITION (CMP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)**INSTALLATION**

1. Lubricate new O-ring (Figure 3, Item 3) with clean engine oil and install on CMP sensor (Figure 3, Item 1).

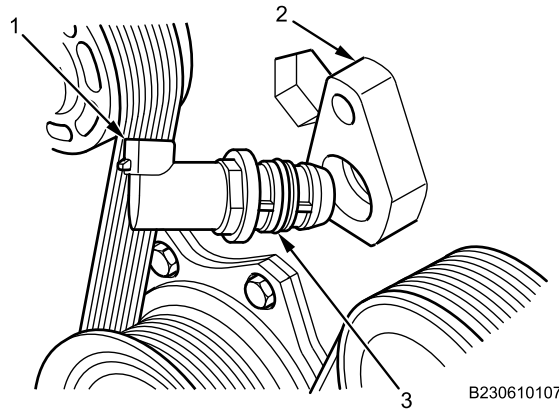


Figure 3. CMP Sensor and O-Ring.

2. Install CMP sensor (Figure 3, Item 1) in front cover (Figure 3, Item 2).

WARNING

Corrosion preventive compound is toxic. Use only in well-ventilated area. Do not get in eyes; wear chemical safety goggles and full-face shield when using. Avoid contact with skin and wear rubber or plastic, solvent-resistant gloves. In case of contact, remove contaminated clothing and immediately wash area with soap and water. If compound contacts eyes, flush eyes with large amounts of water for at least 15 minutes and get immediate medical attention. If swallowed, do not induce vomiting; contact a physician immediately. Failure to comply may result in serious injury or death to personnel.

3. Apply compound on CMP sensor bolt threads.

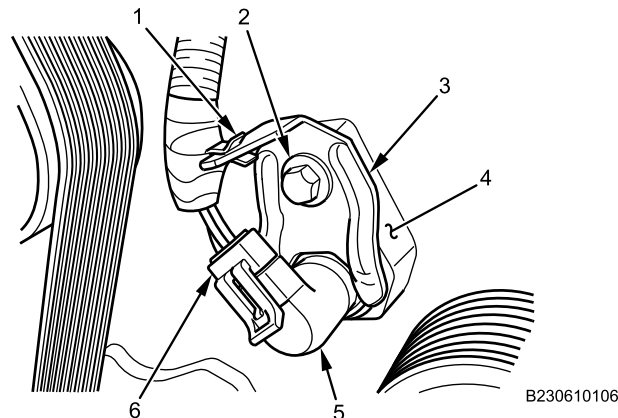
CAMSHAFT POSITION (CMP) SENSOR REMOVAL AND INSTALLATION - (CONTINUED)

Figure 4. Engine Front Cover and CMP Sensor.

4. Install CMP sensor bracket (Figure 4, Item 3) on front cover (Figure 4, Item 4) with bolt (Figure 4, Item 2). Torque to 13 lb-ft (17 N•m).

WARNING

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

5. Apply grease in electrical connector (Figure 4, Item 6) and connect on engine CMP sensor (Figure 4, Item 5).
6. Install harness clip (Figure 4, Item 1) on CMP sensor bracket (Figure 4, Item 3).

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Start engine; run to operating temperature (TM 9-2355-106-10).
3. Checks for leaks (TM 9-2355-106-10).
4. Check instrument panel cluster to ensure no engine lights are illuminated (TM 9-2355-106-10).
5. Turn engine off (TM 9-2355-106-10).
6. Turn MAIN POWER switch off (TM 9-2355-106-10).
7. Close engine hood (TM 9-2355-106-10).
8. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**TRANSFER CASE MODE SWITCH REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

General Mechanic's Tool Kit (GMTK)
(WP 0795, Item 37)

WP 0786

WP 0782

Materials/Parts

Grease (WP 0794, Item 27)

Equipment Condition

Parking brake set (TM 9-2355-106-10)

Transmission set in NEUTRAL (N) (TM
9-2355-106-10)

Engine off (TM 9-2355-106-10)

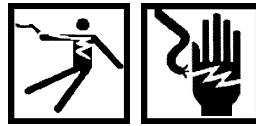
MAIN POWER switch off (TM 9-2355-106-10)

Wheels chocked (TM 9-2355-106-10)

References

TM 9-2355-106-10

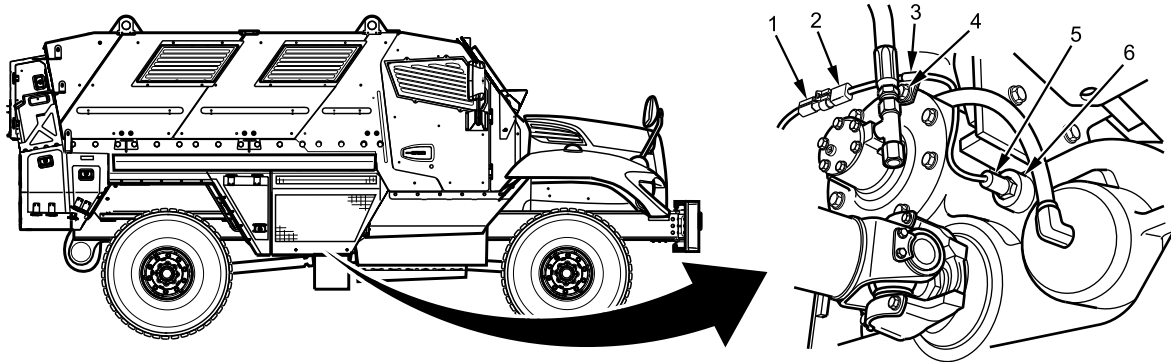
TM 9-2355-106-23P

WARNING

Use extreme caution when testing or working on or around electrical circuits. Always assume that electrical circuits are live. Electrical shock can occur upon contact with voltage high enough to cause current flow through muscles or nerves. On Direct Current (DC) systems, generally 1 milliamp of current can be felt, 5 milliamps can cause severe pain, 15 milliamps can cause loss of muscle control, and 70 milliamps can be fatal. Wear protective clothing; ensure skin, clothing, and surrounding areas are dry; do not wear jewelry; and touch only the insulated, nonmetallic parts of electrical components and testing equipment. To prevent electrical arcing, avoid shorting electrical test probes and jumper wires. Electrical arcing can cause bright flashes of light, capable of causing temporary blindness. If electrical injury occurs, immediately shut off power supply and seek medical assistance. Failure to comply may result in serious injury or death to personnel.

TRANSFER CASE MODE SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**REMOVAL**

1. Disconnect transfer case mode switch connector (Figure 1, Item 2) from vehicle electrical harness connector (Figure 1, Item 1).



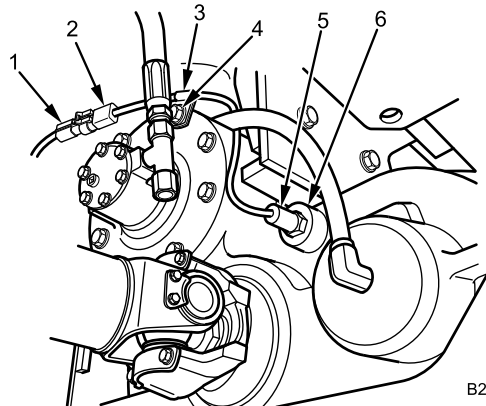
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Figure 1. Transfer Case Mode Switch Removal.

2. Remove retaining bolt (Figure 2, Item 4) from transfer case (Figure 2, Item 6).
3. Remove retaining clip (Figure 2, Item 3) from transfer case mode switch (Figure 2, Item 5).
4. Remove transfer case mode switch (Figure 2, Item 5) from transfer case (Figure 2, Item 6).

END OF TASK**INSTALLATION**

1. Install transfer case mode switch (Figure 2, Item 5) on transfer case (Figure 2, Item 6). Tighten switch securely.



B230610173

Figure 2. Transfer Case Mode Switch Installation.

TRANSFER CASE MODE SWITCH REMOVAL AND INSTALLATION - (CONTINUED)**WARNING**

Dielectric grease is harmful to skin and eyes. If grease contacts eyes, rinse thoroughly and contact physician if irritation persists. If skin is contacted, wash thoroughly with soap and water. Failure to comply may result in serious injury to personnel.

2. Apply dielectric grease to all electrical connections.
3. Connect transfer case mode switch connector (Figure 1, Item 2) to vehicle electrical harness connector (Figure 1, Item 1).
4. Position retaining clip (Figure 2, Item 3) on transfer case mode switch (Figure 2, Item 5).
5. Install retaining clip (Figure 2, Item 3) on transfer case (Figure 2, Item 6) with bolt (Figure 2, Item 4). Tighten bolt securely.

END OF TASK**FOLLOW-ON MAINTENANCE**

1. Turn MAIN POWER switch on (TM 9-2355-106-10).
2. Verify proper transfer case operation (TM 9-2355-106-10).
3. Turn MAIN POWER switch off (TM 9-2355-106-10).
4. Remove wheel chocks (TM 9-2355-106-10).

END OF TASK**END OF WORK PACKAGE**

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE <i>Date you filled out this form.</i>	
For use of this form, see AR 25-30; the proponent agency is OAASA.								
TO (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000						FROM (Activity and location) (Include ZIP Code) <i>Your mailing address</i>		
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS								
PUBLICATION/FORM NUMBER <i>TM Number</i>						DATE <i>Date of the TM</i>	TITLE <i>Title of the TM</i>	
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)		
	0007-3					<i>Figure 2, Item 9 should show a lockwasher. Currently shows a flat washer.</i>		
	0018-2					<i>Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be change to (12).</i>		
SAMPLE								
TYPED NAME, GRADE OR TITLE						TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE
<i>Your Name</i>						<i>Your Phone Number</i>		<i>Your Signature</i>

TO <i>(Forward direct to addressee listed in publication)</i> U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	FROM <i>(Activity and location) (Include ZIP Code)</i> <i>Your Address</i>	DATE <i>Date you filled out this form</i>
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER <i>TM Number</i>	DATE <i>Date of the TM</i>	TITLE <i>Title of the TM</i>
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
<h1>SAMPLE</h1>								

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE <i>Your Name</i>	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION <i>Your Phone Number</i>	SIGNATURE <i>Your Signature</i>
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
For use of this form, see AR 25-30; the proponent agency is OAASA							
TO (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 9-2355-106-23-3						DATE 19 November 2012	TITLE MAINTENANCE MANUAL FOR MINE RESISTANT AMBUSH PROTECTED VEHICLE
	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

TO <i>(Forward direct to addressee listed in publication)</i> U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	FROM <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER TM 9-2355-106-23-3	DATE 19 November 2012	TITLE MAINTENANCE MANUAL FOR MINE RESISTANT AMBUSH PROTECTED VEHICLE
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
For use of this form, see AR 25-30; the proponent agency is OAASA							
TO (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 9-2355-106-23-3						DATE 19 November 2012	TITLE MAINTENANCE MANUAL FOR MINE RESISTANT AMBUSH PROTECTED VEHICLE
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

TO <i>(Forward direct to addressee listed in publication)</i> U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	FROM <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER TM 9-2355-106-23-3	DATE 19 November 2012	TITLE MAINTENANCE MANUAL FOR MINE RESISTANT AMBUSH PROTECTED VEHICLE
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remark, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
For use of this form, see AR 25-30; the proponent agency is OAASA							
TO (Forward to proponent of publication or form) (Include ZIP Code) U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000						FROM (Activity and location) (Include ZIP Code)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 9-2355-106-23-3						DATE 19 November 2012	TITLE MAINTENANCE MANUAL FOR MINE RESISTANT AMBUSH PROTECTED VEHICLE
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
TYPED NAME, GRADE OR TITLE					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE

TO <i>(Forward direct to addressee listed in publication)</i> U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	FROM <i>(Activity and location) (Include ZIP Code)</i>	DATE
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By Order of the Secretary of the Army:

Official:



JOYCE E. MORROW
*Administrative Assistant to the
Secretary of the Army*

1229005

RAYMOND T. ODIERNO
*General, United States Army
Chief of Staff*

By Order of the Secretary of the Air Force:

JANET C. WOLFENBARGER
*General, United States Air Force
Commander, AFMC*

MARK A. WELSH, III
*General, United States Air Force
Chief of Staff*

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 381168 requirements for TM 9-2355-106-23-3.

THE METRIC SYSTEM AND EQUIVALENTS

<p>Linear Measure</p> <p>1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches 1 Kilometer = 1000 Meters = 0.621 Miles</p> <p>Weights</p> <p>1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces 1 Kilogram = 1000 Grams = 2.2 Pounds 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons</p> <p>Liquid Measure</p> <p>1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces</p>	<p>Square Measure</p> <p>1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles</p> <p>Cubic Measure</p> <p>1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet</p> <p>Temperature</p> <p>$9/5 C^{\circ} + 32 = F^{\circ}$ $5/9 (F^{\circ} - 32) = C^{\circ}$ 212° Fahrenheit is equivalent to 100° Celsius 90° Fahrenheit is equivalent to 32.2° Celsius 32° Fahrenheit is equivalent to 0° Celsius</p>
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APPROXIMATE CONVERSION FACTORS

To Change	To	Multiply By
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Sq Inches	Sq Centimeters	6.451
Sq Feet	Sq Meters	0.093
Sq Yards	Sq Meters	0.836
Sq Miles	Sq Kilometers	2.590
Acres	Sq Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

To Change	To	Multiply By
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Sq Inches	0.155
Sq Meters	Sq Feet	10.764
Sq Meters	Sq Yards	1.196
Sq Kilometers	Sq Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

PIN: 084304-000