

***TM 9-2355-335-10**

OPERATOR MANUAL

FOR

**MINE RESISTANT AMBUSH PROTECTED
ALL TERRAIN VEHICLE (M-ATV)**

M1240

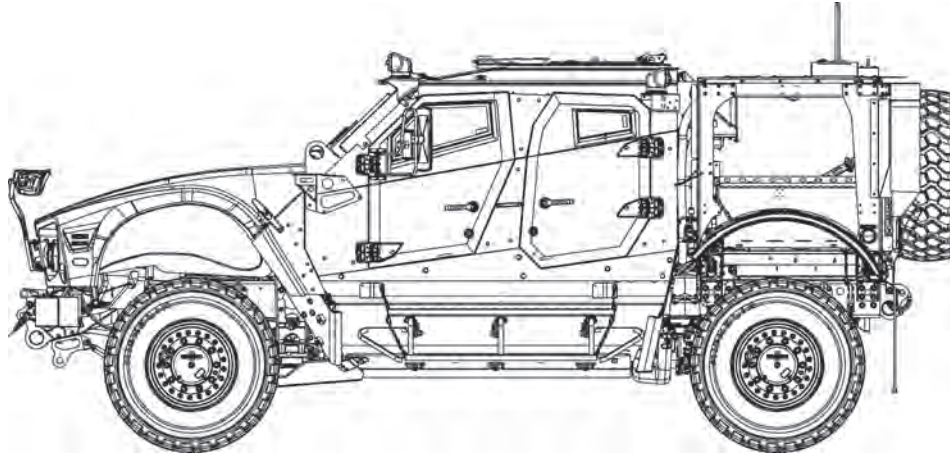
NSN: 2355-01-575-9632 (EIC 1UT)

M1240A1

NSN: 2355-01-596-1330 (EIC 1ZW)

M1245

NSN: 2355-01-586-8070 (EIC 1VE)



*This manual supersedes TM 9-2355-335-10, dated 31 March 2011.

COPYRIGHT RELEASE STATEMENT: Oshkosh Corporation states this Commercial Off the Shelf (COTS) manual dated July 2012 is free from copyright restrictions. The Government may edit, reprint, and distribute information in this manual as required.

DISTRIBUTION STATEMENT C: Distribution authorized to US Government agencies and their contractors; proprietary information. Other requests for this document shall be referred to U.S. Army TACOM Life Cycle Management Command, PM-MRAP, ATTN: AMSTA-LCC-MM/TECH PUBS, 6501 E. 11 Mile Road, Warren, MI 48397-5000.

DESTRUCTION NOTICE: Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

HEADQUARTERS, DEPARTMENT OF THE ARMY

17 AUGUST 2012

SAFETY SUMMARY

SCOPE

This section is a guide to safe handling of the MRAP-All Terrain Vehicle (M-ATV). It is imperative that safety be considered at all times while handling the M-ATV. It is important that the M-ATV Operator's Manual be thoroughly read and understood before driving the M-ATV. The operator must become accustomed to the "feel" of the M-ATV and learn its capabilities and limitations in order to maintain control while driving this vehicle. Strict attention must be paid to maximum speeds and load combinations for road conditions and operation in unusual conditions. Review the M-ATV Operator's Manual thoroughly and often to maintain vehicle and passenger safety. Operation beyond the limits specified in this M-ATV Operator's Manual could result in injury death or to personnel.

This section provides the unique handling characteristics of the M-ATV so that it can be operated safely.

WARNING

- **DO NOT OPERATE unless you are TRAINED and have read and understood the M-ATV Operator's Manual. Read all WARNINGS and CAUTIONS before operating. Failure to comply may result in serious injury or death to personnel.**
- **If you have any questions or are unsure of how to operate this vehicle, DO NOT OPERATE this vehicle. Failure to comply may result in serious injury or death to personnel.**

CENTER OF GRAVITY

CENTER OF GRAVITY (CG) is defined as the point in a vehicle where the weight is concentrated. The CG will change depending on the cargo weight and distribution. An M-ATV has a higher CG when compared to automobiles and light trucks

SAFE VEHICLE OPERATION

WARNING

DO NOT operate the M-ATV beyond its design capabilities. Failure to comply may result in serious injury or death to personnel.

Always keep within maximum speeds and load combinations adjusted for on-road or off-road conditions.

Make sure vehicle speed is reduced enough by braking before a corner or curve so that you can accelerate slightly through the corner or curve to maintain control.

The weight of the M-ATV plus the weight of the cargo and passengers must not exceed the M-ATV's GVWR.

SAFETY SUMMARY (CONTINUED)

SIDE SLOPE OPERATION

WARNING

- **DO NOT attempt maneuvers on a side slope unless you have carefully and slowly developed experience. Start at slow speeds. Gradually and systematically learn the limits of the vehicle by slowly increasing the speed and sharpness of turns under controlled conditions with adequate safety precautions. Failure to comply may result in serious injury or death to personnel.**
- **Pay attention to the side slope surface. The more unstable the surface is, the slower the speed you must drive, the turns you can safely make are reduced, and the side slope angle capabilities are lessened.**
- **The specified side slope capability has been verified only on hard-surfaced slopes with known gradients and under tightly controlled testing circumstances.**
- **Failure to comply may result in the vehicle rolling down hill causing serious injury or death to personnel.**

Do not drive on side slopes beyond the M-ATV's capability. Side slopes are a major factor that can cause loss of control and rollover accidents, which can result in death or serious injury.

- All side slope operations require extreme caution and close attention.
- Based on information you receive as you drive, you must decide:
 - Whether the surface of the side slope is stable enough to drive and turn on.
 - What percent of side slope gradient is safe to drive on.
 - What speed you can safely drive.
 - How sharply you can turn the steering wheel relative to both the speed and the side slope gradient without losing vehicle control.
- As a general rule, make every effort NOT TO turn up-slope. To go UP a slope, start at a small (i.e., up to 10 percent) side slope, and turn to drive straight up the hill.
- DO NOT attempt to climb a hill by driving across its side slope.
- DO NOT turn on a slope unless necessary, and then turn SLOWLY AND GRADUALLY DOWNHILL, if possible. Always turn slowly. If you feel the vehicle begin to slide or tip or roll excessively, IMMEDIATELY turn the steering wheel DOWN SLOPE. Do not accelerate.

SAFETY SUMMARY (CONTINUED)

This list summarizes critical warnings and cautions in this technical manual. They are repeated here to let you know how important they are. Study these warnings and cautions carefully. They can save your life and the lives of personnel you work with as well as preventing damage to equipment. If there is any doubt or questions contact your Supervisor.

WARNING

Air drain valves may be under extreme pressure. Do not allow face to be in front of air drain valves while draining air reservoirs. Open air drain valves slowly to prevent sudden blast of air. Failure to comply may result in injury to personnel.

WARNING

All personnel must stand clear, at least twice length of deployed winch cable, during winch operations. Snapped winch cable may cause injury or death to personnel.

WARNING

Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.

WARNING

Always install the hatch safety pins when the hatch covers are opened. Failure to comply may result in injury to personnel.

WARNING

Always use an assistant to stow winch cable. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Always use seat belts when vehicle is in operation. Failure to comply may result in injury or death to personnel.

WARNING

Always use turret gunner restraint system when vehicle is in operation. Failure to comply may result in injury or death to personnel.

WARNING

Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken wire will cause injury to personnel.

WARNING

Antennae emit radio frequency radiation. Avoid contact with active antennae and maintain proper standoff distances from active antennae. Ensure that radios are powered off before conducting fueling operations or maintenance activities. Failure to comply may result in injury to personnel.

WARNING

Any slack in the harness anchor straps will reduce the effectiveness of the restraint. Remove all slack from harness anchor straps. Failure to comply may result in injury or death to personnel.

WARNING

Avoid exposure to contents of fire extinguisher if wearing contact lenses, have respiratory illnesses, or have skin allergies. In case of contact with agent, flush the affected area with clean, cool water. Failure to comply may result in injury to personnel.

WARNING

Avoid quick, jerking winch operation. Keep all personnel well away from vehicle involved in winching operation. Snapped cable or shifting load may cause injury or death to personnel.

WARNING

Ballistic glass may become very hot when exposed to sun or when in a hot environment. Avoid contacting hot ballistic glass with hands or skin. Failure to comply may result in injury to personnel.

WARNING

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 and notify Field Maintenance. Failure to comply may result in injury or death to personnel and/or damage to equipment.

WARNING

Before operating vehicle, verify optical sensors are in position, are clear of dirt and dust, and are not obstructed by occupants or equipment. Failure to comply may result in injury or death to personnel.

WARNING

Blue transportation caps must be removed from aerosol generators prior to vehicle operation. Failure to comply may result in injury or death to personnel.

WARNING

Cable is not fully mission capable and cable may break if: Cable has more than three broken wires per inch on same strand, or cable has more than six broken wires on all strands in one inch of cable. Maximum number of broken wires shall not occur in any two consecutive inches of cable. For example, if six wires are broken in one inch of cable, none would be allowed in next consecutive inch. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Cable is under tension when wrapped around drum. Keep hands away from drum when operating winch. Failure to comply may result in injury or death to personnel.

WARNING

Camera glass may become very hot when exposed to sun or when in a hot environment. Avoid contacting hot glass with hands or skin. Failure to comply may result in injury to personnel.

WARNING

Canisters are considered hazardous material and must be handled with care and disposed of in accordance with current directives. Failure to comply may result in injury or death to personnel.

WARNING

Capsule interior fire suppression system activation rapidly releases highly pressurized gas. Never put fingers inside of or look directly into fire suppression cylinder. Do not leave equipment or other objects near the cylinders. Failure to comply may result in injury to personnel.

WARNING

Capsule interior fire suppression system uses optical fire detectors. Do not smoke or have open flame inside the capsule, as fire suppression system may activate. Failure to comply may result in injury to personnel.

WARNING

Capsule interior fire suppression system uses optical fire detectors. Do not have open flame inside the capsule, as fire suppression system may activate. Failure to comply may result in injury to personnel.

WARNING

Care should be taken when operating door. Door may cause injury if fingers, hands, or feet are caught between door and capsule. Failure to comply may result in injury to personnel.

WARNING

Cooling system components are very hot and pressurized during vehicle operation. Let cooling system cool before checking hoses. Failure to comply may result in burns to personnel.

WARNING

Cooling system components become pressurized and extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury or death to personnel.

WARNING

Diesel fuel is flammable. Do not fill the fuel tank while the engine is running, while smoking, or near open flames. Avoid overfilling the fuel tank and immediately clean up spilled fuel. Avoid operating electrical equipment, such as radios and personnel heaters, while refueling. Failure to comply may cause explosions and fire, and may result in injury or death to personnel and damage to equipment.

WARNING

DO NOT attempt maneuvers on a side slope unless you have carefully and slowly developed experience. Start at slow speeds. Gradually and systematically learn the limits of the vehicle by slowly increasing the speed and sharpness of turns under controlled conditions with adequate safety precautions. Failure to comply may result in serious injury or death to personnel.

WARNING

Do not attempt to ford water deeper than 36 inches. Ensure bottom surface under water is hard. Reduce speed during fording. Ensure brakes are dry and operating correctly upon completion of fording operation before commencing normal driving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

WARNING

Do not discharge a fire extinguisher in a person's face. Failure to comply may result in injury or death to personnel.

WARNING

Do not disengage winch under load. Failure to comply may result in injury or death to personnel.

WARNING

Do not drive the vehicle further than 30 mi (48 km) or exceed speeds of 30 mph (48 km/h) while operating on the run-flat inserts. Failure to comply may cause a tire fire and/or loss of vehicle control, which may result in injury or death to personnel and damage to equipment.

WARNING

Do not incinerate fire extinguisher as this may cause explosion. Failure to comply may result in injury or death to personnel.

WARNING

Do not inhale the dry chemical agent. Failure to comply may result in injury or death to personnel.

WARNING

Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.

WARNING

Do not remove chain from tackle block while under load. Release tension on winch cable. Failure to comply may result in injury or death to personnel.

WARNING

Do not remove tackle block while under load. Failure to comply may result in injury or death to personnel.

WARNING

Do not smoke or have open flame inside engine compartment, as fire suppression system may activate. Failure to comply may result in injury to personnel.

WARNING

Do not smoke or use open flame near batteries. Batteries may explode from spark. Failure to comply may result in injury or death to personnel.

WARNING

Do not use tackle block for recovery of any vehicle. Winch cable may snap and cause injury or death to personnel.

WARNING

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.

WARNING

Doors are heavy. Ensure that no one is standing directly behind the door before opening and closing it. Ensure that hands and feet are clear for the area before closing the door. Use caution when opening or closing doors especially when the vehicle is parked on an incline. Failure to comply may result in injury to personnel.

WARNING

During operations, the ventilation system(s) must remain on to provide adequate ventilation to the vehicle occupants. Failure to comply may result in injury to personnel.

WARNING

Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury to personnel.

WARNING

Engine cooling system is hot and pressurized. Do not remove radiator cap while engine is hot; steam and hot coolant can escape and burn personnel. Allow the system to cool and remove cap slowly to relieve pressure. Failure to comply may result in serious injury or death to personnel.

WARNING

Engine must be shut off prior to removing engine oil fill cap. Failure to comply may result in injury or death to personnel.

WARNING

Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in injury or death to personnel.

WARNING

Ensure auxiliary mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

WARNING

Ensure battery disconnect switch is in OFF position. Failure to comply may result in injury or death to personnel.

WARNING

Ensure side view mirrors and auxiliary mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

WARNING

Ensure to keep speeds within limits of road conditions. Failure to comply may result in injury or death to personnel.

WARNING

Ensure vehicle battery disconnect switch is OFF before inspecting engine compartment fire suppression system. Failure to comply may result in injury or death to personnel.

WARNING

Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49°C). Avoid contact with skin and eyes. Avoid breathing of fumes. Do not store spare containers in capsule. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel.

WARNING

Exposure to a dry chemical fire extinguishing agent can result in breathing difficulty. Immediately evacuate the vehicle upon indication of a fire and discharge extinguishers from outside the cab. Open hatches and doors for ventilation and wash down the cab before re-entry. If respiratory irritation, skin or eye contact, or ingestion occurs, seek medical attention. Failure to comply may result in injury to personnel.

WARNING

Fuel is flammable and can explode. Keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.

WARNING

Fuel is flammable and can explode. To avoid injury or death, keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.

WARNING

Gunner hatch is extremely heavy. Use caution when opening and closing. Keep arms and hands clear of gunner hatch when closing. Gunner hatch can only be opened or closed when vehicle is stationary and on a level surface. Do not attempt to open or close hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. 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 support to maintain stability at all times and shall wear a gunner's restraint when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.

WARNING

Hood support must be used and installed properly whenever hood is in upright position. Wind or sudden shifting of vehicle may cause hood to fall. Failure to comply may result in injury or death to personnel.

WARNING

If engine has been running for any period of time, it may be hot. Ensure engine is cooled prior to contact. Failure to comply may result in injury to personnel.

WARNING

If the operator leaves the vehicle, even momentarily, when engine is running, the transmission **MUST** be in N (neutral), **PARKING BRAKE** must be engaged, and wheel **MUST** be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

WARNING

In extreme temperature environments, follow work-rest schedules as well as the guidance of TB-MED 507 Heat Stress Control and Heat Stress Management and TB-MED 508 Prevention and Management of Cold Weather Injuries. Failure to comply may result in injury to personnel.

WARNING

Increased effort will be required to turn steering wheel if there is a failure of hydraulic steering system or engine stops running. Stop vehicle as soon as road conditions permit. Operating vehicle with impaired steering could result in injury or death to personnel.

WARNING

Keep all personnel away from winch cable during winch operation. Failure to comply may result in injury or death to personnel.

WARNING

Keep hands and clothing clear of moving parts in 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 area is clear of personnel and obstructions before starting engine. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from any pinch point area of the capsule door assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from any pinch point areas of the 5th seat assembly and gunner's platform, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from any pinch point areas of the 5th seat assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of cargo doors. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of hatch covers. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of side steps. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point area of the arm rest assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of the cargo door assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of the litter door assembly. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers away from pinch point areas of the spare tire assembly, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

WARNING

Keep hands and fingers clear of hatch and capsule contact area. Failure to comply may result in injury to personnel.

WARNING

Keep hands clear of winch area when winch is reeling in cable. If hands are caught in winch or cable, severe injury or death may result.

WARNING

Lead-acid batteries contain sulfuric acid, which can cause severe burns. Avoid contact with skin, eyes, or clothing. Wear safety goggles and gloves. If battery electrolyte is spilled, take immediate action to stop its corrosive (burning) effects. If battery acid is spilled on clothing or vehicle, wash immediately with cold water. Neutralize with baking soda or household ammonia solution. If battery acid comes in contact with skin, flush with cold water to remove acid. If eyes are contacted, flush with cold water for at least 15 minutes. If swallowed, drink large amounts of water or milk, follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention.

WARNING

Make sure both air pressure gauge needles read at least 120 psi (827 kPa) and that LOW AIR indicator lights have gone out and warning alarm has quit sounding before pushing in PARKING BRAKE control valve and driving vehicle. If LOW AIR indicator light comes back on and warning alarm sounds when PARKING BRAKE control valve is pushed in, pull PARKING BRAKE control valve out and allow more air to build up in system. Do NOT drive vehicle until PARKING BRAKE control valve can be pushed in without LOW AIR indicator light coming on and warning alarm sounding. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Maximum braking requires 85 psi (586 kPa) or more air pressure for service brakes, as indicated by red needle of air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in injury or death to personnel.

WARNING

Never winch a load with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.

WARNING

Operating vehicle with items on dashboard is dangerous and may result in injury to personnel.

WARNING

Operator **MUST** fully understand how to use the CTIS system. Misuse of CTIS system can result in loss of control of vehicle. Failure to comply may result in injury or death to personnel.

WARNING

Pay attention to the side slope surface. The more unstable the surface is, the slower the speed you must drive, the turns you can safely make are reduced, and the side slope angle capabilities are lessened.

WARNING

Perform this task with the aid of an assistant while ground guiding. Failure to comply may result in injury or death to personnel.

WARNING

Prior to performing brake test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.

WARNING

Rapid operation of service brakes will consume compressed air supply and cause automatic spring brake application. Always observe air pressure gauges. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Rapid operation of service brakes will consume compressed air supply. If red needle of air pressure gauge reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Release service brakes slowly. Fast release of service brakes may allow vehicle to roll before parking brakes engage. Failure to comply may result in injury to personnel.

WARNING

Remove all jewelry, such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal or positive electrical circuit, a direct short may result in instant heating of tools, injury or death to personnel, or damage to equipment.

WARNING

Single hearing protection is required in and around an operating vehicle. Double hearing protection is required during weapons firing. Failure to comply may result in injury to personnel.

WARNING

The driver is responsible for the safety of the personnel riding on their vehicle. Drivers will refuse to move a vehicle if anyone is in an unsafe position or the vehicle has too many passengers. Failure to comply may result in injury or death to personnel.

WARNING

The driver's field of view is limited. Ground guides must be used when operating in congested areas or when operating in reverse. Ground guides must stand clear of the vehicle and remain within view of the driver. Failure to comply may result in injury or death to personnel and damage to equipment.

WARNING

The seat belts must be worn during driving operation. Avoid twisting the straps when putting the seatbelt on and be sure to remove slack. Failure to comply may result may result in serious death or injury to personnel.

WARNING

The specified side slope capability has been verified only on hard-surfaced slopes with known gradients and under tightly controlled testing circumstances.

WARNING

The vehicle has a high center of gravity. Slow down for turns and other maneuvers. Approach slopes head on and avoid side slopes when possible. Failure to comply may result in injury or death to personnel and damage to equipment.

WARNING

To prevent arcing, do not allow tools to contact batteries or other battery terminals. Failure to comply may result in injury or death to personnel.

WARNING

Towbar assembly weighs 70 lbs. (31.7 kg). Do not attempt to lift or move towbar assembly without the aid of an assistant. Failure to comply may result in injury to personnel.

WARNING

Use care when working around ether canister as ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel.

WARNING

Use exhaust brake/retarder only when vehicle tires have good traction. Use of exhaust brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

WARNING

Use extreme care not to short out slave receptacle terminals. Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around slave receptacle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause severe burns or electrical shock. Failure to comply may result in injury or death to personnel.

WARNING

Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn. Failure to comply may result in injury or death to personnel.

WARNING

Use only front, rear, and side tiedown eyes to secure the vehicle. Do not use bumpers, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in injury or death to personnel or damage to equipment.

WARNING

Wear safety goggles, acid-proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

WARNING

When connecting to a quick-disconnect coupling, hold the end of the air hose(s). Air hoses are under pressure and can fly out at a fast rate of speed causing injury to personnel.

WARNING

When entering or exiting capsule, use three-point contact system. Doors may cause injury if fingers, hands, or feet are caught between doors and capsule. Failure to comply may result in injury to personnel.

WARNING

When operating the vehicle in the transmission limp home mode, the operator must not rely on the parking brake to hold the vehicle in place. The service brakes must also be applied. Failure to comply may result in injury or death to personnel.

WARNING

When parking on steep grades, the CTIS must be in MSS or EMER setting in order to lock transfer case and create more stability. Driveline must be in full lock condition prior to shutting off engine. Failure to comply may result in injury or death to personnel.

WARNING

Winch components become hot during normal operation. Use care when operating winch. Failure to comply may result in injury to personnel.

CAUTION

Adequate air pressure is required to begin or continue any pressure-changing sequence. Failure to comply may result in damage to equipment.

CAUTION

All guidelines set forth for maintaining corrosion preventive compounds must be adhered to. Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.

CAUTION

All snow and ice should be removed from vehicle as soon as possible. Snow and ice may slow or stop movement of crucial parts if allowed to pile up. Failure to comply may result in damage to equipment.

CAUTION

Always place the side steps in an upright position when not in use. If the EFP kit is installed, side steps in the lowered position will NOT allow the passenger door to fully open. Failure to comply may result in damage to equipment.

CAUTION

Always place the side steps in an upright position when not in use. If the Explosively Formed Penetrator (EFP) kit is installed, side steps in the lowered position will NOT allow the passenger door to fully open. Failure to comply may result in damage to equipment.

CAUTION

An accurate fluid level check cannot be made unless the engine is idling (500 to 800 rpm) in N (neutral), the transmission fluid is at the proper temperature, and the vehicle is on a level surface. Failure to comply may result in damage to equipment.

CAUTION

An assistant is required to keep tension on cable until clevis is 3 in. (76 mm) from cable guide.

CAUTION

Ballistic glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Failure to comply may result in damage to equipment.

CAUTION

CTIS increases tire pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until tires are inflated to correct pressure (WP 0031). Failure to comply may result in damage to equipment.

CAUTION

CTIS must be set in MUD, SAND, SNOW while snow chains are installed. Failure to comply may result in damage to equipment.

CAUTION

CTIS settings must not be changed once snow chains are installed. Failure to comply may result in damage to equipment.

CAUTION

Do not allow engine speed to go above 2600 rpm when driving downhill, or damage to engine can result.

CAUTION

Do not allow vehicle to coast in N (neutral). This can result in severe transmission damage and unsafe operation.

CAUTION

Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.

CAUTION

Do not change the CTIS controller terrain settings while turning a corner or wheels are slipping. Damage to driveline may result.

CAUTION

Do not crank engine for longer than 10 seconds. Failure to comply may result in damage to equipment.

CAUTION

Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result. Failure to comply may result in damage to equipment.

CAUTION

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased wear of threads. Failure to comply may result in damage to equipment.

CAUTION

Do not move camera shields by hand. Failure to comply may result in damage to equipment.

CAUTION

Do not operate vehicle at more than 10 mph (16 km/h) when all differential and transfer case driveline locks are engaged. Failure to comply may result in damage to equipment.

CAUTION

Do not overfill fuel tank or fuel spillage will occur. Failure to comply may cause damage to equipment.

CAUTION

Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.

CAUTION

Do not turn ignition switch to START position while engine is rotating, or damage to equipment may result.

CAUTION

Do not turn ignition switch to START position while engine is rotating. Failure to comply may result in damage to equipment.

CAUTION

Do not use an abrasive brush to wash vehicle. Failure to comply may result in damage to equipment.

CAUTION

Do not use cool water when cleaning hot ballistic glass. Putting cool water on hot ballistic glass may cause window to crack or delaminate. Failure to comply may result in damage to equipment.

CAUTION

Do not use first gear to move M-ATV if tires are frozen to ground or brakes are frozen to drums. Failure to comply may result in damage to driveline.

CAUTION

Do not use first gear to move vehicle if tires are frozen to ground or brakes are frozen to drums. Failure to comply may result in damage to driveline.

CAUTION

Do not wipe dirt off vehicle when vehicle is dry. Dirt, stones, or debris can scratch paint off the vehicle. Failure to comply may result in damage to equipment.

CAUTION

During first five miles of driving operation, all cornering should be performed slowly and carefully. Failure to comply may result in damage to driveline components.

CAUTION

Engine must run for at least 10 minutes with minimum coolant temperature of 160°F (71°C) prior to shutting off engine. Failure to comply may result in damage to engine.

CAUTION

Ensure battery disconnect switch is turned OFF prior to performing battery maintenance. Failure to comply may result in damage to equipment.

CAUTION

Ensure both air pressure gauges read at least 120 psi (827 kPa) prior to performing Step (8). Failure to comply may result in damage to equipment.

CAUTION

Ensure camera shields are closed on both cameras. Failure to comply may result in damage to equipment.

CAUTION

Ensure vehicle is stopped prior to using the driveline lock switch. Failure to comply may result in damage to equipment.

CAUTION

Excessive wheel slippage while traveling up steep grade could cause driveline damage. When wheel slippage is detected, stop vehicle immediately.

CAUTION

For transport, auxiliary mirrors should be rotated to the transport position. Do not transport vehicle with auxiliary mirrors in deployed position. Failure to comply may result in damage to equipment.

CAUTION

Fuel/water separator should be drained of water before topping off fuel tank. Keep fuel tank as full as possible during cold operations. Water forms in empty fuel tank as it cools. Water in fuel system could freeze and block fuel system. Failure to comply may result in damage to equipment.

CAUTION

Glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Failure to comply may result in damage to equipment.

CAUTION

If a circuit breaker trips again after being reset, report problem to Field Maintenance. Failure to comply may result in damage to equipment.

CAUTION

If a substantial amount of winch cable is payed out, tension must be maintained on winch cable while reeling in winch cable. Failure to comply may result in tangled winch cable and damage to equipment.

CAUTION

If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.

CAUTION

If engine fails to start in two minutes, turn ignition switch to OFF position. Allow starter to cool at least two minutes before trying again. Failure to comply may result in damage to starter.

CAUTION

If engine fails to start within 30 seconds, turn ignition switch to OFF and allow starter motor to cool at least two minutes before trying again. Failure to comply could result in damage to starter.

CAUTION

If engine fails to start, wait 15 seconds prior to next start attempt to allow starter to cool. Failure to comply may result in damage to equipment.

CAUTION

If engine oil needs to be drained, contact Field Maintenance. Failure to comply may result in damage to equipment.

CAUTION

If engine runs rough, continue to let engine idle. Do not raise engine RPM until engine is running smoothly. Failure to comply may result in damage to equipment.

CAUTION

If oil pressure gauge does not show appropriate engine oil pressure within 10 to 15 seconds after starting engine, shut off engine immediately and refer to Troubleshooting Symptoms. Lack of lubrication will damage engine.

CAUTION

If oil pressure gauge does not show engine oil pressure within 10 to 15 seconds after starting engine, shut off engine immediately and refer to Troubleshooting Symptoms. Lack of lubrication will damage engine.

CAUTION

If overheating occurs when operating in the transmission limp home mode, the operator should stop the vehicle (do not turn off the engine) and allow the transmission and engine to cool down to normal operating levels. If the engine and transmission do not cool down or overheating reoccurs, the operator should turn off the engine and notify Field Maintenance. Failure to comply may result in damage to equipment.

CAUTION

If the audible alarm comes on when operating the vehicle in the EMER (Emergency) position, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to vehicle.

CAUTION

If the CTIS controller flashes the four terrain setting indicators as well as the run flat indicator, the operator should stop the vehicle and refer to sections Run Flat Feature and OVER SPEED CHECK TIRES LIGHT of this work package. Failure to comply may result in damage to equipment.

CAUTION

If the operator has selected the EMER (Emergency) setting and the audible over speed alarm comes on, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.

CAUTION

If the OVER SPEED CHECK TIRES indicator comes on, the operator should stop the vehicle and refer to OVER SPEED CHECK TIRES LIGHT section of this work package. Failure to comply may result in damage to equipment.

CAUTION

If the OVER SPEED indicator blinks, and the operator has not selected the EMER (Emergency) setting, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.

CAUTION

If the OVER SPEED indicator comes on solid without audible alarm, the operator must assume that the automatic Over Speed Protection feature is no longer operable and caution must be used to not exceed speed parameters. Continue with mission and notify Field Maintenance when mission is completed. Failure to comply may result in damage to vehicle.

CAUTION

If the RUN FLAT indicator light comes on, the operator should be aware that tire damage may be present and that the CTIS is attempting to compensate for this damage. Perform troubleshooting. Failure to comply may result in damage to equipment.

CAUTION

If transmission fluid is too high and needs to be drained, notify Field Maintenance. Failure to comply may result in damage to equipment.

CAUTION

If two terrain setting indicators turn on solid, the operator should stop the vehicle and refer to the troubleshooting section of this work package. Failure to comply may result in damage to equipment.

CAUTION

If wheels start to slip when CTIS controller is in EMERGENCY position, stop vehicle and set CTIS controller to MUD, SAND, SNOW position. Failure to comply may result in damage to equipment.

CAUTION

If winch does not move vehicle, stop using winch. Failure to comply may result in damage to equipment.

CAUTION

Maximum governed engine speed with transmission in N (neutral) is approximately 2600 rpm. Never allow engine speed to exceed this figure. Under load, governed speed is approximately 2600 rpm. If engine is allowed to go over governed speed, engine damage can result.

CAUTION

Maximum speed for vehicles equipped with snow chains is 24 mph (39 km/h) off road and 10 mph (16 km/h) on highway. Failure to comply may result in damage to equipment.

CAUTION

Observe instrument panel closely. If there are any unusual readings, stop vehicle and shut off engine. Check immediately to prevent damage to equipment.

CAUTION

Prior to operating the CTIS in temperatures below 0°F (-18°C), the CTIS will need to be disabled (refer to WP 0046). Failure to comply may result in damage to equipment.

CAUTION

Prior to shutting off engine, run engine at 800 to 1000 rpm with transmission in N (neutral) for three minutes to allow turbocharger to slow down and cool off. Engine components may be damaged if not allowed to cool off. Failure to comply may result in damage to equipment.

CAUTION

Prolonged or continuous use will overheat the winch. Do not continue to run a “stalled” winch. Failure to comply may result in damage to equipment.

CAUTION

Remove spotlight covers prior to operation. Failure to comply may result in damage to equipment.

CAUTION

Rotate universal joint to obtain access to the fitting. Forcing the grease gun onto the fitting can result in broken or damaged fitting.

CAUTION

Select the appropriate CTIS controller settings before entering an area where poor traction conditions are likely to occur. Failure to comply may result in damage to equipment.

CAUTION

Service brake pedal must be applied and vehicle stopped when shifting among D-N-R shift selections. Failure to comply may result in damage to equipment.

CAUTION

Snow chains must not be used when driving on hard surfaces where there is no wheel slippage. Failure to comply may result in damage to equipment.

CAUTION

Snow chains must only be installed on rear tires. Failure to comply may result in damage to equipment.

CAUTION

Support DVE display prior to loosening T-handles. Failure to comply may result in damage to equipment.

CAUTION

The blackout spotlight switch has a switch lock, and cannot be pushed up unless the switch lock is pushed up. Failure to comply may result in damage to equipment.

CAUTION

The CTIS controller cargo load setting must be changed as required immediately upon adding or removing cargo from the vehicle. Failure to comply may result in damage to equipment.

CAUTION

The EMER (Emergency) button is for extreme conditions only and should not be used for normal driving. Damage to driveline may result.

CAUTION

The Emergency mode is for extreme conditions only and should not be used for normal driving conditions. Failure to comply may result in damage to equipment.

CAUTION

The Run Flat feature should not be used in an attempt to inflate tires with substantial damage. Using the Run Flat feature in these circumstances may result in other tires losing pressure, resulting in damage to equipment.

CAUTION

The transmission must not be operated for extended periods of time until Hot Check has verified proper fluid level. Transmission damage can result from extended operation at improper fluid level conditions.

CAUTION

Use extreme care when cleaning radiator fins, charge air cooler fins, and A/C condenser fins to prevent damage to equipment.

CAUTION

Use care when stowing BII and COEI to ensure items are not broken or deformed. Failure to comply may result in damage to equipment.

CAUTION

When installing dipstick, ensure fill cap is inserted all the way into tube prior to tightening. Failure to comply may result in damage to equipment.

CAUTION

When lowering and raising the 5th seat, ensure the wire harness attached to the arm rest is clear, to avoid rubbing.

CAUTION

When operating vehicle, there are two speed limitations imposed. One limitation comes from the CTIS terrain setting. The other comes from the driveline lock setting. The lower speed limitation of the two must be adhered to. Failure to comply may result in damage to vehicle.

CAUTION

When positioning auxiliary mirrors for operation or transportation, apply pressure to attachment arm, not mirror assembly. Failure to comply may result in damage to equipment.

CAUTION

When using 395/85R20 tire, travel no more than a distance of 300 miles (482 km) at a maximum speed of 30 mph (48 km/h). Failure to comply may result in damage to equipment.

CAUTION

When using a pressure washer to clean cab interior, keep nozzle of pressure washer away from vehicle or components a distance of 5 ft. (1.5 m) or more. Failure to comply may result in damage to equipment.

CAUTION

When using a pressure washer to clean vehicle, do not allow stream to contact dash, dash components, or other electrical components. Failure to comply may result in damage to equipment.

CAUTION

When using EMERGENCY mode on CTIS, top speed should not exceed 5 mph (8 km/h). Use extreme care as steering response is limited due to driveline lock configuration. Failure to comply may result in damage to equipment.

CAUTION

When using the winch, do not allow the cable to deviate more than 30 degrees from straight ahead of the vehicle. The winch efficiency will degrade. Winch fairlead is located so the winch cable, when properly used, will not contact vehicle components. Do not winch vehicle if 30 degrees in front of the vehicle cannot be maintained. Failure to comply may result in damage to equipment.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: This manual supersedes TM 9-2355-335-10 dated 31 March 2011. Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 17 August 2012

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 50 AND TOTAL NUMBER OF WORK PACKAGES IS 72, CONSISTING OF THE FOLLOWING:

Page/WP No.	Change No.	Page/WP No.	Change No.
Cover	0	WP 0030 (2 pgs)	0
Safety Summary (24 pgs)	0	WP 0031 (14 pgs)	0
i thru vi	0	WP 0032 (2 pgs)	0
Chp 1 Title page	0	WP 0033 (2 pgs)	0
WP 0001 (4 pgs)	0	WP 0034 (4 pgs)	0
WP 0002 (20 pgs)	0	WP 0035 (2 pgs)	0
WP 0003 (4 pgs)	0	WP 0036 (8 pgs)	0
WP 0004 (6 pgs)	0	WP 0037 (4 pgs)	0
WP 0005 (4 pgs)	0	WP 0038 (4 pgs)	0
WP 0006 (2 pgs)	0	WP 0039 (8 pgs)	0
Chp 2 Title page	0	WP 0040 (2 pgs)	0
WP 0007 (36 pgs)	0	WP 0041 (4 pgs)	0
WP 0008 (2 pgs)	0	WP 0042 (8 pgs)	0
WP 0009 (2 pgs)	0	WP 0043 (2 pgs)	0
WP 0010 (6 pgs)	0	WP 0044 (6 pgs)	0
WP 0011 (2 pgs)	0	WP 0045 (2 pgs)	0
WP 0012 (2 pgs)	0	WP 0046 (6 pgs)	0
WP 0013 (2 pgs)	0	WP 0047 (4 pgs)	0
WP 0014 (2 pgs)	0	WP 0048 (4 pgs)	0
WP 0015 (2 pgs)	0	WP 0049 (12 pgs)	0
WP 0016 (2 pgs)	0	WP 0050 (2 pgs)	0
WP 0017 (2 pgs)	0	WP 0051 (2 pgs)	0
WP 0018 (8 pgs)	0	WP 0052 (4 pgs)	0
WP 0019 (2 pgs)	0	WP 0053 (4 pgs)	0
WP 0020 (4 pgs)	0	WP 0054 (6 pgs)	0
WP 0021 (4 pgs)	0	WP 0055 (6 pgs)	0
WP 0022 (4 pgs)	0	WP 0056 (10 pgs)	0
WP 0023 (6 pgs)	0	Chp 3 Title page	0
WP 0024 (2 pgs)	0	WP 0057 (14 pgs)	0
WP 0025 (2 pgs)	0	Chp 4 Title page	0
WP 0026 (2 pgs)	0	WP 0058 (2 pgs)	0
WP 0027 (10 pgs)	0	WP 0059 (72 pgs)	0
WP 0028 (2 pgs)	0		
WP 0029 (2 pgs)	0		

Page/WP No.	Change No.	Page/WP No.	Change No.
Chp 5 Title page	0	WP 0067 (2 pgs)	0
WP 0060 (2 pgs).	0	WP 0068 (20 pgs)	0
WP 0061 (6 pgs).	0	Chp 6 Title page	0
WP 0062 (2 pgs).	0	WP 0069 (2 pgs)	0
WP 0063 (2 pgs).	0	WP 0070 (20 pgs)	0
WP 0064 (4 pgs).	0	WP 0071 (4 pgs)	0
WP 0065 (2 pgs).	0	WP 0072 (2 pgs)	0
WP 0066 (4 pgs).	0	Back Cover	0

**HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 August 2012**

OPERATOR MANUAL

for

MINE RESISTANT AMBUSH PROTECTED ALL TERRAIN VEHICLE (M-ATV)

M1240

NSN: 2355-01-575-9632 (EIC 1UT)

M1240A1

NSN: 2355-01-596-1330 (EIC 1ZW)

M1245

NSN: 2355-01-586-8070 (EIC 1VE)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet on the TACOM Unique Logistics Support Applications (TULSA) Web site. The Internet address is <https://tulsa.tacom.army.mil>. Access to all applications requires CAC authentication, and you must complete the Access Request form the first time you use it. The DA Form 2028 is located under the TULSA Applications on the left-hand navigation bar. Fill out the form and click on SUBMIT. Using this form on the TULSA Web site will enable us to respond more quickly to your comments and to better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-MPP/ TECH PUBS, MS 727, 6501 E. 11 Mile Road, Warren, MI 48397-5000. The e-mail address is tacomlcmc.daform2028@us.army.mil. The fax number is DSN 786-1856 or Commercial (586) 282-1856. A reply will be furnished to you.

*This manual supersedes TM 9-2355-335-10, dated 31 March 2011.

DISTRIBUTION STATEMENT C: Distribution authorized to US Government agencies and their contractors; proprietary information. Other requests for this document shall be referred to U.S. Army TACOM Life Cycle Management Command, PM-MRAP, ATTN: AMSTA-LCC-MM/TECH PUBS, 6501 E. 11 Mile Road, Warren, MI 48397-5000.

DESTRUCTION NOTICE: Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

TABLE OF CONTENTS

		<u>WP Sequence No.</u>
CHAPTER 1	GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION	
	General Information	WP 0001
	Equipment Description and Data	WP 0002
	Mechanical Theory	WP 0003
	Electrical Theory	WP 0004
	Preparation For Use	WP 0005
	Preparation For Shipment	WP 0006
CHAPTER 2	OPERATOR INSTRUCTIONS	
	Location and Function of Controls and Indicators	WP 0007
	Preparation for Operation	WP 0008
	Chock/Unchock Wheels	WP 0009
	Capsule Doors Open/Close	WP 0010
	Combat Lock Key Operation (M1245)	WP 0011
	Driver Seat Adjustment	WP 0012
	Front Seat Adjustment (M1240A1)	WP 0013
	Side View Mirror Adjustment	WP 0014
	Auxiliary Mirror Adjustment	WP 0015
	Five-Point Seat Belt Operation (M1240/M1240A1)	WP 0016
	Five-Point Seat Belt Operation (M1245)	WP 0017
	5th Seat Operation (M1245)	WP 0018
	Arm Rest - 5th Seat Operation (M1245)	WP 0019
	Normal Start - Above 32°F (0°C)	WP 0020
	Operate Service Brakes	WP 0021
	Operate Transmission	WP 0022
	Normal Driving Procedures	WP 0023
	Operate Exhaust Brake/Retarder	WP 0024
	Park Vehicle	WP 0025
	Shut Off Engine	WP 0026
	Instrument Panel Operation	WP 0027
	Operate Service Lights/Blackout Lights (M1240/M1240A1)	WP 0028
	Blackout Switch/Service Light Operation (M1245)	WP 0029
	Windshield Wiper/Washer Functions	WP 0030

TABLE OF CONTENTS (CONTINUED)

	<u>WP Sequence No.</u>
Central Tire Inflation System (CTIS)	WP 0031
Spotlight Operation	WP 0032
Spotlight Blackout Mode Operation (M1245)	WP 0033
Raise/Lower Hood	WP 0034
Hood Side Step Operation (M1245)	WP 0035
Check-6 Operation	WP 0036
Hatch Cover Open/Close	WP 0037
Hatch Open/Close (RWS Equipped)	WP 0038
Turret Gunner Restraint System	WP 0039
Rear Capsule Doors Operation (M1245)	WP 0040
Litter Door Operation (M1245)	WP 0041
Rear Cargo Doors Operation (M1245)	WP 0042
Off-Road Conditions	WP 0043
Steep Grades	WP 0044
Slippery Conditions	WP 0045
Operate Vehicle In Cold Environment 32° to -25°F (0° To -32°C)	WP 0046
Automatic Fire Suppression System	WP 0047
Fire Extinguisher	WP 0048
Winch	WP 0049
Spare Tire Limp Home Procedure (M1240A1)	WP 0050
Preparation for Being Towed - Transfer Case	WP 0051
Slave Start Disabled Vehicle	WP 0052
Transportability Requirements	WP 0053
Data Plates, Decals, and Stencils	WP 0054
Stowage Guide (M1240/M1240A1)	WP 0055
Stowage Guide (M1245)	WP 0056
CHAPTER 3 TROUBLESHOOTING PROCEDURES	
Troubleshooting Procedures	WP 0057
CHAPTER 4 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INSTRUCTIONS	
PMCS Introduction	WP 0058
PMCS Table	WP 0059

TABLE OF CONTENTS (CONTINUED)

	<u>WP Sequence No.</u>
CHAPTER 5 MAINTENANCE INSTRUCTIONS	
Draining Air System	WP 0060
Tire Inflate/Deflate	WP 0061
Battery Cover Removal/Installation (M1240/M1240A1).	WP 0062
Resetting Circuit Breakers	WP 0063
Transmission, Engine Dipstick, and Fill Caps	WP 0064
Priming Fuel System	WP 0065
Snow Chains Installation/Removal	WP 0066
Towbar Stow/Unstow (M1245)	WP 0067
Lubrication Instructions	WP 0068
CHAPTER 6 SUPPORTING INFORMATION	
References	WP 0069
Components of End Item (COEI) and Basic Issue Items (BII) Lists	WP 0070
Additional Authorization List (AAL)	WP 0071
Expendable and Durable Items List.	WP 0072

HOW TO USE THIS MANUAL

This single volume manual is divided into CHAPTERS and WORK PACKAGES. For a specific Chapter or Work Package, refer to the TABLE OF CONTENTS (page iii).

This manual contains operating instructions for the M1240, M1245, and M1240A1.

Items or instructions unique to a specific model or configuration are called out through the use of titles, NOTE's, or Steps. If no specific variant is called out the procedure is valid for all three M-ATV variants.

Air Force Personnel: This manual was written for the Army Two-Level Maintenance Concept. Should a maintenance task/procedure in this manual exceed the expertise of your Air Force Specialty Code (AFSC), defer the task/procedure to appropriate maintenance personnel. Do not attempt to perform maintenance tasks or procedures outside of the qualifications of your AFSC.

The TABLE OF CONTENTS lists the titles of each Chapter and Work Package.

CHAPTER 1 provides general information, equipment description, and theory of operation.

CHAPTER 2 provides operator instruction procedures. These work packages are used to learn more about the operations of the vehicle.

CHAPTER 3 provides troubleshooting procedures. These work packages are used to determine causes of malfunctions encountered when operating the vehicle.

CHAPTER 4 provides Preventive Maintenance Checks and Services (PMCS) Instructions.

CHAPTER 5 provides operator maintenance instructions. These work packages are used to perform maintenance on the vehicle.

CHAPTER 6 provides supporting information.

CHAPTER 1

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND
THEORY OF OPERATION
FOR
M1240, M1240A1, AND M1245**

GENERAL INFORMATION

PURPOSE

This manual is provided to maximize use of the M-ATV by presenting clear operating and maintenance instructions. Read these instructions thoroughly before operating vehicle.

SCOPE

This manual contains instructions for operation and operator performed maintenance of the M-ATV and associated equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M-ATV needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance.

All non-Aviation/Missile EIRs and PQDRs must be submitted through the Product data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: <http://www.pdrep.csd.disa.mil/>.

If you do not have Internet access, you may submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 using email, regular mail, or fax using the addresses/fax numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastic, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or braking. SF FORM 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

The form should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF MATERIAL TO PREVENT ENEMY USE

Procedures for destruction of equipment to prevent enemy use can be found in TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment To Prevent Enemy Use (U.S. Army TACOM Life Cycle Management Command).

ABBREVIATIONS/ACRONYMS

Abbreviations and acronyms used in this manual are listed below:

AAL	Additional Authorization List
ABS	Anti-lock Brake System
A/C	Air Conditioner
AEPS	Army Electronic Product Support
amp	Ampere
AR	Army Regulation
ATC	Automatic Traction Control
ATTN:	Attention
BII	Basic Issue Items
B.O.	Blackout
C	Celsius
CA	Container, Tubular
CAGEC	Commercial And Government Entity Code
CARC	Chemical Agent Resistant Coating
CC	Cross Country
CCA	Cold Cranking Ampere
cm	Centimeters
cm ²	Centimeter Squared
cm ³	Cubic Centimeter
CN	Container
COEI	Components of End Item
CPC	Corrosion Prevention Control
CTIS	Central Tire Inflation System
D	Drive
DA	Department of the Army
DR	Drum
DSN	Defense Switched Network
DTC	Diagnostic Trouble Code
DVE	Driver's Vision Enhancer
ea.	Each
ECM	Electronic Control Module
EFP	Explosively Formed Penetrator
EIR	Equipment Improvement Recommendation
EMER	Emergency
etc.	and so forth (Et Cetera)
F	Fahrenheit
FM	Field Manual
ft.	Feet
GAA	Grease Automotive and Artillery

gal	Gallon
GAWR	Gross Axle Weight Rating
GFE	Government Furnished Equipment
GL	Gallon
GO	Gear Oil
GVW	Gross Vehicle Weight
GVWR	Gross Vehicle Weight Rating
hp	Horsepower
HVAC	Heating, Venting, and Air Conditioning
HWY	Highway
IAW	In Accordance With
in.	Inches
in. ²	Inches Squared
in. ³	Inches Cubed
in.h20	Inches of Water
kg	Kilogram
km	Kilometer
Km/h	Kilometer per Hour
kPa	Kilopascals
kW	Kilowatt
L	Liter
lb-ft	Pounds - Foot
lbs.	Pounds
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LI	Lubrication Instructions
m.	Meter
(m)	Mode
m/min	Meters Per Minute
M-ATV	MRAP All-Terrain Vehicle
Max.	Maximum
MED	Medium
mm	Millimeter
mph.	Miles Per Hour
MSS	Mud/Sand/Snow
N.	Neutral
N•m.	Newton-Meters
NATO	North Atlantic Treaty Organization
NSN	National Stock Number
No.	Number
OE/HDO	OIL Engine/Heavy Duty Oil
OLI	Overload Interrupt Module
PAM	Pamphlet
PMCS	Preventive Maintenance Checks and Services
POL	Petroleum, Oils, and Lubricants
POL	Polarity
PQDR	Product Quality Deficiency Report
psi.	Pounds Per Square Inch
qt	Quart
qty	Quantity
R.	Reverse
rpm	Revolutions Per Minute
rqr	Required
SAE	Society of Automotive Engineers

SOCOM	Special Operations Command
SOP	Standard Operating Procedure
SPD	Speed
SST	Start-Up Self Test
(t)	Trip
T-Case	Transfer Case
TACOM	Tank-Automotive and Armament Command
TAMMS	The Army Maintenance Management System
TBD	To Be Determined
TC	Traction Control
TCM	Transmission Control Module
TEMP	Temperature
TGRS	Turret Gunner Restraint System
TM	Technical Manual
TU	Tube
UI	Underbody Improvement
U/I	Unit of Issue
UV	Ultraviolet
VCW	Vehicle Curb Weight
VDC	Volts Direct Current
VIN	Vehicle Identification Number
w/	With
WCA	Warranty Claim Action
WP	Work Package

END OF WORK PACKAGE

EQUIPMENT DESCRIPTION AND DATA

PHYSICAL DESCRIPTION

The M-ATV is designed for use on all types of roads, highways, and cross-country terrain. These vehicles also operate in extreme conditions and temperatures. Major subsystems of the vehicles are capsule, engine, transmission, drivetrain, suspension, electrical system, pneumatic (air) system, and Central Tire Inflation System (CTIS).

FUNCTIONAL DESCRIPTION

1. The M-ATV is capable of operating in temperatures from -25 to 130°F (-32 to 54°C).
2. The M-ATV is capable of fording 36 in. (91.4 cm) of water. It can also travel at 65 mph (105 km/h) on paved surfaces.
3. The M-ATV (M1240/M1245) is capable of traversing a 60% grade and a 40% side slope up to 5 mph (8 km/h).
4. The M-ATV (M1240A1) is capable of traversing a 60% grade and a 30% side slope up to 5 mph (8 km/h).

NOTE

The M-ATV is capable of traveling 65 mph (105 km/h). However, the operator **MUST** adhere to the speed limits set by unit Standard Operating Procedure (SOP).

5. The M-ATV is provided with sufficient tiedown points located so that the vehicle can be restrained in all directions for shipment.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (M1240/M1240A1)

Major components and accessories found on the M1240 and M1240A1 are illustrated in Figure 1, Figure 2, and Figure 3 and are described as follows:

1. **ENGINE.** Engine supplies power to move vehicle and operate equipment and accessories.
2. **CAPSULE.** Provides protection from weather for crew, vehicle controls, gauges, and indicators. The capsule also has environmental control capability and provides blast protection for the crew.
3. **GLADHANDS.** Couples air supply to towed vehicle or trailer.
4. **PINTLE HOOK.** Allows connection to a towed vehicle or trailer.
5. **AXLE NO. 2.** Transmits power to hubs to turn wheels.
6. **FUEL TANK.** Stores fuel to operate vehicle.
7. **BATTERY BOXES.** Stores four batteries for normal operating conditions and auxiliary equipment. Two battery boxes are located underneath cargo deck.
8. **WINCH.** Used to move obstacles and debris. The winch is located on front of vehicle.
9. **EXHAUST PIPING.** Used to direct exhaust fumes from engine.
10. **TOWING EYES.** Attachment points for safety chains, towing shackles, and vehicle towing.
11. **AXLE NO. 1.** Controls direction of vehicle when in motion. Transmits power to hubs to turn wheels.
12. **AIR CLEANER.** Filters out dust and debris from entering air induction system.
13. **TIEDOWN EYES.** Attaching points for securing the vehicle for shipment.
14. **CHECK-6 CAMERAS.** Provide crew with a view rear of vehicle.
15. **NATO SLAVE CONNECTOR.** Used to help start vehicle with depleted batteries.
16. **B PILLAR HANDLES.** Used to help crew get in and out of vehicle.
17. **AUXILIARY MIRRORS.** Provides driver with increased field of view. Auxiliary mirrors are located on the hood.

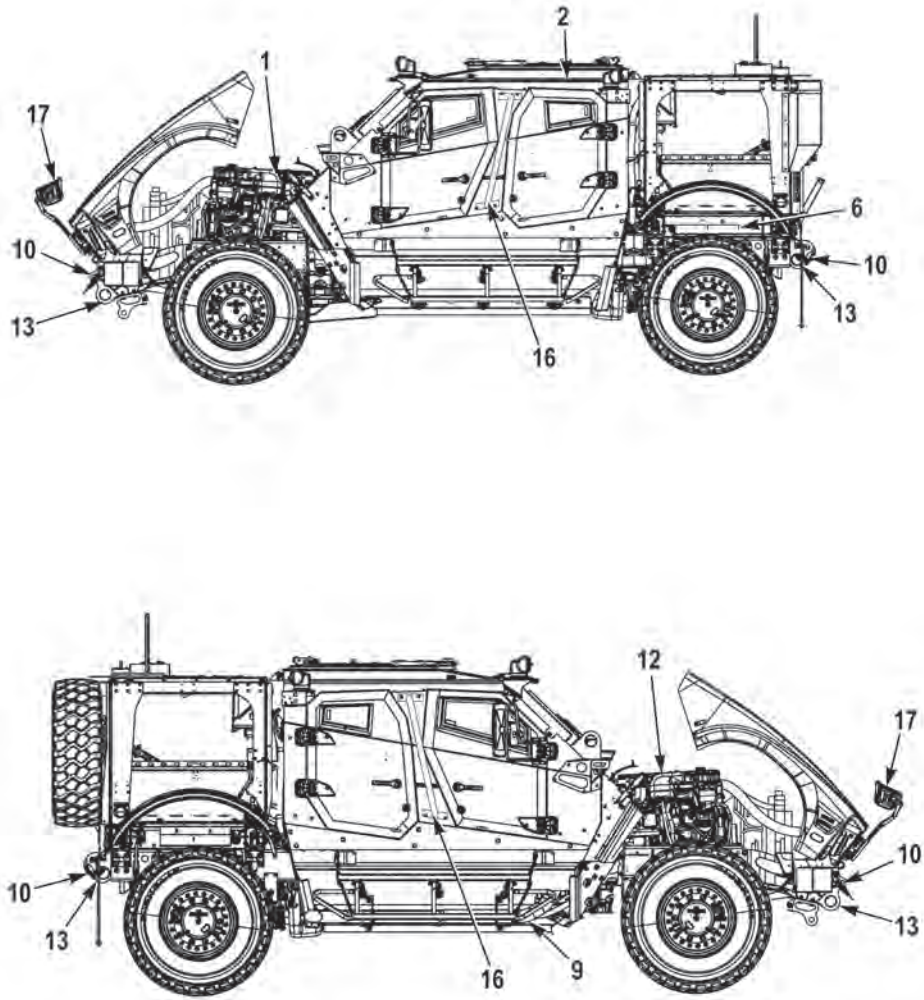


Figure 1. Location and Description of Major Components.

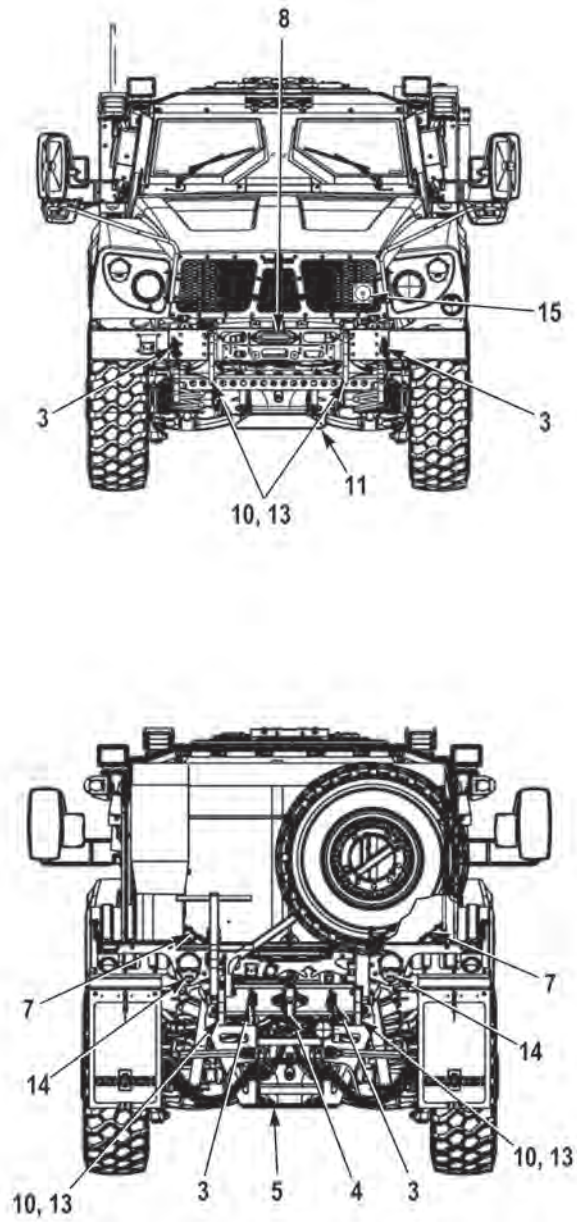


Figure 2. Location and Description of Major Components.

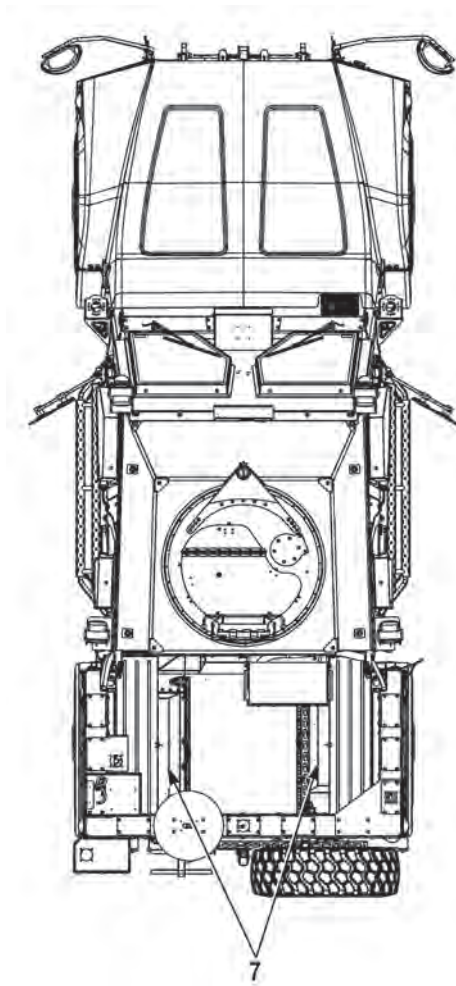


Figure 3. Location and Description of Major Components.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (M1245)

Major components and accessories found on the M1245 are illustrated in Figure 4, Figure 5, and Figure 6 and are described as follows:

1. **PUSH BUMPER.** Heavy duty bumper able to withstand higher forces than the standard bumper.
2. **COMBAT LOCK KEY.** Emergency tool used to disengage the combat lock from outside the vehicle.
3. **SIDE LITTER DOOR.** Side doors to facilitate the extraction of the litter from rear cargo deck.
4. **LEFT BATTERY BOX.** Stores two batteries for engine operation.
5. **RIGHT BATTERY BOX.** Stores two batteries for operation of Government Furnished Equipment.
6. **HOOD ACCESS STEPS.** Side steps and hand point on hood to allow access to the capsule roof.
7. **INFRARED (IR) LIGHTS.** Lights used to provide infrared light.
8. **REAR CARGO DOOR.** Rear door allowing access to the cargo deck.
9. **DYNEEMA PANELS.** Removable panels used for protection of rear cargo deck.
10. **FIRE EXTINGUISHERS.** Dry chemical fire extinguisher used to extinguish liquid and electrical fires.

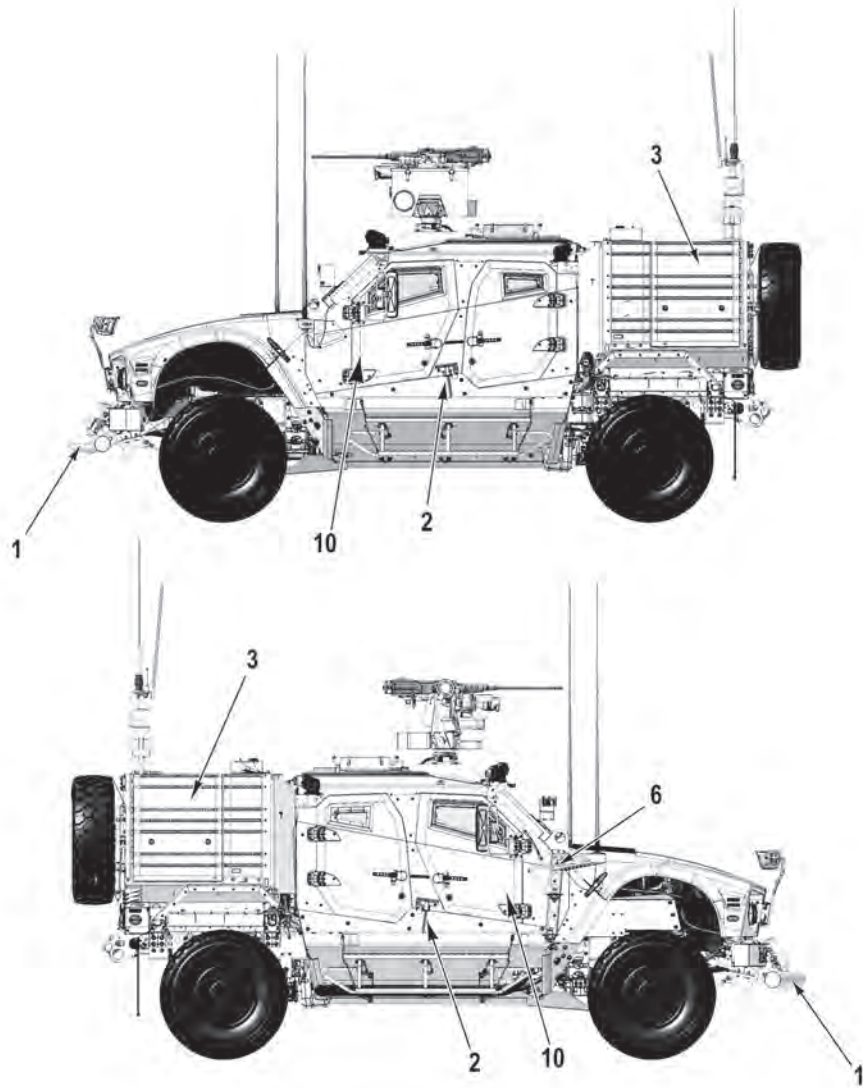


Figure 4. Location and Description of Major Components (M1245).

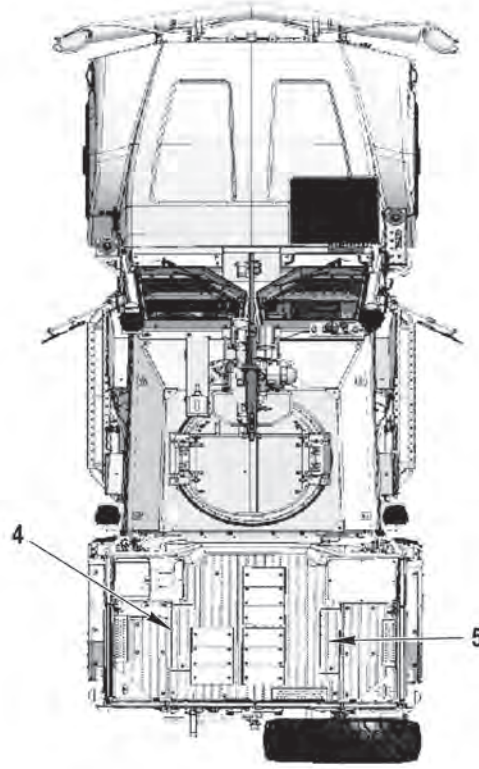


Figure 5. Location and Description of Major Components (M1245).

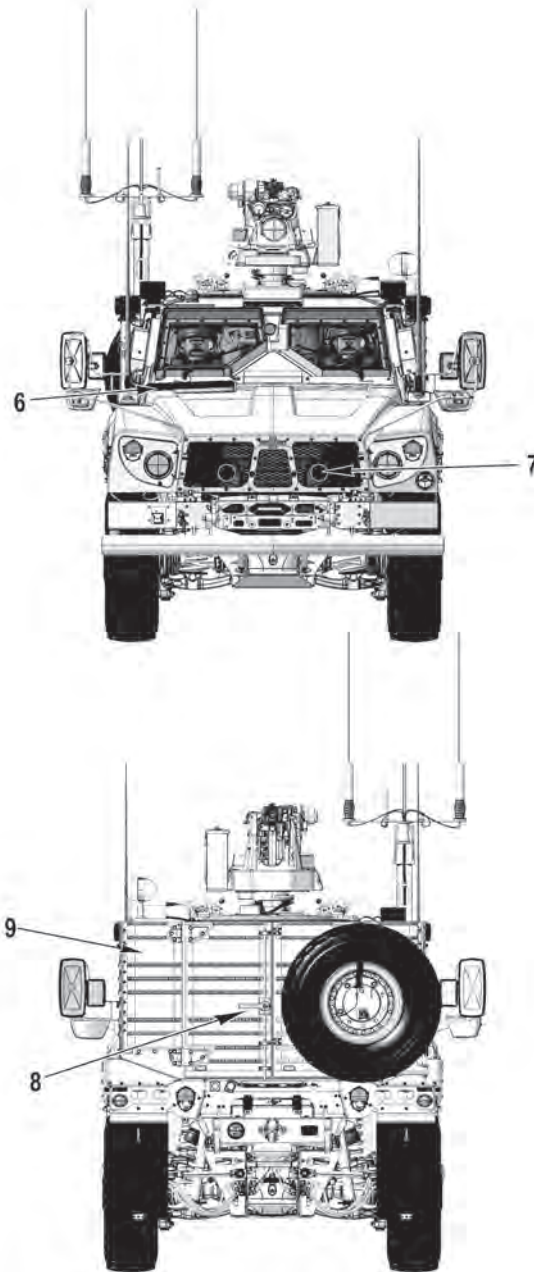


Figure 6. Location and Description of Major components (M1245).

REFERENCE DATA TABLES

Refer to the following tables for specific equipment data:

Table 1. Dimensions.

Item	Specification
Width	98.0 in. (248.9 cm)
Height (M1240)	102 in. (259 cm)
Height (M1240A1)	108.9 in. (276.6 cm)
Height (M1245)	105 in. (266.7 cm)
Length (M1240/M1240A1)	246.8 in. (626.9 cm)
Length (M1245)	265.1 in. (673.4 cm)

Table 2. Weight.

Item	Specification
Vehicle Curb Weight (VCW) (M1240)	24,500 lbs. (11 123 kg)
Vehicle Curb Weight (VCW) (M1240A1)	28,500 lbs. (12 940 kg)
Vehicle Curb Weight (VCW) (M1245)	27,174 lbs. (12 325 kg)
Gross Vehicle Weight Rating (GVWR)	37,000 lbs. (16 798 kg)

Table 3. Performance.

Item	Specification
Gradient (Grade)	
Longitudinal (Up Slope)	60%
Side Slope (M1240/M1245)	40%
Side Slope (M1240A1)	30%
Environmental Operation	-25 to 130°F (150°F storage) [-32 to 54°C (66°C storage)]
Speed, Maximum GVW Road	65 mph (105 km/h)
Fording	36 in. (91.4 cm)
Cruising Range	320 miles (515 km) (M1240)
Turning Radius	66.5 ft. (20.3 m) wall to wall 31.6 ft. (9.6 m) curb to curb

Table 4. Axles.

Item	Specification
Axles Configuration	4 x 4 - Two axles
Make	Oshkosh - Defense
Rated Capacity	
Front Axle	17,000 lbs. (7 718 kg)
Rear Axle	20,000 lbs. (9 080 kg)
Type	Full-time all-wheel drive Fixed center differential and planetary hub reduction
Interaxle Differential Lock	CTIS-controlled terrain selection with manual override
Intraxle Differential Lock	Controlled by CTIS terrain selection on all axles with manual override

Table 5. Parking Brakes.

Item	Specification
Type	Spring brakes on Axle No. 2 Modulated emergency system
Make	Arvin Meritor

Table 6. Service Brakes.

Item	Specification
Type	Drum with internal shoe Dual actuator air wedge
Make	Front Axle Meritor RDA type - 12 wedge Rear Axle Meritor RDA type - 12 wedge

Table 7. Capsule.

Item	Specification
Construction and Accessories	Welded Armor Steel Hull Replaceable Underbelly Armor Two-Piece Armored Windshield Replaceable Armored Side Doors
Instrumentation	Modular Dash Panels Multiplex Gauge Control J1708 and J1939 Data Bus Communications US/Metric Color Band Gauges

Table 8. Central Tire Inflation System (CTIS).

Item	Specification
Type	Eaton, electronic controlled, terrain and payload biased, automatic upon operator selection
Control	Transfer case and rear axle side-to-side lockup control, with manual override
Features	Preset tire pressures for highway, cross-country, mud/sand/snow, and emergency Over speed function with warning and automatic tire pressure and driveline lock corrections Run flat function provides continuous air to punctured tire Utilizes SAE J1708 and 1939 data bus for external control functions
Tire Pressure Settings	Refer to Tables 16 and 17 for all tire pressure settings

Table 9. Air System.

Item	Specification
Air Governor	Bendix
Air Dryer	HALDEX #N500 11 H

Table 10. Cooling System.

Item	Specification
Type	Cross flow fin and tube type radiator, includes internal transmission cooler and external charge air cooler
Frontal Area	810 in ² (5 226 cm ²)
Construction	One piece assembly with integral side tanks
Fan	32 in. (81 cm), nine blade, serpentine belt driven
Fan Clutch	Temperature controlled

Table 11. Electrical System.

Item	Specification
Alternator	570 amp
Voltage	24 volts with 12 volt accessory provision in capsule
Battery	Four, 12 volt (800 CCA ea. at -18°F [-28°C])

Table 12. Steering System.

Item	Specification
Type	R.H. Shepard integral power steering with booster and separate fluid reservoir includes primary and secondary gears
Steering Gear Ratio	18:1

Table 13. Engine.

Item	Specification
Make and Model	Caterpillar C-7 electronic control
Type	4-stroke, in-line, six cylinder, electronic
Bore	4.33 in. (11 cm)
Stroke	5 in. (12.7 cm)
Displacement	441 in ³ (7.2 L)
Maximum Horsepower	370 hp (276 kW)
Peak Torque	925 lb-ft (1 254 N•m)
Exhaust brake/retarder	PAC engine brake

Table 14. Suspension.

Item	Specification
Type	Oshkosh Modular Independent Suspension, coil spring, control arm
Wheel Travel	
Front Axle	16 in. (40.6 cm)
Rear Axle	16 in. (40.6 cm)

Table 15. Tires.

Item	Specification
Type	395/85R20 (M1240/M1245) 16.00 R20 XZLT LRM (M1240A1)
Quantity	Four
Additional Capability	Run flat capability in case of flat tire where CTIS cannot maintain pressure.

Table 16. Tire Pressures (M1240/M1245).

LOAD		TERRAIN			
		HWY	CC	MSS	EMER
CURB WEIGHT	Front	61 PSI	42 PSI	23 PSI	18 PSI
	Rear	57 PSI	40 PSI	21 PSI	16 PSI
LOADED NO EFP	Front	71 PSI	50 PSI	27 PSI	21 PSI
	Rear	91 PSI	65 PSI	36 PSI	28 PSI
EFP ARMOR	Front	84 PSI	59 PSI	33 PSI	26 PSI
	Rear	96 PSI	71 PSI	40 PSI	32 PSI
	MAX. SPD. MPH	65	40*	15	5
NOTE: All tire pressures are \pm 3 PSI.					
*When CTIS setting is CROSS COUNTRY and CURB WEIGHT, MAX. SPD. is 45 mph.					

Table 17. Tire Pressures (M1240A1).

LOAD		TERRAIN			
		HWY	CC	MSS	EMER
CURB WEIGHT	Front	48 PSI	32 PSI	16 PSI	13 PSI
	Rear	50 PSI	33 PSI	17 PSI	14 PSI
LOADED NO EFP	Front	50 PSI	33 PSI	16 PSI	14 PSI
	Rear	64 PSI	45 PSI	24 PSI	18 PSI
GVW NO EFP	Front	51 PSI	34 PSI	17 PSI	14 PSI
	Rear	72 PSI	51 PSI	28 PSI	20 PSI
	MAX. SPD. (MPH)	65	40*	15	5
NOTE: All tire pressures are \pm 3 PSI.					
*When CTIS setting is CROSS COUNTRY and CURB WEIGHT, MAX. SPD. is 45 mph.					

Table 18. Transfer Case.

Item	Specification
Make and Model	Marmon - Herrington MVG - 750
Type	Three-shaft, two-speed with Neutral
Ratio	1:1 High 2:1 Low
Torque Split (unlocked drive line)	30% Front, 70% Rear

Table 19. Transmission.

Item	Specification
Make and Model	Allison 3500 SP, automatic electronic control, GEN IV
Type	Six-speed automatic with TC 418 torque converter, second gear start
Ratios	
Sixth	0.65:1
Fifth	0.75:1
Fourth	1.0:1
Third	1.5:1
Second	2.3:1
First	4.6:1
Reverse	5.0:1

Table 20. Wheels.

Item	Specification
Type	Two-piece bolt together, aluminum disc
Size	20 x 10 in. (50.8 x 25.4 cm)

Table 21. Winch.

Item	Specification
Make and Model	WARN Severe Duty 18
Wire Rope	8 Strand Steel Cable
Diameter	0.44 in. (11.2 mm)
Length	75 ft. (22.9 m)
Deployment	Front only
Maximum Load Rating	18,000 lbs. (8 172 kg)
Drum Barrel Diameter	4 in. (10.16 cm)
Overload Interrupt Module	Digital Limiter
Sensing Current (Set Point) Range	50 to 400 amps
Supply Voltage	8.5 to 32 VDC

Table 22. Winch Electric Performance Data.

Line Load (First Layer) lbs.	Line Load kg	Line Speed Layer 1 ft./min.	Line Speed Layer 1 m/min.	Motor Current amps
0	0	18.5	5.6	58.1
3000	1362	11.0	3.4	104.0
6000	2724	8.6	2.6	137.8
9000	4086	7.1	2.2	169.4
12000	5448	6.0	1.8	209.7
15000	6810	4.9	1.5	253.2
18000	8172	4.6	1.4	278.2

Table 23. Winch Performance Data.

Layer 1 Line Speed ft./min.	Maximum Line Load lbs.	Layer 2 Line Speed ft./min.	Maximum Line Load lbs.	Layer 3 Line Speed ft./min.	Maximum Line Load lbs.	Layer 4 Line Speed ft./min.	Maximum Line Load lbs.
18.5	0	22.6	0.0	26.7	0.0	30.8	0.0
11.0	3000	13.4	2454.5	15.9	2076.9	18.3	1800.0
8.6	6000	10.5	4909.1	12.4	4153.8	14.3	3600.0
7.1	9000	8.7	7363.6	10.3	6230.8	11.9	5400.0
6.0	12000	7.3	9818.2	8.6	8307.7	9.9	7200.0
4.9	15000	6.0	12272.7	7.1	10384.6	8.2	9000.0
4.6	18000	5.6	14727.3	6.6	12461.5	7.7	10800.0

Table 24. Petroleums, Oils, and Lubricant (POL) Capacities.

Item	Specification
Engine	20 qt. (18.9 L) With Filter
Transmission	26 qt. (24.6 L) Drain and Refill
Transfer Case	5.1 qt. (4.8 L)
Power Steering Reservoir	9.5 qt. (9 L)
Cooling System	31 qt. (29.3 L)
Axles No. 1 and No. 2	10.5 qt. (9.9 L)
Wheel Ends	1.6 qt. (1.5 L)
Fuel Tank	47 gal. (177.9 L)

Table 25. Recommended Modes of CTIS Operation.

Road Condition	CTIS SETTING			
	HWY	CC	MSS	Emer
Highway/Paved & Smooth	X			
Gravel/Smooth	1	2		
Gravel/Dirt W/ Potholes or Washboard		X		
Cobblestone/ Belgium Block	X			
Mud/Sand/Snow		1	2	
Fording-Hard Bottom		X		
Fording-Soft Bottom		1	2	
Grade-Slight (<10%)	X			
Grade-Moderate (10%-25%)		X		
Grade-Steep (>25%)		1	2	

Where more than one CTIS terrain setting is identified above, first try choice 1. If wheelspin occurs, remove power to stop the spin and try choice 2.

Where conditions are a combination of the above classifications (such as a moderate grade with mud/sand/snow), it is likely that choice 2 will be needed to complete the required task.

This table cannot cover all possible terrain and considerations. If you do not see a table choice that addresses your particular situation, choose a terrain/road condition CTIS setting that suggests a worse environment than the one you will encounter.

END OF WORK PACKAGE

MECHANICAL THEORY

This work package explains the mechanical theory of operation for the M-ATV.

The engine generates power to move the vehicle. This power is transferred to the transmission, which converts the power into a controllable speed. The transmission transfers this controlled speed to the transfer case, which transfers this speed to the axles. The axles then transfer this speed to the right and left wheels of the vehicle.

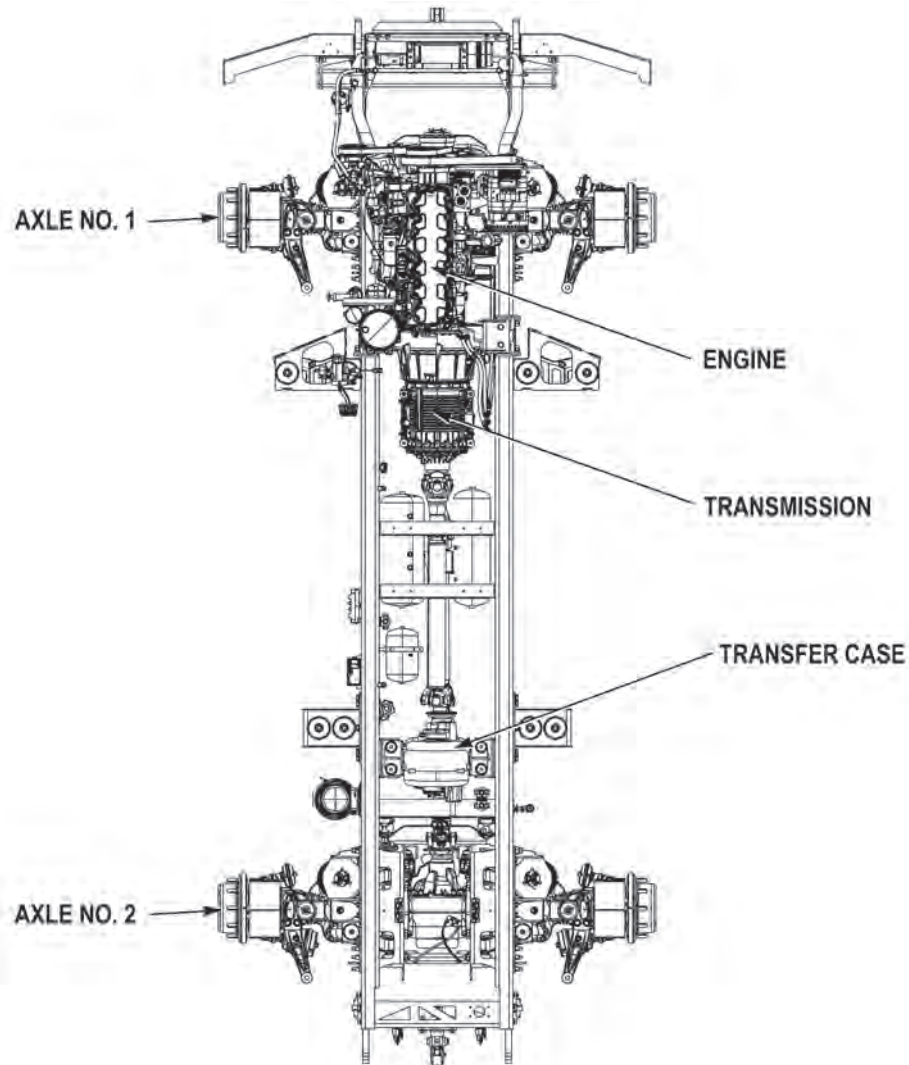


Figure 1. Mechanical Theory.

CAPSULE

The capsule features a full width configuration and is positioned rearward of axle No. 1. The capsule controls and operating mechanisms are designed to accommodate a crew of up to five. Heating, ventilation, noise control, and vibration and shock control are provided to the occupants. The capsule also provides blast protection for the crew as well as protection from small arms fire. The capsule contains all of the driving controls, gauges, and warning lights and indicators.

DRIVE TRAIN

Power for the M-ATV is provided by a diesel engine, which is coupled directly to an automatic transmission. Power from the transmission is transferred to the transfer case and onto the drive and drive/steering axles through a series of prop shafts and universal joints. The M-ATV drive train is enhanced through the use of electronic control modules for both the Caterpillar engine and Allison transmission.

TRANSFER CASE

The transfer case incorporates a differential. The transfer case differential provides full time, all wheel drive, and supplies torque to the front and rear axles. The differential has an operator controlled, air actuated, driveline lock mechanism, which consists of a sliding lockout collar that locks the differential housing to the output shaft. The differential driveline lock mechanism provides increased mobility in adverse operating conditions.

SUSPENSION

The M-ATV incorporates TAK-4[®] independent suspension system with battle tested technology. This suspension system incorporates half-shafts, springs, shock absorbers, jounce bumpers, rebound bumpers, and upper and lower control arms in the independent suspension design. This suspension system design maintains tire/ground contact under adverse terrain profiles and conditions. This design equalizes loads between axles and provides roll stability. The half-shafts incorporated into this design move up and down independently of each other. This independent motion allows for a smoother ride than a standard walking beam suspension design.

AXLES

The M-ATV incorporates four half-shafts in the vehicle's independent suspension design. The half-shafts of the front axle work in conjunction with the wheel ends and hub assemblies to drive and steer the vehicle. The half-shafts of the rear axle work in conjunction with the hub assemblies to drive the vehicle. The four half-shafts incorporated into this design move up and down independently of each other. This allows the half-shafts to maintain tire/ground contact under adverse terrain profiles and conditions.

COOLING SYSTEM

The pressure type cooling system protects the engine by removing heat generated by the engine during the combustion process. Pressure within the cooling system is regulated by a pressure release in the filler cap. The hot coolant flows from the engine to the radiator and through the radiator core where a stream of air removes heat from the coolant. This stream of air is drawn through the radiator core by the engine fan. The water pump on the engine draws the coolant from the radiator, pushes it through the engine, past the thermostats, and back onto the radiator. This process is repeated continuously.

AIR INTAKE SYSTEM

The air intake system consists of a dry-type air cleaner, ducting, turbocharger, and charge air cooler. Engine exhaust gases flow through the turbocharger driving a turbine wheel. A compressor wheel on the opposite end of the turbine shaft rotates and draws in fresh air through the air cleaner. The air is then compressed by the turbocharger and pushed into the charge air cooler to cool the compressed air. The air then flows into the intake manifold of the engine to be used for combustion.

If the air pressure inside the turbocharger reaches a predetermined pressure, the wastegate on the turbocharger will open to relieve excess pressure. When the pressure returns to the safe operating range, the wastegate will close.

FUEL SYSTEM

In the fuel system, fuel is drawn from the fuel tank, through the fuel/water separator, and into the fuel pump. The fuel pump then pushes the fuel through a fuel filter and into the engine. Surplus fuel from the electronic injectors is returned to the fuel tank through a return line.

PNEUMATIC (AIR) SYSTEM

The air system consists of an engine driven air compressor and either two or four air reservoirs. The system includes valves and air lines to control the vehicle's air-operated devices, including the brakes. Pressurized air from the air compressor is passed through the air dryer to the reservoirs. The air dryer removes moisture and dirt from the compressed air.

STEERING SYSTEM

The steering system power is supplied to the steering gears by a hydraulic steering pump. The steering wheel, which is mechanically linked to the primary steering gear, manipulates and controls the hydraulic pressures in the steering gear. The primary steering gear is hydraulically connected to the secondary steering gear. The secondary steering gear mirrors the movements of the primary steering gear. The steering gear's pivot pitman arms, which in turn move a tie rod and two toe control links. This action causes the tires to move left or right causing the vehicle to steer left or right.

ANTILOCK BRAKE SYSTEM

The brake system for the M-ATV incorporates an Antilock Brake System (ABS) into its design. ABS controlled braking ensures optimum vehicle stability while minimizing stopping distance.

When applying the service brakes, the ABS monitors all wheels on the vehicle for a wheel lock condition. If wheel lock occurs, the ABS makes a new assessment of the conditions and will adjust the air pressure to the service brakes to eliminate wheel lock. The ABS will in effect, pulse the brakes, through four ABS valves, to eliminate wheel lock. Once the ABS detects that the wheel lock condition is eliminated, it will stop adjusting the air pressure to the service brakes.

END OF WORK PACKAGE

ELECTRICAL THEORY

The alternator generates electricity and distributes the load as necessary (i.e., to batteries, lights, winch, etc.). The batteries store generated electricity which is used to start the vehicle. The electricity then transfers to the circuit breakers, which safeguards the electrical components from power surges. From there, the electricity is distributed throughout the vehicle. The main electrical components are comprised of six components.

The subordinate circuits operate all the lights, the winch controls, heater controls, etc. The engine Electronic Control Module (ECM) primarily controls the fuel injection by monitoring temperature, oil pressure, rpms, etc. The CTIS system operates tire inflation, deflation, and driveline lockups. The Antilock Brake System (ABS) prevents tires from locking up during braking and aids in traction control. The Transmission Control Module (TCM) controls the shifting for the GEN IV transmission. The J1708/J1939 data bus is used for diagnostic purposes.

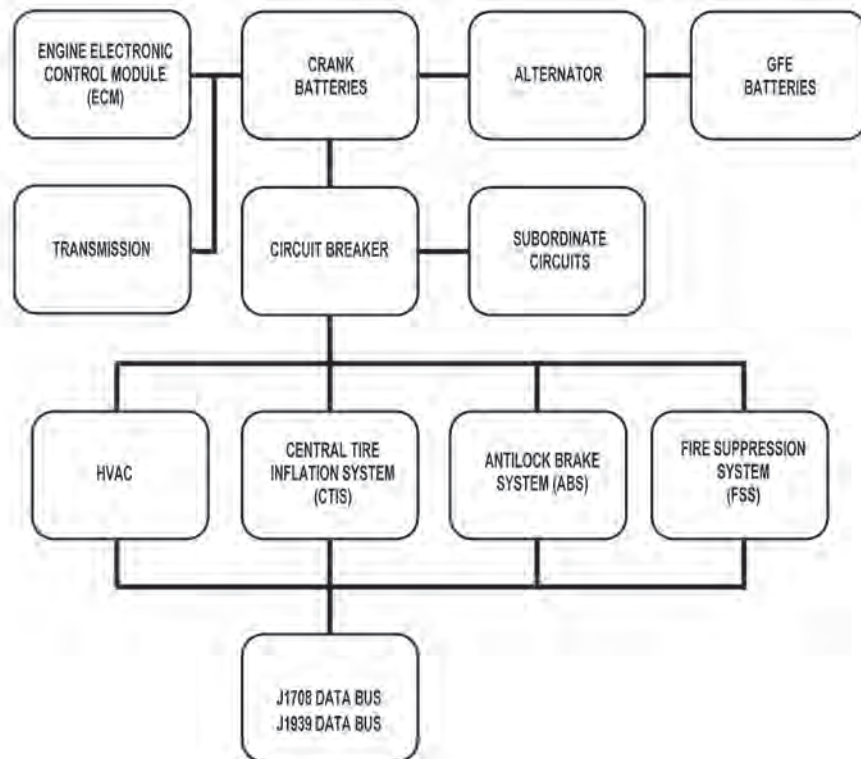


Figure 1. Electrical Theory (M1240/M1240A1).

ANTILOCK BRAKE SYSTEM (ABS)

NOTE

When operating vehicle in CC, MSS, or EMER CTIS settings, ABS and ATC systems are disabled.

The brake system for the M-ATV incorporates an ABS into its design. ABS controlled braking ensures optimum vehicle stability while minimizing stopping distance.

When applying the service brakes, the ABS monitors all wheels on the vehicle for a wheel lock condition. If wheel lock occurs, the ABS makes a new assessment of the conditions and will adjust the air pressure to the service brakes to eliminate wheel lock. The ABS will, in effect, pulse the brakes to eliminate wheel lock. Once the ABS detects that the wheel lock condition is eliminated, it will stop adjusting the air pressure to the service brakes.

AUTOMATIC TRACTION CONTROL (ATC) LIGHT

The ATC light will illuminate steadily when the ignition switch is turned on. The light will remain on until the service brake pedal is engaged for the first time. The light will then turn off.

When operating the vehicle with CTIS set to HWY terrain setting, the ATC light will remain off unless the ATC system detects a wheel slip condition and activates. The light will then flash rapidly until the wheel slip condition is no longer present.

If the ATC light illuminates steadily when operating the vehicle in the HWY CTIS setting, the ATC is malfunctioning.

NOTE

If the ATC light indicates a malfunction, the ATC and possibly the ABS system may be disabled. If the ATC and/or ABS is disabled, the emergency and service brake systems remain functional.

The ATC light will illuminate steadily when CTIS is set to CC, MSS, or EMER terrain settings to indicate that the ATC system is disabled. This indication is normal and does not indicate a malfunction in the ATC.

ENGINE

The M-ATV is equipped with a Caterpillar, diesel engine, Model C-7. The Caterpillar engine incorporates an electronic control system.

The main components of the electronic control system are the Engine Control Module (ECM) and multiple engine sensors. The ECM is the computer that controls the engine.

The electronic controls on the engine serve as the engine governor. The electronic controls determine when and how much fuel to deliver to the cylinders, based on the actual and desired conditions at any given time.

The governor uses a sensor on the throttle pedal to determine the desired engine speed and compares this to the actual engine speed as determined by the engine crankshaft position sensor. If the desired engine speed is greater than the actual engine speed, the governor injects more fuel to increase engine speed. If desired engine speed is less than the actual engine speed, the governor injects less fuel to decrease engine speed.

Once the governor has determined how much fuel is required, it must next determine when to inject the fuel. Injection timing is determined by the ECM after considering input from the coolant temperature sensor, intake manifold air temperature sensor, atmospheric pressure sensor, and boost pressure sensor.

The ECM determines where top dead center on cylinder number one is located from the engine camshaft position sensor signal. The ECM decides when injection should occur relative to top center and provides the signal to the injector at the desired time. The ECM adjusts timing for best engine performance, fuel economy, and white smoke control.

The ECM controls the amount of fuel injected by varying high voltage signals to the injectors. The injectors will pump fuel only when the injector solenoid is energized. By controlling the timing and duration of the high voltage signal, the ECM can control injection timing and the amount of fuel injected.

Included with the ECM is an engine monitoring system. The Caterpillar engine monitoring system monitors engine oil pressure, coolant temperature, and intake manifold air temperature. If the engine monitoring system detects a sensor reading outside of the normal operating parameters, the ECM causes the Warning Lamp to turn on and the Check Engine Lamp to flash to indicate a problem has been detected.

TRANSMISSION

The M-ATV uses an Allison 3500 series, six speed, automatic transmission. The transmission is directly coupled to the Caterpillar C-7 engine. The main components of the transmission are the transmission assembly, Transmission Control Module (TCM), and Transmission Range Selector.

The TCM, which contains the microprocessor based electronics, is located in the dash near the circuit breaker/relay panel. The TCM receives information, in the form of signals from switches and sensors, processes the information, and sends electrical signals to the appropriate solenoids inside the transmission. These solenoids control the operation to the transmission. The TCM also protects the transmission from cold weather start-ups by inhibiting normal shifting functions until a minimum sump oil temperature of 19°F (-7°C) is attained.

The Transmission Range Selector is totally electronic. When the M-ATV is started, the Range Selector automatically defaults to N (neutral). Range selection is achieved by means of six buttons located on the face of the Transmission Range Selector. When D (drive) is selected, the truck will start in first gear and will automatically up shift to a high gear as output speed increases. As the truck slows down, output speed decreases and the transmission automatically downshifts to the appropriate gear. When R (reverse) is selected, the transmission will shift to reverse and the range selector will also activate the reverse light and reverse alarm.

By using the up arrow button or down arrow button on the Transmission Range Selector, the operator can adjust the range of gears he wishes to operate in.

ELECTRICAL

The M-ATV has a 24 VDC electrical system that is waterproof and includes a 12 VDC auxiliary receptacle located on the dash, inside the cab. Manual and automatic resetting circuit breakers are used throughout the system. The voltage of the electrical system is indicated by a voltmeter located on the dash, inside the capsule.

The electrical system is powered by four 12-volt batteries located in the cargo deck. Two batteries are for cranking power and two batteries power GFE (Government Furnished Equipment) in silent watch mode.

A battery disconnect switch is located inside the capsule between front of driver seat and passenger seat. The battery disconnect switch provides power to operating and control circuits throughout the vehicle.

A 570 amp alternator delivers up to full alternator output on demand to any single or combined 24 VDC load requirement. The alternator provides sufficient amperage to operate all electrical components and charge the batteries when the engine is running.

A connector is provided at the rear of the truck to supply power to towed loads. Another connector is located at the front of the truck to provide access for incoming auxiliary power when vehicle is being towed.

Part of the electrical system includes a heavy-duty starting motor mounted on the engine flywheel housing. The starting motor provides the cranking power necessary for starting the engine.

CENTRAL TIRE INFLATION SYSTEM (CTIS)

The CTIS is designed to adjust the pressure of all tires on the truck for different terrain conditions. The CTIS controller has four terrain settings, three load settings, and a run flat setting which the operator selects and activates in the capsule. The main components of the CTIS consist of control valves for air supply and distribution, a dash mounted electrical controller that adjusts tire pressure, associated air tubing, and electrical cables.

The driveline lock controls are integrated with the CTIS to simplify operation of the M-ATV. The CTIS will engage a specific driveline lock configuration based on the terrain and load settings chosen by the operator.

AUTOMATIC TRACTION CONTROL (ATC)

The brake system for the M-ATV incorporates an Automatic Traction Control (ATC) system. The ATC system helps improve traction on slippery or unstable driving surfaces by reducing drive wheel slippage.

The ATC system constantly monitors the wheel for a wheel slip condition. If a wheel slip condition occurs, the ATC system activates and throttles back the engine to help reduce wheel slip. If the vehicle is traveling at a speed of less than 25 mph (40 km/h), the ATC will also pulse the service brake system, through the Traction Control Valve, to aid in reducing wheel slip. Once the ATC system detects that the wheel slip condition is no longer present, it will return the engine and service brake system to normal operating condition.

FIRE SUPPRESSION SYSTEM

The M-ATV incorporates three fire suppression systems into its design: capsule, engine compartment, and undercarriage fire suppression systems.

The capsule fire suppression system covers the interior of the capsule. It is triggered by sensors that monitor for hot spots and air particles (smoke) inside the capsule. When triggered, it disperses a fire suppression agent throughout the interior of the capsule.

The M-ATV has one of two different engine compartment fire suppression configurations listed below:

- The engine compartment fire suppression system covers the interior of the engine compartment. It is triggered by thermosensors that monitor the temperature of the engine compartment. When triggered, they activate four aerosol generators which disperse a fire suppression agent throughout the interior of the engine compartment.

or

- The engine compartment fire suppression system covers the interior of the engine compartment. It is triggered by a sensor wire that monitors the temperature of the engine compartment. When triggered, it activates five aerosol generators which disperse a fire suppression agent throughout the interior of the engine compartment.

The M-ATV has one of two different undercarriage fire suppression configurations listed below:

- Undercarriage fire suppression system covers the underside of vehicle. It is triggered when a fire burns through a sensor hose. The sensor hoses run under the vehicle and are slightly pressurized with nitrogen. Once pressure is released from a hose, the fire suppression system will disperse a fire suppression agent to extinguish fires under the vehicle.

or

- Sensor wires are routed under vehicle, wheel wells, fenders, differentials and are coated in a heat sensitive polymer. Once the polymer melts, two wires within the detection line touch and complete the circuit. The fire suppression system will then disperse a fire suppression agent to extinguish fires under the vehicle.

END OF TASK

END OF WORK PACKAGE

PREPARATION FOR USE

HANDLING

Check equipment against packing slip to ensure that shipment is complete. Clean all external surfaces as needed. If paint scratches are found, notify Field Maintenance. Remove all Basic Issue Items (BII). Conduct a complete inventory against BII list then stow in accordance with Stowage Guide.

END OF TASK

SERVICING

1. Removal of Protective Components.

Upon receipt of the M-ATV, inspect vehicle for obvious damage. Undo any tiedowns, shackles, or banding that are securing the M-ATV.

2. Cleaning.

WARNING

Ballistic glass may become very hot when exposed to sun or when in a hot environment. Avoid contacting hot ballistic glass with hands or skin. Failure to comply may result in injury to personnel.

CAUTION

- **Do not use cool water when cleaning hot ballistic glass. Putting cool water on hot ballistic glass may cause window to crack or delaminate. Failure to comply may result in damage to equipment.**
 - **Do not wipe dirt off vehicle when vehicle is dry. Dirt, stones, or debris can scratch paint off the vehicle. Failure to comply may result in damage to equipment.**
 - **Do not use an abrasive brush to wash vehicle. Failure to comply may result in damage to equipment.**
- a. Use a clean cloth, wash vehicle with cool or warm water. Do not use strong detergents or abrasives.
 - b. While cleaning vehicle, look closely for rust or corrosion, bare metal, or other damage. Report damage to Field Maintenance.
 - c. Air intake opening may be covered with tape, and windshield may be protected with packing material. Remove any protective tape and packing material and follow the procedure for preparing the vehicle after transport.

CAUTION

- **When using a pressure washer to clean vehicle, do not allow stream to contact dash, dash components, or other electrical components. Failure to comply may result in damage to equipment.**
- **When using a pressure washer to clean cab interior, keep nozzle of pressure washer away from vehicle or components a distance of 5 ft. (1.5 m) or more. Failure to comply may result in damage to equipment.**

- d. Use clean cloth, wipe loose dust and dirt from cab interior.
- e. Clean seats and seatbelts using a mild solution of warm water and soap solution. Never use solvents or abrasives.

3. Lubrication.

Refer to Lubrication Instructions (WP 0068) for all lubrication requirements for the M-ATV.

END OF TASK

INITIAL CHECKOUT AND ADJUSTMENT

This paragraph includes instructions for the initial checkout and adjustment values for the M-ATV. Complete inspection of the vehicle must be performed to ensure there are no loose wires or bent pin contacts that would cause a short circuit when power is applied.

1. Make complete visual inspection to ensure that required tools, publications, accessories, and attachments are with vehicle.
2. Perform all "B" (Before Operation) PMCS (WP 0059).
3. Rotate auxiliary mirrors to deployed position (WP 0015).
4. Visually inspect entire vehicle for loss of parts or damage which may have occurred during loading, removal, or shipment.
5. Check tires for proper inflation, refer to Central Tire Inflation System (CTIS) (WP 0031).
6. Check radiator shroud to ensure shroud is free of dents or other damage from shipment.
7. Inspect muffler, air cleaner, oil filter, fuel filter, and fan for visible damage.
8. Inspect all visible wire connectors for firm connections.
9. Inspect starter and alternator for loose connections and insecure mounting.
10. Examine winch connections for visible signs of damage.
11. Visually inspect all piping, lines, hoses, and wiring for cracks or damage, loose connections, or missing parts. Ensure all drain plugs are securely tightened.
12. Check front and rear undercarriage fire suppression detection tube pressure gauges if equipped for proper pressure (indicator in the green zone on dial) (WP 0059).
13. Inspect fuel tank for signs of damage.
14. Inspect taillights, headlights, clearance lights, spotlights, and blackout lights for proper operation.

-
15. Check fan belt and alternator belt for proper tension. Belt has proper tension when belt can be depressed approximately one-half inch by normal pressure (10 to 15 lbs. [4.5 to 6.8 kg]).

NOTE

Perform Step (16) for M1245 only.

16. Check rear capsule doors for proper operation, refer to Rear Capsule Operation (WP 0040). Inspect door tracks and seals for damage.

NOTE

- Perform Step (17) for M1240 and M1240A1 combat lock operation.
- Perform Step (18) for M1245 combat lock operation.

17. Check doors in the combat locked and combat unlocked position, refer to Capsule Doors Open/Close (WP 0010). Inspect latches and hinges for damage.
18. Check doors in combat locked and combat unlocked position refer to Combat Lock Key Operation (M1245) (WP 0011). Inspect latches and hinges for damage.

NOTE

Perform Step (19) for M1245.

19. Inspect Dyneema Panels for signs of damage and improper mounting.

END OF TASK

END OF WORK PACKAGE

PREPARATION FOR SHIPMENT

PREPARATION

Before vehicle is shipped, perform the following tasks:

NOTE

Notify Field Maintenance for tasks that cannot be performed with BII tools.

- (1) Perform all Preventive Maintenance Checks and Services (PMCS).
- (2) Correct all deficiencies noted during inspection if facilities are available.
- (3) Store and secure Basic Issue Items (BII).
- (4) Conduct a visual inspection of the vehicle. Check lubricant levels and tire pressures. Correct any discrepancies.
- (5) Completely lubricate the chassis and all subordinate equipment in accordance with Lubrication Instructions.
- (6) Clean batteries and battery cables. Keep the batteries fully charged and clean.
- (7) Clean the exterior, interior of cab, engine, and undercarriage. Wash any oil, grease, or mud from tires.

END OF TASK**END OF WORK PACKAGE**

CHAPTER 2

OPERATOR INSTRUCTIONS FOR M1240, M1240A1, AND M1245

LOCATION AND FUNCTION OF CONTROLS AND INDICATORS

This section shows the location and describes the function of controls and indicators used to operate the M-ATV.

Know the location and proper function of every control and indicator before operation of the M-ATV. Use this section to learn about each control and indicator to be used. Separate illustrations with keys are provided for each group of controls and indicator.

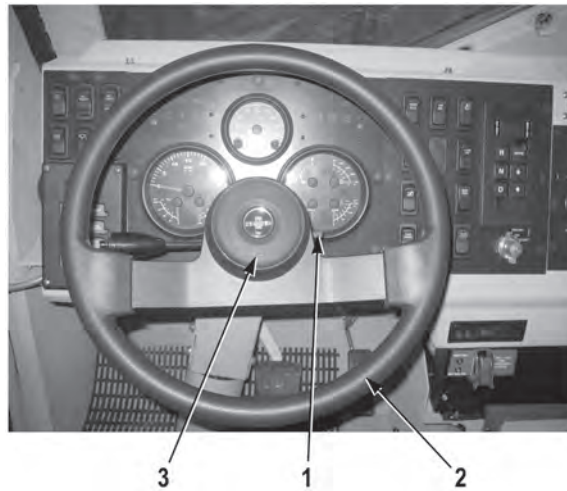


Figure 1. Steering Column Mounted Controls (Sheet 1 of 2).

Key Fig. 1	Control or Indicator	Function
1	Emergency Flasher Control	Turns hazard warning flashers on and off. Push red switch inward to turn on hazard warning flashers. Pull switch out to turn off hazard warning flashers.
2	Steering Wheel	Controls direction of vehicle.
3	Horn	Button sounds horn when pressed.

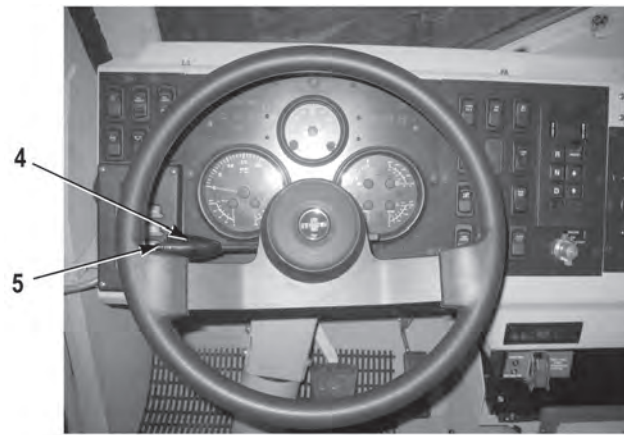


Figure 1. Steering Column Mounted Controls (Sheet 2 of 2).

Key Fig. 1	Control or Indicator	Function
4	Turn Signal Lever	Push up to signal right turn. Pull down to signal left turn. When turn is completed, lever will automatically return to center position.
5	High Beam	Push button to turn high beams on or off. High beam indicator will light (blue) when high beams are on.

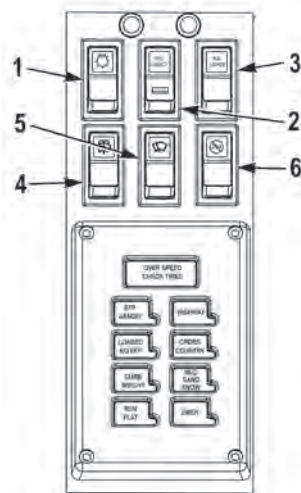


Figure 2. Instrument Panel Controls and Indicators (Sheet 1 of 16).

Key Fig. 2	Control or Indicator	Function
1	Headlights/Clearance/Marker Lights (3-way rocker switch)	Turns headlights and clearance/marker lights ON and OFF. CENTER position operates clearance/marker lights and parking lights. UP position adds headlights. DOWN position turns headlights and clearance/marker lights off.
2	Blackout Select (2-way rocker switch)	Selects between normal and blackout mode. Press smaller bottom switch up and hold while pressing main switch up (blackout light mode) or down (normal mode). Releasing small switch locks main switch in selected position. In blackout mode, backup alarm will not operate.
3	Blackout Light (3-way rocker switch)	Turns blackout drive lights ON and OFF. CENTER position turns blackout composite lights on. UP position adds blackout headlights. Press switch DOWN to turn blackout composite lights and headlights off.
4	Windshield Washer Switch	Controls function of windshield washer. For operation refer to (WP 0030).
5	Windshield Wiper Switch	Controls function of windshield wipers. For operation refer to (WP 0030).
6	CTIS OFF Switch	This switch is used to partially disable the CTIS when operating in temperatures below 0°F (-18°C) (WP 0046). The switch should normally be in the DOWN or OFF position.

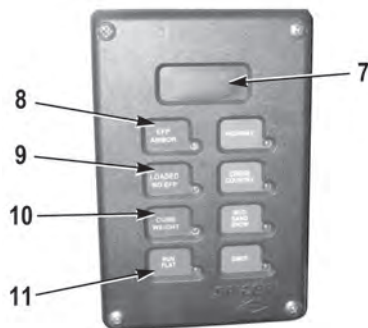


Figure 2. Instrument Panel Controls and Indicators (Sheet 2 of 16).

NOTE

For 1240A1 only, EFP Armor button is replaced with GVW NO EFP button.

Key Fig. 2	Control or Indicator	Function
7	OVER SPEED CHECK TIRES Light (Amber)	When OVER SPEED indicator is lit, indicator alerts driver that vehicle speed exceeds maximum allowable speed as determined by CTIS. An audible alarm will also come on with OVER SPEED indicator. When CHECK TIRES indicator is lit, indicator alerts operator that substantial damage may have occurred to one or more tires.
8	EFP ARMOR Button (M1240 and M1245)	Selects preset system tire pressure for full load conditions. Switching load setting results in pressure check.
8	GVW No EFP Button (M1240A1)	Selects preset system tire pressure for full load conditions. Switching load setting results in pressure check.
9	LOADED NO EFP Button	Selects preset system tire pressure for partial load.
10	CURB WEIGHT Button	Selects preset system tire pressure for empty conditions.
11	Run Flat Button	Used when vehicle has sustained minor tire damage.



Figure 2. Instrument Panel Controls and Indicators (Sheet 3 of 16).

Key Fig. 2	Control or Indicator	Function
12	HIGHWAY Button	Selects tire pressure for travel over improved paved roads.
13	CROSS COUNTRY Button	Adjusts tire pressure for travel over nonpaved, secondary roads and hard-packed surfaces.
14	MUD SAND SNOW Button	Selects automatic tire pressure for travel on soft surface trails and other unimproved surfaces.
15	EMER Button	Selects adjustment for very low tire pressure to help free a stuck vehicle or to travel short distance over terrain known to require very low tire pressure.

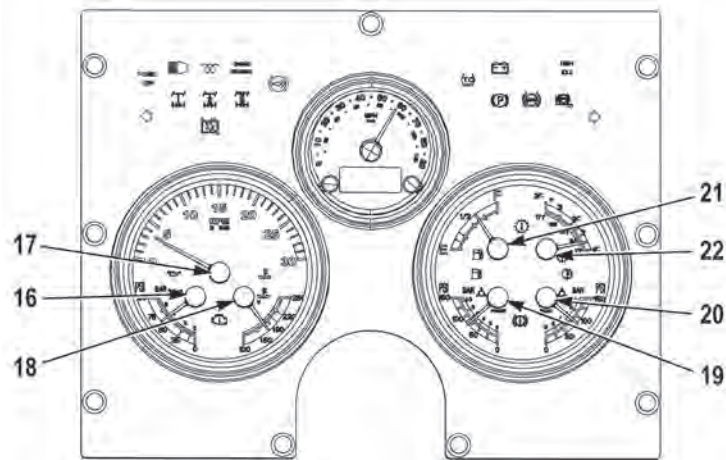


Figure 2. Instrument Panel Controls and Indicators (Sheet 4 of 16).

Key Fig. 2	Control or Indicator	Function
16	Engine Oil Pressure Gauge	Indicates engine oil pressure.
17	Tachometer	Indicates engine operating speed (rpm x 100).
18	Water Temperature Gauge	Indicates engine coolant temperature.
19	Front Air Pressure Gauge	Indicates front brake air pressure.
20	Rear Air Pressure Gauge	Indicates rear brake air pressure.
21	Fuel Gauge	Indicates amount of fuel in fuel tank.
22	Transmission Oil Temperature Gauge	Indicates transmission oil temperature.

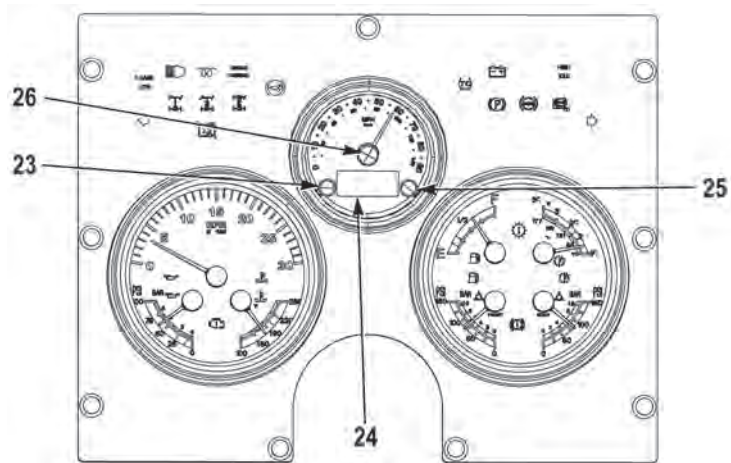


Figure 2. Instrument Panel Controls and Indicators (Sheet 5 of 16).

Key Fig. 2	Control or Indicator	Function
23	(m) Button	Multifunctional button for mode selection and scrolling.
24	LCD Instrument Panel Display	Displays odometer, trip odometer, hour meter, voltage reading, tests gauges, and indicator lights. Odometer indicates total miles traveled on vehicle. Trip odometer indicates total miles traveled since last time trip odometer was reset. Hour meter displays hours that engine has run. Gauge and indicator lights test, tests each gauge and indicator light on instrument panel for proper operation.
25	(t) Button	Multifunctional button for menu selection and scrolling.
26	Speedometer	Indicates vehicle travel speed.

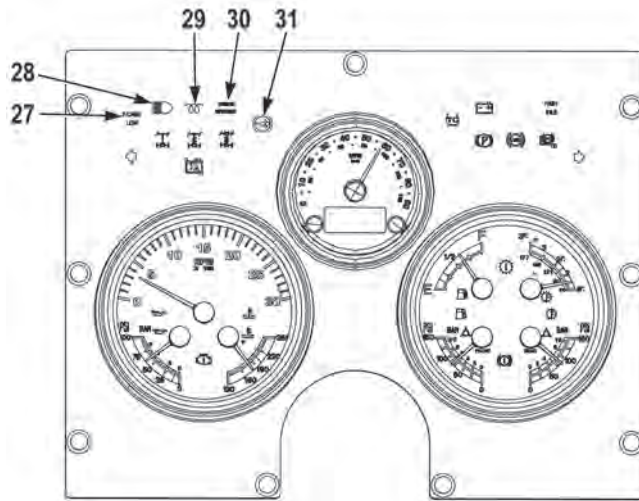


Figure 2. Instrument Panel Controls and Indicators (Sheet 6 of 16).

Key Fig. 2	Control or Indicator	Function
27	T-Case Low Indicator (green)	Illuminates when T-case is in low.
28	High Beam Indicator (blue)	Illuminates when vehicle lights are on high beam.
29	Wait to Start Indicator (yellow)	When illuminated, indicates engine intake heater is warming up in preparation to start engine. When indicator goes out, engine start can be attempted.
30	Engine Warning Indicator (red)	Illuminates when coolant temperature reaches 217°F (103°C) or when oil pressure is low (dependent on engine rpm) (audible alarm).
31	Exhaust Brake Indicator (green)	Illuminates when exhaust brake is ON.

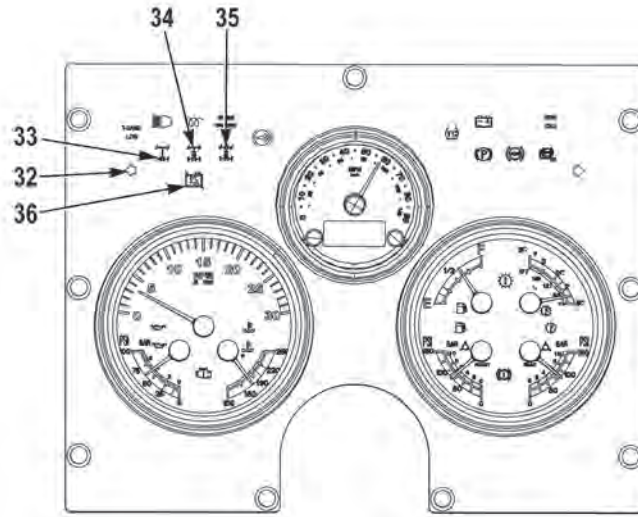


Figure 2. Instrument Panel Controls and Indicators (Sheet 7 of 16).

Key Fig. 2	Control or Indicator	Function
32	Left Turn Indicator (green)	Flashes when left turn signal is on.
33	DRIVELINE Lock Indicator (green)	Indicates transfer case lock is engaged.
34	DRIVELINE Lock Indicator (green)	Indicates transfer case and side-to-side lock on axle No. 2 are engaged.
35	DRIVELINE Lock Indicator (green)	Indicates transfer case and side-to-side lock on both axles are engaged.
36	Fan OFF Indicator (yellow)	Illuminates when engine cooling fan is OFF.

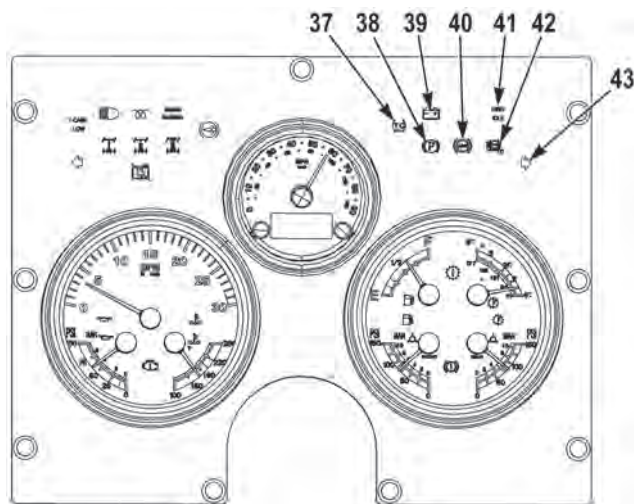


Figure 2. Instrument Panel Controls and Indicators (Sheet 8 of 16).

Key Fig. 2	Control or Indicator	Function
37	Traction Control Indicator (yellow)	Illuminates at key-on and remains lit until operator presses brake pedal when system is configured for TC. TC indicator flashes/blinks while changing to CC or EMER mode. Once cycle is complete, indicator stays illuminated.
38	Park Brake Indicator (red)	Illuminates when parking brake is activated.
39	Charge Indicator (red)	Illuminates when alternator is not charging.
40	Antilock Brake System (ABS) Indicator (yellow)	Under normal conditions, ABS indicator illuminates steadily for a two-second bulb check whenever ignition switch is ON. Light turns OFF after bulb check when no ABS malfunctions are present. Illuminates steadily when ABS is malfunctioning. Blinks fault codes when diagnostic codes are activated.
41	HIGH IDLE Indicator (yellow)	Illuminates when engine is in HIGH IDLE mode.
42	Trailer Antilock Brake System (ABS) Indicator (yellow)	Illuminates when trailer ABS is malfunctioning.
43	Right Turn Indicator (green)	Flashes when right turn signal is on.

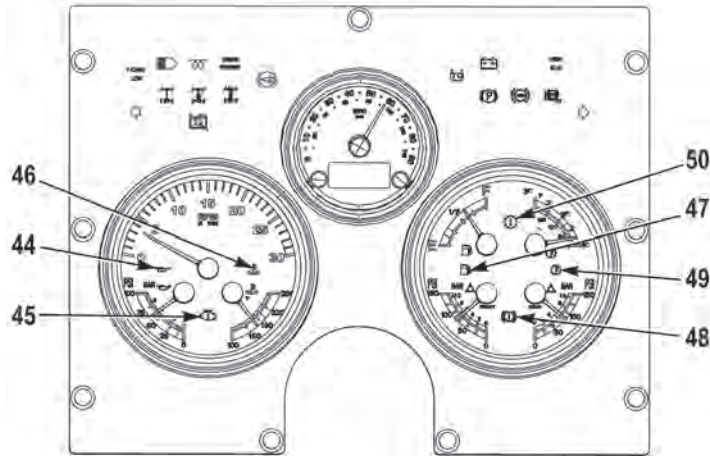


Figure 2. Instrument Panel Controls and Indicators (Sheet 9 of 16).

Key Fig. 2	Control or Indicator	Function
44	Oil PSI Warning Indicator (red)	Illuminates when engine oil pressure is below 5 psi (34 kPa) (audible alarm).
45	Check Engine Indicator (yellow)	Illuminates when fault is detected in engine.
46	Water Temperature Indicator (red)	Illuminates when coolant temperature reaches 235°F (113°C). Audible buzzer also sounds. Cooling system fan turns ON when coolant temperature reaches 205°F (96°C) (audible alarm).
47	Low Fuel Indicator (yellow)	Illuminates when fuel level is low.
48	LOW AIR Warning Indicator (red)	Illuminates when either front or rear air system pressure drops between 64 and 76 psi (441 and 524 kPa) (audible alarm).
49	Transmission Temperature Indicator (red)	Illuminates when transmission fluid temperature reaches 300°F (149°C) (audible alarm).
50	Check Transmission Indicator (yellow)	Illuminates when transmission indicates a problem (sinking input).

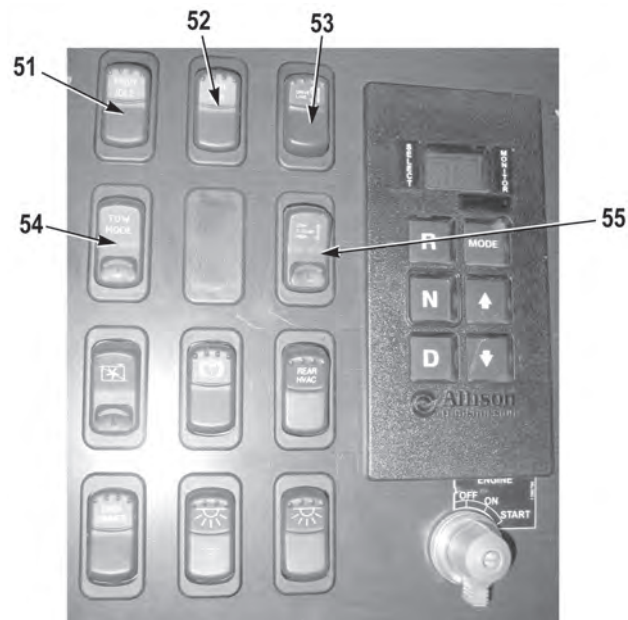


Figure 2. Instrument Panel Controls and Indicators (Sheet 10 of 16).

Key Fig. 2	Control or Indicator	Function
51	HIGH IDLE (momentary)	Toggles high idle system between ON and OFF with each upward activation of switch.
52	EXH BRK (2-position switch)	Turn exhaust brake/retarder ON when switch is in UP position.
53	Driveline Lock Switch	Allows operator to manually override CTIS by sequentially engaging locks for transfer case and axles.
54	TOW MODE	Unlock transfer case solenoids so transfer case can be put in neutral.
55	T-Case LOW/HIGH	Toggles between T-Case in LOW setting and T-Case HIGH setting.

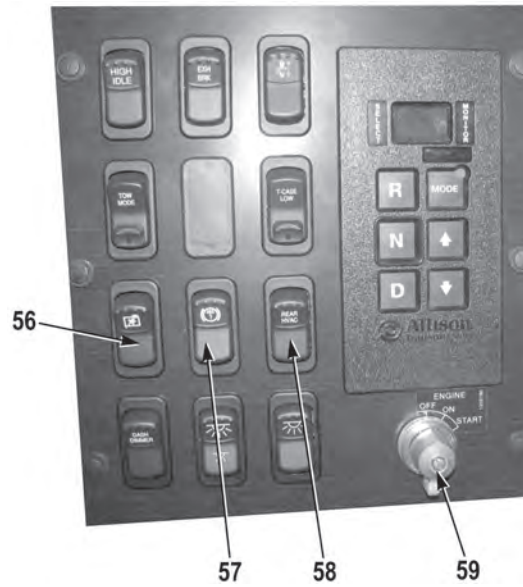


Figure 2. Instrument Panel Controls and Indicators (Sheet 11 of 16).

Key Fig. 2	Control or Indicator	Function
56	Fan Ford (2-position) Switch	Turns engine fan ON and OFF. Fan OFF light will illuminate when switch is turned ON.
57	ABS Diagnostics (2-way momentary switch)	Turns ON and OFF Antilock Brake System (ABS) diagnostics. ABS light will illuminate when ON.
58	REAR HVAC Switch	Turns ON and OFF REAR HVAC system.
59	Engine Ignition Switch	Turns engine ON and OFF.



Figure 2. Instrument Panel Controls and Indicators (Sheet 12 of 16).

Key Fig. 2	Control or Indicator	Function
60	Dash Light Dimmer Switch	Toggles dash lights from bright to dim.
61	Dome Light Dimmer Switch	Toggles dome lights from bright to dim.
62	Dome Light Switch	3-way switch turns dome lights ON and OFF. <ul style="list-style-type: none"> • Select dome lights (up) for normal operation. • Select center position to turn dome lights OFF. <p style="text-align: center;">NOTE</p> Dome lights (up position) will not work while in blackout mode. <ul style="list-style-type: none"> • Select B.O. dome lights (down) for dome lights during blackout operation.

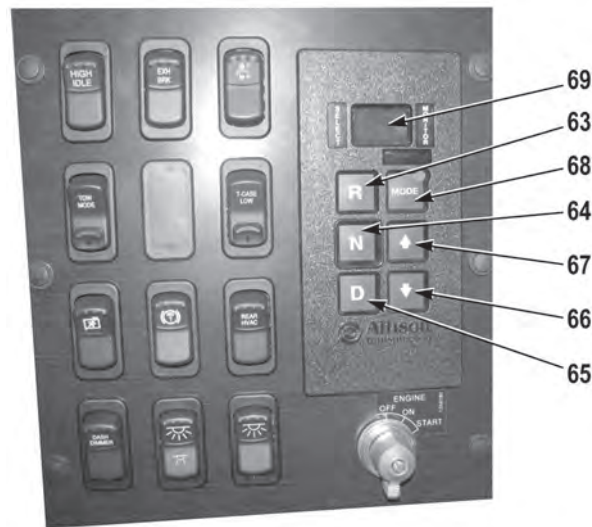


Figure 2. Instrument Panel Controls and Indicators (Sheet 13 of 16).

Key Fig. 2	Control or Indicator	Function
63	R (Reverse)	Use for backing vehicle.
64	N (Neutral)	Use this position when starting engine, parking vehicle, or if vehicle is unattended while the engine is running.
65	D (Drive)	Use for all normal driving conditions. Transmission will upshift and downshift automatically. Transmission will start in first gear.
66	Down Arrow	Depress when in DRIVE to request next lower speed range. Continuously press arrow to reset in lowest range available.
67	Up Arrow	Depress when in DRIVE to request next higher speed range. Continuously press arrow to reset in highest range available.
68	MODE	Use for selecting Diagnostic Trouble Codes (DTC).
69	Digital Display	Shows highest attainable and current speed range, diagnostic codes logged, and transmission fluid level.

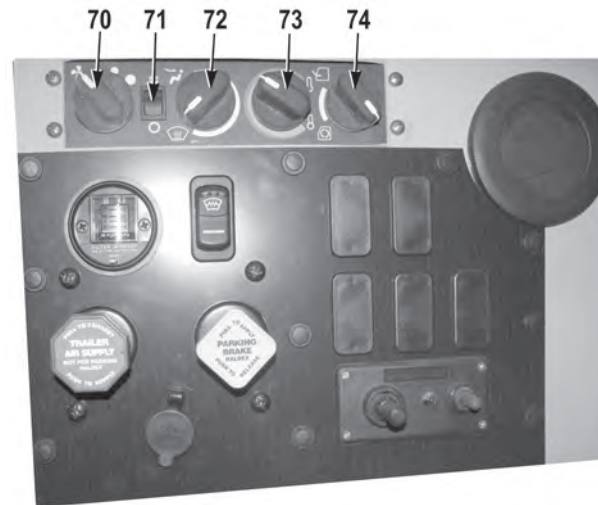


Figure 2. Instrument Panel Controls and Indicators (Sheet 14 of 16).

Key Fig. 2	Control or Indicator	Function
70	Fan Control Switch	Controls speed of fan (LOW/MED/HIGH). Lowest setting turns fan OFF.
71	Air conditioning (A/C) Control	Turns A/C ON or OFF.
72	Cab Air Directional Control Switch	Controls direction of air. Turn switch to direct air to defroster louvers. Turn switch to direct air to floor.
73	Temperature Control Switch	Controls temperature level or amount of heat entering cab.
74	Vent Control Switch	Bottom position recirculates air throughout cab. Top position controls amount of outside air entering cab through fresh air vent.

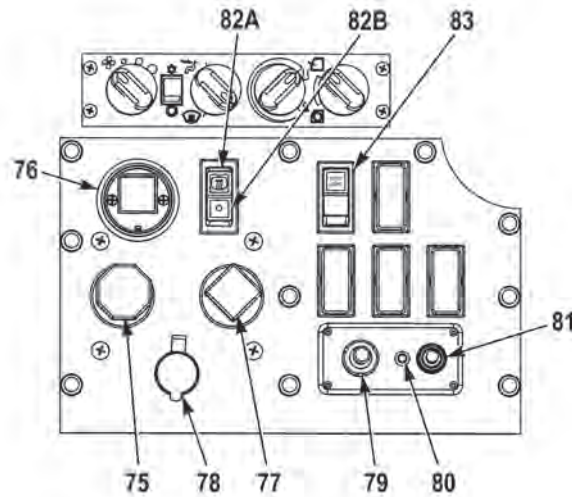


Figure 2. Instrument Panel Controls and Indicators (Sheet 15 of 16).

Key Fig. 2	Control or Indicator	Function
75	TRAILER AIR SUPPLY	Push to supply air to trailer air system. Pull to shut off trailer air.
76	Air Filter Restriction Indicator	Shows condition of air filter. Push button to reset.
77	PARKING BRAKE Control	Push to release vehicle brakes. Pull to apply vehicle and trailer brakes.
78	12 VDC AUX Receptacle	Power supply for 12-VDC AUX components.
79	Front Spotlight Joystick	Controls position of front spotlight.
80	Front Spotlight Indicator	Illuminates red when front spotlight is activated.
81	Front Spotlight ON/OFF Switch	Turns front spotlight power ON and OFF.
82A	DEICER ON/OFF Switch	Turns DEICER ON and OFF. DEICER system warms windshield to help remove snow and ice. <ul style="list-style-type: none"> • UP position turns DEICER ON. • DOWN position turns DEICER OFF.
82B	DEICER ON/OFF Indicator	Illuminates when DEICER is activated.
83	Spotlight ON/OFF Switch (M1240 and M1240A1)	Turn front and rear spotlights ON and OFF.

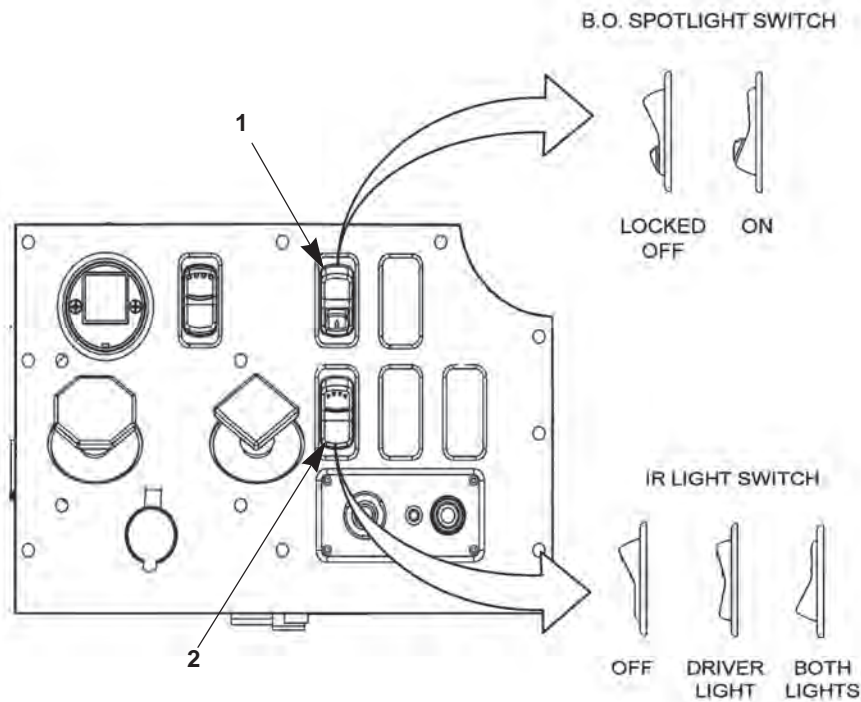


Figure 2. Instrument Panel Controls and Indicators (M1245) (Sheet 16 of 16).

Key Fig. 2	Control or Indicator	Function
1	B.O. (Blackout) Spotlight Switch	Toggle switch ON, (up position) to place spotlights in blackout mode.
2	Infrared (IR) Switch	Toggle switch to the center position to activate the driver side IR Light. Toggle switch to the up position to activate both IR Lights.

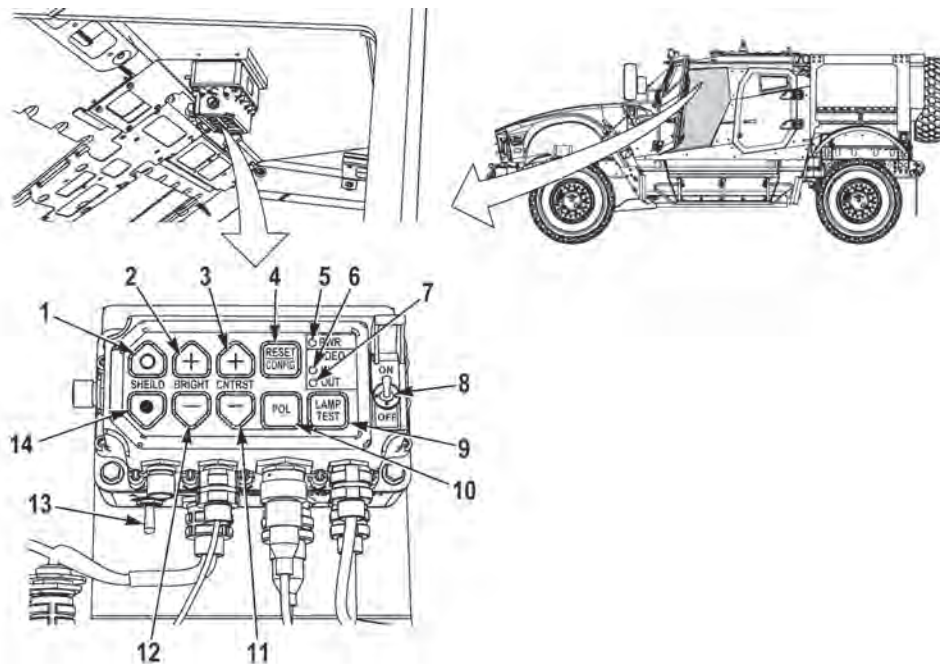


Figure 3. Check-6 Control Boxes (M1240/M1240A1 If Equipped).

Key Fig. 3	Control or Indicator	Function
1	Protective SHIELD Button	Opens protective shield on camera.
2	BRIGHT + Control	Increases the brightness of video display.
3	CNTRST + Control	Increases the contrast of video display.
4	RESET/CONFIG Button	Is a dual functionality button. RESET brings the system back to default settings. CONFIG enables the selection of various system background overlays.
5	PWR Indicator	A green colored LED is illuminated indicating power to the system.
6/7	VIDEO IN/OUT Indicator	An amber colored LED that is not illuminated unless loss of video signal is detected.
8	Power Switch	Turns power ON and OFF to components of Check-6 system.
9	LAMP TEST Button	Illuminates all three LEDs (PWR, VIDEO IN, VIDEO OUT) as a check that they are operational.
10	POL Button	Adjusts the infrared display from a white-on-black to black-on-white display.
11	CNTRST - Control	Decreases the contrast of video display.
12	BRIGHT - Control	Decreases the brightness of video display.
13	Camera Toggle Switch	Activates selected camera by switching between "A" and "B".
14	Protective SHIELD Button	Closes protective shield on camera.

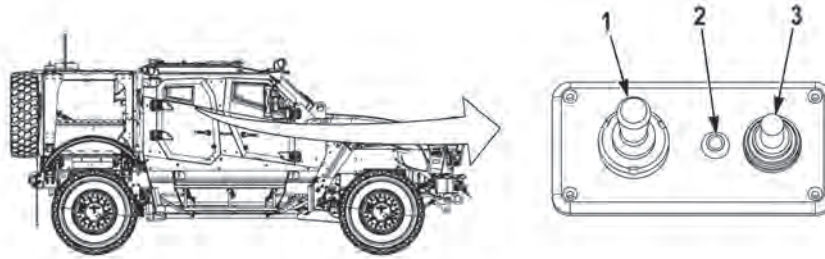


Figure 4. Rear Spotlight Controls.

Key Fig. 4	Control or Indicator	Function
1	Rear Spotlight Joystick	Controls position of rear spotlight. Located above door.
2	Rear Spotlight Indicator	Illuminates red when rear spotlight is activated. Located above door.
3	Rear Spotlight ON/OFF Switch	Turns rear spotlight power ON and OFF. Located above door.

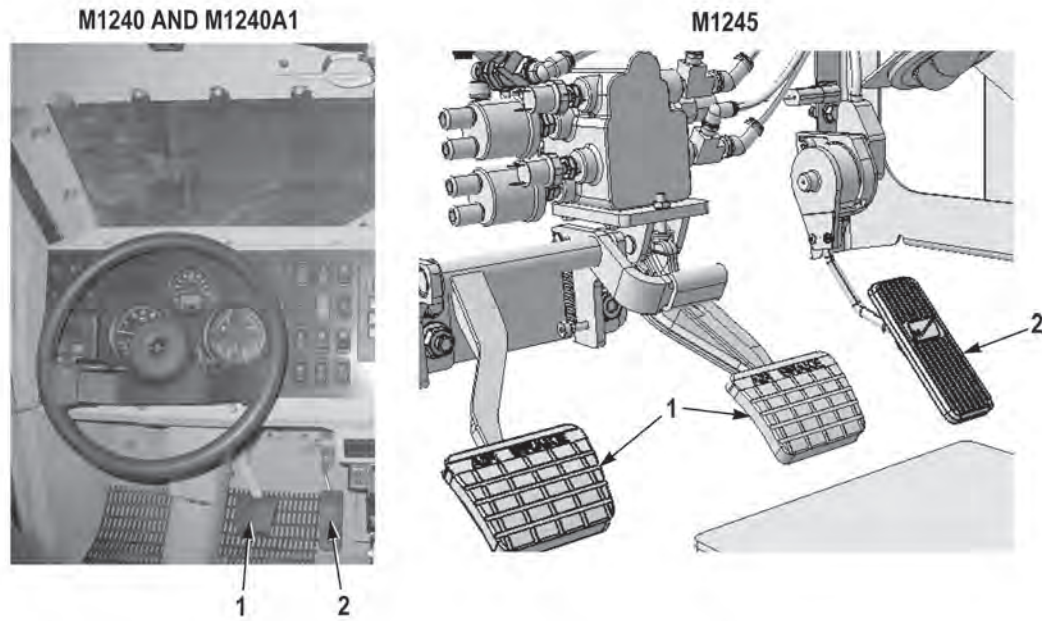


Figure 5. Capsule Mounted Foot Controls.

Key Fig. 5	Control or Indicator	Function
1	Service Brake Pedal	Applies service brakes.
2	Throttle Control	Controls engine speed.

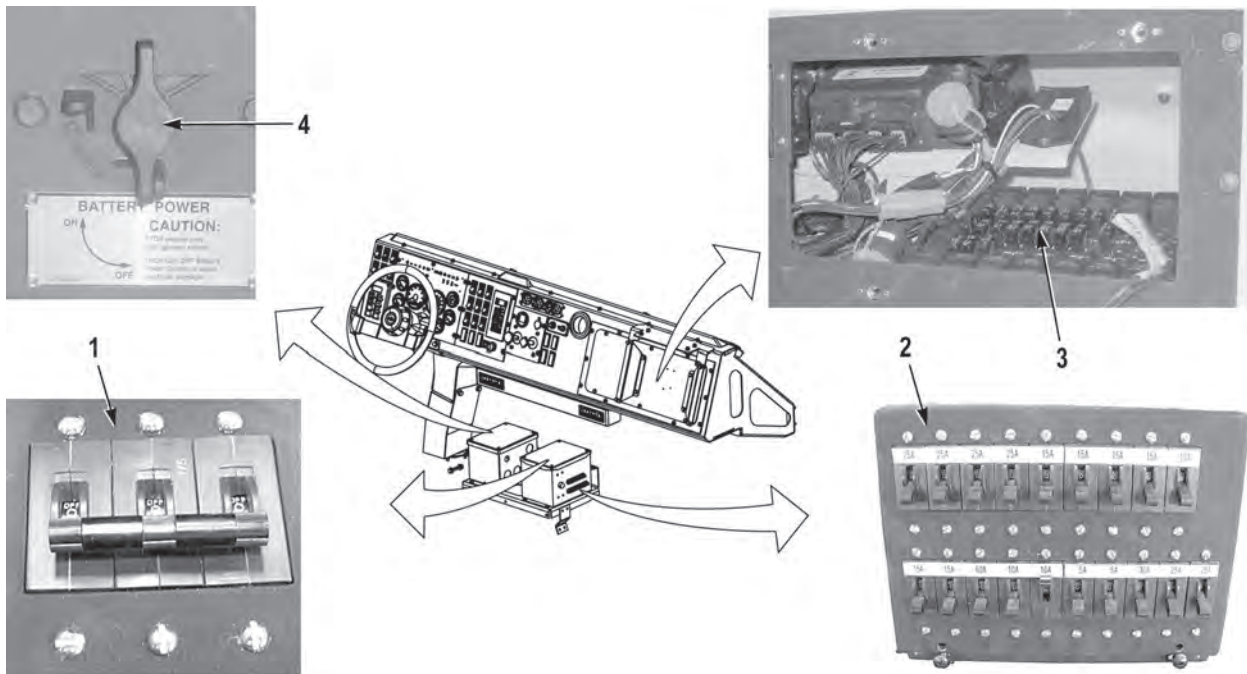


Figure 6. Crew Compartment Controls and Indicators.

Key Fig. 6	Control or Indicator	Function
1	Main Circuit Breakers	Protects main components from electrical overload.
2	Auxiliary Component Circuit Breakers	Protects auxiliary components from electrical overload.
3	M-ATV Engine and Chassis Circuit Breakers	Protects M-ATV engine and chassis components from electrical overload.
4	Battery Disconnect Switch	Turns M-ATV battery power ON and OFF.

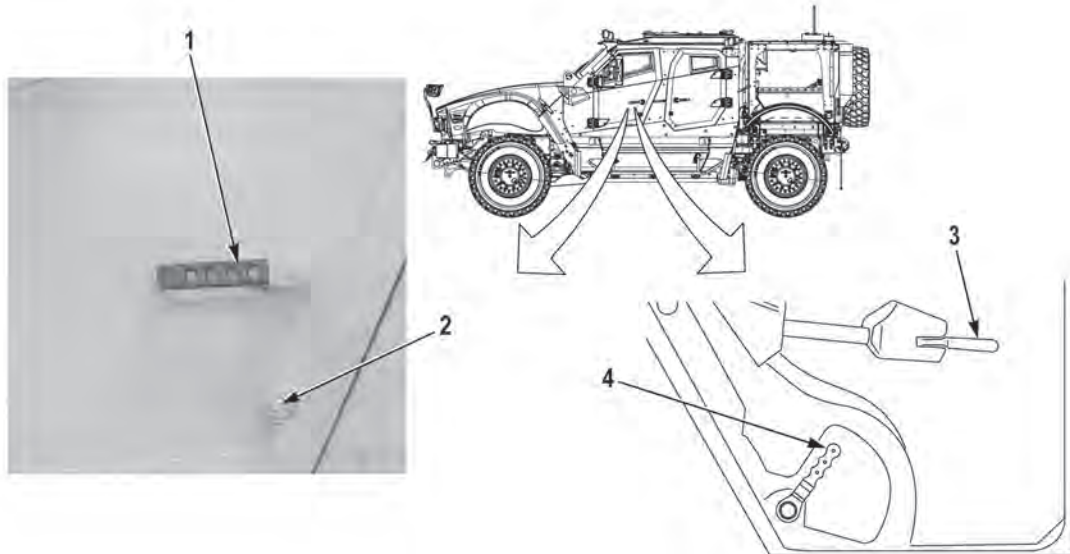


Figure 7. Door Controls.

Key Fig. 7	Control or Indicator	Function
1	Capsule Door Outside Handle	To open door from outside of capsule.
2	Combat Latch Override	Used to unlock combat latch.
3	Capsule Door Inside Handle	Pull handle to open door from inside.
4	Combat Latch	Push handle down to lock capsule door.

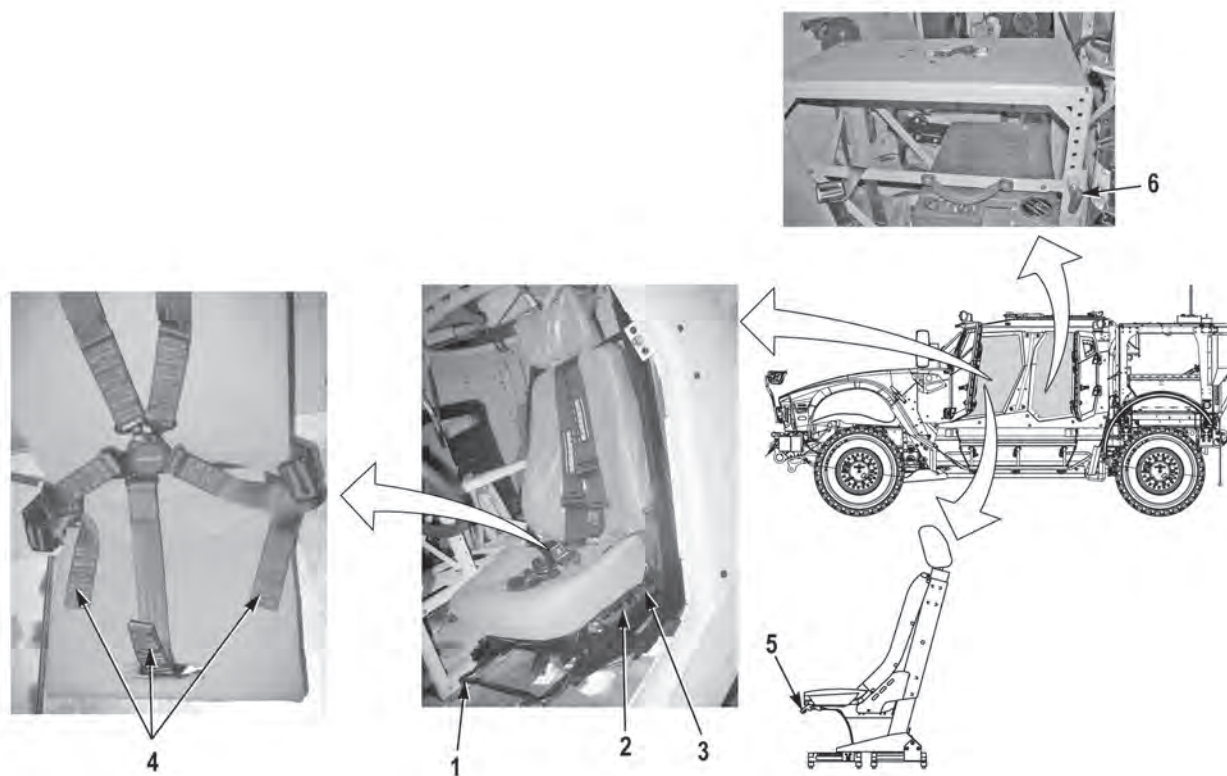


Figure 8. Seat Controls.

Key Fig. 8	Control or Indicator	Function
1	Forward/Backward Adjustment Controls (M1240 and M1245)	Used to move driver seat forward or backward.
2	Front Height Adjustment Control (M1240 and M1245)	Used to raise or lower driver seat.
3	Rear Height Adjustment Control (M1240 and M1245)	Used to raise or lower driver seat.
4	Seat Belt Adjustment Straps	Used to adjust size of seat belts.
5	Forward/Backward Adjustment Control (M1240A1)	Used to move driver and passenger seats forward or backward.
6	Gunnery Platform Adjustment Pins (M1240/1240A1)	Used to adjust height of gunners platform.

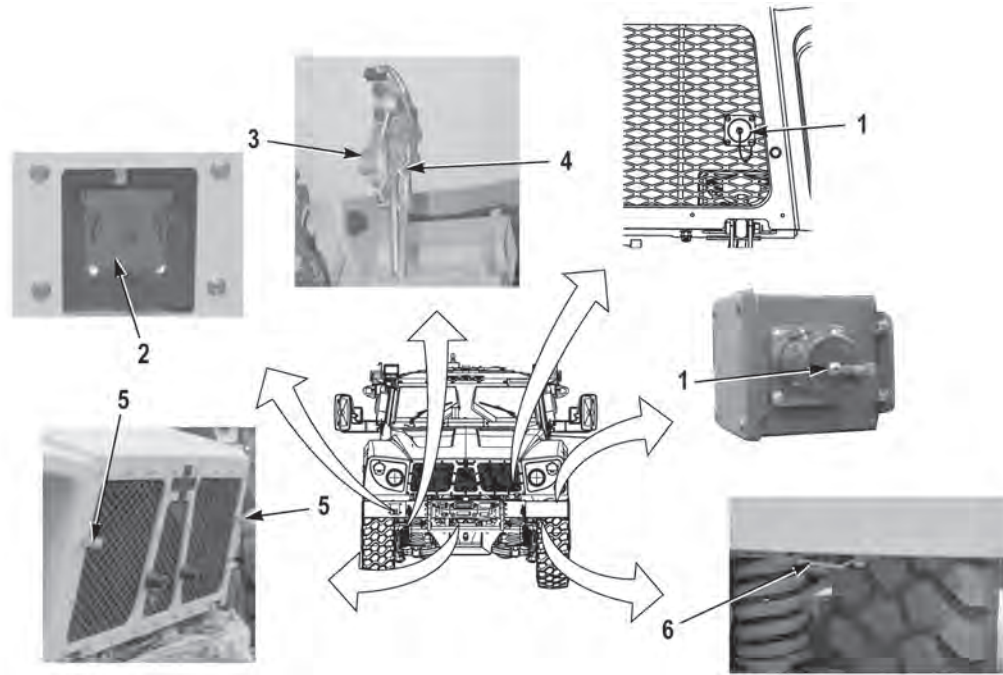


Figure 9. Front Exterior Mounted Controls.

NOTE

Vehicles will have NATO slave connector located under hood on driver side or on driver side bumper.

Key Fig. 9	Control or Indicator	Function
1	NATO Slave Receptacle (on driver side bumper)	Used with NATO slave cable to help start vehicles with dead batteries. Located on driver side bumper.
1	NATO Slave Receptacle (on driver side grill)	Used with NATO slave cable to help start vehicles with dead batteries. Located on driver side grill.
2	Front Intervehicular 24 VDC Electrical Connector	Connects M-ATV electrical system to electrical system of towing vehicle.
3	Front Gladhands	Allows towing vehicle to feed air into air system of M-ATV when connected. Blue is for service and red is for emergency.
4	Front Gladhand Covers	Attaches to brackets (5) on front of hood to secure hood while in the raised position.
5	Bracket	To secure hood while in the raised position.
6	Transfer Case Neutral Shift Lever	Shift transfer case of M-ATV to neutral so vehicle may be towed.

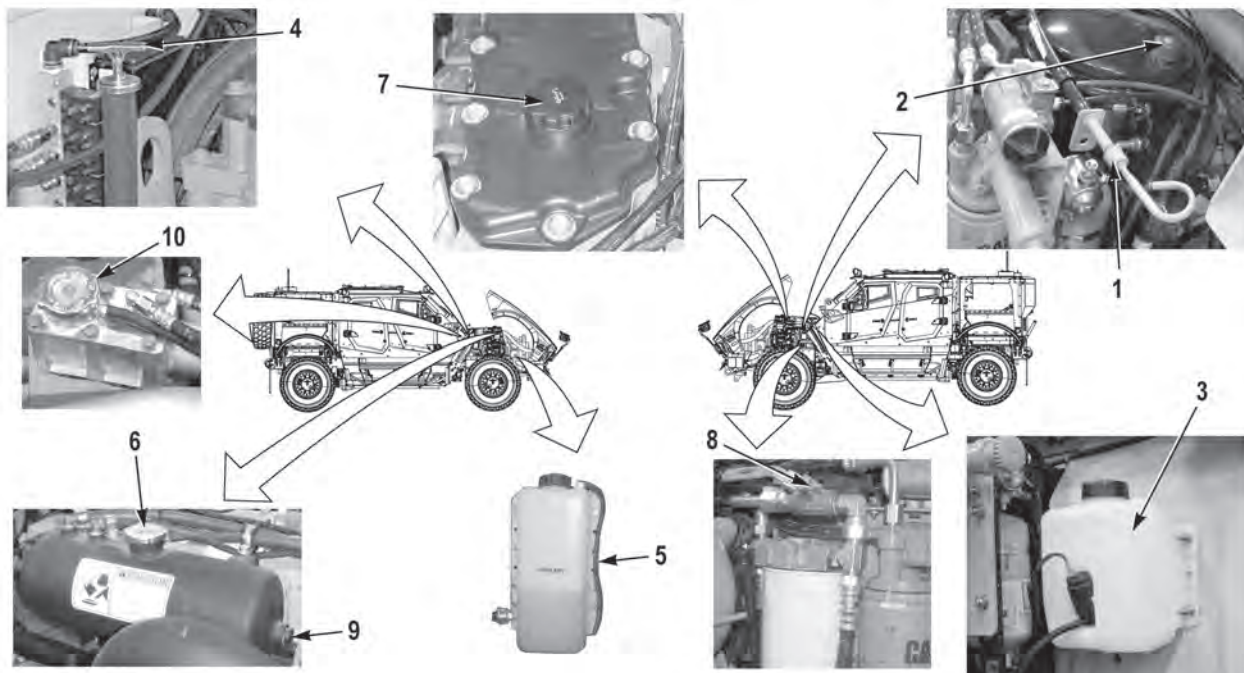


Figure 10. Engine Compartment Controls and Indicators.

NOTE

Vehicles will be equipped with either a coolant reservoir or a coolant surge tank.

Key Fig. 10	Control or Indicator	Function
1	Engine Oil Dipstick	Indicates engine oil level.
2	Power Steering Reservoir Dipstick/ Filler	Indicates power steering reservoir fluid level and provides opening to add power steering fluid to power steering reservoir.
3	Windshield Washer Reservoir	Stores windshield washer fluid.
4	Transmission Oil Dipstick/Filler	Indicates transmission oil level and provides opening to add transmission fluid to transmission.
5	Coolant Overflow Reservoir	Stores excess coolant for cooling system.
6	Coolant Surge Tank	Stores excess coolant for cooling system.
7	Engine Oil Filler	Provides opening to add engine oil to engine.
8	Fuel Shut Off Valve	Shuts off fuel flow to engine.
9	Sight Glass	Indicates coolant level.
10	Cooling System Fill	Provides opening to add coolant when performing cooling system drain/fill.

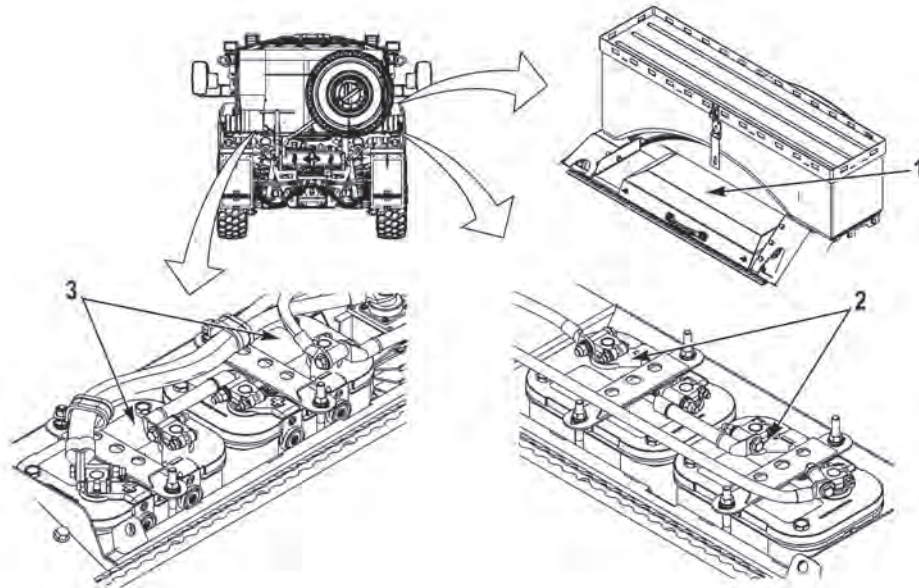


Figure 11. Batteries.

Key Fig. 11	Control or Indicator	Function
1	Battery Cover	Covers passenger side and driver side batteries. Provides protection from dirt, dust, and debris.
2	Passenger Side Batteries	Provides electrical power for GFE.
3	Driver Side Batteries	Provides electrical power for M-ATV.

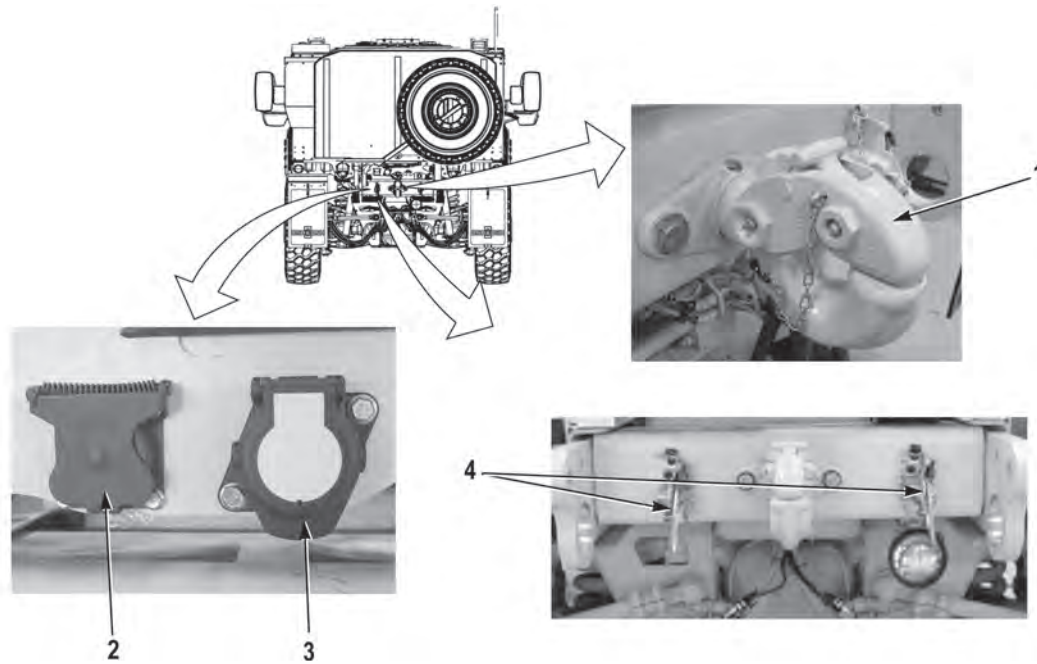


Figure 12. Rear Exterior Mounted Controls.

Key Fig. 12	Control or Indicator	Function
1	Pintle Hook	Used for attaching trailers and towbars.
2	Rear Intervehicular Electrical Connector	Used to connect M-ATV electrical system to electrical system of towed vehicle or trailer.
3	Trailer ABS Connector	Used to connect M-ATV ABS to trailer.
4	Rear Gladhands	Allows M-ATV to supply air to towed vehicle or trailer. Red is for emergency and blue is for service.

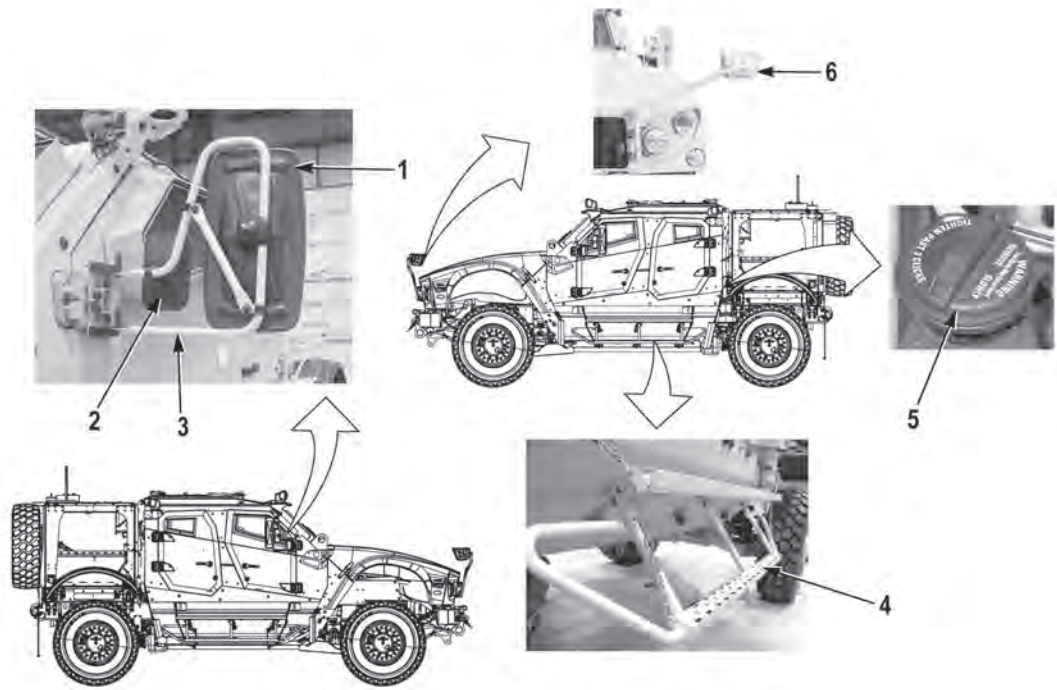


Figure 13. Side Mounted Exterior Control.

Key Fig. 13	Control or Indicator	Function
1	Driver Side and Passenger Side Side Mirror	Permits viewing of side of M-ATV, traffic, and terrain to rear of vehicle.
2	Driver Side and Passenger Side Spotter Mirror	Allows viewing of blind spots along side and lower section of vehicle.
3	Driver Side and Passenger Side Mirror Mount	Provides for mirror mounting and adjustment of mirrors.
4	Driver Side and Passenger Side Crew Capsule Steps	Allows entrance and exit of crew capsule.
5	Fuel Filler	Provides opening for filling fuel tank.
6	Driver Side and Passenger Side Auxiliary Mirror	Provides increased field of vision to sides of vehicle.

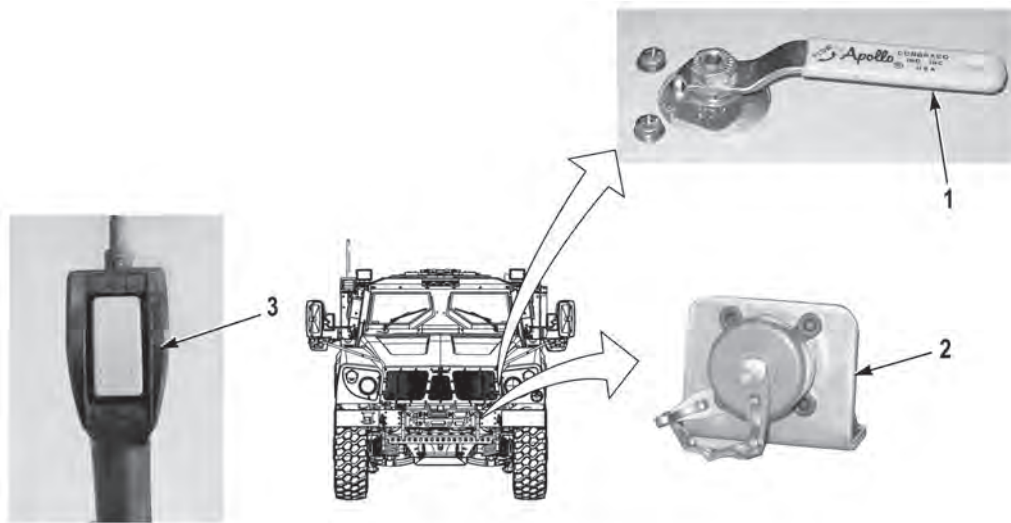


Figure 14. Winch Controls.

Key Fig. 14	Control or Indicator	Function
1	Winch Brake (Winch Free Spool Valve)	Allows winch to be placed in neutral for manual cable payout.
2	Winch Remote Control Connector	Allows winch remote control to connect to winch.
3	Winch Remote Control	Remotely controls winch (located in BII).

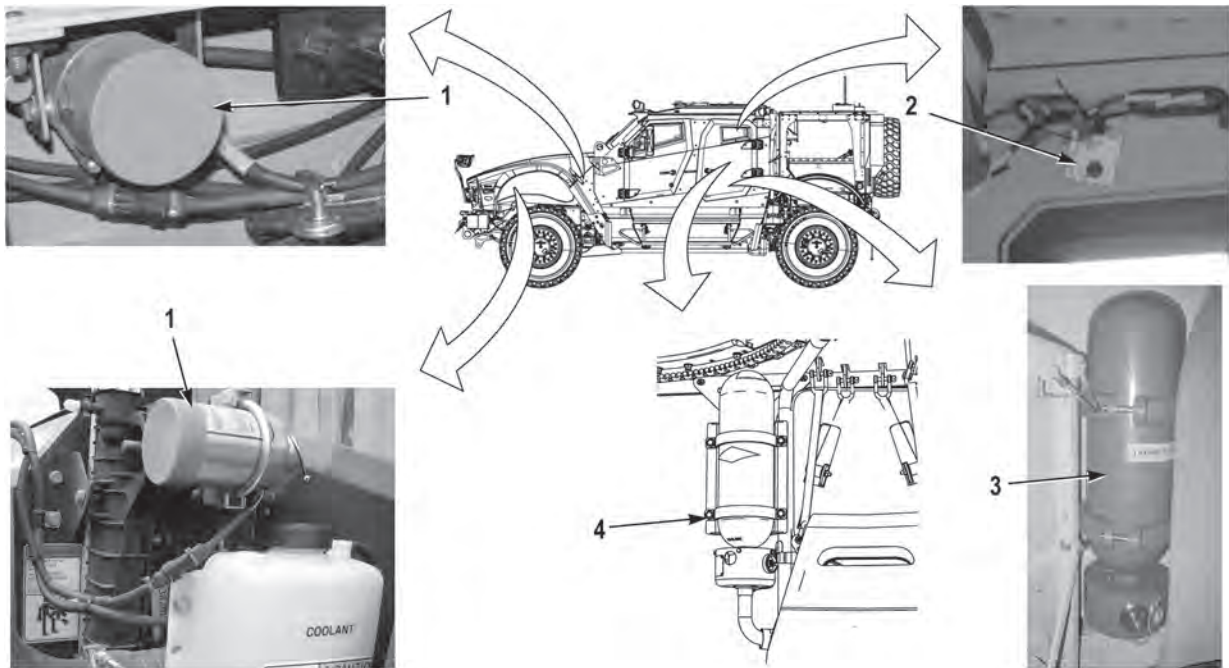


Figure 15. Fire Suppression Controls (Sheet 1 of 4).

NOTE

- Vehicles will be equipped with crew compartment extinguishing cylinder on gunner's platform or rear wall.
- Vehicles will be equipped with four or five aerosol generators. For vehicles with five generators the fifth is located beneath the turbo charger.

Key Fig. 15	Control or Indicator	Function
1	Engine Compartment Fire Suppression Aerosol Generators	When activated, releases fire extinguishing compound into engine compartment.
2	Crew Compartment Fire Sensor	Detect fire in crew compartment located in back, driver side above door.
3	Crew Compartment Extinguishing Cylinder (located on gunner's platform)	When activated, releases fire extinguishing compound into crew compartment.
4	Crew Compartment Extinguishing Cylinder (located on rear wall)	When activated, releases fire extinguishing compound into crew compartment.

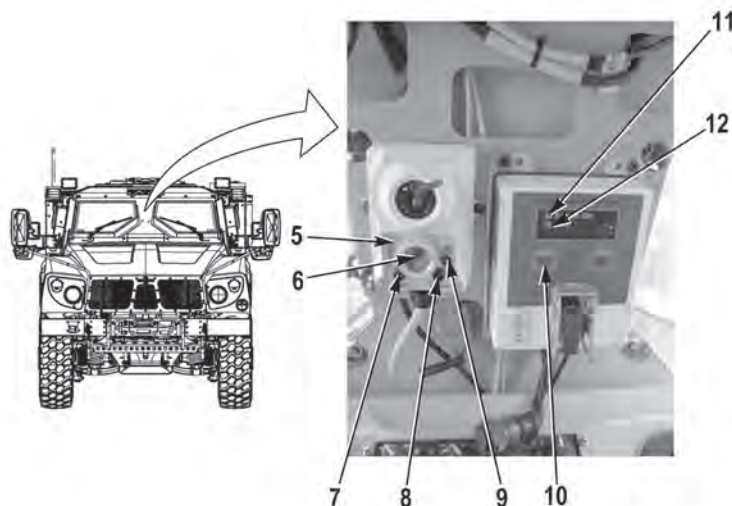


Figure 15. Fire Suppression Controls (Sheet 2 of 4).

Key Fig. 15	Control or Indicator	Function
5	Crew Compartment Fire Sensor With Manual Activation Switch	Detect fire in crew compartment and allows operator to manually activate crew compartment fire suppression system located on front window panel in between windshields.
6	Capsule Crew Compartment Fire Suppression System Manual Activation Button	Manually activates crew compartment fire suppression system.
7	Fault LED	Indicates different types of faults when flashing.
8	Power LED	Indicates proper operation when on and power fault when flashing.
9	Dimmer Switch	Turns off power and fault LEDs for black-out operation.
10	Service System LED	Indicates different types of faults when flashing.
11	System OK LED	Indicates system OK when lit.
12	Fire LED	Indicates system has discharged when lit.

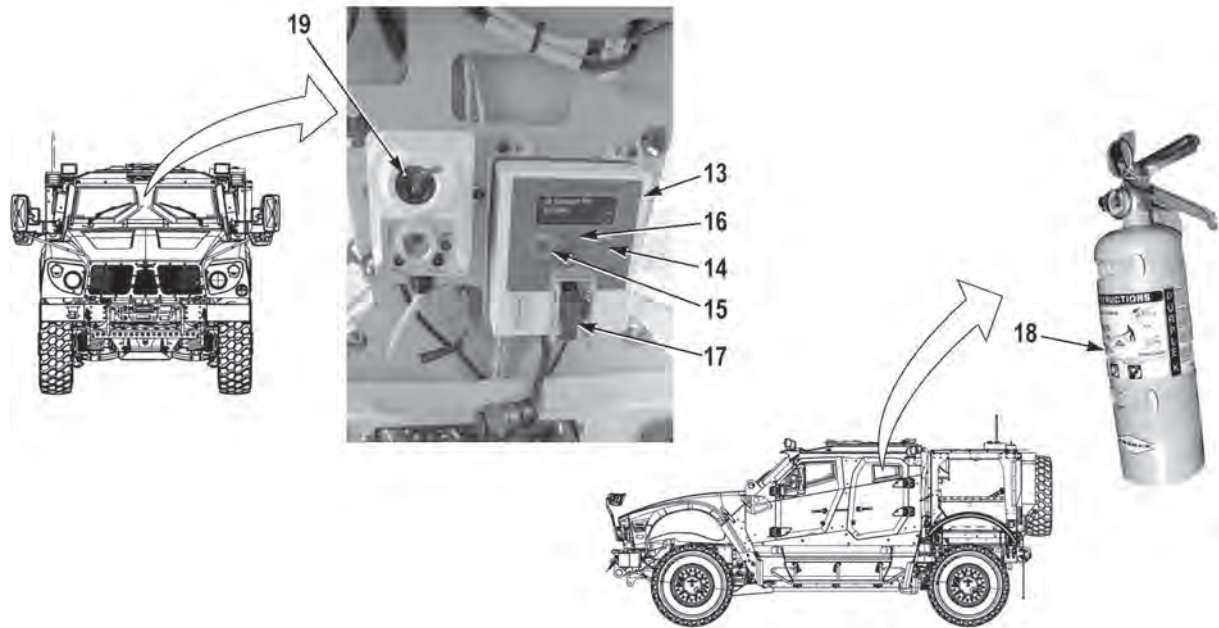


Figure 15. Fire Suppression Controls (Sheet 3 of 4).

Key Fig. 15	Control or Indicator	Function
13	Engine Compartment Fire Suppression System Control Module	Allows for automatic or manual activation of engine compartment fire suppression system.
14	Alarm Silence Button	Press to silence audible alarm.
15	Relay Reset Button	Press to reset relay contacts.
16	Test Button	Press to turn LED's and audible alarm off. Hold to test LED's and audible alarm.
17	Engine Compartment Fire Suppression System Manual Activation Toggle Switch	Manually activates engine compartment fire suppression system.
18	Hand Held Fire Extinguisher	Manually extinguish fires. Located behind driver seat (M1240).
18	Hand Held Fire Extinguisher	Manually extinguish fires. Located under dash (M1240A1).
19	Self Test Indicator	Indicates self test when flashing.

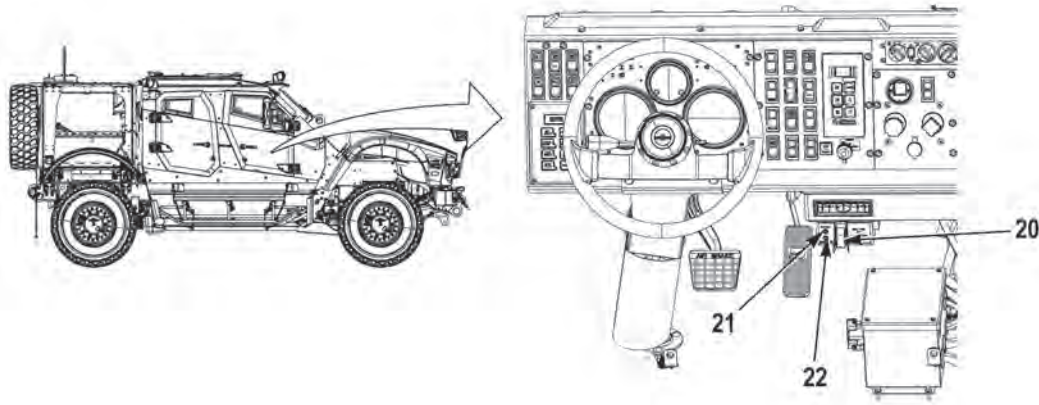


Figure 15. Fire Suppression Controls (Sheet 4 of 4).

Key Fig. 15	Control or Indicator	Function
20	Undercarriage Fire Suppression System Manual Trigger	Manually actuates all undercarriage fire suppression cylinders.
21	Front Tires LED	Indicates system OK when green, system fired when amber and system manually activated when red.
22	Rear Tires/Fuel LED	Indicates system OK when green, system fired when amber and system manually activated when red.

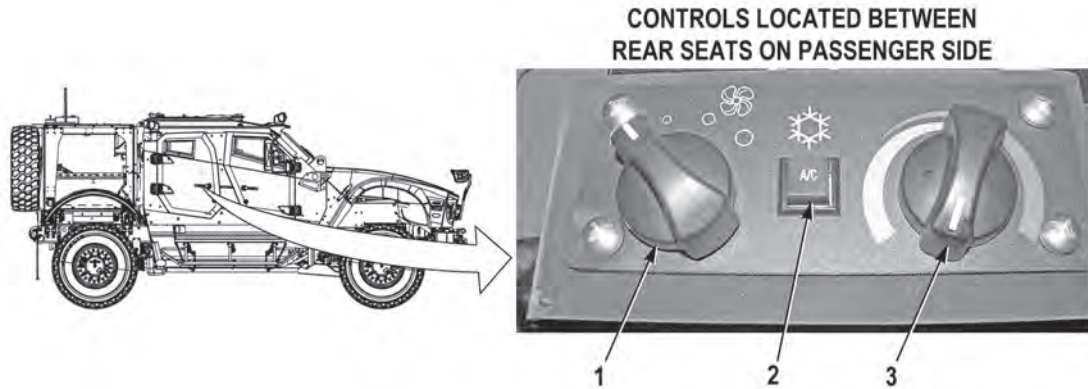


Figure 16. Rear HVAC Controls (M1240 and M1240A1).

Key Fig. 16	Control or Indicator	Function
1	Fan Control Switch	Controls speed of fan (LOW/MED/HIGH). Lowest setting turns fan OFF.
2	Air Conditioning (A/C) Control	Turns rear A/C ON or OFF.
3	Temperature Control Switch	Controls temperature level or amount of heat entering cab.

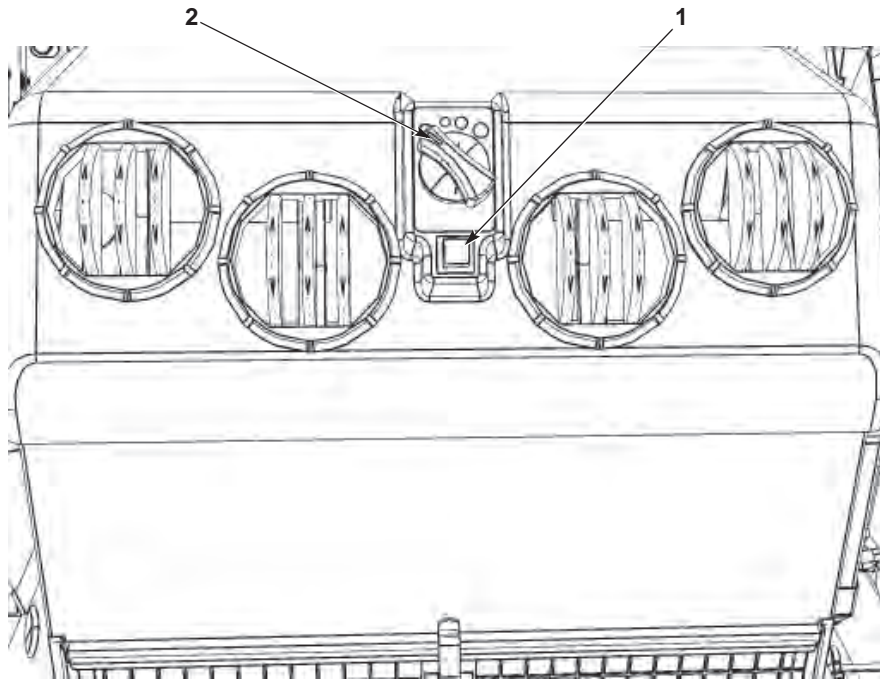


Figure 17. Rear Air Conditioning (A/C) Controls (M1245).

Key Fig. 17	Control or Indicator	Function
1	Rear Air Conditioning (A/C) Control	Turns A/C ON or OFF.
2	Fan Control Switch	Controls speed of fan (LOW/MED/HIGH). Lowest setting turns fan OFF.

END OF WORK PACKAGE

PREPARATION FOR OPERATION

WARNING

- In extreme temperature environments, follow work-rest schedules as well as the guidance of TB-MED 507 Heat Stress Control and Heat Stress Management and TB-MED 508 Prevention and Management of Cold Weather Injuries. Failure to comply may result in injury to personnel.
 - Antennae emit radio frequency radiation. Avoid contact with active antennae and maintain proper standoff distances from active antennae. Ensure that radios are powered off before conducting fueling operations or maintenance activities. Failure to comply may result in injury to personnel.
 - Single hearing protection is required in and around an operating vehicle. Double hearing protection is required during weapons firing. Failure to comply may result in injury to personnel.
 - The driver is responsible for the safety of the personnel riding on their vehicle. Drivers will refuse to move a vehicle if anyone is in an unsafe position or the vehicle has too many passengers. Failure to comply may result in injury or death to personnel.
 - Operating vehicle with items on dashboard is dangerous and may result in injury to personnel.
 - During operations, the ventilation system(s) must remain on to provide adequate ventilation to the vehicle occupants. Failure to comply may result in injury to personnel.
1. Remove and stow wheel chocks prior to operation (WP 0009).

WARNING

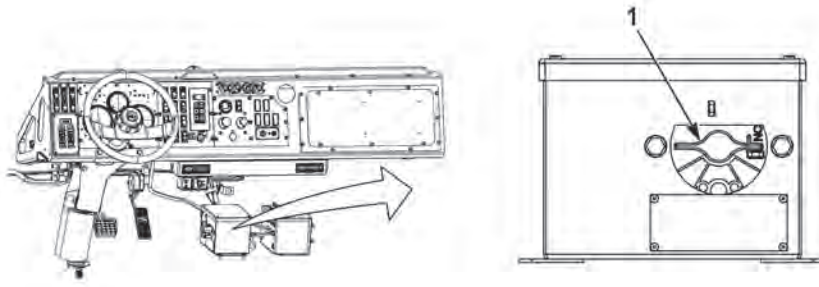
When entering or exiting capsule, use three-point contact system. Doors may cause injury if fingers, hands, or feet are caught between doors and capsule. Failure to comply may result in injury to personnel.

2. Enter capsule using three-point contact.

WARNING

Ensure side view mirrors and auxiliary mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

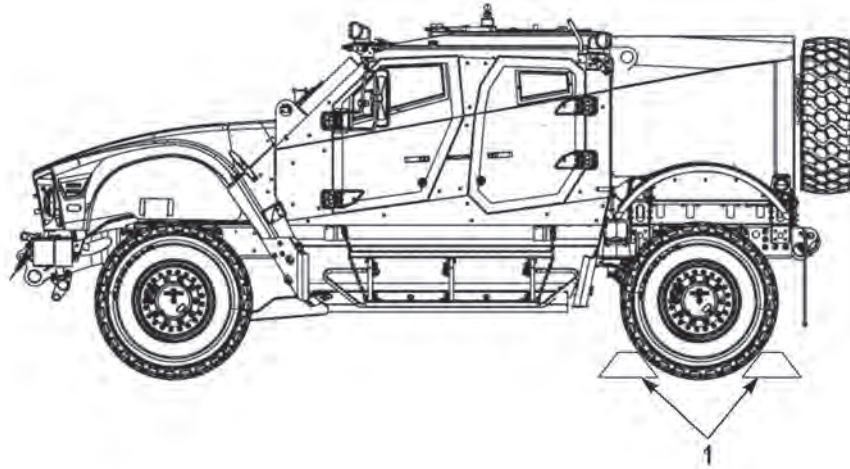
3. Adjust side view mirrors (WP 0014).
4. Adjust auxiliary mirrors (WP 0015) if equipped.



5. Turn battery disconnect switch (1) to ON position.

END OF WORK PACKAGE

CHOCK/UNCHOCK WHEELS

CHOCK WHEELS**NOTE**

Ensure to always chock wheels when vehicle is not in operation.

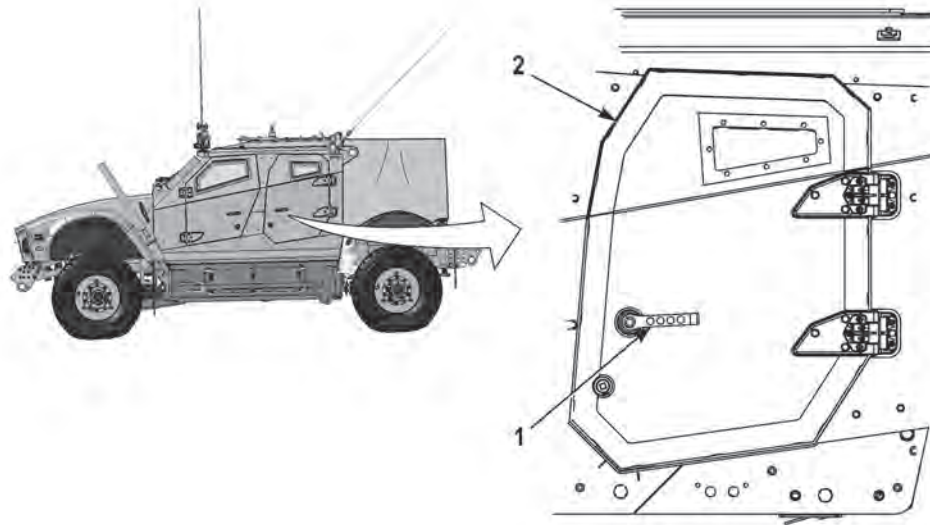
1. Remove two wheel chocks (1) from stowage.
2. Place wheel chocks (1) tight up against front and rear of rear axle tire.
3. Repeat Steps (1) and (2) if more than one wheel is chocked.

END OF TASK**UNCHOCK WHEELS**

1. Remove wheel chocks (1) from front and rear of tire.
2. Return wheel chocks (1) to stowage.
3. Repeat Steps (1) and (2) if more than one wheel is chocked.

END OF TASK**END OF WORK PACKAGE**

CAPSULE DOORS OPEN/CLOSE

OPEN CAPSULE DOORS FROM OUTSIDE CAPSULE**WARNING**

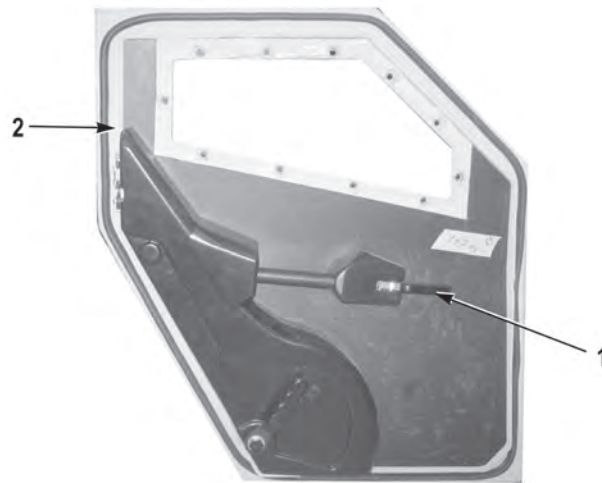
- Doors are heavy. Ensure that no one is standing directly behind the door before opening and closing it. Ensure that hands and feet are clear for the area before closing the door. Use caution when opening or closing doors especially when the vehicle is parked on an incline. Failure to comply may result in injury to personnel.
- Care should be taken when operating door. Door may cause injury if fingers, hands, or feet are caught between door and capsule. Failure to comply may result in injury to personnel.

NOTE

All doors are opened the same way. Rear driver side shown.

1. To open, pull door handle (1) down and pull capsule door (2) open.

END OF TASK

OPEN CAPSULE DOORS FROM INSIDE CAPSULE (FRONT DRIVER SIDE AND FRONT PASSENGER SIDE)**WARNING**

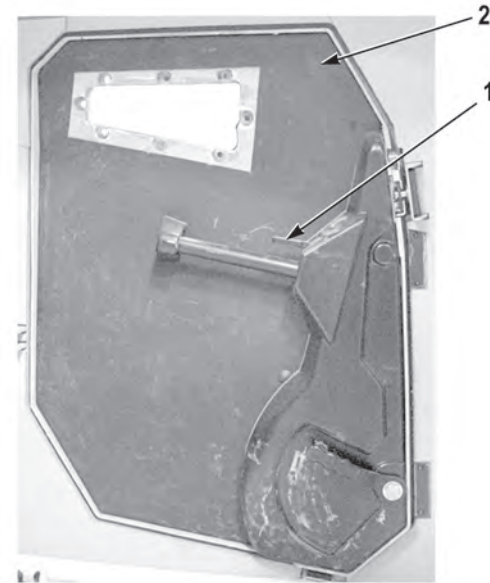
Care should be taken when operating door. Door may cause injury if fingers, hands, or feet are caught between door and capsule. Failure to comply may result in injury to personnel.

NOTE

Both doors are opened the same way. Driver side shown.

1. To open, pull latch (1). Push capsule door (2) open.

END OF TASK

OPEN CAPSULE DOORS FROM INSIDE CAPSULE (REAR DRIVER SIDE AND REAR PASSENGER SIDE)**WARNING**

Care should be taken when operating door. Door may cause injury if fingers, hands, or feet are caught between door and capsule. Failure to comply may result in injury to personnel.

NOTE

Both doors are opened the same way. Driver side shown.

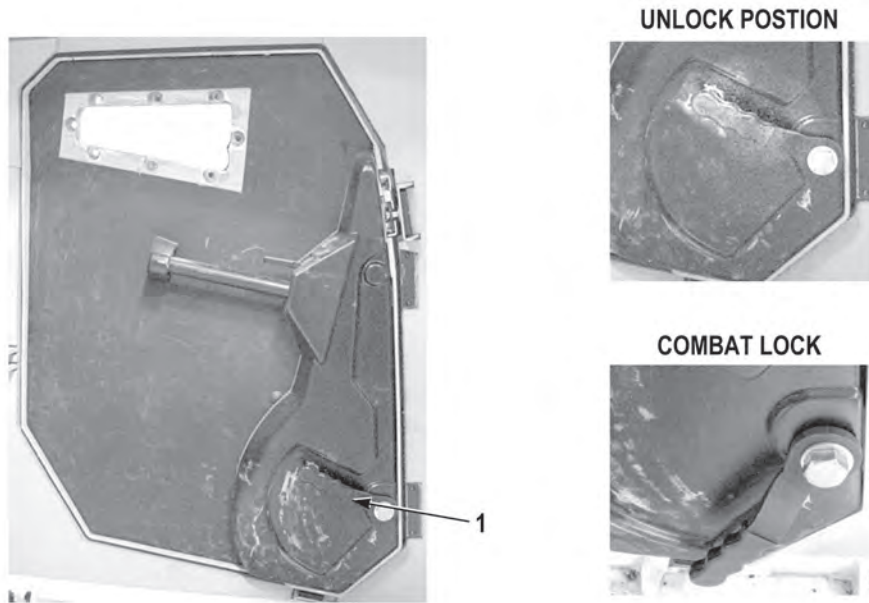
1. To open, press latch (1) down and push capsule door (2) open.

END OF TASK

ENGAGE/DISENGAGE COMBAT LOCK (FRONT DRIVER SIDE AND FRONT PASSENGER SIDE)**UNLOCKED POSITION****LOCKED POSITION**

1. To engage, push handle (1) down to combat lock position.
2. To disengage, pull handle (1) up to unlock position.

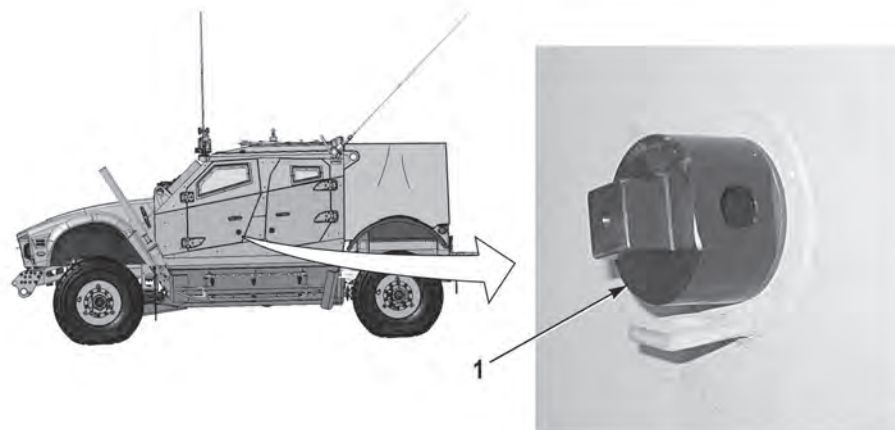
END OF TASK

ENGAGE/DISENGAGE COMBAT LOCK (REAR DRIVER SIDE AND REAR PASSENGER SIDE)**NOTE**

Both combat locks are engaged and disengaged the same way. Driver side shown.

1. To engage, push handle (1) down to combat lock position.
2. To disengage, pull handle (1) up to unlock position.

END OF TASK

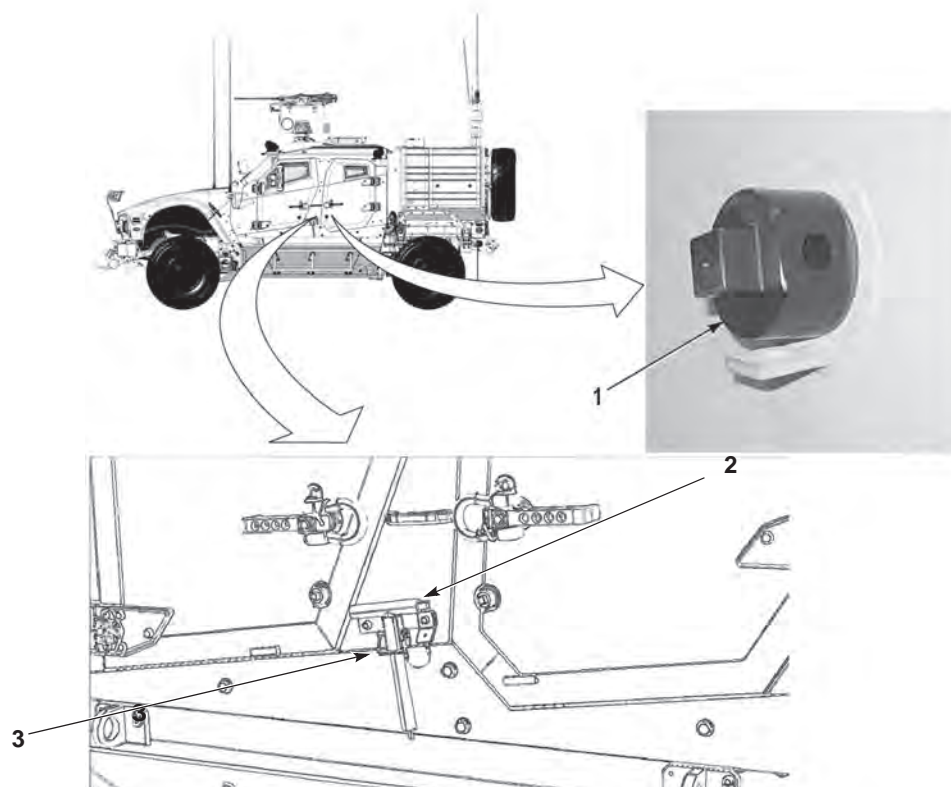
COMBAT LOCK OVERRIDE (M1240/M1240A1)**NOTE**

- For front driver side door and rear passenger side door, perform Step (1).
- For front passenger side door and rear driver side door, perform Step (2).
- 4-Way from BII or any tool that will turn combat OVERRIDE knob may be used in emergency situation.

1. Rotate combat lock OVERRIDE knob (1) counterclockwise.
2. Rotate combat lock OVERRIDE knob (1) clockwise.

END OF TASK**END OF WORK PACKAGE**

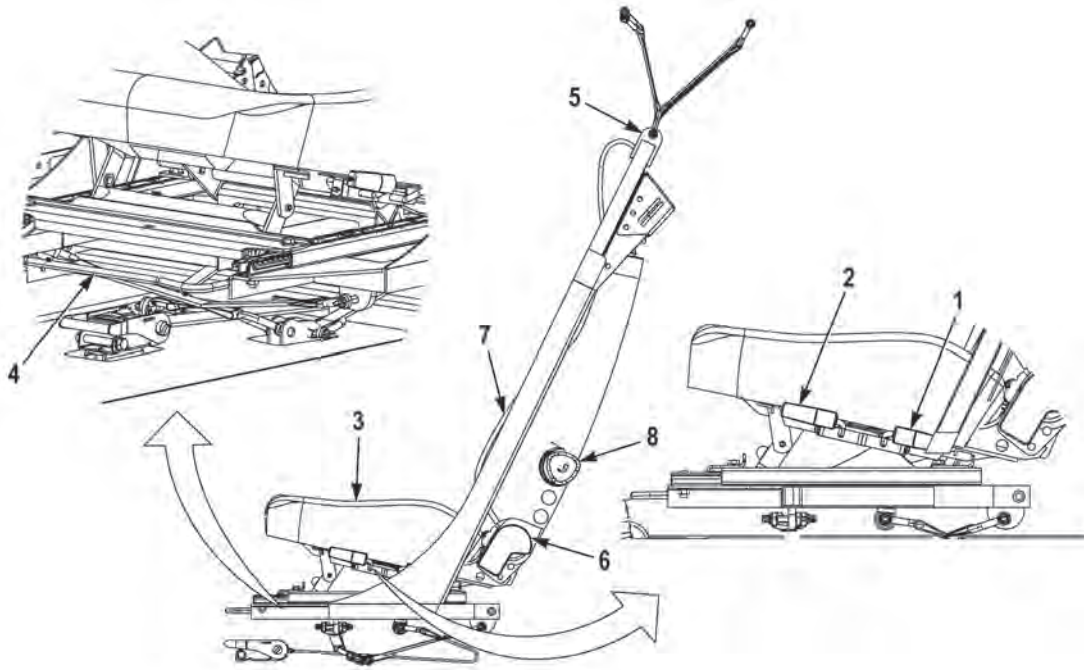
COMBAT LOCK KEY OPERATION (M1245)

**NOTE**

- For front passenger side door and rear driver side door, perform Step (1).
 - For front driver side door and rear passenger side door, perform Step (2).
 - Emergency ingress tool or any tool that will turn combat OVERRIDE knob may be used in emergency situation.
 - The emergency ingress tool (2), is secured with a link pin (3), and must be removed first.
1. Remove link pin (3), and use the emergency ingress tool (2) to rotate combat lock OVERRIDE knob (1) counterclockwise to unlock.
 2. Remove link pin (3), and use the emergency ingress tool (2) to rotate combat lock OVERRIDE knob (1) clockwise to unlock.

END OF WORK PACKAGE

DRIVER SEAT ADJUSTMENT

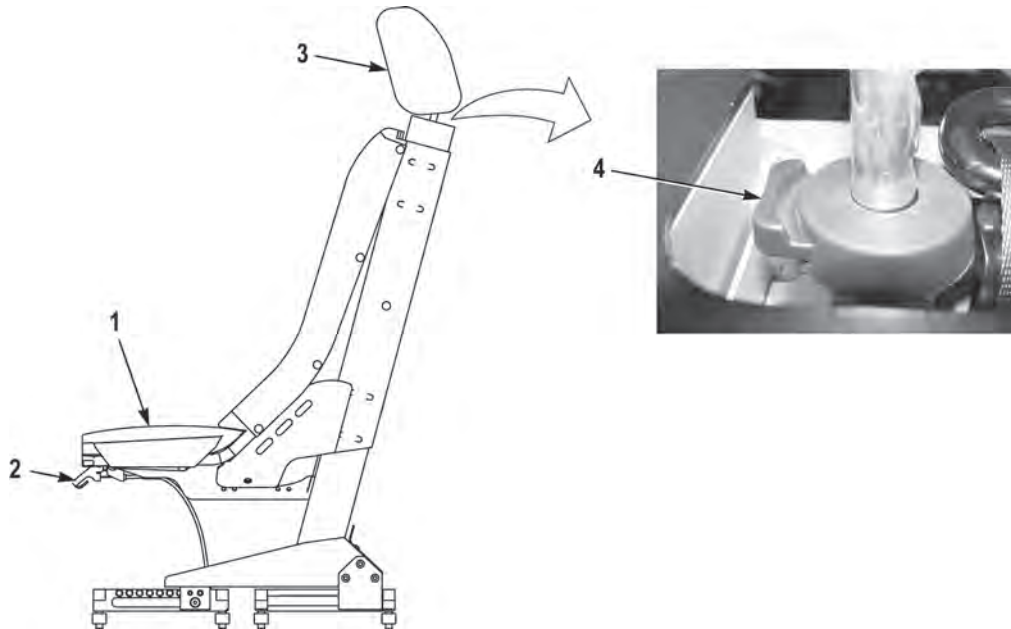
**NOTE**

- For M1240A1 driver and passenger seats adjustment, refer to (WP 0013).
- Prior to adjusting seat height, seat must be in forward position.
- Operator must be able to easily reach brake pedal, throttle pedal, and dash controls with seat adjusted and seat belt and shoulder harness on.

1. Adjust rear seat height, as required, with height adjustment lever (1).
2. Adjust front seat height, as required, with height adjustment lever (2).
3. Adjust seat (3) forward or backward, as required, using adjustment lever (4).
4. Adjust back of seat (5) using adjustment lever (6).
5. Adjust lumbar of seat (7), as required, using adjustment knob (8).

END OF WORK PACKAGE

FRONT SEAT ADJUSTMENT (M1240A1)

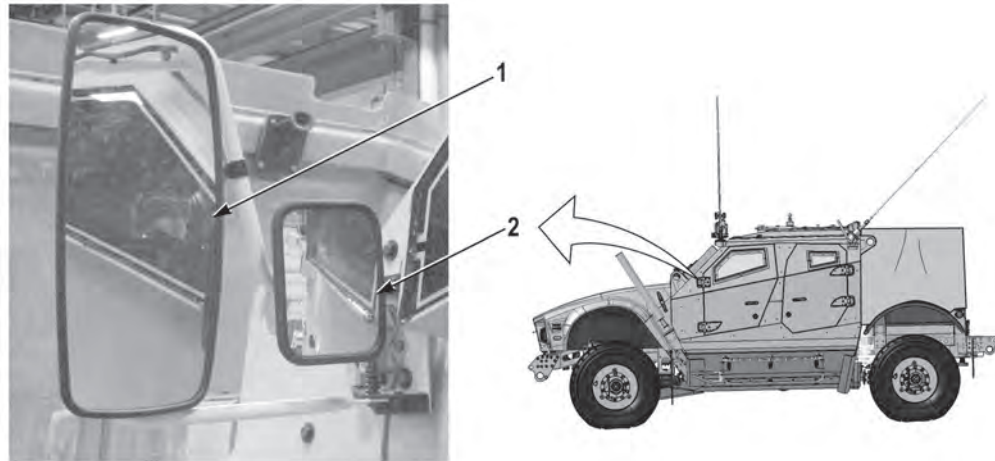
**NOTE**

- Task applies to driver and passenger seats.
- Operator must be able to easily reach brake pedal, throttle pedal, and dash controls with seat adjusted and seat belt and shoulder harness on.

1. Adjust seat (1) forward or backward, as required, using adjustment lever (2).
2. Adjust headrest (3) by pulling up to desired position. To lower headrest push tab (4) on left hand side of headrest (3) and lower headrest to desired position.
3. To remove headrest (3), push tab (4) and pull headrest (3) up from seat (1).
4. Install headrest (3) on seat (1) and adjust as required.

END OF WORK PACKAGE

SIDE VIEW MIRROR ADJUSTMENT

**WARNING**

Ensure side view mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

NOTE

- Both side view mirrors are adjusted the same. Driver side, side view mirror shown.
 - During adjustment of side view mirrors and spotter mirrors driver must be sitting in driver's seat in driving position while assistant adjusts the side view mirrors according to driver's instructions.
1. With the aid of an assistant, adjust side view mirrors (1) and spotter mirrors (2) by pivoting them until back of vehicle and road can be seen.

END OF WORK PACKAGE

AUXILIARY MIRROR ADJUSTMENT

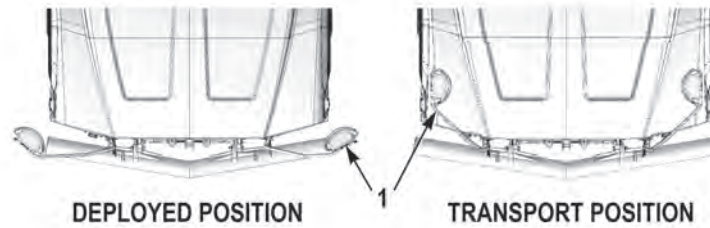


WARNING

Ensure auxiliary mirrors are adjusted to allow for full range of view prior to operating vehicle. Failure to comply may result in injury or death to personnel.

NOTE

- Both auxiliary mirrors are adjusted the same.
 - During adjustment of auxiliary mirrors, driver must be sitting in driver seat in driving position while assistant adjusts the auxiliary mirrors according to driver instructions.
1. With the aid of an assistant, adjust vehicle auxiliary mirrors (1) by pivoting them until mirrors are in desired position.



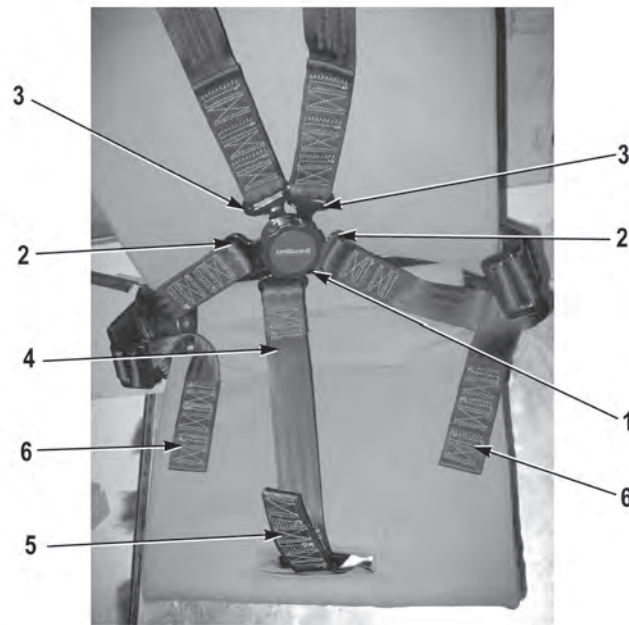
CAUTION

- For transport, auxiliary mirrors should be rotated to the transport position. Do not transport vehicle with auxiliary mirrors in deployed position. Failure to comply may result in damage to equipment.
- When positioning auxiliary mirrors for operation or transportation, apply pressure to attachment arm, not mirror assembly. Failure to comply may result in damage to equipment.

2. Position auxiliary mirrors (1) in deployed or transport position as necessary.

END OF WORK PACKAGE

FIVE-POINT SEAT BELT OPERATION (M1240/M1240A1)

**WARNING**

Always use seat belts when vehicle is in operation. Failure to comply may result in injury or death to personnel.

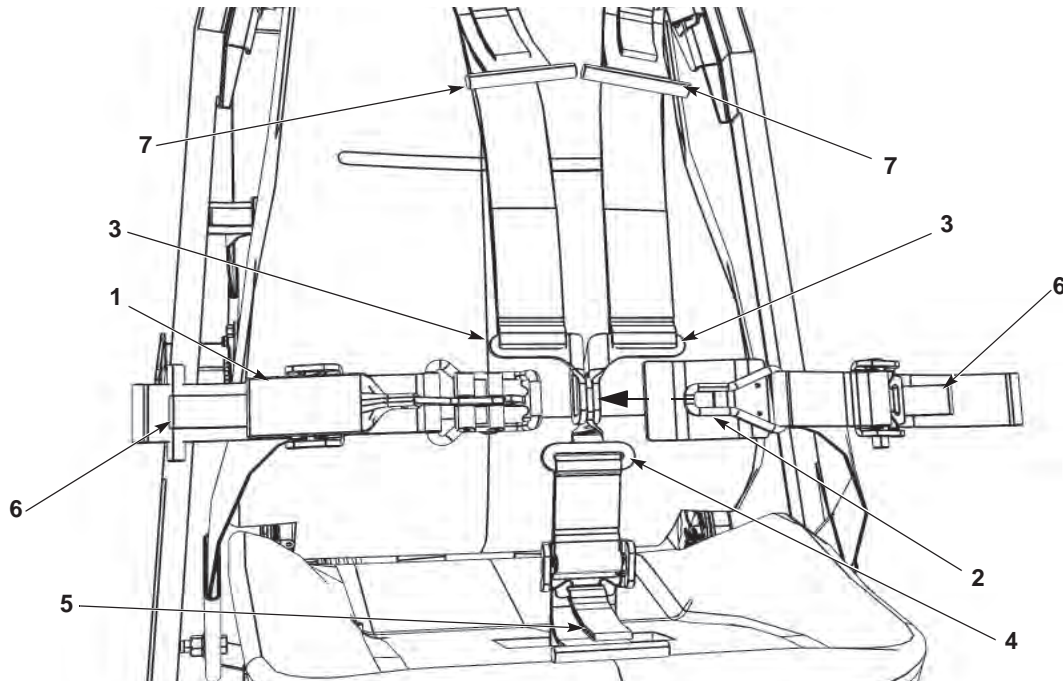
NOTE

- Shoulder harness is the two belts that come through the top of the back of the seat and attach to the top of the buckle.
- Seat belt is the two belts that wrap around from the side of the seat and attach to the sides of the buckle.
- Center belt comes through front center of seat with buckle attached to the top.

1. Turn buckle (1) to center position.
2. Insert two seat belt latches (2) and shoulder harness latches (3) into buckle (1) on center belt (4).
3. Adjust center belt (4) by pulling forward and up on strap (5).
4. Adjust seat belt (2) by pulling on straps (6) until seat belt fits snug at hips.
5. To release seat belt (2) and shoulder harness (3), rotate buckle (1) clockwise or counterclockwise.

END OF WORK PACKAGE

FIVE-POINT SEAT BELT OPERATION (M1245)

**WARNING**

The seat belts must be worn during driving operation. Avoid twisting the straps when putting the seatbelt on and be sure to remove slack. Failure to comply may result in serious death or injury to personnel.

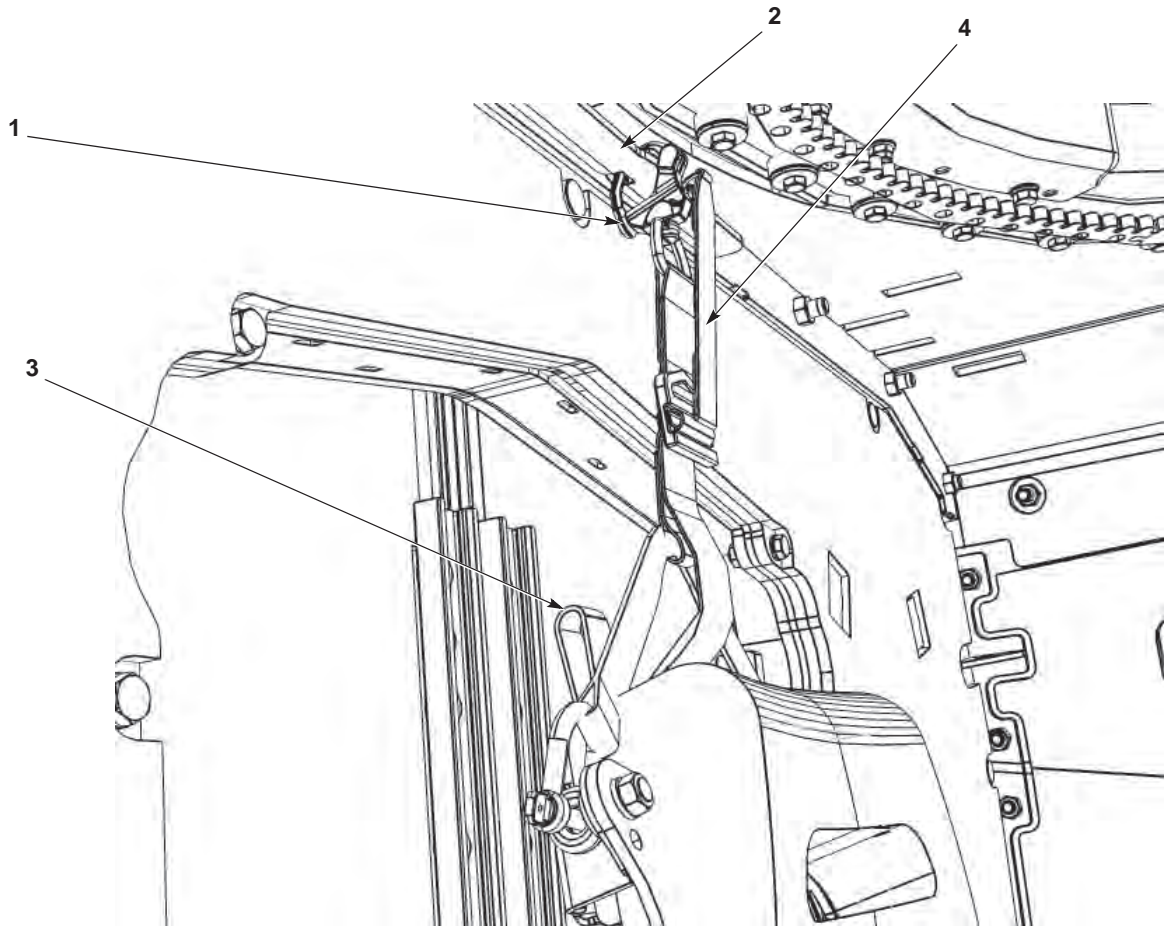
NOTE

- Shoulder harness has two belts that come through the top of the back of the seat and attach to the top of the buckle.
- Seat belt is the two belts that wrap around from each side of the seat.
- Center belt comes through front center of seat with buckle attached to the top.

1. Lift the latch on seat belt buckle (1).
2. Place each shoulder harness link (3) on each side of the center belt link (4).
3. Insert the link of seat belt (2) through the shoulder harness links (3) and center belt link (4).
4. Insert the seat belt buckle (1) into the link of seat belt (2) and close the latch on seat belt buckle (1).
5. Adjust center belt (4) by pulling forward and up on strap (5).
6. Adjust seat belt (2) and seat belt buckle (1) by pulling on straps (6) until seat belt fits snug at hips.
7. Adjust shoulder harness straps (3) by pulling on straps (7).
8. To release, lift the latch on seatbelt buckle (1).

END OF WORK PACKAGE

5TH SEAT OPERATION (M1245)

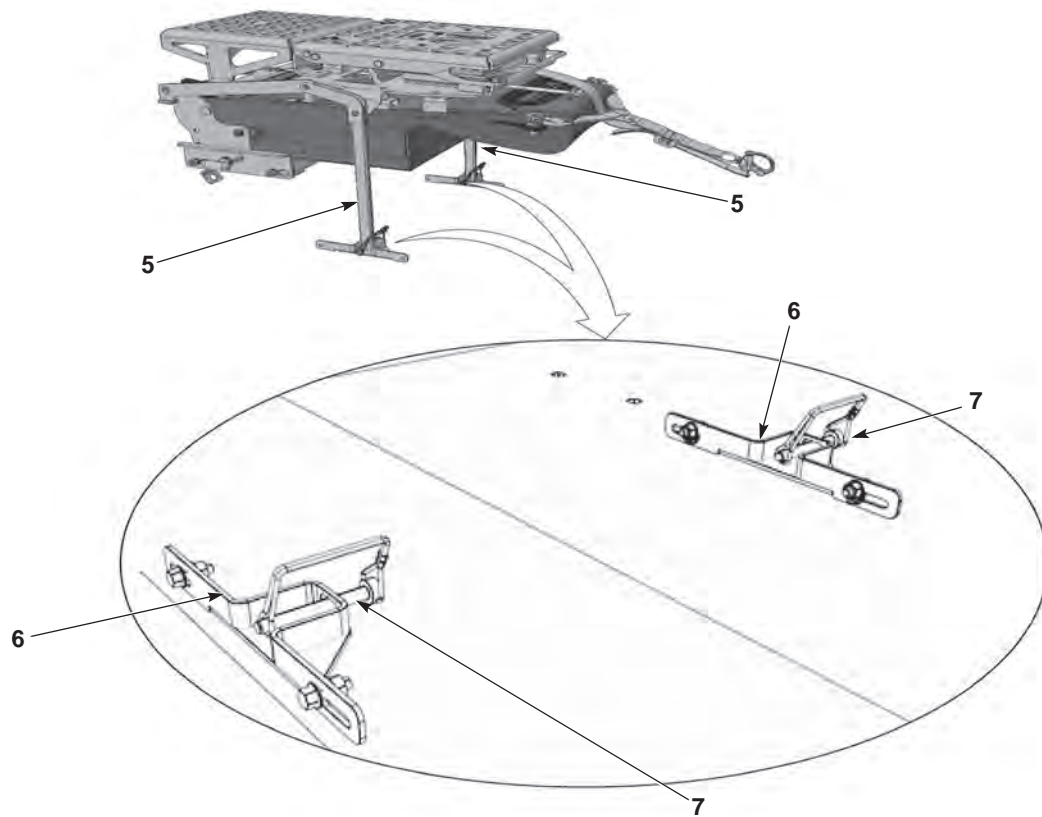
LOWERING THE 5TH SEAT**WARNING**

Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.

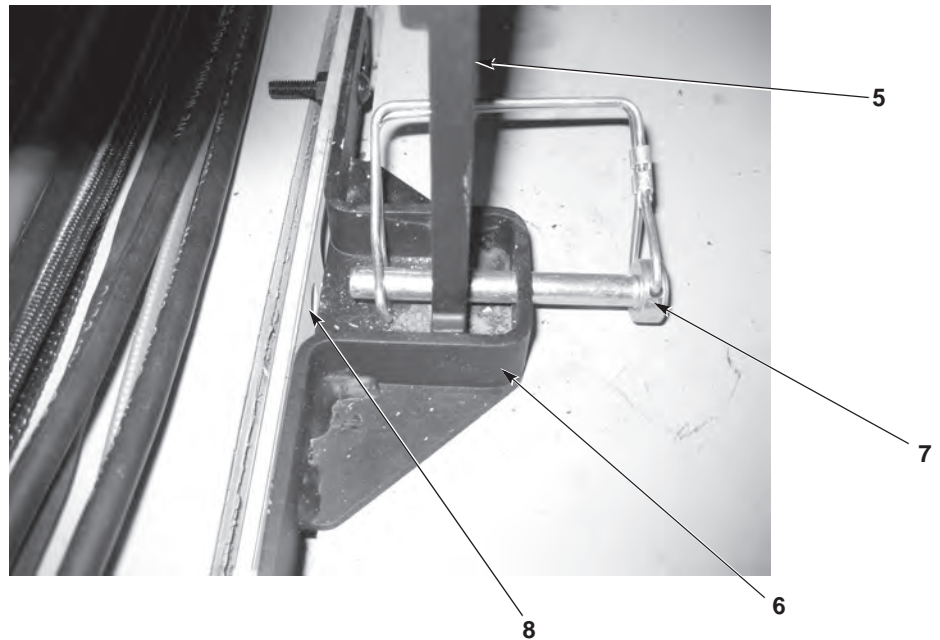
CAUTION

When lowering and raising the 5th seat, ensure the wire harness attached to the arm rest is clear, to avoid rubbing.

1. Pull the top yellow release strap (4) to remove the shackle (1) from the bracket (2).
2. Pull the release strap up (3), and fold the 5th seat down.

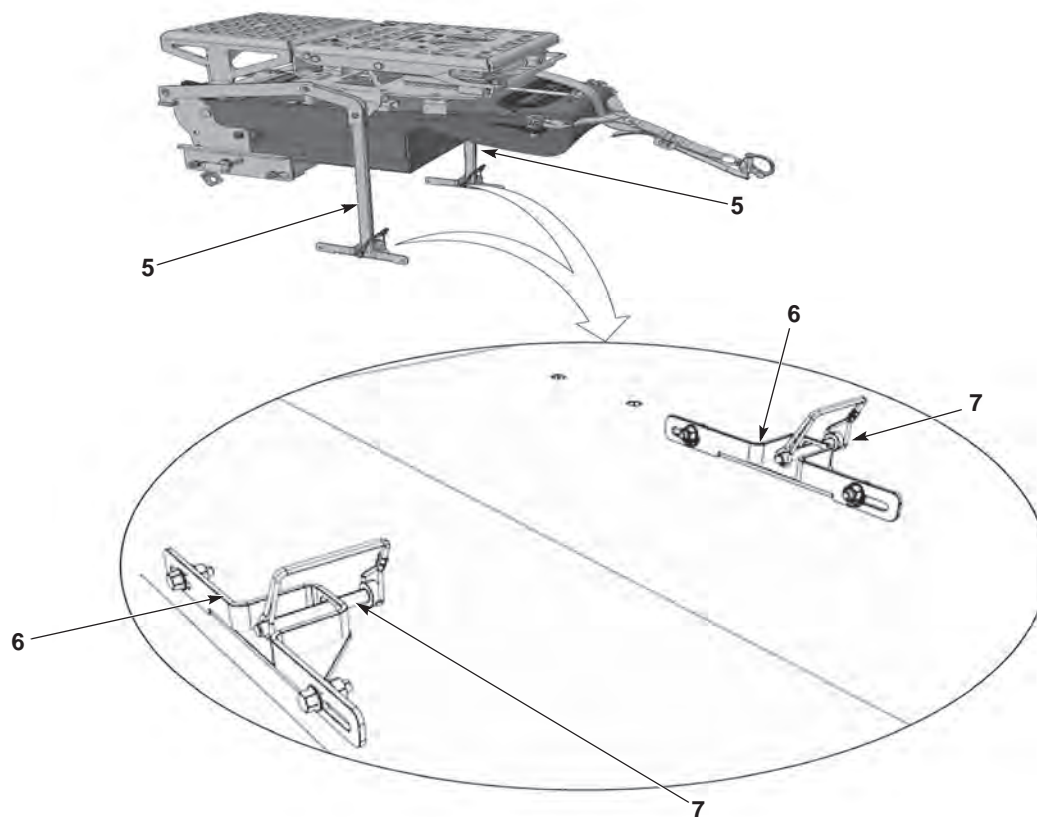
LOWERING THE 5TH SEAT – CONTINUED**WARNING**

- Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.
- Keep hands and fingers away from any pinch point areas of the 5th seat assembly and gunner's platform, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

LOWERING THE 5TH SEAT – CONTINUED**NOTE**

- Before folding the 5th seat down, ensure pins (7) are pulled from each support bracket (6).
 - When the 5th seat is folded, automatic vertical supports will simultaneously unfold from each side of the seat.
 - Pins can only be inserted through the 5th seat support bracket (6) and the vertical support (5), they will not pass through the 3rd hole on the capsule floor (8).
3. Secure each vertical support (5) to their respective 5th seat support bracket (6) using pins (7).

END OF TASK

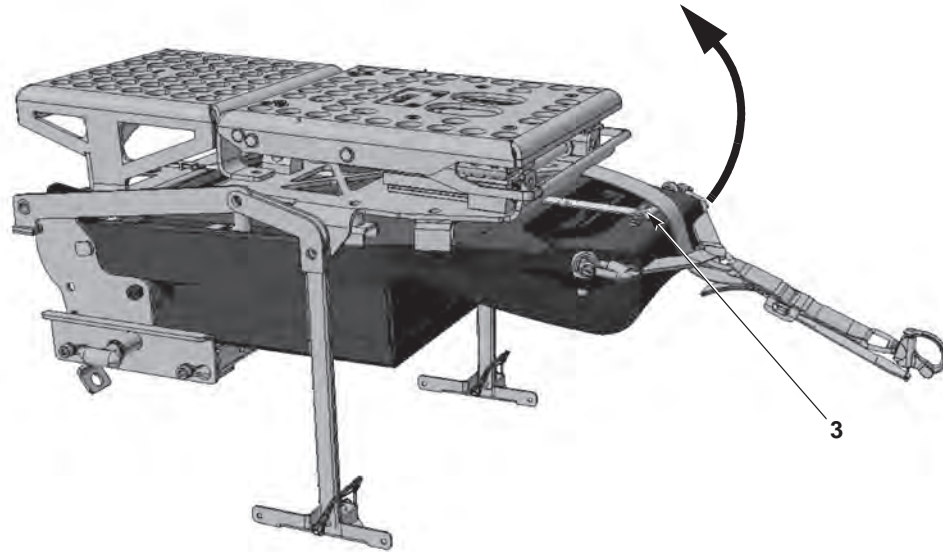
RAISING THE 5TH SEAT**WARNING**

- Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.
- Keep hands and fingers away from any pinch point areas of the 5th seat assembly and gunner's platform, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

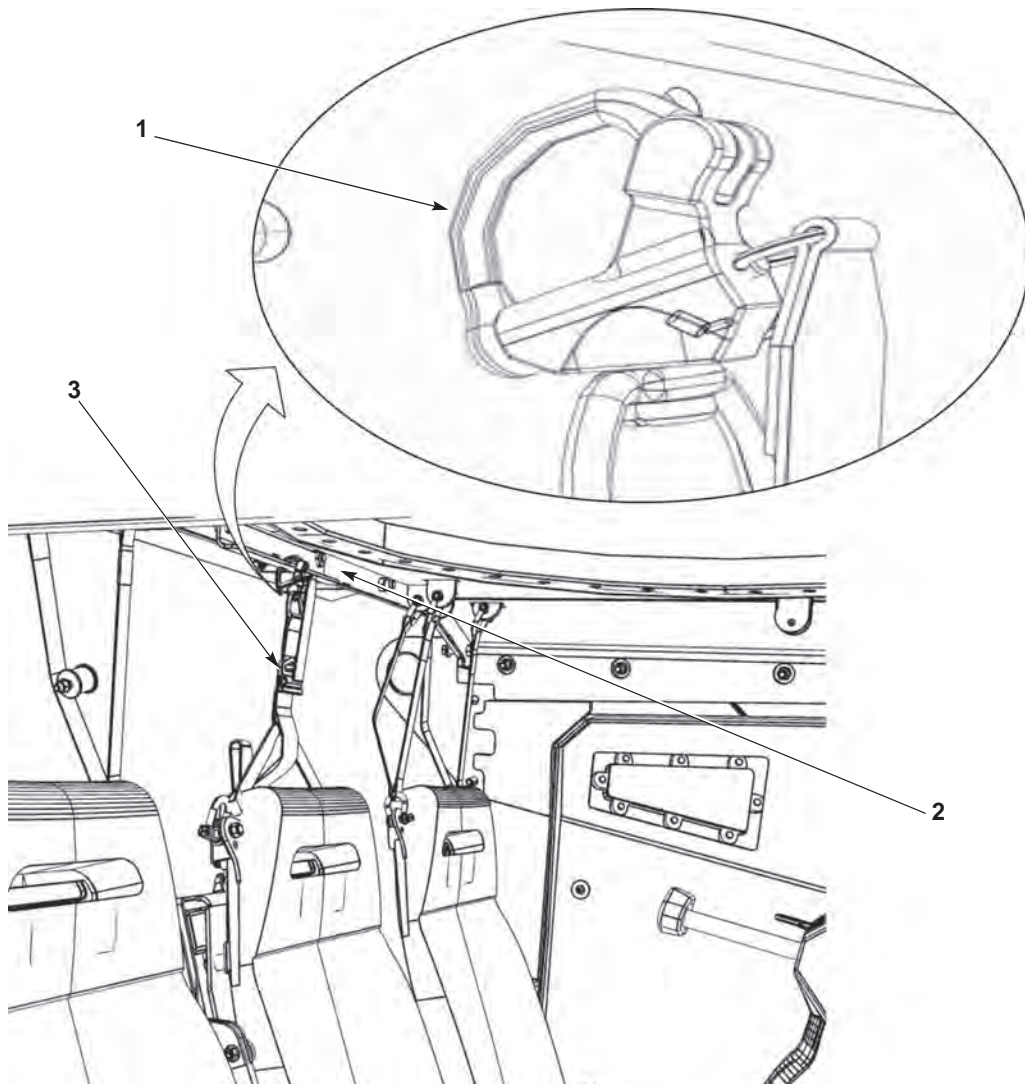
- When the 5th seat is unfolded, automatic vertical supports (5) will simultaneously fold along each side of the seat.
- Gunner's platform MUST be adjusted to the lowest position before raising and securing 5th seat.

1. Remove each pin (7) from their respective 5th seat support bracket (6).

RAISING THE 5TH SEAT – CONTINUED**WARNING**

- Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.
- Keep hands and fingers away from any pinch point areas of the 5th seat assembly and gunner's platform, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

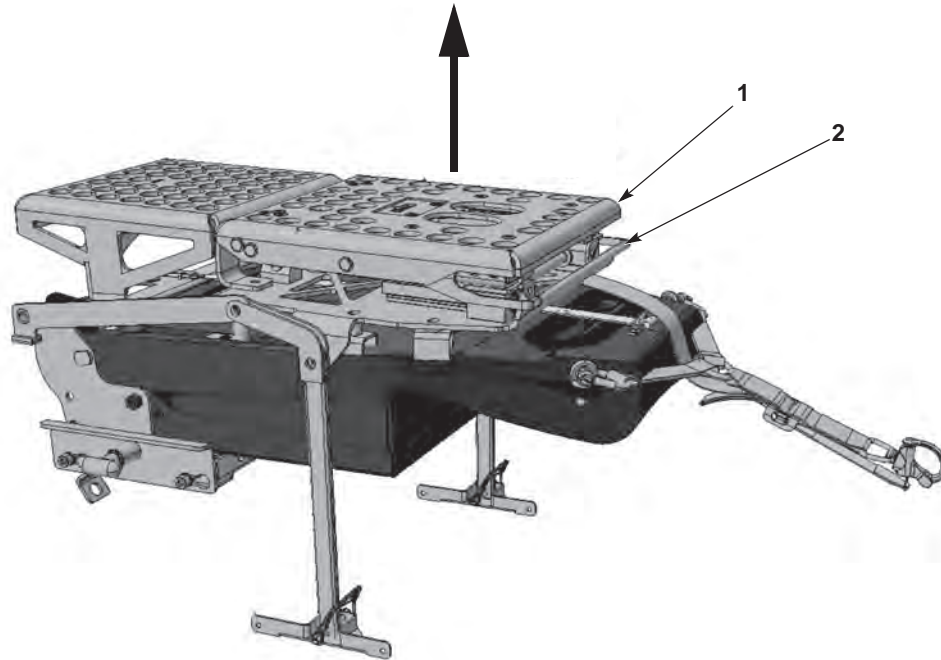
2. Pull the release strap (3), and lift upward on the 5th seat.

RAISING THE 5TH SEAT – CONTINUED**WARNING**

Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.

3. Attach the shackle (1) to the bracket (2), securing the 5th seat in the upright position.
4. Verify that shackle (1) is locked into position.
5. Ensure that the adjustment strap (3) is pulled tight on the 5th seat.

END OF TASK

RAISE GUNNER'S PLATFORM HEIGHT**WARNING**

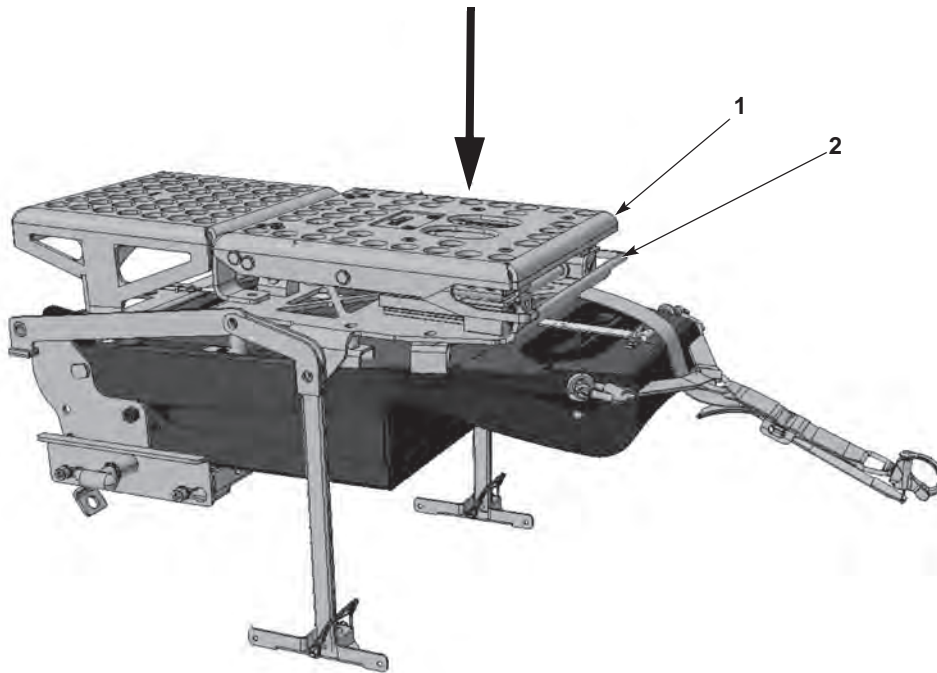
- Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.
- Keep hands and fingers away from any pinch point areas of the 5th seat assembly and gunner's platform, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

5th seat MUST be in the folded position to use the gunner's platform.

1. Pull the gunner's platform adjustment handle (2) and lift the gunner's platform (1) up to raise.

END OF TASK

LOWER GUNNER'S PLATFORM HEIGHT**WARNING**

- Always have top securing shackle or securing pins in place when using the 5th seat and gunner's platform. Failure to comply may result in injury to personnel.
- Keep hands and fingers away from any pinch point areas of the 5th seat assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

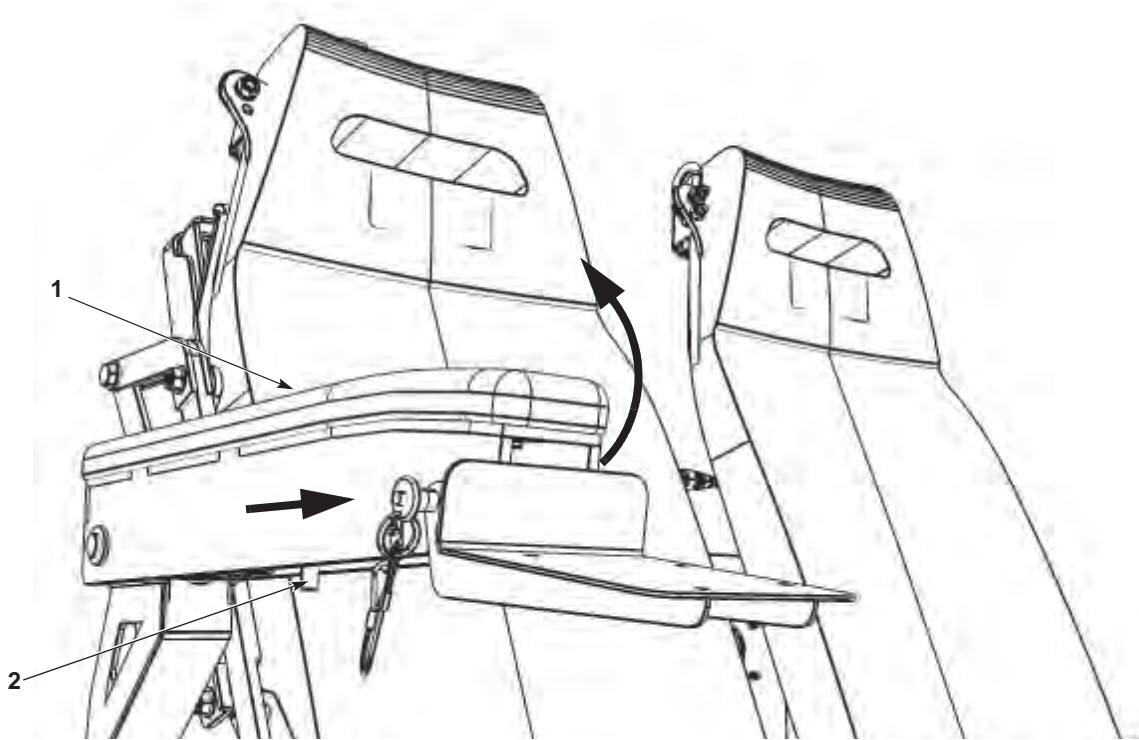
Gunner's platform MUST be adjusted to the lowest position before raising and securing 5th seat.

1. Pull the gunner's platform adjustment handle (2) and push the gunner's platform (1) down to lower.

END OF TASK

END OF WORK PACKAGE

ARM REST - 5TH SEAT OPERATION (M1245)

RAISE ARM REST**WARNING**

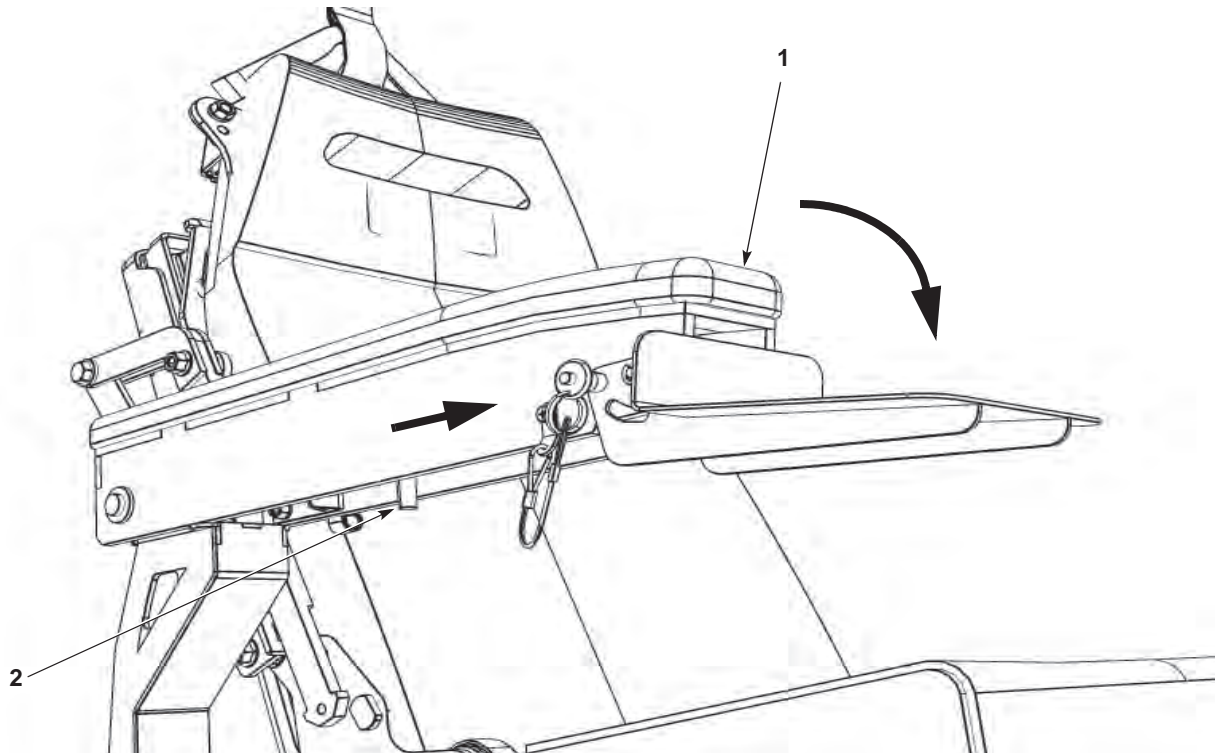
Keep hands and fingers away from pinch point area of the arm rest assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

Latch is located underneath arm rest.

1. Move the arm rest latch (2) forward, and raise the arm rest (1) upward to the locked position.
2. Confirm arm rest latch (2) returns to the locked position.

END OF TASK

LOWER ARM REST**WARNING**

Keep hands and fingers away from pinch point area of the arm rest assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

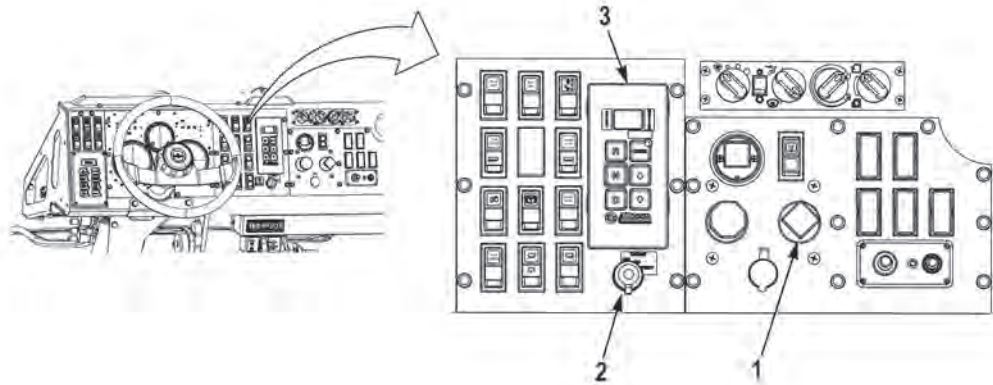
Latch is located underneath arm rest

1. Move the arm rest latch (2) forward, and lower the arm rest (1) down to the locked position.
2. Confirm arm rest latch (2) returns to the locked position.

END OF TASK

END OF WORK PACKAGE

NORMAL START - ABOVE 32°F (0°C)

**WARNING**

Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in injury or death to personnel.

NOTE

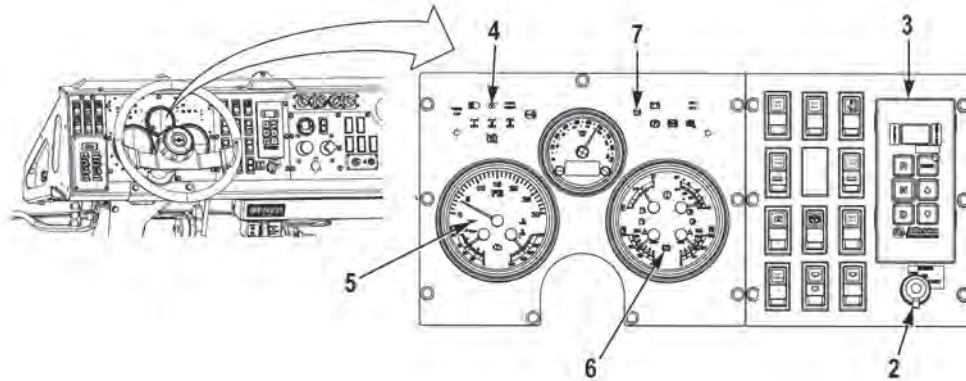
Before attempting to operate vehicle, be sure to perform PMCS. Also, be familiar with all controls and indicators (WP 0007).

1. Turn on battery disconnect switch (WP 0007).
2. Apply parking brake by pulling out on PARKING BRAKE valve (1).

NOTE

Transmission range selector will automatically be set in N (neutral). Reset to neutral if engine stops or if power is interrupted.

3. Turn ignition switch (2) to ON position and ensure transmission range selector (3) is in N (neutral).

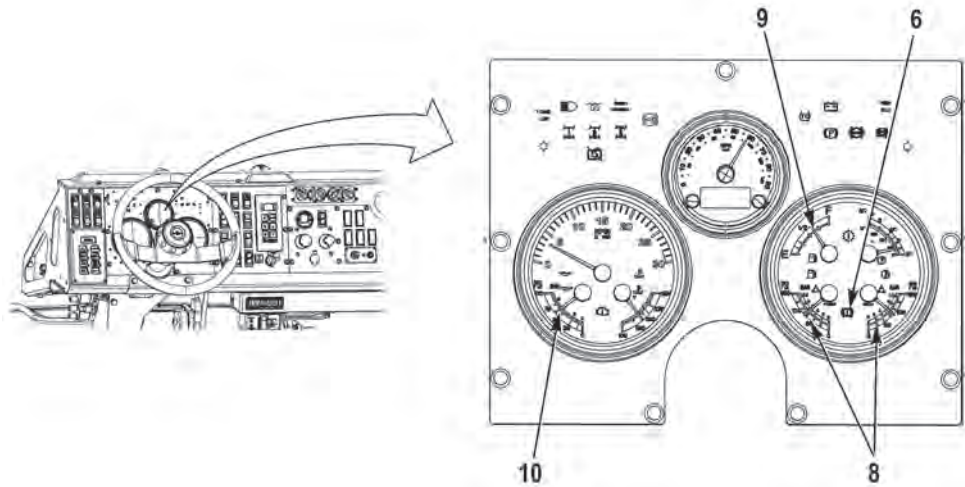


CAUTION

- If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.
- Do not turn ignition switch to START position while engine is rotating. Failure to comply may result in damage to equipment.
- If engine fails to start, wait 15 seconds prior to next start attempt to allow starter to cool. Failure to comply may result in damage to equipment.
- Do not crank engine for longer than 10 seconds. Failure to comply may result in damage to equipment.

NOTE

- Ensure air pressure gauge is in operating range.
 - If air pressure in the brake system is low, a warning buzzer and LOW AIR warning lights in capsule will activate. This is normal for initial starts. Buzzer and lights will shut off once air pressure builds up to 64 to 76 psi (441 to 524 kPa).
 - If engine fails to start, ignition switch must be returned to OFF position prior to next start attempt.
 - LOW AIR warning light may illuminate.
4. When WAIT TO START light (4) goes out, turn ignition switch (2) to START position until engine starts. Release ignition switch (2). Ignition switch (2) will spring back to ON position. Low oil pressure light (5) and LOW AIR warning light (6) may illuminate. ATC light (7) will illuminate.

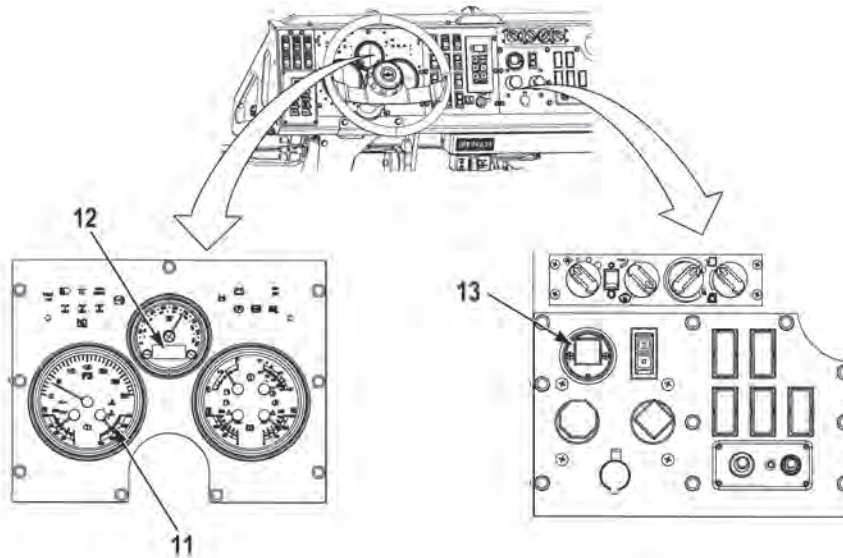


CAUTION

If oil pressure gauge does not show engine oil pressure within 10 to 15 seconds after starting engine, shut off engine immediately and refer to Troubleshooting Symptoms. Lack of lubrication will damage engine.

NOTE

- Engine warning light will illuminate for 10 to 15 seconds after startup. Check that oil pressure gauge reads in safe operating range and low oil pressure warning light is not lit.
 - If both air pressure gauges do not read 100 to 125 psi (689 to 862 kPa) after warm-up, shut off engine and notify Field Maintenance.
5. Run engine at 800 to 1000 rpm for three minutes.
 6. Check that both needles on air pressure gauges (8) read 100 to 125 psi (689 to 862 kPa).
 7. Check that LOW AIR warning light (6) remains illuminated until gauges reach 64 to 76 psi (441 to 524 kPa).
 8. Check that FUEL gauge (9) shows sufficient fuel to complete mission.
 9. Check that oil pressure gauge (10) reads in safe operating range.



NOTE

WATER TEMP gauge may not show reading at engine idle.

10. Check that WATER TEMP gauge (11) does not read over 220°F (104°C).
11. Check LCD screen (12) for voltage reading of between 24 and 30 volts (WP 0027).
12. Check that air filter restriction indicator (13) shows green and less than 15 in.h20 (3.74 kPa).

NOTE

To complete a mission, vehicle may be operated until air filter restriction indicator reads up to a maximum of 20 in.h20 (5.0 kPa).

13. If air filter restriction indicator (13) reads 15 in.h20 (3.74 kPa) or more, notify Field Maintenance.
14. Check that fire suppression power loss alarm is unsilenced (WP 0007).

END OF WORK PACKAGE

OPERATE SERVICE BRAKES

ANTILOCK BRAKE SYSTEM (ABS) LIGHT THEORY OF OPERATION

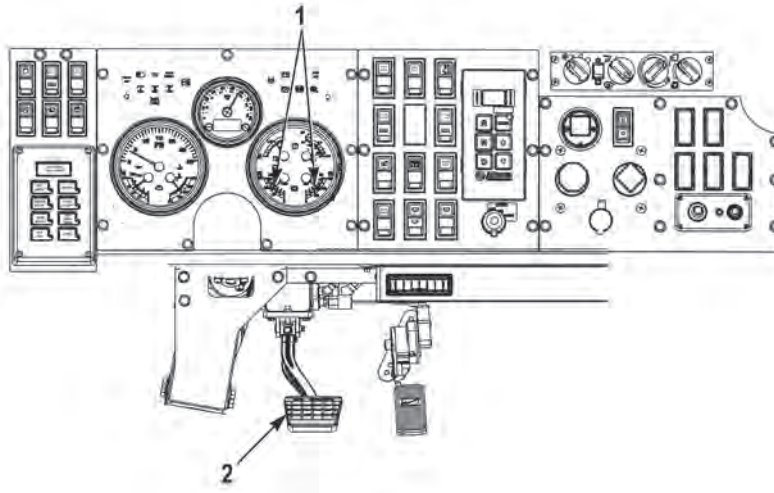
1. The ABS light (WP 0007) on the dash will illuminate steadily for a two second bulb check whenever the ignition switch is turned ON. The ABS light turns OFF after the two second bulb check if there are no ABS malfunctions. If the light remains ON after the two second bulb check, or if the light comes ON and illuminates steadily while operating the vehicle, there is a malfunction with the ABS. Notify Field Maintenance if ABS light indicates a malfunction in the ABS.

NOTE

If the ABS light indicates a malfunction, the ABS and possibly the ATC system may be disabled. If the ABS and/or ATC is disabled, the emergency and service brake systems remain functional.

2. The ABS light will flash slowly when CTIS is set to CC, MSS, or EMER terrain settings (WP 0031) to indicate that the ABS is disabled. This indication is normal and does not indicate a malfunction in the ABS.

END OF TASK

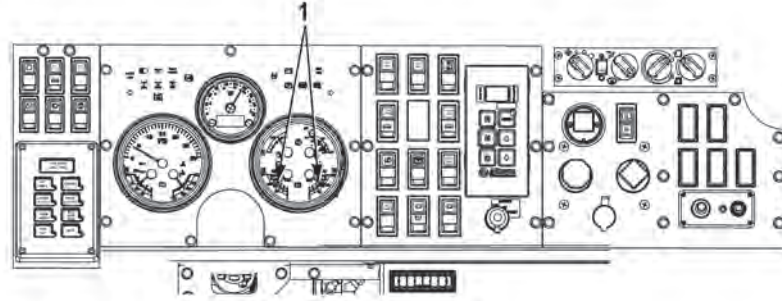
OPERATION OF SERVICE BRAKES FOR M1240 AND M1240A1**WARNING**

- **Rapid operation of service brakes will consume compressed air supply. If red needle of air pressure gauge reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.**
- **Maximum braking requires 85 psi (586 kPa) or more air pressure for service brakes, as indicated by red needle of air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in injury or death to personnel.**

1. Prior to operating vehicle, ensure both air pressure gauges (1) read at least 120 psi (827 kPa).
2. Push down and hold service brake pedal (2) as required to slow or stop vehicle.

END OF TASK

OPERATION OF SERVICE BRAKES FOR M1245

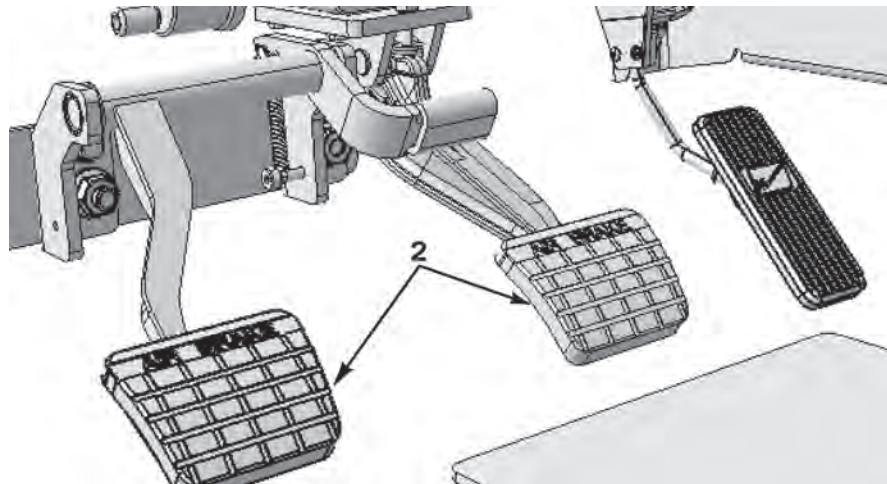


WARNING

- Rapid operation of service brakes will consume compressed air supply. If red needle of air pressure gauge reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.
- Maximum braking requires 85 psi (586 kPa) or more air pressure for service brakes, as indicated by red needle of air pressure gauge. If air pressure drops below 100 psi (690 kPa), braking ability will be reduced. If air pressure continues to drop, air system is malfunctioning. Operating vehicle with reduced air pressure may result in injury or death to personnel.

NOTE

- Both brake pedals operate the same way.
 - Any instruction given in this manual for operating the right brake pedal applies to the left brake pedal as well.
1. Prior to operating vehicle, ensure both air pressure gauges (1) read at least 120 psi (827 kPa).



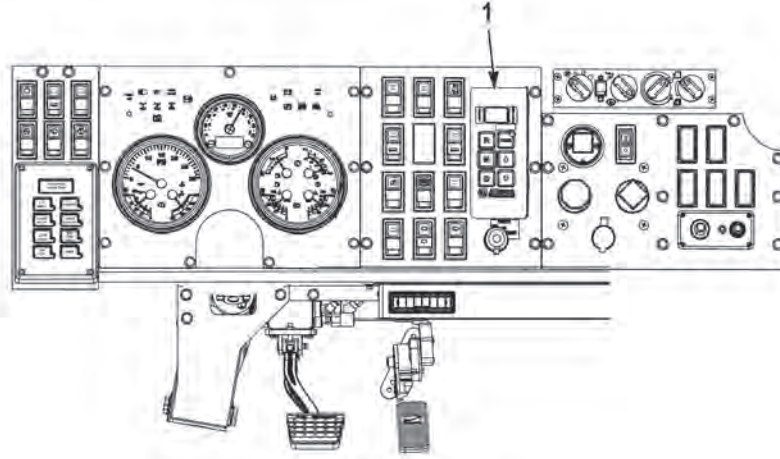
2. Push down and hold either service brake pedal (2) as required to slow or stop vehicle.

END OF TASK

END OF WORK PACKAGE

OPERATE TRANSMISSION

OPERATE TRANSMISSION



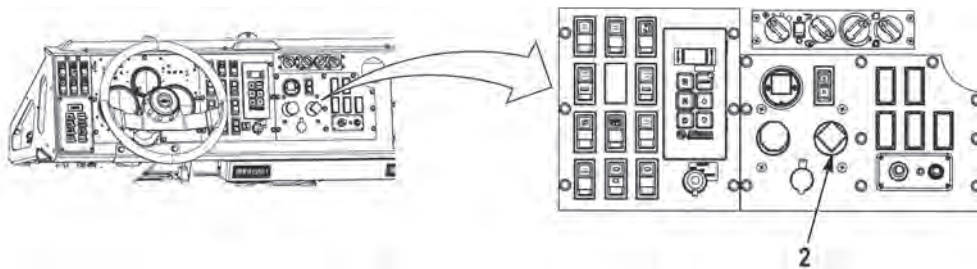
1. Start engine (WP 0020).

WARNING

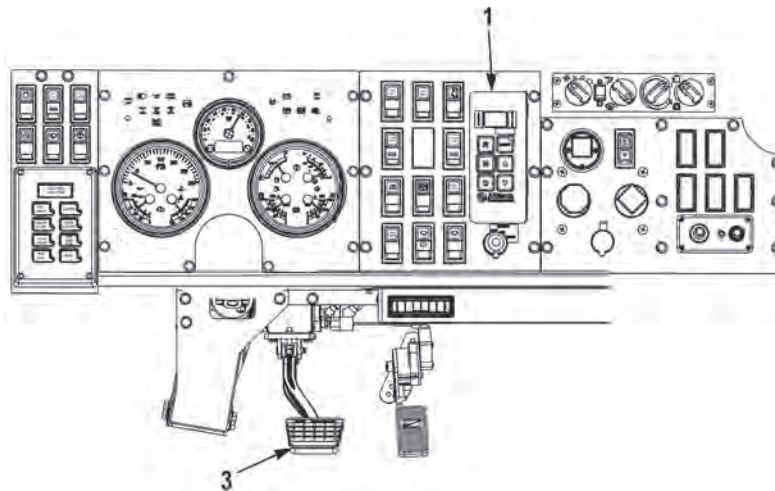
- **The driver's field of view is limited. Ground guides must be used when operating in congested areas or when operating in reverse. Ground guides must stand clear of the vehicle and remain within view of the driver. Failure to comply may result in injury or death to personnel and damage to equipment.**
- **The vehicle has a high center of gravity. Slow down for turns and other maneuvers. Approach slopes head on and avoids side slopes when possible. Failure to comply may result in injury or death to personnel and damage to equipment.**
- **Single hearing protection is required in and around an operating vehicle. Double hearing protection is required during weapons firing. Failure to comply may result in injury to personnel.**

NOTE

- Transmission range selector has six buttons and a digital display. The six buttons are R (reverse), N (neutral), D (drive), ^ (up), v (down), and MODE. The vehicle has six forward gears. Maximum forward gear available is gear six.
 - When vehicle is positioned in D (drive), gear six is automatically chosen and displayed in digital display window. The transmission automatically upshifts and downshifts within the selected range during vehicle operation.
 - Digital display at the top left of the transmission range selector displays the top forward gear of gear range selected and can be changed by using ^ (up), v (down) buttons. The digital display at the top right of the transmission range selector displays what gear the vehicle is currently in.
2. Ensure transmission range selector (1) is set to N (neutral).



3. Push in PARKING BRAKE control (2) to release parking brake.



CAUTION

Service brake pedal must be applied and vehicle stopped when shifting among D-N-R shift selections. Failure to comply may result in damage to equipment.

4. Apply service brake pedal (3) and push appropriate buttons on transmission range selector (1) to set transmission range to desired position.

WARNING

Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

5. To move vehicle backward, select R (reverse).

WARNING

If the operator leaves the vehicle, even momentarily, when engine is running, the transmission MUST be in N (neutral), PARKING BRAKE must be engaged, and wheel MUST be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.

6. To start or park vehicle, select N (neutral).
7. To drive in normal conditions or move forward from a stopped position, select D (drive).

END OF TASK

TRANSMISSION LIMP HOME PROCEDURE

1. Select R (reverse) on the transmission range selector and note if the vehicle does shift.
2. If vehicle does shift into R (reverse), set transmission range selector to appropriate position, continue with mission, and notify Field Maintenance when mission is completed.
3. If vehicle does not shift into R (reverse), the transmission may be locked into a specific gear and may not come out of that gear until the engine is turned OFF. The operator must be aware that once the engine is turned OFF, the vehicle will not be operable until the problem is corrected.

WARNING

When operating the vehicle in the transmission limp home mode, the operator must not rely on the parking brake to hold the vehicle in place. The service brakes must also be applied. Failure to comply may result in injury or death to personnel.

4. No additional damage to the transmission will occur, so the operator can continue to operate the vehicle in the limp home mode and complete the mission. However, the operator must be aware of a few guidelines:
 - a. The engine must not be turned OFF until the operator deadlines the vehicle. Once the engine is turned OFF, the vehicle will not be operable until the problem is corrected.
 - b. As the engine cannot be turned OFF and the transmission is locked into gear, the operator will not be able to leave the cab until the vehicle is deadlined.
 - c. The vehicle will not be able to operate in reverse.
 - d. Depending on the gear the transmission is locked into, the vehicle may not be able to drive up steep grades.
 - e. The brakes may need to be applied slightly earlier than normal when stopping the vehicle.
 - f. Depending upon the gear the transmission is locked into and the terrain the vehicle is operating in, the engine or transmission may overheat. The operator must closely monitor the Water Temperature Gauge and the Transmission Oil Temperature Gauge (WP 0007).

CAUTION

If overheating occurs when operating in the transmission limp home mode, the operator should stop the vehicle (do not turn off the engine) and allow the transmission and engine to cool down to normal operating levels. If the engine and transmission do not cool down or overheating reoccurs, the operator should turn off the engine and notify Field Maintenance. Failure to comply may result in damage to equipment.

5. Once vehicle is deadlined, the operator must notify Field Maintenance.

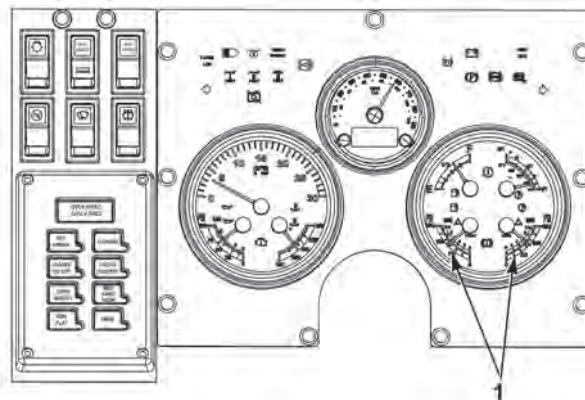
END OF TASK

END OF WORK PACKAGE

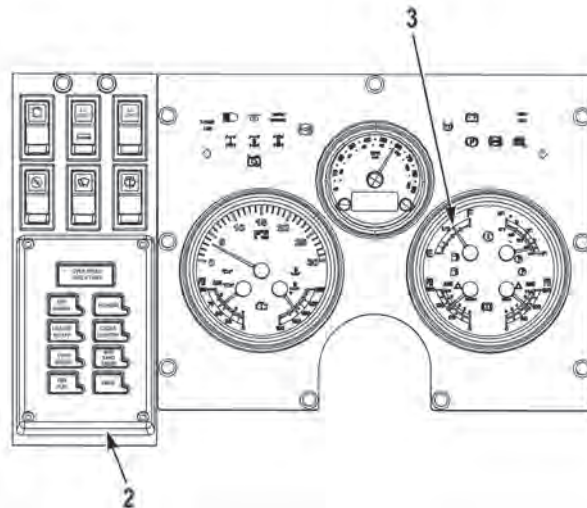
NORMAL DRIVING PROCEDURES

WARNING

- If the operator leaves the vehicle, even momentarily, when engine is running, the transmission **MUST** be in N (neutral), **PARKING BRAKE** must be engaged, and wheel **MUST** be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.
 - Increased effort will be required to turn steering wheel if there is a failure of hydraulic steering system or engine stops running. Stop vehicle as soon as road conditions permit. Operating vehicle with impaired steering could result in 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 and notify Field Maintenance. Failure to comply may result in injury or death to personnel and/or damage to equipment.
 - Diesel fuel is flammable. Do not fill the fuel tank while the engine is running, while smoking, or near open flames. Avoid overfilling the fuel tank and immediately clean up spilled fuel. Avoid operating electrical equipment, such as radios and personnel heaters, while refueling. Failure to comply may cause explosions and fire, and may result in injury or death to personnel and damage to equipment.
1. Drive forward.
 - a. Remove and stow wheel chocks (WP 0009).
 - b. Adjust seat as required (WP 0012) M1240/M1245 or (WP 0013) M1240A1.
 - c. Adjust each side view mirror (WP 0014).
 - d. Adjust auxiliary mirrors (if equipped) (WP 0015).
 - e. Secure any items located in cargo deck.
 - f. Adjust and fasten seatbelt (WP 0016) M1240/M1240A1 or (WP 0017) M1245.
 - g. Start engine (WP 0020).
 - h. Turn on lights as required (WP 0028).



- i. Make sure both air pressure gauges (1) read at least 120 psi (827 kPa) before driving vehicle.



WARNING

- Rapid operation of service brakes will consume compressed air supply. If red needle of air pressure gauge reads approximately 45 psi (310 kPa) or less, spring brakes will be applied automatically, causing vehicle to stop rapidly. Always observe air pressure gauge. Failure to comply may result in damage to equipment or injury to personnel.
- Make sure both air pressure gauge needles read at least 120 psi (827 kPa) and that LOW AIR indicator lights have gone out and warning alarm has quit sounding before pushing in PARKING BRAKE control valve and driving vehicle. If LOW AIR indicator light comes back on and warning alarm sounds when PARKING BRAKE control valve is pushed in, pull PARKING BRAKE control valve out and allow more air to build up in system. Do NOT drive vehicle until PARKING BRAKE control valve can be pushed in without LOW AIR indicator light coming on and warning alarm sounding. Failure to comply may result in damage to equipment or injury to personnel.

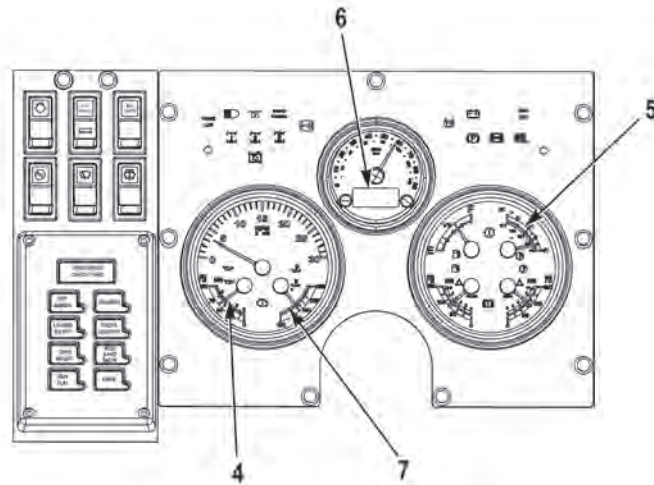
CAUTION

Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.

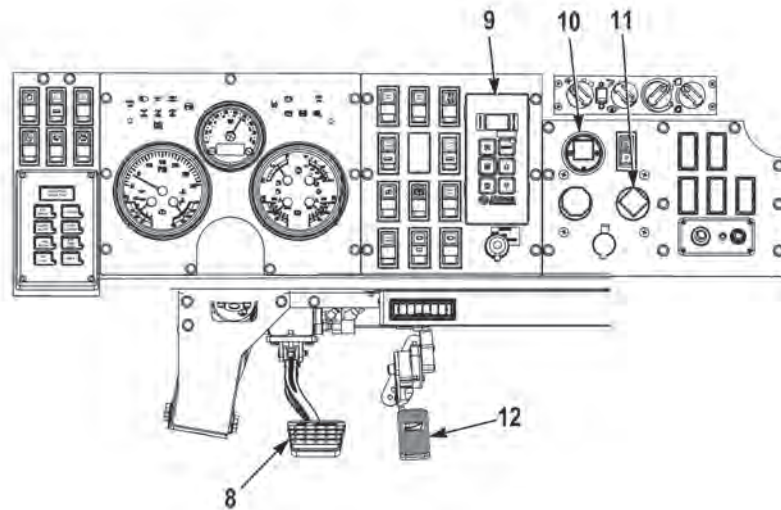
NOTE

For a detailed explanation of the CTIS refer to (WP 0031).

- j. Set CTIS controller (2) to appropriate settings.
- k. Check that fuel gauge (3) indicates enough fuel to complete mission.



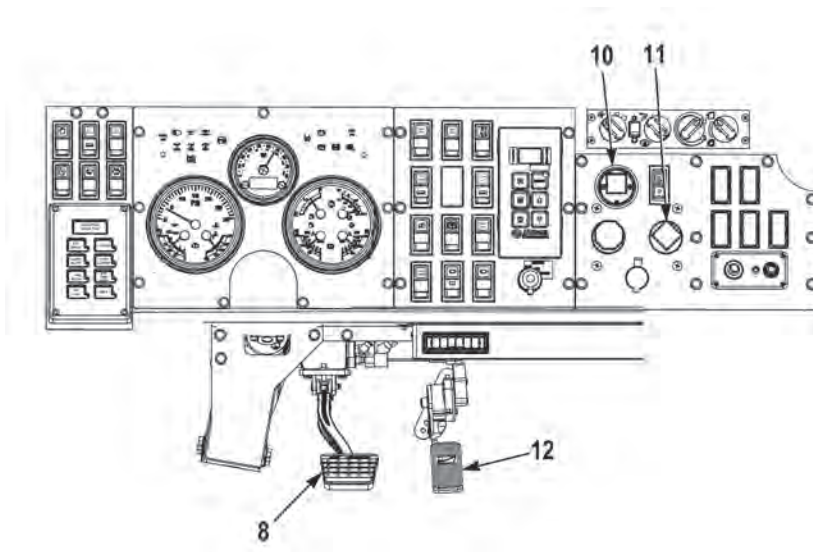
- l. Check that oil pressure gauge (4) indicates safe range at idle and increases as engine speed increases.
- m. After transmission warms up, check that transmission oil temperature gauge (5) reads below 250°F (121°C).
- n. Check LCD screen (6) for voltage reading of 24 to 30 volts (WP 0027).
- o. Check that water temperature gauge (7) reads below 220°F (104°C).



WARNING

Do not back up without a ground guide. Failure to comply may result in damage to vehicle or injury or death to personnel.

- p. Apply service brake pedal (8) and set transmission range selector (9) to appropriate range.
- q. Check that air filter restriction indicator (10) shows green and less than 15 inches.



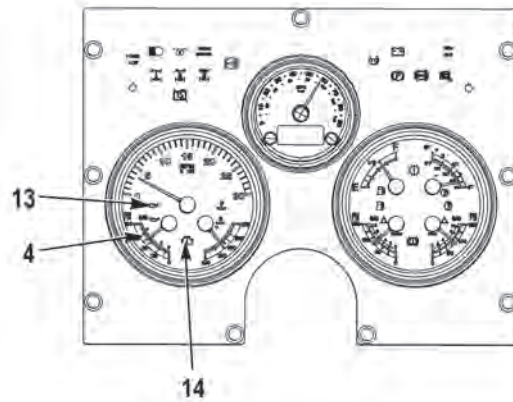
NOTE

To complete a mission, vehicle may be operated until air filter restriction indicator reads up to a maximum of 20 inches.

- r. If air filter restriction indicator (10) reads 15 inches or more, notify Field Maintenance.
- s. Push in PARKING BRAKE control valve (11).
- t. Release service brake pedal (8) and slowly press down on throttle pedal (12).

CAUTION

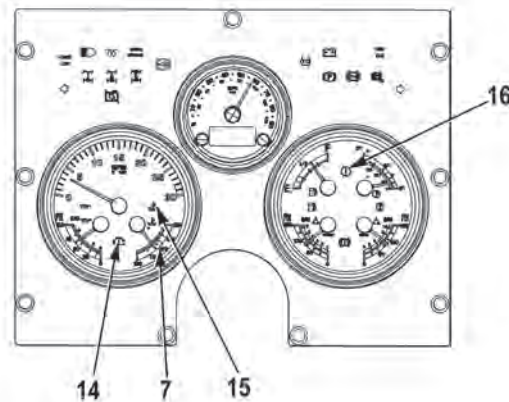
- Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result. Failure to comply may result in damage to equipment.
 - CTIS increases tire pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until tires are inflated to correct pressure (WP 0031). Failure to comply may result in damage to equipment.
 - Do not allow vehicle to coast in N (neutral). This can result in severe transmission damage and unsafe operation.
 - Maximum governed engine speed with transmission in N (neutral) is approximately 2600 rpm. Never allow engine speed to exceed this figure. Under load, governed speed is approximately 2600 rpm. If engine is allowed to go over governed speed, engine damage can result.
- u. Accelerate, brake, and steer as required.
 - v. Check system gauges often.



NOTE

Engine oil pressure has three monitoring systems: low oil pressure light, check engine light, and oil pressure gauge. If two of the three systems indicate a problem, park vehicle, shut off engine, and notify Field Maintenance. If only one system indicates a problem, and the other two indicate normal, proceed with mission and then notify Field Maintenance.

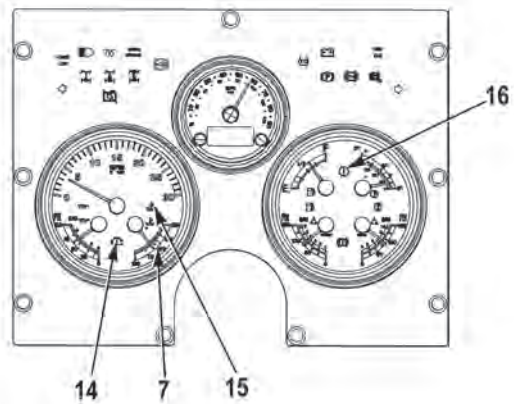
- w. Check engine oil pressure by monitoring oil pressure gauge (4), oil pressure light (13), and check engine light (14).



NOTE

- Engine coolant temperature has three monitoring systems: water temperature light, check engine light, and water temperature gauge. If two of the three systems indicate a problem, park vehicle and idle engine at 800 to 1000 rpm until water temperature cools down. If water temperature does not cool down, notify Field Maintenance.
- If only one system indicates a problem, and the other two indicate normal, proceed with mission and then notify Field Maintenance.

- x. Check engine coolant temperature by monitoring water temperature gauge (7), check engine light (14), and water temperature light (15).
- y. If the check engine light (14) illuminates other than at startup, there is a problem in the engine that could cause damage to the engine. Check for low oil pressure or high water temperature. If indications are normal, continue the mission. Notify Field Maintenance at completion of mission.



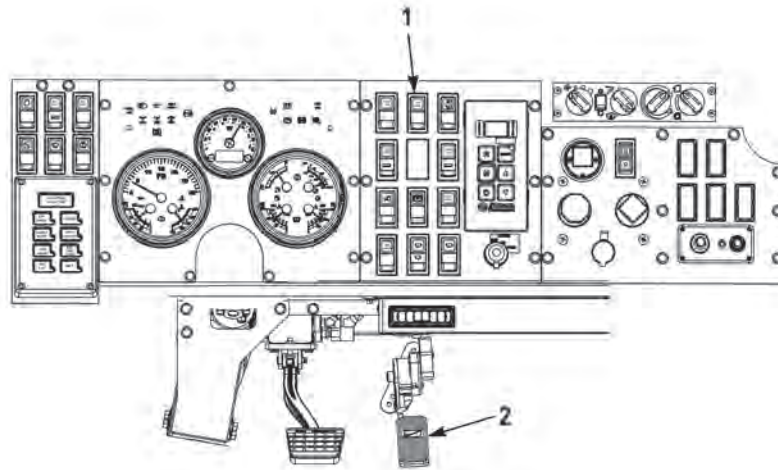
NOTE

If transmission check light illuminates at any time other than startup, do NOT turn off engine or shift transmission to neutral (N).

- z. If the transmission check light (16) illuminates other than at startup, there is a potential problem in the transmission and transmission may need to be serviced. Check for correct oil level and high transmission oil temperature. If indications are normal, continue the mission. Notify Field Maintenance at completion of mission.

END OF WORK PACKAGE

OPERATE EXHAUST BRAKE/RETARDER

**WARNING**

Use exhaust brake/retarder only when vehicle tires have good traction. Use of exhaust brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

NOTE

- Service brakes may be used in addition to exhaust brake/retarder to obtain maximum braking.
- Use exhaust brake/retarder when long application of service brakes are not desired (i.e., long downgrades).
- Exhaust brake/retarder will not engage when transmission is in first gear.
- Exhaust brake/retarder disengages when engine speed drops below 1200 rpm or when accelerator is reengaged.

1. Set exhaust brake/retarder ON/OFF switch (1) to ON (up).

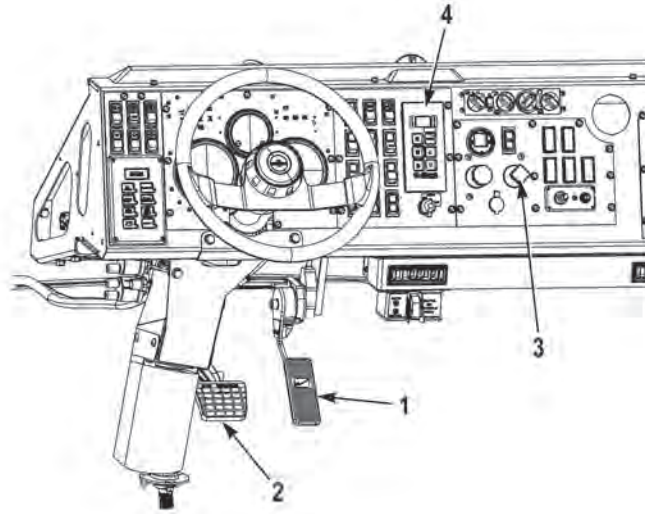
NOTE

- When exhaust brake/retarder is engaged and vehicle is decelerating, the No. 2 will be displayed on the transmission digital display showing the gear that the transmission is down shifting to, while the right side will continue to show the current gear the vehicle is in.
- Optimum braking occurs with engine between 1650 and 2600 rpm. Select appropriate transmission range to maintain desired effect.

2. Lift foot off throttle pedal (2). Exhaust brake/retarder will automatically slow vehicle.
3. When no engine braking is required, turn exhaust brake/retarder switch (1) to OFF.

END OF WORK PACKAGE

PARK VEHICLE

**WARNING**

- Perform this task with the aid of an assistant while ground guiding. Failure to comply may result in injury or death to personnel.
- When parking on steep grades, the CTIS must be in MSS or EMER setting in order to lock transfer case and create more stability. Driveline must be in full lock condition prior to shutting off engine. Failure to comply may result in injury or death to personnel.

1. Lift foot off of throttle pedal (1). Allow automatic downshifting of transmission to slow vehicle.

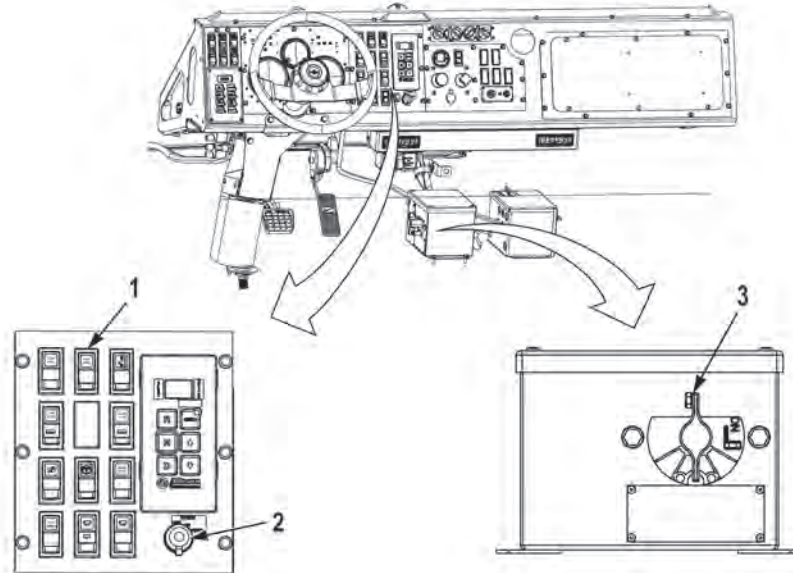
WARNING

Rapid operation of service brakes will consume compressed air supply and cause automatic spring brake application. Always observe air pressure gauges. Failure to comply may result in damage to equipment or injury to personnel.

2. Push down on service brake pedal (2) until vehicle comes to complete stop.
3. Pull out PARKING BRAKE control valve (3).
4. Position transmission range selector (4) to N (neutral) mode.
5. Align front tires in straight-ahead position.
6. Chock wheels (WP 0009).

END OF WORK PACKAGE

SHUT OFF ENGINE



1. Park vehicle (WP 0025).
2. Shut off exhaust brake (1) (if activated).
3. Shut off all lights and switches.

CAUTION

Prior to shutting off engine, run engine at 800 to 1000 rpm with transmission in N (neutral) for three minutes to allow turbocharger to slow down and cool off. Engine components may be damaged if not allowed to cool off. Failure to comply may result in damage to equipment.

4. Run engine at 800 to 1000 rpm for 3 minutes.
5. Turn engine ignition switch (2) to OFF.
6. Turn battery disconnect switch (3) to OFF.

END OF WORK PACKAGE

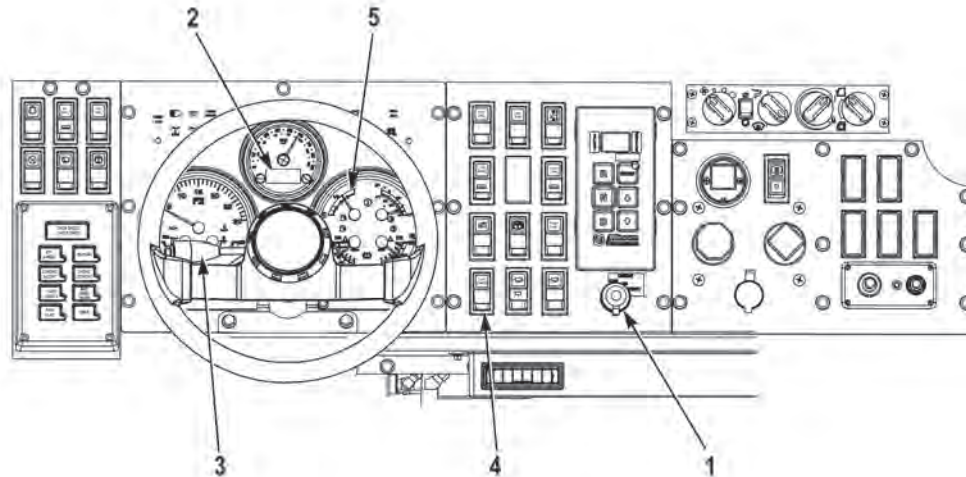
INSTRUMENT PANEL OPERATION

GENERAL

The instrument panel on the M-ATV incorporates electronic gauges, indicator lights, and a Liquid Crystal Display (LCD) to communicate information to the operator. The LCD has multiple modes and functions.

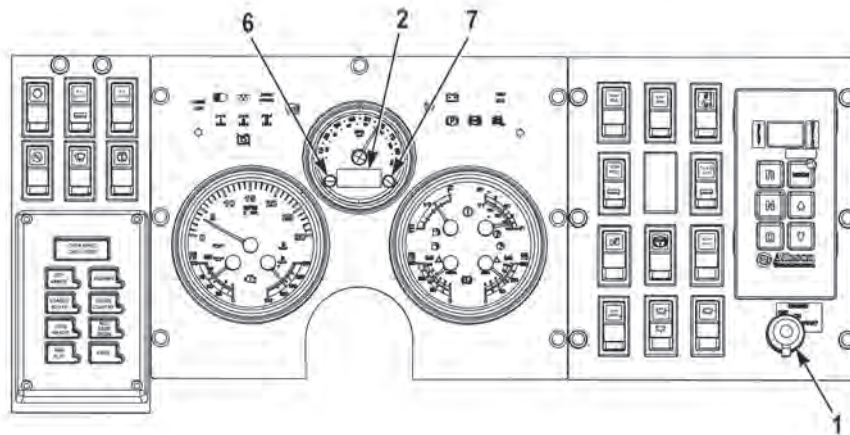
The LCD can display the odometer reading as well as test gauges and indicator lights. The LCD can also be set to display measured units in English or Metric.

INSTRUMENT PANEL MODES



Sleep Mode: The instrument panel is normally in sleep mode when the ignition switch (1) is turned off. The gauges, indicator lights or LCD (2) do not operate in this mode.

Limited Mode: If the turn signal lever (3) or dimmer switch (4) is actuated, the instrument panel goes into limited mode. In limited mode, the turn signals, odometer (2) and fuel gauge (5) are active. The remaining gauges go to zero.



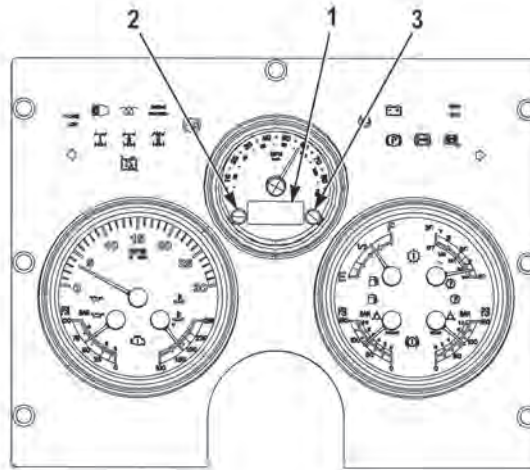
Start-Up Mode: The instrument panel enters start-up mode when the ignition is switched on. After key-on, an optional gauge Start-Up Self Test (SST) may be performed. The operator can enable or disable the SST by pressing and holding both the mode (m) button (6) and trip (t) button (7) while placing the ignition switch (1) in ON position. The LCD displays a screen that allows the operator to enable SST (Yes) or disable SST (No).

During Start-Up Mode:

- With SST disabled, the gauges will move to zero, and then move to their current status positions. With SST enabled, the gauges move up-scale, pausing at half-scale before going to full-scale. The gauges then go to zero before moving to their current status positions.
- The LCD (2) displays any warning messages and then displays the odometer, trip odometer, engine hour meter and battery voltage. The LCD (2) then reverts to normal drive mode screen. If SST is enabled, the LCD (2) will also turn on and off, followed by the OSHKOSH logo, and software information before going to the normal drive mode screen.
- The warning lights turn on and off, followed by the active warning lights (if any) coming back on.
- With SST disabled, there is no sound at start-up. With SST enabled, there is a one-second alarm at start-up.

Ignition Mode: The instrument panel is in ignition mode whenever the ignition switch (1) is on. The instrument panel is fully active in this mode.

Diagnostics Mode: From ignition mode, with vehicle speed at zero, pressing the mode (m) button (6) for more than two seconds allows the instrument panel to enter diagnostics mode. This provides three functions: set units, adjust contrast, and instrument diagnostics.

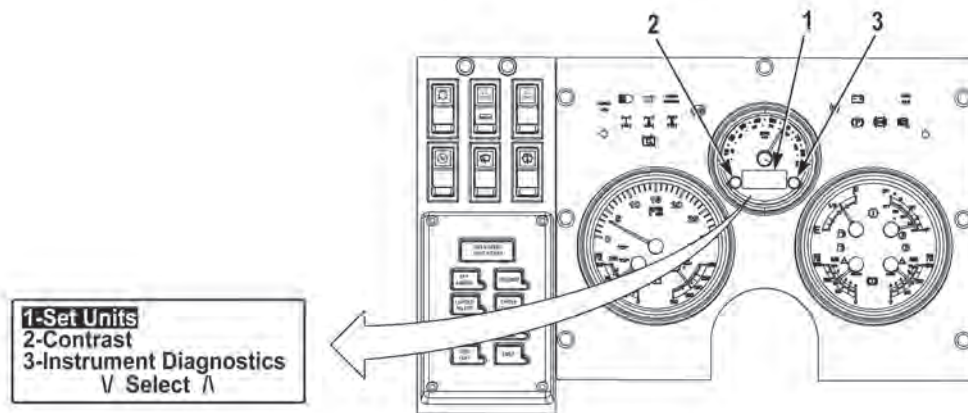
LCD MESSAGE CENTER**NOTE**

The LCD displays warnings as dictated by the various control systems on the vehicle. The warning will remain on the screen until it is no longer valid or until the operator pushes the (t) button.

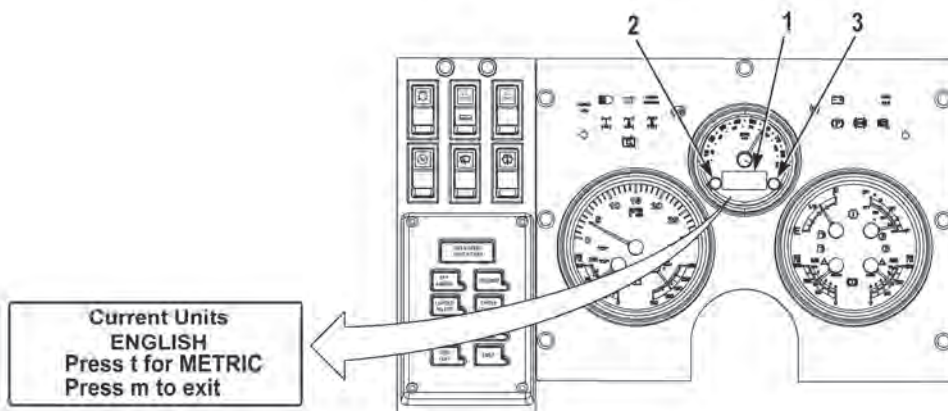
Drive Mode Screen: This is the normal display screen when operating the vehicle. In drive mode, the LCD (1) displays the odometer reading, system voltage reading and trip odometer reading.

Settings and Diagnostics: From drive mode, with engine running and vehicle parked, pressing the mode (m) button (2) for more than two seconds places the instrument panel in settings and diagnostics mode. Once in settings and diagnostics mode, pressing either the (t) button (3) or (m) button (2) individually scrolls through the various selections. Pressing the (t) button (3) and (m) button (2) at the same time selects the highlighted item.

CHANGING MEASUREMENT UNITS

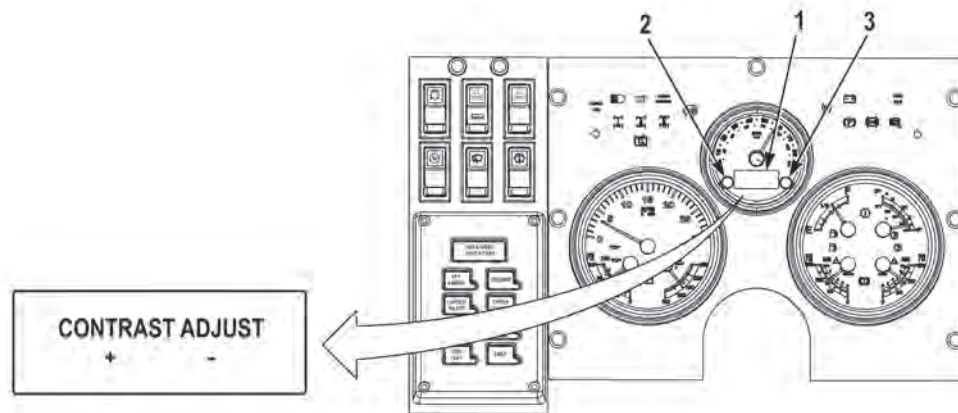


1. From drive mode, with engine running and vehicle parked, press (m) button (2) for more than two seconds to enter LCD (1) settings and diagnostics screen.
2. Use (m) button (2) or (t) button (3) to scroll through selections until "1 - Set Units" is highlighted.
3. Press (m) button (2) and (t) button (3) at the same time to select "1 - Set Units".



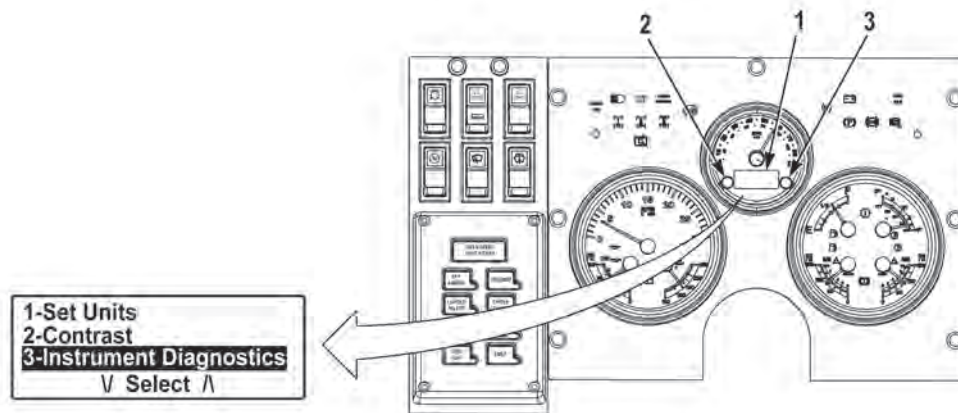
4. Press (t) button (3) to change measurement units to ENGLISH or METRIC, as desired.
5. Press (m) button (2) to return to drive mode.

CHANGING LCD SCREEN CONTRAST SETTING

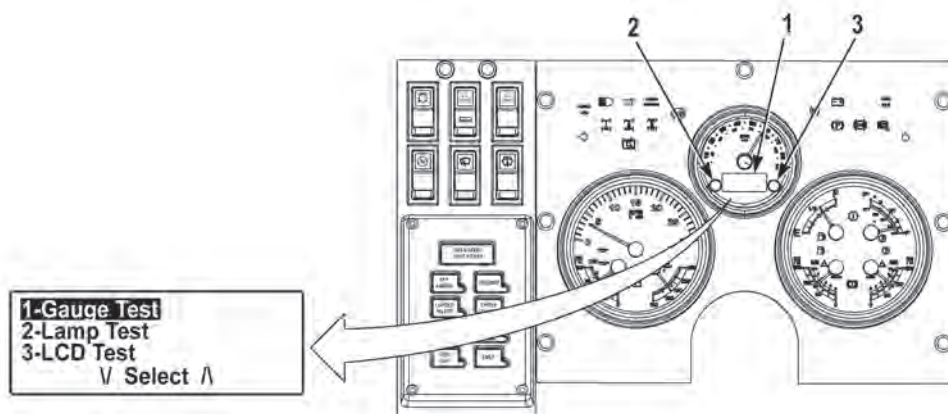


1. From drive mode, with engine running and vehicle parked, press (m) button (2) for more than two seconds to enter LCD (1) settings and diagnostics mode.
2. Use (m) button (2) or (t) button (3) to scroll through selections until "2 - Contrast" is highlighted.
3. Press (m) button (2) and (t) button (3) at the same time to select "2 - Contrast".
4. Press (m) button (2) to increase contrast, or press (t) button (3) to decrease contrast.
5. LCD (1) will automatically return to drive mode.

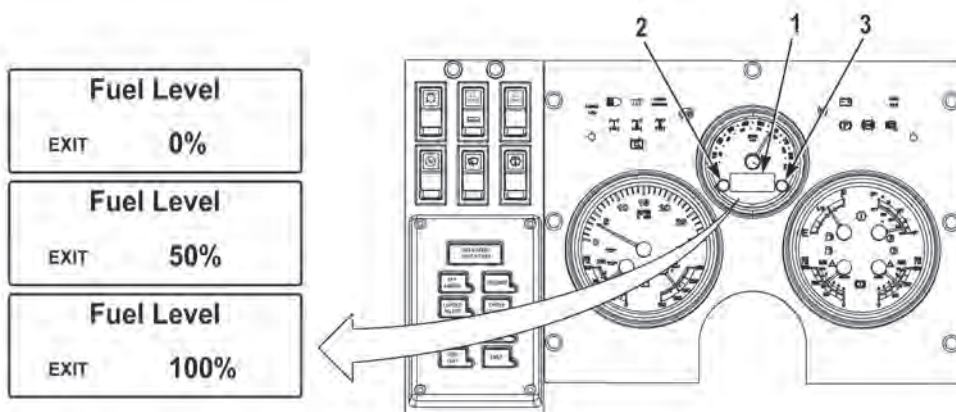
INSTRUMENT PANEL GAUGES TESTING



1. From drive mode, with engine running and vehicle speed at zero, press (m) button (2) for more than two seconds to enter settings and diagnostics mode.
2. Use (m) button (2) or (t) button (3) to scroll through selections until "3 - Instrument Diagnostics" is highlighted.
3. Press (m) button (2) and (t) button (3) at the same time to display instrument diagnostics menu.

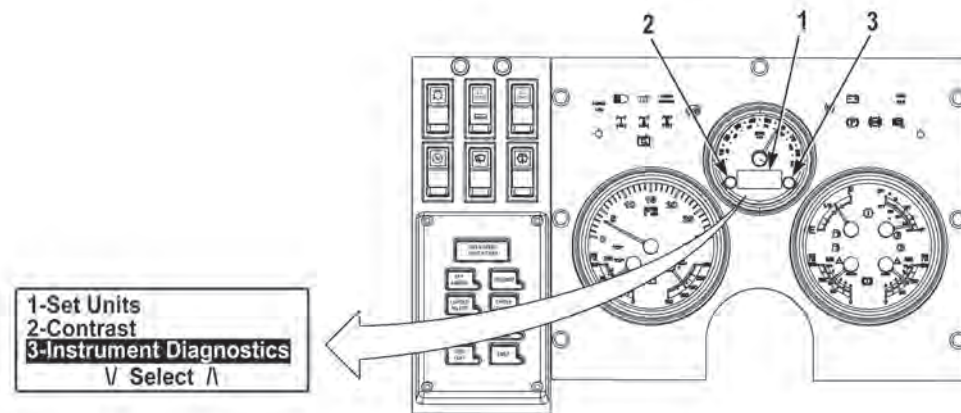


- Use (m) button (2) or (t) button (3) to scroll through selections until "1 - Gauge Test" is highlighted.

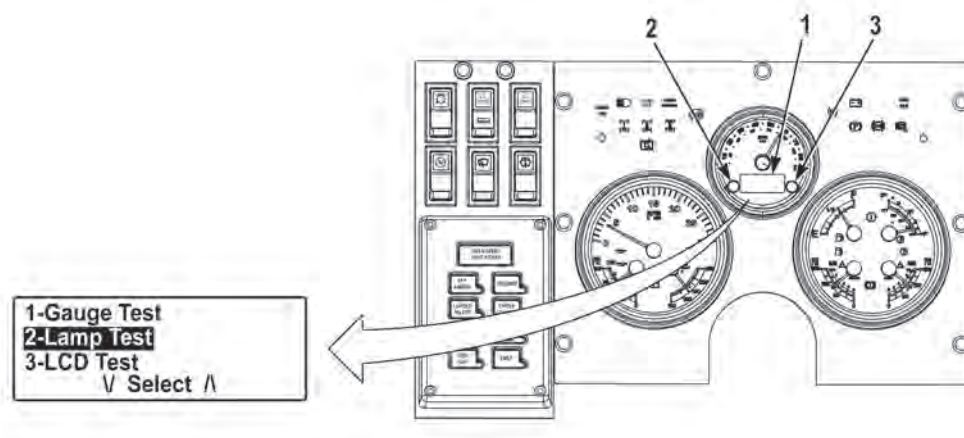


- Press (m) button (2) and (t) button (3) at the same time to begin testing gauges (fuel gauge test shown). Each gauge is tested, in turn, at 0%, 50%, and 100%. The LCD (1) displays the corresponding percentage.
- Press (m) button (2) to end test and return to drive mode screen.
- Contact Field Maintenance to replace main gauge/instrument panel if corresponding gauge does not reflect LCD (1) percentage indication.

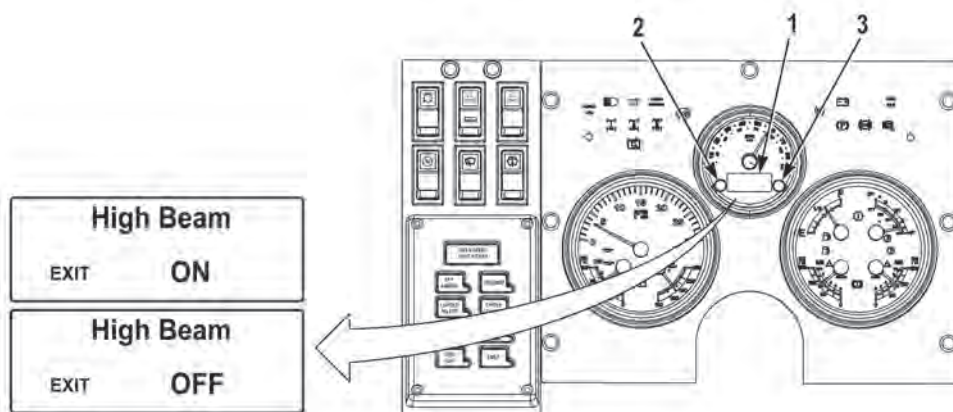
INSTRUMENT PANEL INDICATOR LAMPS TESTING



1. From drive mode, with engine running and vehicle parked, press (m) button (2) for more than two seconds to enter settings and diagnostics mode.
2. Use (m) button (2) or (t) button (3) to scroll through selections until "3 - Instrument Diagnostics" is highlighted.

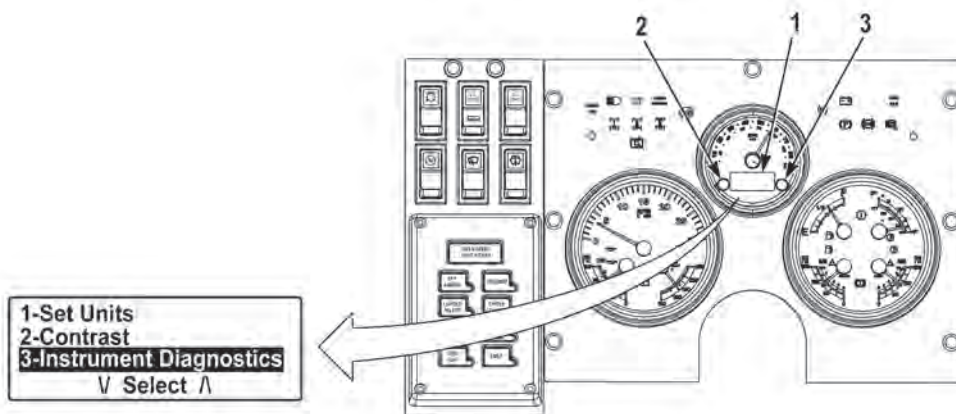


3. Press (m) button (2) and (t) button (3) at the same time to display instrument diagnostics menu.
4. Use (m) button (2) or (t) button (3) to scroll through selections until "2 - Lamp Test" is highlighted.



5. Press (m) button (2) and (t) button (3) at the same time to begin testing warning lamps. Each indicator lamp on main gauge/instrument panel is turned on and off in turn. The LCD (1) displays the corresponding warning lamp under test (high beam indicator test shown).
6. Press (m) button (2) to end test and return to drive mode screen.
7. Contact Field Maintenance to replace main gauge/instrument panel if an indicator fails to illuminate as indicated by the LCD (1).

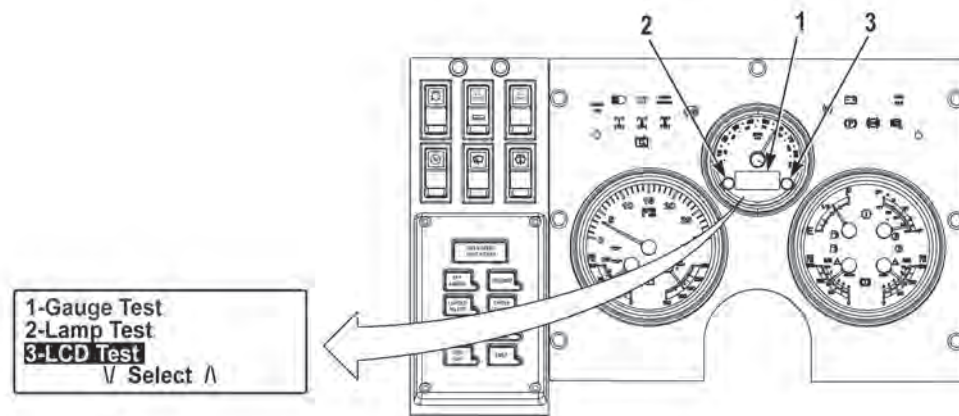
INSTRUMENT PANEL LCD TESTING



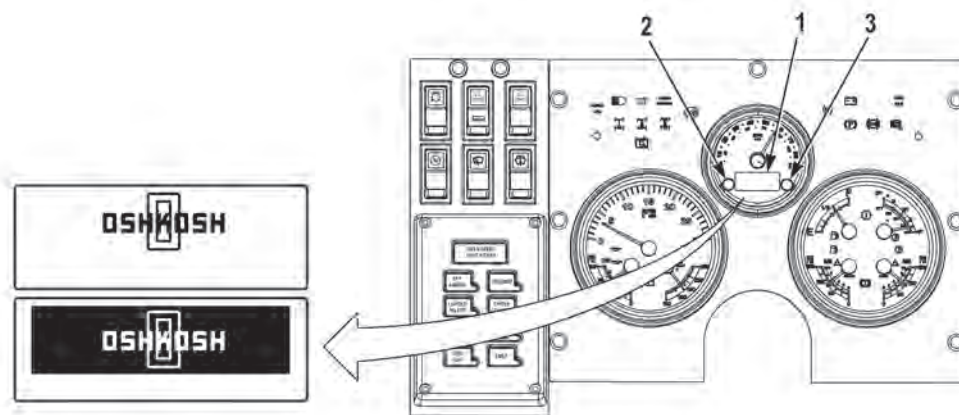
NOTE

The instrument panel LCD is used as part of the test procedure. If the LCD is unreadable during any part of the test, it should be considered defective and replaced.

1. From drive mode, with engine running and vehicle parked, press (m) button (2) for more than two seconds to enter settings and diagnostics mode.
2. Use (m) button (2) or (t) button (3) to scroll through selections until "3 - Instrument Diagnostics" is highlighted.



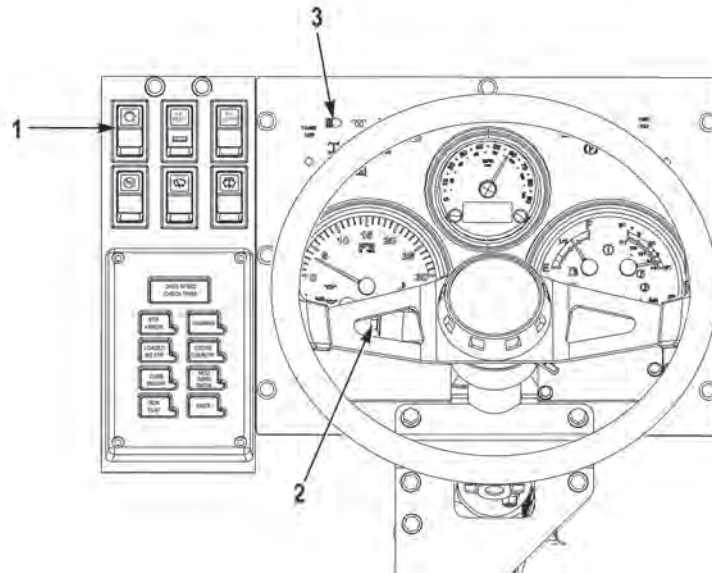
3. Press (m) button (2) and (t) button (3) at the same time to display instrument diagnostics menu.
4. Use (m) button (2) or (t) button (3) to scroll through selections until "3 - LCD Test" is highlighted.



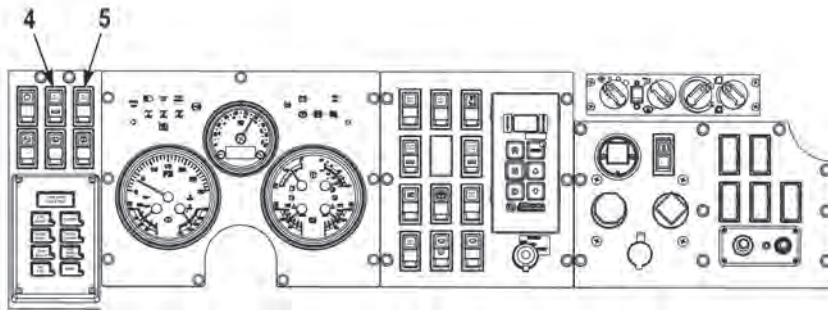
5. Press (m) button (2) and (t) button (3) at the same time to begin testing LCD (1). The logo display should appear in normal and reverse modes three times before returning to drive mode screen.
6. Contact Field Maintenance to replace main gauge/instrument panel if LCD (1) fails to illuminate as shown.

END OF WORK PACKAGE

OPERATE SERVICE LIGHTS/BLACKOUT LIGHTS (M1240/M1240A1)

**NOTE**

- Use rocker switches on instrument panel to check operation of the following lights.
 - The headlight/clearance light switch has three positions: OFF (down), CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (middle), and HEADLIGHTS WITH CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (up).
 - Headlights/clearance lights and blackout lights will operate only when ignition switch is in ON position.
1. Push headlight/clearance light switch (1) to UP position.
 2. With headlights on, press dimmer switch (2) to select HIGH or LOW beam. High beam indicator (3) will light when HIGH beam is on.



NOTE

- Push switch lock on lower part of switch up to operate blackout select switch.
 - Panel dimmer switch is a three-position switch. Down position is OFF, center position is LOW, and up position is HIGH.
3. Push blackout selector switch (4) up to position lighting system in BLACKOUT mode.

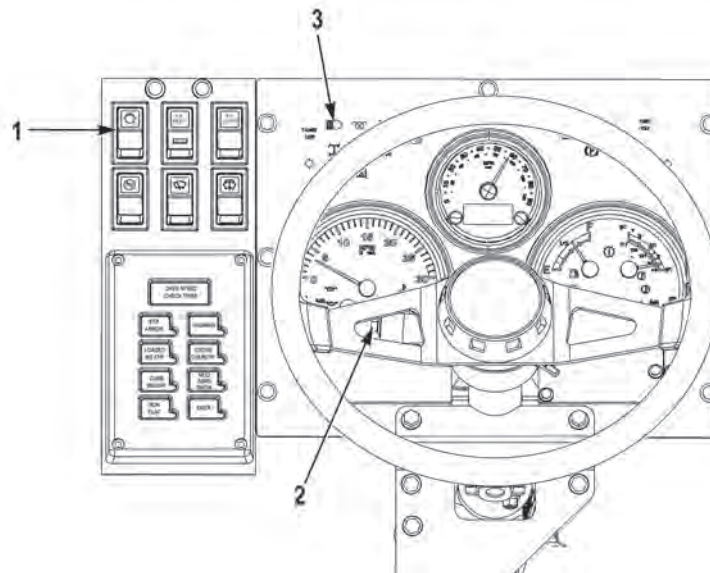
NOTE

Blackout light switch has three positions: OFF (down), COMPOSITE LIGHTS (middle), and COMPOSITE LIGHTS and HEADLIGHT (up).

4. Push blackout drive lights (5) to UP position.

END OF WORK PACKAGE

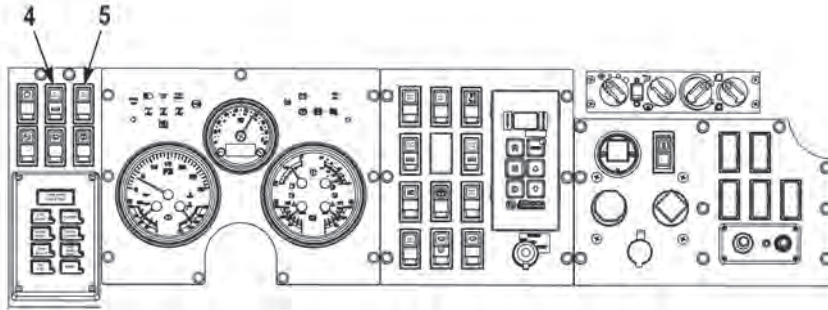
BLACKOUT SWITCH/SERVICE LIGHT OPERATION (M1245)

SERVICE LIGHT OPERATION**NOTE**

- Use rocker switches on instrument panel to check operation of the following lights.
- The headlight/clearance light switch has three positions: OFF (down), CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (middle), and HEADLIGHTS WITH CLEARANCE/MARKER LIGHTS and PARKING LIGHTS (up).
- Headlights/clearance lights and blackout lights will operate only when ignition switch is in ON position.
- When driving in Blackout Mode and returning to service drive mode, HEADLIGHT/CLEARANCE LIGHT SWITCH must be first pressed DOWN, and then pressed back UP.

1. Push headlight/clearance light switch (1) to UP position.
2. With headlights on, press dimmer switch (2) to select HIGH or LOW beam. High beam indicator (3) will light when HIGH beam is on.

END OF TASK

BLACKOUT SWITCH OPERATION**NOTE**

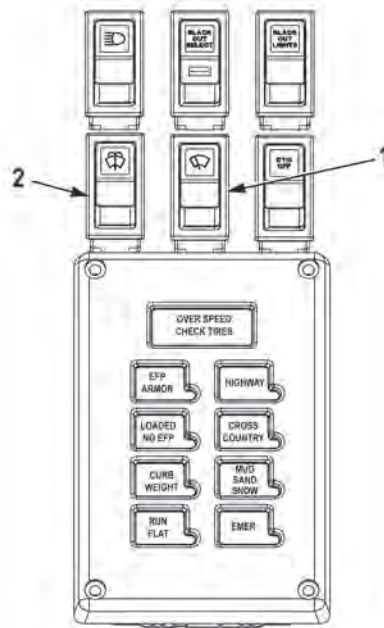
- Push switch lock on lower part of switch up to operate blackout select switch.
- When the blackout selector switch is ON (up position), the CTIS Panel Lights, Transmission Selector Panel Lights, and Dash Panel Lights are not illuminated.
- Blackout light switch has three positions: OFF (down), COMPOSITE LIGHTS (middle), and COMPOSITE LIGHTS and HEADLIGHT (up).
- When driving in Blackout Mode and returning to service drive mode, HEADLIGHT/CLEARANCE LIGHT SWITCH must be first pressed DOWN, and then pressed back UP.

1. Push blackout selector switch (4) up to position lighting system in BLACKOUT mode.
2. Push blackout drive lights (5) to UP position.

END OF TASK**END OF WORK PACKAGE**

WINDSHIELD WIPER/WASHER FUNCTIONS

WIPER SWITCH FUNCTION



1. Press wiper switch (1) to middle position for low speed and up for high speed.
2. Press wiper switch (1) to down position to stop windshield wipers.

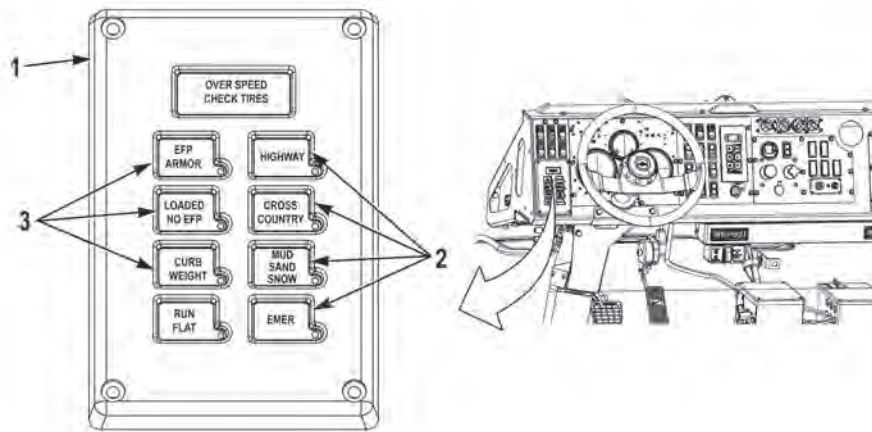
WASHER SWITCH FUNCTION

1. Press and hold the washer switch (2) to spray cleaning fluid on windshield.
2. Press wiper switch (1) to middle position for low speed.
3. Release washer switch (2) to stop washer spray. Wipers will automatically stop.
4. Press wiper switch (1) to down position to stop windshield wipers.

END OF WORK PACKAGE

CENTRAL TIRE INFLATION SYSTEM (CTIS)

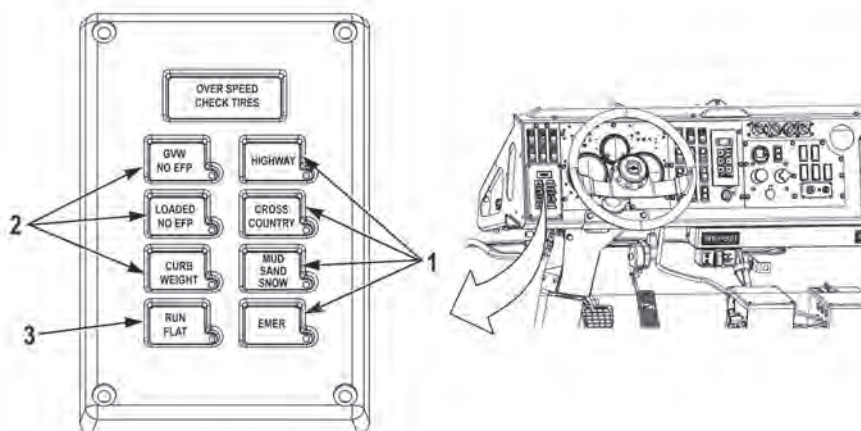
GENERAL



1. The Central Tire Inflation System (CTIS) is designed to maximize traction, mobility, and ride quality. It will adjust the air pressure in all tires to correspond to the cargo setting and the terrain setting selected by the operator.
2. The CTIS controller (1) has four terrain settings (2) and three cargo settings (3). These settings will affect the tire inflation pressure on both the front and rear tires. Refer to the following tire pressures listed in Table 1.

Table 1. Tire Pressures (M1240 and M1245).

LOAD		TERRAIN			
		HWY	CC	MSS	EMER
CURB WEIGHT	Front	61 psi (421 kPa)	42 psi (290 kPa)	23 psi (159 kPa)	18 psi (124 kPa)
	Rear	57 psi (393 kPa)	40 psi (276 kPa)	21 psi (145 kPa)	16 psi (110 kPa)
LOADED NO EFP	Front	71 psi (490 kPa)	50 psi (345 kPa)	27 psi (186 kPa)	21 psi (145 kPa)
	Rear	91 psi (627 kPa)	65 psi (448 kPa)	36 psi (248 kPa)	28 psi (193 kPa)
EFP ARMOR	Front	84 psi (579 kPa)	59 psi (407 kPa)	33 psi (228 kPa)	26 psi (179 kPa)
	Rear	96 psi (662 kPa)	71 psi (490 kPa)	40 psi (276 kPa)	32 psi (221 kPa)
	MAX. SPD. (MPH)	65 (105 km/h)	40* (64 km/h)	15 (24 km/h)	5 (8 km/h)
NOTE: All tire pressures are ± 3 psi (± 21 kPa).					
*When CTIS setting is CROSS COUNTRY and CURB WEIGHT, MAX. SPD. is 45 mph (72 km/h).					



NOTE

For M1240A1 the EFP armor button is replaced by GVW NO EFP button.

Table 2. Tire Pressures (M1240A1).

LOAD		TERRAIN			
		HWY	CC	MSS	EMER
CURB WEIGHT	Front	48 psi (331 kPa)	32 psi (221 kPa)	16 psi (110 kPa)	13 psi (90 kPa)
	Rear	50 psi (345 kPa)	33 psi (228 kPa)	17 psi (117 kPa)	14 psi (97 kPa)
LOADED NO EFP	Front	50 psi (345 kPa)	33 psi (228 kPa)	16 psi (110 kPa)	14 psi (97 kPa)
	Rear	64 psi (441 kPa)	45 psi (310 kPa)	24 psi (165 kPa)	18 psi (124 kPa)
GVW NO EFP	Front	51 psi (352 kPa)	34 psi (234 kPa)	17 psi (117 kPa)	14 psi (97 kPa)
	Rear	72 psi (496 kPa)	51 psi (352 kPa)	28 psi (193 kPa)	20 psi (138 kPa)
	MAX. SPD. (MPH)	65 (105 km/h)	40* (64 km/h)	15 (24 km/h)	5 (8 km/h)
NOTE: All tire pressures are ± 3 psi (± 21 kPa).					
*When CTIS setting is CROSS COUNTRY and CURB WEIGHT, MAX. SPD. is 45 mph (72 km/h).					

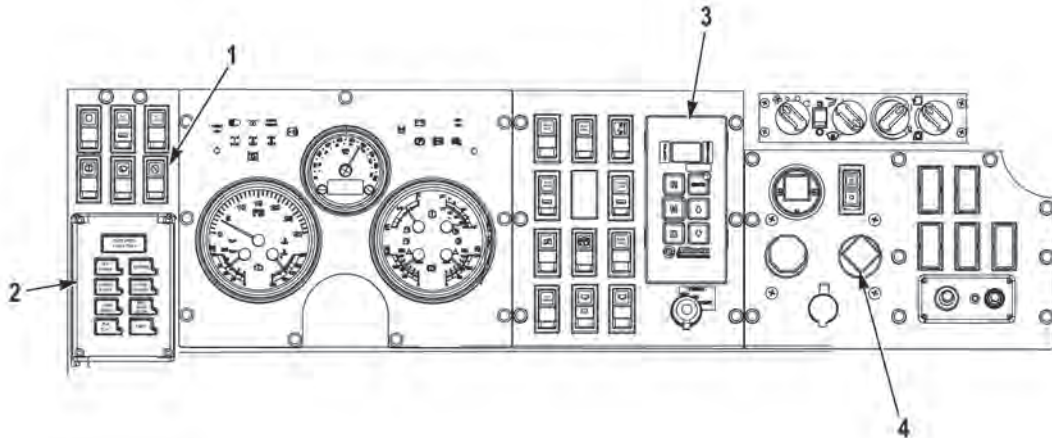
3. Tire pressure is immediately checked and adjusted, if necessary, upon pushing one of the terrain or cargo setting buttons (1) or (2). The CTIS automatically checks tire pressure every 15 minutes and adjusts the pressure if needed.
4. If RUN FLAT (3) is selected, the CTIS will check tire pressures every 15 seconds instead of every 15 minutes. If the CTIS detects a significantly low tire pressure, "CHECK TIRES" will be displayed.
5. The CTIS is operational whenever the vehicle is running, unless the CTIS is partially disabled by the CTIS OFF switch (WP 0007).
6. If air system pressure drops below 85 psi (586 kPa), the CTIS will automatically stop tire pressure increase adjustments. The CTIS will automatically resume operation when air system pressure rises above 112 psi (772 kPa).

OPERATING PROCEDURES**WARNING**

- Operator **MUST** fully understand how to use the CTIS system. Misuse of CTIS system can result in loss of control of vehicle. Failure to comply may result in injury or death to personnel.
- Do not drive the vehicle further than 30 mi (48 km) or exceed speeds of 30 mph (48 km/h) while operating on the run-flat inserts. Failure to comply may cause a tire fire and/or loss of vehicle control, which may result in injury or death to personnel and damage to equipment.

CAUTION

- When operating vehicle, there are two speed limitations imposed. One limitation comes from the CTIS terrain setting. The other comes from the driveline lock setting. The lower speed limitation of the two must be adhered to. Failure to comply may result in damage to vehicle.
 - Do not change the CTIS controller terrain settings while turning a corner or wheels are slipping. Damage to driveline may result.
 - The EMER (Emergency) button is for extreme conditions only and should not be used for normal driving. Damage to driveline may result.
 - Select the appropriate CTIS controller settings before entering an area where poor traction conditions are likely to occur. Failure to comply may result in damage to equipment.
 - Adequate air pressure is required to begin or continue any pressure-changing sequence. Failure to comply may result in damage to equipment.
 - If the OVER SPEED indicator blinks, and the operator has not selected the EMER (Emergency) setting, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.
 - If the operator has selected the EMER (Emergency) setting and the audible over speed alarm comes on, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to equipment.
 - If the OVER SPEED indicator comes on solid without audible alarm, the operator must assume that the automatic Overspeed Protection feature is no longer operable, and caution must be used to not exceed speed parameters. Continue with mission and notify Field Maintenance when mission is completed. Failure to comply may result in damage to vehicle.
 - If the RUN FLAT indicator light comes on, the operator should be aware that tire damage may be present and that the CTIS is attempting to compensate for this damage. Perform troubleshooting. Failure to comply may result in damage to equipment.
 - Prior to operating the CTIS in temperatures below 0°F (-18°C), the CTIS will need to be disabled (refer to WP 0046). Failure to comply may result in damage to equipment.
1. Start vehicle (WP 0020).



NOTE

Perform Steps (2) through (5) only when starting a vehicle in 0°F (-18°C) temperatures or lower.

2. Position CTIS OFF switch (1) in the up (or ON) position.
3. Select appropriate terrain and cargo load setting on CTIS controller (2).

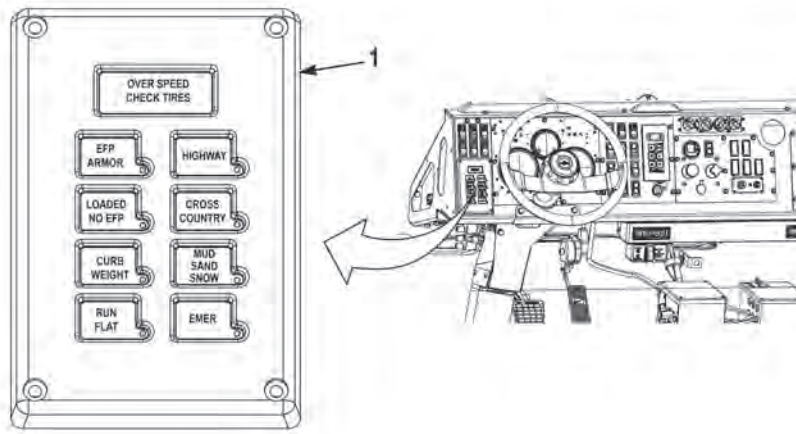
CAUTION

- **During first five miles of driving operation, all cornering should be performed slowly and carefully. Failure to comply may result in damage to driveline components.**
- **Do not use first gear to move M-ATV if tires are frozen to ground or brakes are frozen to drums. Failure to comply may result in damage to driveline.**

NOTE

If transmission fluid temperatures is below 19°F (-7°C), the following will occur:

- Transmission will operate in N (neutral), R (reverse), and 3 (third gear) only.
 - Above 19°F (-7°C), transmission will operate in all ranges.
4. Set transmission range selector (3) to 3 (third gear), release parking brake (4), and slowly drive M-ATV three to five miles to warm up CTIS components and tires.
 5. Position CTIS OFF switch (1) in the down (or OFF) position.



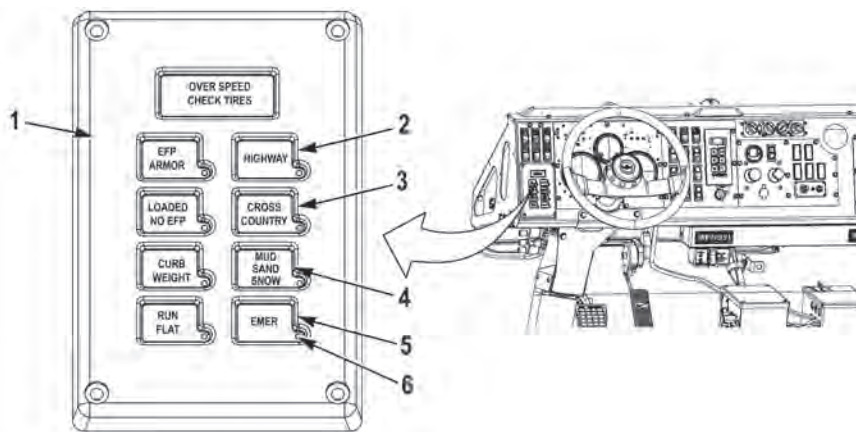
CAUTION

- If the **OVER SPEED CHECK TIRES** indicator comes on, the operator should stop the vehicle and refer to **OVER SPEED CHECK TIRES LIGHT** section of this work package. Failure to comply may result in damage to equipment.
 - If two terrain setting indicators turn on solid, the operator should stop the vehicle and refer to the troubleshooting section of this work package. Failure to comply may result in damage to equipment.
 - If the CTIS controller flashes the four terrain setting indicators as well as the run flat indicator, the operator should stop the vehicle and refer to sections **Run Flat Feature** and **OVER SPEED CHECK TIRES LIGHT** of this work package. Failure to comply may result in damage to equipment.
6. With vehicle running, select appropriate terrain setting on CTIS controller (1).

CAUTION

- The CTIS controller cargo load setting must be changed as required immediately upon adding or removing cargo from the vehicle. Failure to comply may result in damage to equipment.
7. Select appropriate cargo load setting on CTIS controller (1) and drive vehicle.

TERRAIN SETTINGS



1. The CTIS controller (1) has four terrain settings: HIGHWAY (2), CROSS COUNTRY (3), MUD SAND SNOW (4), and EMER (5). The terrain setting needed for the conditions the vehicle is operating in can be determined by using Table 3. The terrain settings can be changed while the vehicle is moving.

CAUTION

The Emergency mode is for extreme conditions only and should not be used for normal driving conditions. Failure to comply may result in damage to equipment.

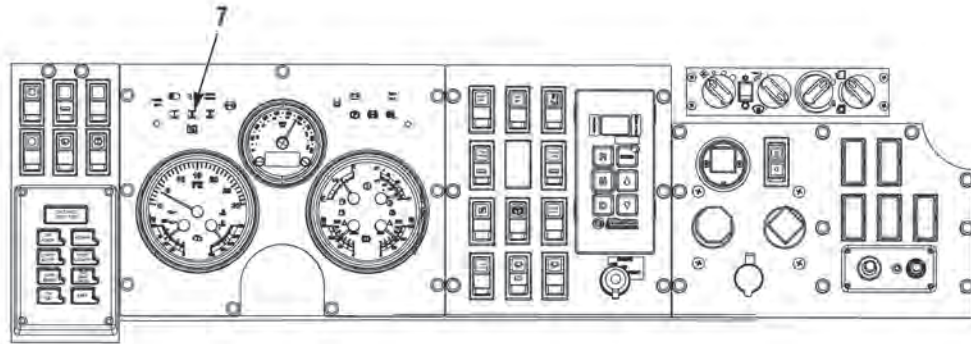
NOTE

Prior to selecting EMER (Emergency) setting, the vehicle must be traveling below the 5 mph (8 km/h), maximum allowable speed for that setting.

2. During normal operation, when a terrain setting button is pushed, the indicator light (6) next to the selected button will blink to indicate that the specific terrain button has been pushed. The indicator (6) will continue to blink until the tire pressure has been adjusted to this setting. It will then stop blinking and will stay on steady. The indicator will then blink briefly every 15 minutes when the CTIS checks and adjusts tire pressure.

Table 3. CTIS Settings and Terrain Conditions.

CTIS Setting	Terrain Conditions
HIGHWAY (2)	For operation on improved paved surfaces.
CROSS COUNTRY (3)	For operation on nonpaved secondary roads and hard-packed trails.
MUD SAND SNOW (4)	For operation on soft-surface trails and other unimproved surfaces.
EMER (5)	For selection of extremely low tire pressure to help free a mired vehicle or to traverse a short distance over a terrain known to require very low tire pressure.



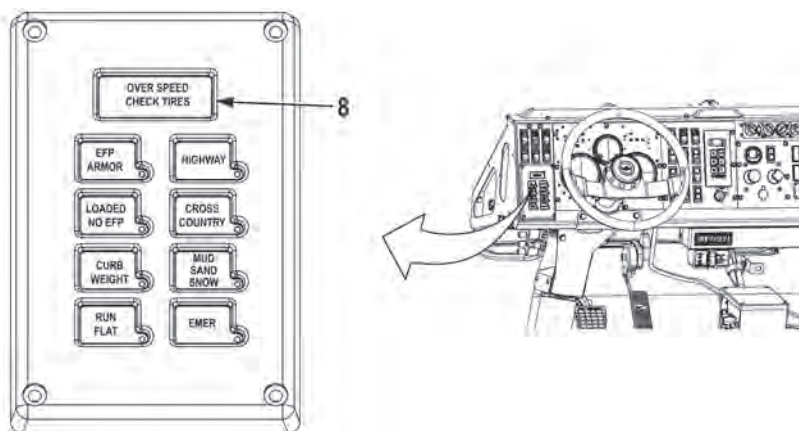
NOTE

An automatic upshift in the CTIS terrain mode does not automatically dictate a driveline lock change. The driveline lock setting will not change until the parameters listed in Table 3 are exceeded.

- Each terrain setting has a maximum allowable speed (refer to Table 4). Each setting also dictates a default driveline lock configuration which will be displayed with icons (7) on the instrument panel (refer to Driveline Lock section of this work package).

Table 4. Maximum Allowable Speed.

Terrain Setting	Maximum Allowable Speed	Driveline Lock Configuration
Highway	65 mph (113 km/h)	No Driveline Lock
Cross-Country	45 mph (72 km/h)	No Driveline Lock
Mud Sand Snow	20 mph (32 km/h)	Transfer Case Lock
EMER	10 mph (16 km/h)	Transfer Case and Rear Side-To-Side Lock



CAUTION

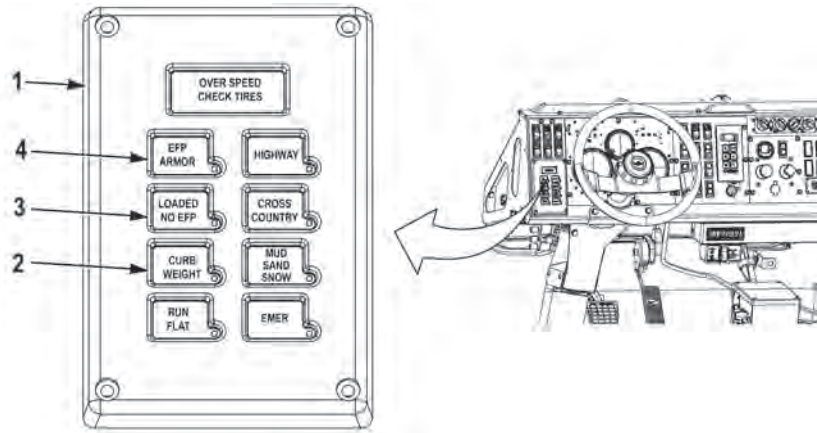
- If the **OVER SPEED** indicator comes on solid without audible alarm, the operator must assume that the automatic Over Speed Protection feature is no longer operable and caution must be used to not exceed speed parameters. Continue with mission and notify Field Maintenance when mission is completed. Failure to comply may result in damage to vehicle.
- If the audible alarm comes on when operating the vehicle in the **EMER (Emergency)** position, the operator should reduce vehicle speed and/or shift the CTIS controller to an appropriate terrain setting for the vehicle speed. Failure to comply may result in damage to vehicle.

NOTE

When **EMER (Emergency)** position is selected by the operator, the **OVER SPEED** indicator will blink when tire pressure has reached the pressure setting appropriate for the **EMER (Emergency)** position.

4. **Tire Over speed Protection.** The CTIS includes an automatic feature called Over speed Protection used to prevent damage to tires. If the maximum allowable speed for a specific terrain setting is exceeded, the CTIS will monitor the over speed situation for a predetermined time (15 to 90 seconds, depending on terrain setting). If vehicle speed does not decrease to an allowable level during this predetermined time, an alarm will sound and the **OVER SPEED** indicator (8) will blink. Once the alarm sounds, the operator has 30 seconds to adjust vehicle speed or upshift to a new CTIS terrain setting. If the operator does not adjust vehicle speed or terrain setting, the CTIS will automatically upshift the terrain setting to the next setting appropriate for the speed of the vehicle.

CARGO LOAD SETTINGS



1. The CTIS controller (1) has three cargo load settings:
 - (a) CURB WEIGHT (2)
 - (b) LOADED NO EFP (3)
 - (c) EFP ARMOR (4)
 - (d) GVW NO EFP (4) (M1240A1)

Table 5. CTIS Cargo Load/Setting.

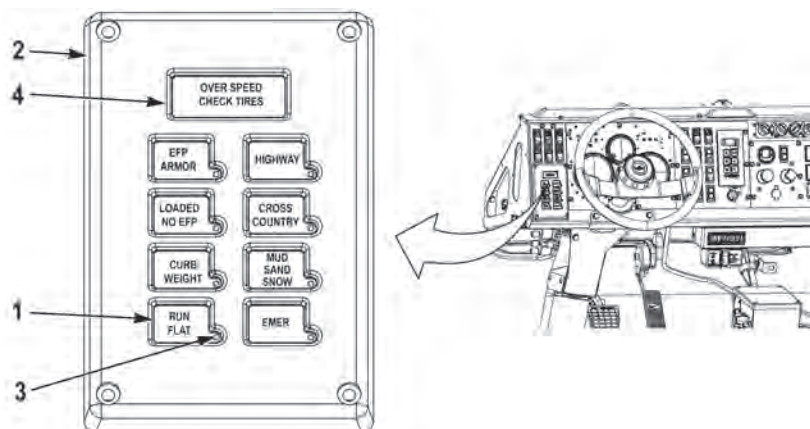
Load Setting	Description
CURB WEIGHT (2)	Vehicle with no cargo, no armor, and no personnel except for the driver.
LOADED NO EFP (3)	Vehicle with cargo and/or more personnel than just the driver. Vehicle has no EFP Kit installed.
EFP ARMOR (4)	Vehicle has EFP Kit installed. Vehicle has any size load and has any number of personnel.
GVW NO EFP (4) (M1240A1)	Vehicle has any size load and has any number of personnel.

CAUTION

The CTIS controller cargo load setting must be changed as required immediately upon adding or removing load from the vehicle. Failure to comply may result in damage to equipment.

2. Switching the cargo load setting will result in a tire pressure check and a possible adjustment in tire pressure, as determined by the CTIS.

RUN FLAT FEATURE



WARNING

Do not drive the vehicle further than 30 mi (48 km) or exceed speeds of 30 mph (48 km/h) while operating on the run-flat inserts. Failure to comply may cause a tire fire and/or loss of vehicle control, which may result in injury or death to personnel and damage to equipment.

CAUTION

The Run Flat feature should not be used in an attempt to inflate tires with substantial damage. Using the Run Flat feature in these circumstances may result in other tires losing pressure, resulting in damage to equipment.

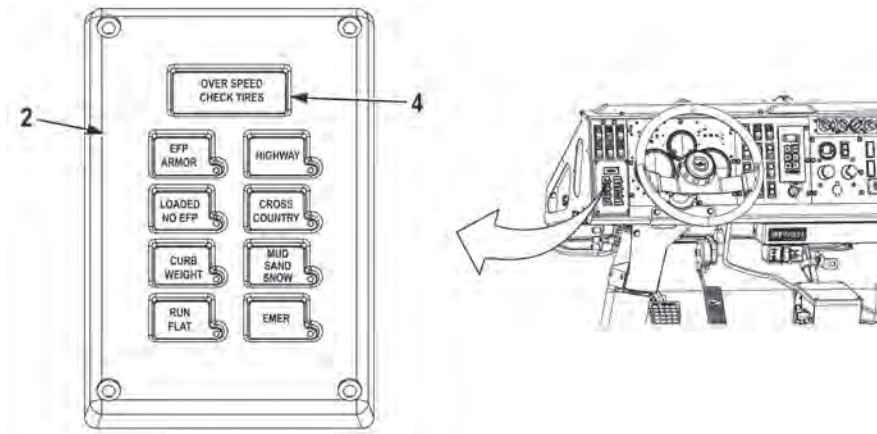
1. The RUN FLAT button (1) on the CTIS Controller (2) should be engaged whenever the operator knows the vehicle has sustained minor tire damage so the operator can continue the mission, or as a preventive measure when operator is traveling in conditions where tire damage is likely.
2. By pushing the RUN FLAT button (1), the intervals between tire pressure checks and adjustments are reduced from 15 minutes to 15 seconds. The indicator (3) next to the RUN FLAT button will blink to indicate that it is engaged. The Run Flat feature will then stay engaged until the CTIS has inflated the low tire to appropriate pressure or for 10 minutes. If needed, the Run Flat feature can be reactivated by pushing the RUN FLAT button again.

NOTE

The CTIS in the M-ATV operates two channels. One channel monitors and adjusts the two tires on the front axle. The other channel monitors and adjusts the two tires on the back axle.

3. The Run Flat feature will be automatically engaged by the CTIS if, during a normal tire pressure check/adjust cycle, the CTIS notices a substantial tire pressure imbalance between tires on a specific channel. The Run Flat feature will then stay engaged until the CTIS has inflated the low tire to appropriate pressure.
4. If the Run Flat feature was automatically engaged by the CTIS, the operator should be aware that tire damage may be present and that the CTIS is attempting to compensate for this damage. The operator should inspect for tire damage at the earliest convenience.
5. If the damage becomes too great for the Run Flat feature to compensate for, the OVER SPEED CHECK TIRES indicator (4) will illuminate.

OVER SPEED CHECK TIRES LIGHT

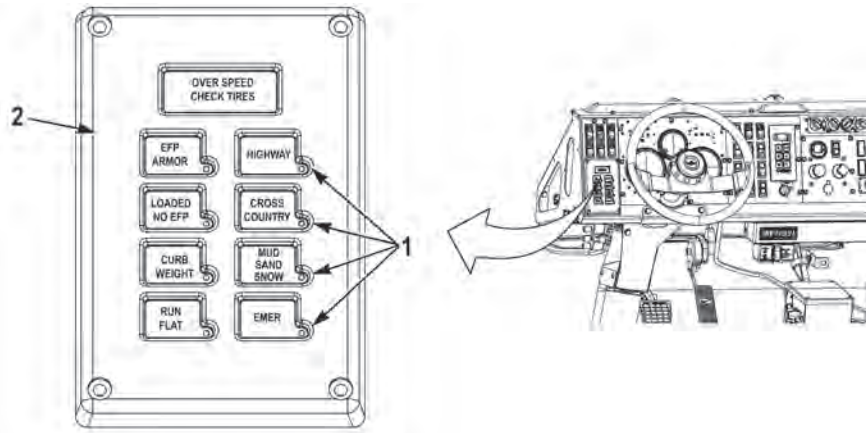


1. The OVER SPEED CHECK TIRES indicator (4) on the CTIS Controller (2) automatically illuminates when a consistent and/or substantial leak develops in a tire or air line.

NOTE

- If the RUN FLAT button is pushed to allow the CTIS to compensate for minor tire damage, the OVER SPEED CHECK TIRES indicator may go out, depending on the severity and type of damage. The OVER SPEED CHECK TIRES indicator may come on again once the Run Flat system disengages.
 - Excessive air seal leakage on cold weather startup may result in the OVER SPEED CHECK TIRES indicator coming on. If upon inspection, no tire damage exists, the operator may continue to operate the vehicle. This condition should correct itself as the seals warm up with use. To help prevent this situation from occurring, use the CTIS OFF switch (refer to Operating Procedures). If the condition continues to exist, contact Field Maintenance.
2. When the OVER SPEED CHECK TIRES indicator (4) comes on, the operator should stop the vehicle and assess the situation. If minor tire damage is found, the operator should push the RUN FLAT button and reassess the situation. If no tire damage is found, or the CTIS is able to compensate for the damage, the operator should continue with the mission and contact Field Maintenance when mission is completed. If major tire damage is found or the CTIS is not able to compensate for the damage, the operator should contact Field Maintenance.

DRIVELINE LOCK



1. When a terrain setting (1) is selected on the CTIS Controller (2), a specific driveline lock configuration is engaged by the CTIS according to Table 3.
2. **Driveline Lock Overspeed Protection.** The CTIS has a driveline lock over speed protection system similar to the terrain over speed protection feature (refer to Table 6). If the vehicle exceeds the maximum allowable speed for the driveline lock setting that it is in for more than 30 seconds, the CTIS automatically shifts the driveline lock configuration to the next setting appropriate for the speed of the vehicle. When an automatic shift in driveline lock setting occurs, the icons on the instrument panel will change to show new setting.

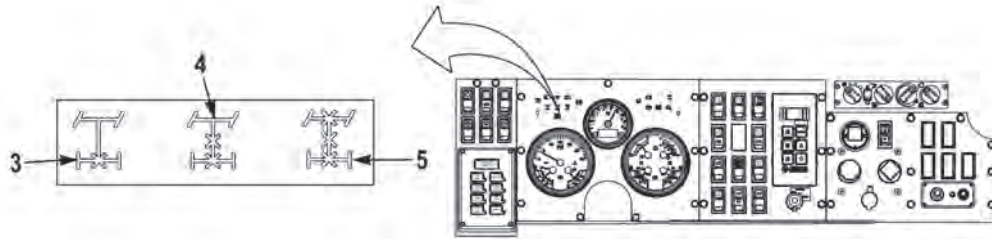


Table 6. Driveline Overspeed Protection.

Driveline Lock Setting	Maximum Allowable Speed	Icons Lit
Transfer Case	30 mph (48 km/h)	(3)
Transfer Case, Interaxle, and Rear Interaxle	10 mph (16 km/h)	(3) and (4)
Transfer Case, and Side-To-Side Lock on Both Axles	10 mph (16 km/h)	(3), (4), and (5)

CAUTION

Ensure vehicle is stopped prior to using the driveline lock switch. Failure to comply may result in damage to equipment.

3. In the vast majority of conditions encountered by the vehicle, the default driveline lock setting selected by the CTIS is the setting most appropriate for the situation. The driveline lock setting can be overridden when unusual conditions are encountered by using the driveline lock switch (refer to WP 0007) on the instrument panel. The operator can use this switch to add more locks to the configuration, but the CTIS will not allow the operator to select fewer locks than the default setting selected by the terrain settings of the CTIS controller. To return to default CTIS selection, select original CTIS terrain settings.

CTIS CONTROLLER DISPLAYS

NOTE

CTIS will automatically shut off when it cannot function properly. Indicator lights will continue to illuminate until problem is corrected.

(a) **Single Terrain Light**

- Flashing - System working to achieve new pressure.
- Steady - Pressure achieved. Wheel valves closed. System stable.

(b) **Two Terrain Lights On (Solid)**

- System has shut off with tire pressure between two settings.
- Vehicle is still operational.
- CTIS is still operational, desired terrain setting can be reselected to reattempt pressure change.
- If encountered frequently, notify Field Maintenance.

(c) **Check Tires Light (Flashing)**

- System has shut off due to an air leak or possible tire damage.
- Selecting RUN FLAT may allow CTIS operation if tire damage is minimal.
- CTIS should not be operated if major tire damage is found.
- Vehicle is still operational (depending on tire damage).
- Notify Field Maintenance as soon as possible.

(d) **Five Lights Flashing (Four Terrain Lights and Run Flat Light)**

- System has shut off at least one channel (front or rear) due to fault detection of CTIS component.
- Vehicle is still operational without CTIS. Operator should verify tire pressures are adequate for desired load and speed.

(e) **No Terrain Lights**

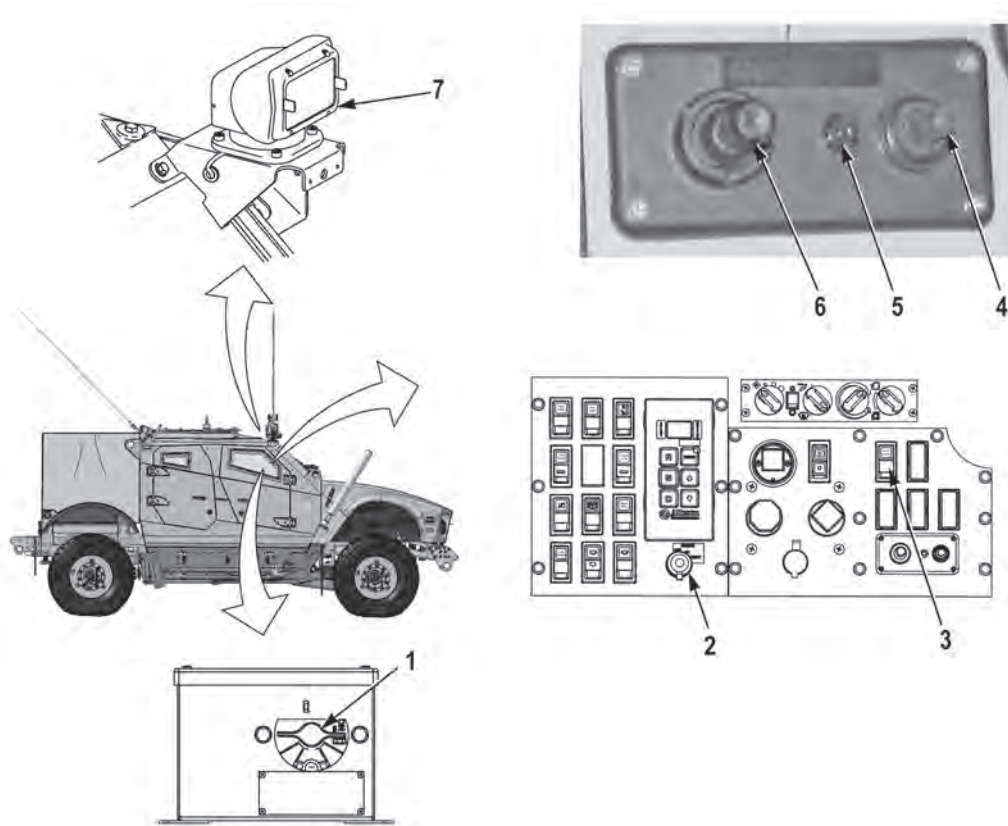
- Inadequate vehicle power.
- Electrical solenoid fault.
- CTIS is not operational. Vehicle may be operated after operator has verified tire pressures are correct.

(f) **Run Flat Light Flashing (With a Terrain Light)**

- System has detected a low tire or line leak and is working to correct problem.

END OF WORK PACKAGE

SPOTLIGHT OPERATION



1. Turn battery quick disconnect (1) on.
2. Turn ignition switch (2) to ON (do not start).
3. Position spotlight switch to up position.

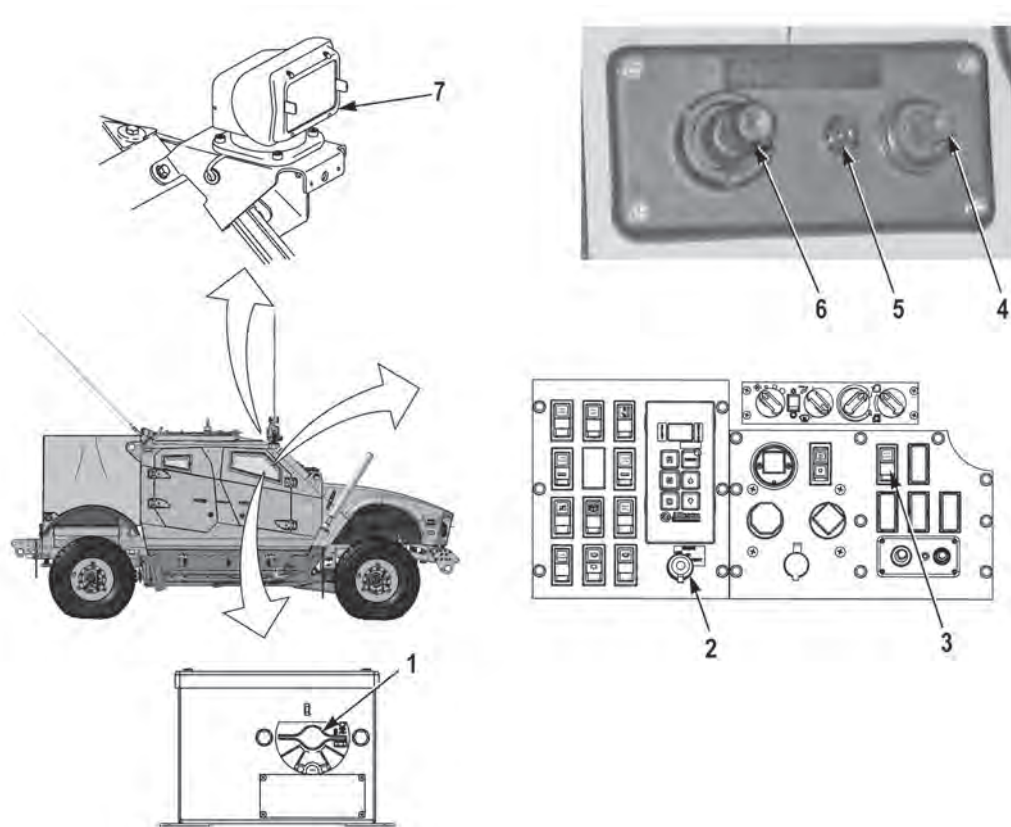
CAUTION

Remove spotlight covers prior to operation. Failure to comply may result in damage to equipment.

NOTE

There are two separate controls for front and rear spotlight operation. Both operate the same way, front spotlights and control shown.

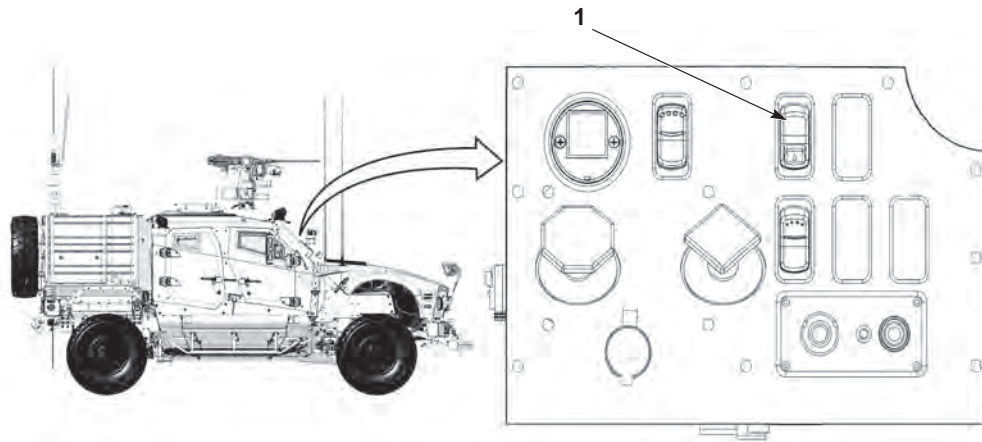
4. Move spotlight ON/OFF switch (4) up or down to ON position. Spotlight ON indicator (5) illuminates red.
5. Use joystick (6) to move both spotlights (7) up, down, left or right, as desired.



6. When spotlight is no longer needed, move spotlight ON/OFF switch (4) up or down to OFF position. Spotlight ON indicator (5) turns off.
7. Position stoplight switch (3) to down position.
8. Turn ignition switch (2) to OFF.
9. Turn battery quick disconnect (1) OFF.

END OF WORK PACKAGE

SPOTLIGHT BLACKOUT MODE OPERATION (M1245)

ACTIVATING THE SPOTLIGHT BLACKOUT MODE**CAUTION**

The blackout spotlight switch has a switch lock, and cannot be pushed up unless the switch lock is pushed up. Failure to comply may result in damage to equipment.

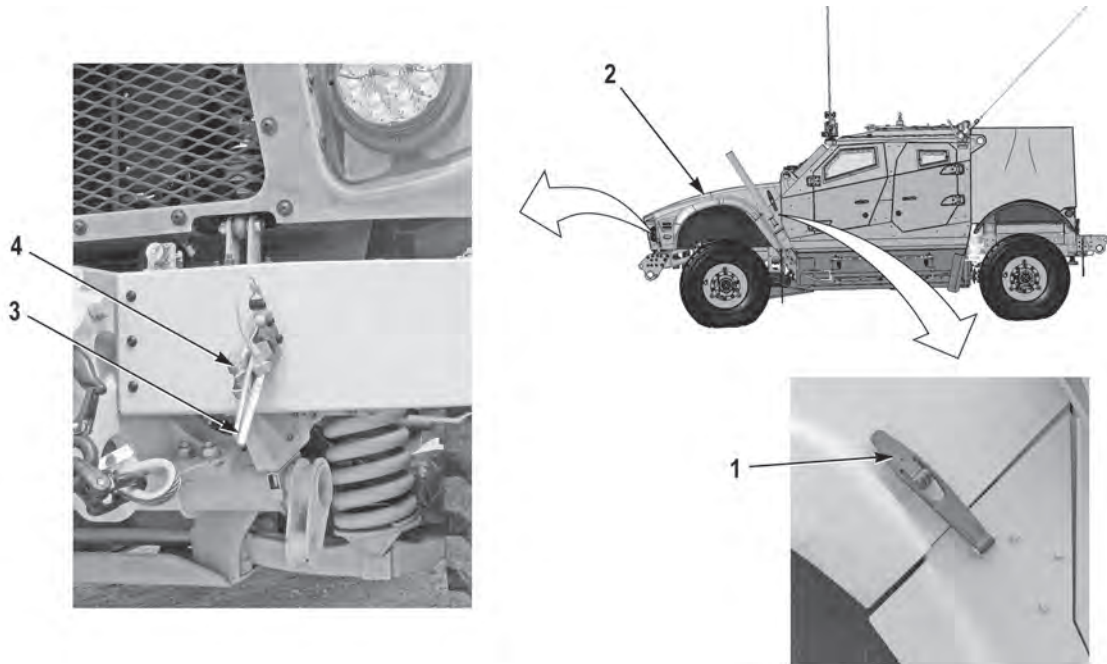
NOTE

When the blackout spotlight switch is ON (up position), the spotlights will not illuminate.

1. Push the switch lock on lower part of blackout spotlight switch UP, and toggle the blackout spotlight switch (1) ON (up position).
2. Push the blackout spotlight switch (1) UP, to place the spotlights in BLACKOUT mode.
3. Push down on the spotlight switch (1) to turn OFF blackout mode.

END OF WORK PACKAGE

RAISE/LOWER HOOD

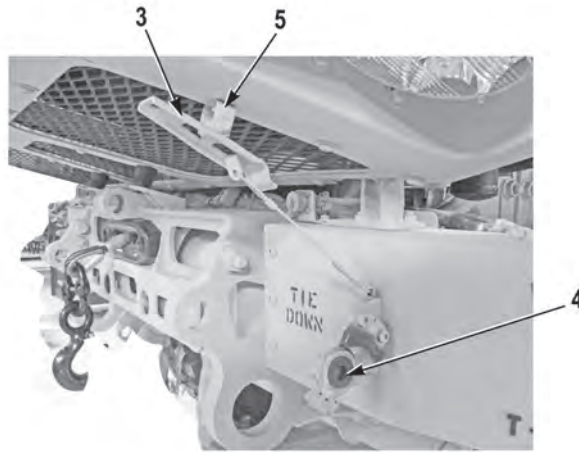
RAISE HOOD**WARNING**

Hood support must be used and installed properly whenever hood is in upright position. Wind or sudden shifting of vehicle may cause hood to fall. Failure to comply may result in injury or death to personnel.

NOTE

This task requires two personnel.

1. Unhook rubber latch (1) on each side of hood (2).
2. With the aid of an assistant, raise hood (2) until hood is in fully upright position.
3. Remove gladhand covers (3) from gladhands (4).



4. Install gladhand covers (3) on hood bracket (5).

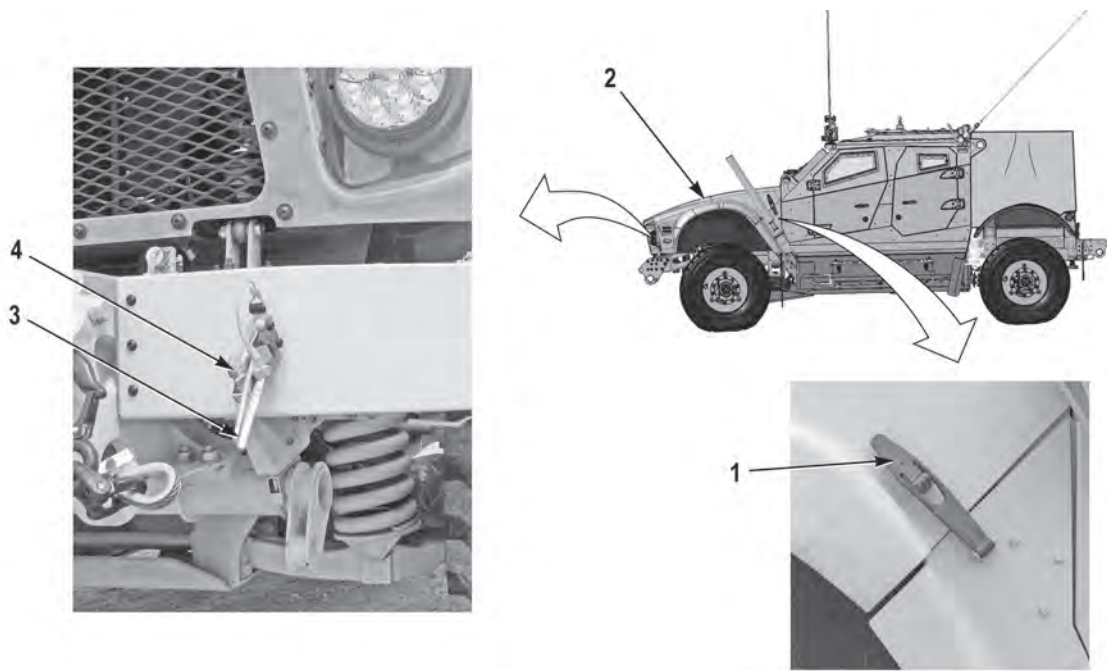
END OF TASK

LOWER HOOD

NOTE

This task requires two personnel.

1. Remove gladhand covers (3) from hood brackets (5).
2. Lock gladhand covers (3) to gladhands (4).



3. With the aid of an assistant, slowly lower hood (2).
4. Secure hood (2) with rubber latch (1) on each side of hood (2).

END OF TASK

END OF WORK PACKAGE

HOOD SIDE STEP OPERATION (M1245)

LOWERING SIDE STEPS**WARNING**

Keep hands and fingers away from pinch point areas of side steps. Failure to comply may result in injury to personnel.

CAUTION

Always place the side steps in an upright position when not in use. If the Explosively Formed Penetrator (EFP) kit is installed, side steps in the lowered position will NOT allow the passenger door to fully open. Failure to comply may result in damage to equipment.

1. Pull downward on each side step (1) until completely unfolded.

END OF TASK

RAISING SIDE STEPS**WARNING**

Keep hands and fingers away from pinch point areas of side steps. Failure to comply may result in injury to personnel.

CAUTION

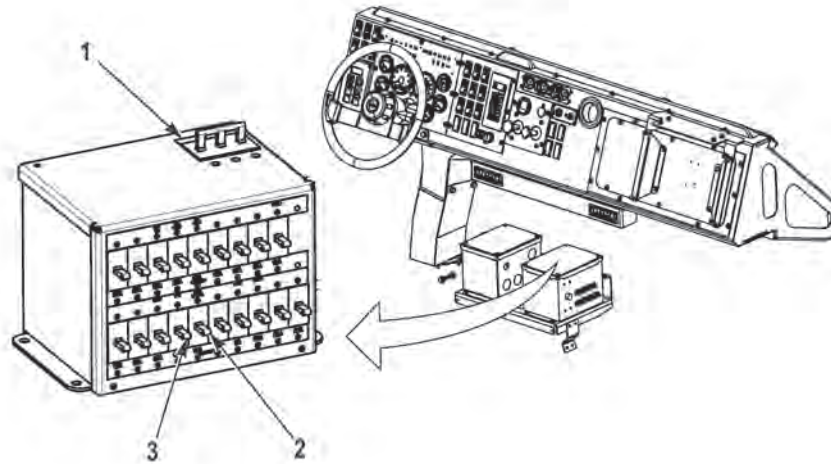
Always place the side steps in an upright position when not in use. If the EFP kit is installed, side steps in the lowered position will NOT allow the passenger door to fully open. Failure to comply may result in damage to equipment.

1. Pull upward on each side step (1) until completely folded.

END OF TASK

END OF WORK PACKAGE

CHECK-6 OPERATION

SYSTEM OPERATION**NOTE**

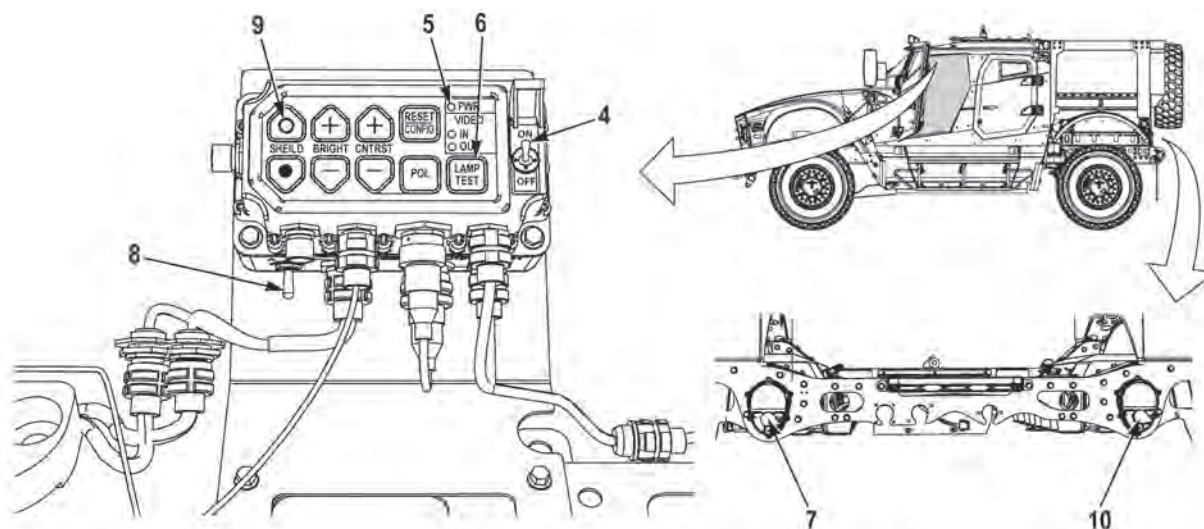
- 175A main circuit breaker may already be in the ON position if other GFE (government furnished equipment) is being used.
- Perform Step (1) if 175A main circuit breaker needs to be turned on.

1. Turn 175A main circuit breaker (1) to the on position.
2. Turn 10A rear camera circuit breaker (2) to the on position.

NOTE

Perform Step (3) if Driver's Vision Enhancer (DVE) display is present.

3. Turn 10A DVE circuit breaker (3) to the on position.



- Turn power switch (4) to the ON position.

NOTE

- PWR (power) LED illuminates GREEN indicating power is applied. Normal operating state is illuminated green.
- VIDEO IN/OUT LEDs illuminate AMBER indicating loss of video signal (IN) from the sensor or (OUT) at video connections. Normal operating state is not illuminated.

- Check for proper LED (5) functionality by pressing the LAMP TEST button (6).

CAUTION

Do not move camera shields by hand. Failure to comply may result in damage to equipment.

NOTE

- Toggle switch has two positions "A" and "B". Position "A" selects the driver side camera. Position "B" selects the passenger side camera.
- Perform Step (6) if using driver side camera.

- Open driver side camera shield (7) by moving toggle switch (8) to the "A" position and pressing the SHIELD open button (9).

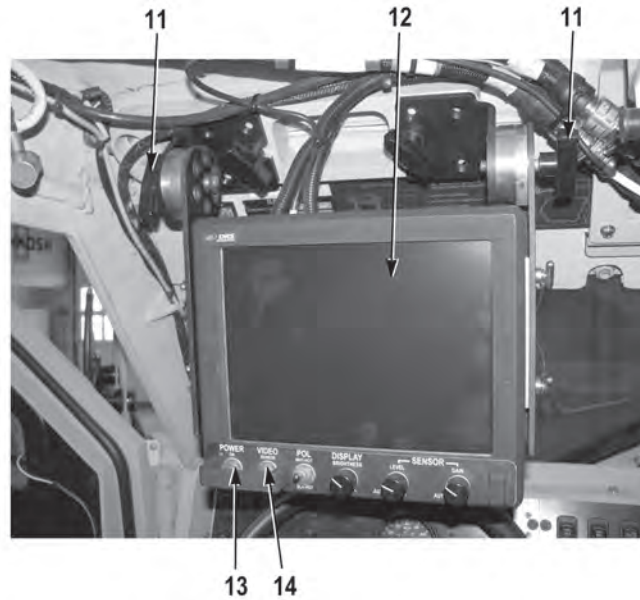
CAUTION

Do not move camera shields by hand. Failure to comply may result in damage to equipment.

NOTE

Perform Step (7) if using passenger side camera.

- Open passenger side camera shield (10) by moving toggle switch (8) to the "B" position and pressing the SHIELD open button (9).



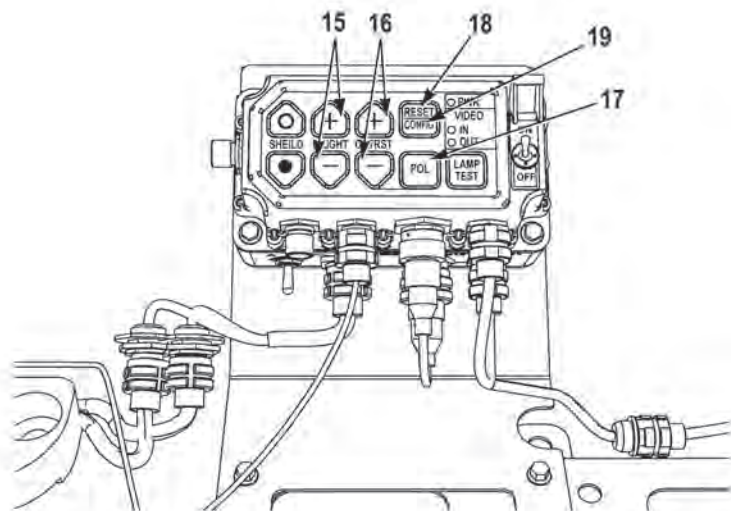
CAUTION

Support DVE display prior to loosening T-handles. Failure to comply may result in damage to equipment.

NOTE

Perform Steps (8) through (12) if DVE display is present.

8. Loosen two T-handles (11) and rotate DVE display (12) to desired position.
9. Tighten two T-handles (11).
10. Turn POWER switch (13) to the on position on DVE display (12).
11. Turn VIDEO switch (14) to external position on DVE display (12).
12. Verify that image is displayed on DVE display (12).



NOTE

- The (+) BRIGHT button increases brightness on DVE display.
- The (-) BRIGHT button decreases brightness on DVE display.
- Perform Step (13) if DVE display is present.

13. Push BRIGHT (+/-) buttons (15) for desired brightness.

NOTE

- The (+) CNTRST (contrast) button increases contrast on DVE display.
- The (-) CNTRST (contrast) button decreases contrast on DVE display.
- Perform Step (14) if DVE display is present.

14. Push CNTRST (+/-) buttons (16) for desired contrast.

NOTE

- The Check-6 system is infrared-based and the white-on-black or black-on-white display can be selected by switching the polarity of the system by pressing the POL (polarity) button.
- Perform Step (15) if DVE display is present.

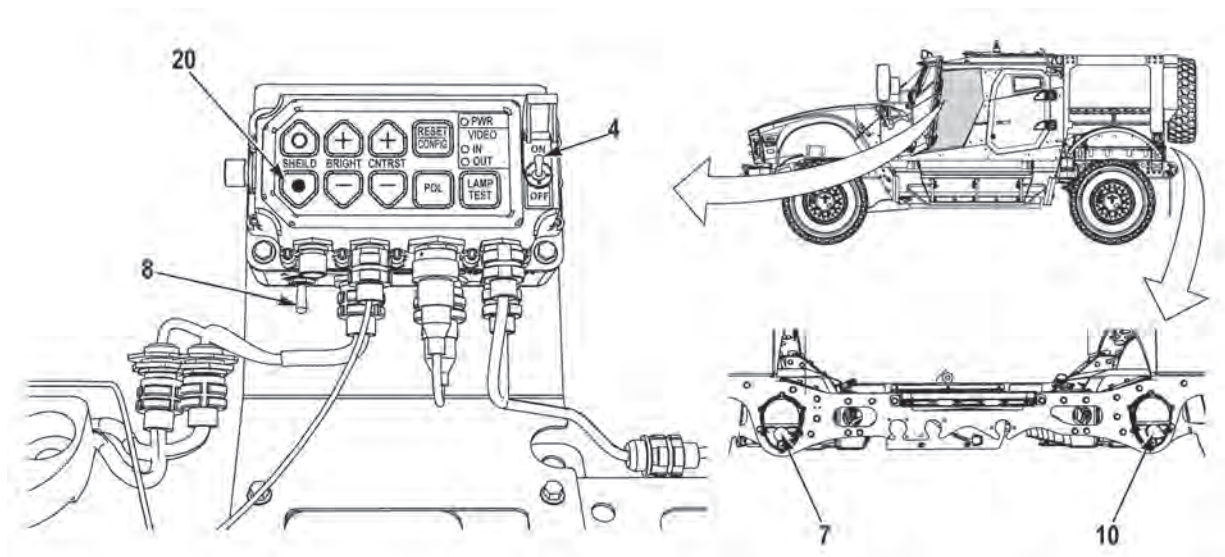
15. Push POL (polarity) button (17) for desired polarity.

NOTE

- The RESET/CONFIG button shares dual functionality.
 - To select an overlay, press and hold the RESET/CONFIG button for six seconds, then release. OVERLAY SELECT will be on steady.
 - Pressing and releasing the RESET/CONFIG button will toggle through the different overlays. Stop pressing the RESET/CONFIG button when the desired overlay label appears in the upper right corner of display. After approximately four seconds, the system will exit OVERLAY SELECT. Upon completion of the overlay selection process, the last overlay selected is maintained during subsequent power cycles.
 - The RESET/CONFIG button, in addition to providing the capability to display/remove overlays, also allows the operator to restore altered image brightness/contrast to a default setting.
 - Perform Steps (16) and (17) if DVE display is present.
16. Press the RESET button (18) to return system to default settings.
 17. Press the CONFIG (configuration) button (19) for desired system background overlay.

END OF TASK

TURNING SYSTEM OFF

**CAUTION**

Ensure camera shields are closed on both cameras. Failure to comply may result in damage to equipment.

NOTE

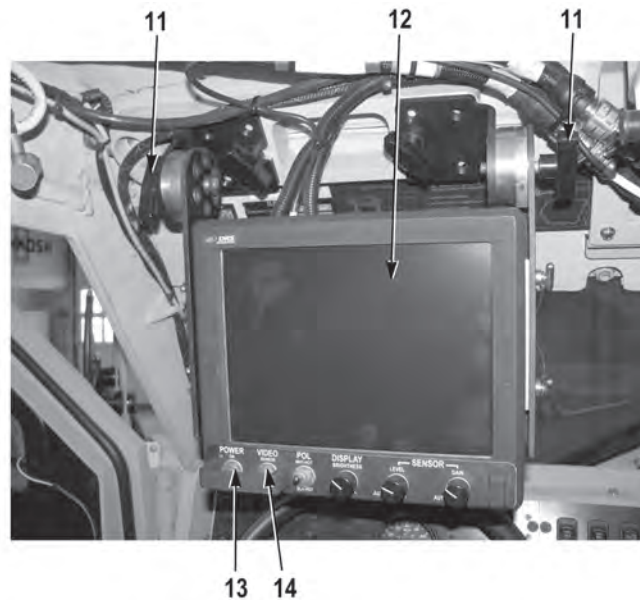
Perform Step (1) if driver side camera shield needs to be closed.

1. Close driver side camera shield (7) by moving toggle switch (8) to the "A" position and pressing the SHIELD closed button (20).

NOTE

Perform Step (2) if passenger side camera shield needs to be closed.

2. Close passenger side camera shield (10) by moving toggle switch (8) to the "B" position and pressing the SHIELD closed button (20).
3. Turn power switch (4) to the OFF position.



NOTE

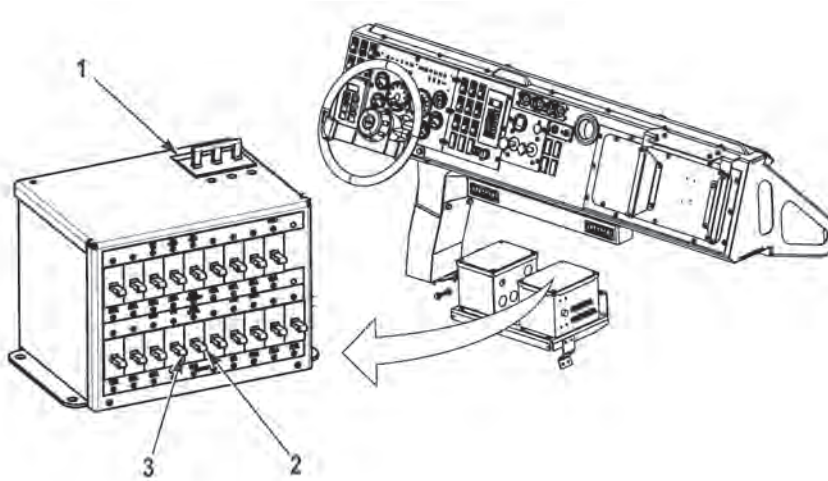
Perform Steps (4) through (7) if DVE display is present.

4. Turn POWER switch (13) off on DVE display (12).
5. Turn VIDEO switch (14) to sensor position on DVE display (12).
6. Loosen two T-handles (11).

CAUTION

Support DVE display while tightening T-handles. Failure to comply may result in damage to equipment.

7. Raise DVE display (12) to stowed position and tighten two T-handles (11).

**NOTE**

Perform Step (8) if DVE display is present.

8. Turn 10A DVE circuit breaker (3) to the off position.
9. Turn 10A rear camera circuit breaker (2) to the off position.

NOTE

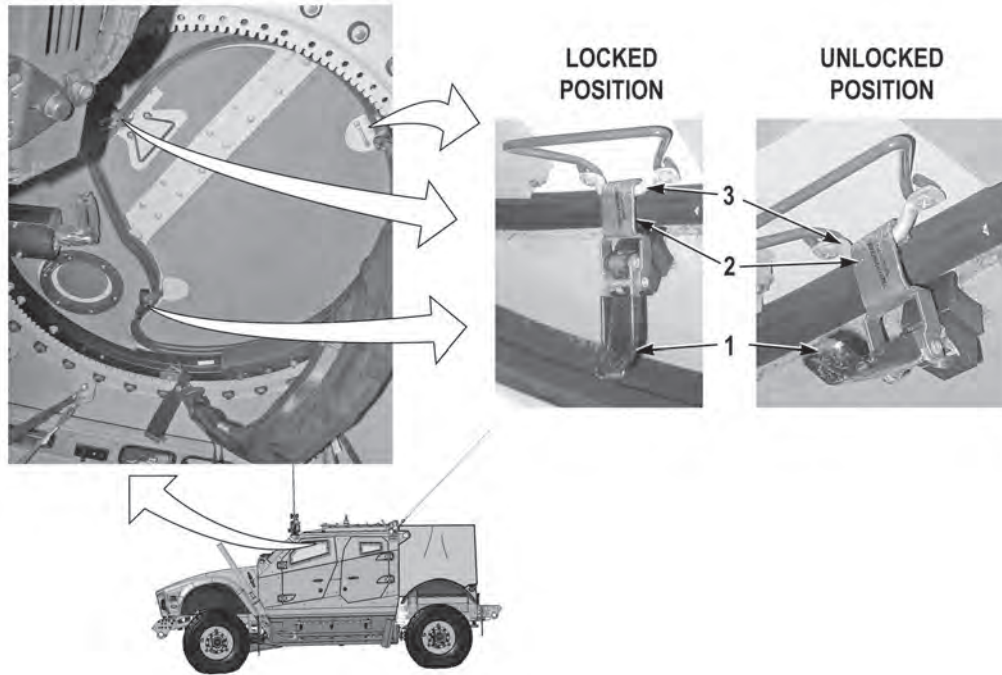
Perform Step (10) if turning off 175A main circuit breaker.

10. Turn 175A main circuit breaker (1) to OFF position.

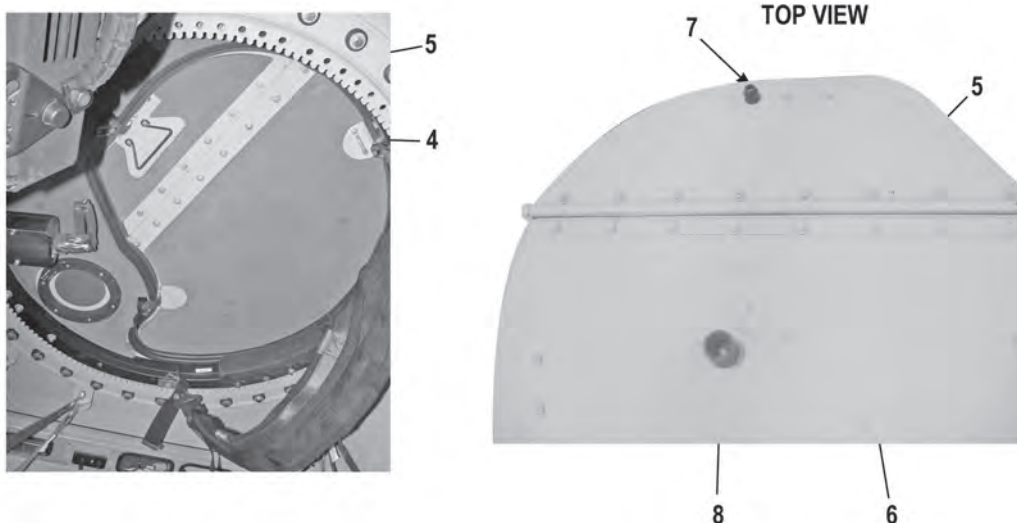
END OF TASK

END OF WORK PACKAGE

HATCH COVER OPEN/CLOSE

HATCH COVER OPEN

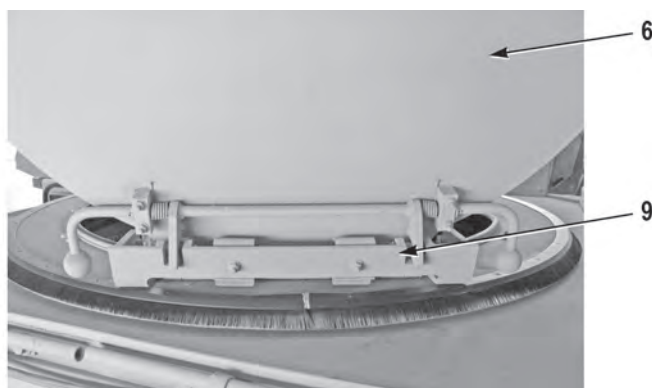
1. Release three latches (1) and remove three hooks (2) from brackets (3).



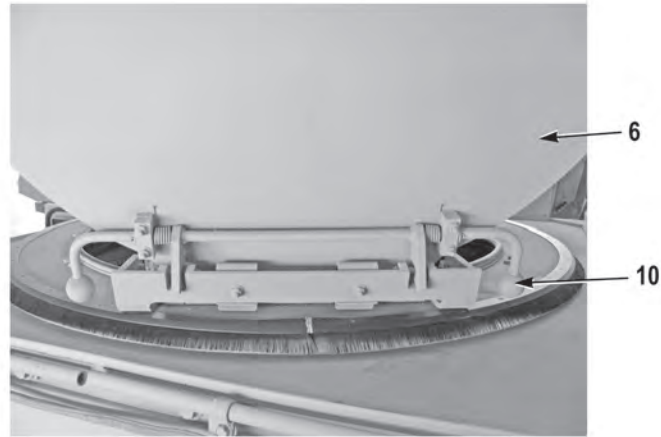
WARNING

- Gunner hatch is extremely heavy. Use caution when opening and closing. Keep arms and hands clear of gunner hatch when closing. Gunner hatch can only be opened or closed when vehicle is stationary and on a level surface. Do not attempt to open or close hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. 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 support to maintain stability at all times and shall wear a gunner's restraint when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.
- Keep hands and fingers clear of hatch and capsule contact area. Failure to comply may result in injury to personnel.

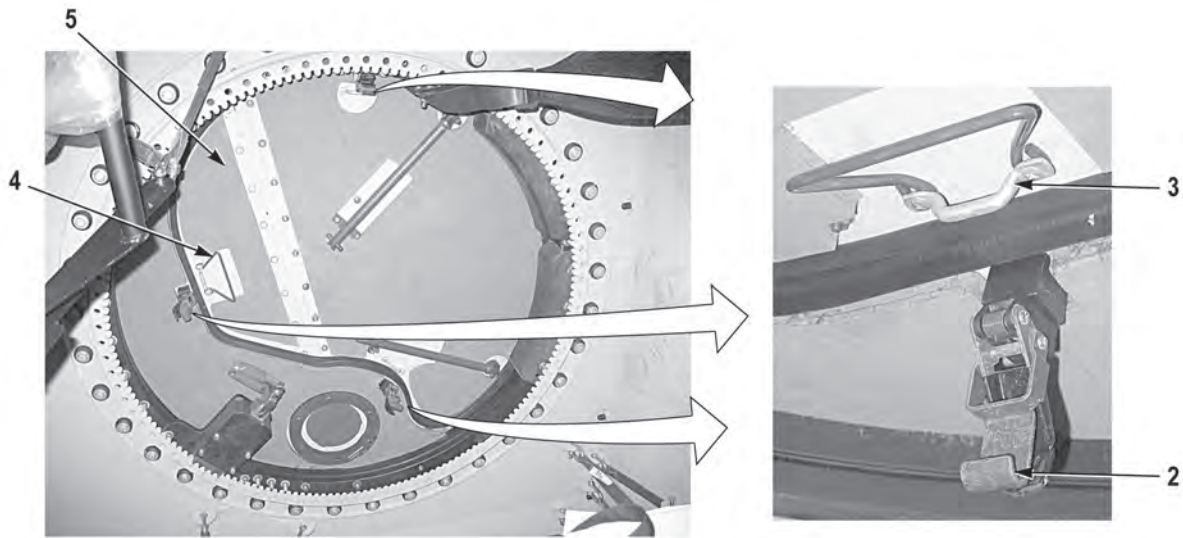
2. Using handle (4), push small hatch (5) open.
3. Fold small hatch (5) over onto large hatch (6) until lock (7) is seated in grommet (8).



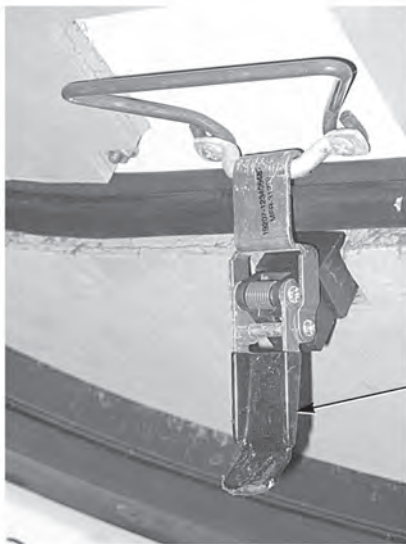
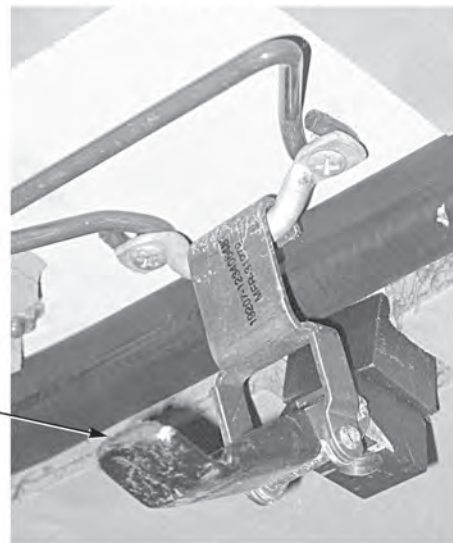
4. Raise large hatch (6).
5. Push large hatch (6) until locked on locking mechanism (9).

HATCH COVER CLOSE**WARNING**

- **Gunner hatch is extremely heavy. Use caution when opening and closing. Keep arms and hands clear of gunner hatch when closing. Gunner hatch can only be opened or closed when vehicle is stationary and on a level surface. Do not attempt to open or close hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. 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 support to maintain stability at all times and shall wear a gunner's restraint when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.**
 - **Keep hands and fingers clear of hatch and capsule contact area. Failure to comply may result in injury to personnel.**
1. Push large hatch (6) to release pressure on locking mechanism (9) and push handle (10) up to release large hatch (6).
 2. Lower large hatch (6).



3. Using handle (4), unfold and lower small hatch (5).
4. Attach three hooks (2) to brackets (3).

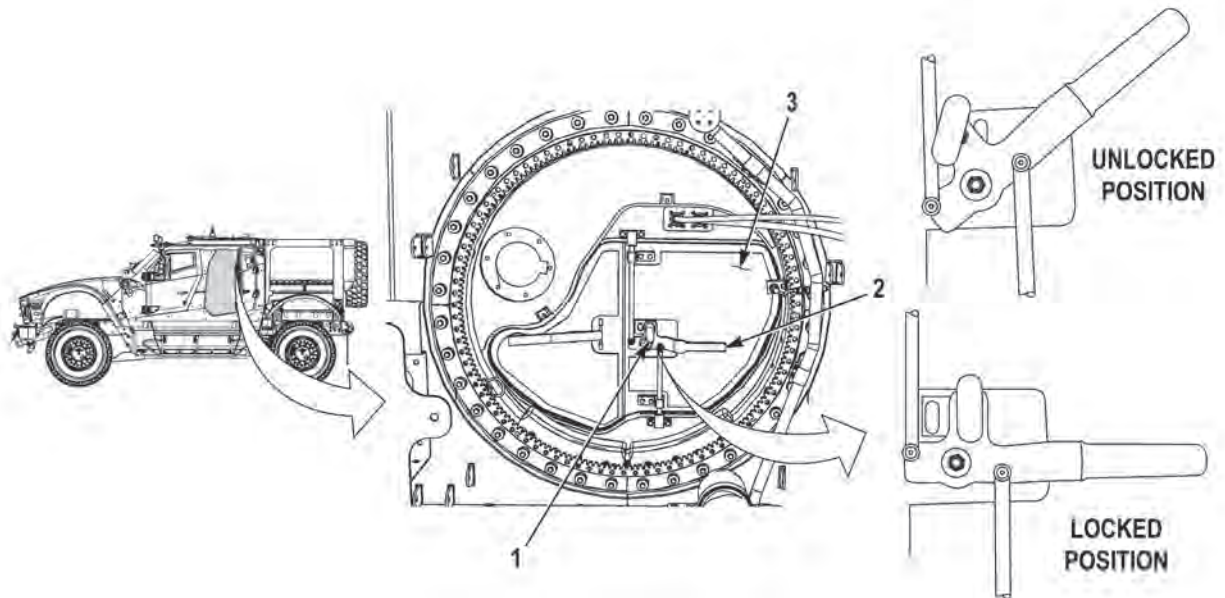
LOCKED POSITION**UNLOCKED POSITION**

5. Push three latches (1) to LOCKED position.

END OF TASK

END OF WORK PACKAGE

HATCH OPEN/CLOSE (RWS EQUIPPED)

HATCH OPEN**NOTE**

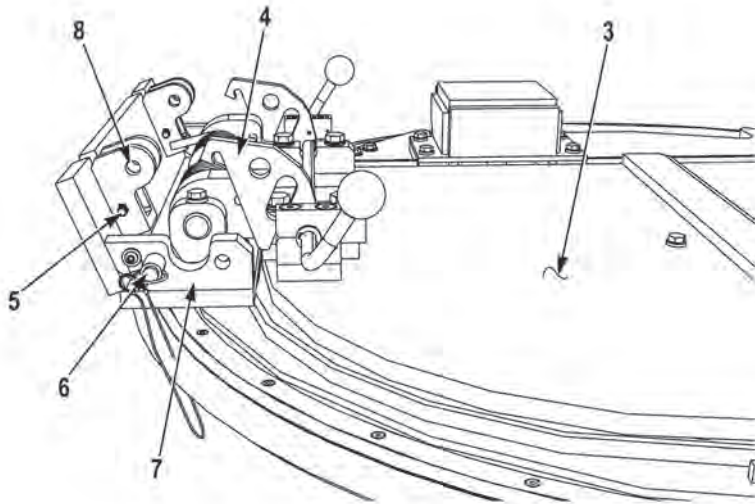
Perform Step (1) for M1245.

1. Fold 5th seat down (WP 0018).

WARNING

Gunner hatch is extremely heavy. Use caution when opening and closing. Keep arms and hands clear of gunner hatch when closing. Gunner hatch can only be opened or closed when vehicle is stationary and on a level surface. Do not attempt to open or close hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. 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 support to maintain stability at all times and shall wear a gunner's restraint when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.

2. Pull T-handle pin (1) out, rotate handle (2) to unlocked position, and raise driver side hatch (3).

**WARNING**

Keep hands and fingers away from pinch point areas of hatch covers. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

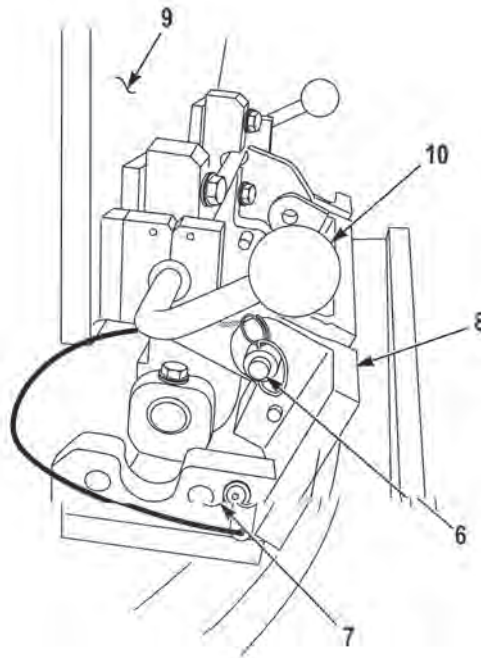
3. Push driver side hatch (3) open until slam latch (4) locks on catch (5).
4. Remove quick pin (6) from quick pin holder (7).

WARNING

Always install the hatch safety pins when the hatch covers are opened. Failure to comply may result in injury to personnel.

5. Install quick pin (6) on slam latch lock (8).
6. Perform Steps (3) through (5) on passenger side hatch.

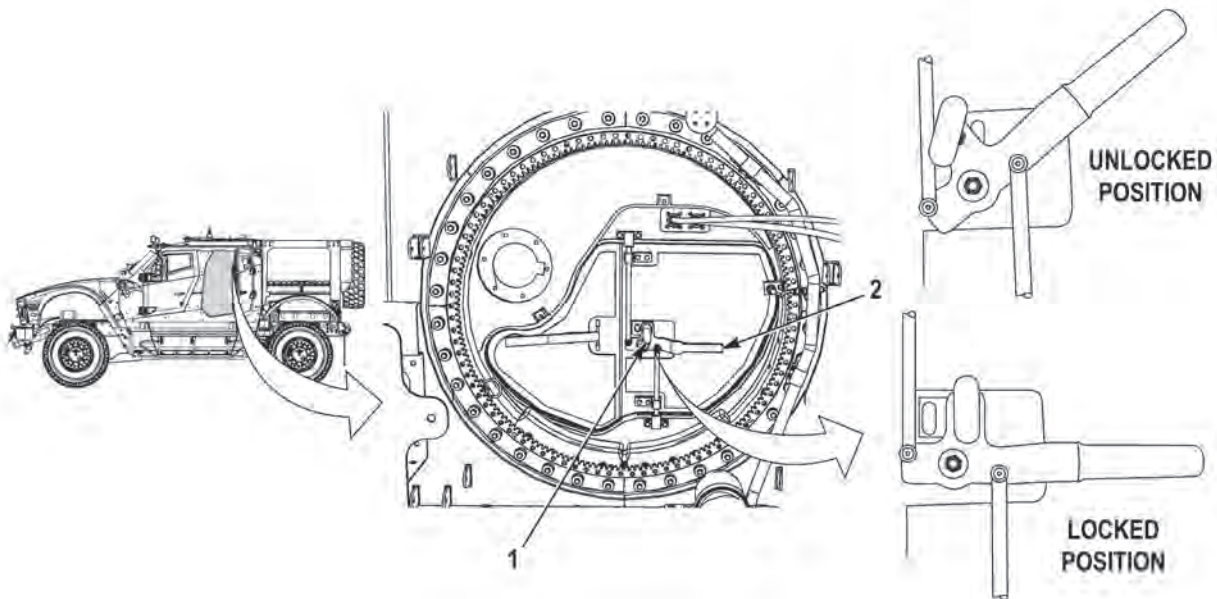
END OF TASK

HATCH CLOSE

1. Remove quick pin (6) from slam latch lock (8).
2. Install quick pin (6) in quick pin holder (7).

WARNING

- **Gunner hatch is extremely heavy. Use caution when opening and closing. Keep arms and hands clear of gunner hatch when closing. Gunner hatch can only be opened or closed when vehicle is stationary and on a level surface. Do not attempt to open or close hatch when vehicle is in motion. Make sure latch locks are secured into place in the open or closed positions before vehicle starts moving. 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 support to maintain stability at all times and shall wear a gunner's restraint when vehicle is in motion. Failure to comply may result in serious injury or death to personnel.**
 - **Keep hands and fingers clear of hatch and capsule contact area. Failure to comply may result in injury to personnel.**
3. Push passenger side hatch (9) to release pressure on slam latch handle (10) and pull slam latch handle (10) toward passenger side hatch (9) to release and close passenger side hatch (9).
 4. Perform Steps (1) through (3) on driver side hatch.

**WARNING**

Keep hands and fingers away from pinch point areas of hatch covers. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

5. Pull T-handle pin (1) out and rotate handle (2) to locked position.

END OF TASK

END OF WORK PACKAGE

TURRET GUNNER RESTRAINT SYSTEM

PLATFORM HARNESS ADJUSTMENT

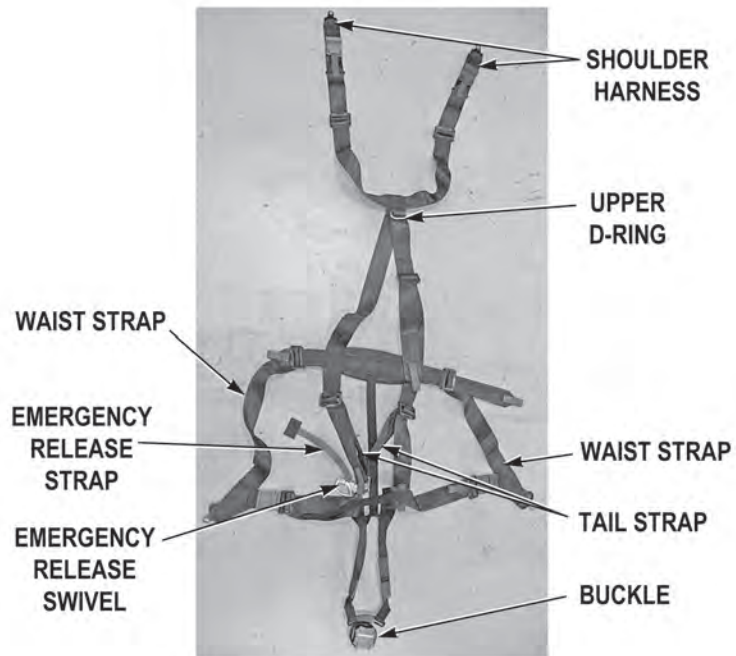


NOTE

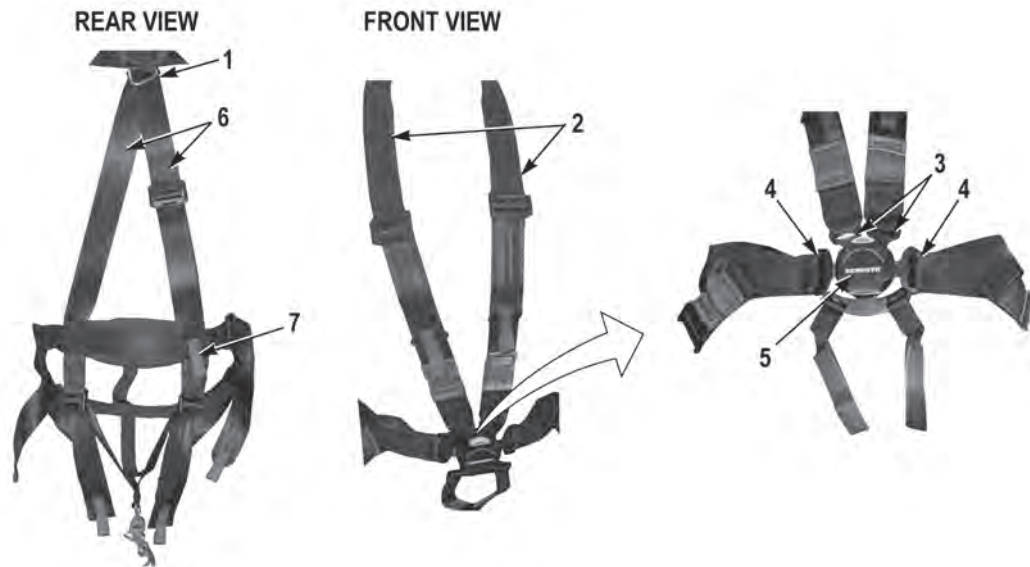
- Task applies to M1240 only.
 - Adjust platform with the aid of an assistant.
 - Back left pin will be completely removed for adjustment of platform.
1. With the aid of an assistant, pull pins (1) and turn to lock position.
 2. Adjust platform (2) to desired height.
 3. Turn pins (1) to unlocked position.
 4. Reinsert pins into platform legs.

END OF TASK

PARTS OF HARNESS



END OF TASK

DONNING AND REMOVING GUNNER RESTRAINT HARNESS**WARNING**

Always use turret gunner restraint system when vehicle is in operation. Failure to comply may result in injury or death to personnel.

NOTE

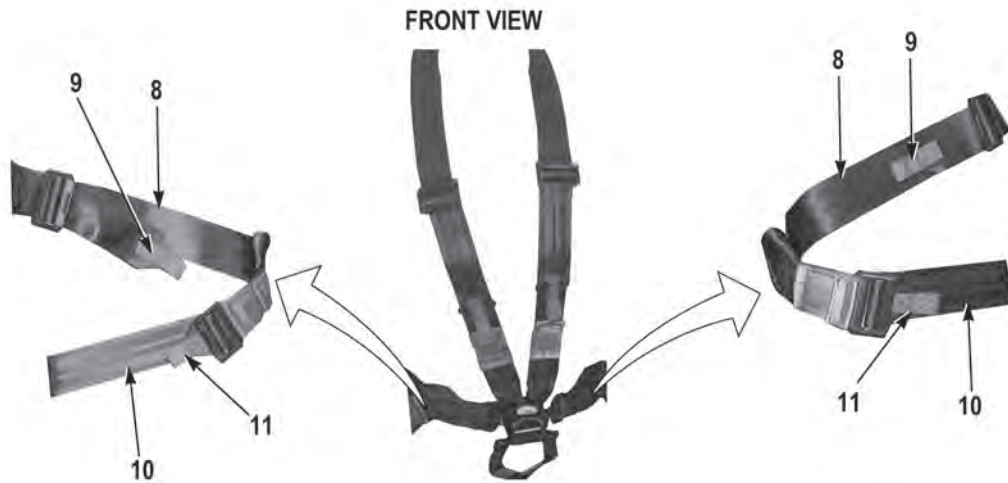
- Turret gunner restraint system is only to be used when personnel are in machine gunner position.
- The gunner restraint system is only designed to prevent gunner from being ejected from vehicle; it will not pull the gunner back into vehicle.

1. Locate D-ring (1) and place at base of neck with shoulder straps (2) over shoulder.
2. Insert shoulder strap latches (3) and waist belt latches (4) into buckle (5).

NOTE

Rear shoulder strap adjustment is used to adjust height of waist strap.

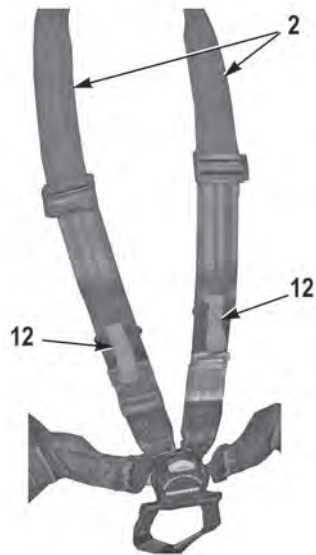
3. Adjust rear shoulder straps (6) by pulling down on strap (7).



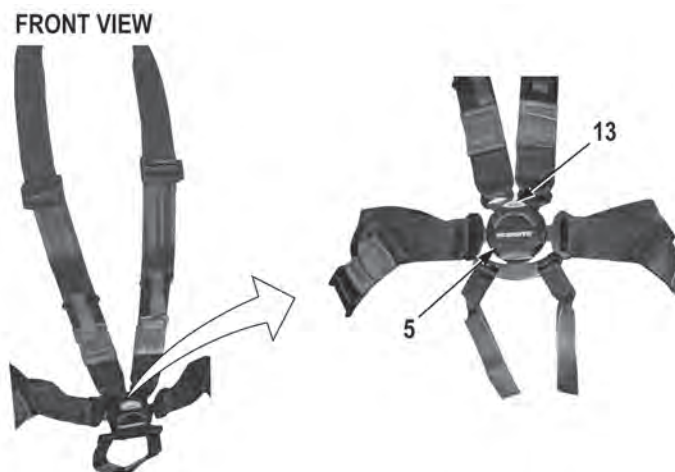
NOTE

Both sides of waist belt and leg straps are adjusted the same way. Adjust both sides of waist belt evenly.

4. Adjust waist belt (8) by pulling straps (9) until belt fits snug around waist.
5. Adjust leg straps (10) by pulling straps (11) until belts fit snug around legs.



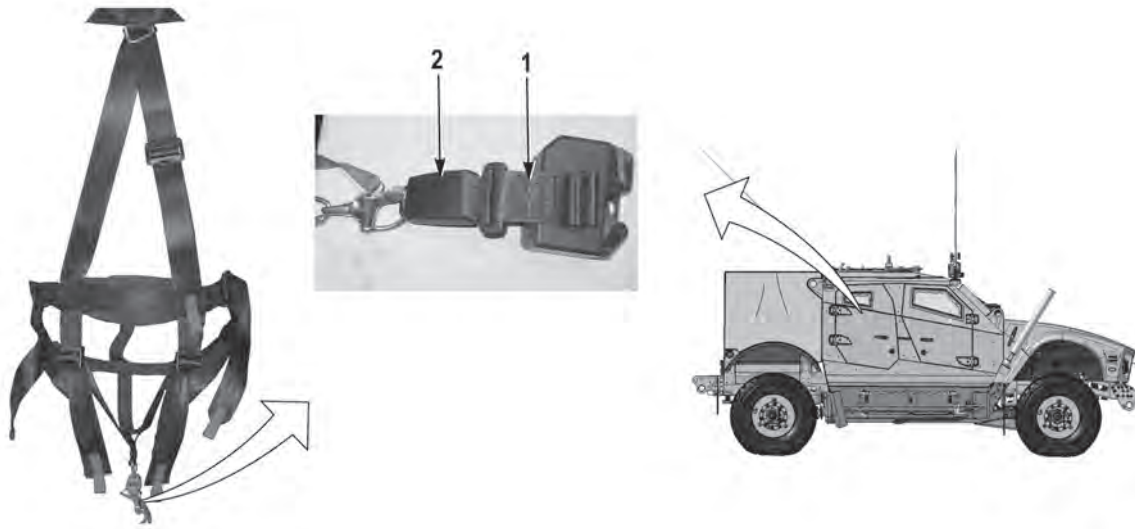
6. Adjust shoulder straps (2) by pulling on straps (12) until shoulder harness fits snug against chest.



7. To remove gunner restraint harness, push yellow button (13) and turn buckle (5) clockwise or counterclockwise.

END OF TASK

OPERATION OF GUNNER RESTRAINT SYSTEM



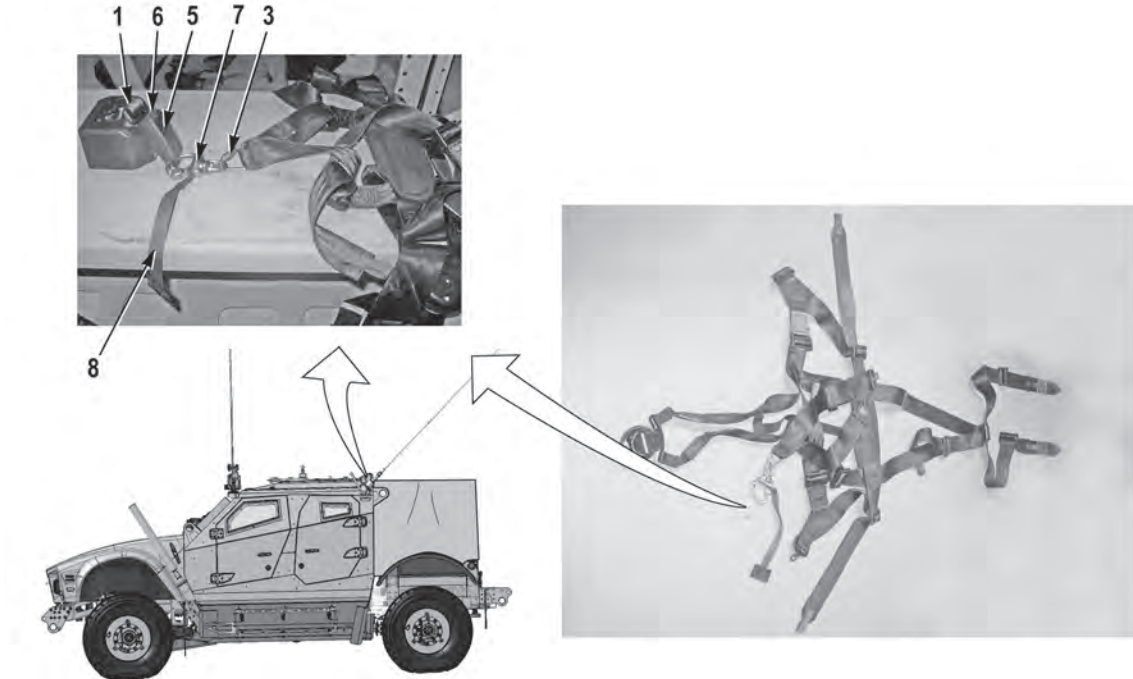
1. Attach vertical anchor strap (1) to buckle (2).



WARNING

Any slack in the harness anchor straps will reduce the effectiveness of the restraint. Remove all slack from harness anchor straps. Failure to comply may result in injury or death to personnel.

2. Adjust harness anchor straps (3) by pulling down on straps (4).



NOTE

- There are two ways to release gunner restraint harness from vertical anchor strap.
- For operation under normal conditions, use the anchor strap buckle, perform Step (3).
- For emergencies that require a quick exit of vehicle, use the emergency release, perform Step (4).

3. To release buckle (5), press red button (6) and remove vertical anchor strap (1) from buckle (5).

NOTE

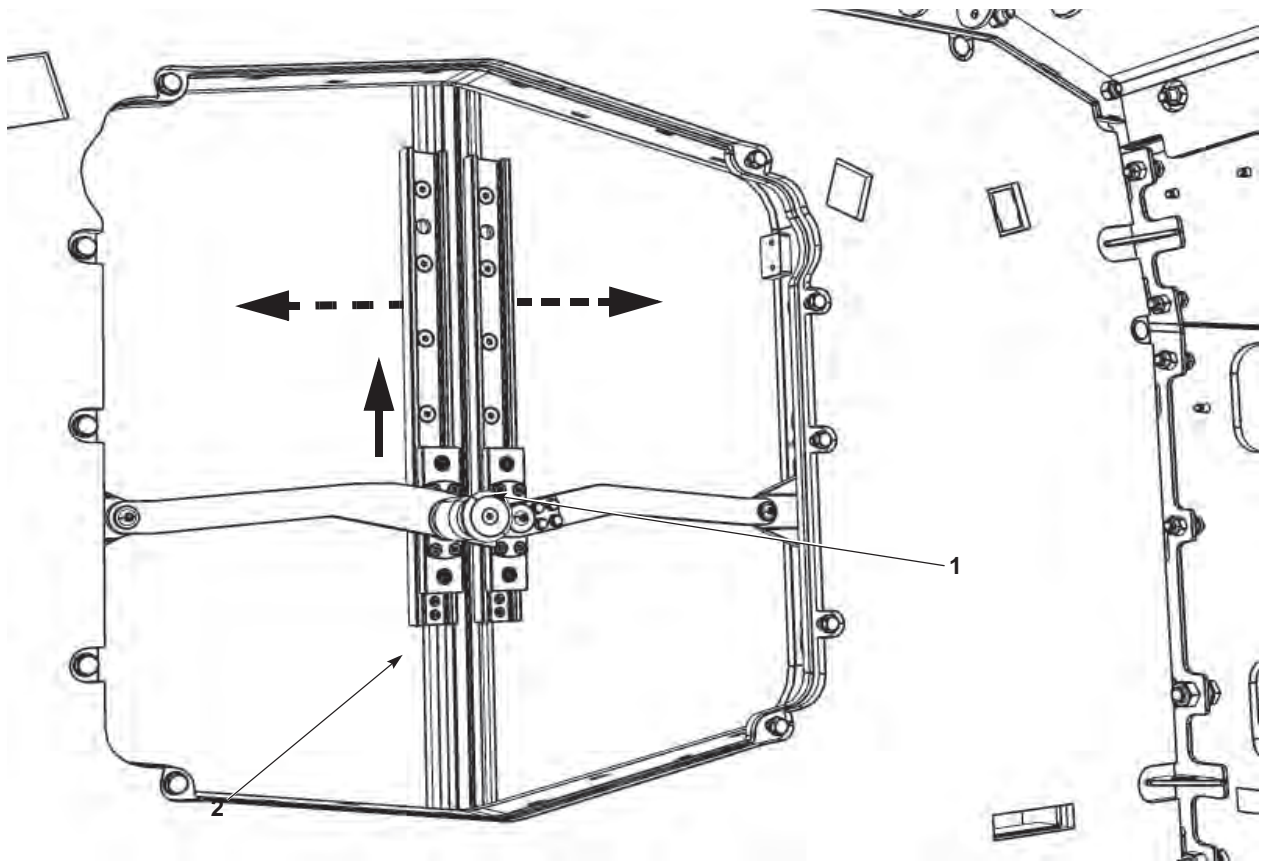
Use emergency release only in the event of an emergency that required a quick exit of vehicle.

4. To release emergency release swivel (7), pull emergency release strap (8) and pull anchor strap (3) from buckle (5).

END OF TASK

END OF WORK PACKAGE

REAR CAPSULE DOORS OPERATION (M1245)

OPEN REAR CAPSULE DOOR**WARNING**

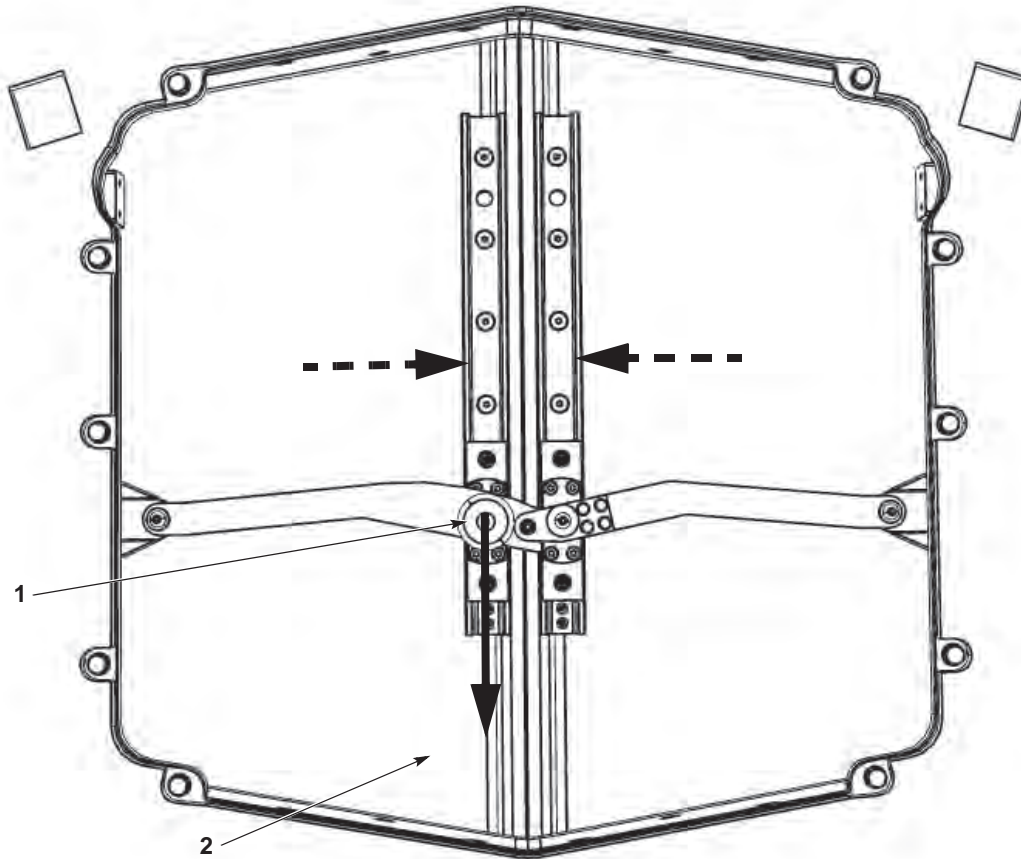
Keep hands and fingers away from any pinch point area of the capsule door assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

NOTE

- As one side of the capsule door opens, the other side will also open.
- Operation of the capsule doors can ONLY be done from inside capsule.
- To gain access to the capsule door handle the 5th seat MUST be in the folded position.

1. Pull the capsule door handle (1) outward to disengage the lock.
2. Move the capsule door handle (1) upward to open the capsule door (2).
3. When capsule door (2) is fully opened, push capsule door handle (1) inward to re-engage lock.

END OF TASK

CLOSE REAR CAPSULE DOOR**WARNING**

Keep hands and fingers away from any pinch point area of the capsule door assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

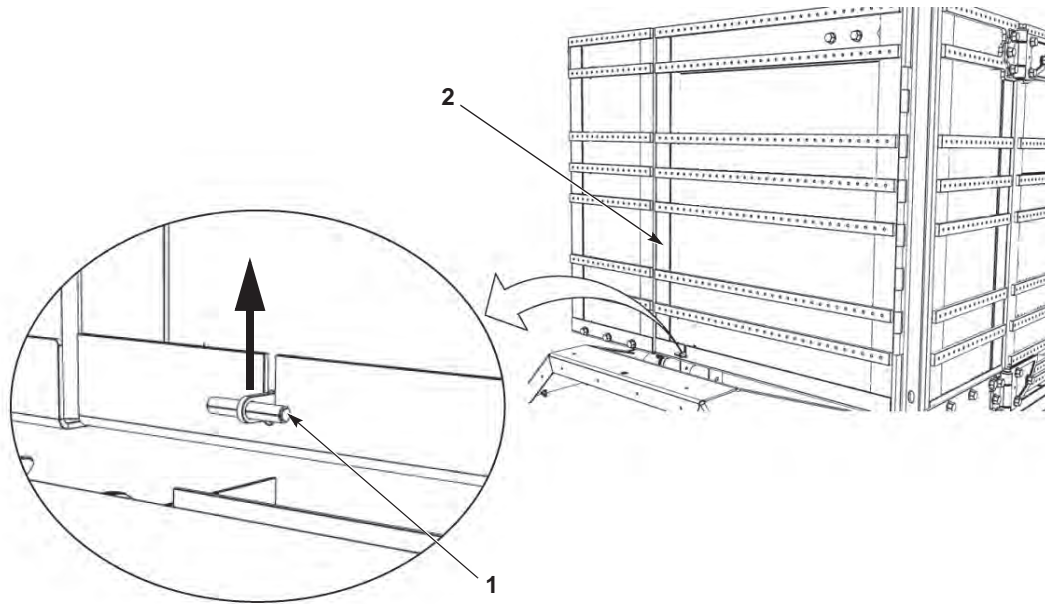
NOTE

- As one side of the capsule door closes, the other side will also close.
- Operation of the capsule doors can ONLY be done from inside capsule.
- To gain access to the capsule door handle the 5th seat MUST be in the folded position.

1. Pull the capsule door handle (1) outward to disengage the lock.
2. Push downward on the capsule door handle (1) to close the capsule door (2).
3. When capsule door (2) is fully closed, push capsule door handle (1) inward to re-engage lock.

END OF TASK**END OF WORK PACKAGE**

LITTER DOOR OPERATION (M1245)

OPEN LITTER DOORS (OUTSIDE OF CARGO BED)**WARNING**

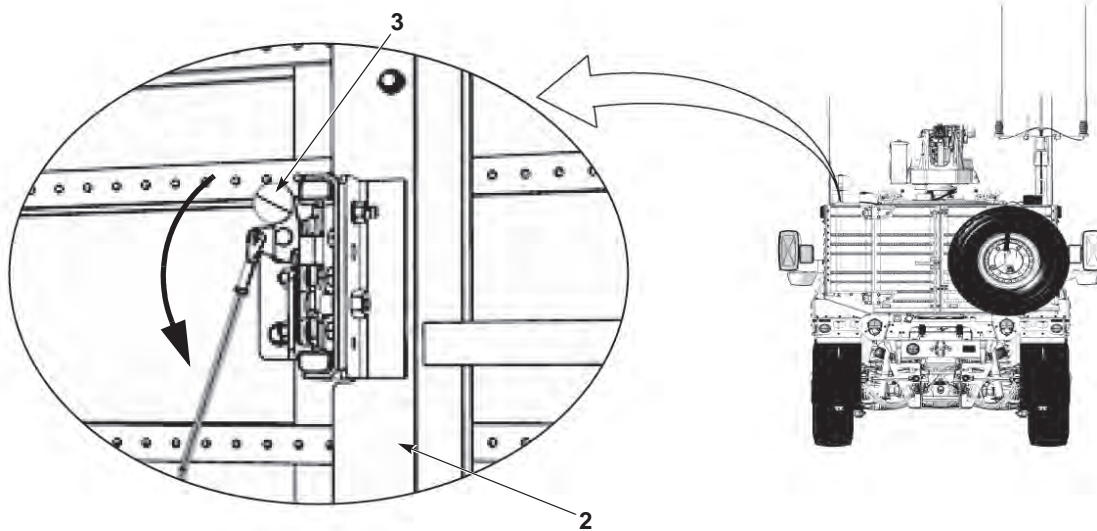
Keep hands and fingers away from pinch point areas of the litter door assembly. Failure to comply may result in injury to personnel.

NOTE

Procedure is the same for driver and passenger sides.

1. From the outside of the vehicle, lift upward on the litter door latch (1).
2. Pull the litter door (2) outward to open.

END OF TASK

OPEN LITTER DOORS (INSIDE OF CARGO BED)**WARNING**

Keep hands and fingers away from pinch point areas of the litter door assembly. Failure to comply may result in injury to personnel.

NOTE

Procedure is the same for driver and passenger sides.

1. From the inside of the vehicle, push sideways on the litter door latch (3).
2. Push the litter door (2) outward to open.

END OF TASK

CLOSE LITTER DOORS**WARNING**

Keep hands and fingers away from pinch point areas of the litter door assembly. Failure to comply may result in injury to personnel.

NOTE

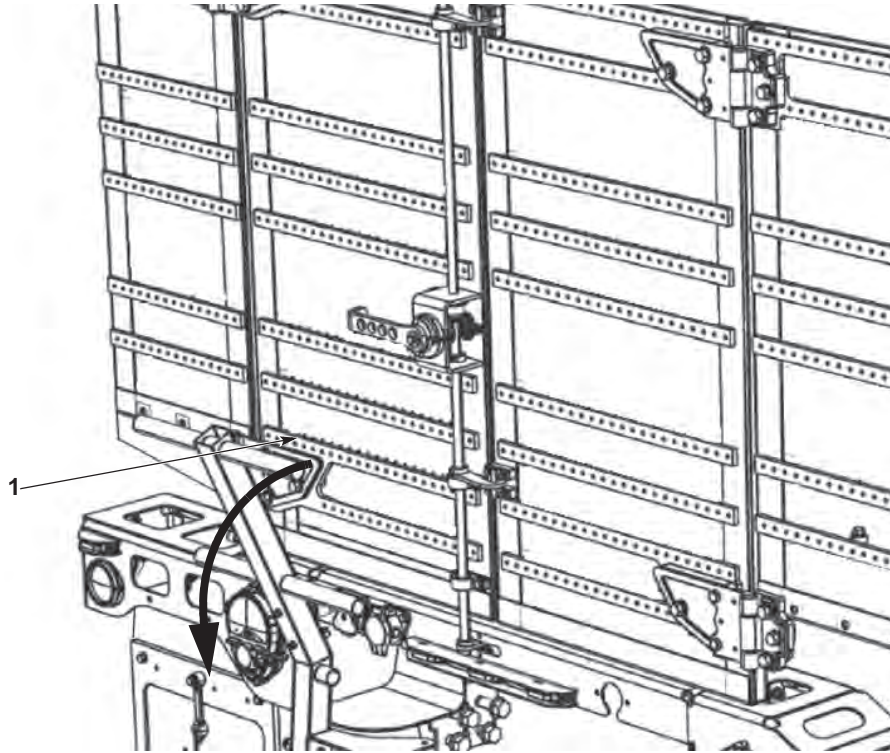
Procedure is the same for driver and passenger sides.

1. Verify that the litter door (2) is clear of all obstructions.
2. Push the litter door (2) inward to close.
3. Verify the litter door (2) is secure.

END OF TASK

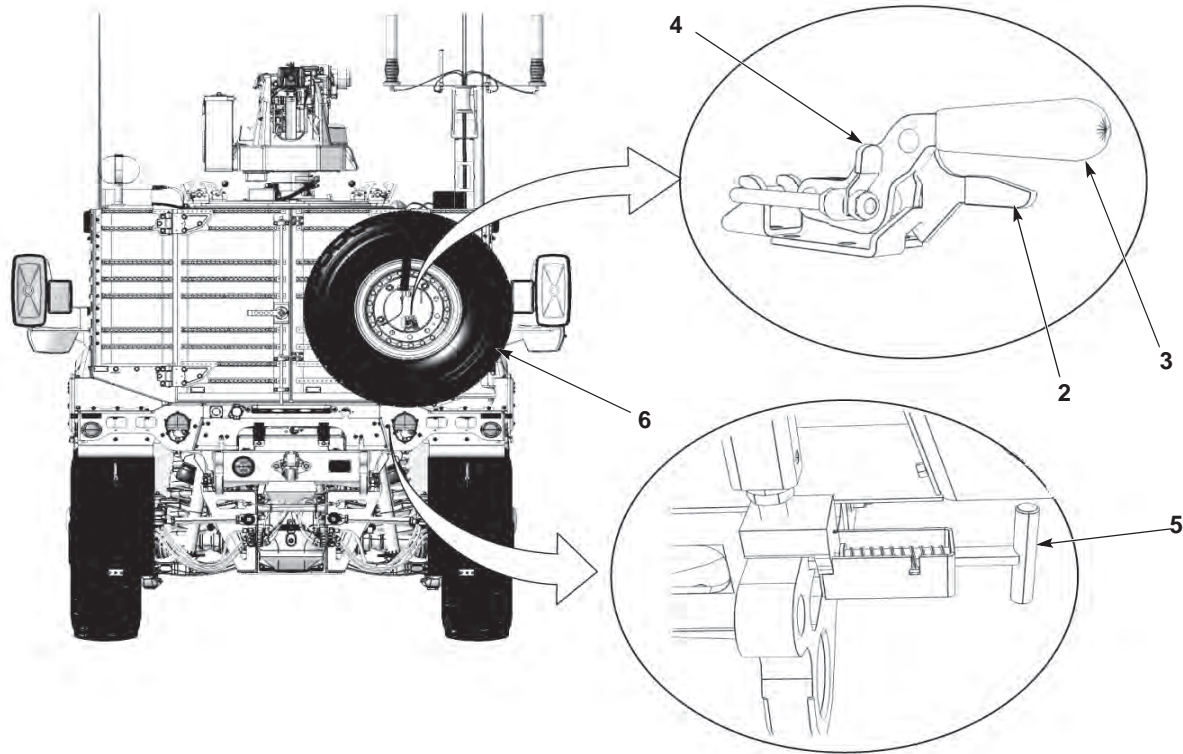
END OF WORK PACKAGE

REAR CARGO DOORS OPERATION (M1245)

OPEN REAR CARGO DOORS**WARNING**

Keep hands and fingers away from pinch point areas of cargo doors. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

1. Pull and lower the cargo bed ladder (1) from the stowed position.

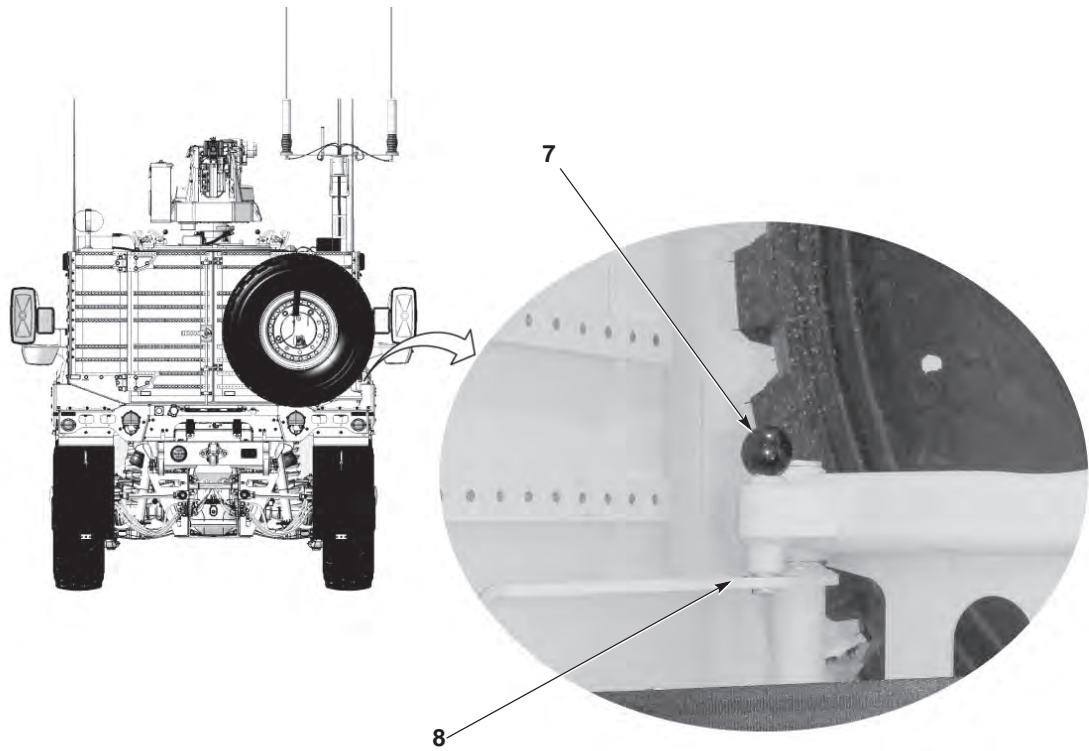
OPEN REAR CARGO DOORS – CONTINUED**WARNING**

Keep hands away from pinch point areas of the spare tire assembly when swinging. Hands and fingers could get crushed. Failure to comply may result in injury to personnel.

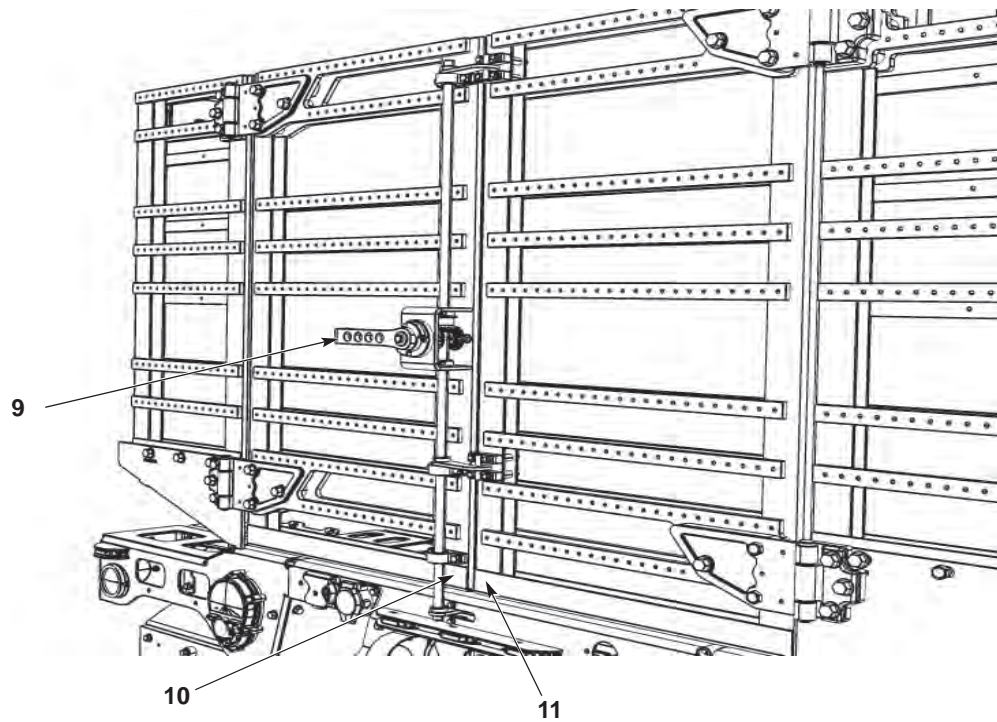
NOTE

- Passenger side rear cargo door cannot be opened when spare tire carrier is in the stowed position.
- Perform steps 2–5 if opening passenger side rear cargo door.

2. Lift the spare tire locking latch (2) and lift lever (3) upward.
3. Pull the thumb tab (4) away from the vehicle to unlock.
4. Pull the “T” handle (5) and turn to unlock the lower portion of the spare tire assembly (6) from the frame.

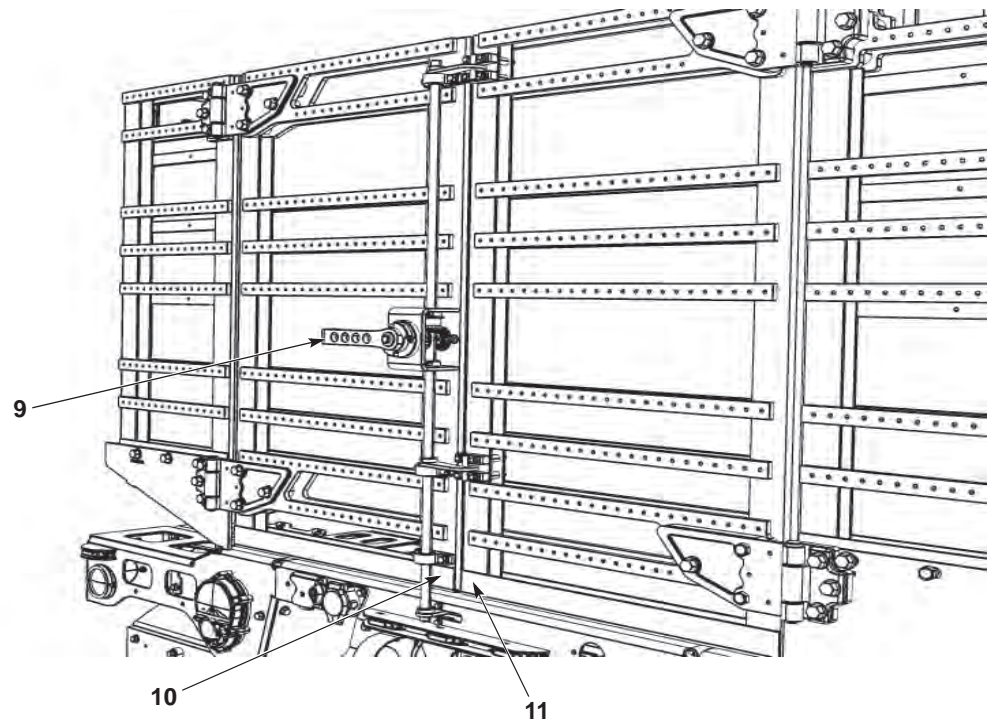
OPEN REAR CARGO DOORS – CONTINUED

5. Carefully swing the complete assembly away from the vehicle until the safety latch (7) engages into the frame (8).

OPEN REAR CARGO DOORS – CONTINUED

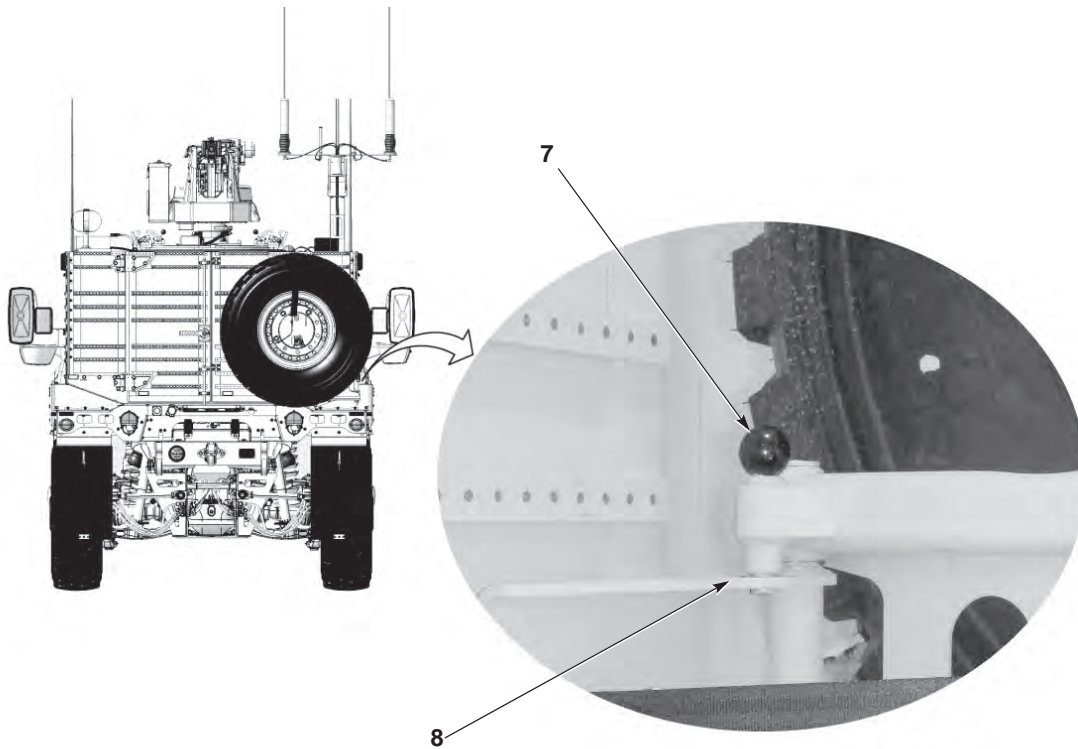
6. When opening door from outside turn handle (9) down and pull outward to open the driver-side of the rear cargo door (10).
7. When opening door from the inside, turn handle (9) upward and push outward to open the driver-side of the rear cargo door (10).
8. Swing the passenger-side of the cargo door (11) outward to the open position.

END OF TASK

CLOSE REAR CARGO DOORS**WARNING**

Keep hands and fingers away from pinch point areas of the cargo door assembly. Hands and fingers could get pinched. Failure to comply may result in injury to personnel.

1. Swing the passenger-side of the cargo door (11) inward to the closed position.
2. Swing the driver-side of the cargo door (10) inward to the closed position.
3. Apply slight pressure to cargo doors (10 and 11), and turn the handle (9) upward to lock.

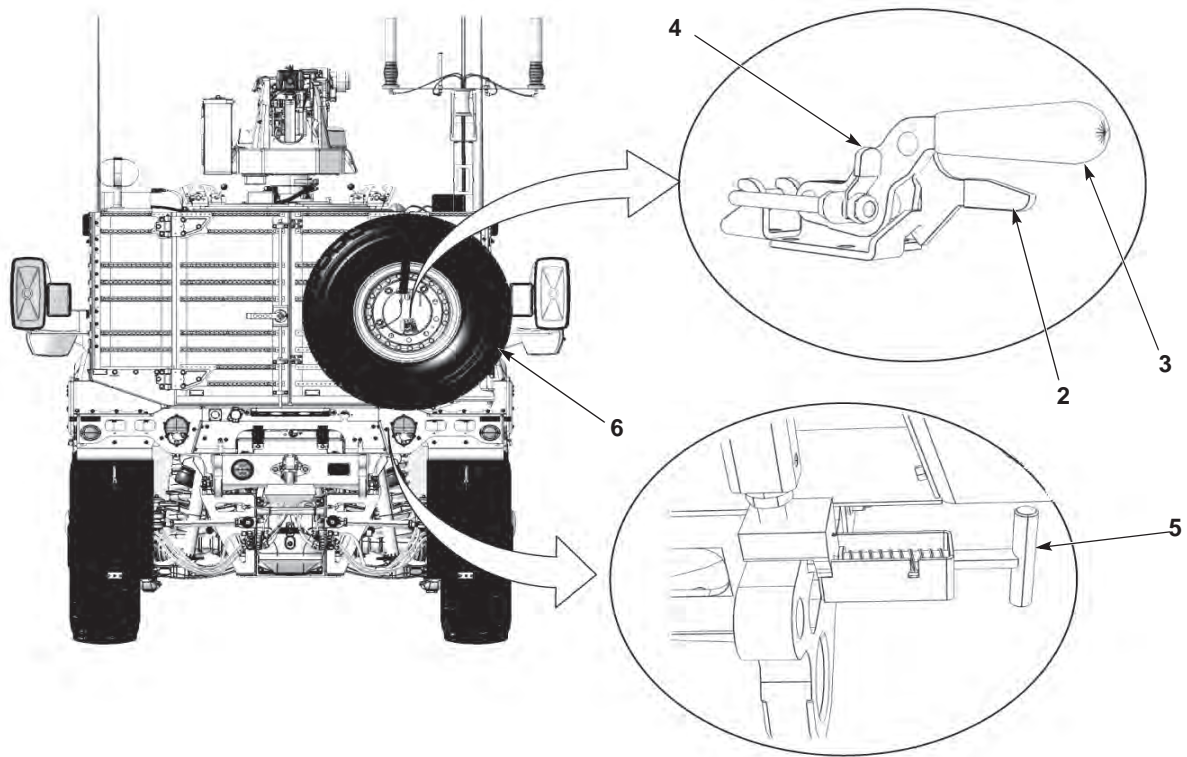
CLOSE REAR CARGO DOORS – CONTINUED**WARNING**

Keep hands and fingers away from pinch point areas of the spare tire assembly, hands and fingers could get pinched. Failure to comply may result in injury to personnel.

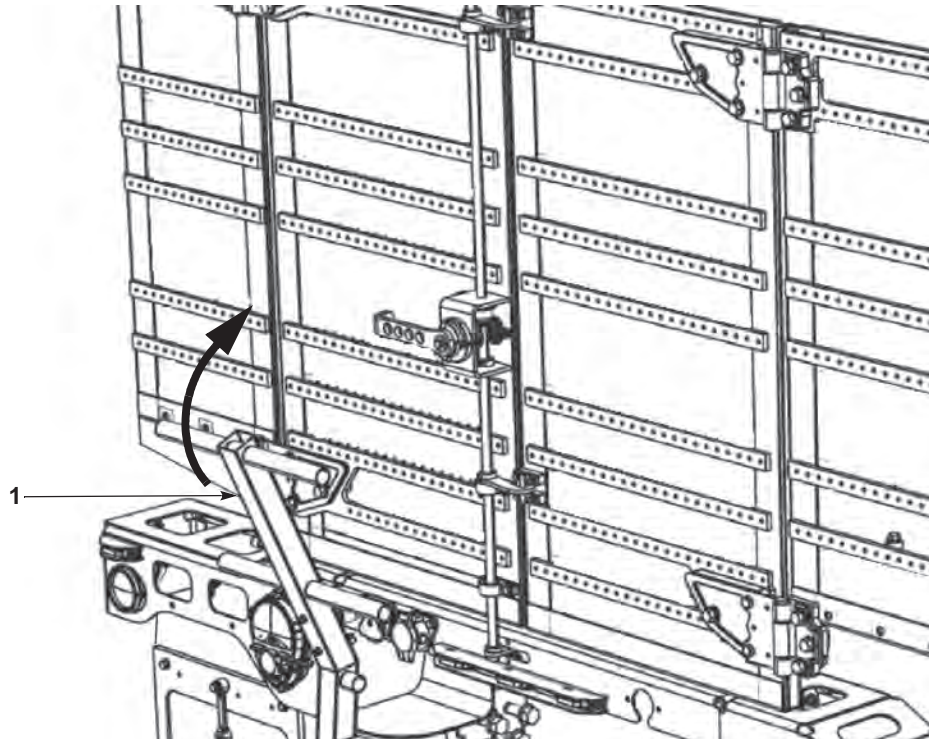
NOTE

Perform steps 4–9 if passenger side rear cargo door had been opened.

4. Pull the safety latch (7) to unlock the spare tire assembly from the frame (8). Carefully swing the complete spare tire assembly back to a stowed position.

CLOSE REAR CARGO DOORS – CONTINUED

5. Align the holes in the lower portion of the spare tire assembly (6) and the frame.
6. Turn the "T" handle (5) allowing it to lock into place.
7. Verify that the "T" handle (5) is secured and locked into position.
8. Push the thumb tab (4) downward.
9. Pull downward on lever (3) until the locking latch (2) engages.

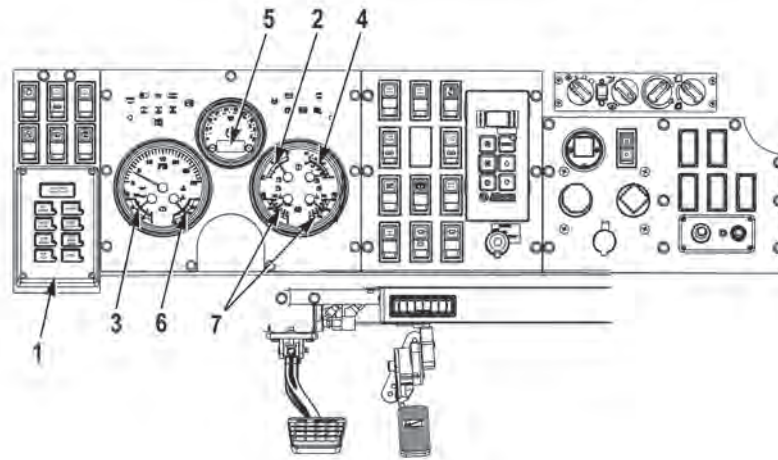
CLOSE REAR CARGO DOORS – CONTINUED

10. Lift the cargo bed ladder (1) into a stowed position.

END OF TASK

END OF WORK PACKAGE

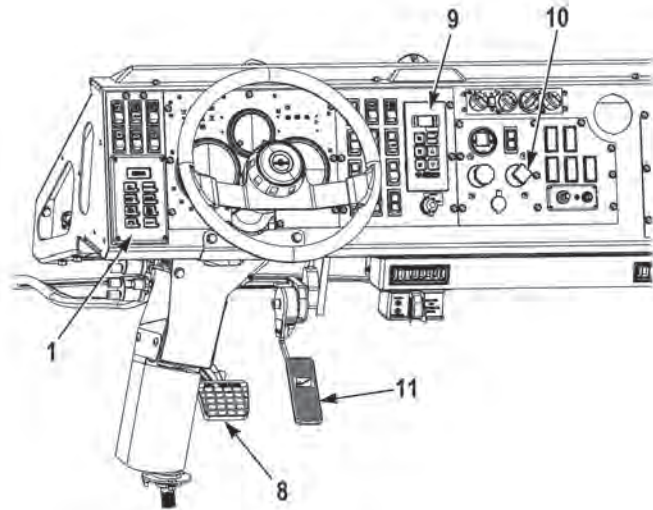
OFF-ROAD CONDITIONS



WARNING

- **The vehicle has a high center of gravity. Slow down for turns and other maneuvers. Approach slopes head on and avoid side slopes when possible. Failure to comply may result in injury or death to personnel and damage to equipment.**
- **Do not attempt to ford water deeper than 36 inches. Ensure bottom surface under water is hard. Reduce speed during fording. Ensure brakes are dry and operating correctly upon completion of fording operation before commencing normal driving. Failure to comply may result in injury to personnel or damage to equipment.**
- **If the operator leaves the vehicle, even momentarily, when engine is running, the transmission **MUST** be in N (neutral), **PARKING BRAKE** must be engaged, and wheel **MUST** be chocked. Unexpected and sudden vehicle movement may occur causing injury or death to personnel.**

1. Set CTIS controller (1) to CROSS COUNTRY position (WP 0031).
2. Check that fuel gauge (2) shows enough fuel to complete mission.
3. Check that oil pressure gauge (3) reads in safe operating range and increases as engine speed increases.
4. Check that transmission oil temperature gauge (4) reads below 250°F (121°C) after transmission warms up.
5. Check LCD screen (5) for voltage reading of 24 to 30 volts (WP 0027).
6. Check that water temperature gauge (6) reads below 220°F (104°C).
7. Check that air pressure gauges (7) read 120 to 125 psi (827 to 862 kPa).



CAUTION

Ensure both air pressure gauges read at least 120 psi (827 kPa) prior to performing Step (8). Failure to comply may result in damage to equipment.

8. Apply service brake pedal (8) and position transmission range selector (9) in D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions.
9. Push in PARKING BRAKE control valve (10).

CAUTION

Maximum governed engine speed with transmission in N (neutral) is approximately 2600 rpm. Never allow engine speed to exceed this figure. Under load, governed speed is approximately 2600 rpm. If engine is allowed to go over governed speed, engine damage can result.

10. Release service brake pedal (8) and slowly press down throttle pedal (11) until vehicle reaches desired speed.

CAUTION

- **Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result. Failure to comply may result in damage to equipment.**
- **CTIS increases tire pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until tires are inflated to correct pressure (WP 0031). Failure to comply may result in damage to equipment.**

11. Accelerate, brake, and steer as required.
12. Check system gauges often during vehicle operation.
13. When returning to on-road conditions, return transmission range selector (9) and CTIS controller (1) to appropriate settings (WP 0031).

END OF WORK PACKAGE

STEEP GRADES

WARNING

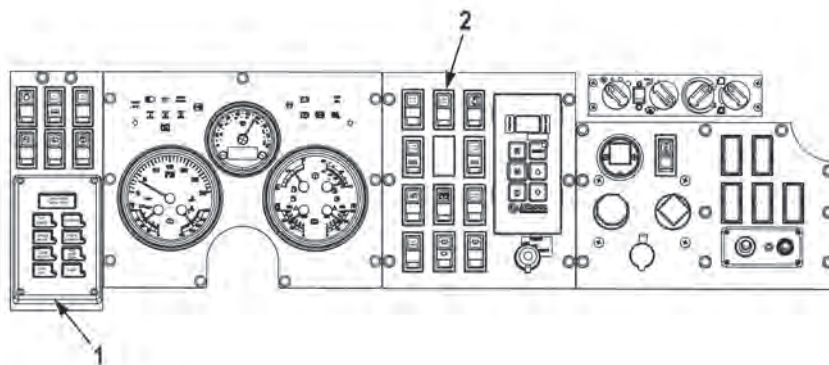
- The vehicle has a high center of gravity. Slow down for turns and other maneuvers. Approach slopes head on and avoid side slopes when possible. Failure to comply may result in injury or death to personnel and damage to equipment.
- Use exhaust brake/retarder only when vehicle tires have good traction. Use of exhaust brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

CAUTION

- Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.
- Do not operate vehicle at more than 10 mph (16 km/h) when all differential and transfer case driveline locks are engaged. Failure to comply may result in damage to equipment.
- Do not allow engine speed to go above 2600 rpm when driving downhill, or damage to engine can result.

NOTE

- Engine works hardest when driving uphill. Proper use of gear ranges will minimize stress on engine.
- Use exhaust brake/retarder when long application of service brakes is not desired (i.g., long downgrades).
- Exhaust brake/retarder will not engage when transmission is in first gear.

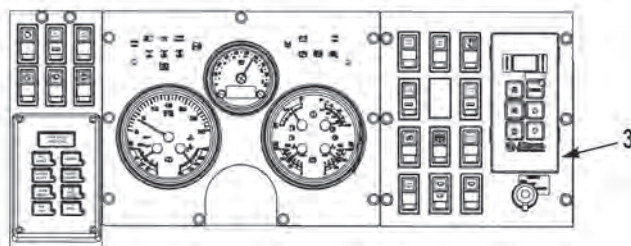


1. Set CTIS controller (1) and exhaust brake/retarder switch (2) to appropriate settings.

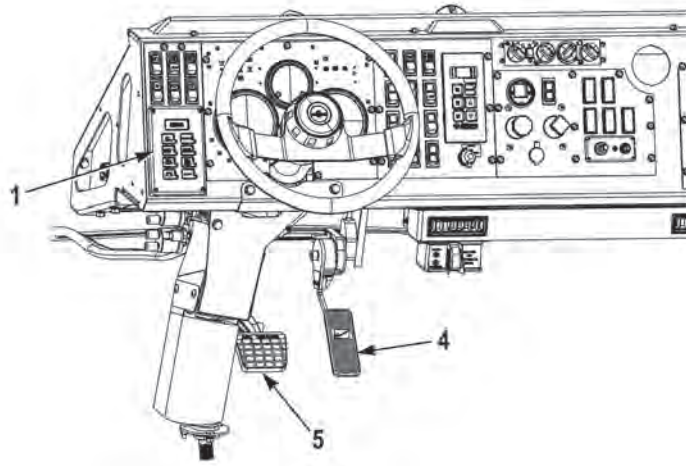
Table 1. Recommended Modes of CTIS Operation.

Road Condition	CTIS SETTING			
	HWY	CC	MSS	Emer
Grade-Slight (<10%)	X			
Grade-Moderate (10% to 25%)		X		
Grade-Steep (>25%)		1 (First Choice)	2 (Second Choice)	

NOTE: For grades greater than 25%, initial setting should be CC. If wheels start to slip, adjust CTIS to MSS setting.



2. Engage all differential and transfer case driveline locks (WP 0031).
3. Unless uphill grade is steep, begin with transmission range selector (3) in gear range D (drive). If there is enough power for safe and satisfactory road speed, remain in D range and allow transmission to shift automatically.
4. If uphill grade causes steady decrease in road speed and engine rpm, perform the following Steps:
 - a. Position transmission range selector (3) to D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions.



CAUTION

Excessive wheel slippage while traveling up steep grade could cause driveline damage. When wheel slippage is detected, stop vehicle immediately.

- b. If wheels start to slip, stop vehicle and adjust CTIS controller (1) to EMERGENCY setting. Gradually apply throttle pedal (4) and release service brake pedal (5) as traction allows (WP 0031).
5. Check system gauges often during vehicle operation as noted during normal driving procedures.

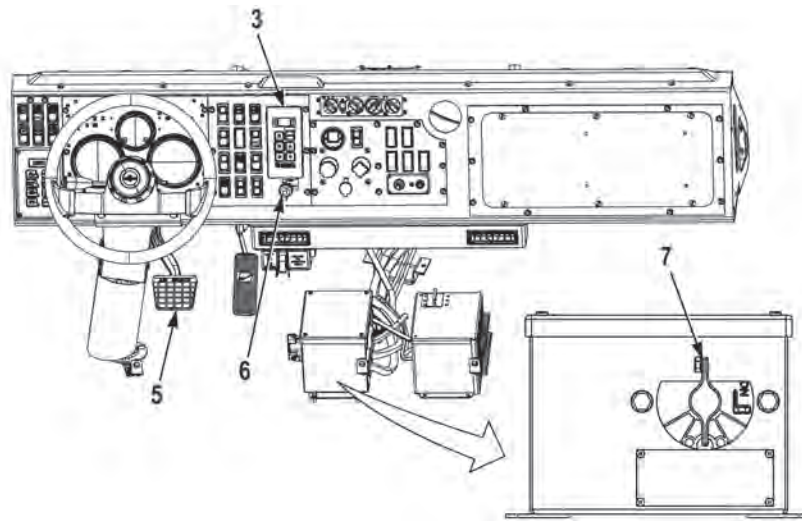
WARNING

When parking on steep grades, the CTIS must be in MSS or EMER setting in order to lock transfer case and create more stability. Driveline must be in full lock condition prior to shutting off engine. Failure to comply may result in injury or death to personnel.

NOTE

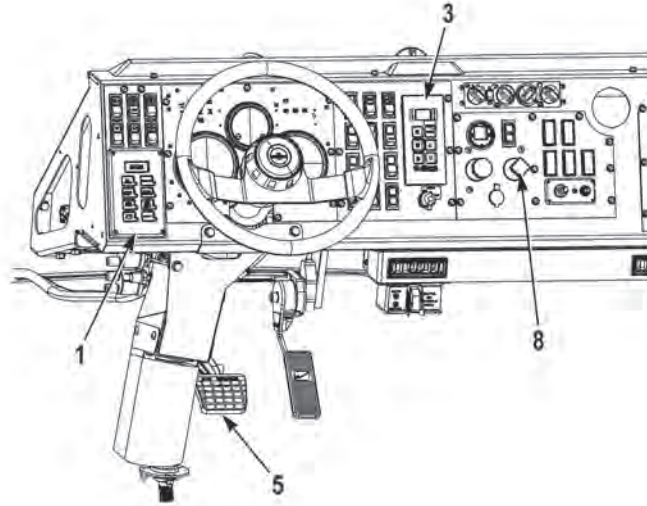
If parking the M-ATV on a steep grade, perform Steps (6) through (13).

6. Lift foot off throttle pedal (4).
7. Push down on service brake pedal (5).
8. When vehicle comes to a complete stop, continue applying service brake and apply parking brake (WP 0007).

**WARNING**

Release service brakes slowly. Fast release of service brakes may allow vehicle to roll before parking brakes engage. Failure to comply may result in injury to personnel.

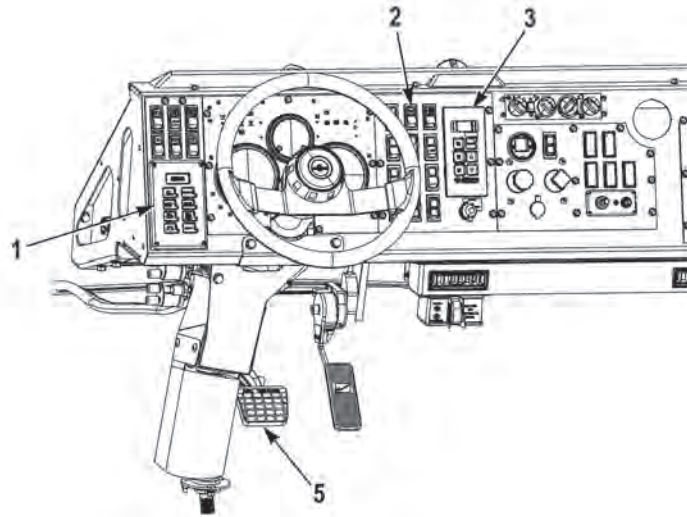
9. Slowly release service brake pedal (5).
10. Note transmission setting for future use and then position transmission range selector (3) to N (neutral).
11. Turn engine ignition switch (6) to OFF.
12. Turn battery disconnect switch (7) to OFF.
13. Chock wheels (WP 0009).



NOTE

When starting a vehicle that is parked on a steep grade, perform Steps (14) through (20).

14. Remove and stow wheel chocks (WP 0009).
15. Start engine (WP 0020).
16. Engage all differential and transfer case driveline locks (WP 0031).
17. Set transmission range selector (3) to setting that was noted in Step (10).
18. Push down on service brake pedal (5).
19. Push in parking brake control valve (8).
20. Release service brake pedal (5), accelerate slowly and drive as required.
21. Once grade is crested, adjust transmission range selector (3) and CTIS controller (1) to appropriate settings.



22. When driving down steep grades, perform the following Steps:

WARNING

Ensure to keep speeds within limits of road condition. Failure to comply may result in injury of death to personnel.

CAUTION

Do not allow engine speed to go above 2600 rpm when driving downhill, or damage to engine can result.

- a. Position transmission range selector (3), as required, to keep engine speed on tachometer below 2600 rpm.

WARNING

Rapid operation of service brakes will consume compressed air supply and cause automatic spring brake application. Always observe air pressure gauges. Failure to comply may result in damage to equipment or injury to personnel.

- b. Apply service brake pedal (5) as required to control vehicle speed.
- c. Use exhaust brake/retarder (2) as required.
- d. Accelerate, brake, and steer as required.
- e. Check system gauges often during vehicle operation as noted in Normal Driving Procedures (WP 0023).
23. When conditions improve, return transmission range selector (3) and adjust CTIS controller (1) to appropriate settings (WP 0031).

END OF WORK PACKAGE

SLIPPERY CONDITIONS

AUTOMATIC TRACTION CONTROL (ATC) THEORY OF OPERATION

NOTE

When operating vehicle in CC, MSS, or EMER CTIS settings (WP 0029), ABS and ATC systems are disabled.

1. The M-ATV incorporates an ATC system. The ATC system helps improve traction on slippery or unstable driving surfaces by reducing drive wheel slippage.
2. The ATC system constantly monitors the wheel for a wheel slip condition. If a wheel slip condition occurs, the ATC system activates and throttles back the engine to help reduce wheel slip. If the vehicle is traveling at a speed of less than 25 mph (40 km/h), the ATC will also pulse the service brake system to aid in reducing wheel slip. Once the ATC system detects that the wheel slip condition is no longer present, it will return the engine and service brake system to normal operation condition.

END OF TASK

OPERATION IN SLIPPERY CONDITIONS

WARNING

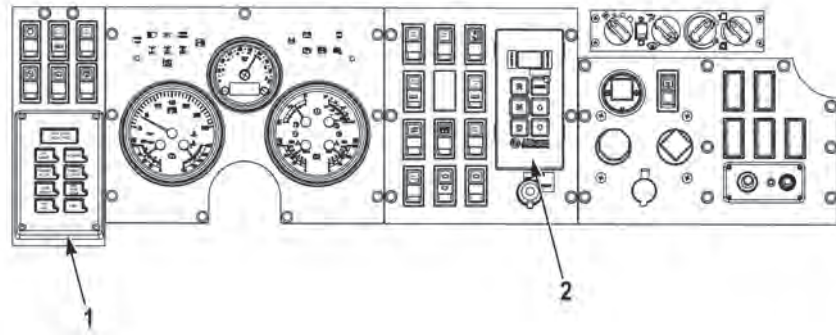
- The vehicle has a high center of gravity. Slow down for turns and other maneuvers. Approach slopes head on and avoid side slopes when possible. Failure to comply may result in injury or death to personnel and damage to equipment.
- Ensure to keep speeds within limits of road conditions. Failure to comply may result in injury or death to personnel.
- Use exhaust brake/retarder only when vehicle tires have good traction. Use of exhaust brake/retarder on slick or loose surfaces can cause vehicle to skid and cause injury or death to personnel.

CAUTION

- Do not change CTIS controller or driveline lock settings while vehicle is turning or wheels are slipping. Damage to equipment may occur.
- When using EMERGENCY mode on CTIS, top speed should not exceed 5 mph (8 km/h). Use extreme care as steering response is limited due to driveline lock configuration. Failure to comply may result in damage to equipment.

NOTE

Tire chains may be required to aid in traction during slippery conditions.

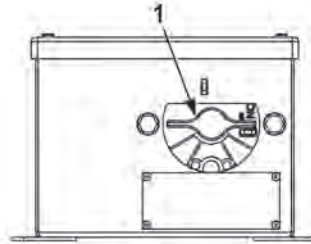


1. For maximum traction under adverse conditions, set CTIS controller switch (1) to MUD, SAND, SNOW position, or if conditions warrant, to EMERGENCY position (WP 0031).
2. Position transmission range selector (2) to D (drive) mode and use arrow buttons to select 3, 2, or 1, depending on ground conditions. A lower range will give better control on slick or icy roads as well as on steep downgrades.
3. Accelerate, brake, and steer as required.
4. Check system gauges often during vehicle operation, as noted in Normal Driving Procedures.
5. When conditions improve, return transmission range selector (2) and CTIS controller (1) to appropriate settings (WP 0031).

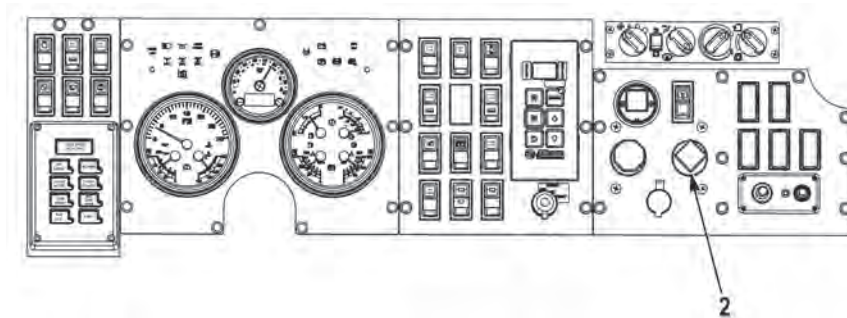
END OF TASK

END OF WORK PACKAGE

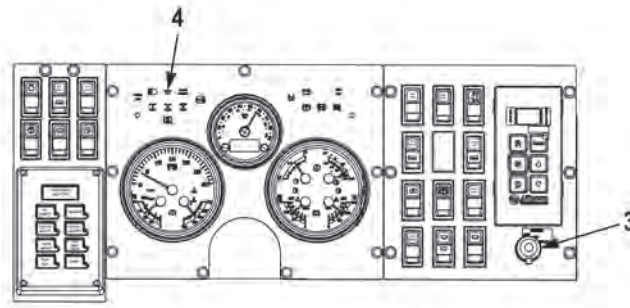
OPERATE VEHICLE IN COLD ENVIRONMENT 32° TO -25°F (0° TO -32°C)



1. Turn battery disconnect switch (1) to ON position.



2. Ensure PARKING BRAKE (2) is engaged.
3. Adjust driver seat (WP 0012) M1240/M1245 or (WP 0013) M1240A1.
4. Adjust side view mirrors (WP 0014).
5. Adjust auxiliary mirrors (if equipped) (WP 0015).
6. Fasten and adjust seat belts (WP 0016) M1240/M1240A1 or (WP 0017) M1245.
7. Ensure vehicle front and side windows are clean. If not, clean windows prior to attempting to start vehicle.
8. Turn off all accessories prior to starting engine.



NOTE

Ignition switch must be turned to ON position for a minimum of 20 seconds before starting engine. To allow ether start system to cycle and provide ether to engine air intake manifold when temperature is below 32°F (0°C).

9. Turn ignition switch (3) to ON position for a minimum of 20 seconds.
10. Do not start until WAIT TO START indicator (4) is illuminated.

WARNING

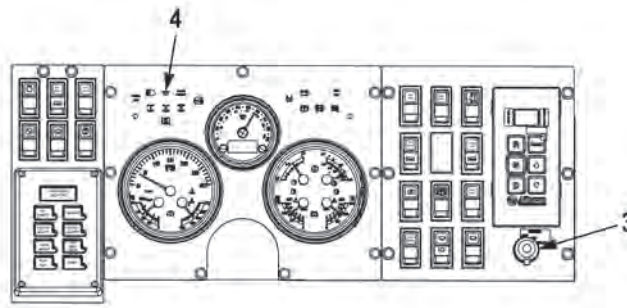
Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of vehicle are clear of personnel prior to attempting to start engine. Failure to comply may result in injury or death to personnel.

CAUTION

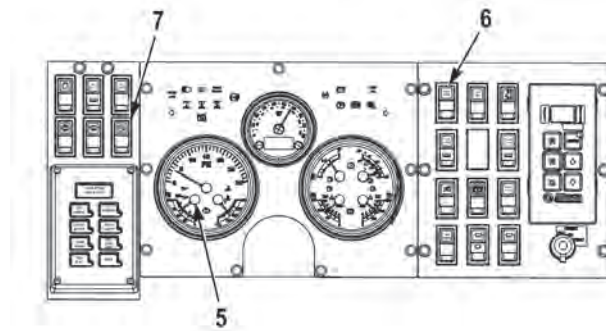
- If engine fails to start in two minutes, turn ignition switch to OFF position. Allow starter to cool at least two minutes before trying again. Failure to comply may result in damage to starter.
- If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.
- Do not turn ignition switch to START position while engine is rotating, or damage to equipment may result.
- Observe instrument panel closely. If there are any unusual readings, stop vehicle and shut off engine. Check immediately to prevent damage to equipment.
- All snow and ice should be removed from vehicle as soon as possible. Snow and ice may slow or stop movement of crucial parts if allowed to pile up. Failure to comply may result in damage to equipment.
- Fuel/water separator should be drained of water before topping off fuel tank. Keep fuel tank as full as possible during cold operations. Water forms in empty fuel tank as it cools. Water in fuel system could freeze and block fuel system. Failure to comply may result in damage to equipment.

NOTE

- Before operating vehicle in cold environment, make sure vehicle has been prepared as described in FM 9-207.
- If engine fails to start, ignition switch must be turned to OFF position prior to next start attempt. This will disengage engine restart interlock, which prevents starter engagement from ON position.
- Ether is automatically injected into engine whenever ignition is turned to start position and temperature is below 32°F (0°C).
- In severe cold, engine coolant and windshield washer fluid can freeze, batteries can freeze and crack, oil and grease may get thick and stiff, and rubber may crack or break easily.



11. When WAIT TO START light (4) goes out, turn ignition switch (3) to START position until engine starts. Release switch as soon as engine starts.

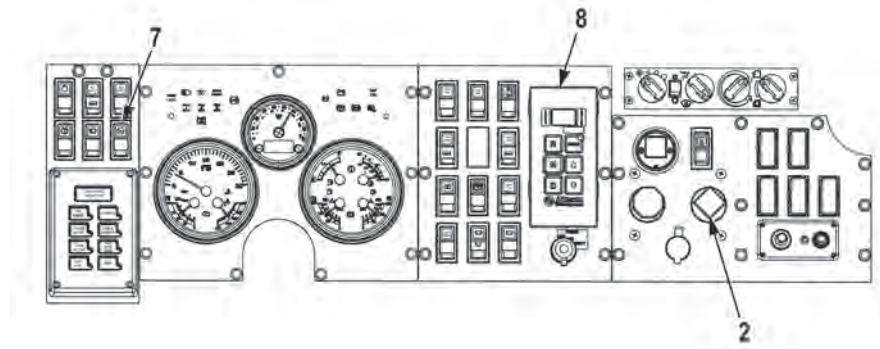


CAUTION

- **If engine fails to start after five start attempts, refer to Troubleshooting. Failure to comply may result in damage to equipment.**
 - **If oil pressure gauge does not show appropriate engine oil pressure within 10 to 15 seconds after starting engine, shut off engine immediately and refer to Troubleshooting Symptoms. Lack of lubrication will damage engine.**
12. Check that oil pressure gauge (5) reads in safe range during idle and increases as engine speed increases.
 13. Check that fire suppression power loss alarm is audible (WP 0007).
 14. Run engine until engine idles smoothly, then increase engine speed to 1200 to 1500 rpm or engage high idle switch (6) for another 25 minutes.

NOTE

- When operating in temperatures below 0°F (-18°C), the CTIS OFF switch must be positioned in the ON position during the first 5 miles (8 km) of operation. This allows the tires to warm up and ensures a tight seal between the tire and wheel.
 - When the CTIS OFF switch is in the ON position, the CTIS controller will display a FIVE LIGHTS FLASHING fault code (WP 0031) 4 minutes after turning the switch ON.
 - When operating in cold environments, operate heater and defroster controls as needed.
15. When operating in temperatures below 0°F (-18°C), position the CTIS OFF switch (7) in the up (or ON) position.



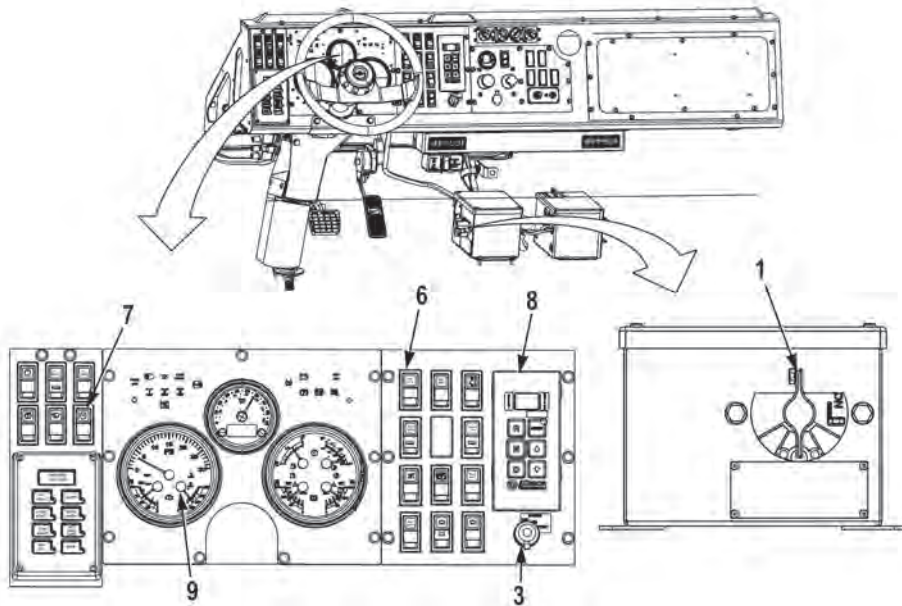
CAUTION

- **During first five miles of driving operation, all cornering should be performed slowly and carefully. Failure to comply may result in damage to driveline components.**
- **Do not use first gear to move vehicle if tires are frozen to ground or brakes are frozen to drums. Failure to comply may result in damage to driveline.**

NOTE

If transmission fluid temperature is below 19°F (-7°C), the following will occur:

- Transmission will operate in neutral (N), reverse (R), and third (3) gear only.
 - Above 19°F (-7°C), transmission will operate in all ranges.
16. Set transmission range selector (8) to third gear, release parking brake (2), and slowly drive vehicle three to five miles to warm up driveline components and tires.
 17. Position the CTIS OFF switch (7) in the down (or OFF) position.
 18. Park vehicle as follows:
 - a. Park vehicle in sheltered area out of wind if possible. If no shelter is available, park so vehicle does not face wind.
 - b. Park vehicle on high, dry ground if possible. If high, dry ground is not available, spread out planks or brush to make raised and dry area so tires will not freeze in snow, water, ice, or mud.
 - c. Park vehicle on level ground.



19. Shut off engine as follows:

CAUTION

Engine must run for at least 10 minutes with minimum coolant temperature of 160°F (71°C) prior to shutting off engine. Failure to comply may result in damage to engine.

- a. Set transmission range selector (8) to neutral (N).
- b. Idle engine at 1200 to 1500 rpm or engage high idle switch (6) until coolant temperature reaches 160°F (71°C).

NOTE

Depending on environmental conditions, it may take as long as 45 minutes for coolant temperature to reach 160°F (71°C).

- c. Once coolant temperature gauge (9) reads above 160°F (71°C), continue to idle engine between 1200 and 1500 rpm for minimum of 10 minutes.
- d. Turn ignition switch (3) to OFF position.
- e. Turn battery disconnect switch (1) to OFF position.

END OF WORK PACKAGE

AUTOMATIC FIRE SUPPRESSION SYSTEM

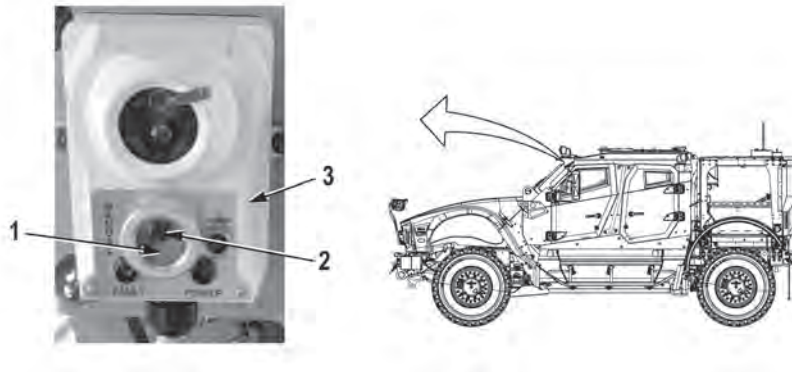
CAPSULE INTERIOR AUTOMATIC FIRE SUPPRESSION SYSTEM OPERATION

WARNING

- **Before operating vehicle, verify optical sensors are in position, are clear of dirt and dust, and are not obstructed by occupants or equipment. Failure to comply may result in injury or death to personnel.**
- **Capsule interior fire suppression system activation rapidly releases highly pressurized gas. Never put fingers inside of or look directly into fire suppression cylinder. Do not leave equipment or other objects near the cylinders. Failure to comply may result in injury to personnel.**
- **Capsule interior fire suppression system uses optical fire detectors. Do not have open flame inside the capsule, as fire suppression system may activate. Failure to comply may result in injury to personnel.**

NOTE

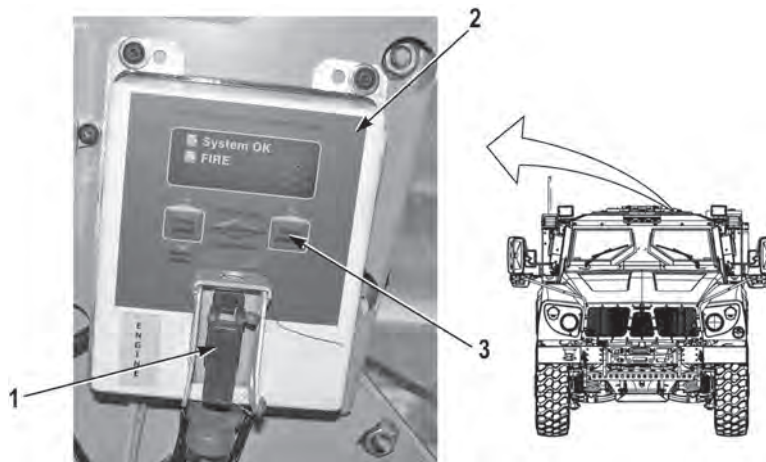
- If capsule automatic fire suppression system has been discharged, notify Field Maintenance.
- The extinguishing agent used in the capsule interior automatic fire suppression system is non-toxic and not dangerous to the crew when exposed at the concentrations resulting from system activation. As a rule, there is no need to evacuate the vehicle after activation of the fire suppression system. However, if, as a result of system activation, symptoms such as strong irritation in the eyes and respiratory tract, or dizziness appear, leave the vehicle until the fire suppression gas is evacuated from the capsule.
- In most situations, the capsule interior automatic fire suppression system requires no operator intervention to operate. Optical sensors automatically actuate the system.
- If operator detects a capsule fire, suppression system can be manually discharged. Perform Step to manually discharge capsule fire suppression system.
- Battery backup will operate system for a short time after ignition switch is placed in OFF position.
- Battery backup provides only limited functionality for normal operation. Place ignition switch to ON position.



To manually actuate capsule fire suppression system, using thumb or finger, break protective shield (1) in front of MANUAL button (2), press MANUAL button (2) on driver's optical sensor/control panel (3).

END OF TASK

ENGINE COMPARTMENT AUTOMATIC FIRE SUPPRESSION SYSTEM



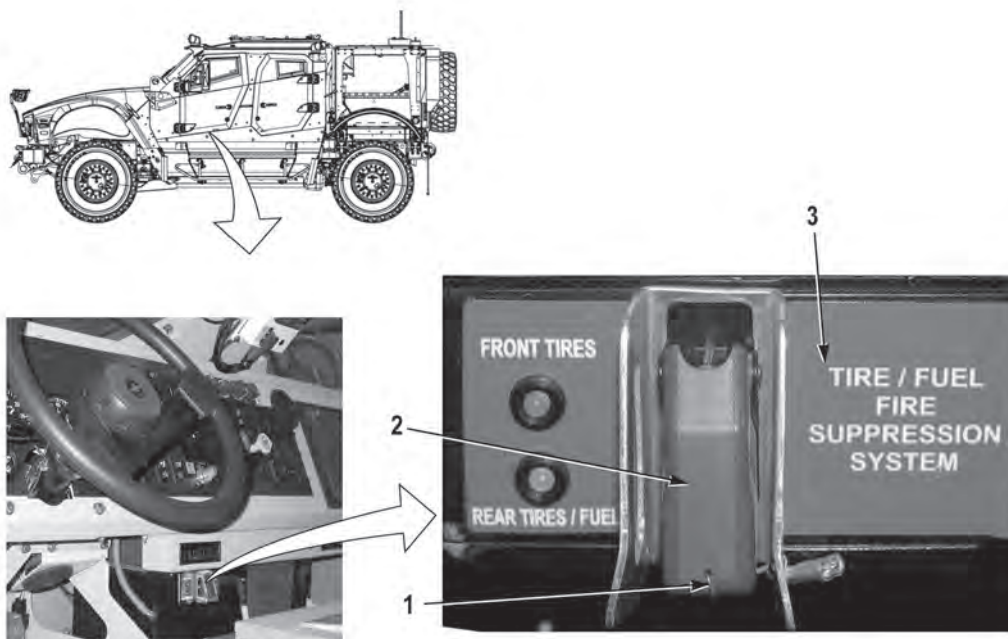
NOTE

- Under hood automatic fire suppression system consists of four or five aerosol generators actuated by four thermal sensors or by a sensor wire or by a manual switch on the exterior fire suppression system control panel in the capsule interior.
- In most situations, the engine compartment automatic fire suppression system requires no operator intervention to operate. The thermal sensors or sensor wire automatically actuates the system.
- If operator detects an engine compartment fire, the fire suppression system can be manually discharged. Perform Step to manually discharge engine compartment fire suppression system.
- If engine compartment fire suppression system has been discharged, notify Field Maintenance.
- Battery backup will operate system for a short time after ignition switch is placed in OFF position.
- Battery backup provides only limited functionality for normal operation, place ignition switch to ON position.

To manually actuate the engine compartment fire suppression system break lock wire (1), lift toggle switch safety cover (2) on engine compartment fire suppression system control panel (3) and move switch to up position.

END OF TASK

UNDERCARRIAGE AUTOMATIC FIRE SUPPRESSION SYSTEM



NOTE

- Undercarriage automatic fire suppression system consists of four or six pressurized cylinders containing dry chemical fire suppression material. The cylinders are actuated by sensor wires detecting a fire condition or by release of pressure from nitrogen-pressurized detector tubing designed to rupture when exposed to flame.
- In most situations, the undercarriage fire suppression system requires no operator action to operate. Sensor wires or detector tubing automatically actuate the system.
- Automatic actuation of the undercarriage fire suppression system can take place individually in two zones (front wheel wells or rear wheel wells and fuel tank) or in both zones, depending on where fire is detected. Manual actuation discharges both zones at once.
- If operator detects an undercarriage fire before a tube rupture or sensor wire detects a fire condition, the undercarriage fire suppression system can be manually discharged.
- If undercarriage fire suppression system has been discharged, notify Field Maintenance.
- Ignition switch must be placed in ON position for system to operate.

To manually actuate the undercarriage fire suppression system, break lock wire (1), lift toggle switch safety cover (2) on undercarriage fire suppression system control panel (3), and move switch to up position.

END OF TASK

END OF WORK PACKAGE

FIRE EXTINGUISHER

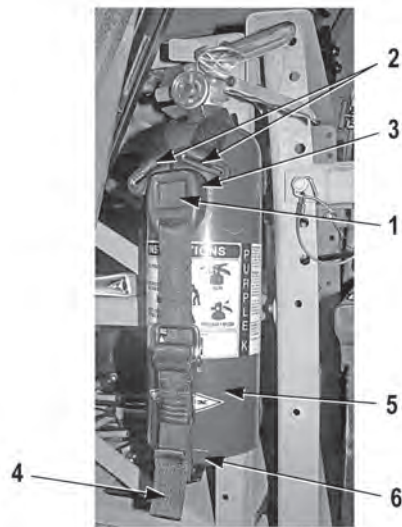
WARNING

- **Exposure to a dry chemical fire extinguishing agent can result in breathing difficulty. Immediately evacuate the vehicle upon indication of a fire and discharge extinguishers from outside the cab. Open hatches and doors for ventilation and wash down the cab before re-entry. If respiratory irritation, skin or eye contact, or ingestion occurs, seek medical attention. Failure to comply may result in injury to personnel.**
- **Do not incinerate fire extinguisher as this may cause explosion. Failure to comply may result in injury or death to personnel.**
- **Do not discharge a fire extinguisher in a person's face. Failure to comply may result in injury or death to personnel.**
- **Do not inhale the dry chemical agent. Failure to comply may result in injury or death to personnel.**
- **Avoid exposure to contents of fire extinguisher if wearing contact lenses, have respiratory illnesses, or have skin allergies. In case of contact with agent, flush the affected area with clean, cool water. Failure to comply may result in injury to personnel.**

NOTE

- M1240 fire extinguishers are located on radio rack. M1240A1 fire extinguishers are located under dash on driver and passenger side.
- Become familiar with operating instructions, warnings, and cautions listed on fire extinguisher, if different from operators manual.

1. Remove Fire Extinguisher from Capsule.

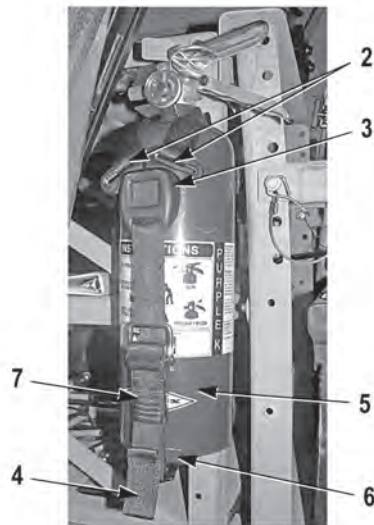


- a. Push button (1) to release two strap latches (2) from buckle (3).

NOTE

If buckle does not release, perform Step (b).

- b. Pull up on strap (4) and push button (1).
- c. Pull fire extinguisher (5) straight out and remove from bracket (6).



2. Hold fire extinguisher upright and pull the ring safety pin.
3. Aim fire extinguisher nozzle at base of fire.
4. Squeeze handles together and sweep the fire extinguisher side to side.
5. Install fire extinguisher in capsule.

NOTE

Ensure fire extinguisher nozzle is facing front of vehicle.

- a. Position fire extinguisher (5) in bracket (6).
- b. Insert two strap latches (2) in buckle (3).
- c. Pull strap (4) until it is snug.
- d. Push down latch (7) and secure strap (4).
- e. Replace used fire extinguisher (5) as soon as possible with a properly charged fire extinguisher.

END OF WORK PACKAGE

WINCH

GENERAL

The M-ATV winch is designed to assist operators moving obstacle or debris from operating area. The M-ATV can only winch from the front. An assistant is required for operations of winch.

WARNING

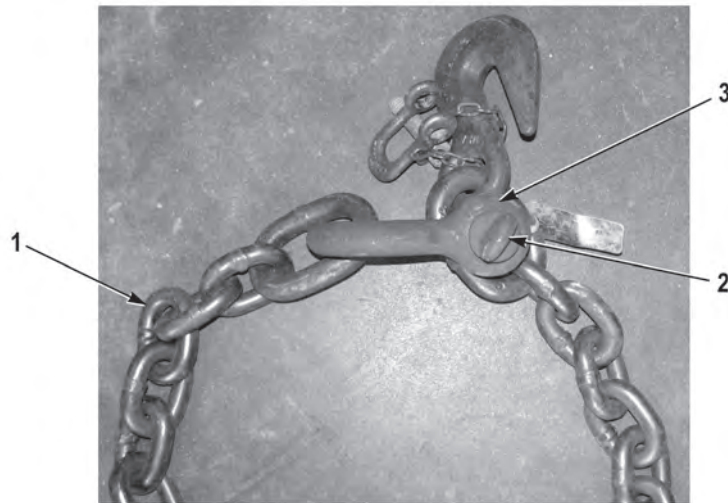
- Do not use winch for self-recovery or recovery of any vehicle. Failure to comply may result in damage to equipment and injury or death to personnel.
- Do not exceed load capacity of winch as listed below for each cable layer on drum:
 - With pulling with one layer on drum (closest to drum) do not exceed 18,000 lbs (8 172 kg)
 - With pulling with two layers on drum do not exceed 14,727 lbs (6 686 kg).
 - With pulling with three layers on drum do not exceed 12,461 lbs (5 658 kg).
 - With pulling with fourth layer on drum do not exceed 10,800 lbs (4 903 kg).
- Failure to comply may result in damage to equipment and injury or death to personnel.
- All personnel must stand clear, at least twice length of deployed winch cable, during winch operations. Snapped winch cable may cause injury or death to personnel.
- Do not disengage winch under load. Failure to comply may result in injury or death to personnel.
- Winch is NOT to be used for lifting or moving of persons. Failure to comply may result in injury or death to personnel.
- Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken wires will cause injury to personnel.
- Winch components become hot during normal operation. Use care when operating winch. Failure to comply may result in injury to personnel.

CAUTION

- When using the winch, do not allow the cable to deviate more than 30 degrees from straight ahead of the vehicle. The winch efficiency will degrade. Winch fairlead is located so the winch cable, when properly used, will not contact vehicle components. Do not winch vehicle if 30 degrees in front of the vehicle cannot be maintained. Failure to comply may result in damage to equipment.
- Prolonged or continuous use will overheat the winch. Do not continue to run a “stalled” winch. Failure to comply may result in damage to equipment.

NOTE

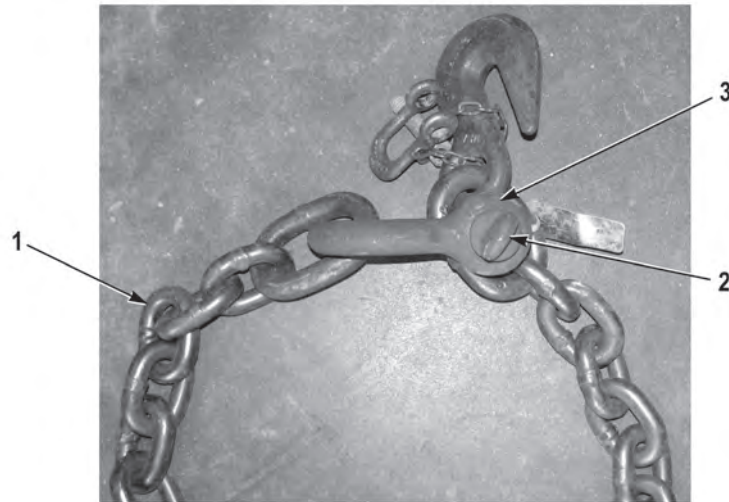
- The Overload Interrupt module (OLI) shuts winch down when overheating, exceeding load limit or not receiving proper amount of amperage. Turn battery disconnect switch to OFF for three to five seconds to reset OLI.
- Two (2) personnel are required to operate winch.
- To allow even winding of winch cable, tension must be maintained on winch cable during operation.

ATTACHMENT OF CHAIN TO OBSTACLE OR DEBRIS

1. Position chain (1) close to obstacle or debris.
2. Remove pin (2) from shackle (3).
3. Place ends of chain (1) around obstacle or debris and attach chain (1) ends together using shackle (3).
4. Install pin (2) in shackle (3).
5. Continue with winch operation.

END OF TASK

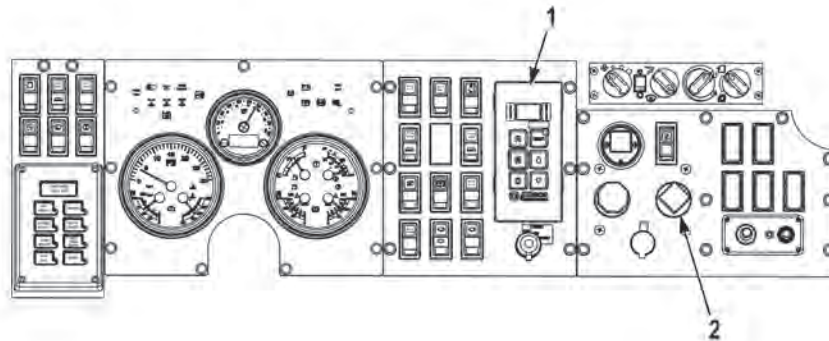
REMOVAL OF CHAIN FROM OBSTACLE OR DEBRIS



1. Remove pin (2) from shackle (3).
2. Remove shackle (3) from chain (1).
3. Install pin (2) in shackle (3) and return shackle (3) and chain (1) to stowage.

END OF TASK

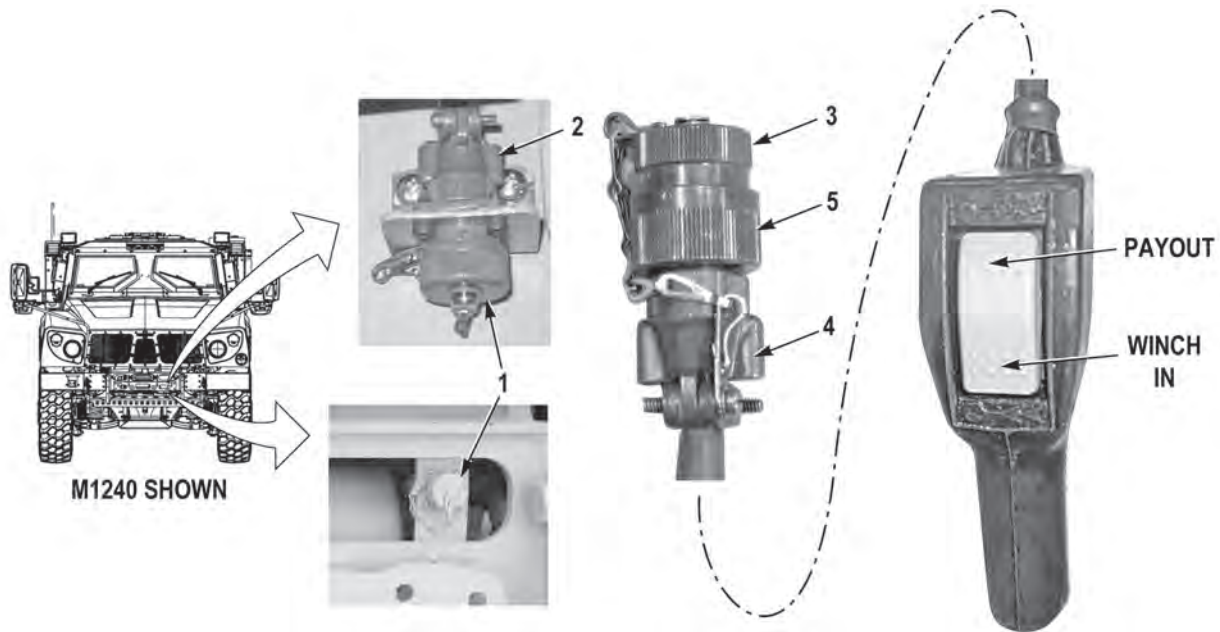
PREPARATION FOR USE



1. Start engine (WP 0020).
2. Park vehicle directly facing toward object to be winched, if possible.
3. Position transmission selector (1) in N (neutral).
4. Apply parking brake (2).

END OF TASK

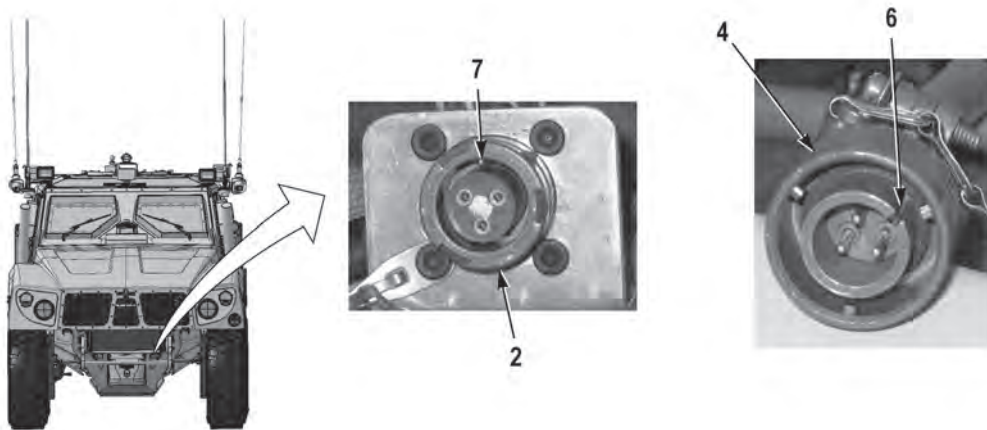
UNWINDING WINCH CABLE



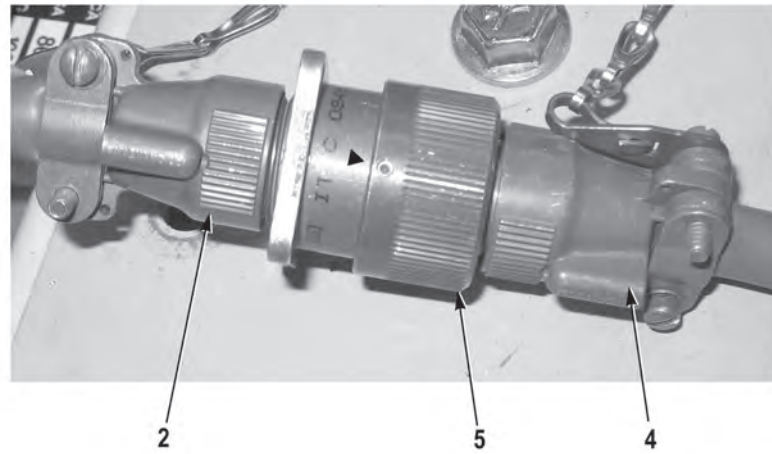
NOTE

- For vehicles equipped with standard SPARK, the connector is mounted on top of the driver side bumper.
- For vehicles equipped with updated SPARK, connector is mounted on front crossmember.

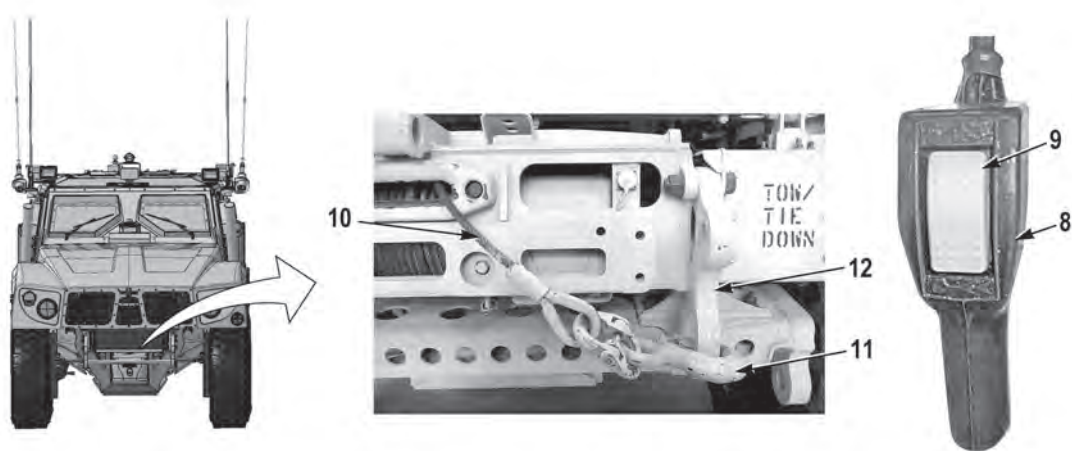
1. Remove cap (1) from winch connector (2) by twisting cap (1), counterclockwise.
2. Remove cap (3) from winch remote control connector (4) by twisting lock ring (5), counterclockwise.



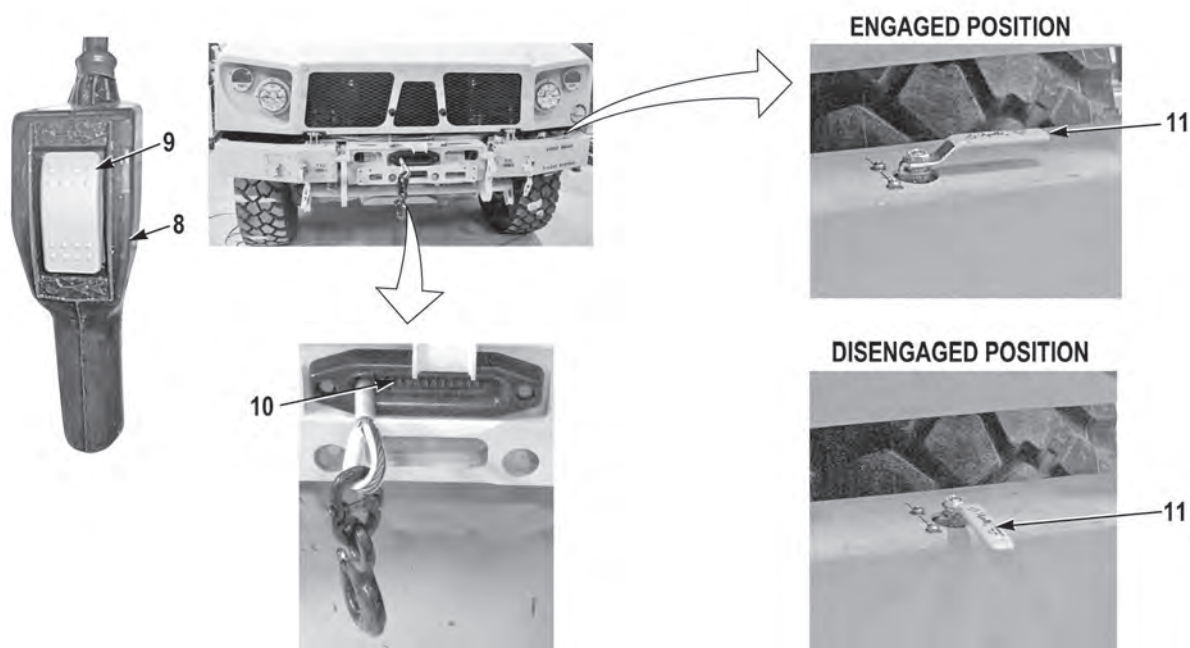
3. Align slot (6) in winch remote control connector (4) with guide pin (7) in winch connector (2).



4. Turn lock ring (5) clockwise until snug on winch remote control connector (4).



5. Using winch remote control (8), press and hold WINCH IN/OUT switch (9) to PAYOUT position and payout 3 ft. (0.9 m) of cable (10).
6. Release WINCH IN/OUT switch (9).
7. Remove hook (11) from tow eye (12).



WARNING

- Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken wires will cause injury to personnel.
- Never winch a load with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.
- Avoid quick, jerking winch operation. Keep all personnel well away from vehicle involved in winching operation. Snapped cable or shifting load may cause injury or death to personnel.

NOTE

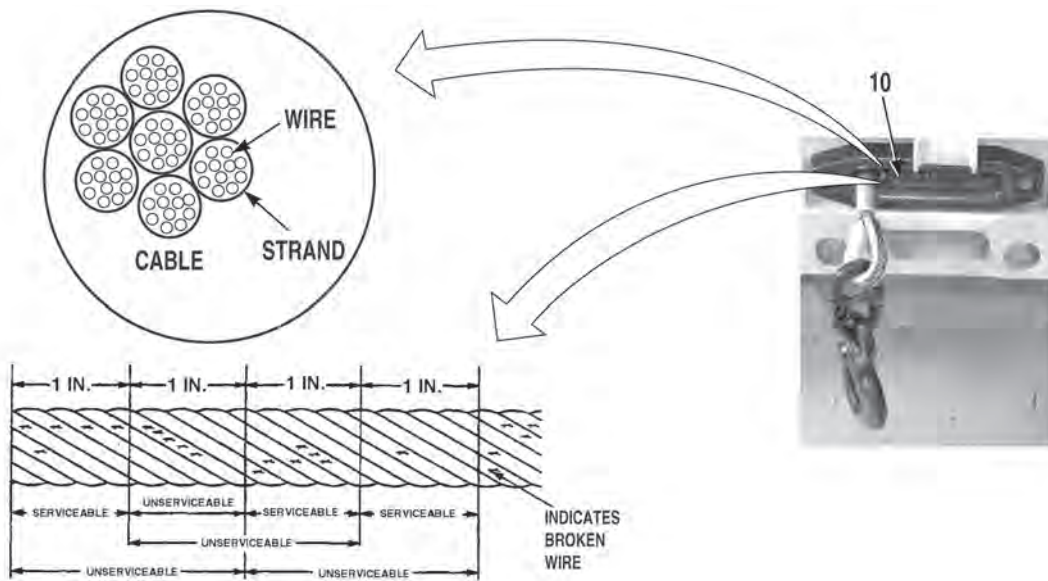
Winch remote control or freespool can be used to payout required amount of cable. If using remote control, perform Steps (8) and (9). If using freespool, perform Steps (10) and (11).

Payout Using Remote Control

8. Using winch remote control (8), press and hold WINCH IN/OUT switch (9) to PAYOUT position and, with the aid of an assistant, payout required amount of cable (10) to reach obstacle or debris to be pulled.
9. Release WINCH IN/OUT switch (9).

Payout Using Freespool

10. Turn WINCH BRAKE (freespool valve) (11) to DISENGAGE position, and, with the aid of an assistant, slowly payout required amount of cable (10) to reach obstacle or debris to be pulled.
11. Turn WINCH BRAKE (freespool valve) (11) to ENGAGE position.

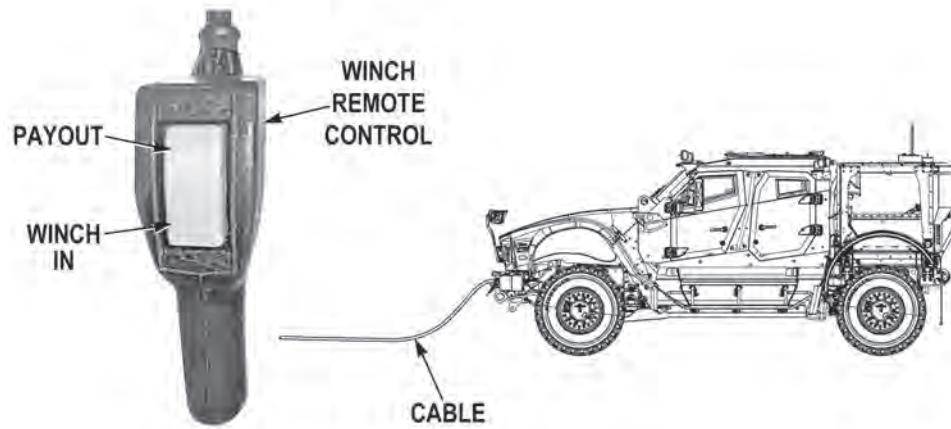


WARNING

Cable is not fully mission capable and cable may break if: Cable has more than three broken wires per inch on same strand, or cable has more than six broken wires on all strands in one inch of cable. Maximum number of broken wires shall not occur in any two consecutive inches of cable. For example, if six wires are broken in one inch of cable, none would be allowed in next consecutive inch. Failure to comply may result in damage to equipment or injury to personnel.

12. Check cable (10) for broken wires or kinks. If in doubt, notify Field Maintenance.
13. Check for at least five wraps of cable (10) left on winch. If at least five wraps of cable (10) are not left on winch, stop using winch.

END OF TASK

WINDING IN WINCH CABLE

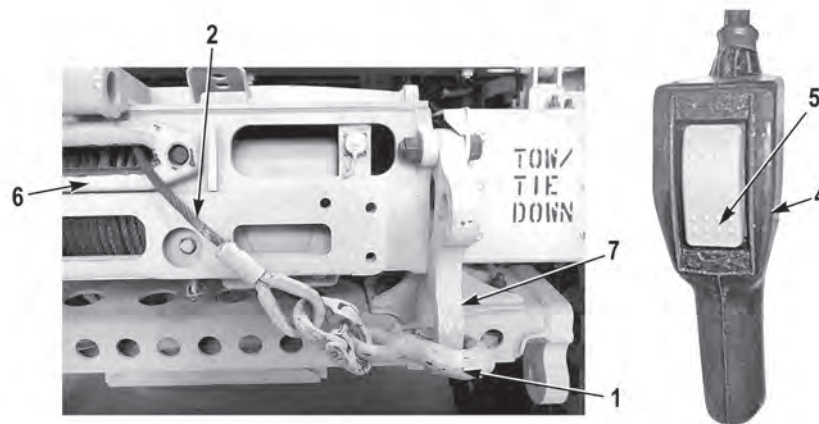
ATV2773

CAUTION

When pulling load, do not pull load closer than 3 ft (0.9 m) from vehicle. Failure to comply may result in damage to equipment.

1. With the aid of an assistant and using the winch remote control, press and hold the WINCH IN/OUT switch to WINCH IN position and wind in cable until operation is complete.
2. Using winch remote control, press and hold WINCH IN/OUT switch to PAYOUT position and payout amount of cable needed to disconnect cable from obstacle or debris.

STOWING WINCH CABLE



WARNING

- Keep hands clear of winch area when winch is reeling in cable. If hands are caught in winch or cable, severe injury or death may result.
- Always use an assistant to stow winch cable. Failure to comply may result in injury to personnel or damage to equipment.
- Always wear heavy leather gloves when handling winch cable. Never let cable run through hands. Broken wires will cause injury to personnel.

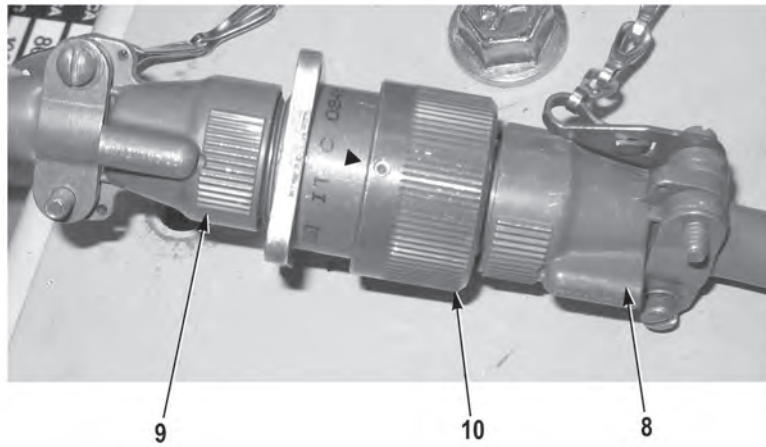
CAUTION

An assistant is required to keep tension on cable until clevis is 3 in. (76 mm) from cable guide.

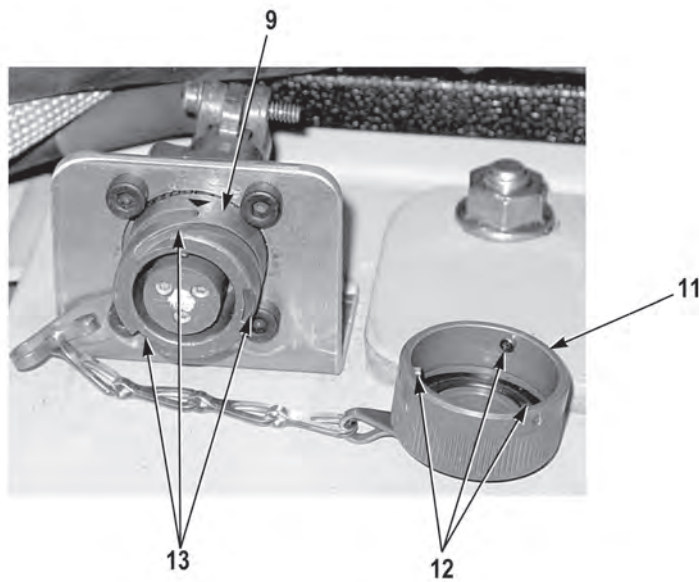
NOTE

Ensure that cable is evenly wound on spool.

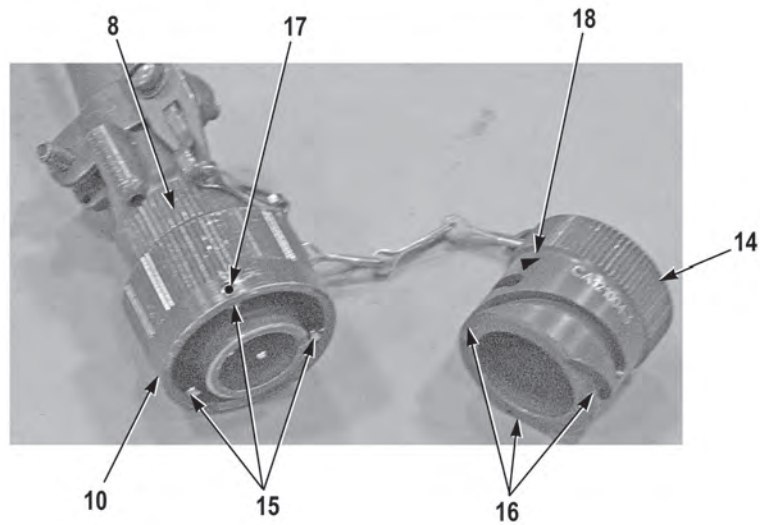
1. With the aid of an assistant and using winch remote control (4), push and hold WINCH IN/OUT switch (5) to WINCH IN position and wind cable (2) until hook (1) is approximately 3 ft. (0.915 m) from fairlead (6).
2. Release WINCH IN/OUT switch (5).
3. Attach hook (1) to tow eye (7).
4. Using winch remote control (4), push WINCH IN/OUT switch (5) to WINCH IN position until cable (2) is snug against fairlead (6).
5. Release WINCH IN/OUT switch (5).
6. Shut OFF engine (WP 0026).



7. Disconnect winch remote control connector (8) from winch connector (9) by turning locking ring (10), counterclockwise.



8. Install cap (11) on winch connector (9) by aligning three pins (12) in cap (11) with three grooves (13) in winch connector (9) and turning cap (11) clockwise until snug.



9. Install cap (14) on winch remote control connector (8) by aligning three pins (15) in locking ring (10) with three grooves (16) in cap (14) and turn locking ring (10) clockwise until the red dot (17) is aligned with red triangle (18).

10. Stow winch control.

END OF TASK

END OF WORK PACKAGE

SPARE TIRE LIMP HOME PROCEDURE (M1240A1)

NOTE

- This task applies to M1240A1 only.
 - 395/85R20 wheel valve is isolated from the CTIS system and must be manually inflated.
 - When operating on public roads and a flat 16.00R20 tire is being carried on the spare tire carrier, recommend use of a “trail” vehicle with working turn signals and brake lights to provide warning of slowing and/or upcoming turns to other vehicles to rear.
1. Inflate spare tire to 96 psi (662 kPa) (WP 0061).
 2. Set CTIS controller to cross-country setting (WP 0031).

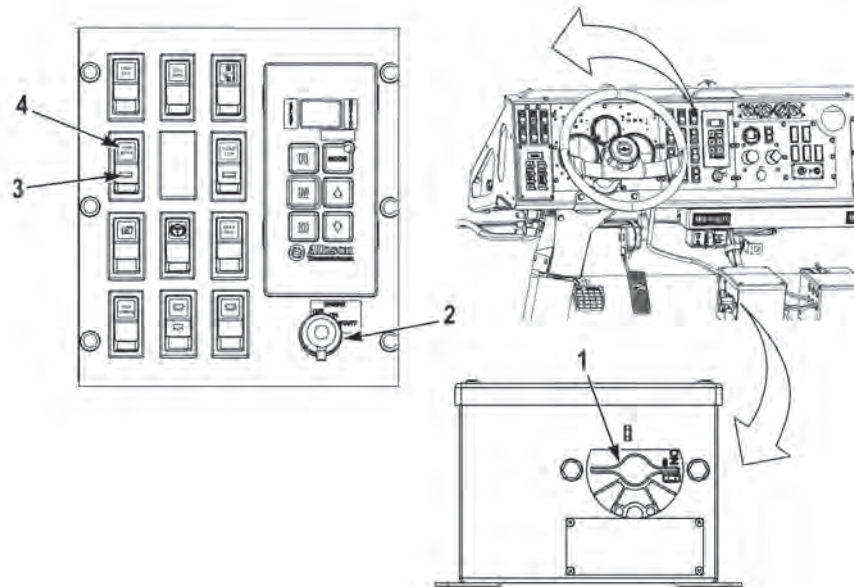
CAUTION

When using 395/85R20 tire, travel no more than a distance of 300 miles (482 km) at a maximum speed of 30 mph (48 km/h). Failure to comply may result in damage to equipment.

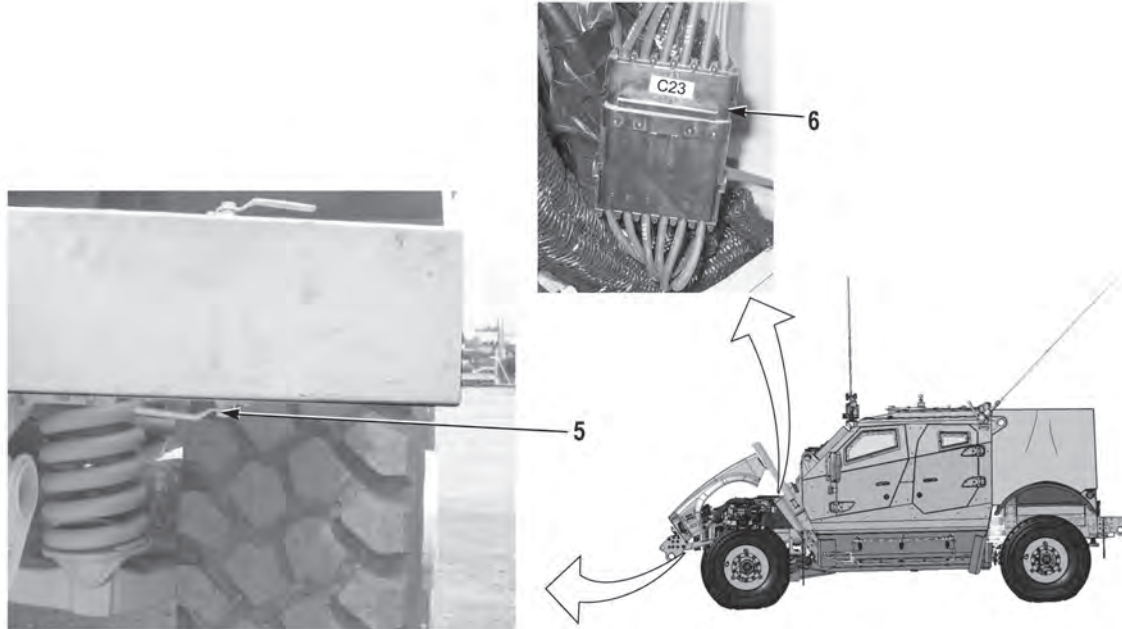
3. Continue with mission, and notify Field Maintenance when done.

END OF TASK**END OF WORK PACKAGE**

PREPARATION FOR BEING TOWED - TRANSFER CASE



1. Turn on battery disconnect switch (1) (WP 0007).
2. Turn ignition switch to ON position (2) (engine off) (WP 0007).
3. Push switch lock (3) up and push TOW MODE button (4) up on dash panel.



4. Turn transfer case locknut valve (5) 90 degrees forward to shift transfer case to neutral position.
5. Turn off ignition switch and battery disconnect switch (WP 0007).
6. Raise hood of disabled vehicle (WP 0034).

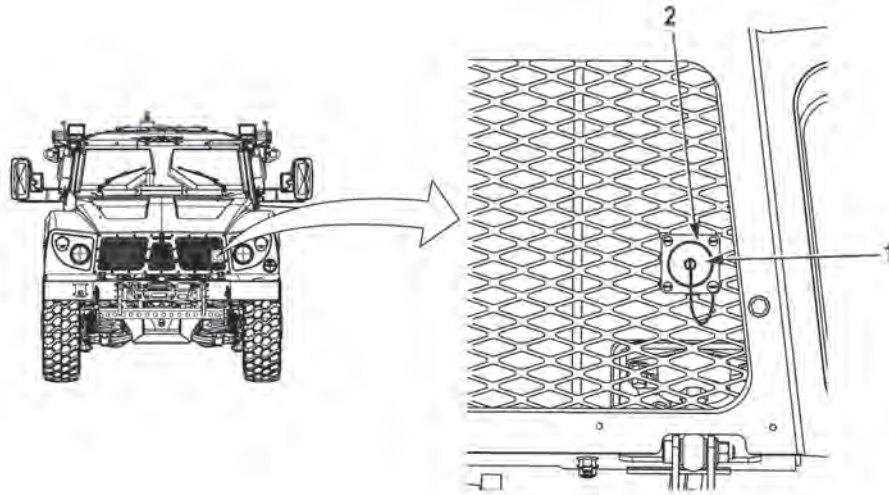
NOTE

- The C23 connector is located on the drivers side near the firewall, under the electrical bulkhead connectors, behind the wheel deflector armor.
 - Remove cable ties as required.
7. Disconnect connector C23 (6).
 8. Close hood of disabled vehicle (WP 0034).

END OF TASK

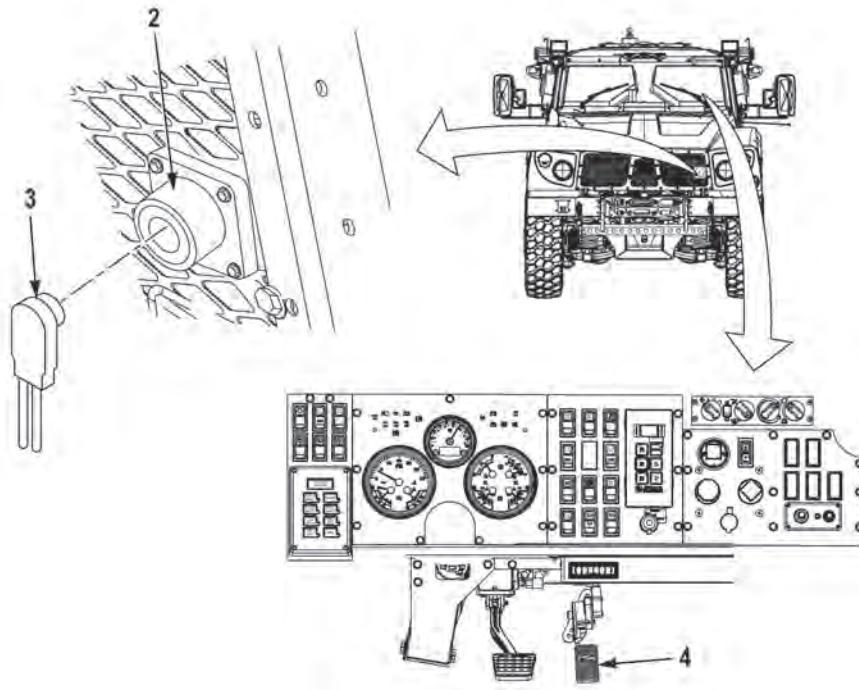
END OF WORK PACKAGE

SLAVE START DISABLED VEHICLE

**NOTE**

NATO slave receptacle is located on driver side in grill or on driver side bumper bracket.

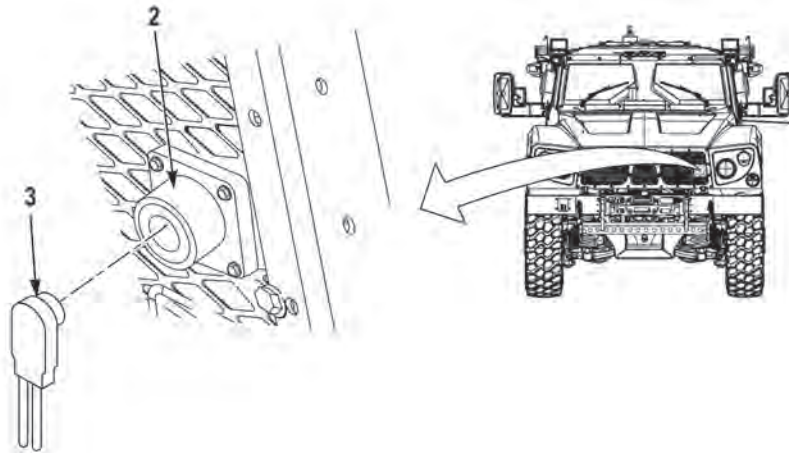
1. Start operational vehicle (WP 0020).
2. Move into position in front of disabled vehicle so slave receptacles on both vehicles face each other.
3. Shut OFF engine on operational vehicle (WP 0026).
4. Remove caps (1) from slave receptacles (2) on both vehicles.



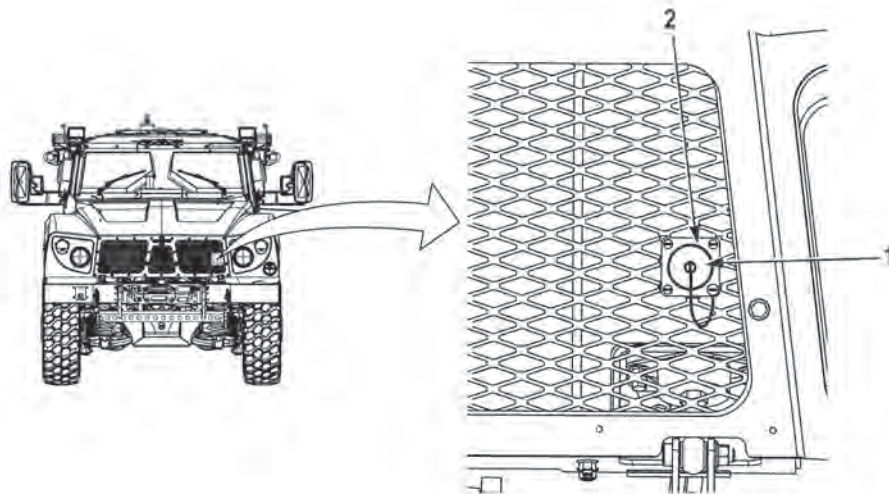
NOTE

Make sure connectors and receptacles are free from dirt, sand, and debris before use.

5. Remove NATO slave cable (3) from stowage and, connect NATO slave cable (3) to slave receptacles (2) on both vehicles.
6. Start engine of operational vehicle (WP 0020).
7. Using the throttle pedal (4), increase operational vehicle engine speed to more than 1000 rpm, while assistant starts engine of disabled vehicle.



8. As soon as disabled vehicle engine is running smoothly, remove NATO slave cable (3) from slave receptacles (2) of both vehicles and return NATO slave cable (3) to stowage.



9. Install caps (2) on slave receptacles (1) of both vehicles.

END OF TASK

END OF WORK PACKAGE

TRANSPORTABILITY REQUIREMENTS

VEHICLE TIEDOWN EYES

The M-ATV is equipped with eight tiedown eyes. Two eyes are located in the front of the vehicle and two in the rear. There are two intermediate tiedown eyes located on each frame rail, which are only used for air transport. Tiedown Eyes Figure shows location of tiedown eyes. The tiedown eyes are designed to support the weight of the vehicle. When securing the vehicle use only the tiedown eyes. Do not use bumpers, axles, towing pintles, or towing hooks as points of attachment.

Table 1. Tiedown Eye Strength With Out Explosively Formed Penetrator Armor.

Tiedown	Longitudinal Load (lbs.)	Vertical Load (lbs.)	Lateral Load (lbs.)
Right Front	75,363	17,493	25,653
Left Front	71,997	16,711	25,653
Right Rear	75,476	20,219	29,607
Left Rear	71,884	19,257	29,607
Intermediate	15,000	15,000	15,000

Table 2. Tiedown Eye Strength With Explosively Formed Penetrator Armor.

Tiedown	Longitudinal Load (lbs.)	Vertical Load (lbs.)	Lateral Load (lbs.)
Right Front	66,790	15,258	22,274
Left Front	63,210	14,441	22,274
Right Rear	66,909	18,169	26,476
Left Rear	63,091	17,132	26,476
Intermediate	15,000	15,000	15,000

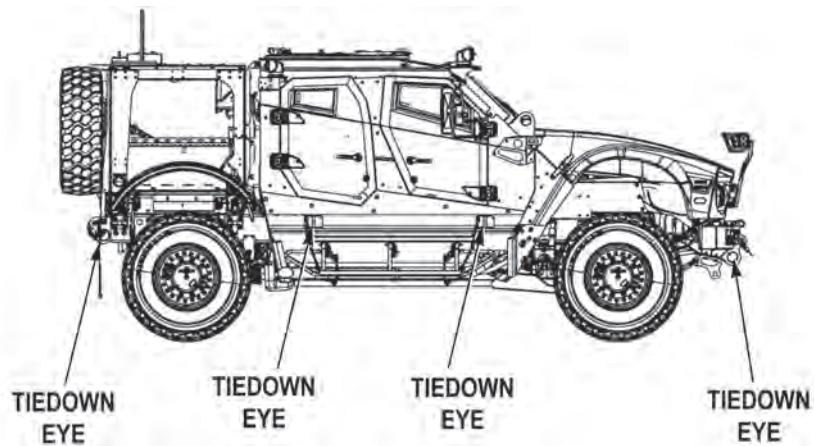


Figure 1. M-ATV Tiedown Eyes.

Whenever possible, tie down the vehicle with chains. Chains to secure vehicle are normally provided by transporting organization. The size and number of tiedowns are determined by the gross weight of the vehicle. For specific instructions on the size and number of chains refer to Surface Deployability and Distribution Command Transportation Engineering Agency (SDDCTEA) Pamphlet 55-20, Tiedown Handbook for Truck Movements.

END OF TASK

TRUCK TRANSPORT OF THE M-ATV

1. General

The M-ATV can be transported on semi-trailers with deck heights ranging up to 40.4 in. (102.6 cm). SDDCTEA Pamphlet 55-20, Tiedown Handbook for Truck Movements, provides detailed guidance on proper methods for preparing and securing vehicles to trucks.

2. Safety

- a. All facilities and equipment used to load and transport the M-ATV must be inspected for certification, serviceability and proper function prior to use.
- b. Use ground guides when loading vehicle via ramps. Ensure ground guide keeps a safe distance from vehicle while loading. Position guide in a prominent location to assure constant visual contact with vehicle driver.
- c. Ensure gross weight of M-ATV does not exceed capacity of vehicle hauling truck.
- d. Make sure tractor and semi-trailer brakes are set to assure maximum vehicle stability during drive on operations.
- e. Warn personnel to stand clear of the semi-trailer during loading operations.

3. Preparation for Shipment by Truck

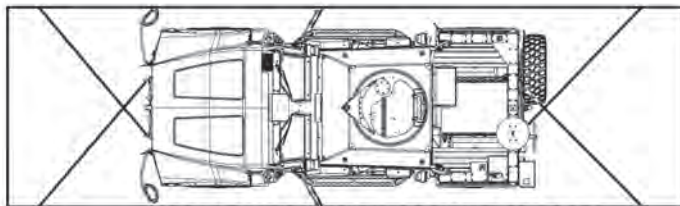
The M-ATV can be transported on a lowbed trailer or highbed trailer and stay within the US height limits of 13.5 ft (4.1 m). The following preparation procedures are required:

- a. Protect the windshield.
- b. Secure any material or equipment on the platform of the vehicle by banding, chains, or cargo straps.
- c. Set CTIS system to highway.
- d. Check fuel level. Fuel level must be 3/4 full or less. If fuel needs to be drained, notify Field Maintenance.
- e. Seal off exhaust/intake opening from the environment once vehicle is loaded aboard the truck.
- f. Notify Field Maintenance to disable engine, under carriage, and capsule AFES systems.
- g. Set auxiliary mirrors to transport position (WP 0015).

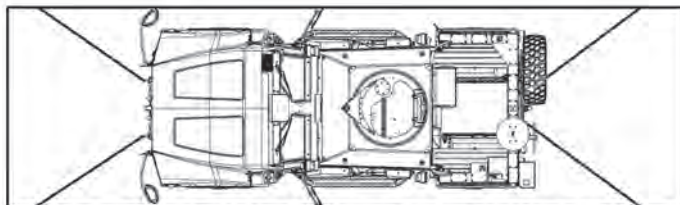
4. Loading

The M-ATV can be driven on the trailer by use of a suitable ramp.

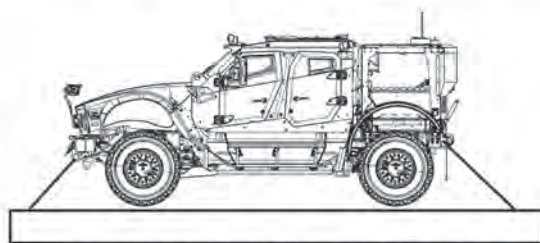
5. Securing the Vehicle



TOP VIEW OF MATV, TIEDOWNS CROSSED



TOP VIEW OF MATV, TIEDOWNS SAME SIDE



SIDE VIEW OF MATV ON SEMI-TRAILER

Figure 2. M-ATV Tiedown to Semi-Trailer.

- a. When vehicle is in position on truck bed, place transmission in neutral and set parking brake.
- b. Make sure all BII (WP 0070) items are properly stowed according to Stowage Guide (WP 0055) M1240A1 or (WP 0056) M1245.
- c. Turn ignition switch and battery disconnect switch to OFF position.

WARNING

Use only front, rear, and side tiedown eyes to secure the vehicle. Do not use bumpers, axles, towing pintles, or tow eyes as points of attachment. Failure to comply may result in injury or death to personnel or damage to equipment.

- d. Using the four front and rear tiedown eyes on the M-ATV, secure the vehicle with chains. M-ATV Tiedown to Semi-Trailer figure shows two ways the vehicle can be tied-down to the semi-trailer.

END OF TASK

END OF WORK PACKAGE

DATA PLATES, DECALS, AND STENCILS

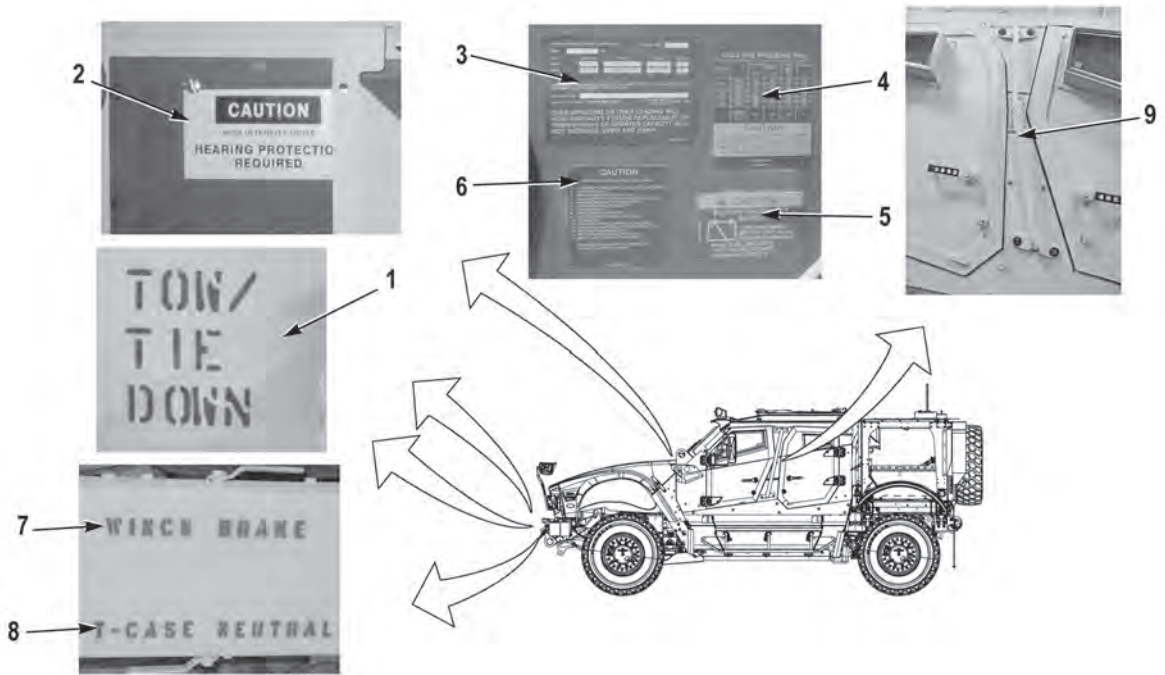


Figure 1. Data Plates, Decals, and Stencils (sheet 1 of 5).

Data Plate Number	Data Plate Description
1	Stencil, TOW/TIE DOWN
2	Label, CAUTION, HEARING PROTECTION
3	Label, VEHICLE DATA
4	Label, TIRE PRESSURE
5	Label, CAUTION, BATTERY DISCONNECT SWITCH
6	Label, CAUTION, WELDING
7	Stencil, WINCH BRAKE
8	Stencil, T-CASE NEUTRAL
9	Stencil, CAUTION

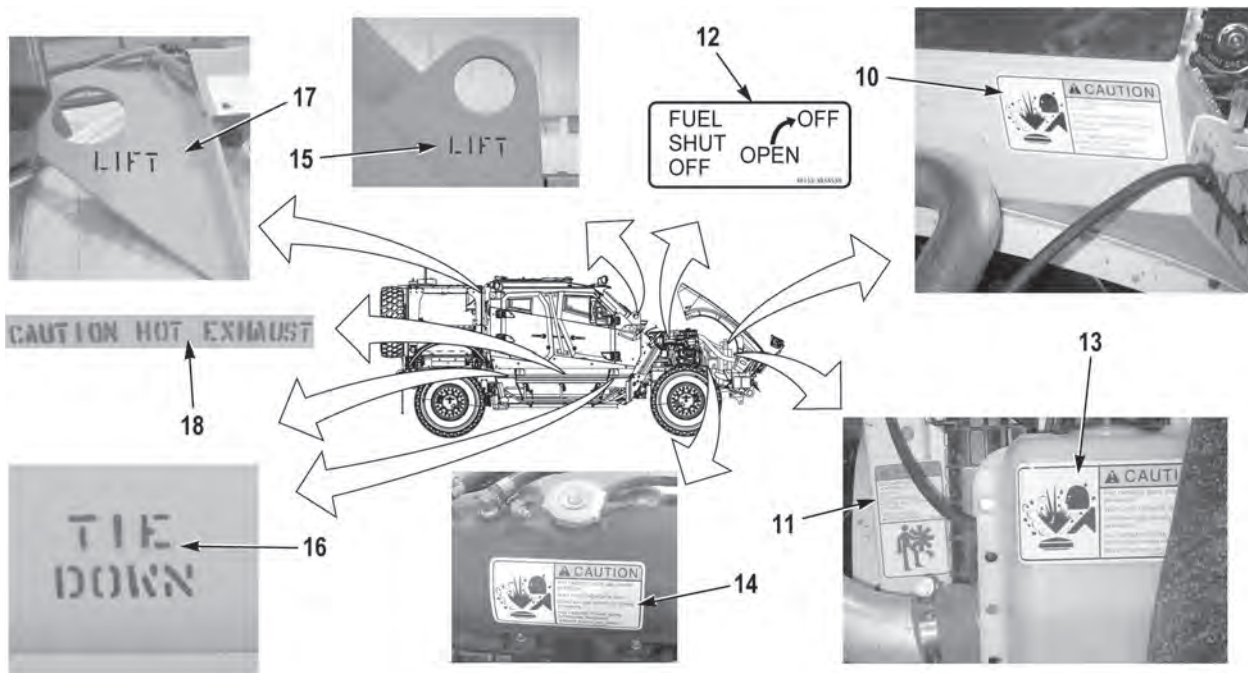


Figure 1. Data Plates, Decals, and Stencils (sheet 2 of 5).

Data Plate Number	Data Plate Description
10	Label, CAUTION, RADIATOR FLUID
11	Label, WARNING, FAN
12	Label, FUEL SHUT OFF
13	Label, CAUTION, RADIATOR FLUID (coolant overflow reservoir)
14	Label, CAUTION, RADIATOR FLUID (coolant surge tank)
15	Stencil, LIFT
16	Stencil, TIE DOWN
17	Stencil, LIFT
18	Stencil, CAUTION HOT EXHAUST

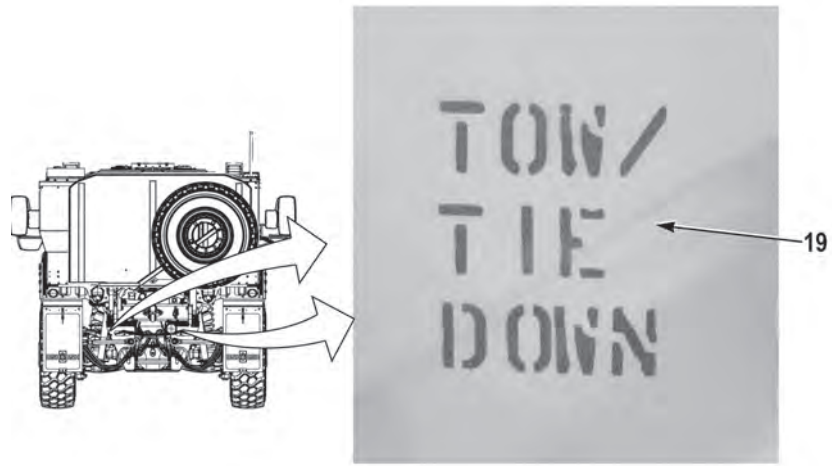


Figure 1. Data Plates, Decals, and Stencils (sheet 3 of 5).

Data Plate Number	Data Plate Description
19	Stencil, TOW/TIE DOWN

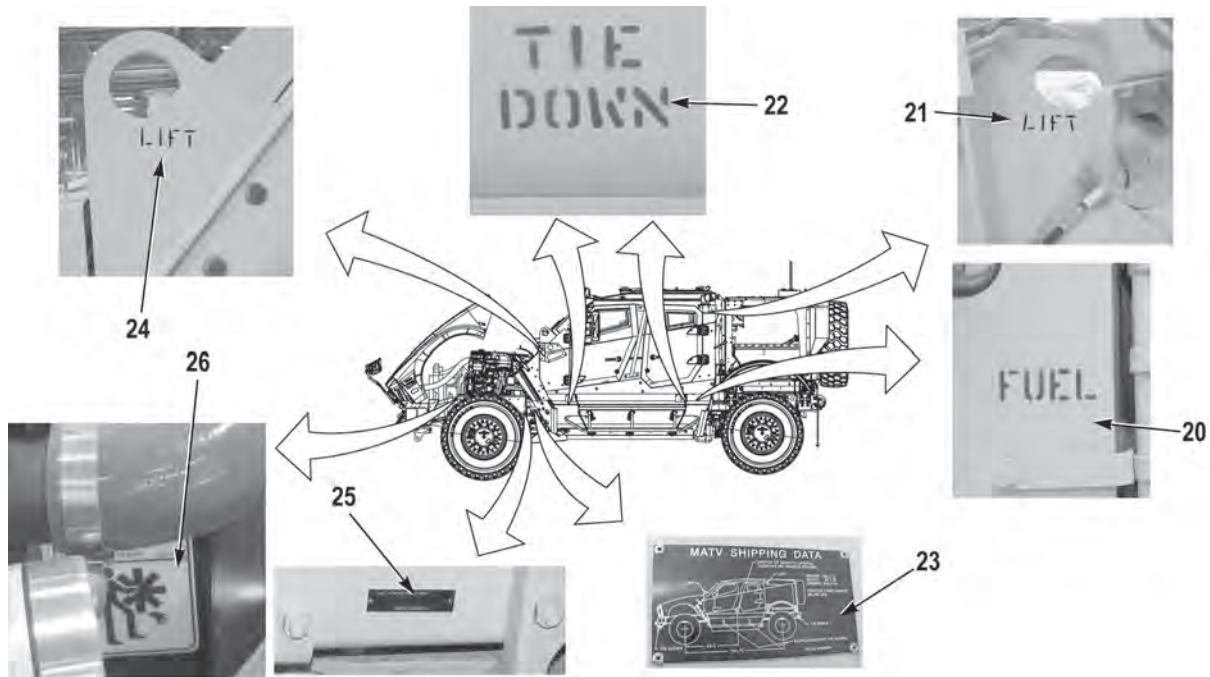


Figure 1. Data Plates, Decals, and Stencils (sheet 4 of 5).

Data Plate Number	Data Plate Description
20	Stencil, FUEL
21	Stencil, LIFT
22	Stencil, TIE DOWN
23	Plate, MATV SHIPPING DATA
24	Stencil, LIFT
25	Plate, VIN NUMBER
26	Label, FAN

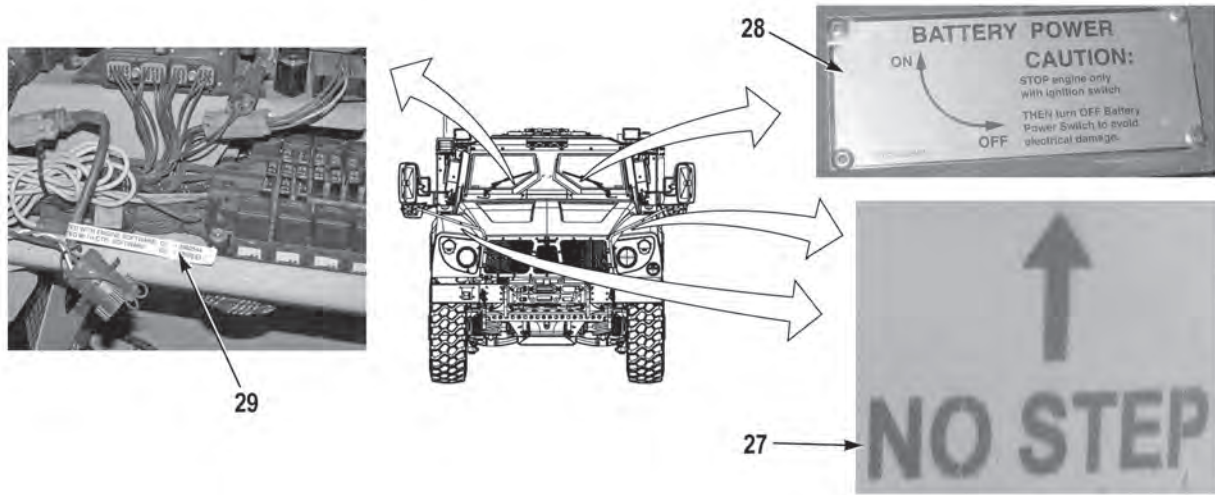


Figure 1. Data Plates, Decals, and Stencils (sheet 5 of 5).

Data Plate Number	Data Plate Description
27	Stencil, NO STEP
28	Plate, CAUTION, BATTERY DISCONNECT (inside vehicle)
29	Label, Info, Software Version (M1240A1) (located inside dash cover)

END OF WORK PACKAGE

STOWAGE GUIDE (M1240/M1240A1)

This work package identifies the stowage location for the BII and COEI equipment of the M1240 and M1240A1.

CAUTION

Use care when stowing BII and COEI to ensure items are not broken or deformed. Failure to comply may result in damage to equipment.

Table 1. Equipment Stowed in Capsule.

Description	NSN	Quantity
Cutter, Strap	2590-01-576-2424	5
Fire Extinguisher	4210-01-577-3170	2

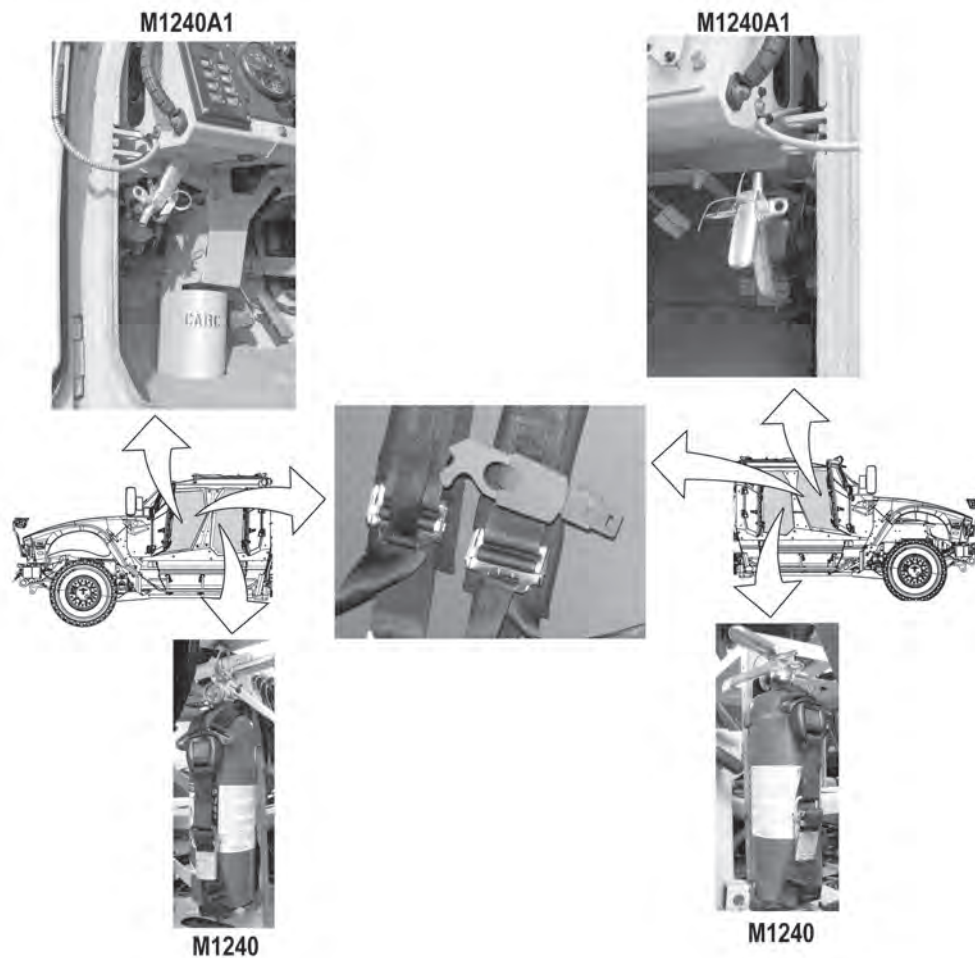


Table 2. Equipment Stowed in Driver Side Fender Box.

Description	NSN	Quantity
Bag, Stowage	8105-01-439-6178	2
Bar, Pinch, 26 in.	5120-00-224-1372	1
Chain Assembly, Tire (M1240A1)	2540-01-593-1152	2
Chain Assembly, Tire (M1240)	2540-01-492-2489	4
Chock, Wheel	2540-01-500-6119	2
Combination Tool, Hand, Set	5120-01-416-8568	1
a. Axe, Single Bit	5110-01-416-7827	1
b. Bag, Carrying, Combination Tool	5140-01-416-8569	1
c. Broad Pick Attachment	5120-01-416-8572	1
d. Lock Pin Set (Set of 12)	5120-01-416-8575	1
e. Mattock Attachment	5120-01-416-8571	1
f. Pick Attachment	5120-01-416-8573	1
g. Rake-Hoe Attachment	5120-01-416-8577	1
h. Rake-Hoe Fastener	5120-01-416-8574	1
i. Sheath, Ax Head	5110-01-416-7830	1
j. Shovel Attachment	5120-01-416-8570	1
Controller, Winch	6110-01-575-8471	1
Flashlight	6230-00-264-8261	2
Hammer, Sledge	5120-00-243-2957	1
Jack, Hydraulic, 20 Ton	5120-01-351-2074	1
Lubricating Gun, Hand	4930-01-480-9063	1
Padlock (Secures Fender Box)	5340-00-158-3807	1
Panel, Marker	8345-00-174-6865	2
Shackle, Screw Pin, 1-1/4 in.	2510-01-321-1221	1
Spout, Flexible, Can	7140-00-177-6154	1
Chain, Recovery, ASSY	4010-01-577-4959	1
Shackle	4030-01-504-7788	2

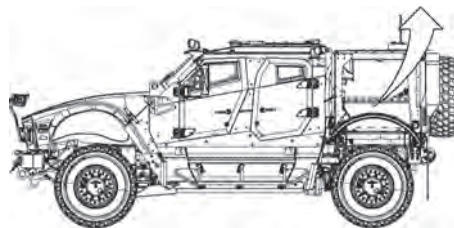


Table 3. Equipment Stowed In Passenger Side Fender Box.

Description	NSN	Quantity
Adapter, Grease Gun	4930-00-204-2550	1
Adapter, Jack (M1240A1)	4910-01-600-4974	1
Bag, Assembly, Pamphlet	8105-01-353-2497	1
Bag, Tool	5140-00-473-6256	1
Bar, Emergency	2590-01-550-2593	1
Binder, Loose-Leaf	7510-00-889-3494	1
Brush, Wire	7920-00-269-1259	1
Cable Assy, NATO Slave	6150-01-577-2785	1
Equipment Record Folder	7510-01-065-0166	1
Extension, Socket, 10.0 x 1/2" Drive	5120-00-022-9797	1
Extension, Socket, 5.0 x 1/2" Drive	5120-01-335-1050	1
First Aid Kit, General Purpose	6545-00-922-1200	2
Fitting, Lubrication, Straight	4730-00-050-4208	1
Funnel, Steel, Flex Mount	7240-00-559-7364	1
Hammer, Ball Peen, 32 oz.	5120-00-061-8546	1
Handle, Sliding Tee, 3/4 in. Drive	5120-01-242-7218	1
Handle, Socket, Wrench	5120-00-230-6385	1
Inflator-Gauge, Pneumatic Tire, 18 ft.	4910-01-038-2820	1
Key Set, Socket Head	5120-01-335-1508	1
Lug Nut Wrench Extension, 8 in.	5120-00-243-7328	1
Padlock (Secures Fender Box)	5340-00-158-3807	1
Pliers, Side Cutting, 8 in.	5120-00-239-8251	1
Pliers, Slip Joint, 8 in.	5120-00-223-7397	1
Screwdriver, Phillips #3, 6 in.	5120-01-398-8053	1
Screwdriver, Standard, 10 in.	5120-00-293-3309	1
Socket, 10MM X 1/2 in. Drive	5120-01-349-1042	1
Socket, 13MM X 1/2 in. Drive	5120-01-398-8033	1
Socket, 14MM X 1/2 in. Drive	5120-01-398-7943	1
Socket, 16MM X 1/2 in. Drive	5120-01-348-9035	1
Socket, 18MM X 1/2 in. Drive	5120-01-348-9037	1
Socket, 19MM X 1/2 in. Drive	5120-01-398-7919	1
Socket Wrench, 1/2 in. Drive, 1/2 in. 6 pt	5120-01-398-7937	1
Socket Wrench, 1/2 in. Drive, 15/16 in. 6 pt, Deep Well, Impact	5130-00-714-0600	1
Socket Wrench, 1/2 in. Drive, 3/4 in.	5120-00-189-7985	1
Socket Wrench, 1/2 in. Drive, 5/8 in.	5120-00-189-7946	1
Socket Wrench, 1/2 in. Drive, 7/16 in.	5120-01-366-8399	1

Table 3. Equipment Stowed In Passenger Side Fender Box. (Continued)

Description	NSN	Quantity
Socket Wrench, 1/2 in. Drive, 7/8 in.	5120-00-189-7934	1
Socket Wrench, 1/2 in. Drive, 9/16 in.	5120-00-189-7932	1
Socket, Lug Nut, 33MM, Impact 3/4 in. Drive	5130-01-400-0196	1
Strap, Nylon (M1240A1 only)	5340-01-599-0234	1
Strap, Rubber	5340-00-340-0980	3
Technical Manual, Operators	TM 9-2355-335-10	1
Adapter, HMMWV	2530-01-520-6537	2
Harness, Intervehicular, 24 V	5995-00-772-8813	1
Hose ASSY, Intervehicular	4720-01-582-5006	1
Hose ASSY, Intervehicular	4720-01-582-5003	1
Pin, Quick Release	5310-01-490-7325	4
Pin, Straight, Headed	5315-01-520-6541	2
Pin, Straight, Headed	5315-01-500-5324	2
Pin, Straight, Headed	5315-01-228-0416	2
Warning Kit, Highway	9905-01-480-0644	1
Wrench, Adjustable, 12 in.	5120-00-264-3796	1
Wrench, Adjustable, 8 in.	5120-00-240-5328	1
Wrench, Plier, Curve	5120-00-494-1911	1

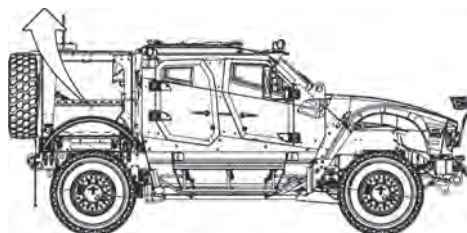


Table 4. Equipment Stowed in Rear Deck.

Description	NSN	Quantity
Blanket, Fire	4210-01-324-2734	2
Can, Military, Fuel, Tan	7240-01-337-5268	2
Can, Military, Water, Plastic	7240-00-089-3827	2
Plate, Jack Support	4910-01-577-1432	1
Ring Assembly, Tie Down	5340-01-582-5124	4
Strap, Tie Down	5340-01-577-2673	2

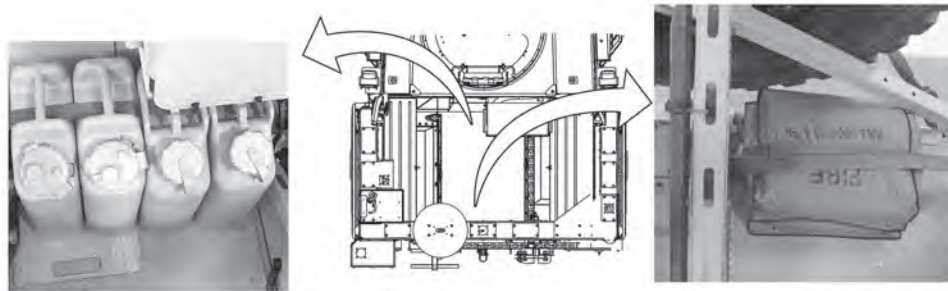


Table 5. Equipment Stowed on Front Tie Down Eyes.

Description	NSN	Quantity
Shackle	4030-01-187-0964	2

Table 6. Equipment Stowed on Rear Tie Down Eyes.

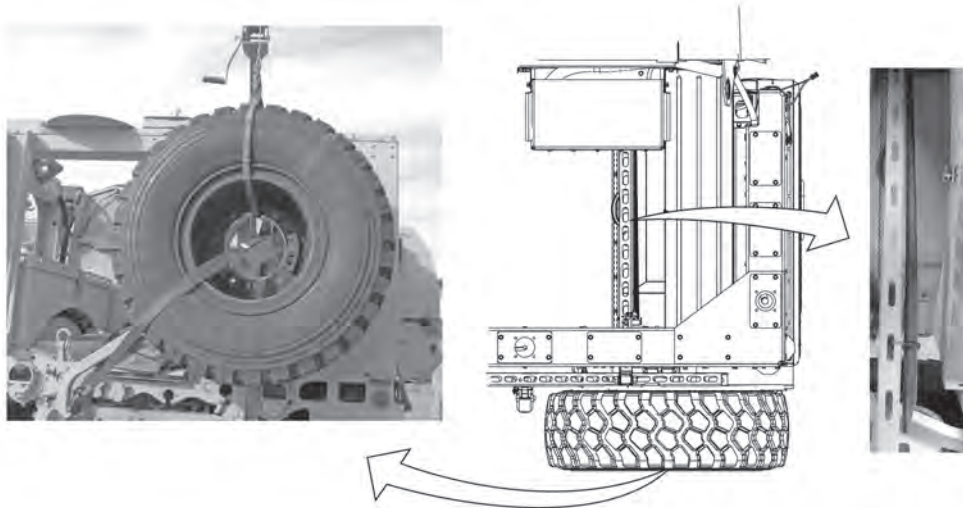
Description	NSN	Quantity
Shackle	4030-01-187-0964	2

Table 7. Equipment Stowed on Spare Tire Carrier.

Description	NSN	Quantity
Crowbar 58 in. (147.3 cm)	5120-00-224-1390	1
Instl, Wire Rope (Located on Spare Tire Winch)	4010-01-153-9403	1
Nut, Self-Locking (Located on Spare Tire Winch)	5310-01-288-1116	3
Screw, Cap, Hex (Located on Spare Tire Winch)	5306-01-287-5714	3

Table 7. Equipment Stowed on Spare Tire Carrier. (Continued)

Strap, Nylon (Located on Spare Tire), 60 in. 395/85R20	5340-01-599-0238	1
Strap, Tie Down (Secures Spare Tire), 70 in. 16.00R20	5340-01-577-2673	1
Winch Bracket (Installed in Spare Tire Carrier)	2590-01-577-3992	1
Winch, Drum, Hand Operated (Installed on Winch Bracket)	3950-01-154-6794	1



END OF WORK PACKAGE

STOWAGE GUIDE (M1245)

This work package identifies the stowage location for the BII equipment of the M-ATV SOCOM Variant.

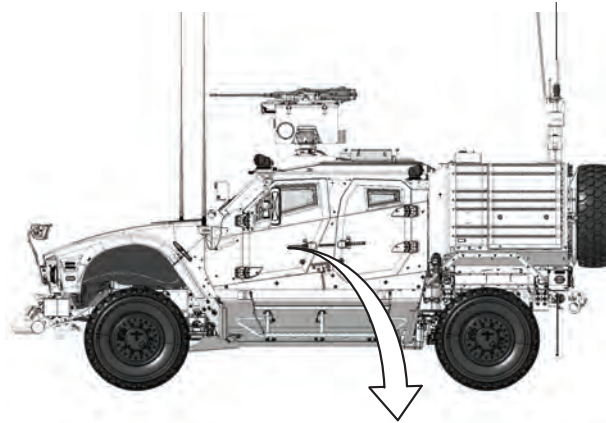


Table 1. Equipment Stowed in Cab.

Description (Part Number)	NSN	Qty
Cutter, Strap (22-01943)	7510-01-065-0166	5
Extinguisher, Fire, Portable, CO2, 2.5 lbs. (3828332)	4210-01-577-3170	2

CAUTION

**Use care when stowing BII and COEI to ensure items are not broken or deformed.
Failure to comply may result in damage to equipment.**

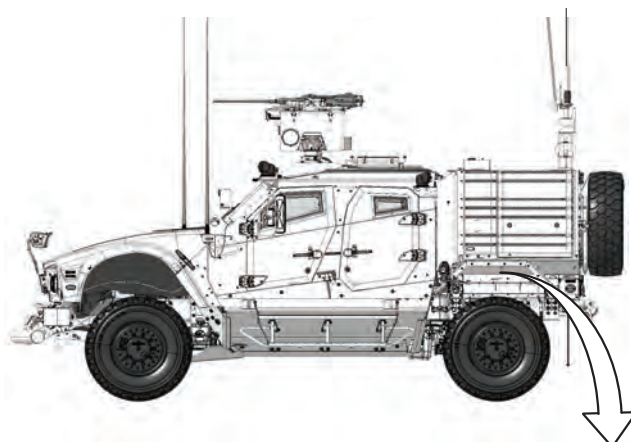


Table 2. Equipment Stowed Driver Side Fender Box.

Description	NSN/Part Number	Qty
Padlock W-Chain (1362720)	5340-00-158-3807	1
Panel Marker Signal, Ground to Air, Red/Yellow (3819270)	8345-00-174-6865	2
Shackle, Screw Pin (3819275)	2510-01-321-1221	1
Tow Bar, Kit, M-ATV (3829488)	2540-01-577-2423	1
a. Link, Adaptor, Towbar (3834756)	2540-01-577-3987	2
b. Hose ASSY, Intervehicular, Blue (3410504)	4720-01-582-5006	1
c. Hose ASSY, Intervehicular, Red (3410503)	5120-00-240-5003	1
d. Pin, Assembly (3379668)	5315-01-228-0416	2
e. Pin, 1, 54 x 5.13 Tow Bar (3390992)	4030-01-504-7788	2
f. Pin, Klick, 31 x 2.34 (3406240)	5315-01-490-7325	4
g. Pin, Assembly (3379668)	5315-01-520-6541	2
h. Anchor, Shackle (3442534)	4030-01-504-7788	2
i. Adapter, HMMVV Machining (3406264)	2530-01-520-6537	2
j. Adapter, MTRV, IBIS TEK (3834905)	2540-01-577-3988	2
l. Harness, Intervehicular (64297CX)	5995-00-772-8813	1
m. Chain, Recovery Assy, 62-10 ft. (3829510)	4010-01-577-4959	1

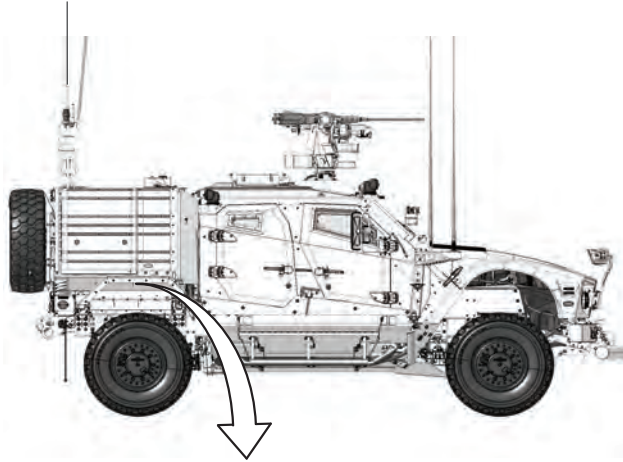


Table 3. Equipment Stowed Passenger Side Fender Box.

Description	NSN/Part Number	Qty
Adapter, Grease Gun (3819243)	4930-00-204-2550	1
Brush, Wire Scratch (3494194)	7920-00-269-1259	1
Cable, Assembly Nato Slave (3827228)	6150-01-577-2785	1
Fitting, Lubrication, Straight (3821396)	4730-00-050-4208	1
Funnel, Steel, Flex Mount (3819260)	7240-00-559-7364	1
Gauge, tire pressure w/hose (3819261)	4910-01-038-2820	1
Lubricating Gun, Hand (1429580)	4930-01-480-9063	1
Padlock W-Chain (1362720)	5340-00-158-3807	1
Spout, Can, Flexible w/Filter Screen, 2 1/2 in. OD, 16 in. lg. (1167020)	7240-00-177-6154	1
Strap, Ratchet (3703803)	5340-01-577-2673	2
Tool, Emergency Ingress (3821246)	2590-01-550-2593	1
Winch System, Tackle Block (3825996)	3940-01-577-3646	1

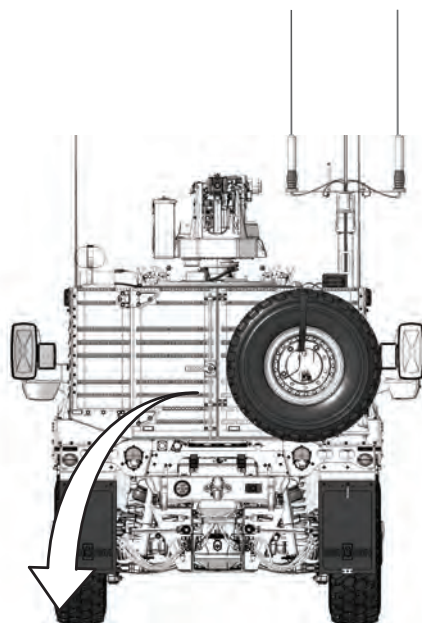


Table 4. Equipment Stowed Rear Deck.

Description	NSN/Part Number	Qty
Bag, Stowage, Pamphlet (1362710)	8105-01-353-2497	1
Bag, Stowage, Pamphlet (3819244)	8105-01-439-6178	1
Bar, Pinch, 26 in. (1362550)	5120-00-224-1372	1
Binder, Loose Leaf, 3 Ring, Green (1362730)	7510-00-889-3494	1
Can, Fuel, Military, Tan (3819249)	7240-01-337-5268	2
Can, Water, Military, Plastic, 5 Gallon, Tan (3819249)	7240-00-089-3827	2
Crowbar, Pinch Point, 59 to 62 in.(1362590)	5120-00-224-1390	1
Fire Blankets (1612440)	4210-01-324-2734	2
First Aid Kit, General Purpose (1728180)	6545-00-922-1200	2
Flashlight MX 991U (3336840)	6545-00-922-1200	2
Folder, Equipment Record, 2.5 in.x 8 in.x 10 in. (in pamphlet bag) (3434387)	7510-01-065-0166	1
Hammer, Hand, Sledge, Double-Faced, 10 lbs. (3819263)	5120-00-243-2957	1
Jack, Hydraulic, Hand, 20 ton (1919670)	5120-01-351-2074	1
Max Tool Kit, Combination Tool, Hand (3252183)	5120-01-416-8568	1
a. Carry Case (595-030)	5140-01-416-8569	1
b. Ax (595-010)	5110-01-416-7827	1

Table 4. Equipment Stowed Rear Deck. (Continued)

Description	NSN/Part Number	Qty
c. Ax Sheath (595-020)	5110-01-416-7830	1
d. Shovel Attachment (595-040)	5120-01-416-8570	1
e. Mattock Attachment (595-050)	5120-01-416-8571	1
f. Pick Attachment (595-060)	5120-01-416-8573	1
g. Broad pick Attachment (595-070)	5120-01-416-8572	1
h. Rake Hoe Attachment (595-080)	5120-01-416-8577	1
i. Rake Hoe Fastener (595-090)	5120-01-416-8574	1
j. Safety Locking Pin (595-999)	5120-01-416-8575	7
Ring, Single Stud (3848524)	5340-01-582-5124	4
Strap, Ratchet (3703803)	5340-01-577-2673	1
Snow Chains (1885700)	2510-01-321-1221	4
Support Plate, Jacking (3819327)	4910-01-577-1432	1
Technical Manual, Operators (3829256)	5340-21-914-1589	1
Winch Remote Control (3851415)	6110-01-575-8471	1
Wire, Rope (66295AX)	4010-01-153-9403	1
a. Winch, Brake (3320108)	3950-01-154-6794	1
b. Winch, Bracket (3838929)	2950-01-577-3992	1
c. Choker, Strap (3841145)	5340-01-577-3586	1
d. Nut, Flg, LKDT (10823-00318)	5310-01-288-1116	3
e. Scr, Flg, Hex (0155849)	5306-01-287-5714	3
Wrench, Bar Socket (3819334)	5120-00-243-2419	1

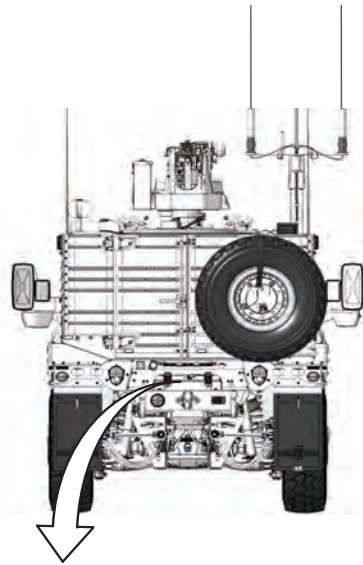


Table 5. Equipment Stowed Rear Tow Bar Stowage.

Description	NSN/Part Number	Qty
k. Tow Bar, Medium-Duty, IBISTEK (3834791)	2540-01-577-3683	1

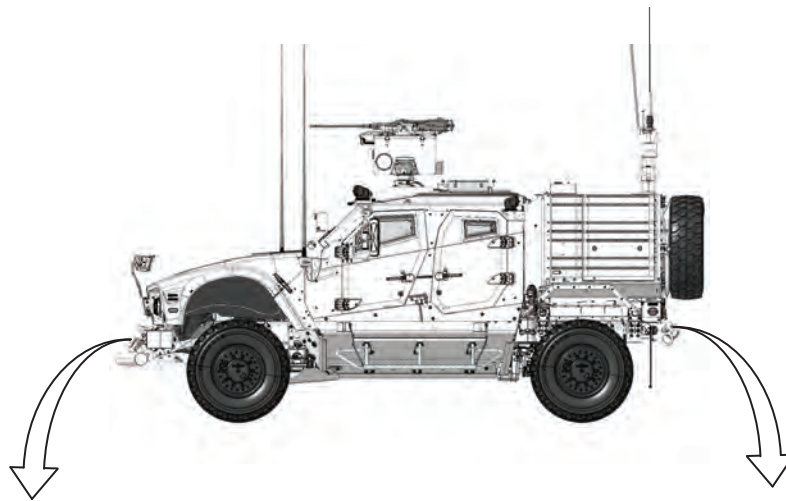


Table 6. Equipment Stowed Front and Rear Tie Down Eye.

Description	NSN/Part Number	Qty
Shackle, Safety Anchor (3F19274)	4030-01-187-0964	4

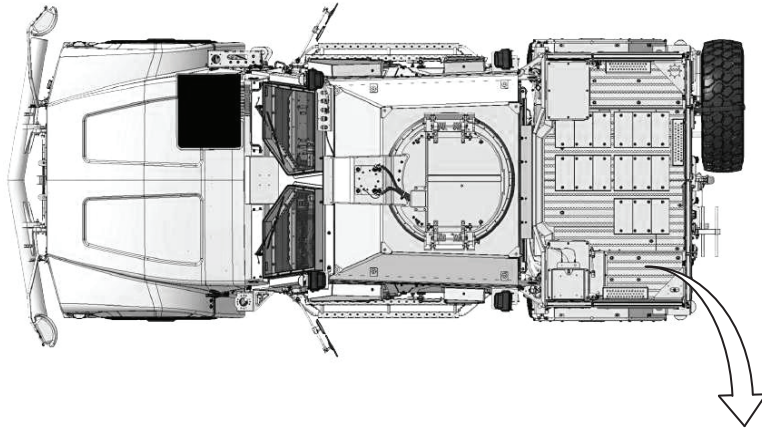


Table 7. Equipment Stowed Top of Driver Fender Stowage Box.

Description	NSN/Part Number	Qty
Chock, Wheel (3819250)	2540-01-500-6119	2
Strap, Rubber (44583AX)	5340-00-340-0980	2

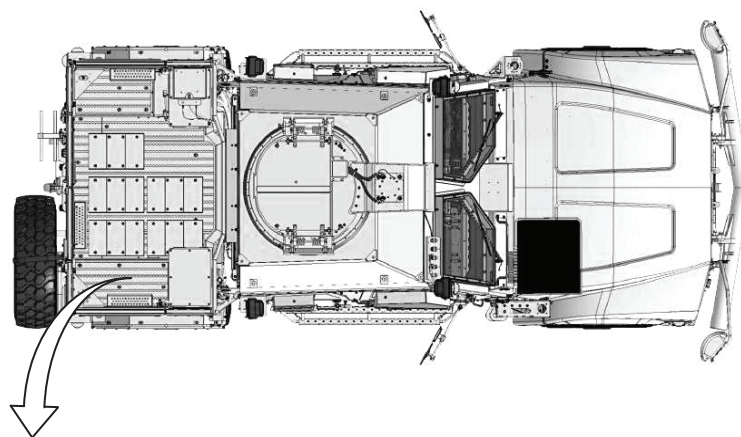


Table 8. Equipment Stowed Top of Passenger Fender Stowage Box.

Description	NSN/Part Number	Qty
Strap, Rubber (44583AX)	5340-00-340-0980	1
Bag, Tool Satchel (3819246)	5140-00-473-6256	1
Extension, Socket Wrench, 5 in. long, 1/2 inch Drive (3819253)	5120-01-335-1050	1
Extension, Socket Wrench, 10 in. Long, 1/2 in. Drive (3819254)	5120-00-227-8074	1
Hammer, Hand, Machinist's Ball Peen (3819262)	5120-00-061-8546	1
Handle, Socket Wrench, 1/2 in. Drive (3819264)	5120-00-230-6385	1
Key Set, Socket Head (3819267)	5120-01-335-1508	1
Pliers, Linemans Side Cutting, 8 in. (3819271)	5120-00-239-8251	1
Pliers, Combination, Slip Joint, 8 in. long (3819272)	5120-00-223-7397	1
Screwdriver, Cross Tip, #3, 6 in. long (32746AX)	5120-01-398-8053	1
Screwdriver, Flat Tip, #2, 6 in. long (1350160)	5120-00-293-3309	1
Socket, Socket Wrench, 1/2 inch Drive, 7/16 inch, 12 pt.(3819276)	5120-00-237-0984	1
Socket, Socket Wrench, 1/2 inch Drive, 1/2 inch, 6 pt.(3819314)	5120-01-398-7937	1
Socket, Socket Wrench, 1/2 inch Drive, 9/16 inch, 12 pt.(3819315)	5120-00-189-7932	1
Socket, Socket Wrench, 1/2 inch Drive, 5/8 inch, 12 pt.(3819316)	5120-00-189-7946	1
Socket, Socket Wrench, 1/2 inch Drive, 3/4 inch, 12 pt.(3819317)	5120-00-189-7985	1

Table 8. Equipment Stowed Top of Passenger Fender Stowage Box. (Continued)

Description	NSN/Part Number	Qty
Socket, Socket Wrench, 1/2 inch Drive, 7/8 inch, 12 pt. (3819318)	5120-00-189-7394	1
Socket, Socket Wrench, 1/2 inch Drive, 15/16 inch, 6 pt.(3819320)	5130-00-714-0600	1
Socket, Socket Wrench, 1/2 inch Drive, 10 mm, 6 pt. (3819321)	5120-01-349-4547	1
Socket, Socket Wrench, 1/2 inch Drive, 13 mm, 6 pt. (3819322)	5120-01-398-8033	1
Socket, Socket Wrench, 1/2 inch Drive, 14 mm, 6 pt. (3819323)	5120-01-398-7937	1
Socket, Socket Wrench, 1/2 inch Drive, 16 mm, 6 pt. (3819324)	5120-01-348-9035	1
Socket, Socket Wrench, 1/2 inch Drive, 18 mm, 6 pt. (3819325)	5120-01-348-9037	1
Socket, Socket Wrench, 1/2 inch Drive, 19 mm, 6 pt. (3819326)	5120-01-398-7919	1
Socket, Socket Wrench, 33 mm (3819333)	5130-01-400-0196	1
Wrench, Adjustable, 8 in. (3819329)	5120-00-240-5328	1
Wrench, Adjustable, 12 in. (120405A)	5120-00-264-3796	1
Wrench, Lug Nut-Extension, Socket Wrench, 8 in., 3/4 in. Drive (3819331)	5120-00-243-7328	1
Wrench, Lug Nut - Handle, Socket Wrench, 19.5 in. Sliding Tee, 3/4 in. Drive(1505380)	5120-01-242-7218	1
Wrench, Plier (1362660)	5120-01-522-0827	1
Wrench, Socket (3819335)	5120-00-316-9217	1

END OF WORK PACKAGE

CHAPTER 3

**TROUBLESHOOTING PROCEDURES
FOR
M1240, M1240A1, AND M1245**

TROUBLESHOOTING PROCEDURES

INTRODUCTION

This work package contains operator troubleshooting procedures. Table 1 lists most common malfunctions found during operation of the M-ATV and its components. Tests or inspections and corrective actions should be performed in the order listed. If a malfunction is not listed on the table refer to Field Maintenance.

To quickly find the troubleshooting procedure you need, use the Fault Symptom Index (Table 1). Components and symptoms are listed first; common malfunctions are listed under those components or system headings.

This manual cannot list all malfunctions that may occur. Nor can it list all tests, inspections, and corrective actions. If a malfunction is not listed, or if listed corrective actions are not adequate, notify your Supervisor.

Table 1. Symptom Index.

Troubleshooting Procedure	Page
ENGINE	
Engine Fails to Crank When Ignition Switch is Turned to Start Position	57-3
Engine Cranks But Fails to Start	57-4
Engine Shuts Down While Running.	57-4
Engine Runs Roughly After Proper Warm-Up, Does Not Develop Full Power, or Makes Excessive Exhaust Smoke	57-5
Engine Overheats	57-6
Low Engine Oil Pressure Gauge Indication.	57-6
Excessive Engine Oil Consumption	57-7
TRANSMISSION	
Noisy When Operating	57-7
Transmission Temperature Gauge or High Transmission Temp Light Indicates Overheating During Normal Operation	57-7
Transmission Will Not Shift into Gear or Shift Out of Gear (Check Transmission Indicator On)	57-8
Check Transmission Indicator Comes On During Operation.	57-8
Check Transmission Indicator Comes On and Remains On After Startup	57-8
WHEELS	
Wheel Wobbles	57-9
STEERING	
Vehicle Shimmies, Wanders, or Pulls to One Side	57-9
Vehicle is Hard to Steer or Steering is Slow to Respond or Intermittent	57-9

Table 1. Symptom Index.

Troubleshooting Procedure (Continued)	Page
AIR SYSTEM	
Low Air Buzzer Sounds and Low Air Indicator Lights are On.	57-10
Trailer Brakes Do Not Apply when Service Brake Pedal or Parking Brake is Used. . . .	57-10
ELECTRICAL	
No Electrical Circuits Operate	57-11
Voltmeter Reads Less Than 26 Volts While Engine is Running.	57-11
Windshield Washer Will Not Operate	57-12
One or More Lighting Circuits Not Operating (Headlights, Blackout Lights, Turn Signals, Brake Lights, Spotlights, Marker Lights, Reverse Lights, Trailer Lights)	57-12
WINCH	
Winch Does Not Operate	57-13
Winch Unusually Noisy When Operating	57-13
CAPSULE FIRE SUPPRESSION SYSTEM	
No LED's illuminated	57-13
Power LED not illuminated	57-13
ENGINE FIRE SUPPRESSION SYSTEM	
Service system LED is flashing once	57-14
UNDERCARRIAGE FIRE SUPPRESSION SYSTEM	
No LED's illuminated	57-14
GOVERNMENT FURNISHED EQUIPMENT (GFE)	
Government Furnished Equipment (GFE) does not operate	57-14

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ENGINE**ENGINE FAILS TO CRANK WHEN IGNITION SWITCH IS TURNED TO START POSITION**

- Step 1. Check that instrument panel lights illuminate with ignition switch on.
If instrument panel lights do not illuminate, check battery disconnect switch.
- Step 2. Check for tripped circuit breakers (WP 0063). If tripped, reset. If circuit breakers trip again, notify Field Maintenance.
- Step 3. Check that transmission range selector is switched to N (neutral).
If transmission range selector is not in neutral (N), position transmission range selector to neutral (N). Attempt to restart engine.

WARNING

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.

NOTE

- Notify Field Maintenance to open battery covers for M1245.
- Step 4. Remove battery covers (WP 0062, M1240/M1240A1).
- Check for dirty battery connectors, and loose or broken battery cables.
 - If battery cables are loose, corroded, or damaged, notify Field Maintenance.
- Step 5. Attempt to start, if problem still exists, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ENGINE CRANKS BUT FAILS TO START

- Step 1. Check for tripped circuit breakers (WP 0063). If tripped, reset. If circuit breaker trips again, notify Field Maintenance.

WARNING

Fuel is flammable and can explode. To avoid injury or death, keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.

- Step 2. Check indication on FUEL gauge.

If fuel gauge indicates fuel tank is empty, fill fuel tank, prime engine (WP 0065), and attempt to restart engine.

- Step 3. Reset and check air filter restriction indicator.

If indicator shows RED after resetting, notify Field Maintenance.

- Step 4. Check fuel/water separator for contamination or water.

NOTE

Refer to local procedures and plans for use, storage or disposal of drained fluids.

If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out. Attempt to restart engine.

- Step 5. Check fuel filter and fuel/water separator for damage or leaks.

a. If fuel filter or fuel/water separator is loose and leaking, notify Field Maintenance.

b. If fuel filter or fuel/water separator is damaged, notify Field Maintenance.

- Step 6. Check fuel lines and connections for leaks or damage.

If hoses are leaking or damaged, notify Field Maintenance.

- Step 7. Attempt to start engine, if problem still exists, notify Field Maintenance.

ENGINE SHUTS DOWN WHILE RUNNING

- Step 1. Check indication on fuel gauge.

If fuel gauge indicates fuel tank is empty, fill fuel tank, prime engine (WP 0065), and attempt to restart engine.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

- Step 2. Reset and check air filter restriction indicator.
- If indicator shows RED after resetting, notify Field Maintenance.
- Step 3. Check fuel/water separator for contamination or water.

NOTE

Refer to local procedures and plans for use, storage or disposal of drained fluids.

If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out. Attempt to restart engine. If problem still exists, notify Field Maintenance.

ENGINE RUNS ROUGHLY AFTER PROPER WARM-UP, DOES NOT DEVELOP FULL POWER, OR MAKES EXCESSIVE EXHAUST SMOKE

- Step 1. Check air filter restriction indicator.
- a. If indicator reads below RED, go to Step 2.
 - b. If indicator reads in RED, reset indicator.
 - c. If indicator still reads in RED after resetting, notify Field Maintenance.

WARNING

Fuel is flammable and can explode. To avoid injury or death, keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.

- Step 2. Check fuel/water separator for contamination or water.

NOTE

Refer to local procedures and plans for use, storage or disposal of drained fluids.

If water or contamination is present, drain fuel from sediment bowl until clean fuel flows out.

- Step 3. With engine OFF, check fuel filter (on engine) and fuel/water separator for damage or leaks.
- If fuel filter or fuel/water separator is loose, leaking, or damaged, notify Field Maintenance.
- Step 4. Check fuel lines and connections for leaks or damage.
- If hoses are leaking or damaged, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

Step 5. Attempt to start engine.

If problem still exists, notify Field Maintenance.

ENGINE OVERHEATS

Step 1. Check that FAN FORD switch is in the OFF (down) position (WP 0007).

WARNING

Cooling system components are very hot and pressurized during vehicle operation. Let cooling system cool before checking hoses. Failure to comply may result in burns to personnel.

Step 2. With engine OFF and hood open, check coolant level in coolant overflow reservoir.

If coolant level is low, add coolant to overflow reservoir until level is at COLD mark.

a. For vehicles fitted with a coolant overflow reservoir, add coolant until level is at COLD mark

b. For vehicles fitted with a coolant surge tank, add coolant until level is visible in sight glass.

Step 3. Check radiator cooling fins, charge air cooler fins, and hood grill for obstructions (leaves, paper, etc.).

If obstructed, clear obstruction.

Step 4. Check radiator hoses, clamps, and radiator for leaks.

If surge tank, radiator, or hoses leak, notify Field Maintenance.

Step 5. Attempt to start vehicle, if problem still exists, notify Field Maintenance.

LOW ENGINE OIL PRESSURE GAUGE INDICATION

Step 1. With engine OFF and hood open, check engine oil level (WP 0059).

If engine oil level is low, add oil as required.

Step 2. Check under vehicle for Class III leaks.

If Class III leaks are found, notify Field Maintenance.

Step 3. If problem still exists, notify Field Maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

EXCESSIVE ENGINE OIL CONSUMPTION

Step 1. Check underneath vehicle for Class III leaks.

If Class III leaks are found, notify Field Maintenance.

Step 2. If problem still exists, notify Field Maintenance.

TRANSMISSION**NOISY WHEN OPERATING**

Step 1. Check transmission fluid level (WP 0059).

If fluid level is low, add necessary amount of oil. If fluid level is high, notify Field Maintenance.

Step 2. If problem still exists, notify Field Maintenance.

TRANSMISSION TEMPERATURE GAUGE OR HIGH TRANSMISSION TEMP LIGHT INDICATES OVERHEATING DURING NORMAL OPERATION

Step 1. Check that FAN FORD switch is in OFF (down) position (WP 0007).

Step 2. Check transmission fluid level (WP 0059).

If transmission fluid level is low, add necessary amount of oil. If fluid level is high, notify Field Maintenance.

WARNING

Cooling system components are very hot and pressurized during vehicle operation. Let cooling system cool before checking hoses. Failure to comply may result in burns to personnel.

Step 3. With engine OFF and hood open, check coolant level.

If coolant level is low, add coolant.

- a. For vehicles fitted with a coolant overflow reservoir, add coolant until level is at COLD mark
- b. For vehicles fitted with a coolant surge tank, add coolant until level is visible in sight glass.

Step 4. Check if radiator cooling fins, charge air cooler fins, and hood grill are obstructed (leaves, paper, etc.).

If obstructed, clear obstruction.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

-
- Step 5. Check radiator hoses, clamps, and radiator for leaks.
- a. Tighten loose hose clamps.
 - b. If radiator or hoses leak, notify Field Maintenance.
- Step 6. If problem still exists, notify Field Maintenance.

**TRANSMISSION WILL NOT SHIFT INTO GEAR OR SHIFT OUT OF GEAR
(CHECK TRANSMISSION INDICATOR ON)****WARNING**

- **The driver's field of vision is limited. Ground guides must be used when operating in congested areas or when operating in reverse. Ground guides must stand clear of the vehicle and remain within view of the driver. Failure to comply may result in injury or death to personnel and damage to equipment.**
- **Single hearing protection is required in and around an operating vehicle. Double hearing protection is required during weapons firing. Failure to comply may result in injury to personnel.**

NOTE

When transmission oil is below 19°F (-7°C), the only gears available are reverse (R), neutral (N), and third gear when drive (D) is selected. Remaining gears in drive (D) will not be available until oil in sump warms above 19°F (-7°C).

CHECK TRANSMISSION INDICATOR COMES ON DURING OPERATION

If check transmission indicator comes on when operating vehicle, apply service brakes, stop vehicle, do NOT shift into neutral (N), and perform Transmission Limp Home procedure (WP 0022).

CHECK TRANSMISSION INDICATOR COMES ON AND REMAINS ON AFTER STARTUP

If check transmission indicator remains on after startup, prior to operating vehicle, stop engine, wait 15 seconds, and restart engine. If check transmission indicator does not stay on, the fault has cleared and the vehicle can be operated normally. Notify Field Maintenance at earliest opportunity.

If check transmission indicator comes on and remains on after second startup, turn off engine, do not operate vehicle, and notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION****WHEELS****WHEEL WOBBLES**

- Step 1. Check wheels for loose, missing, or broken lug nuts.
- Tighten loose lug nuts and notify Field Maintenance to have lug nuts tightened to proper torque requirements.
- Step 2. Check tires for bulges and visually inspect for bent wheel.
- If wheel is bent or tire has bulges, notify Field Maintenance.
- Step 3. If problem still exists, notify Field Maintenance.

STEERING**VEHICLE SHIMMIES, WANDERS, OR PULLS TO ONE SIDE**

- Step 1. Check wheels for loose, missing, or broken lug nuts.
- Tighten loose lug nuts and notify Field Maintenance to have lug nuts tightened to proper torque requirements.
- Step 2. Check for obvious damage to steering components.
- If steering components are damaged, notify Field Maintenance.
- Step 3. Check tires for proper pressure.
- If tire pressure is not correct, adjust tire to proper pressure (WP 0031 and WP 0061).
- Step 4. Check CTIS for proper operation.
- If CTIS is not operating properly, notify Field Maintenance.
- Step 5. If problem still exists, notify Field Maintenance.

VEHICLE IS HARD TO STEER OR STEERING IS SLOW TO RESPOND OR INTERMITTENT

- Step 1. Check hydraulic steering reservoir fluid level.
- If fluid level is low, notify Field Maintenance.
- Step 2. Check for loose or leaking hydraulic steering connections and damaged hydraulic steering lines.
- If lines are loose or damaged, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

-
- Step 3. Check tires for proper pressure.
- If tire pressure is not correct, adjust tire to proper pressure (WP 0031 and WP 0061).
- Step 4. If problem still exists, notify Field Maintenance.

AIR SYSTEM**LOW AIR BUZZER SOUNDS AND LOW AIR INDICATOR LIGHTS ARE ON**

- Step 1. Check air pressure gauges.
- a. If red and green needles show 75 psi (517 kPa) or more, but buzzer and lights are still on, notify Field Maintenance.
 - b. If red and green needles show below 75 psi (517 kPa) and does not build up after several minutes, go to Step 2.
- Step 2. Check that TRAILER AIR SUPPLY control is pulled out (OFF position) (WP 0007).
- Pull out TRAILER AIR SUPPLY control.
- Step 3. Check that all air reservoir drain valves are closed.
- Close all drain valves.
- Step 4. Check for leaks at hoses, lines, fittings, and connectors.
- If leaks are found, notify Field Maintenance.
- Step 5. If problem still exists, notify Field Maintenance.

TRAILER BRAKES DO NOT APPLY WHEN SERVICE BRAKE PEDAL OR PARKING BRAKE IS USED

Check to make sure that service and emergency air hoses are secure and properly connected.

- a. Connect air hoses.
- b. If problem still exists, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ELECTRICAL**NO ELECTRICAL CIRCUITS OPERATE**

- Step 1. Make sure that battery disconnect switch is in the ON position (WP 0007).
- Step 2. Check for tripped circuit breakers (WP 0063). If tripped, reset. If circuit breaker trips again, notify Field Maintenance.

WARNING

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.

NOTE

Notify Field Maintenance to open battery covers for M1245.

- Step 3. Remove battery covers (WP 0062, M1240/M1240A1).
- a. Check for dirty battery connectors, and loose or broken battery cables.
 - b. If battery cables are loose, corroded, or damaged, notify Field Maintenance.
- Step 4. If problem still exists, notify Field Maintenance.

VOLTMETER READS LESS THAN 26 VOLTS WHILE ENGINE IS RUNNING

- Step 1. Check for tripped circuit breakers (WP 0063). If tripped, reset. If circuit breaker trips again, notify Field Maintenance.

WARNING

Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.

NOTE

Notify Field Maintenance to open battery covers for M1245.

- Step 2. Remove battery covers (WP 0062, M1240/M1240A1).
- a. Check for dirty battery connectors, and loose or broken battery cables.
 - b. If battery cables are loose, corroded, or damaged, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

Step 3. If problem still exists, notify Field Maintenance.

WINDSHIELD WASHER WILL NOT OPERATE

Step 1. Check washer fluid level in reservoir (WP 0059).

WARNING

Engine components become extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury to personnel.

If fluid is low, fill reservoir with fluid.

Step 2. If washers do not operate, or if only one washer operates, check that hoses are securely connected.

Tighten any loose connections.

Step 3. If problem still exists, notify Field Maintenance.

ONE OR MORE LIGHTING SYSTEMS NOT OPERATING (HEADLIGHTS, BLACKOUT LIGHTS, TURN SIGNALS, BRAKE LIGHTS, SPOTLIGHTS, MARKER LIGHTS, REVERSE LIGHTS, TRAILER LIGHTS)**NOTE**

Blackout select switch must be in OFF position when operating service lights (WP 0007).

Step 1. Check to make sure lighting system controls are in ON or operating position.

If lighting system controls are OFF, turn to ON position.

Step 2. Check for tripped circuit breakers.

If tripped, reset (WP 0063). If circuit breaker trips again, notify Field Maintenance.

Step 3. If trailer is attached and trailer lighting system is not working, check intervehicular connection.

If cable connector is loose, reconnect cable connector.

Step 4. If problem still exists, notify Field Maintenance.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
--------------------	---------------------------	--------------------------

WINCH**WINCH DOES NOT OPERATE****NOTE**

For more information on the winch refer to WP 0049.

- Step 1. Reset OLI by turning battery disconnect switch to OFF for three to five seconds.
- Step 2. If problem still exists, notify Field Maintenance.

WINCH UNUSUALLY NOISY WHEN OPERATING**WARNING**

- **Keep all personnel away from winch cable during winch operation. Failure to comply may result in injury or death to personnel.**
- **Cable is under tension when wrapped around drum. Keep hands away from drum when operating winch. Failure to comply may result in injury or death to personnel.**

- Step 1. Check to make sure cable is not twisted, tangled, or causing drum to bind.
Pay out or take up cable as necessary to straighten cable.
- Step 2. If problem still exists, notify Field Maintenance.

CAPSULE FIRE SUPPRESSION SYSTEM**NO LED'S ILLUMINATED**

- Step 1. Check if dimmer switch is on.
Place dimmer switch to OFF.
- Step 2. If problem still exists, notify Field Maintenance.

POWER LED NOT ILLUMINATED

- Step 1. Check for tripped circuit breaker CB10.
Reset circuit breaker if tripped (WP 0063).
- Step 2. If problem still exists, notify Field Maintenance.

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ENGINE FIRE SUPPRESSION SYSTEM**SERVICE SYSTEM LED IS FLASHING ONCE**

Step 1. Check for tripped circuit breaker CB10.

Reset circuit breaker if tripped (WP 0063).

Step 2. If problem still exists, notify Field Maintenance.

UNDERCARRIAGE FIRE SUPPRESSION SYSTEM**NO LED'S ILLUMINATED**

Step 1. Check for tripped circuit breaker CB10.

Reset circuit breaker if tripped (WP 0063).

Step 2. If problem still exists, notify Field Maintenance.

GOVERNMENT FURNISHED EQUIPMENT (GFE)**GOVERNMENT FURNISHED EQUIPMENT (GFE) DOES NOT OPERATE**

Step 1. Check if main GFE circuit breaker is tripped.

Reset circuit breaker if tripped (WP 0063).

Step 2. Check if inoperative GFE equipment circuit breaker is tripped.

Reset circuit breaker if tripped (WP 0063).

Step 3. If problem still exists, notify Field Maintenance.

END OF WORK PACKAGE

CHAPTER 4

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INSTRUCTIONS FOR M1240, M1240A1, AND M1245

PMCS INTRODUCTION

GENERAL

This paragraph contains the operator PMCS requirements for the M-ATV. The PMCS table contains checks and services necessary to ensure that the M-ATV is ready for operation. All M-ATV variants are addressed within the PMCS table. Multiple configuration/model specific items are called out with notes and Steps. Using the PMCS table, perform the maintenance at the specified intervals.

USE OF THE PMCS TABLE

1. Interval Column. This column describes when and how often the checks are to be made. Pay close attention to all CAUTIONS and WARNINGS. Checks and services given in table are for normal operation. Extreme weather conditions, periods of high use, or combat conditions may dictate that the PMCS is performed more often than is mentioned in the PMCS table.
 - (a) B (Before): Perform your BEFORE (B) PMCS just before you operate the vehicle and/or its components.
 - (b) D (During): Perform your DURING (D) PMCS while the vehicle and/or its components are in operation.
 - (c) A (After): Perform your AFTER (A) PMCS right after operating the vehicle and/or its components.
 - (d) M (Monthly): Perform your MONTHLY (M) PMCS on a monthly basis. Perform all B and A PMCS tasks when performing monthly checks.
2. Equipment is Not Mission Capable Column. This column contains the criteria that causes the equipment to be classified as not ready/not available because of the inability to perform its primary mission. If severity of the problem is such that the operator thinks the vehicle cannot be operated, the operator should contact their Supervisor.
3. Item to Be Inspected Column. This column lists specific items to be checked and a brief description of the procedure by which the check is to be performed.
4. Always perform your PMCS in the same order.
5. If you find a problem that is beyond your echelon of repair, report the problem to Field Maintenance.

GENERAL MAINTENANCE PROCEDURES

1. *Cleanliness.* Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Always perform PMCS on a clean vehicle.
2. *Nuts and Screws.* Check for obvious looseness, missing, bent, or broken nuts and screws. Look for chipped paint, bare metal, or rust around screw heads.
3. *Welds.* Look for loose or chipped paint, rust, or gaps where parts are welded together.
4. *Electrical Wires and Connectors.* Look for cracked or broken insulation, bare wires, and loose or broken connectors.
5. *Fluid Lines and Fittings.* 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 mean a leak.
6. *Damage.* Damage is defined as any condition that affects safety or would render the vehicle unserviceable for mission requirements.

FLUID LEAKAGE

The following are definitions of the types/classes of leakage for determining the status of fluid systems. Become familiar with them, and remember - **WHEN IN DOUBT, NOTIFY 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 item being checked/inspected.

END OF WORK PACKAGE

PMCS TABLE

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS).

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
1.					<p>MAKE THE FOLLOWING WALK AROUND CHECKS:</p> <p>CAPSULE AND HOOD EXTERIOR</p> <p>NOTE Cracked mirrors can impair driver's vision.</p> <ul style="list-style-type: none"> • a. Inspect side view mirrors (1) for damage and to ensure mirrors are securely attached. • b. Inspect auxiliary mirrors (2) for damage and to ensure mirrors are securely attached. • c. Check under vehicle for fuel, oil, transmission fluid, or coolant leakage. • d. Inspect capsule (3) and hood (4) for damage. • e. Check hood latches for damage (cracks, dry rot, separated rubber). 	<p>Any mirror that is missing, unusable or has cracks that impair driver's vision.</p> <p>Any mirror that is missing, unusable or has cracks that impair driver's vision.</p> <p>Any fuel leak or Class III oil or coolant leak.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly


Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
2.					<p>WINDSHIELD WIPER ARMS AND BLADES</p> <p>Check windshield wiper arms (1) and blades (2) for damage or wear.</p> <div style="text-align: center;">  </div>	Windshield wiper arms cracked or missing. Blades worn, cracked or torn.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
3.					<p>WINDSHIELD AND DOORS</p> <p><u>WARNING</u></p> <p>Ballistic glass may become very hot when exposed to sun or when in a hot environment. Avoid contacting hot ballistic glass with hands or skin. Failure to comply may result in injury to personnel.</p> <p><u>CAUTION</u></p> <ul style="list-style-type: none"> • Do not use cool water when cleaning hot ballistic glass. Putting cool water on hot ballistic glass may cause window to crack or delaminate. Failure to comply may result in damage to equipment. • Ballistic glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Failure to comply may result in damage to equipment. <ul style="list-style-type: none"> • a. Check for broken, scratched, or cracked ballistic glass on windshield (1), front driver and passenger side windows (2), and rear driver and passenger side windows (3). • b. Check both front doors (4) and both rear doors (5) for damage. • c. Check latches (6) and shackles (7) (if equipped) on both front doors (4) and both rear doors (5) for damage and proper operation. • d. Check combat locks (8) for proper operation. 	<p>Ballistic glass cracked or broken. Poor visibility due to scratches.</p> <p>Hinges not functional.</p> <p>Latch not operable or door binds.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

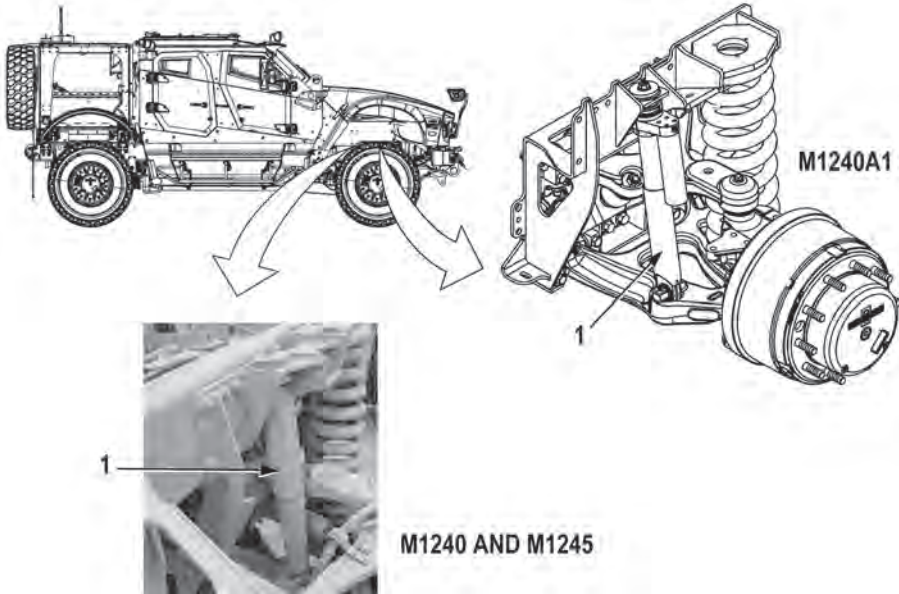
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
4.					<p>SHOCK ABSORBERS</p> <p>NOTE</p> <ul style="list-style-type: none"> Lower shock bearing wear is normal and does not impair vehicle operation. Shock absorbers may have a thin film of oil on the outer surface due to a normal condition known as "misting." Misting is not considered a leak and will not be evident as a stream of fluid. <p>• Check shock absorbers (1) for leaks and damage.</p> 	Leak or damage to shock absorbers that impairs vehicle operation.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
5.					<p>TIRES</p> <ul style="list-style-type: none"> • a. Check tires (1) for cuts, gouges, cracks, leaks, or other damage. • b. Check wheels (2) for broken, cracked, or bent surfaces. • c. Check wheel nuts (3) and wheel studs (4) for obvious looseness or damage. • d. Check that valve caps (5) are securely tightened. 	<p>Any tire has wear or damage that allows ply or belt material to be exposed through the tread or sidewall. Any tire has tread or sidewall separation. Any tire that has an audible leak.</p> <p>Wheel is broken, cracked, or bent.</p> <p>One or more wheel nuts and/or wheel studs are missing, loose, or damaged.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
6.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH SENSOR WIRES)</p> <p>NOTE</p> <ul style="list-style-type: none"> For vehicles equipped with nitrogen detection lines go to Item 7. Location of undercarriage sensor wires are shown in undercarriage sensor wires chart. <p>a. Check undercarriage fire suppression system detection wires for damage.</p>	Wires kinked or damaged.

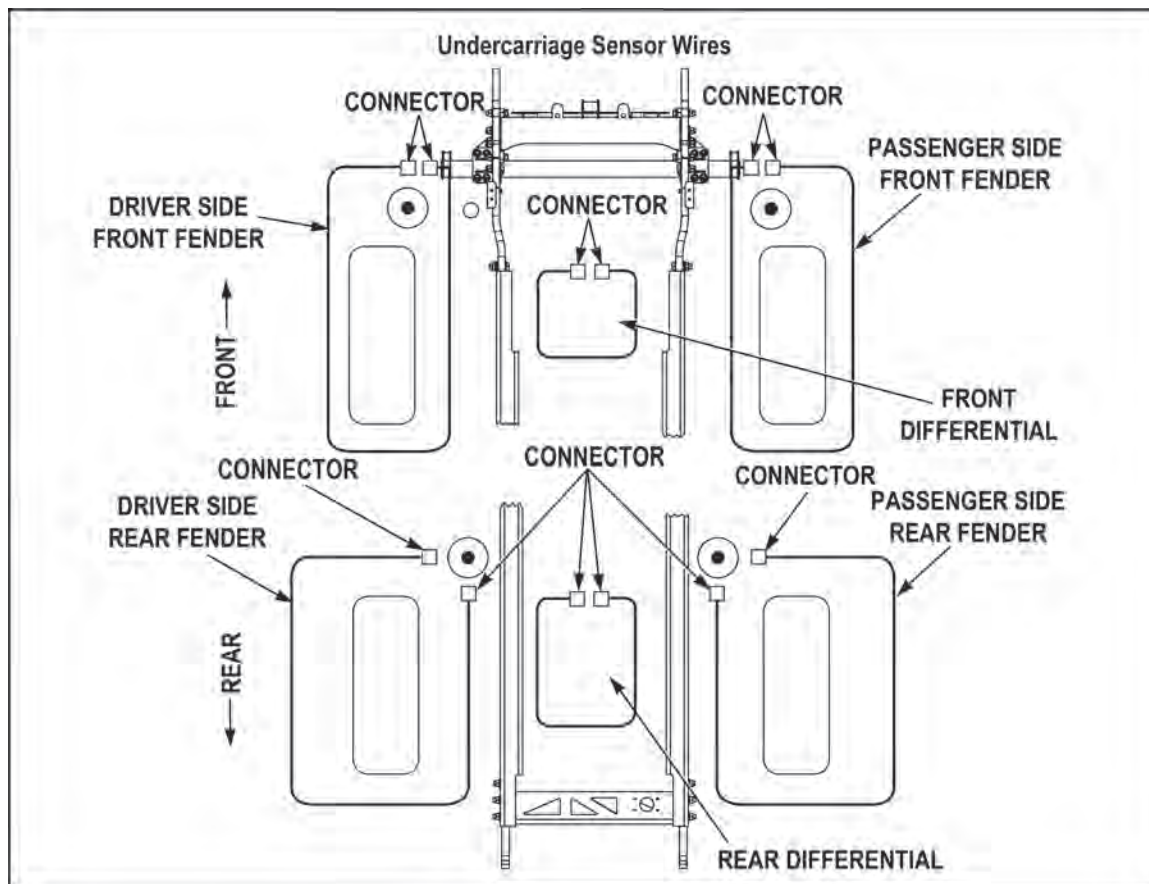


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
6.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH SENSOR WIRES) (Continued)</p> <p style="text-align: center;">NOTE</p> <p>Inspection mirror and flashlight may be required to check date stamp on top of cylinders.</p> <ul style="list-style-type: none"> • b. Check fire suppression cylinder gauge (1) for proper charge and four digit date stamp (2) on top of cylinder (3). • c. Check fire suppression cylinders (3) for damage. • d. Check fire suppression system hoses (4) for kinks or damage. 	<p>Gauges read below green or date stamp is more than five years old.</p> <p>Cylinder(s) is damaged.</p> <p>Hoses kinked or damaged.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
6.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH SENSOR WIRES) (Continued)</p> <ul style="list-style-type: none"> • e. Check for missing fire suppression nozzle protection caps (5) and proper installation. • f. Check wire harness (6) to control switch for proper connection and damage. • g. Ensure that control switch safety cover (7) is secured with wire. • h. Turn battery disconnect switch to ON (WP 0007). • i. Turn ignition switch to ON position (WP 0007) (engine OFF). • j. Check that two fire suppression system LED's (8) are green. • k. Turn ignition switch to OFF position (WP 0007). 	<p>Nozzle protection caps missing.</p> <p>Missing or broken wire.</p> <p>Either LED is not green.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

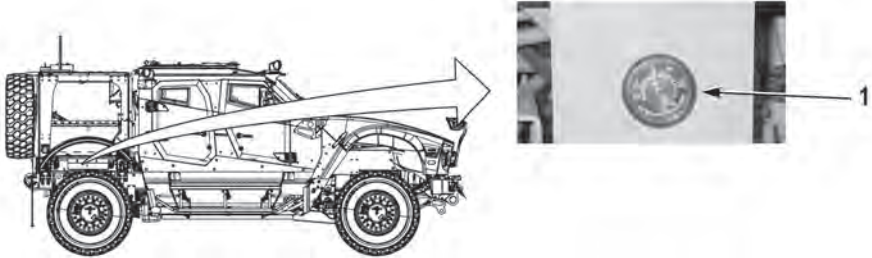
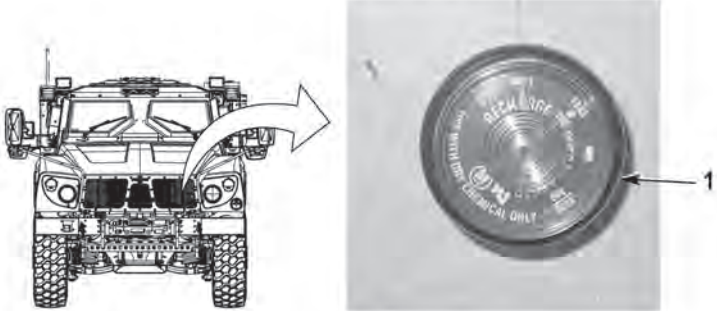
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
7.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH NITROGEN LINES)</p> <p>a. Check undercarriage fire suppression system detector tube pressure gauges (1) for proper pressure (indicator in green range of dial).</p>	Indicator is not in green range of dial.
					 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
7.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH NITROGEN LINES) (Continued)</p> <p>b. Check undercarriage fire suppression system detector lines for kinks or damage.</p>	Lines kinked or damaged.

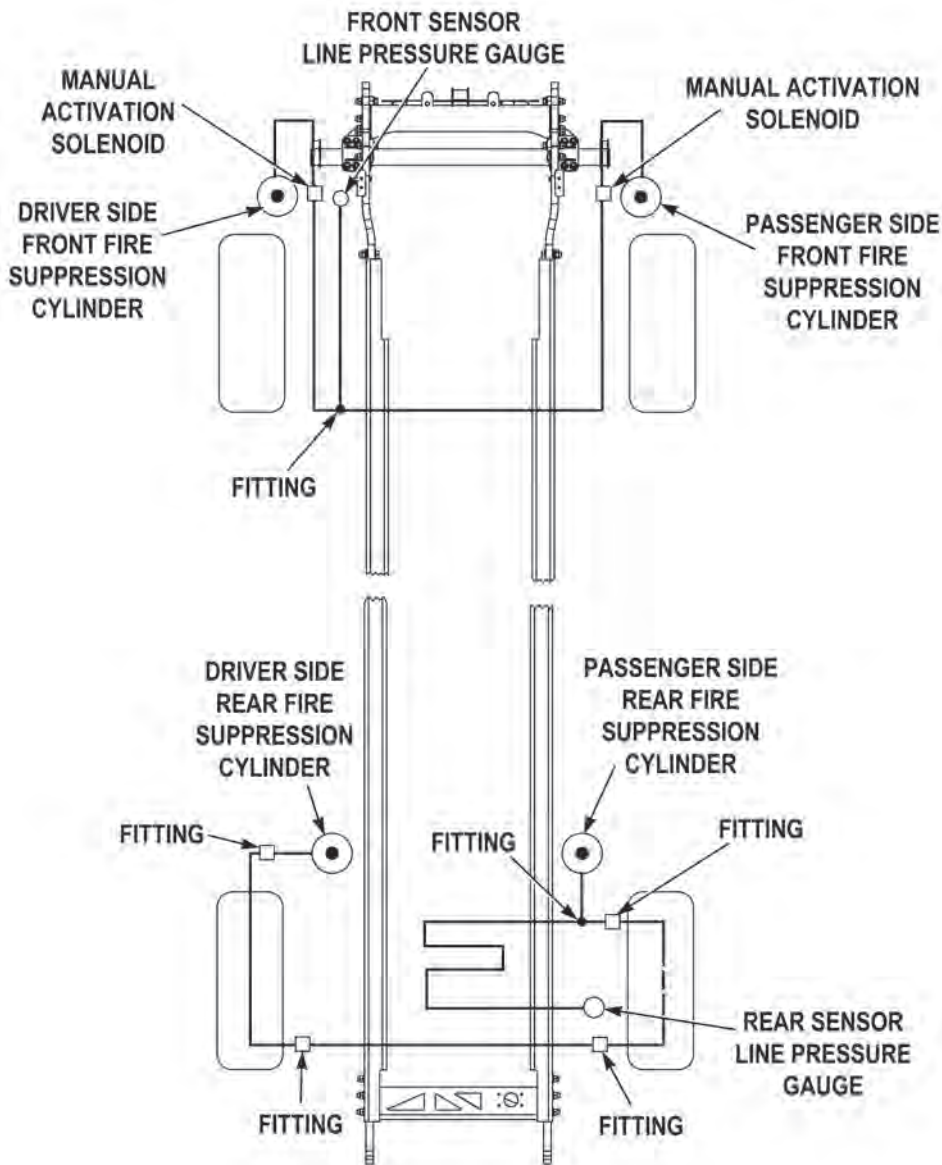


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

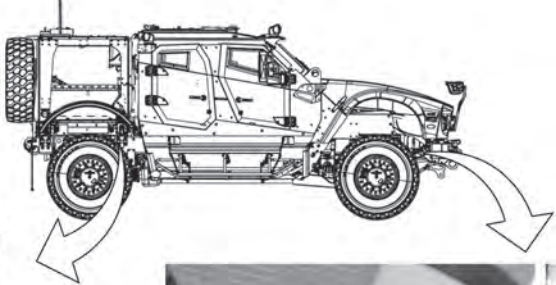
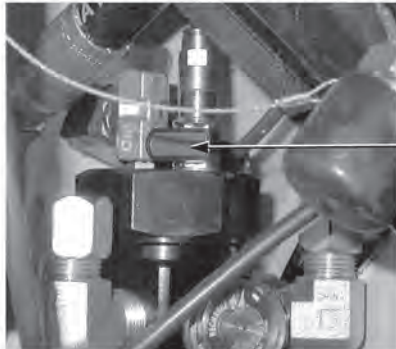

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
7.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH NITROGEN LINES) (Continued)</p> <p>c. Check that undercarriage fire suppression system cylinder ball valves (2) are in open position.</p>	<p>If valves are in closed position notify Field Maintenance.</p>
					 <p>VALVE SHOWN IN CLOSED POSITION</p>  	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
7.					<p>UNDERCARRIAGE FIRE SUPPRESSION SYSTEM (VEHICLES EQUIPPED WITH NITROGEN LINES) (Continued)</p> <ul style="list-style-type: none"> • d. Check for missing fire suppression nozzle protection caps (3) and proper installation. • e. Check wire harness (4) to control switch for proper connection and damage. • f. Ensure that control switch safety cover (5) is secured with wire. • g. Check that two fire suppression system LED's (6) are green. 	<p>Nozzle protection cap missing.</p> <p>Missing or broken wire.</p> <p>Either LED is not green.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
8.					<p>FUEL TANK</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Do not perform fuel system checks while smoking or near flames, fire, or sparks. Fuel could ignite, causing damage to vehicle, severe injury, or death to personnel.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Do not overfill fuel tank or fuel spillage will occur. Failure to comply may cause damage to equipment.</p> <ul style="list-style-type: none"> • a. Ensure fuel cap (1) is securely tightened. • b. Check fuel tank (2) and undercarriage for evidence of leaks. • c. Check fuel hoses and connections for leaks and damage. 	<p>Fuel cap is missing.</p> <p>Any fuel leak.</p> <p>Any leakage or loose connections.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

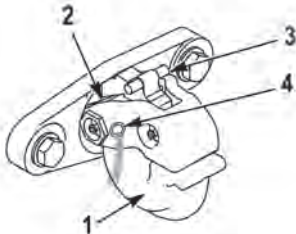
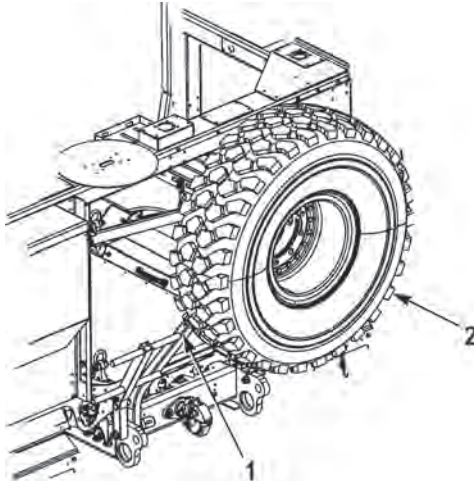
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
9.					<p>PINTLE HOOK</p> <ul style="list-style-type: none"> • a. Check pintle hook (1) for secure mounting and proper operation. Ensure safety latch (2) engages hook lock (3). • b. Ensure safety pin (4) is secured and functional. • c. Lubricate pintle hook (1) after each use (WP 0068). 	Pintle hook is unserviceable.
10.					<p>TIRE CARRIER ASSEMBLY</p> <p>NOTE</p> <ul style="list-style-type: none"> • Perform checks (a) and (b) for M1240 and M1240A1. • Perform checks (c) and (d) for M1245. <ul style="list-style-type: none"> • a. Check spare tire carrier assembly (1) for loose or missing hardware. • b. Check spare tire carrier assembly (1) for corrosion, cracks, and secure tire (2) attachment. 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
10.					<p>TIRE CARRIER ASSEMBLY (Continued)</p> <ul style="list-style-type: none"> • c. Check spare tire carrier assembly (3) for loose or missing hardware. • d. Check spare tire carrier assembly (3) for corrosion, cracks, and secure tire (4) attachment. 	

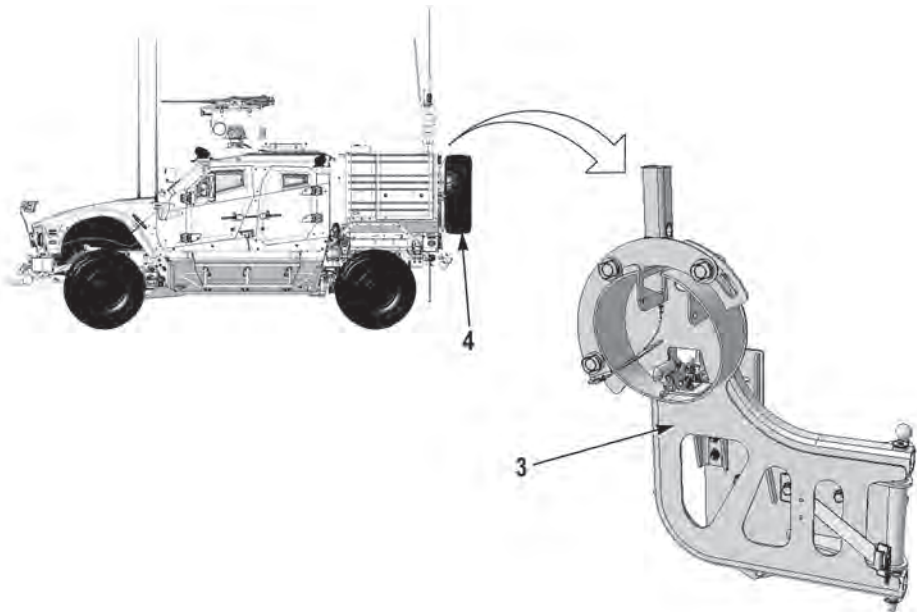


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
11.					<p>FRONT AND REAR GLADHANDS</p> <ul style="list-style-type: none"> • a. Check front and rear gladhands (1) and air lines for damage or obstruction. • b. Inspect front and rear gladhands (1) for missing or rotted seals (rubber grommet). • c. Check lanyards (2) on both front gladhands for damage and serviceability. 	<p>Air line is damaged or obstructed.</p> <p>Seal missing or rotted.</p> <p>Any air leak.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

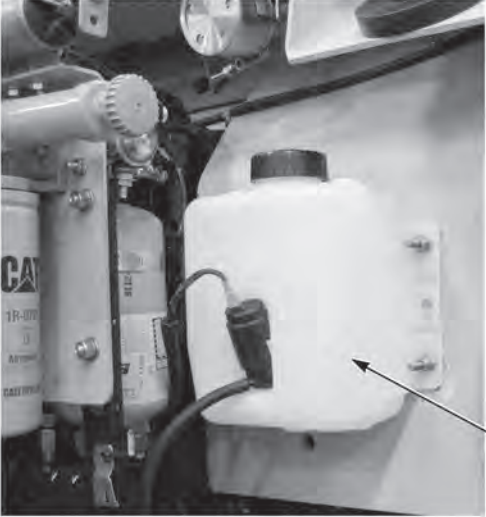
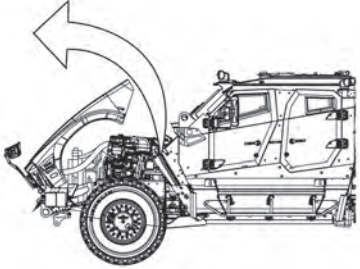
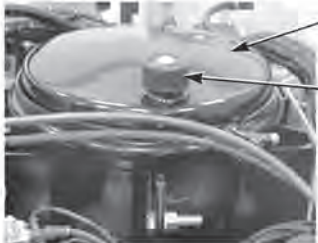
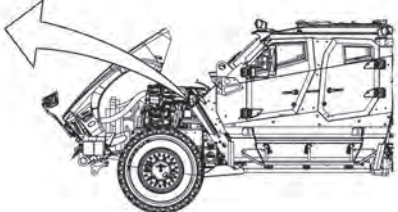
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
12.					<p>WINDSHIELD WASHER FLUID BOTTLE</p> <ul style="list-style-type: none"> Check to ensure there is fluid in windshield washer bottle (1) and that there is no damage to bottle or hoses. Add windshield washer fluid as necessary. 	Any Class III leak.
					 	
13.					<p>HYDRAULIC STEERING SYSTEM</p> <ul style="list-style-type: none"> Check hydraulic steering reservoir (1) for damage or leaks. <p style="text-align: center;">NOTE</p> <p style="text-align: center;">When checking steering hydraulic oil level, the oil temperature should be at outside air temperature.</p> <ul style="list-style-type: none"> Check hydraulic steering reservoir (1) and ensure steering oil level is between ADD and FULL marks on dipstick (2). Add fluid as required (WP 0068). 	Any Class III leak. Oil level not between add and full marks. Any Class III leak.
					 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
13.					<p>HYDRAULIC STEERING SYSTEM (Continued)</p> <p>NOTE</p> <p>Refer to steering hose chart for location of steering hoses and fittings.</p> <ul style="list-style-type: none"> c. Check hydraulic steering hoses and fittings for damage, leakage, or looseness. 	Any Class III leak.

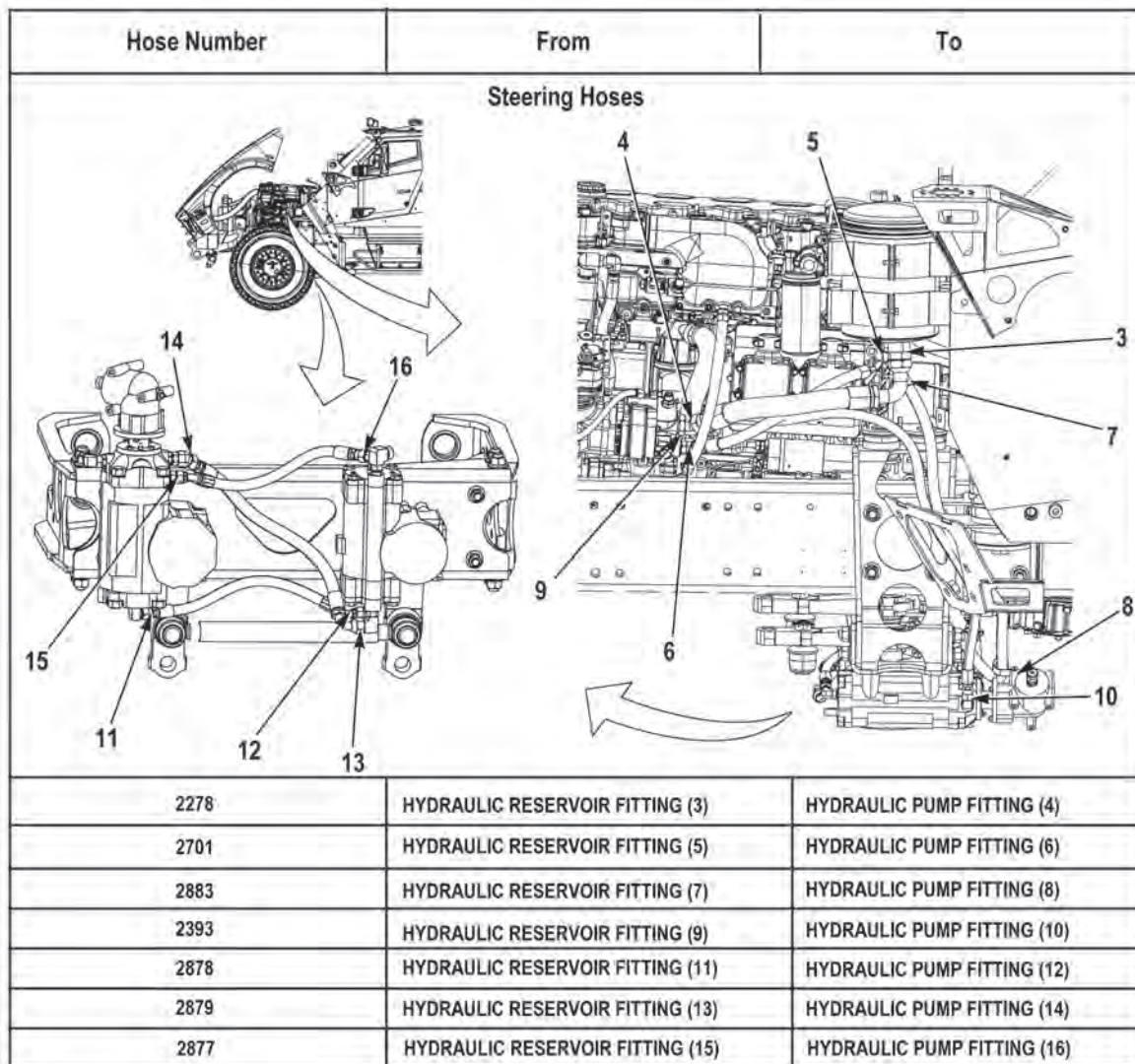


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
14.					<p>ENGINE OIL</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>If engine oil needs to be drained, contact Field Maintenance. Failure to comply may result in damage to equipment.</p> <p style="text-align: center;">NOTE</p> <p>If engine has been running, wait approximately 20 minutes after engine shutdown before checking engine oil.</p> <ul style="list-style-type: none"> • a. Check engine oil on dipstick (1). Oil should be between the ADD and FULL mark. Add oil as required (WP 0068). • b. Ensure dipstick (1) and fill cap (2) are properly installed. • c. Check dipstick tube assembly (3) and oil fill cap (2) for damage or leakage. 	Oil level is too high or too low. Any Class III leak.

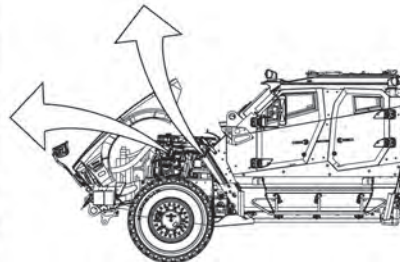
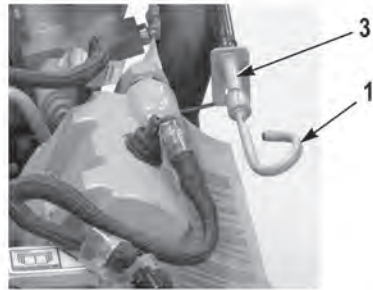
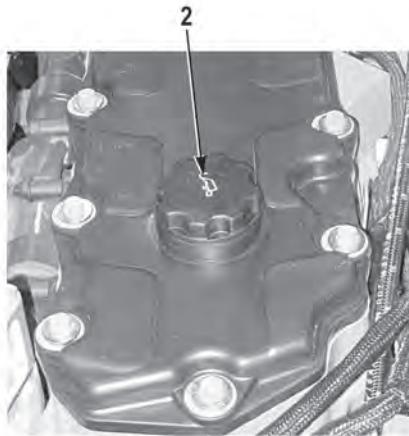


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
15.					<p>ETHER START SYSTEM</p> <p style="text-align: center;"><u>WARNING</u></p> <ul style="list-style-type: none"> • Use care when working around ether canister as ether canister is pressurized and is flammable. Failure to comply may result in injury or death to personnel. • Canisters are considered hazardous material and must be handled with care and disposed of in accordance with current directives. Failure to comply may result in injury or death to personnel. • Ether canister contains diethyl ether with carbon dioxide as a propellant. Keep away from heat and flame. NEVER smoke near contents. Do not incinerate or puncture container. Do not store at temperatures above 120°F (49°C). Avoid contact with skin and eyes. Avoid breathing of fumes. Do not store spare containers in capsule. If swallowed, do not induce vomiting. Contact physician immediately. Failure to comply may result in injury or death to personnel. • Inspect ether canister (1) for punctures or obvious damage. 	

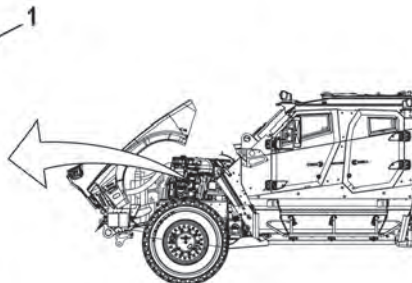


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
16.					<p>FUEL/WATER SEPARATOR</p> <p><u>WARNING</u></p> <p>Fuel is flammable and can explode. Keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.</p> <p>NOTE</p> <p>Refer to local procedures and plans for the use, storage or disposal of drained fluids.</p> <ul style="list-style-type: none"> • a. Check sediment bowl (1) for water. If water is present, drain fuel from bowl into suitable container until clean fuel flows out. To drain fuel from sediment bowl, open drain valve (2) until water and contaminated fuel are allowed to drain from sediment bowl. Close drain valve (2) once all water and contaminated fuel is drained from sediment bowl. • b. Check fuel water separator (3) for leaks, damage, or loose connections. 	Any fuel leak.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

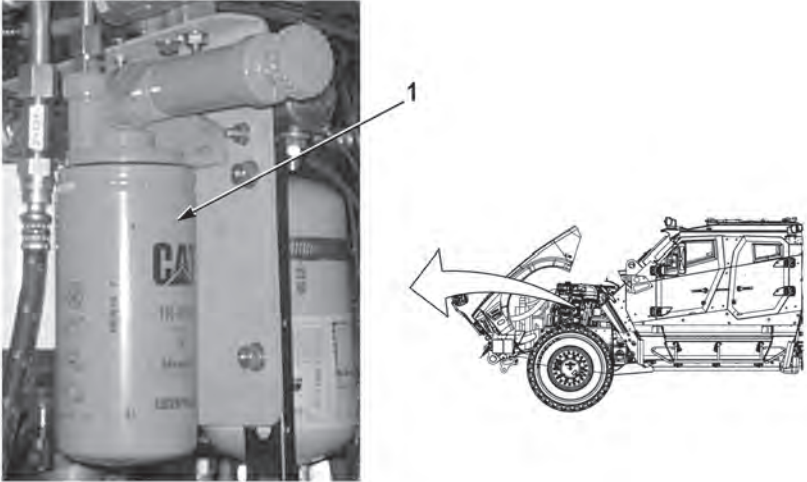
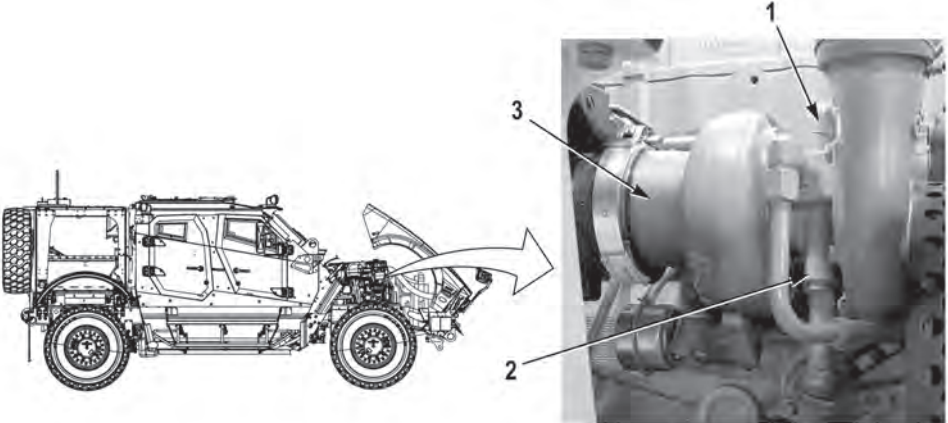
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
17.					<p>FUEL FILTER AND LINES</p> <ul style="list-style-type: none"> • Check fuel filter (1) for damage or leaks. 	Any fuel leak.
						
18.					<p>TURBOCHARGER</p> <ul style="list-style-type: none"> • a. Check turbocharger oil supply line (1) and the drain line (2) for damage or signs of leakage. • b. Inspect mounting screws and clamps on turbocharger (3) for looseness, damage, and exhaust leaks. 	Any Class III leak.
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
19.					<p>BATTERIES</p> <p style="text-align: center;"><u>WARNING</u></p> <ul style="list-style-type: none"> • Do not smoke or use open flame near batteries. Batteries may explode from spark. Failure to comply may result in injury or death to personnel. • Lead-acid batteries contain sulfuric acid, which can cause severe burns. Avoid contact with skin, eyes, or clothing. Wear safety goggles and gloves. If battery electrolyte is spilled, take immediate action to stop its corrosive (burning) effects. If battery acid is spilled on clothing or vehicle, wash immediately with cold water. Neutralize with baking soda or household ammonia solution. If battery acid comes in contact with skin, flush with cold water to remove acid. If eyes are contacted, flush with cold water for at least 15 minutes. If swallowed, drink large amounts of water or milk, follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention. • Remove all jewelry, such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal or positive electrical circuit, a direct short may result in instant heating of tools, injury or death to personnel, or damage to equipment. • To prevent arcing, do not allow tools to contact batteries or other battery terminals. Failure to comply may result in injury or death to personnel. <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • Prior to performing battery PMCS, ensure battery disconnect switch is OFF (WP 0007). Turn battery disconnect switch to ON when battery PMCS is completed. • Batteries are located in cargo deck over rear wheel wells along side cargo deck. Two on driver side and two on passenger side. • Perform check (a) for M1240/M1240A1. • Perform check (b) for M1245. <ul style="list-style-type: none"> • a. Open battery covers (M1240/M1240A1) (WP 0062). 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
19.					<p>BATTERIES (Continued)</p> <ul style="list-style-type: none"> • b. Notify Field Maintenance to open battery covers for M1245. • c. Inspect for any missing or damaged batteries (1). • d. Inspect all batteries (1) for cracks or leaking casing. • e. Inspect terminal posts (2), cables and connections (3) for secure attachment, damage and evidence of burning. • f. Check battery posts (2) and terminals (3) for corrosion. • g. Inspect battery isolator (4) for cracks and damage as well as loose, broken, corroded, or burned terminals (5), cables, and connections (3). • h. Inspect battery hold down (6) for proper installation, security, and missing hardware. 	<p>Battery is missing or damaged.</p> <p>Battery is damaged or leaking.</p> <p>Terminals or cables are broken, burned or loose.</p> <p>Battery posts or terminals are corroded.</p> <p>Battery hold down is not installed, secured, or is missing hardware.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
20.					<p>NATO SLAVE</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Use extreme care not to short out slave receptacle terminals. Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around slave receptacle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause severe burns or electrical shock. Failure to comply may result in injury or death to personnel.</p> <ul style="list-style-type: none"> • Inspect slave receptacle (1) for loose cables, damage, or missing cover. 	

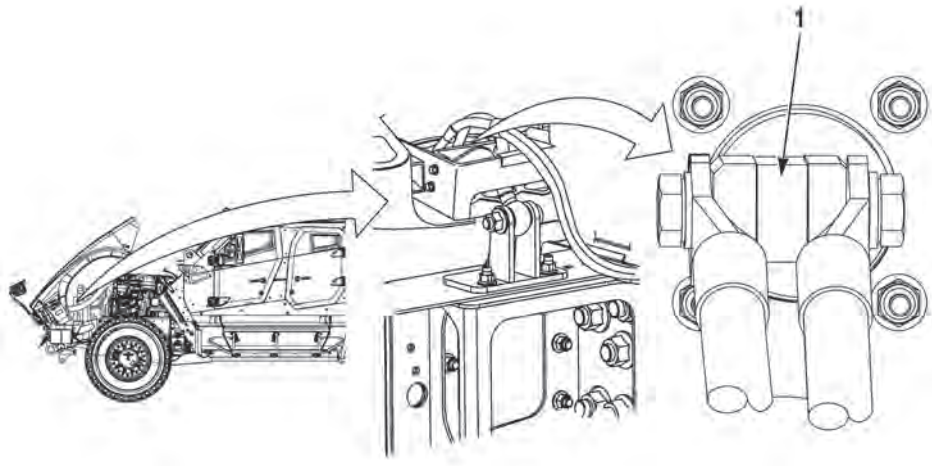


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

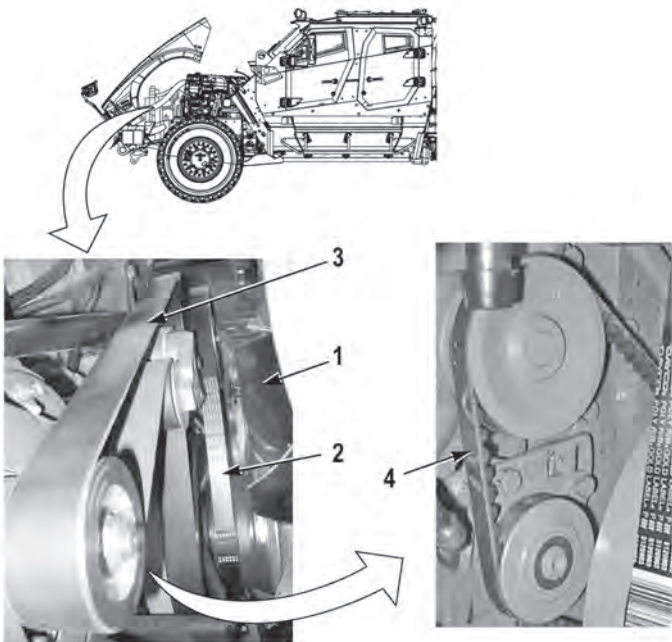
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
21.					<p>COOLING FAN AND BELTS</p> <p><u>WARNING</u></p> <p>Keep hands and clothing clear of moving parts in engine compartment. Rotating parts can cause 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 area is clear of personnel and obstructions before starting engine. Failure to comply may result in injury to personnel.</p> <ul style="list-style-type: none"> • a. Check cooling fan (1) for looseness or damage. • b. Check air conditioner belt (2), alternator belt (3), and water pump belt (4) for cracking, fraying, or other damage. • c. Check air conditioner belt (2), alternator belt (3), and water pump belt (4) for proper tension. Belt has proper tension when belt can be depressed approximately 1/2 in. (1.3 cm) by normal pressure (10 to 15 lbs. [4.5 to 6.8 kg]). 	<p>Loose or damaged fan.</p> <p>Any damage that would prevent the fan belt or alternator belt from driving the cooling fan.</p> <p>Any belt that is broken or cracked to the belt fiber, has more than one crack (1/8 in. (3.2 mm) in depth or 50% of belt thickness) or has frays more than 2 in. (51 mm) long. Any belt is loose.</p>
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
22.					<p>RADIATOR AND COOLANT LINES</p> <p><u>WARNING</u></p> <p>Engine cooling system is hot and pressurized. Do not remove radiator cap while engine is hot; steam and hot coolant can escape and burn personnel. Allow the system to cool and remove cap slowly to relieve pressure. Failure to comply may result in serious injury or death to personnel.</p> <p><u>CAUTION</u></p> <p>Use extreme care when cleaning radiator fins, charge air cooler fins, and A/C condenser fins to prevent damage to equipment.</p> <ul style="list-style-type: none"> • • a. Check radiator (1) for damage and leaks. Check charge air cooler fins (2) for obstructions and clear obstructions as required. • • b. Check A/C condenser fins (3) for obstructions and clear obstructions as required. • • c. Check coolant hoses for leaks, cuts, loose hose clamps, and other obvious damage. • d. Check air conditioning compressor housing (4) for obvious damage. • e. Check air conditioning hoses for leaks, cuts, and other obvious damage. 	<p>Any Class III leak.</p> <p>Any Class III leak.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

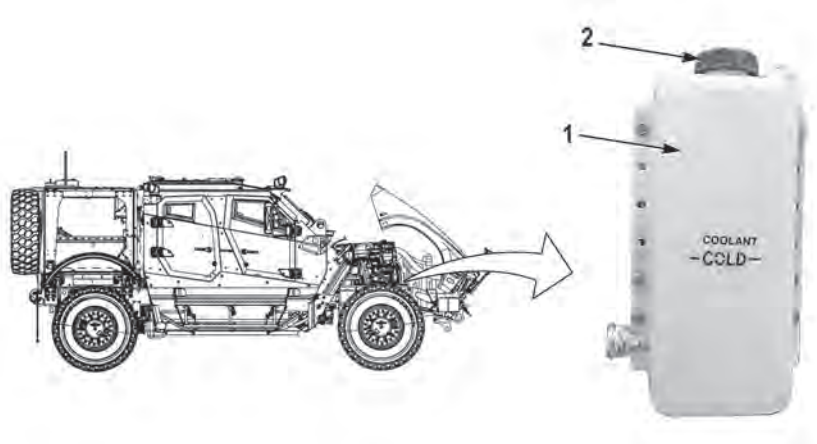
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
23.					<p>COOLANT OVERFLOW TANK AND COOLANT LEVEL (FOR VEHICLES EQUIPPED WITH COOLANT OVERFLOW TANK)</p> <p style="text-align: center;"><u>WARNING</u></p> <ul style="list-style-type: none"> • Engine cooling system is hot and pressurized. Do not remove radiator cap while engine is hot; steam and hot coolant can escape and burn personnel. Allow the system to cool and remove cap slowly to relieve pressure. Failure to comply may result in serious injury or death to personnel. • Cooling system components become pressurized and extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury or death to personnel. <ul style="list-style-type: none"> • a. Check coolant overflow tank (1) and cap (2) for damage or leakage. • b. Check coolant level in coolant overflow tank (1) to ensure it is above the COLD mark. If coolant is low, add coolant to bring it up above the COLD mark. 	Any Class III leak.
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
24.					<p>COOLANT SURGE TANK AND COOLANT LEVEL (FOR VEHICLES EQUIPPED WITH COOLANT SURGE TANK)</p> <p style="text-align: center;"><u>WARNING</u></p> <ul style="list-style-type: none"> • Engine cooling system is hot and pressurized. Do not remove radiator cap while engine is hot; steam and hot coolant can escape and burn personnel. Allow the system to cool and remove cap slowly to relieve pressure. Failure to comply may result in serious injury or death to personnel. • Cooling system components become pressurized and extremely hot during normal operation. Use extreme care when working around hot components. Failure to comply may result in injury or death to personnel. <ul style="list-style-type: none"> • a. Check coolant surge tank (1) and cap (2) for damage or leakage. • b. Check coolant level in coolant surge tank (1) to ensure it is visible in sight glass (3). If coolant is low, add coolant until visible in sight glass (3). 	Any Class III leak.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

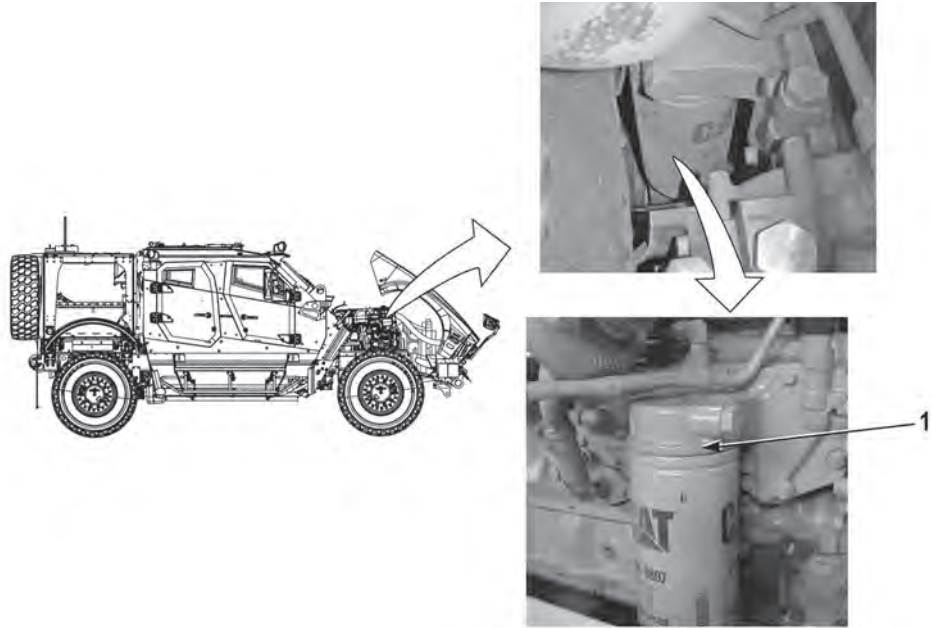
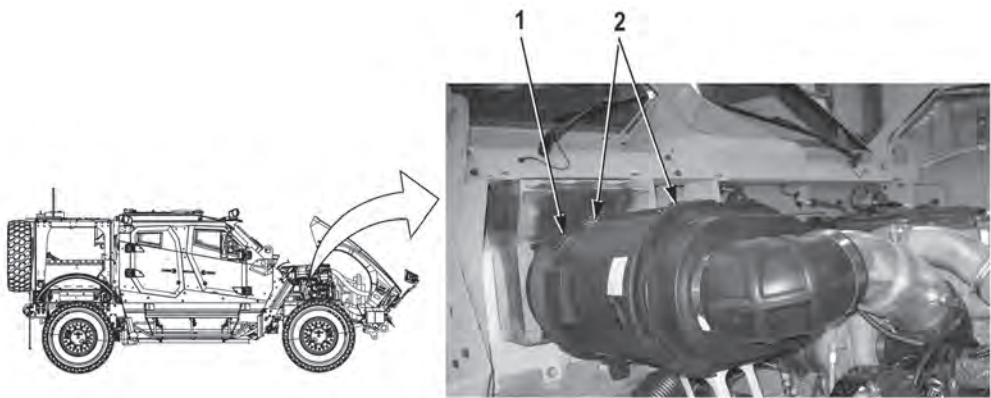
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
25.					<p>OIL FILTER</p> <p>Check engine oil filter (1) for leaks or damage.</p> 	Any Class III leak.
26.					<p>AIR INTAKE SYSTEM</p> <ul style="list-style-type: none"> a. Check air intake system for loose clamps and punctured or damaged hoses or tubes. b. Check air cleaner housing (1) for loose clips (2) and damage. Secure clips as required. c. Check rest of engine compartment for serviceability and looseness of tubes, hoses, wires, nuts, and bolts. 	<p>Any damage that would allow unfiltered air to enter engine.</p> <p>Any damage that would allow unfiltered air to enter engine.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

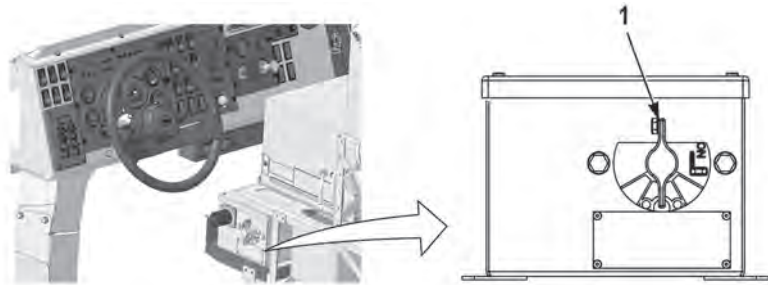

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
27.					<p>ENGINE COMPARTMENT FIRE SUPPRESSION SYSTEM</p> <p><u>WARNING</u></p> <ul style="list-style-type: none"> • Ensure vehicle battery disconnect switch is OFF before inspecting engine compartment fire suppression system. Failure to comply may result in injury or death to personnel. • Do not smoke or have open flame inside engine compartment, as fire suppression system may activate. Failure to comply may result in injury to personnel. <p>a. Turn vehicle battery disconnect switch (1) to OFF (WP 0007).</p>  <p>NOTE</p> <p>Vehicles will be equipped with either four or five aerosol generators.</p> <p>b. Check aerosol generators (2) for damage, discharged condition, and date stamp.</p> 	<p>Aerosol generators are damaged, discharged, or date stamp is more than ten years old.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
27.					<p>ENGINE COMPARTMENT FIRE SUPPRESSION SYSTEM (Continued)</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Blue transportation caps must be removed from aerosol generators prior to vehicle operation. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • Perform checks (c) and (d) for vehicles equipped with five aerosol generators and sensor wire detection. • Perform checks (e) and (f) for vehicles with four aerosol generators and thermal sensor detection. <p>c. Check blue transportation caps (3) are removed from five aerosol generators (2).</p> <p>d. Check sensor line (4) for damage, dirt, or grease.</p>	<p>Blue transportation caps are present.</p> <p>Sensor line is damaged.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
27.					<p>ENGINE COMPARTMENT FIRE SUPPRESSION SYSTEM (Continued)</p> <ul style="list-style-type: none"> • e. Check blue transportation caps (3) are removed from four aerosol generators (2). • f. Check thermal sensors (5) for damage, dirt, dust, or grease. Clean sensors, as required. 	<p>Blue transportation caps are present.</p> <p>Thermal sensors are damaged.</p>
					<ul style="list-style-type: none"> • g. Turn vehicle battery disconnect switch (1) to ON (WP 0007). 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
27.					<p>ENGINE COMPARTMENT FIRE SUPPRESSION SYSTEM (Continued)</p> <ul style="list-style-type: none"> • h. Turn vehicle start switch to ON (engine OFF) (WP 0007) and check the LEDs (6 and 7) on engine fire suppression system control panel (8) in capsule interior for illumination. • i. Ensure toggle switch safety cover (9) is secured with wire. 	<p>If green system OK LED (5) is not illuminated or SERVICE SYSTEM LED (6) is flashing.</p> <p>Safety wire is missing.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
28.					<p>CAPSULE INTERIOR FIRE SUPPRESSION SYSTEM</p> <p><u>WARNING</u></p> <p>Capsule interior fire suppression system uses optical fire detectors. Do not smoke or have open flame inside the capsule, as fire suppression system may activate. Failure to comply may result in injury to personnel.</p> <ul style="list-style-type: none"> • a. Verify optical sensors (1) are not damaged, are in position, clear of dirt and dust and not obstructed. • b. Ensure both self-test LED's (2) are flashing. • c. Turn vehicle battery disconnect switch (3) to ON position (WP 0007). <p>NOTE</p> <p>Wait 15 seconds after turning vehicle start switch to ON before checking POWER LED for illumination.</p> <ul style="list-style-type: none"> • d. Turn vehicle start switch to ON (engine OFF) (WP 0007) and check capsule interior fire suppression system control panel (4) POWER LED (5) for solid illumination. • e. Check capsule interior fire suppression system control panel (4) FAULT LED (6) for fault indication. 	<p>Sensors are damaged or out of position/missing.</p> <p>POWER LED is red, flashing, or not illuminated.</p> <p>FAULT LED flashes.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

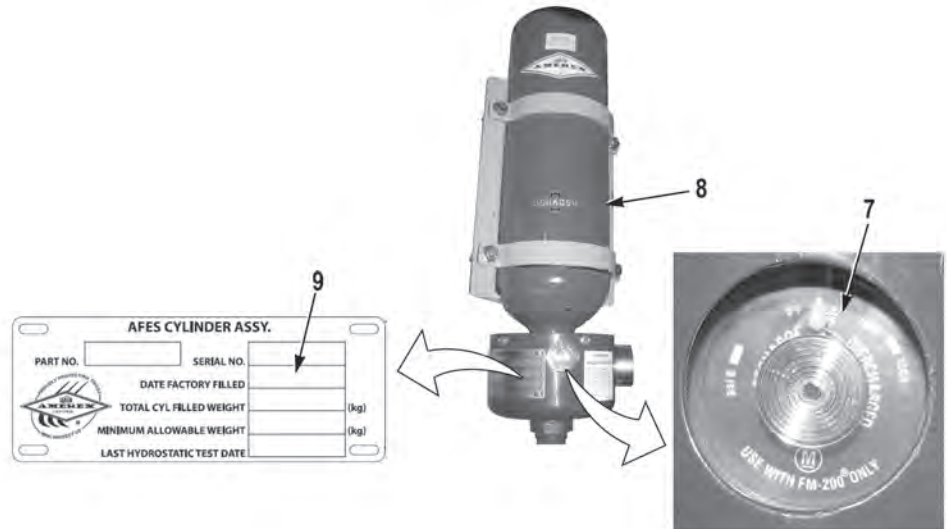
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
28.					<p>CAPSULE INTERIOR FIRE SUPPRESSION SYSTEM (Continued)</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • Inspection mirror and flashlight may be required to check pressure gauge. • Pressure gauge must be checked when capsule temperature is above 0°F (-17.8°C). If capsule temperature is below 0°F (-17.8°C), utilize HVAC to heat vehicle to the minimum inspection criteria (WP 0007). <p>f. Check pressure gauge (7) on extinguisher cylinder (8) for indicator needle positioning, discharged condition, and check extinguisher cylinder (8) for damage and date stamp (9).</p>	<p>Gauge indicator is not in green range of gauge, extinguisher cylinder is damaged, or date stamp is more than six years old.</p>
 <p>The diagram shows an AFES (Automatic Fire Extinguisher System) cylinder assembly. Callout 8 points to the main body of the extinguisher. Callout 7 points to the pressure gauge located on the side of the cylinder. Callout 9 points to the identification label on the bottom of the cylinder. The label includes fields for Part No., Serial No., Date Factory Filled, Total Cyl Filled Weight (kg), Minimum Allowable Weight (kg), and Last Hydrostatic Test Date. The pressure gauge has a needle and a scale with a green range. The bottom of the cylinder has a date stamp and the text 'USE WITH FM-200 ONLY'.</p>						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
29.					<p>LIGHTS</p> <p>NOTE</p> <ul style="list-style-type: none"> To determine location of switches needed to operate lights for the following checks, refer to Location and Function of Controls and Indicators (WP 0007). Prior to turning on lights, battery disconnect switch must be turned ON (WP 0007). An assistant is needed to perform the light checks. When light checks are completed, ensure all lights are turned OFF (WP 0007). <p>a. Position blackout select switch (1) in down position and headlight switch (2) in full up position. Ensure headlights (3) and parking light function (4) of front composite lights (5) illuminate. Operate dimmer switch (6) and ensure headlights (3) change from high beam to low beam and ensure high beam indicator (7) on dash operates properly.</p> <p>b. With headlight switch (2) ON, ensure dash light dimmer (8) switch operates properly.</p>	Headlights are inoperable.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
29.					<p>LIGHTS (Continued)</p> <ul style="list-style-type: none"> • c. Operate turn signal lever (9) and ensure turn signals (10) and (11) function. • d. Push in emergency flasher control switch (12) and ensure turn signals (10) and (11) blink. • e. Position blackout select switch (1) to up position and blackout light switch (13) in full up position, and ensure blackout drive headlight (14) and blackout marker lights (15) illuminate. • f. Check marker lights (16) and reflectors (17) for serviceability. 	

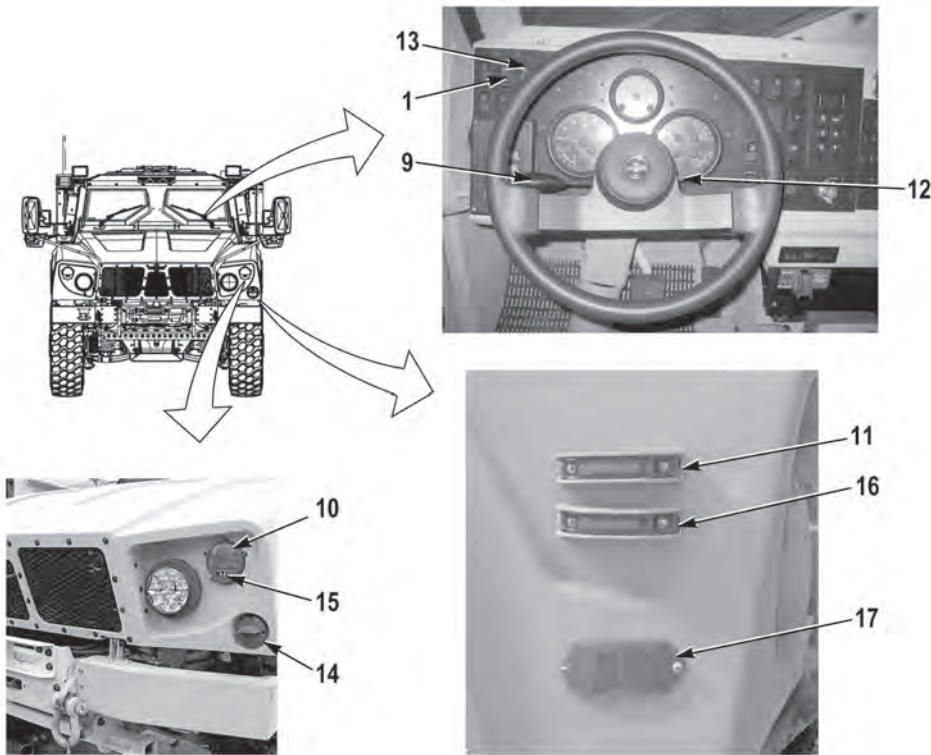


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
29.					<p>LIGHTS (Continued)</p> <ul style="list-style-type: none"> • g. Position blackout select switch (1) in down position and headlight switch (2) in full up position. Ensure parking light function (16) of rear composite lights (17) illuminate. Operate service brake pedal and ensure brake light function (18) of rear composite lights (17) illuminate. • h. Operate turn signal lever (9) and ensure turn signal function (19) of rear composite lights (17) blink. • i. Push in emergency flasher control switch (12) and ensure parking light function (16) of rear composite lights (17) blink. • j. Position blackout select switch (1) in up position and blackout light switch (13) in full up position, and ensure blackout parking light function (20) of rear composite lights (17) illuminate. Operate service brake pedal and ensure blackout marker brake light function (21) of rear composite lights (17) illuminate. 	Brake lights are inoperable or half of LED's are unserviceable.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
29.					<p>LIGHTS (Continued)</p> <ul style="list-style-type: none"> • k. Move front spotlight ON/OFF switch (22) to ON position and ensure spotlight ON indicator (23) and both front spotlights (24) illuminate. • l. Operate front spotlight joystick (25) and ensure both front spotlights (24) move properly. • m. Move rear spotlight ON/OFF switch (26) to ON position and ensure spotlight ON indicator (27) and both rear spotlights (28) illuminate. • n. Operate rear spotlight joystick (29) and ensure both rear spotlights (28) move properly. 	

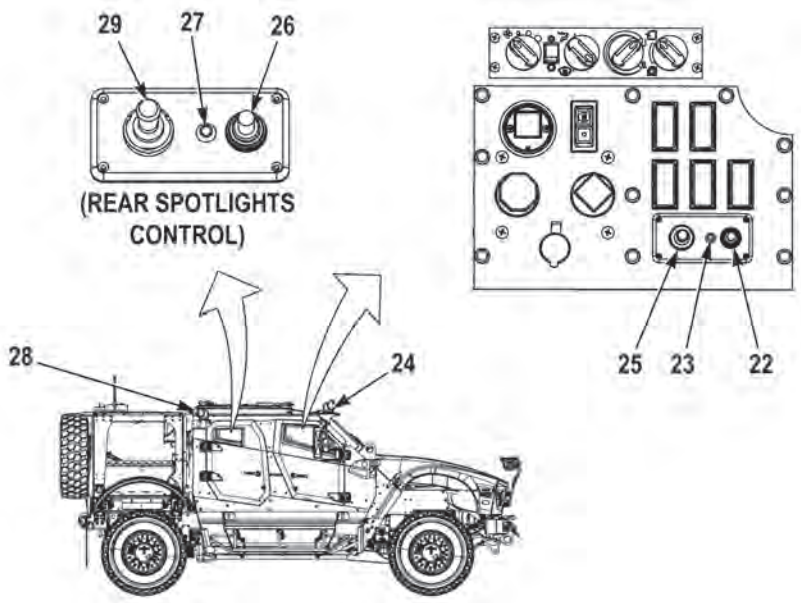


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

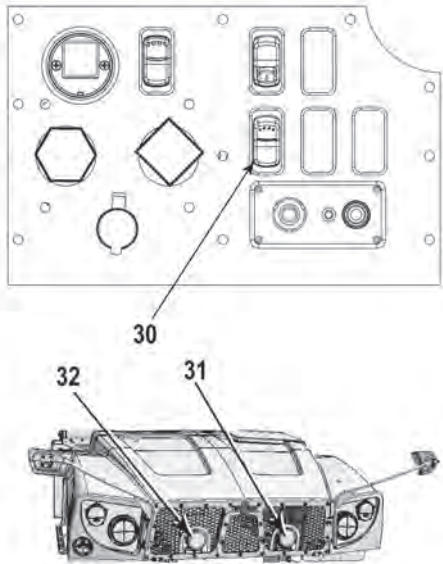
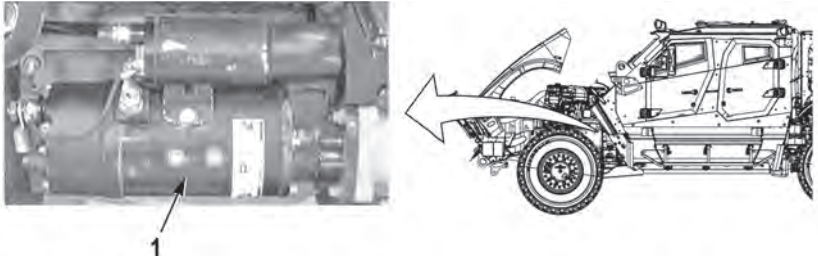
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
29.					<p>LIGHTS (Continued)</p> <p>NOTE</p> <p>Perform check (o) for M1245.</p> <ul style="list-style-type: none"> o. Move IR light switch (30) to center position and ensure driver side IR light (31) illuminates. Move IR light switch (30) to upper position and ensure both IR lights (31, 32) illuminate. 	
30.					<p>ENGINE OPERATION</p> <ul style="list-style-type: none"> a. Inspect starter (1) for secure mounting and loose or damaged wires. b. Start engine (WP 0020) and check starter (1) for slow operation or unusual noises when cranking. c. While running, check engine for excessive smoke, unusual noise, rough running, or misfiring. d. Drive vehicle and ensure engine brake operates (WP 0024). 	<p>Starter is loose or has loose or damaged wires.</p> <p>Starter is noisy or cranks slowly.</p> <p>Any of these conditions are found.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

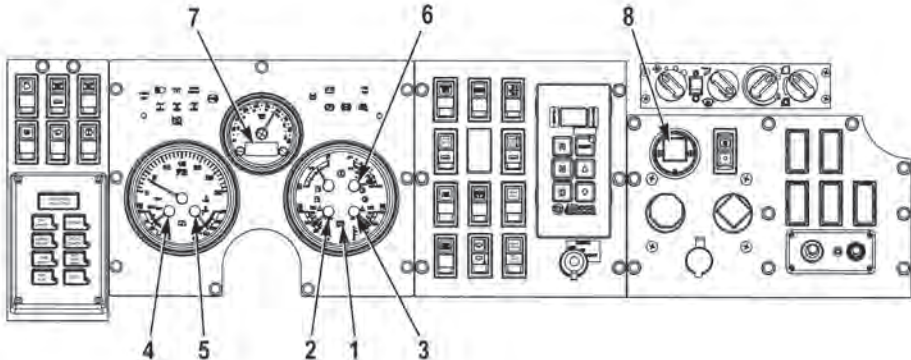
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR</p> <ul style="list-style-type: none"> a. Drain air system (WP 0060). b. Start engine (WP 0020). c. Ensure low air indicator light (1) remains illuminated and warning buzzer sounds until front air pressure gauge (2) and rear air pressure gauge (3) reach 64 to 76 psi (441 to 524 kPa). d. Check to ensure front air pressure gauge (2) and rear air pressure gauge (3) indicate a reading between 90 and 125 psi (621 and 862 kPa). e. Check to ensure oil pressure gauge (4) indicates pressure at idle and increases with engine speed. f. Check to ensure water temperature gauge (5) reads below 220°F (104°C). g. Check to ensure transmission oil temperature gauge (6) reads below 250°F (121°C). h. Check to ensure voltage (7) reads between 24 and 30 volts, refer to (WP 0027). i. Check to ensure air restriction indicator (8) reads below 20 inches. 	<p>Low air indicator light or warning buzzer fails to operate.</p> <p>Air pressure is below 90 psi (621 kPa) or exceeds 125 psi (862 kPa).</p> <p>Oil pressure does not increase as engine speed increases.</p> <p>Water temperature exceeds 220°F (104°C).</p> <p>Transmission oil temperature exceeds 250°F (121°C).</p> <p>Voltage is below 24 volts or above 30 volts.</p> <p>Air restriction indicator reads above 20 inches.</p>
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <p>j. Check seat belts (9) and buckles (10) for serviceability and proper operation (WP 0016).</p> <div style="text-align: center;"> <p>10 M1240/M1240A1</p> <p>9 M1245</p> </div>	Damaged, missing, or inoperable seat belts.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <ul style="list-style-type: none"> • k. Ensure fuel gauge (11) operates. • l. Check horn button (12) for proper operation. <p style="text-align: center;">NOTE</p> <p>With ignition switch OFF, tachometer will not return to zero. Tachometer will “zero out” and indicate correct rpm when ignition switch is ON and engine is operating.</p> <ul style="list-style-type: none"> • m. Ensure tachometer (13) indicates 600 to 800 rpm with engine idling. <p style="text-align: center;">NOTE</p> <p>With ignition switch OFF, speedometer will not return to zero. Speedometer will “zero out” and indicate correct speed when ignition switch is ON and vehicle is in motion.</p> <ul style="list-style-type: none"> • n. Drive vehicle and ensure speedometer (14) operates properly. 	

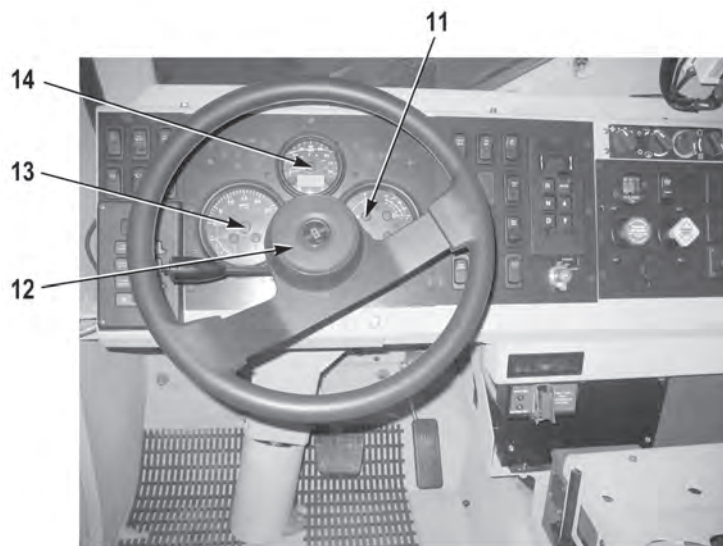


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <ul style="list-style-type: none"> • o. Check windshield washer control (15) and windshield wiper control (16) for proper operation. • • p. Check front fan control (17) for proper fan operation in all settings. • • q. Check heat and defrost controls (18) for proper operation. Check for warm airflow. • • r. Check front air conditioner (19) for proper operation (WP 0007). Wait 5 minutes to allow temperature to stabilize. Check vents for cool air. • • s. Check vent control switch (20) for proper operation. 	<p>Climatic conditions require air conditioning and A/C is inoperable, or vented air is not cooler than ambient temperature.</p>
<p>The diagram shows a top-down view of the capsule's instrument and control panel. On the left side, there are two vertical columns of controls. Callout 16 points to the upper control in the leftmost column, and callout 15 points to the control in the second column from the left. In the center, there are two large circular gauges. To the right of the gauges is a panel with several rectangular buttons and switches. On the far right, there are four circular controls. Callout 17 points to the top-left of these four, 19 points to the top-middle, 20 points to the top-right, and 18 points to the bottom-right.</p>						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

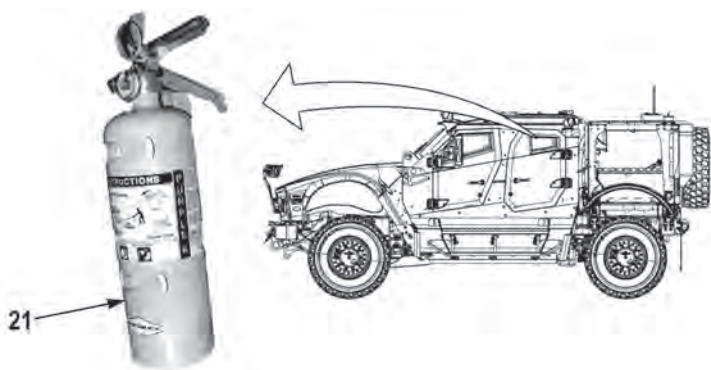
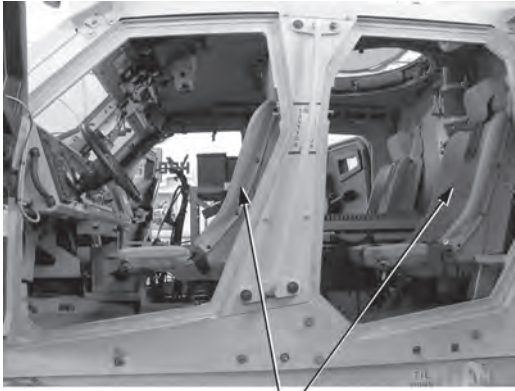
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <p>NOTE</p> <ul style="list-style-type: none"> M1240 fire extinguishers are located on radio rack. M1240A1/M1245 fire extinguishers are located under dash on driver and passenger side. <p>t. Check two fire extinguishers (21) for proper charge, damage, or broken or missing seal.</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> u. Inspect driver and passenger seats (22) for serviceability. <div style="text-align: center;">  </div>	<p>Fire extinguisher not present, not properly charged, or seal broken or missing.</p> <p>Front seats do not adjust. Seat pans or welds are cracked or bent. Frame missing seat cushion. Shocks do not properly support weight of occupant. Shocks bent or leaking oil. Seats not securely mounted.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

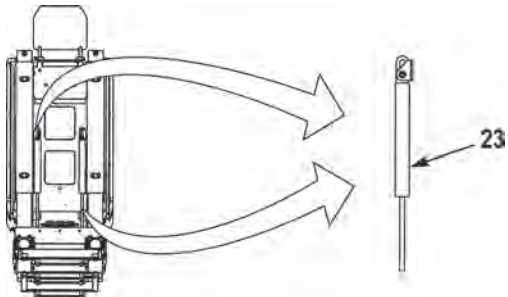
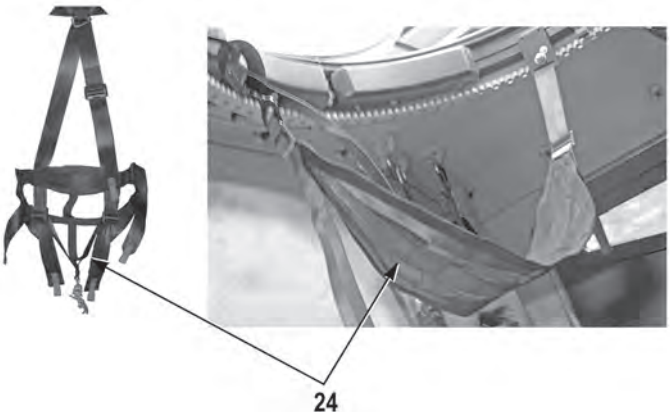
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <p>NOTE</p> <p>Perform check (v) for M1240A1.</p> <p>v. Inspect for bent or leaking seat shocks (23) and verify shocks (23) properly support weight of occupant.</p>  <p>NOTE</p> <p>Turret Gunner Restraint System (TGRS) is considered a personnel restraint device and falls under requirements outlined in AR 385-10. If the TGRS harness is not present, is unserviceable, or is inoperable refer to the Commander or their representative who can make the decision to authorize dispatch of the vehicle if the gunners position is manned based on urgency of mission requirements (refer to AR750-1).</p> <p>w. If equipped inspect Turret Gunner Restraint System (TGRS) harness (24) for any frayed, cut, broken, clips or straps.</p> 	<p>Leaking or damaged.</p> <p>Frayed, cut, broken, clips or straps. TGRS harness not present.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

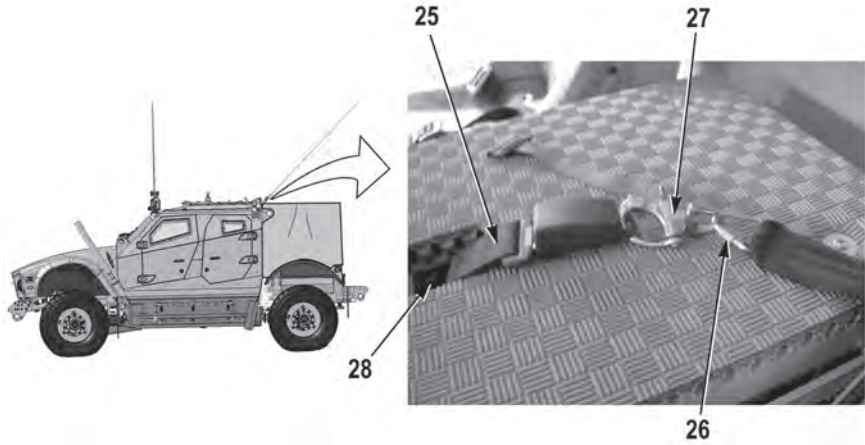
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <ul style="list-style-type: none"> • x. Inspect gunners retractor belt (25) for any cuts or damage. If retractor fails to lock with a swift pull in any direction report damage to field maintenance. • y. Inspect barrel nut (26) for tightness and exposed threads. • z. Inspect emergency relief swivel (27) for connection and ensure emergency relief swivel (27) remains secure on retractor (28). 	Barrel nut is not tight or threads are exposed or damaged.
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
31.					<p>CAPSULE INTERIOR (Continued)</p> <ul style="list-style-type: none"> • • aa. Check rear air conditioner (25) for proper operation (WP 0007). Wait 5 minutes to allow temperature to stabilize. Check vents for cool air. • • ab. Check rear heat control (26) (M1240/M1240A1) for proper operation. • • ac. Check rear fan control (27) for proper operation in all settings. • • ad. Check all visible nuts and bolts for looseness and corrosion. • ae. Check air conditioner louvers (28) for damage or debris. 	<p>Climatic conditions require air conditioning and A/C is inoperable, or vented air is not cooler than ambient temperature.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
32.					<p>CHECK-6 COMPONENTS</p> <ul style="list-style-type: none"> • a. Check control boxes (1) for obvious damage and secure mounting. • b. Check mounting bracket (2) for missing or loose hardware. • c. Check connectors (3) for security. <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Refer to Check-6 operation (WP 0036) for detailed information on operating Check-6 vision system.</p> <ul style="list-style-type: none"> • d. Turn power switch (4) to ON position. <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • The LAMP TEST button illuminates three LEDs (PWR, VIDEO IN, VIDEO OUT). Power LED will stay illuminated green indicating power. • VIDEO IN and VIDEO OUT will illuminate amber when LAMP TEST button is pressed or loss of signal is indicated. <ul style="list-style-type: none"> • e. Check three LEDs (5) by pressing the LAMP TEST button (6). • f. Check that the PWR LED (5) is the only one illuminated. 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

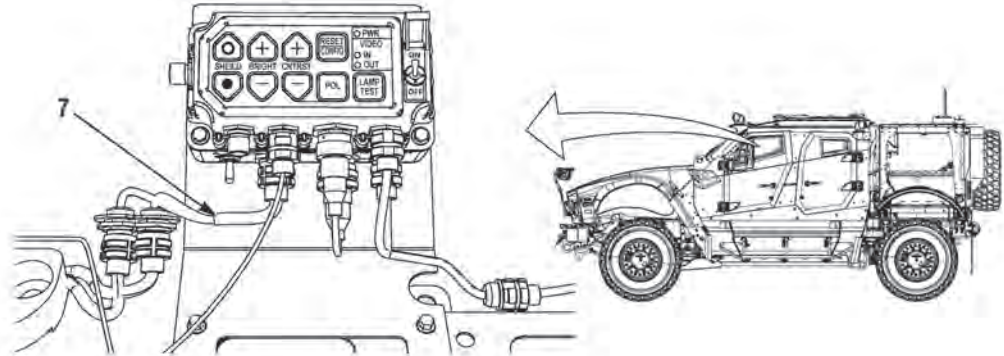
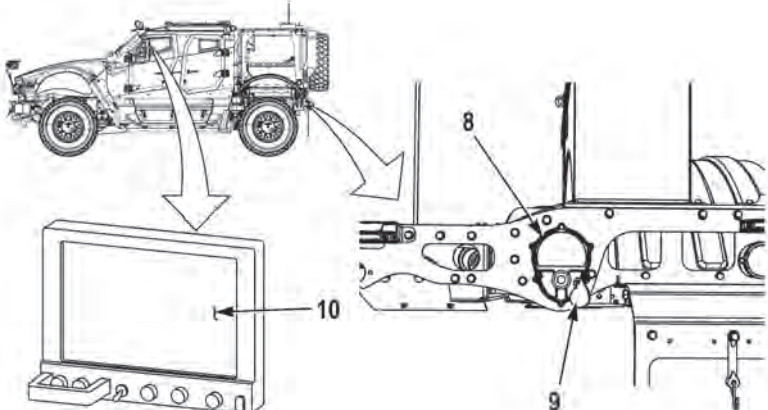
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
32.					<p>CHECK-6 COMPONENTS (Continued)</p> <ul style="list-style-type: none"> • g. Check all cables (7) for obvious damage. • h. Check that all cables (7) are secure and away from moving parts.  <ul style="list-style-type: none"> • i. Check taillights (8) for obvious damage, dirt, and debris. <p style="text-align: center;">CAUTION</p> <p>Do not move camera shields by hand. Failure to comply may result in damage to equipment.</p> <p style="text-align: center;">NOTE</p> <p>Refer to Check-6 operation (WP 0036) for detailed information on operating Check-6 vision system.</p> <ul style="list-style-type: none"> • j. Check operation of camera shields (9). <p style="text-align: center;">NOTE</p> <p>Perform Step (k) if DVE display is present.</p> <ul style="list-style-type: none"> • k. Verify that image is being displayed on DVE display (10). 	<p>Cables are damaged.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

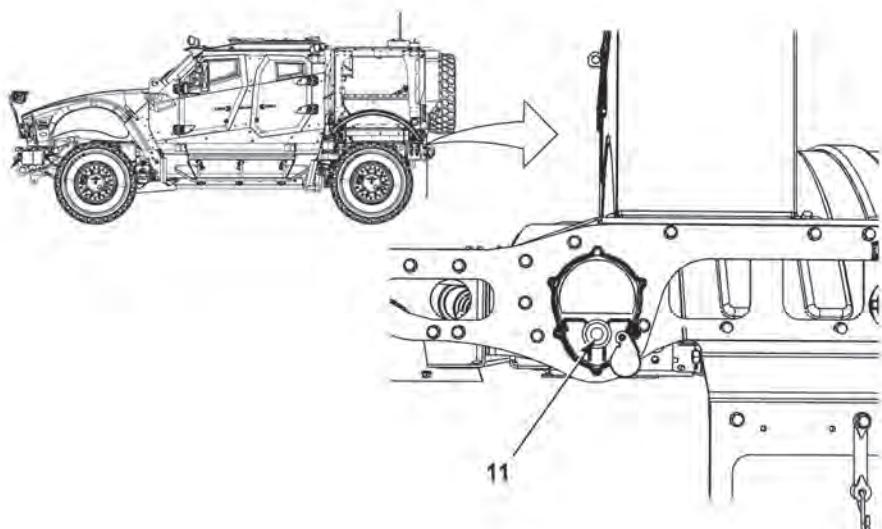
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
32.					<p>CHECK-6 COMPONENTS (Continued)</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Camera glass may become very hot when exposed to sun or when in a hot environment. Avoid contacting hot glass with hands or skin. Failure to comply may result in injury to personnel.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Glass must only be cleaned with a lint-free cloth and a mild solution of warm water and soap. Failure to comply may result in damage to equipment.</p> <p>i. Check for broken, scratched, or dirty camera lens glass (11).</p>	
	•		•		 <p>The diagram shows a side view of a vehicle with a callout arrow pointing to a detailed view of a camera lens assembly. The lens assembly is labeled with the number 11. The detailed view shows the lens housing, mounting brackets, and a circular lens element.</p>	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
32.					<p>CHECK-6 COMPONENTS (Continued)</p> <ul style="list-style-type: none"> • m. Check that the BRIGHT buttons (12) function properly. • n. Check that the CNTRST buttons (13) function properly. • o. Check that the POL button (14) functions properly. • p. Check for missing or loose mounting hardware (15). 	

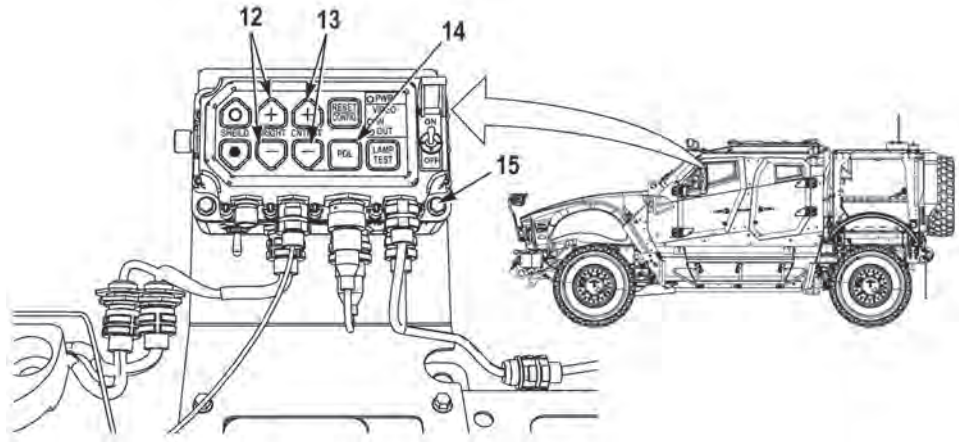


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

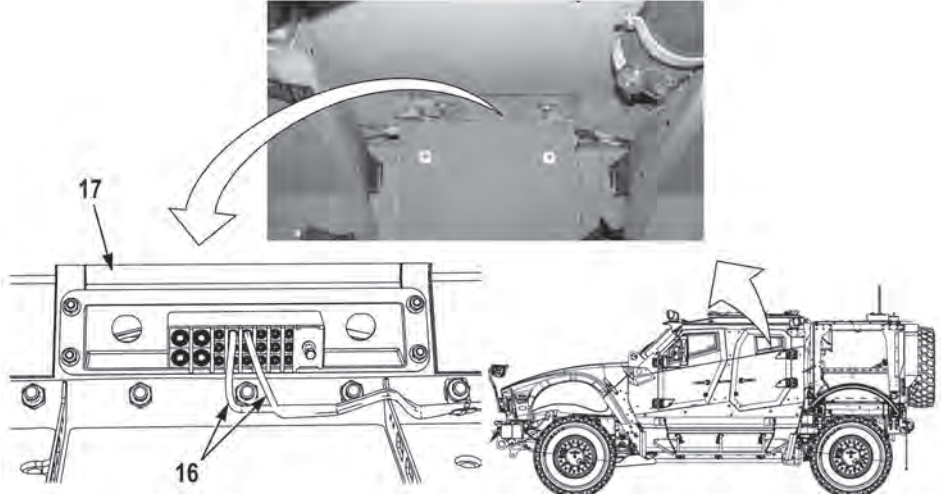
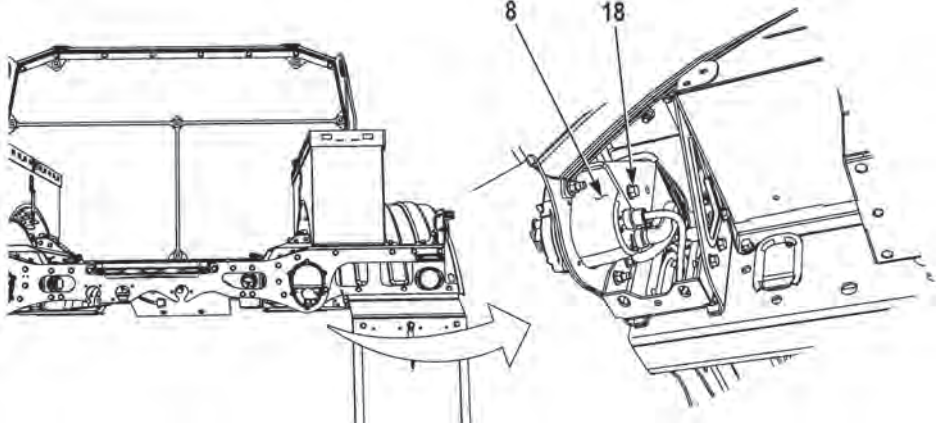
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
32.					<p>CHECK-6 COMPONENTS (Continued)</p> <ul style="list-style-type: none"> q. Check GFE and camera cables (16) for secure mounting on Roxtec assembly (17).  <ul style="list-style-type: none"> r. Check taillights (8) for loose or missing mounting hardware (18). s. Check taillights (8) for obvious damage. 	<p>Mounting is not secure.</p> <p>Mounting hardware is missing.</p> <p>Taillights are damaged.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

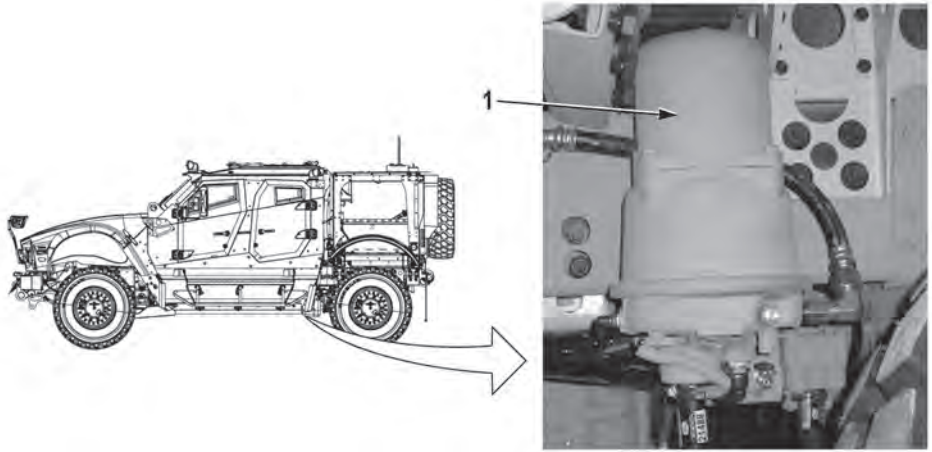
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
33.					<p>AIR DRYER</p> <ul style="list-style-type: none"> • a. Inspect air dryer (1) for punctures and obvious damage. • b. Check air dryer (1) for loose mounting screws and loose or damaged air lines and fittings. • c. Check wires to air dryer (1) for proper connection and damage. • d. Start engine (WP 0020). • e. Check that air dryer (1) purges when governor shuts off air compressor at 125 psi (862 kPa). 	<p>Air dryer is punctured.</p> <p>Air lines or fittings loose or damaged.</p> <p>Wires are damaged or disconnected.</p> <p>Air dryer does not purge. Air dryer is leaking.</p>
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

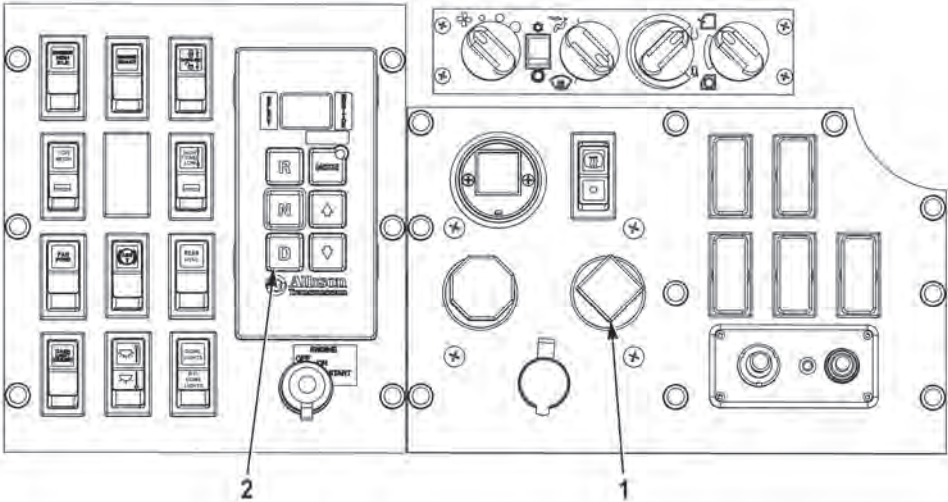
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
34.					<p>PARKING BRAKE</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Prior to performing brake test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>Apply parking brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move. Park vehicle (WP 0025).</p> 	Vehicle moves when parking brake is applied.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

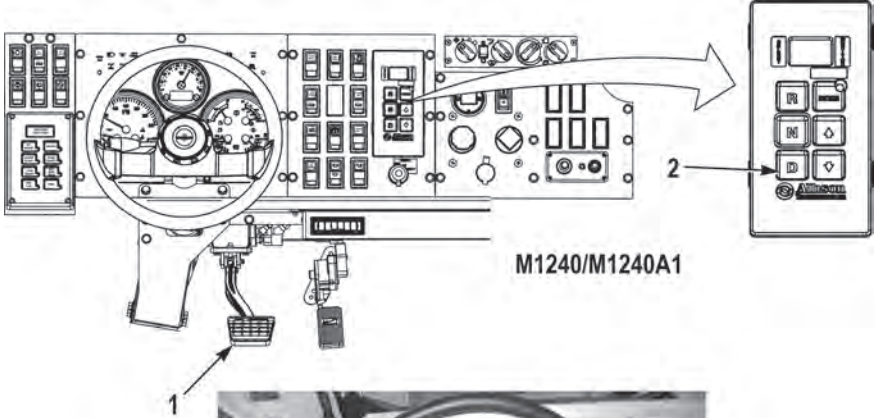

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
35.					<p>SERVICE BRAKE STALL TEST</p> <p><u>WARNING</u></p> <p>Prior to performing brake test, ensure area 30 ft. (9 m) to front of vehicle is clear of objects and personnel. Failure to comply may result in injury or death to personnel.</p> <p>Apply service brake (1). Select D (drive) on transmission range selector (2) and run engine at 1000 rpm. Vehicle should not move. Park vehicle (WP 0025).</p>  <p>M1240/M1240A1</p>  <p>M1245</p>	Vehicle moves when service brake is applied.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
36.					<p>TRANSMISSION FLUID</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Do not permit dirt, dust, or grit to enter transmission filler tube. Thoroughly clean dipstick handle and end of filler tube. Serious internal transmission damage can result if transmission is contaminated.</p> <p style="text-align: center;">NOTE</p> <p>If the transmission oil temperature is between 160° and 250°F (71° and 121°C), go directly to the HOT CHECK procedure. If there is evidence of transmission oil leakage, contact Field Maintenance. If the transmission oil temperature is less than 160°F (71°C), go to the next Step, COLD CHECK procedure.</p> <p>COLD CHECK: The COLD CHECK determines if the transmission has enough fluid to be operated safely until a HOT CHECK can be made.</p> <ul style="list-style-type: none"> • a. Apply parking brake (WP 0025). • b. If the engine has been shut down for an extended time, park the vehicle on a level surface and apply the parking brake. • c. Idle engine at (500 to 800 rpm) in N (neutral) for about one minute. Shift to D (drive) and then to R (reverse) to clear the hydraulic circuits of air. Shift to N (neutral) and leave engine at idle. 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

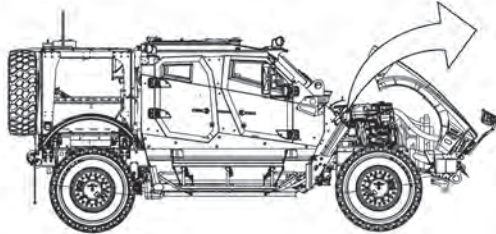

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
36.					<p>TRANSMISSION FLUID (Continued)</p> <ul style="list-style-type: none"> • d. Remove transmission dipstick (1). <p style="text-align: center;"><u>CAUTION</u></p> <p>If transmission fluid is too high and needs to be drained, notify Field Maintenance. Failure to comply may result in damage to equipment.</p> <ul style="list-style-type: none"> • e. After wiping the transmission dipstick (1) clean, check the fluid level. If the fluid on the dipstick is within the COLD RUN band, the level is satisfactory. If the fluid level is not within this band, add fluid as necessary to bring the level within the COLD RUN band. Refer to Lubrication Instruction (WP 0068). • f. Install transmission dipstick (1). • g. Perform HOT CHECK at the first opportunity after normal operating temperature (160° to 250°F [71° to 121°C]) is reached. 	Transmission fluid level is too high or too low. Any Class III leak.
					 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
36.					<p>TRANSMISSION FLUID (Continued)</p> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> • The transmission must not be operated for extended periods of time until Hot Check has verified proper fluid level. Transmission damage can result from extended operation at improper fluid level conditions. • An accurate fluid level check cannot be made unless the engine is idling (500 to 800 rpm) in N (neutral), the transmission fluid is at the proper temperature, and the vehicle is on a level surface. Failure to comply may result in damage to equipment. <p>HOT CHECK: Because the fluid level rises as the temperature increases, the fluid must be hot to ensure an accurate check.</p> <ul style="list-style-type: none"> • • h. Be sure fluid has reached normal operating temperature (160° to 250°F [71° to 121°C]). • • i. Park the vehicle on a level surface and shift to N (neutral). Apply the parking brake and allow the engine to idle (500 to 800 rpm). <p style="text-align: center;"><u>CAUTION</u></p> <p>If transmission fluid is too high and needs to be drained, notify Field Maintenance. Failure to comply may result in damage to equipment.</p> <ul style="list-style-type: none"> • • • j. Remove transmission dipstick (1). • • • k. After wiping the transmission dipstick (1) clean, check the fluid level. The safe operating level is anywhere within the HOT RUN band on the dipstick. If the fluid level is not within this band, add fluid as necessary to bring the level within the HOT RUN band (WP 0068). • • • l. Install transmission dipstick (1). • • m. Be sure that fluid level checks are consistent. Check level more than once, and if readings are not consistent, notify your supervisor or Field Maintenance. • • n. Shut off engine (WP 0026). 	<p>Transmission fluid level is too high or too low. Any Class III leak.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
37.					<p>TRANSFER CASE NEUTRAL SHIFT LEVER</p> <ul style="list-style-type: none"> • a. Push switch lock (1) up and push TOW MODE button (2) to exhaust air from transfer case high and low solenoids. • b. Pull transfer case neutral shift valve handle (3) forward. Put transmission in drive and verify vehicle does not move. • c. Push transfer case neutral shift valve handle (3) back so handle (3) is parallel to bumper. Push switch lock (4) up and push HIGH or LOW on transfer case shift button (5). Put transmission in drive and verify vehicle moves. • d. Shut off engine (WP 0026). 	

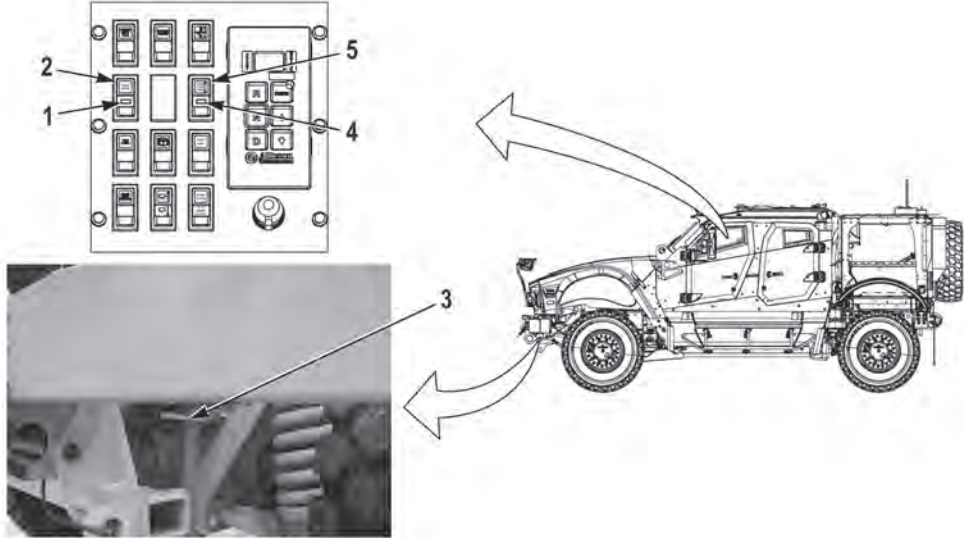


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

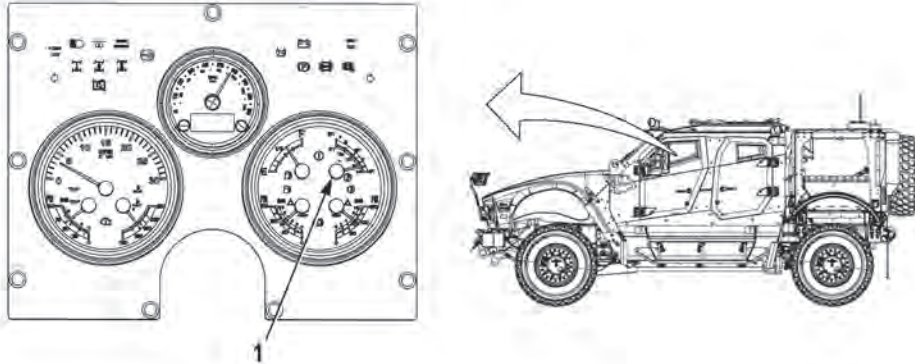
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
38.					<p>TRANSMISSION</p> <ul style="list-style-type: none"> • a. Check transmission for proper shifting (WP 0022). <p style="text-align: center;">NOTE</p> <p>At idle speed, the automatic transmission may not reach 160°F (71°C) oil temperature.</p> <ul style="list-style-type: none"> • b. Check transmission temperature gauge (1) for normal operating temperature of 160° to 250°F (71° to 121°C). If the transmission temperature exceeds 250°F (121°C), downshift to a lower gear to avoid overheating. 	<p>Transmission does not operate any range.</p> <p>Transmission fluid temperature is above 250°F (121°C).</p>
						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

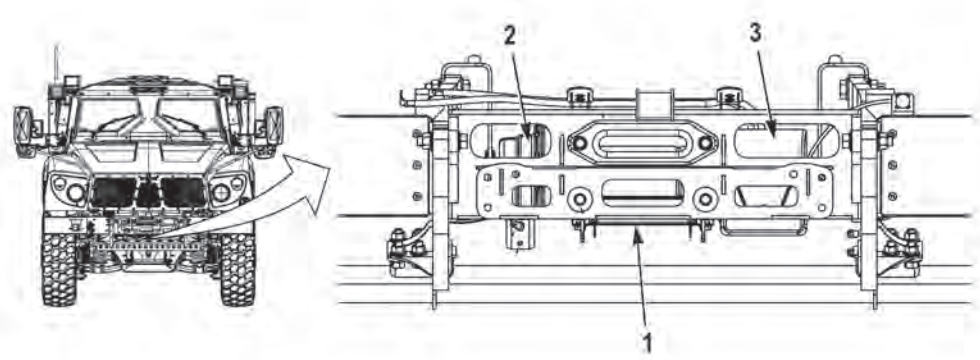
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
39.					<p>WINCH</p> <p>NOTE</p> <p>Refer to Winch (WP 0049) for more detailed information on operation of winch.</p> <ul style="list-style-type: none"> • a. Check for obvious damage to winch (1). • b. Check free spool clutch (2) for air leaks. <p>CAUTION</p> <p>If a substantial amount of winch cable is payed out, tension must be maintained on winch cable while reeling in winch cable. Failure to comply may result in tangled winch cable and damage to equipment.</p> <ul style="list-style-type: none"> • c. With the aid of an assistant, pay out and reel in winch cable and check winch motor (3) for unusual noises and proper operation. 	Free spool clutch leaks air or any air leak that prevents free spool operation.
 <p>The diagram consists of two parts. On the left is a front view of a vehicle with a winch mounted on the front bumper. An arrow points from the winch on the vehicle to a larger, detailed technical drawing of the winch mechanism on the right. In this detailed drawing, three callout numbers are used: '1' points to the winch motor, '2' points to the free spool clutch, and '3' points to the winch cable drum.</p>						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
39.					<p>WINCH (Continued)</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Use heavy leather gloves when checking winch cable. Injury to hands can result if gloves are not worn. Failure to comply may result in injury or death to personnel.</p> <p style="text-align: center;">NOTE</p> <p>Worn spots will show up as flattened spots on the strands.</p> <ul style="list-style-type: none"> • d. Inspect winch cable (4) for kinks and broken strands while cable is being payed out for use. • e. Inspect for worn spots while cable is being payed out for use. 	<p>Cable is frayed, kinked, or worn.</p> <p>Outer strands are reduced in diameter by one-fourth.</p>
<p>The diagram illustrates the inspection process for a winch cable. At the top, a cross-section of a cable is shown with four strands, labeled '4'. Below this, a circular diagram shows a 'STRAND' composed of multiple smaller wires. To the right, a photograph shows a cable with a broken strand, with an arrow pointing to it. At the bottom, a side view of a cable is shown with 1-inch intervals marked. The intervals are labeled 'SERVICEABLE' or 'UNSERVICEABLE'. A legend indicates that a specific symbol 'INDICATES BROKEN STRAND'.</p>						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
39.					<p>WINCH (Continued)</p> <p>f. Inspect broken strands to determine if it is a single broken strand or several broken strands. Inspect while cable is being payed out for use.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>If a substantial amount of winch cable is payed out, tension must be maintained on winch cable while reeling in winch cable. Failure to comply may result in tangled winch cable and damage to equipment.</p> <p>g. Reel in winch cable (4) (WP 0049).</p> <p>h. Check that winch cable hook (5) is not broken.</p>	<p>Individual strands are broken next to one another, six randomly distributed broken strands in one lay (the distance in which the strands make one complete turn around the cable); or three broken strands in one lay.</p> <p>Hook is broken.</p>

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

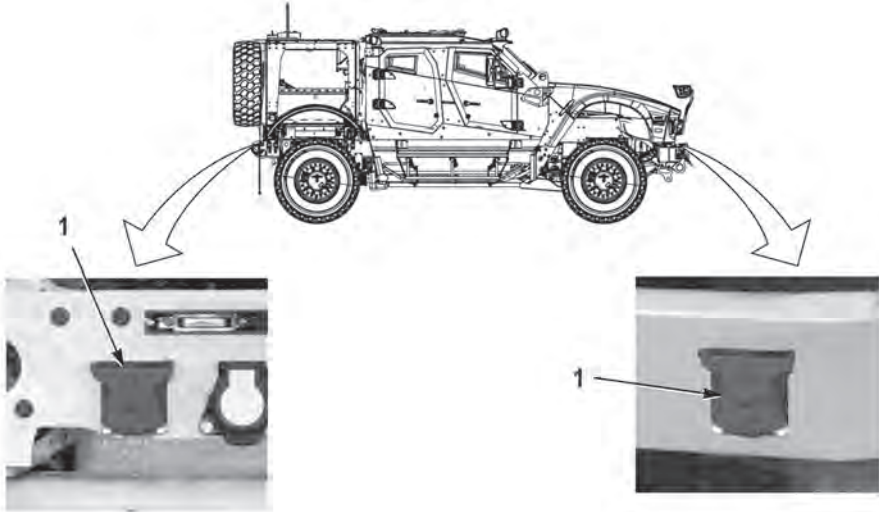
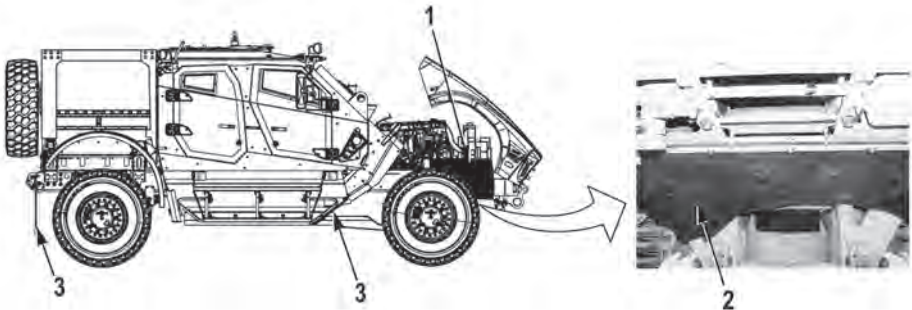
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
40.					<p>FRONT AND REAR INTERVEHICLE ELECTRICAL CONNECTOR</p> <ul style="list-style-type: none"> • a. Inspect both front and rear electrical connectors (1) for damage. • b. Inspect both front and rear electrical connector cover seals for tears or rot. 	
41.					<p>RADIATOR BAFFLES AND MUD FLAPS</p> <ul style="list-style-type: none"> • a. Inspect both side radiator baffles (1) and lower radiator baffle (2) for tears and missing or loose hardware. • b. Inspect all mud flaps (3) for tears and missing or loose hardware. 	

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

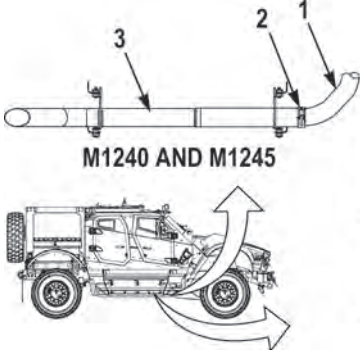
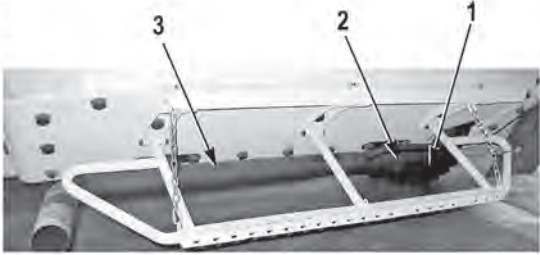
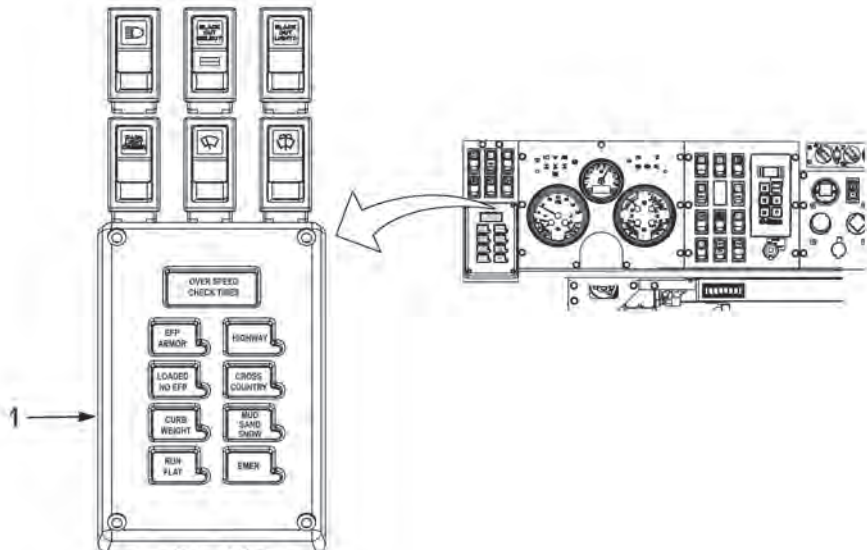
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
42.					<p>EXHAUST SYSTEM</p> <ul style="list-style-type: none"> Check exhaust piping (1), clamps (2), and muffler (3) for looseness or damage. While engine is running, listen for exhaust leaks.  	Exhaust leaks present between elbow turbo. Refer exhaust leak to field maintenance.
43.					<p>CENTRAL TIRE INFLATION SYSTEM (CTIS)</p> <ul style="list-style-type: none"> a. Start engine (WP 0020). b. Activate each button on CTIS controller (1) (WP 0031) and ensure corresponding indicator light illuminates. 	No lights on CTIS board or five lights flashing.

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
44.					<p>AIR COMPRESSOR</p> <ul style="list-style-type: none"> a. Check air compressor (1) for oil or coolant leaks. b. Check air compressor (1), oil fitting (2), coolant fittings (3), and air fittings (4) for looseness and leakage. c. Check that air compressor (1) is securely mounted. 	<p>Any Class III leak.</p> <p>Any Class III leak or air leakage.</p> <p>Compressor is loose.</p>

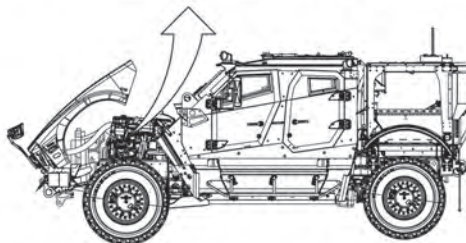
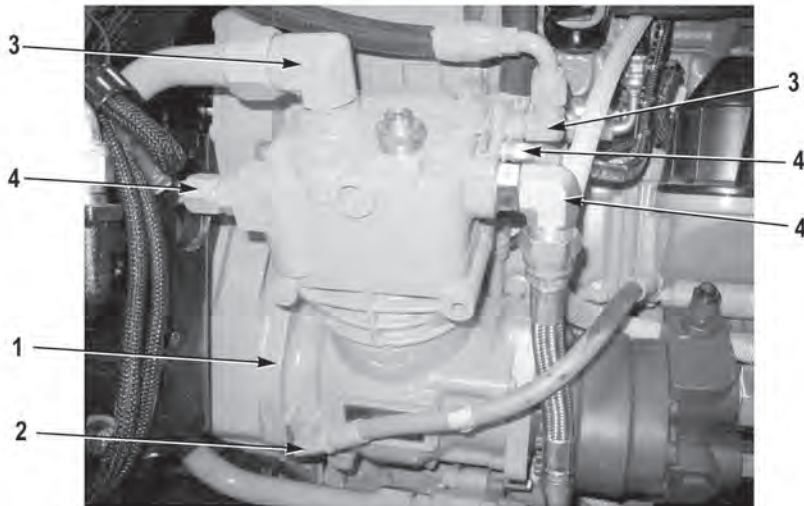


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

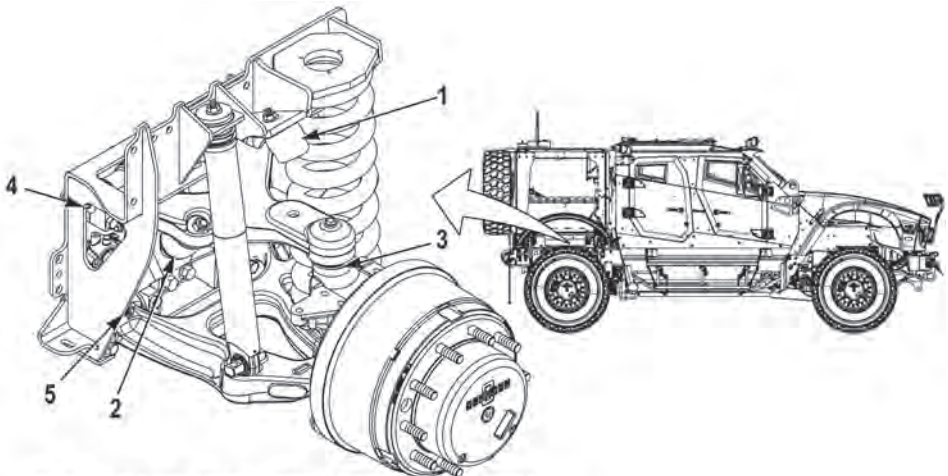
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
45.					<p>UNDERCARRIAGE AND FRAME</p> <ul style="list-style-type: none"> • a. Inspect frame rails and crossmembers for loose or broken screws and cracked or broken welds. • b. Inspect jounce bumpers (1) and rebound bumpers (2) for damage. • c. Inspect upper and lower control arm ball joint boots (3) for leaks and damage. • d. Inspect upper and lower control arm pivot bushing bolts (4) and grease fittings (5) for looseness or damage. • e. Inspect axles No. 1 and No. 2 for leaks or damage. • f. Inspect engine, transmission, and transfer case for leaks or damage. 	<p>Any broken frame rails, crossmembers, broken welds, loose or broken screws.</p> <p>Loose, missing, or damaged pivot bushing bolts.</p> <p>Any damage that would impair vehicle operation.</p> <p>Any Class III leak.</p>
 <p>ONE WHEEL/SUSPENSION ASSEMBLY SHOWN. OTHER THREE SIMILAR.</p>						

Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
45.					<p>UNDERCARRIAGE AND FRAME (Continued)</p> <ul style="list-style-type: none"> g. Inspect springs (6) for cracks, broken coils, or other damage. h. Inspect half shaft boot (7) for damage and proper installation. <p style="text-align: center;"><u>CAUTION</u></p> <p>All guidelines set forth for maintaining corrosion preventive compounds must be adhered to. Failure to follow these guidelines will negatively impact the corrosion control integrity of the vehicle and result in damage to equipment.</p> <ul style="list-style-type: none"> i. Inspect underside of capsule (8) for presence of corrosion. Look for and be aware of spots where paint has been damaged and primer has been exposed. j. Inspect armor mounting nuts and bolts for looseness and corrosion. k. Inspect underside of vehicle for loose or damaged wires. 	Any broken springs are found.

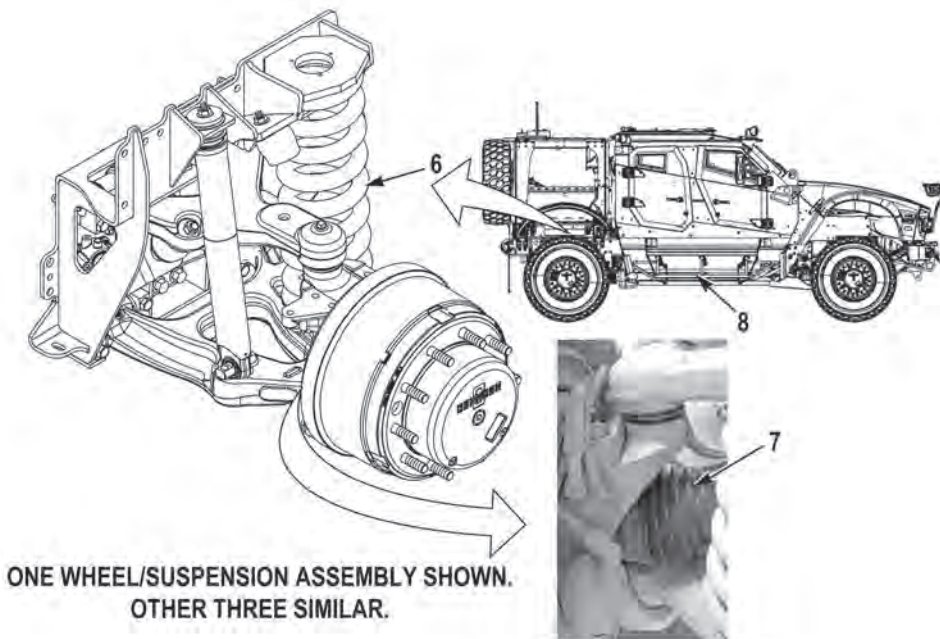


Table 1. Operator/Crew Preventive Maintenance Checks and Services (PMCS). (Continued)

Note: These checks are to be made in the order listed, within designated intervals.

B-Before Operation D-During Operation A-After Operation M-Monthly

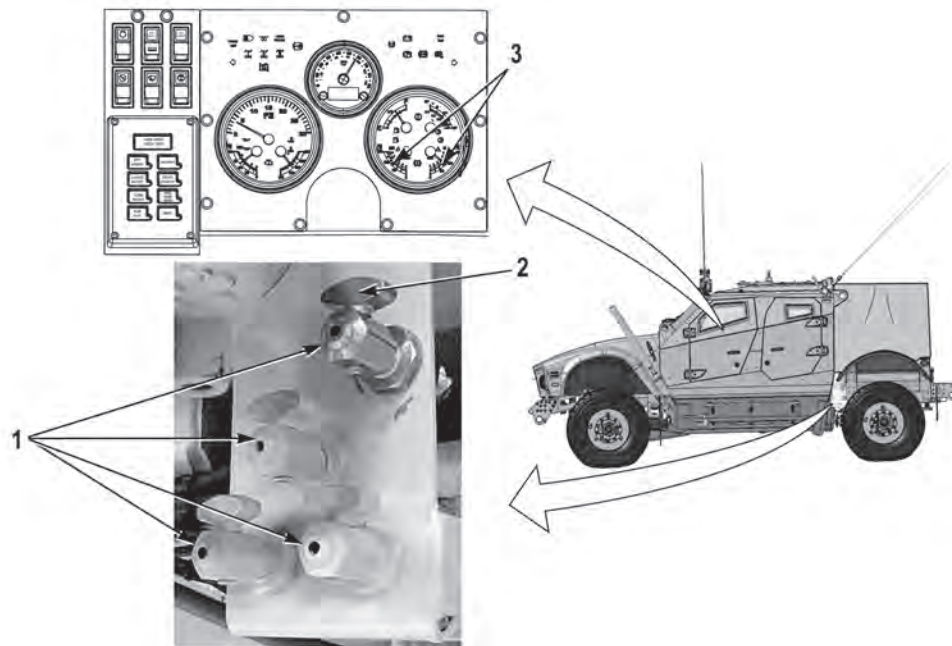
Item No.	Interval				ITEM TO BE INSPECTED/ PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	Not Mission Capable If:
	B	D	A	M		
46.		•			<p>AIR SYSTEM</p> <p>a. Start engine (WP 0020).</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Low air lights must go out prior to performing air reservoir checks.</p> <p>b. Shut engine OFF (WP 0026).</p> <p>c. Listen for leaks.</p> <p>d. Drain air system (WP 0060).</p>	Leak is detected.

END OF WORK PACKAGE

CHAPTER 5

**MAINTENANCE INSTRUCTIONS
FOR
M1240, M1240A1, AND M1245**

DRAINING AIR SYSTEM



1. Shut OFF engine.

WARNING

Air drain valves may be under extreme pressure. Do not allow face to be in front of air drain valves while draining air reservoirs. Open air drain valves slowly to prevent sudden blast of air. Failure to comply may result in injury to personnel.

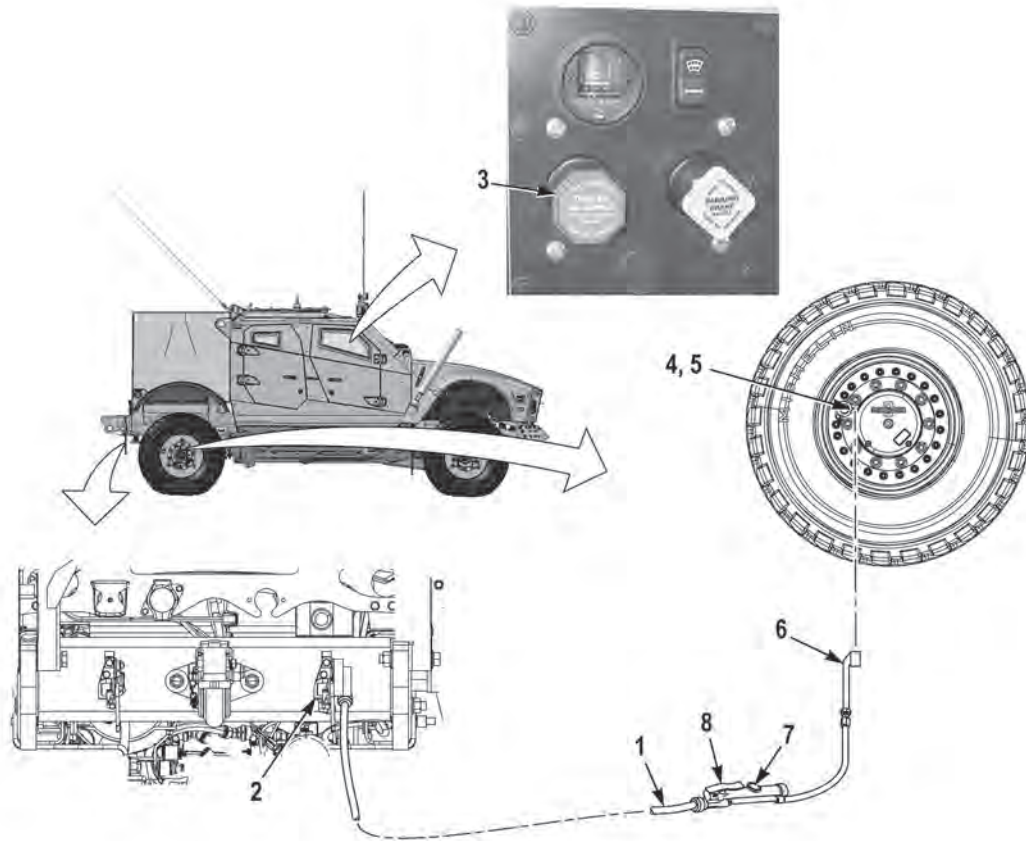
NOTE

Vehicles are equipped with either three or four air valves. Four valve system shown.

2. Open all air valves (1). Turn knob (2) on valve either right or left to open valve.
3. Allow air to drain from system and check air pressure gauges (3). Gauges (3) should both read zero.
4. Close all air valves (1).

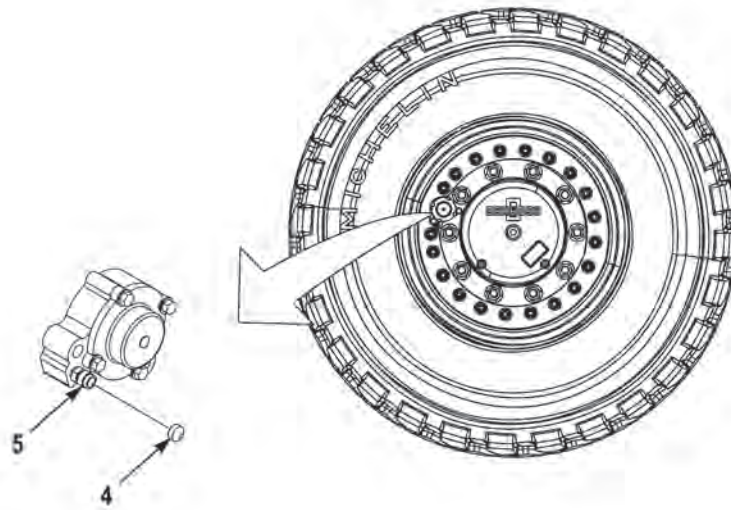
END OF WORK PACKAGE

TIRE INFLATE/DEFLATE

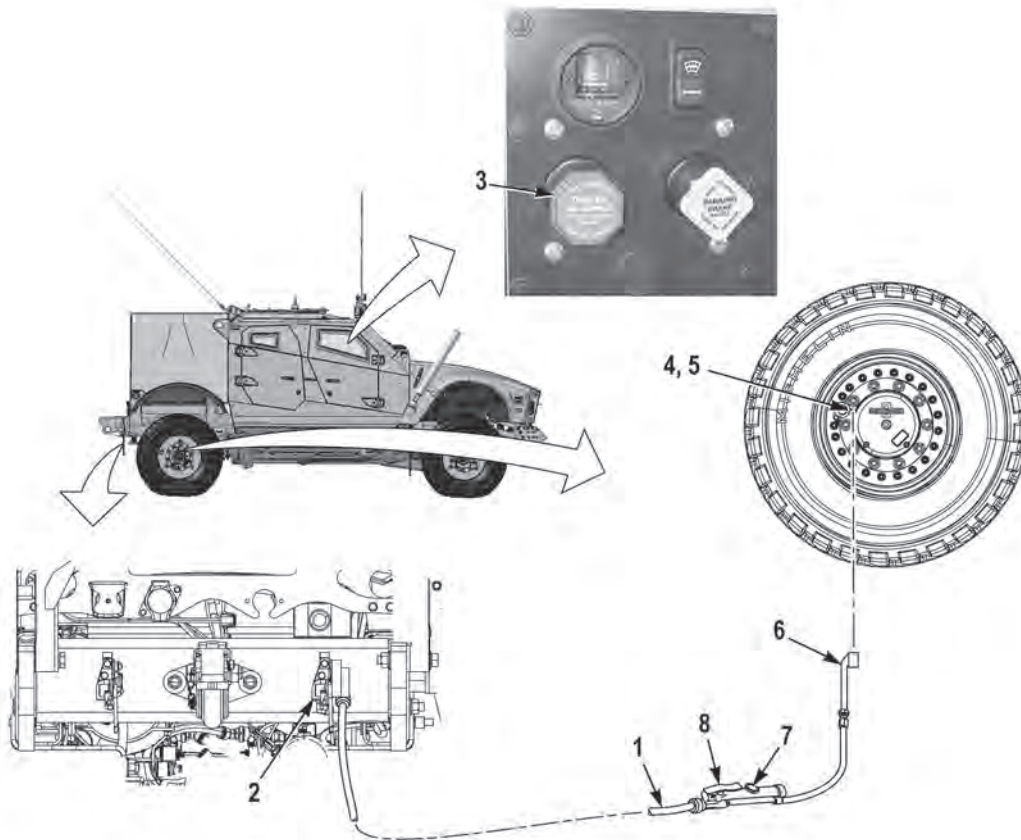
TIRE INFLATE**WARNING**

When connecting to a quick-disconnect coupling, hold the end of the air hose(s). Air hoses are under pressure and can fly out at a fast rate of speed causing injury to personnel.

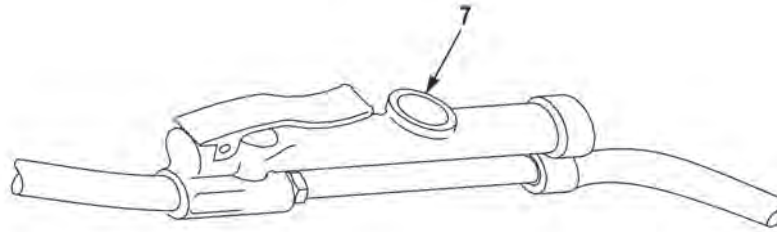
1. Chock front and rear of vehicle (WP 0009).
2. Install air hose assembly (1) to emergency glad hand (2) located in rear of vehicle.
3. Start vehicle (WP 0020).
4. Push in TRAILER AIR SUPPLY knob (3) (WP 0007).



5. Remove valve cap (4) from tire valve (5).



6. Install airchuck (6) of air assembly (1) on valve (5).

**NOTE**

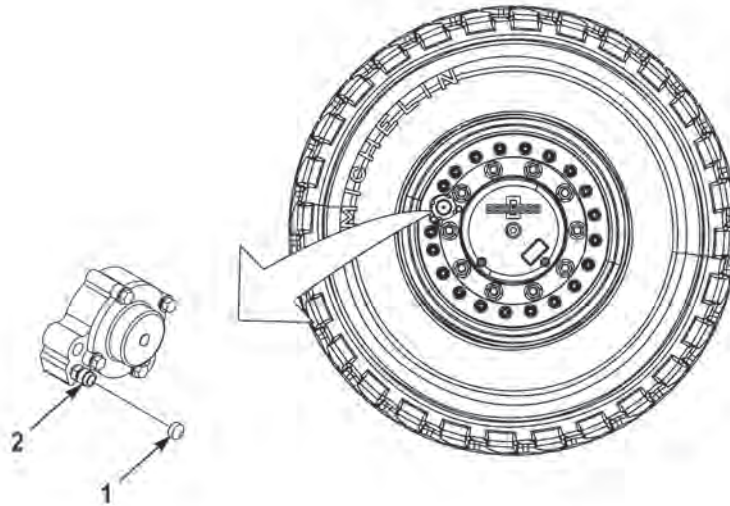
- Tire pressure gauge in handle of hose assembly will only indicate tire pressure setting when lever of handle is released.
- Refer to Central Tire Inflation System (WP 0031), Tire Pressures Table 1, for correct tire pressure readings.
- Air chuck must clamp securely onto tire valve without air leaks or the air pressure reading may be inaccurate.

7. Tire pressure setting is indicated on inflator/gauge (7).

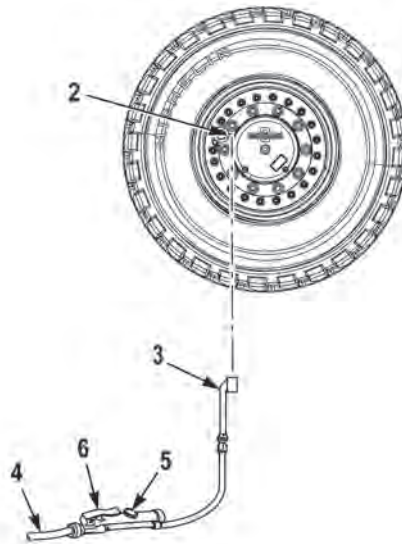
NOTE

If tire pressure needs to be increased, vehicle must be started and air pressure of vehicle must be above 100 psi (689 kPa).

8. To increase tire pressure, press lever (8) on inflator/gauge (7) until desired tire pressure is indicated on inflator/gauge.
9. Once desired pressure is achieved, release lever (8) on inflator/gauge (7) and disconnect air chuck (6) from valve (2).
10. Install valve cap (4) on valve (5).
11. Pullout TRAILER AIR SUPPLY knob (3) (WP 0007).
12. Shut OFF engine (WP 0026).
13. Remove air hose assembly (1) from emergency gladhand (2).

TIRE DEFLATE

1. Remove valve cap (1) from valve (2).



2. Install air chuck (3) of air hose assembly (4) on valve (2).

NOTE

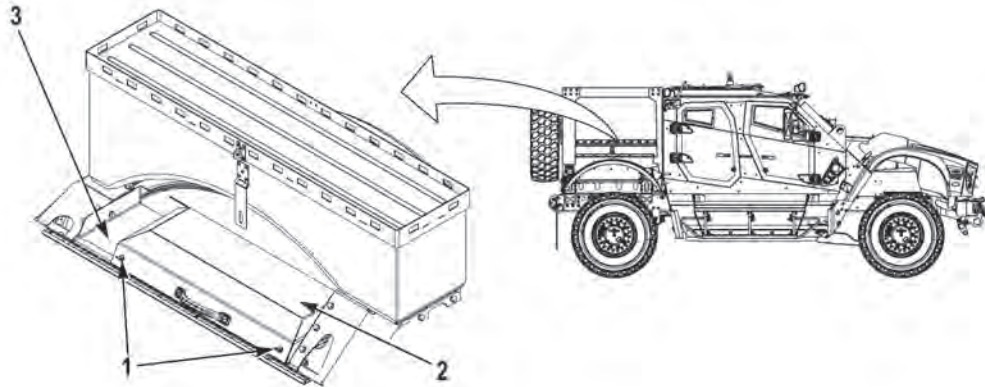
- Tire pressure gauge in handle of hose assembly will only indicate tire pressure setting when lever of handle is released.
- Refer to Central Tire Inflation System (WP 0031), Tire Pressures Table 1, for correct tire pressure readings.
- Air chuck must clamp securely onto tire valve without air leaks or the air pressure reading may be inaccurate.

3. Tire pressure setting is indicated on inflator/gauge (5).

4. To decrease tire pressure, press lever (6) on inflator/gauge (5) until desired tire pressure is indicated on inflator/gauge (5).
5. Once desired tire pressure is achieved, release lever (6) on inflator/gauge (5) and disconnect air chuck (3) from valve (2).
6. Install valve cap (1) on valve (2).

END OF WORK PACKAGE

BATTERY COVER REMOVAL/INSTALLATION (M1240/M1240A1)

BATTERY COVER REMOVAL**WARNING**

- Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.
- Wear safety goggles, acid-proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure battery disconnect switch is turned OFF prior to performing battery maintenance. Failure to comply may result in damage to equipment.

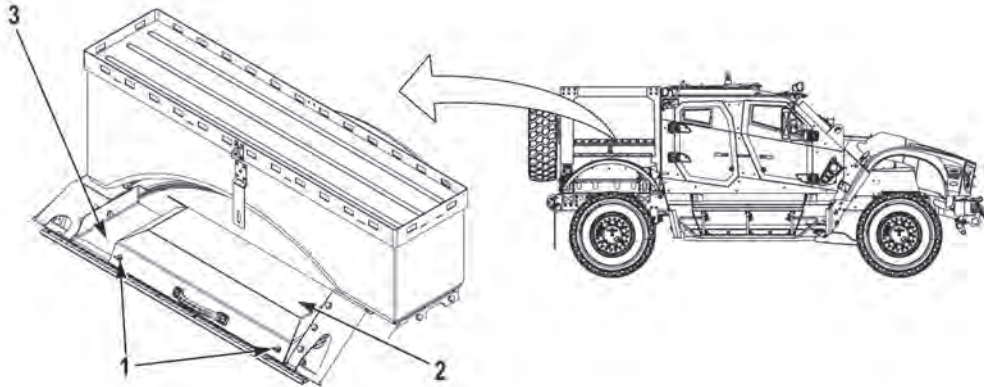
NOTE

- Two batteries are located in the cargo deck, on the driver side, are used to start the vehicle.
- Two batteries are located in the cargo deck, on the passenger side, are used to power GFE in silent watch operations.
- Both driver side and passenger side battery covers are removed the same way. Passenger side shown.

Remove two thumbscrews (1) and battery cover (2) from cargo deck (3).

END OF TASK

BATTERY COVER INSTALLATION



WARNING

- Do not wear watches, rings, or other jewelry when servicing batteries which could short out battery terminals. Do not smoke or use open flame around batteries. Batteries can explode from sparks. Battery acid is harmful to skin and eyes. Failure to comply may result in injury to personnel.
- Wear safety goggles, acid-proof gloves, and a rubber apron when performing battery maintenance. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure battery disconnect switch is turned OFF prior to performing battery maintenance. Failure to comply may result in damage to equipment.

NOTE

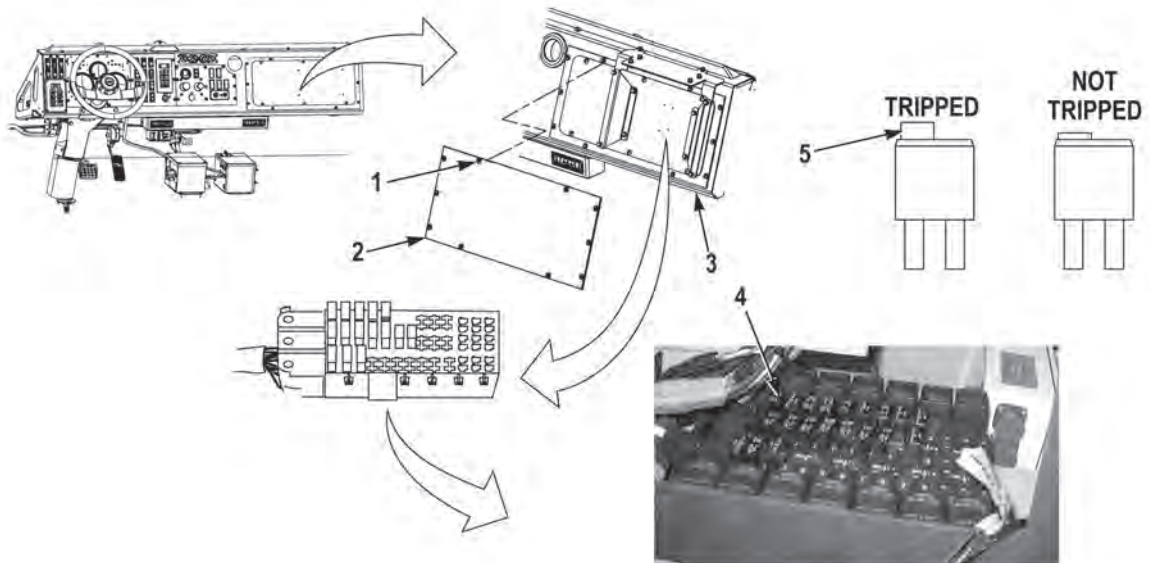
- Two batteries are located in the cargo deck, on the driver side, are used to start the vehicle.
- Two batteries are located in the cargo deck, on the passenger side, are used to power GFE in silent watch operations.
- Both driver side and passenger side battery covers are installed the same way. Passenger side shown.

Install battery cover (2) on cargo deck (3) with two thumbscrews (1).

END OF TASK

END OF WORK PACKAGE

RESETTING CIRCUIT BREAKERS

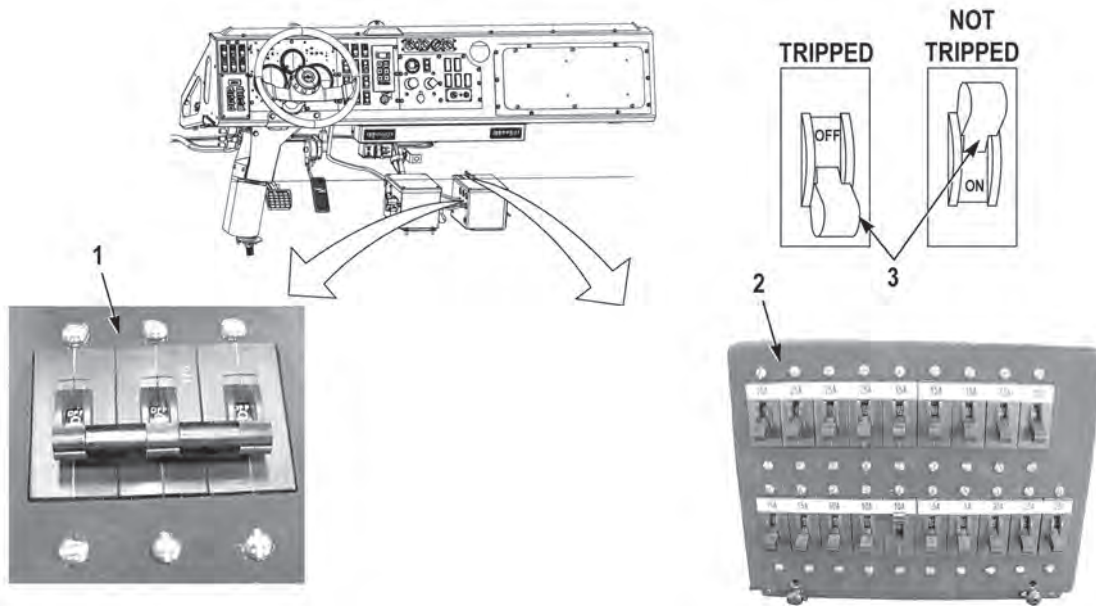
RESETTING BREAKERS**CAUTION**

If a circuit breaker trips again after being reset, report problem to Field Maintenance. Failure to comply may result in damage to equipment.

NOTE

21 and 23 circuit breakers auto resetting.

1. Remove ten screws (1) and remove cover (2) from dash (3).
2. Check for tripped circuit breakers (4).
3. Push down tab (5) on circuit breaker to reset.
4. Install cover (2) on dash (3) and turn ten screws (1) one quarter turn clockwise.

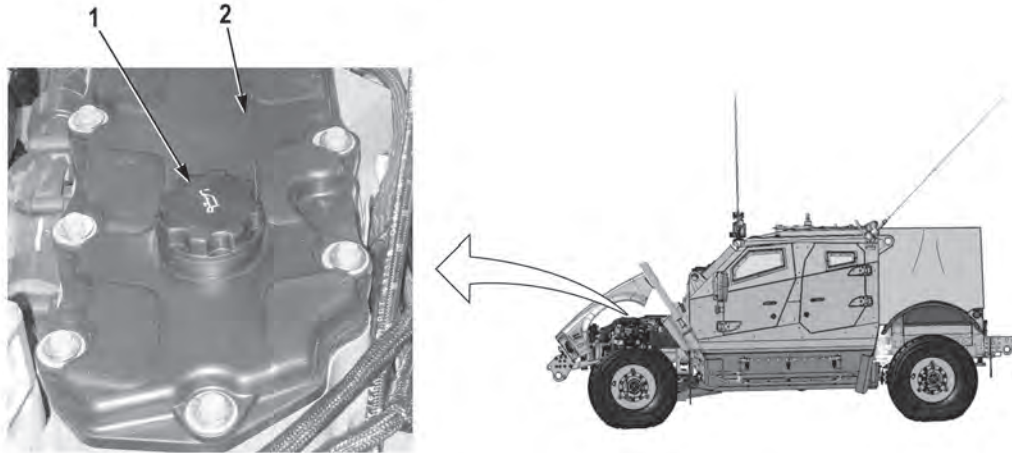
RESETTING AUXILIARY (COMPONENT) CIRCUIT BREAKERS**CAUTION**

If a circuit breaker trips again after being reset, report problem to Field Maintenance. Failure to comply may result in damage to equipment.

1. Check for tripped main breaker (1) and circuit breakers (2).
2. Move switch (3) on circuit breakers (2) to ON position.

END OF WORK PACKAGE

TRANSMISSION, ENGINE DIPSTICK, AND FILL CAPS

ENGINE OIL FILL CAP REMOVAL**WARNING**

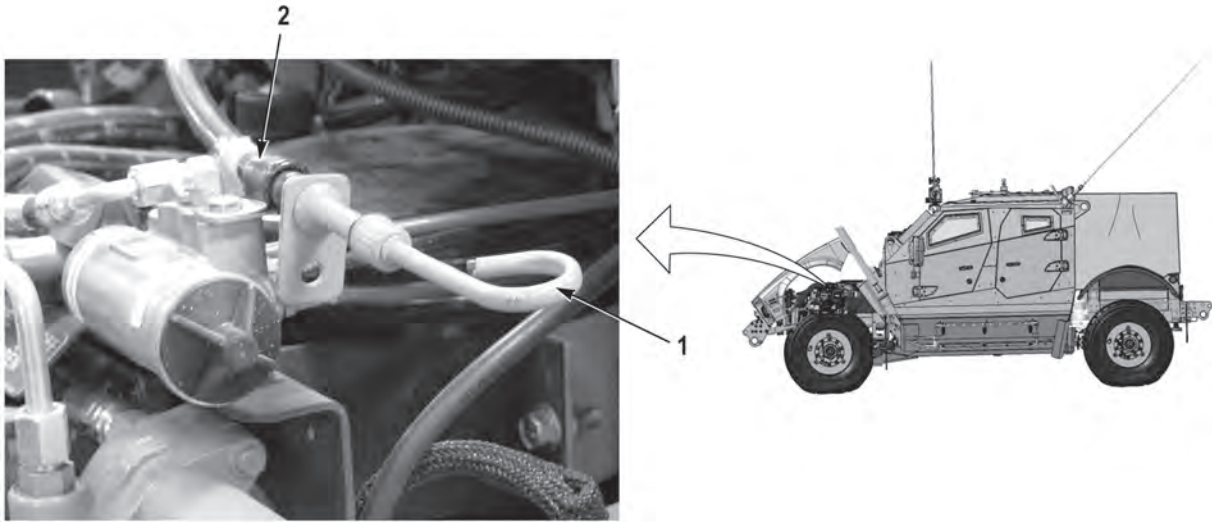
- **Engine must be shut off prior to removing engine oil fill cap. Failure to comply may result in injury or death to personnel.**
- **If engine has been running for any period of time, it may be hot. Ensure engine is cooled prior to contact. Failure to comply may result in injury to personnel.**

1. If engine is running, shut off engine (WP 0026).
2. Raise hood (WP 0034).
3. Turn fill cap (1) counterclockwise until loose in valve cover (2).
4. Remove fill cap (1) from valve cover (2).

END OF TASK**ENGINE OIL FILL CAP INSTALLATION**

1. Install fill cap (1) in valve cover (2).
2. Turn fill cap (1) clockwise until snug.
3. Close hood (WP 0034).

END OF TASK

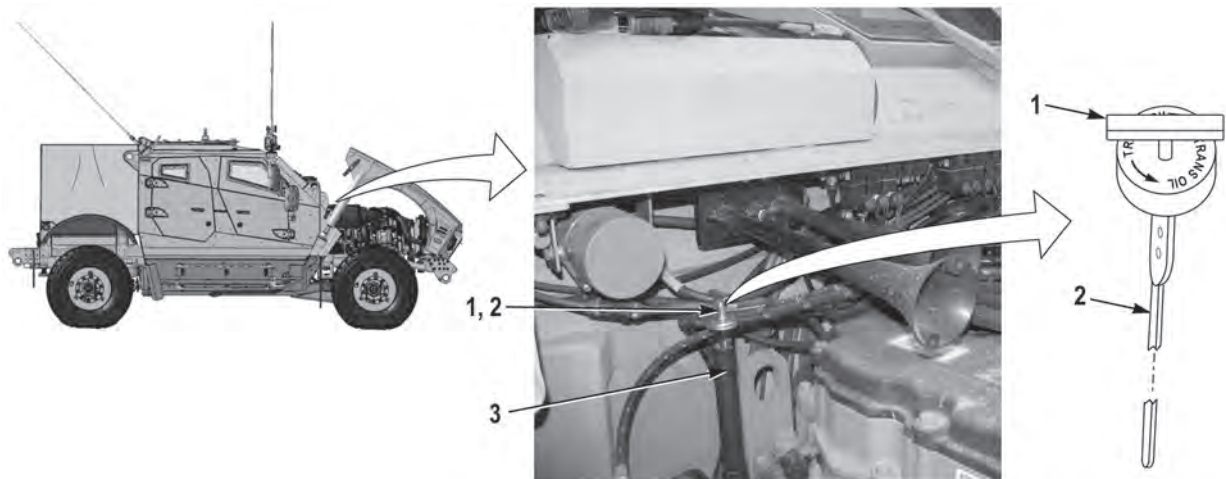
ENGINE OIL DIPSTICK REMOVAL

1. Raise hood (WP 0034).
2. Remove dipstick (1) from tube (2).

END OF TASK**ENGINE OIL DIPSTICK INSTALLATION**

1. Install dipstick (1) in tube (2).
2. Close hood (WP 0034).

END OF TASK

TRANSMISSION DIPSTICK/FILL CAP REMOVAL

1. Raise hood (WP 0034).
2. Turn fill cap/dipstick T-handle (1) counterclockwise until dipstick (2) is loose in tube (3).
3. Remove dipstick (2) from tube (3).

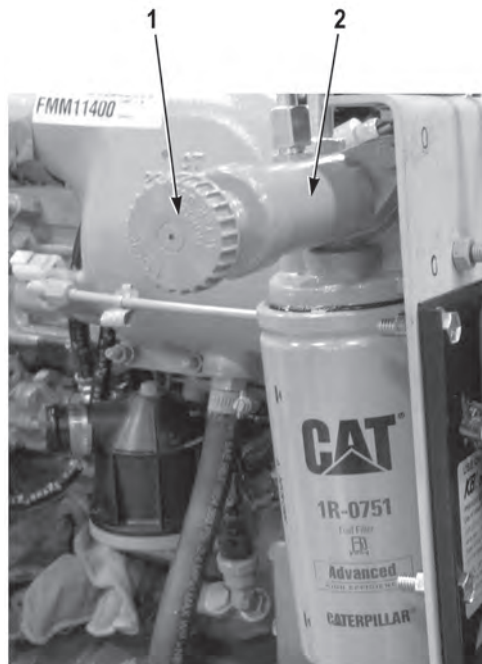
END OF TASK**TRANSMISSION DIPSTICK/FILL CAP INSTALLATION****CAUTION**

When installing dipstick, ensure fill cap is inserted all the way into tube prior to tightening. Failure to comply may result in damage to equipment.

1. Install dipstick (2) in tube (3).
2. Turn fill cap/dipstick T-handle (1) clockwise until snug.
3. Close hood (WP 0034).

END OF TASK**END OF WORK PACKAGE**

PRIMING FUEL SYSTEM

**WARNING**

- Fuel is flammable and can explode. Keep fuel away from open flame and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. Smoking is prohibited while working with fuel. Failure to comply may result in injury or death to personnel.
- Ensure battery disconnect switch is in OFF position. Failure to comply may result in injury or death to personnel.

CAUTION

Do not loosen fuel lines at filter housing to bleed fuel system. Periodic loosening of fittings will result in increased wear of threads. Failure to comply may result in damage to equipment.

NOTE

- It may be necessary to prime fuel system if vehicle has run out of fuel.
- If fuel filter has been replaced, it may require more than 75 pumps to prime fuel system.

1. Raise hood (WP 0034).
2. Turn knob (1) counterclockwise until knob (1) can be pulled out.

NOTE

Priming the fuel system will require considerable strokes.

3. Push and pull knob (1) on priming pump (2) until a strong pressure is felt.



4. Push knob (1) in and turn clockwise.

CAUTION

- **If engine fails to start within 30 seconds, turn ignition switch to OFF and allow starter motor to cool at least two minutes before trying again. Failure to comply could result in damage to starter.**
 - **If engine runs rough, continue to let engine idle. Do not raise engine RPM until engine is running smoothly. Failure to comply may result in damage to equipment.**
5. Attempt to start engine. If engine fails to start, repeat Steps (1) through (4) as required.
 6. If vehicle does not start after three attempts, contact Field Maintenance.

END OF WORK PACKAGE

SNOW CHAINS INSTALLATION/REMOVAL

SNOW CHAINS INSTALLATION

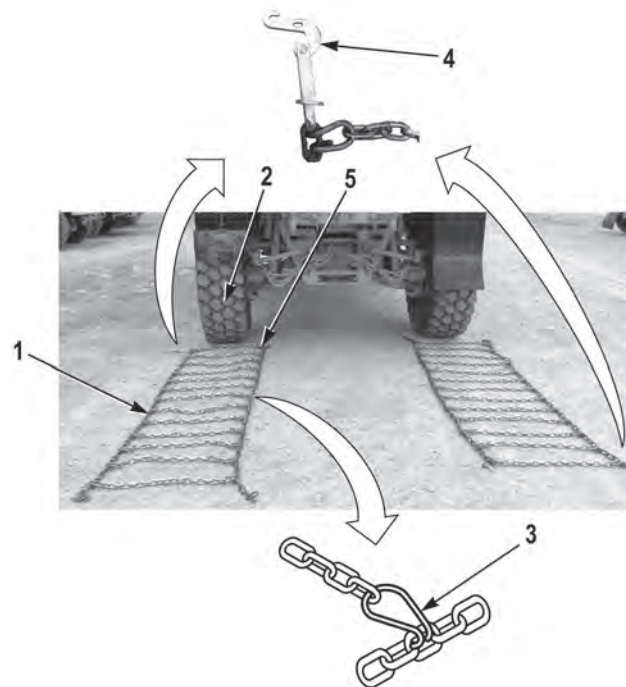
CAUTION

- Snow chains must not be used when driving on hard surfaces where there is no wheel slippage. Failure to comply may result in damage to equipment.
 - CTIS must be set in MUD, SAND, SNOW while snow chains are installed. Failure to comply may result in damage to equipment.
 - CTIS settings must not be changed once snow chains are installed. Failure to comply may result in damage to equipment.
 - Maximum speed for vehicles equipped with snow chains is 24 mph (39 km/h) off road and 10 mph (16 km/h) on highway. Failure to comply may result in damage to equipment.
 - Snow chains must only be installed on rear tires. Failure to comply may result in damage to equipment.
1. Set CTIS to MUD, SAND, SNOW as required (WP 0031).

NOTE

Snow chains are installed the same way on both rear tires. Driver side shown.

2. Remove snow chains from stowage.

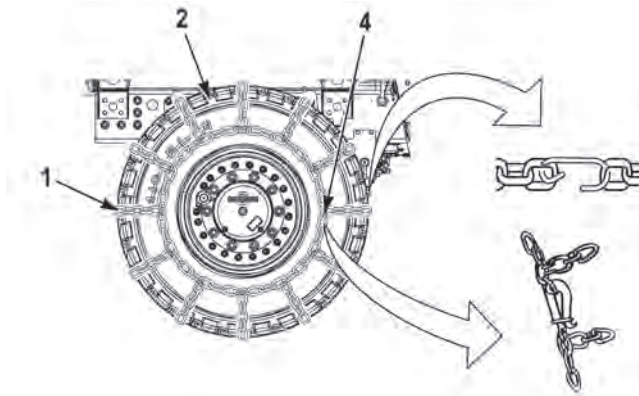


3. Position snow chain (1) on ground, behind tire (2) with cross chain connecting links (3) facing down and snow chain clamps (4) facing outside of tire (2).
4. Start vehicle (WP 0046).

WARNING

The driver's field of view is limited. Ground guides must be used when operating in congested areas or when operating in reverse. Ground guides must stand clear of the vehicle and remain within view of the driver. Failure to comply may result in injury or death to personnel.

5. Back vehicle onto snow chain (1) until tire is approximately 1/3 of the way onto the snow chain.
6. Park vehicle (WP 0025).
7. Ensure tire (2) is not resting on end of snow chain (5).
8. Shut OFF engine (WP 0026).



9. With the aid of an assistant, wrap snow chain (1), as evenly as possible, around tire (2).
10. Connect and secure inside and outside snow chain clamps (4) until snow chain (1) is tight on tire (2).
11. Start vehicle (WP 0046).
12. Drive vehicle ahead 300 ft. (91.5 m).
13. Park vehicle (WP 0025).
14. Shut OFF engine (WP 0026).
15. Check and adjust snow chain as required until a tight fit is obtained.
16. Repeat Steps (3) through (15) to install snow chain on other tire.

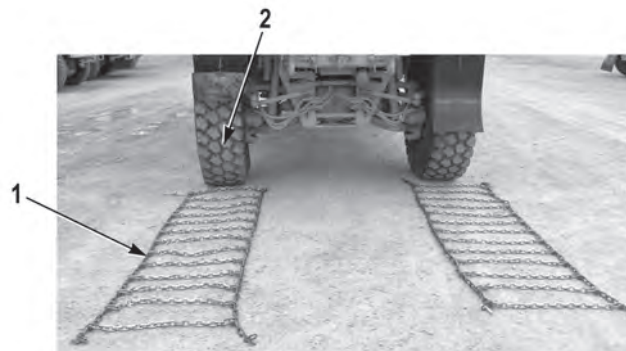
END OF TASK

SNOW CHAINS REMOVAL

NOTE

Snow chains are removed the same way on both rear tires. Driver side shown.

1. Park vehicle (WP 0025).
2. Shut OFF engine (WP 0026).
3. With the aid of an assistant, disconnect inside and outside snow chain clamps (4) of snow chain (1).
4. Unwrap snow chain (1) from tire (2) and spread snow chain (1) out on ground behind vehicle.
5. Start vehicle (WP 0046).

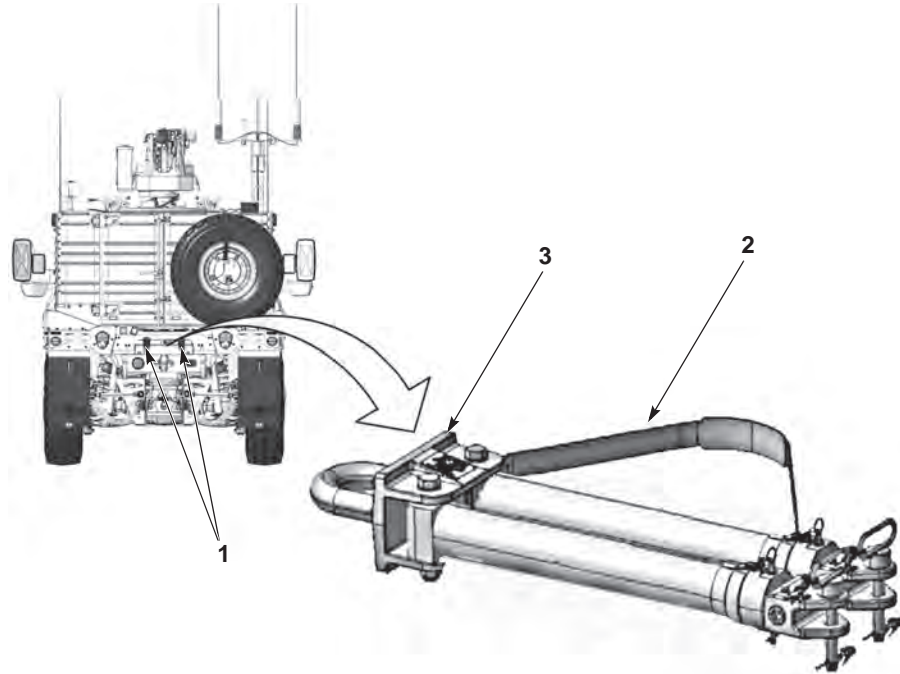


6. With the aid of an assistant, drive vehicle forward until tires (2) are clear of snow chain (1).
7. Park vehicle (WP 0025).
8. Repeat Steps (3) through (7) to remove snow chain from other tire.
9. Return snow chains to stowage.

END OF TASK

END OF WORK PACKAGE

TOWBAR STOW/UNSTOW (M1245)

UNSTOW TOWBAR**WARNING**

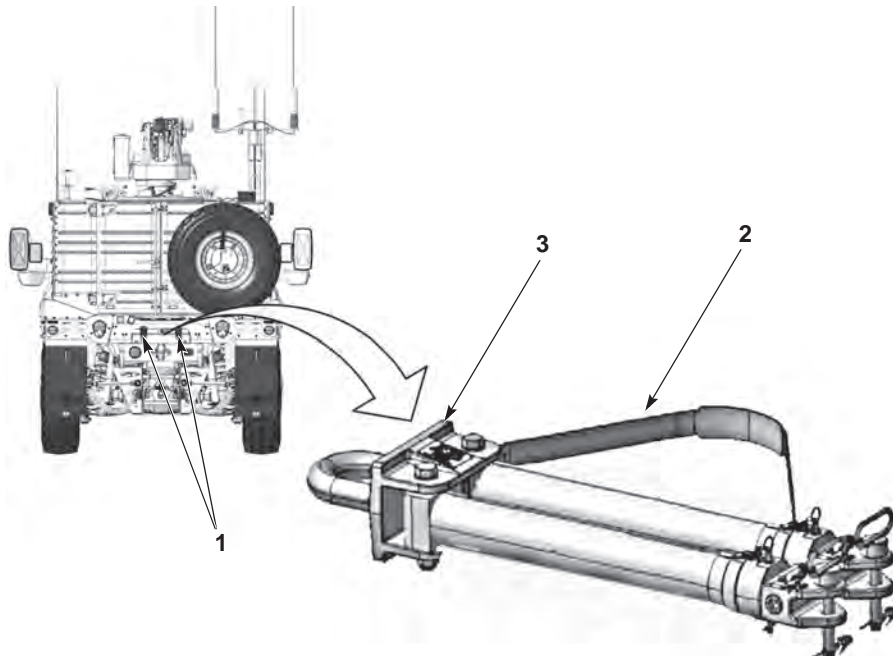
Towbar assembly weighs 70 lbs. (31.7 kg). Do not attempt to lift or move towbar assembly without the aid of an assistant. Failure to comply may result in injury to personnel.

NOTE

Task requires two personnel.

1. Remove two buckle straps (1) securing towbar (3) at the rear of the vehicle.
2. With the aid of an assistant, remove towbar assembly using lifting strap (2) from rear of the vehicle..
3. Remove the lifting strap (2) from the towbar (3).

END OF TASK

STOW TOWBAR**WARNING**

Towbar assembly weighs 70 lbs. (31.7 kg). Do not attempt to lift or move towbar assembly without the aid of an assistant. Failure to comply may result in injury to personnel.

NOTE

Task requires two personnel.

1. Secure the lift strap (2) to the towbar (3).
2. With the aid of an assistant, lift the towbar assembly using the lifting strap (2) into the rear of the vehicle.
3. Install the two buckle straps (1) securing the towbar to the vehicle.

END OF WORK PACKAGE

LUBRICATION INSTRUCTIONS

Intervals are based on normal operation. Intervals may be more frequent if lubricants are contaminated or if vehicle is being operated in adverse operating conditions. Intervals may also be more frequent if vehicle is operating under longer-than-usual operating hours. The interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

Items with a daily interval must be lubricated on a daily basis, but only prior to the first mission of the day.

If operator cannot access any lubrication point, notify Field Maintenance.

Intervals shown in this lubrication instruction are based on mileage and/or calendar times. An example of a mileage and calendar lubrication is 36/A, in which 36 stands for 3,600 miles and A stands for annually. The lubrication is to be performed at whichever interval occurs first for the vehicle.

Dashed lines indicate lubrication on both sides of the vehicle or equipment.

CLEANING. Clean fittings before lubricating. Clean parts and reusable filters with MIL-PRF-680 degreasing solvent type II or equivalent. Dry before lubricating.

LUBRICANTS. Lubricant types and operating temperature ranges are given within the key on pages 73-2 and 73-3. When changing or applying lubricants, be sure to follow the recommended temperature ranges for those lubricants.

AFTER FORDING. Lubricate all fittings below fording depth and check submerged gearboxes, engine, and transmission for the presence of water. Remove crankcase breather hose and inspect crankcase breather tube for sand and dirt. Perform flywheel housing lubrication.

AFTER HIGH-PRESSURE WASHING. Lubricate all grease fittings and oil can points outside and underneath vehicle.

VIEW. A reference to the appropriate localized view is given after the lubrication entry in most cases. Localized views begin on page 73-10.

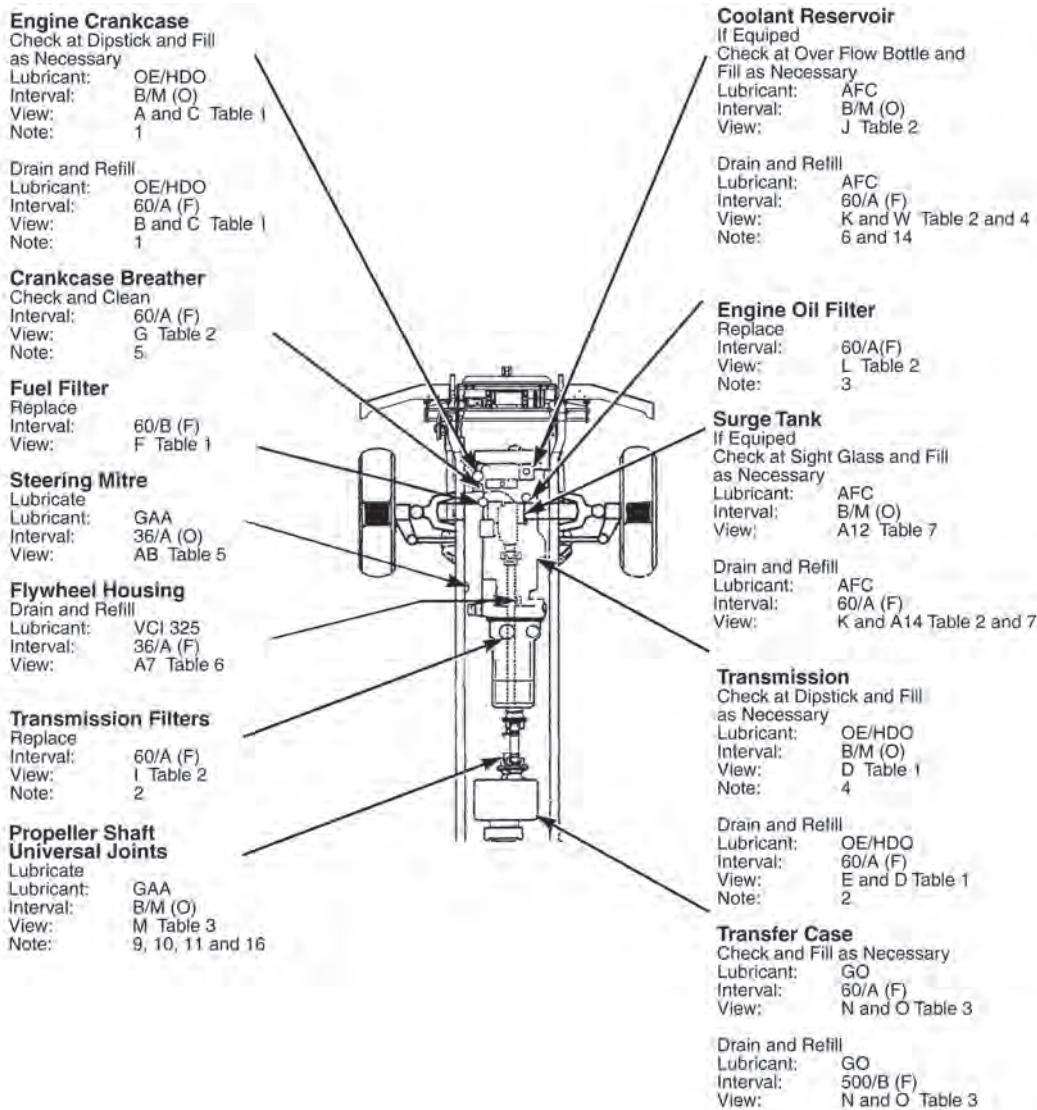
LEVEL OF MAINTENANCE. The lowest level of maintenance authorized to lubricate a point is indicated by one of the following: Operator/Crew (O), and Field Maintenance (F).

COOLANT. Protection to the lowest temperature expected should be the goal of any program. A 50/50 mix which protects to -34°F (-37°C).

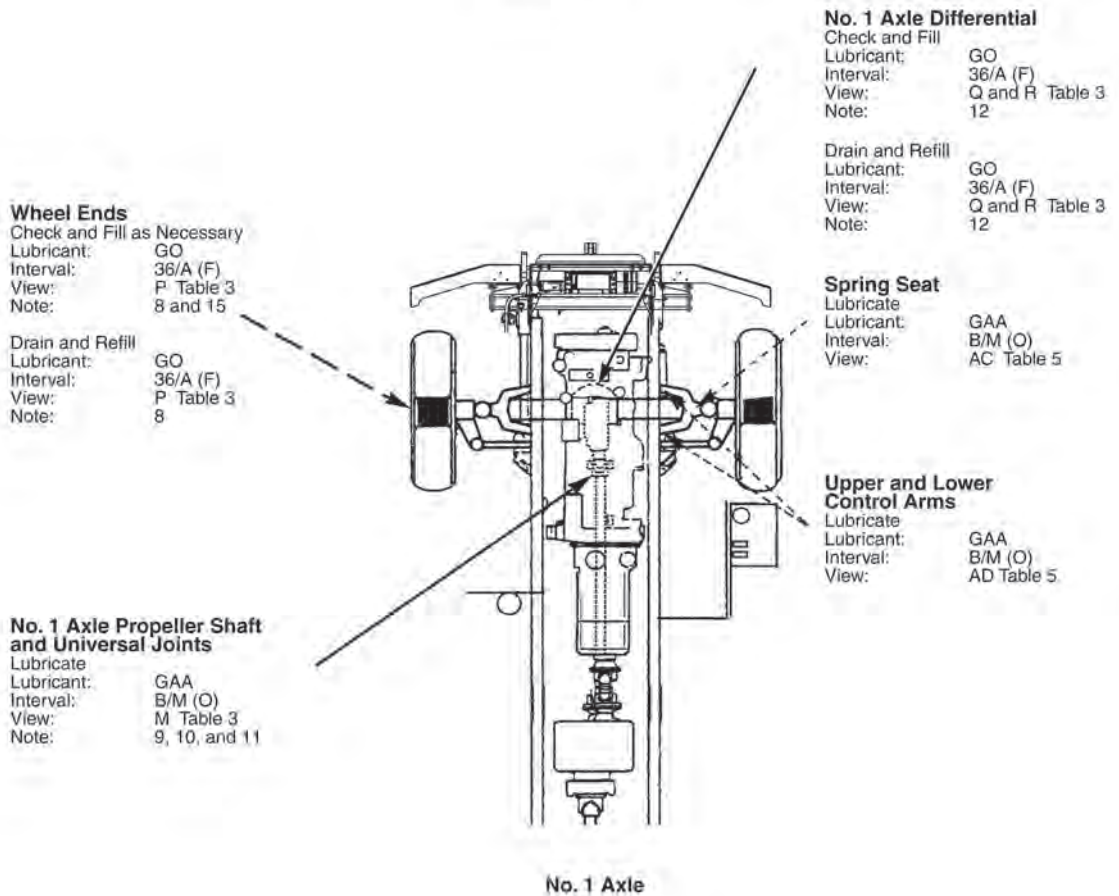
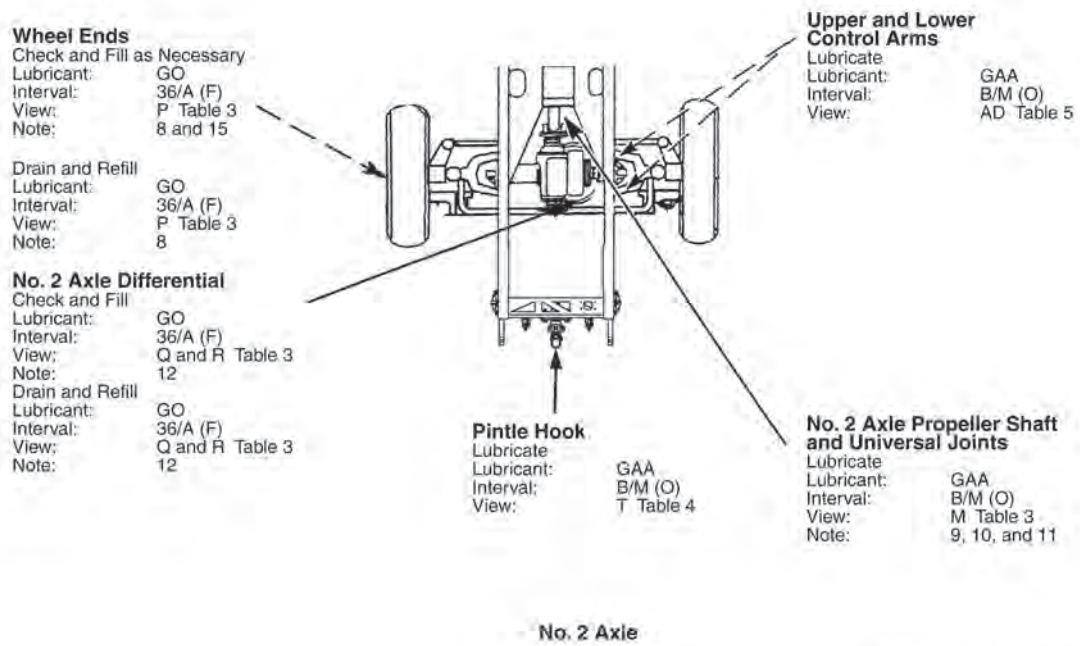
CONTENTS. This LI includes lubrication instructions and filter (lube and nonlube) maintenance information.

KEYS					
Lubricants		Capacities	Expected Temperatures		
			Above 32°F (Above 0°C)	32°F to 0°F (0°C to -18°C)	0°F to -25°F (-18°C to -46°C)
Lubricating Oil, Engine OE/ HDO (MIL-L- 2104) or OEA (MIL-PRF- 46167)	Engine Crankcase	20 qt. (18.9 L) w/filter	OE/HDO 15W40 NSN 9150-01- 421-1424	OE/HDO 15W40 NSN 9150-01- 421-1424	OEA-30W NSN 9150-00- 402-2372
	Power Steering Reservoir	9.5 qt. (9.0 L)	OE/HDO 10 NSN 9150-01- 496-1957	OE/HDO 10 NSN 9150-01- 496-1957	OEA-30W NSN 9150-00- 402-4478
	Winch Cable	A/R	OE/HDO 15W40 NSN 9150-01- 421-1424	OE/HDO 10 NSN 9150-01- 496-1957	OEA-30W NSN 9150-00- 402-2372
	SAE J2360	Transfer Case	5.1 qt (4.8 L)	GO 85W140 NSN 9150-01- 048-4591	GO 85W140 NSN 9150-01- 048-4591
	Transmission (Drain and Refill)	16 qt. (15.1 L) w/filter	OE/HDO 15W40 NSN 9150-01- 421-1424	OE/HDO 15W40 NSN 9150-01- 421-1424	OEA-30W NSN 9150-00- 402-2372
	Transmission (Dry)	26 qt. (24.6 L)	OE/HDO 15W40 NSN 9150-01- 421-1424	OE/HDO 15W40 NSN 9150-01- 421-1424	OEA-30W NSN 9150-00- 402-2372
Lubricating Oil, Carwell Lube	Oil Can Points	A/R	Carwell Lube NSN 8030-01- 414-8947	Carwell Lube NSN 8030-01- 414-8947	Carwell Lube NSN 8030-01- 414-8947
Anti-Freeze Coolant (AFC)	Radiator	31 qt. (29.3 L)	(AFC) Ethylene Glycol (MIL-A-46153) 50/50 Ratio Mixture NSN 6850-01-471-6530		
Gear Oil GO (MIL-L-2105)			Above 10°F (Above -12°C)	30°F to -15°F (-1°C to -26°C)	-15°F to -50°F (-26°C to -46°C)
	No. 1 Axle Differential	10.5 qt. (9.9 L)	GO 75W NSN 9150-01- 035-5391	GO 75W NSN 9150-01- 035-5391	GO 75W NSN 9150-01- 035-5391
	No. 2 Axle Differential	10.5 qt. (9.9 L)	GO 75W NSN 9150-01- 035-5391	GO 75W NSN 9150-01- 035-5391	GO 75W NSN 9150-01- 035-5391
	Wheel Ends	1.6 qt. (1.5 L)	GO 80W90 NSN 9150-01- 035-5393	GO 80W90 NSN 9150-01- 035-5393	GO 80W90 NSN 9150-01- 035-5393

KEYS			
Lubricants		Capacities	Expected Temperatures
Grease, Automotive and Artillery	Capsule Door Hinges		GAA MIL-PRF-10924F NSN 9150-01-197-7689
	Capsule Door Latch		
	No. 1 Axle Propeller Shaft and Universal Joints		
	No. 2 Axle Propeller Shaft and Universal Joints		
	Pintle Hook		
	Propeller Shaft Universal Joints		
	Spring Seat		
	Steering Mitre		
	Steering Shafts		
	Upper and Lower Control Arms		
Vapor Barrier Corrosion Inhibitor (MIL-PRF- 46002)	Flywheel Housing (Field Task)	3 oz (88.7 ml) VCI 325	NSN 9150-00-889-3523
Cleaning Compound, Windshield	Windshield Washer Reservoir	16 oz (473.2 ml)	NSN 685-00-926-2275
<p>INTERVALS B/M - Before/Monthly, A - Annually, B - Biennially (2 years), all numbers indicated in intervals should be multiplied by 100 (x100)</p>			



Engine, Transmission, Transfer Case, Fuel System, and Coolant System



Power Steering Reservoir

Check and Fill
 Lubricant: OE/HDO
 Interval: B/M (O)
 View: S Table 4
 Note: 13

Drain and Refill

Lubricant: OE/HDO
 Interval: 36/A (F)
 View: S Table 4

Power Steering Filter

Replace
 Interval: 36/A (F)
 View: S Table 4

Steering Shafts

Lubricate
 Lubricant: GAA
 Interval: B/M (O)
 View: AA and A4 Table 4 and 6
 Note: 16

Air Dryer Filter

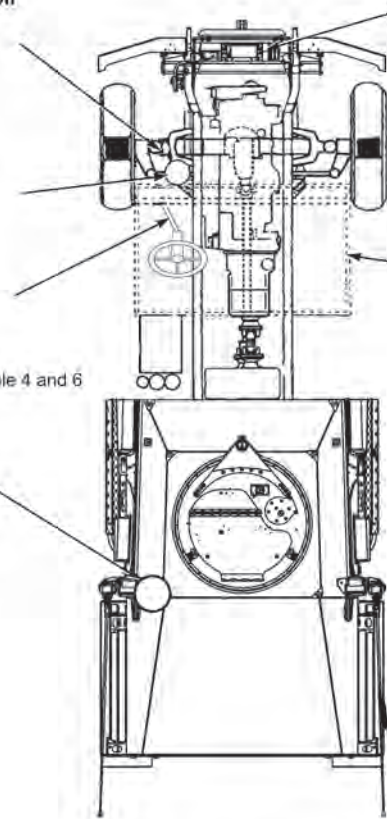
Coalescing Filter
 Desiccant Filter
 Replace
 Interval: 36/A (F)
 View: V Table 4

Winch Cable

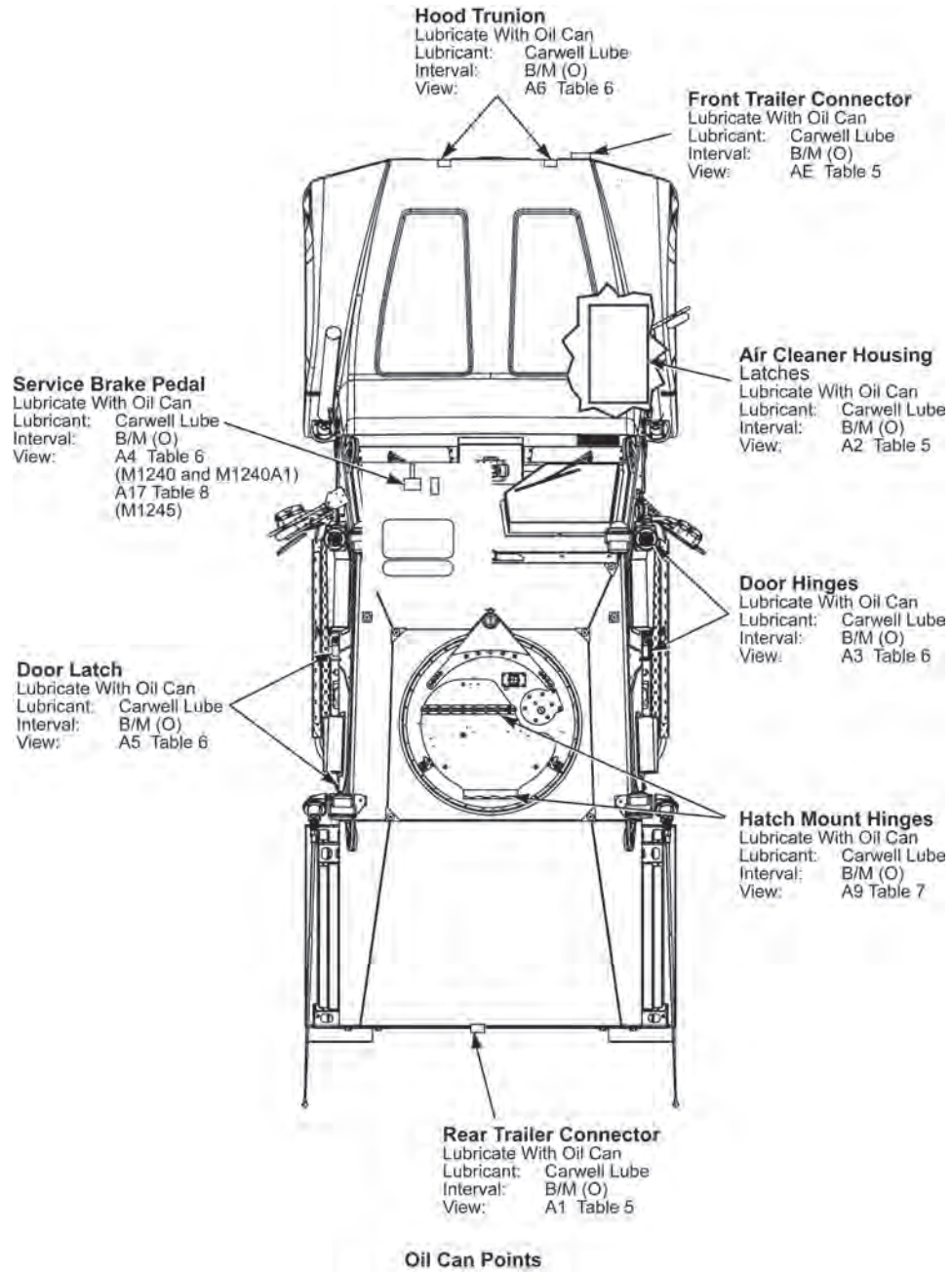
Check during winching operations
 Interval: D (O)
 Lubricate
 Lubricant: OE/HDO or OEA
 Interval: S(F)
 View: A18 Table 8

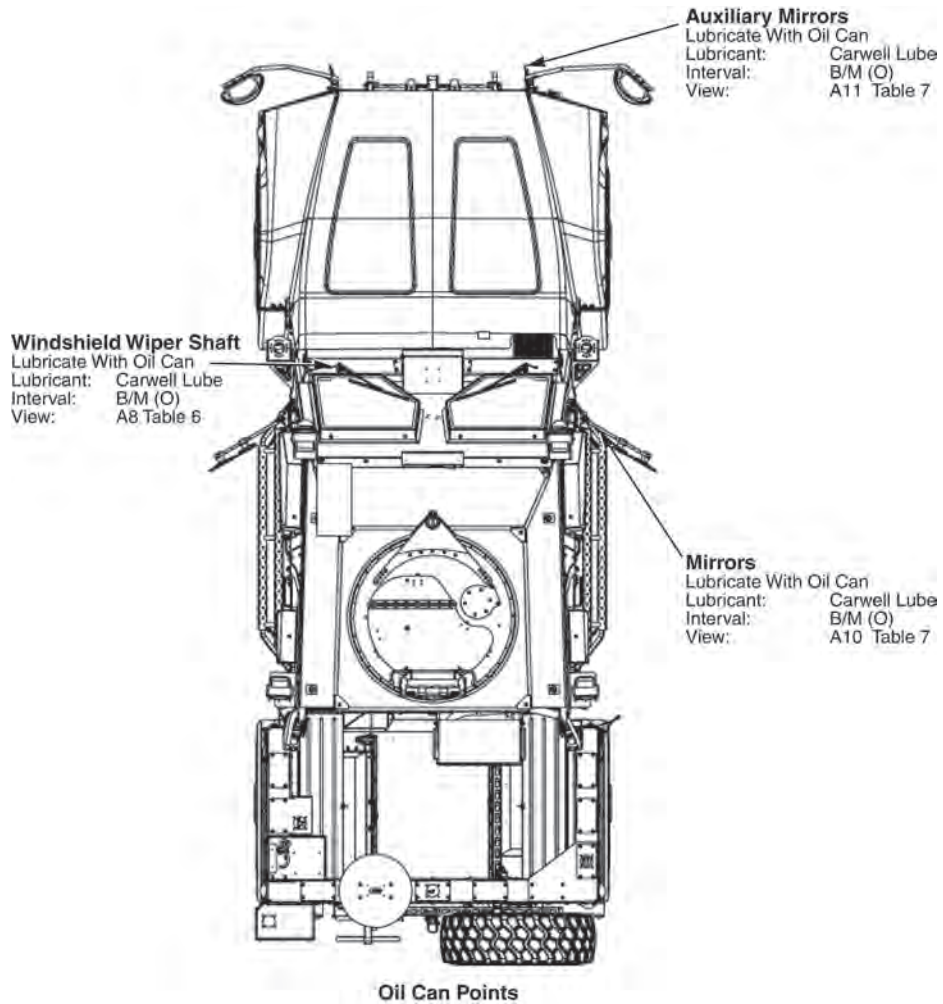
Air Filter

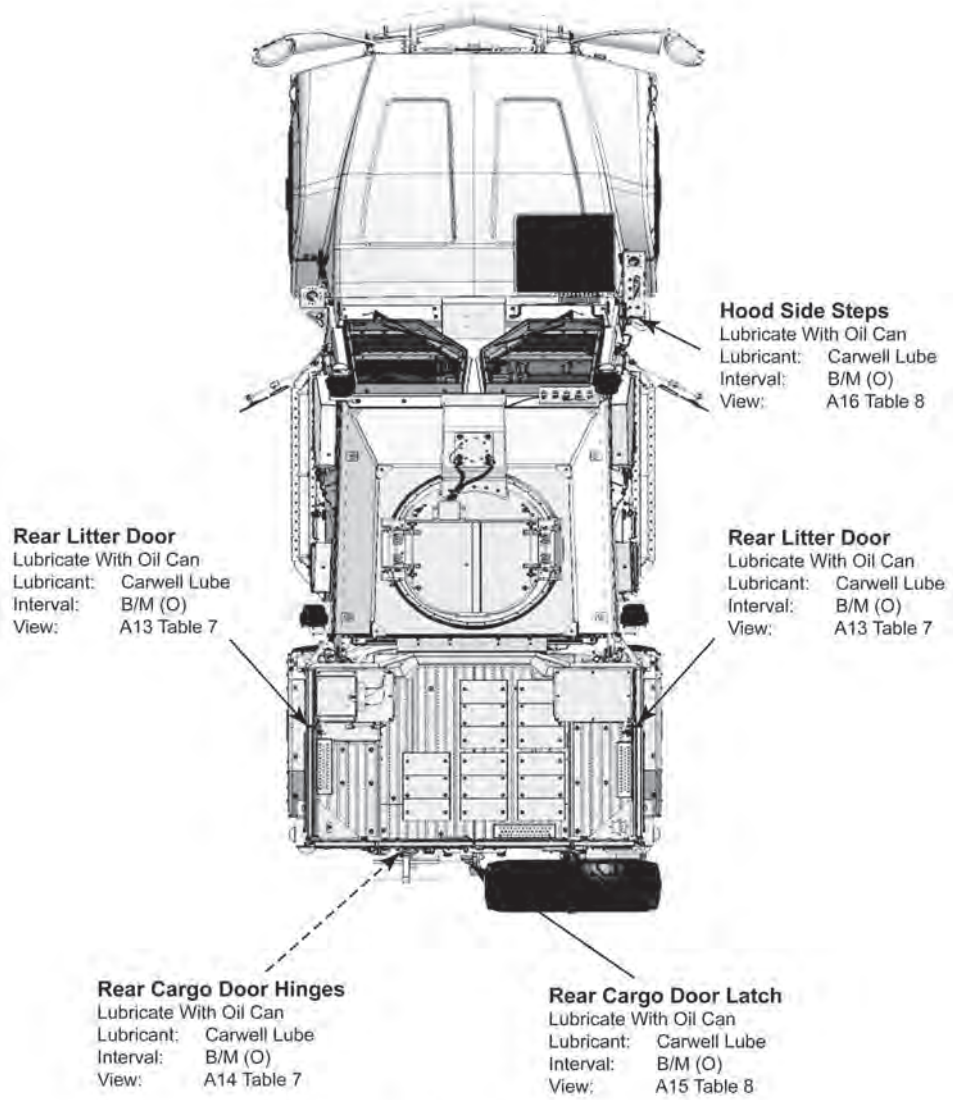
Replace
 Interval: 60/A (F)
 View: U Table 4



Air System, Winch, and Vehicle Exterior







**Oil Can Points
(M1245)**

Table 1.




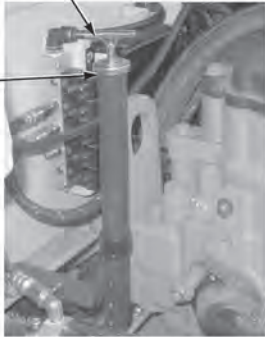


<p>(A)</p>  <p>CHECK</p> <p>ENGINE OIL DIPSTICK</p>	<p>(B)</p>  <p>DRAIN</p> <p>CRANKCASE DRAIN PLUG</p>
<p>(C)</p>  <p>FILL</p> <p>ENGINE OIL FILL CAP</p>	<p>(D)</p>  <p>CHECK</p> <p>FILL</p> <p>TRANSMISSION DIPSTICK & FILL</p>
<p>(E)</p>  <p>DRAIN</p> <p>TRANSMISSION OIL DRAIN</p>	<p>(F)</p>  <p>REPLACE</p> <p>CAT</p> <p>ROTATE</p> <p>FUEL FILTER</p>

Table 2.







<p>G CHECK AND CLEAN</p>  <p>CRANKCASE BREATHER</p>	<p>H REPLACE FILTER</p>  <p>CHECK DRAIN</p> <p>FUEL/WATER SEPARATOR</p>
<p>I</p>  <p>REPLACE</p> <p>TRANSMISSION FILTERS (LOOKING UP)</p>	<p>J CHECK AND FILL</p>  <p>COOLANT</p> <p>— COLD —</p> <p>COOLANT SYSTEM RESERVOIR</p>
<p>K</p>  <p>DRAIN</p> <p>RADIATOR DRAIN</p>	<p>L</p>  <p>REPLACE FILTER</p> <p>ROTATE</p> <p>ENGINE OIL FILTER</p>

Table 3.

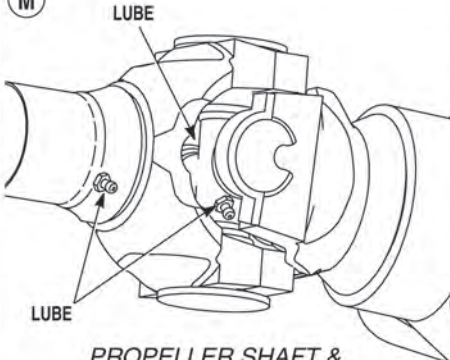





<p>M</p>  <p>LUBE</p> <p>LUBE</p> <p>PROPELLER SHAFT & UNIVERSAL JOINTS</p>	<p>N</p>  <p>CHECK AND FILL</p> <p>TRANSFER CASE FILL PLUG</p>
<p>O</p>  <p>DRAIN</p> <p>TRANSFER CASE DRAIN PLUG</p>	<p>P</p>  <p>ACCESS HOLES</p> <p>WHEEL ENDS</p>
<p>Q</p>  <p>CHECK AND FILL</p> <p>DIFFERENTIAL FILL PLUG</p>	<p>R</p>  <p>DRAIN</p> <p>DIFFERENTIAL DRAIN PLUG</p>

Table 4.






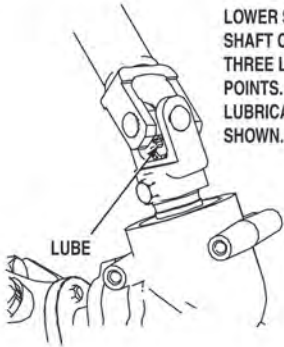
<p>(S)</p> <p>REPLACE CHECK AND FILL</p>  <p>POWER STEERING RESERVOIR</p>	<p>(T)</p> <p>LUBE</p>  <p>PINTLE HOOK</p>
<p>(U)</p> <p>REMOVE COVER AND REPLACE FILTER</p>  <p>AIR FILTER</p>	<p>(V)</p> <p>REMOVE SCREWS</p> <p>REPLACE FILTER</p> <p>LIFT</p>  <p>AIR DRYER FILTER</p>
<p>(W)</p> <p>COOLING SYSTEM FILL</p>  <p>COOLING SYSTEM FILL</p>	<p>(AA)</p> <p>LOWER STEERING SHAFT CONTAINS THREE LUBRICATION POINTS. LOWER LUBRICATION POINT SHOWN.</p> <p>LUBE</p>  <p>LOWER STEERING SHAFT</p>

Table 5.

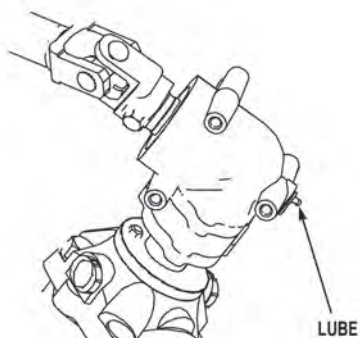

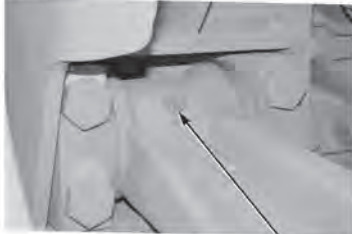

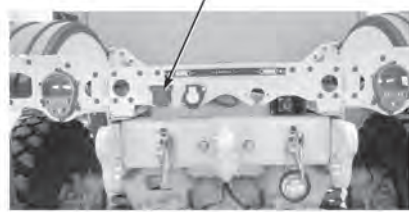
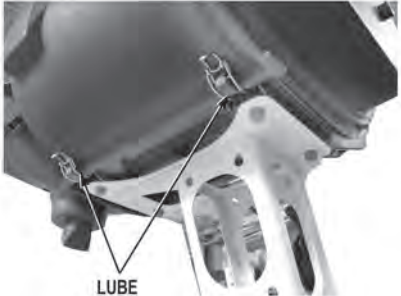
<p>(AB)</p>  <p>LUBE</p> <p>STEERING MITRE</p>	<p>(AC)</p>  <p>LUBE</p> <p>SPRING SEAT</p>
<p>(AD) BOTH UPPER AND LOWER CONTROL ARMS MUST BE LUBRICATED. LOWER SHOWN</p>  <p>LUBE</p> <p>CONTROL ARMS</p>	<p>(AE)</p>  <p>LUBE</p> <p>FRONT INTERVEHICLE CONNECTOR</p>
<p>(A1)</p>  <p>LUBE</p> <p>REAR INTERVEHICLE CONNECTOR</p>	<p>(A2)</p>  <p>LUBE</p> <p>AIR CLEANER HOUSING</p>

Table 6.


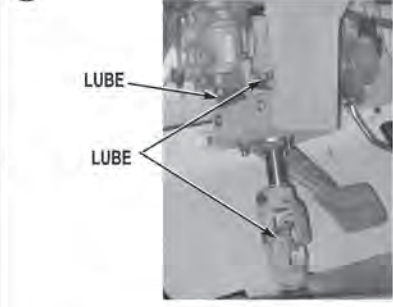

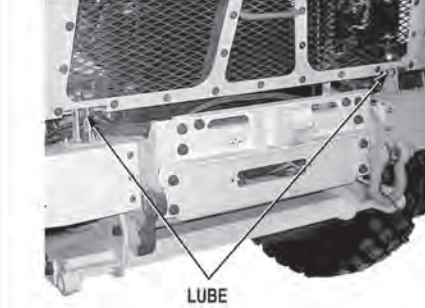
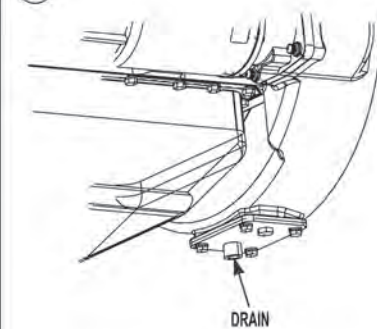
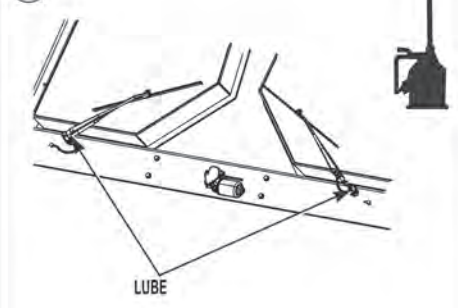
<p>(A3)</p>  <p>DOOR HINGES</p>	<p>(A4)</p>  <p>SERVICE BRAKE PEDAL & UPPER STEERING SHAFT</p>
<p>(A5)</p>  <p>DOOR LATCH</p>	<p>(A6)</p>  <p>HOOD TRUNNION</p>
<p>(A7)</p>  <p>FLYWHEEL HOUSING DRAIN</p>	<p>(A8)</p>  <p>WINDSHIELD WIPER SHAFT</p>

Table 7.

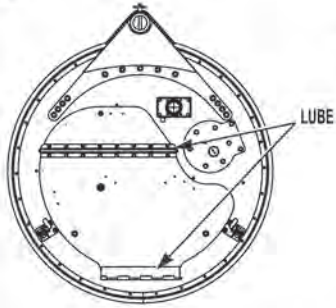
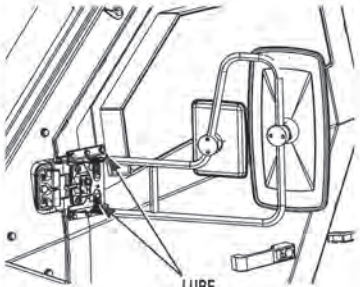
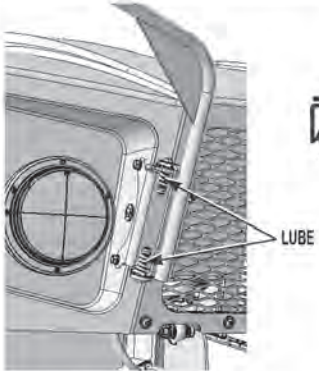
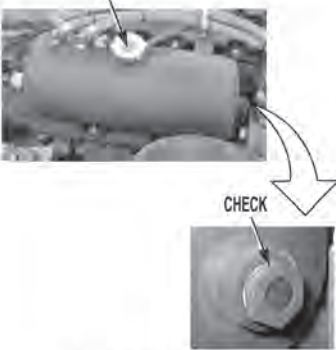

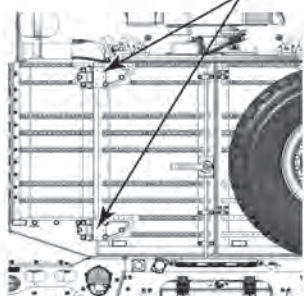
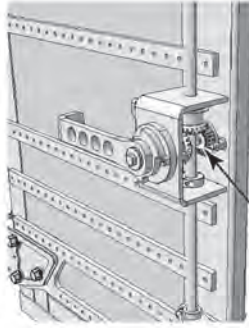

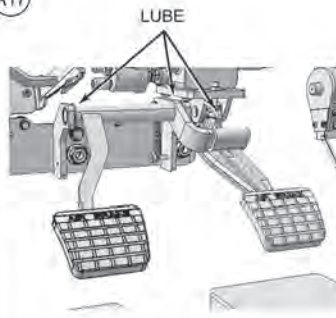
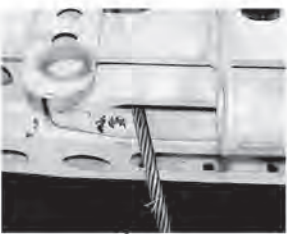
<p>A9</p>  <p>HATCH MOUNT HINGES</p>	<p>A10</p>  <p>MIRRORS</p>
<p>A11</p>  <p>AUXILIARY MIRRORS</p>	<p>A12</p>  <p>SURGE TANK</p>
<p>A13</p>  <p>REAR LITTER DOORS</p>	<p>A14</p>  <p>REAR CARGO DOOR HINGES</p>

Table 8.

<p>(A15)</p>  <p>LUBE</p> <p>REAR CARGO DOOR LATCH</p>	<p>(A16)</p>  <p>LUBE</p> <p>HOOD SIDE STEPS</p>
<p>(A17)</p>  <p>LUBE</p> <p>SERVICE BRAKE PEDALS</p>	<p>(A18)</p>  <p>LUBE</p> <p>SELF-RECOVERY WINCH CABLE</p>

NOTES

1. **Crankcase.** Check oil level with vehicle parked on level ground and the engine off and cool. Do not overfill.
2. **Transmission Fluid.** Transmission fluid must be changed after first 3,600 miles (5 792 km) of vehicle operation. After initial fluid change, fluid must be changed every 7,200 miles (11 585 km). Whenever transmission fluid is changed, transmission filters must also be changed.
3. **Engine Oil Filter.** After installing new filter, fill crankcase, run engine five minutes, and check housing for leaks. Shut off engine, check crankcase oil level, and bring to full mark.
4. **Transmission.** Refer to PMCS Table (WP 0059) for instructions on checking transmission fluid level.
5. **Crankcase Breather.** Loosen hose clamp and remove hose from crankcase breather assembly. Remove crankcase breather assembly from engine. Download ECM logged and active fault codes. Change oil and replace filter. Visually inspect turbocharger compressor for excessive endplay or compressor to wheel and housing contact. Wash the breather element in clean, nonflammable solvent. Allow the breather element to dry prior to reinstallation.
6. **Coolant Level.** After filling cooling system, run engine for five minutes. Shut off engine and check coolant level. Add coolant as required.

NOTE

Refer to local procedures and plans for the use, storage or disposal of drained fluids.

7. **Fuel/Water Separator.** Check fuel/water separator for leaks and/or damage. Visually check sediment bowl for water or contamination. If water or contamination is present, drain fuel from bowl into suitable container until clean fuel flows out.
8. **Wheel Ends.** Position one access hole in the 12 o'clock position and one hole in the 9 o'clock or 3 o'clock position. The oil level should be level with the bottom of the access hole in the 9 o'clock or 3 o'clock position. If oil needs to be added it must be added through the top access hole.
9. **Purging of Lubricant.** When using a grease gun, apply lubricants to the fitting until clean lubricant squeezes out of the part being lubricated.

CAUTION

Rotate universal joint to obtain access to the fitting. Forcing the grease gun onto the fitting can result in broken or damaged fitting.

10. **Universal Joints.** Use the proper lubricants to purge all four bearing seals of each universal joint. Lubricate grease fitting until new grease is evident at seal. This flushes abrasive contaminants from each bearing and ensures that all four bearings are filled properly. More than one grease fitting may be installed in a universal joint. Apply grease to only one fitting.
11. If any seals fail to purge, move propeller shaft from side to side while applying gun pressure. This allows greater clearance on thrust end of the bearing that is not purging.
12. **Differentials.** Differential oil level is at the bottom of the check/fill plug. Fill through check/fill hole until oil starts to run out.
13. **Power Steering Reservoir.** Fluid level must be checked when fluid is in a cold condition.

-
14. **Cooling System.** Refer to TB 750-651 for use of antifreeze solutions, cleaning compounds, and testing.
- Protection to the lowest temperature expected should be the goal of any program. A 50% mix of ethylene glycol-to-water protects to -34°F (-37°C) and should be used in most cases.
 - For protection from -34 to -64°F (-37 to -53°C) use a 60% ethylene glycol to water mix.
 - Do not use more than a 60% ethylene glycol-to-water mix.
15. Oil in wheel ends may look milky due to bronze components of wheel ends. When doing wheel end inspections, check oil in all wheel ends. Oil color in all wheel ends should be consistent. If there is a significant difference in one wheel end, when compared to other three wheel ends, check inside wall of wheel for leaks. If a leak is present, replace wheel seals on affected wheel.
16. Field maintenance may be required to assist operator in component removal in order to complete lubrication.

END OF WORK PACKAGE

CHAPTER 6

SUPPORTING INFORMATION FOR M1240, M1240A1, AND M1245

REFERENCES

SCOPE

This work package lists all pamphlets, field manuals, technical bulletins, and technical manuals referenced in this manual.

ARMY REGULATION

AR 385-10	Army Safety Program
AR 750-1	Army Material Maintenance Policy

DEPARTMENT OF ARMY PAMPHLETS

DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual
SDDCTEA PAMPHLET 55-20	Tiedown Handbook For Truck Movements

FIELD MANUALS

FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather
----------	---

FORMS

DA FORM 2028	Recommended Changes to Publications and Blank Forms
DA FORM 2404/5988E	Equipment Inspection and Maintenance Worksheet
SF 368	Product Quality Deficiency Report

TECHNICAL BULLETINS

TB MED 507	Heat Stress Control and Heat Stress Management
TB MED 508	Prevention and Management of Cold Weather Injuries
TB 750-651	Use of Antifreeze Solutions, Antifreeze Extender Cleaning Compounds and Test Kit in Engine Cooling Systems

TECHNICAL MANUALS

TM 750-244-6

Procedures for Destruction of Tank Automotive
Equipment to Prevent Enemy Use (U.S. Army
Tank-Automotive Command)

END OF WORK PACKAGE

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

SCOPE

This work package lists COEI and BII for the M-ATV M1240, M1240A1, and M1245 to help you inventory items for safe and efficient operation of the equipment.

GENERAL

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the M-ATV. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the M-ATV in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the M-ATV during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify items.

EXPLANATION OF COLUMNS IN THE COEI LIST AND BII LIST

Column (1) - Item Number. Gives you the reference number of the item listed.

Column (2) - National Stock Number (NSN) and Illustration. Identifies the stock number of the item to be used for requisitioning purposes and provides an illustration of the item.

Column (3) - Description, Part Number (CAGEC). Identifies the Federal Item name followed by a minimum description when needed. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC).

Column (4) - Usable On Code (UOC). When applicable, gives you a code if the item you need is not the same for different models of equipment.

Column (5) - U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) - Qty Rqr. Indicates the quantity required.

Table 1. Components of End Item M-ATV.

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
		NONE			

Table 2. Basic Issue Items For M-ATV.


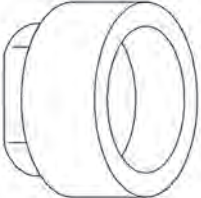


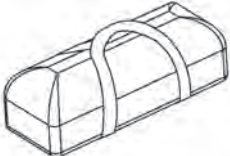
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
1	4930-00-204-2550 	Adapter, Grease Gun 5855 (36251)		EA	1
2	4910-01-600-4974 	Adapter, Jack CMR010391 (19207)		EA	1
3	8105-01-353-2497 	Bag, Assembly, Pamphlet 1362710 (45152)		EA	1
4	8105-01-439-6178 	Bag, Stowage 10557985 (56161)		EA	2
5	5140-00-473-6256 	Bag, Tool 5140-00-473-6256 (64067)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

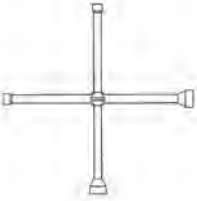

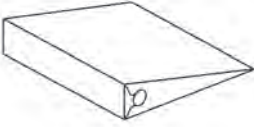
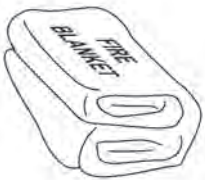


(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
6	2590-01-550-2593 	Bar, Emergency 40163 (75204)		EA	1
7	5120-00-224-1372 	Bar, Pinch, 26 in. 02710 (66080)		EA	1
8	7510-00-889-3494 	Binder, Loose-Leaf 11677003 (19207)		EA	1
9	4210-01-324-2734 	Blanket, Fire 49316 (1GC30)		EA	2
10	7920-00-269-1259 	Brush, Wire 20010 (76861)		EA	1
11	6150-01-577-2785 	Cable Assy, NATO Slave 12 ft. TGC2336-4 (61090)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)


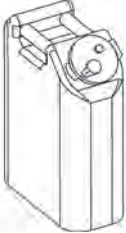
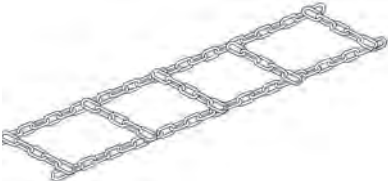
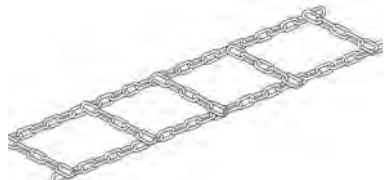
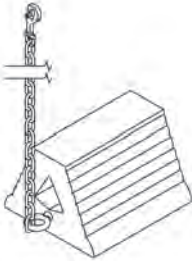
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
12	7240-01-337-5268 	Can, Fuel, Military, Tan 3819247 (45152)		EA	2
13	7240-00-089-3827 	Can, Water, Plastic, 5 Gal, Tan 3819249 (45152)		EA	2
14	2540-01-492-2989 	Chain Assembly, Tire (M1240, M1245) HERKUL SK07 (46156)		EA	4
15	2540-01-593-1152 	Chain Assembly, Tire (M1240A1) 3274665 (45152)		EA	2
16	2540-01-500-6119 	Chock, Wheel A52475-2 (58536)		EA	2

Table 2. Basic Issue Items For M-ATV. (Continued)


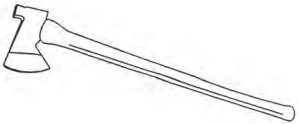
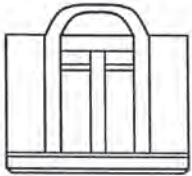


(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
17	5120-01-416-8568 	Combination Tool, Hand 5120-01-416-8568 (80244)		SE	1
	5110-01-416-7827 	a. Axe, Single Bit 595-010 (0T9K4)		EA	1
	5140-01-416-8569 	b. Bag, Carrying, Combination Tool 595-030 (0T9K4)		EA	1
	5120-01-416-8572 	c. Broad Pick Attachment 595-070 (0T9K4)		EA	1
	5120-01-416-8575 	d. Lock Pin Set (Set of 12) 595-999 (0T9K4)		SE	1

Table 2. Basic Issue Items For M-ATV. (Continued)

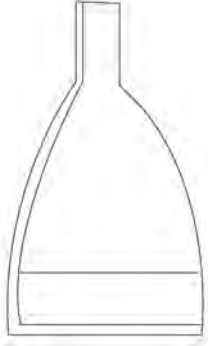

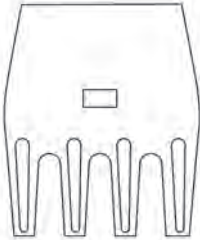

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
	5120-01-416-8571 	e. Mattock Attachment 595-050 (0T9K4)		EA	1
	5120-01-416-8573 	f. Pick Attachment 595-060 (0T9K4)		EA	1
	5120-01-416-8577 	g. Rake-Hoe Attachment 595-080 (0T9K4)		EA	1
	5120-01-416-8574 	h. Rake-Hoe Fastener 595-090 (0T9K4)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)


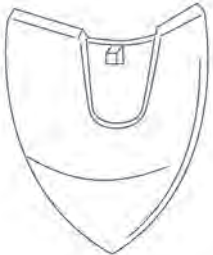



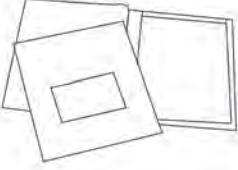
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
	5110-01-416-7830 	i. Sheath, Ax Head 595-020 (0T9K4)		EA	1
	5120-01-416-8570 	j. Shovel Attachment 595-040 (0T9K4)		EA	1
18	6110-01-575-8471 	Controller, Winch 85394 (27646)		EA	1
19	5120-00-224-1390 	Crowbar 58 in. (147.3 cm) 5120-00-224-1390 (80244)		EA	1
20	2590-01-576-2424 	Cutter, Strap 22-01943 (0RAU7)		EA	5
21	7510-01-065-0166 	Equipment Record Folder 3819258 (45152)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)




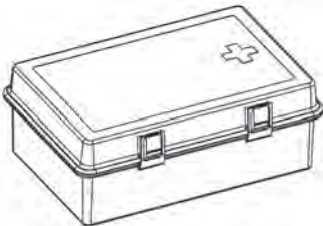

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
22	5120-00-022-9797 	Extension, Socket, 10.0 X 1/2 in. Drive FX61 (C7127)		EA	1
23	5120-01-335-1050 	Extension, Socket, 5.0 X 1/2 in. Drive SXX5 (55719)		EA	1
24	4210-01-577-3170 	Fire Extinguisher 15917 (54905)		EA	2
25	6545-00-922-1200 	First Aid Kit, General Purpose 11677011 (19207)		EA	2
26	4730-00-050-4208 	Fitting, Lubrication, Straight 4759 (52304)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

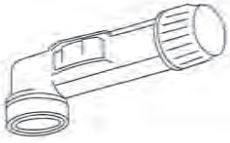
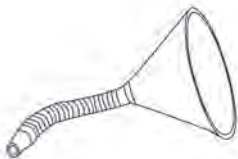

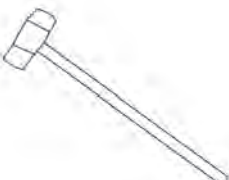

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
27	6230-00-264-8261 	Flashlight N47-IB (84609)		EA	2
28	7240-00-559-7364 	Funnel, Steel, Flex Mount 495 (0T115)		EA	1
29	5120-00-061-8546 	Hammer, Ball Peen, 32 oz 11677028-3 (19207)		EA	1
30	5120-00-243-2957 	Hammer, Sledge, Double-Face 10 lb 13471 (79202)		EA	1
31	5120-01-242-7218 	Handle, Sliding Tee, 3/4 in. Drive 1505380 (45152)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

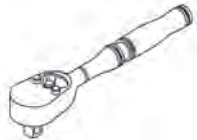



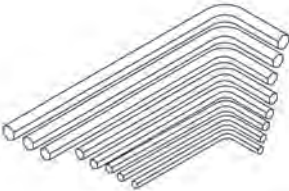
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
32	5120-00-230-6385 	Handle, Socket, Wrench 1/2" in. Drive 71M (C7127)		EA	1
33	4910-01-038-2820 	Inflator-Gauge, Pneumatic Tire, 18 ft 11677140-5 (19207)		EA	1
34	4010-01-153-9403 	Instl, Wire Rope (Located On Spare Tire Winch) 66295AX (45152)		EA	1
35	5120-01-351-2074 	Jack, Hydraulic 20 Ton 76520 (61674)		EA	1
36	5120-01-335-1508 	Key Set, Socket Head, (Contains 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 17, and 19 mm) AWM140DK (55719)		SE	1

Table 2. Basic Issue Items For M-ATV. (Continued)

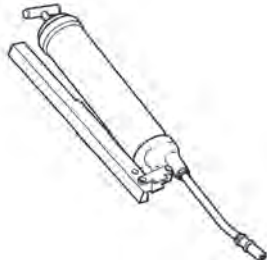




(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
37	4930-01-480-9063 	Lubricating Gun, Hand 30-465 (77335)		EA	1
38	5120-00-243-7328 	Lug Nut Wrench Extension, 8 in. (3/4 in. Dr) 3819331 (45152)		EA	1
39	5310-01-288-1116 	Nut, Self-Locking (Located on Tire Carrier Winch) 10823-00318 (0Y3H3)		EA	3
40	5340-00-158-3807 	Padlock AA59487-2SC (58536)		EA	2
41	8345-00-174-6865 	Panel, Marker 8345-00-174-6865 (64067)		EA	2

Table 2. Basic Issue Items For M-ATV. (Continued)


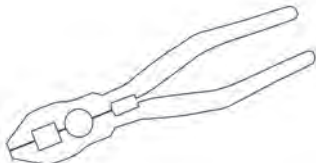



(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
42	4910-01-577-1432 	Plate, Jack Support 3819327 (45152)		EA	1
43	5120-00-239-8251 	Pliers, Side Cutting, 8 in. 67-067 (08292)		EA	1
44	5120-00-223-7397 	Pliers, Slip Joint, 8 in. B107.23 (05047)		EA	1
45	5340-01-582-5124 	Ring Assembly, Tie Down (On Cargo Deck) 3848524 (45152)		EA	4
46	5306-01-287-5714 	Screw, Cap, Hex (Located on Spare Tire Winch) 0155849 (0Y3H3)		EA	3

Table 2. Basic Issue Items For M-ATV. (Continued)



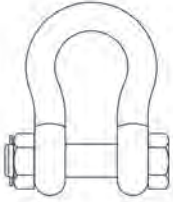


(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
47	5120-01-398-8053 	Screwdriver, Phillips #3, 6 in. SDFP56 (00NS2)		EA	1
48	5120-00-293-3309 	Screwdriver, Standard, 10 in. 66-160 (1CV05)		EA	1
49	4030-01-187-0964 	Shackle 12328579 (19207)		EA	4
50	2510-01-321-1221 	Shackle, Screw Pin G-209-1 1/4 (75535)		EA	1
51	5120-01-349-1042 	Socket 10MM X 1/2 in. Drive, 6 PT 3819321 (45152)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

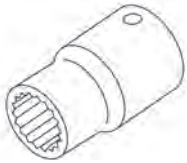




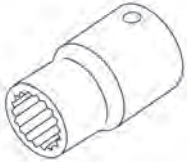

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
52	5120-01-398-8033 	Socket 13MM X 1/2 in. Drive, 6 PT 00944255000 (53800)		EA	1
53	5120-01-398-7943 	Socket 14MM X 1/2 in. Drive, 6 PT 3819323 (45152)		EA	1
54	5120-01-348-9035 	Socket 16MM X 1/2 in. Drive, 6 PT 3819324 (45152)		EA	1
55	5120-01-348-9037 	Socket 18MM X 1/2 in. Drive, 6 PT 3819325 (45152)		EA	1
56	5120-01-398-7919 	Socket 19MM X 1/2 in. Drive, 6 PT 3819326 (45152)		EA	1
57	5120-01-398-7937 	Socket Wrench, 1/2 in. Drive 1/2 in. 6 PT 3819314 (45152)		EA	1
58	5130-00-714-0600 	Socket Wrench, 1/2 in. Drive 15/16 in. 6 PT Deep Well, Impact 7330H (1CV05)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)








(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
59	5120-00-189-7985 	Socket Wrench, 1/2 in. Drive 3/4 in. 12 PT 3819317 (45152)		EA	1
60	5120-00-189-7946 	Socket Wrench, 1/2 in. Drive 5/8 in. 12 PT 3819316 (45152)		EA	1
61	5120-01-366-8399 	Socket Wrench, 1/2 in. Drive 7/16 in. 12 PT V162R (76377)		EA	1
62	5120-00-189-7934 	Socket Wrench, 1/2 in. Drive 7/8 in. 12 PT 3819318 (45152)		EA	1
63	5120-00-189-7932 	Socket Wrench, 1/2 in. Drive 9/16 in. 12 PT 3819315 (45152)		EA	1
64	5130-01-400-0196 	Socket, Lug Nut, 33MM, Impact 3/4 in. Drive 3819333 (45152)		EA	1
65	7240-00-177-6154 	Spout, Flexible, Can 11677020 (19207)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

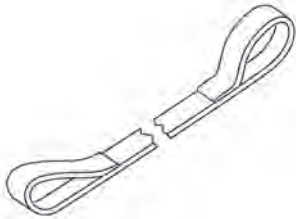
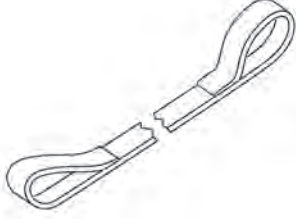

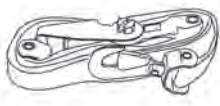

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
66	5340-01-599-0238 	Strap, Nylon, 60 in. 395/85R20 3967774 (45152)		EA	1
67	5340-01-599-0234 	Strap, Nylon, 70 in. 16.00R20 3981427 (45152)		EA	1
68	5340-00-340-0980 	Strap, Rubber 197940 (0GPL7)		EA	3
69	5340-01-577-2673 	Strap, Tie Down (1x Used to Secure Tire) FDC 3700-220 (00994)		EA	3
70		Technical Manual, Operators 3829256 (45152)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)


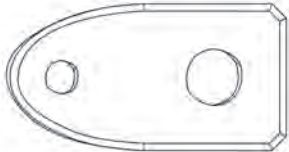
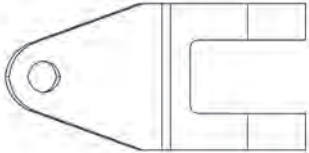




(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
71	2530-01-520-6537 	Adapter, HMMWV 3406264 (45152)		EA	2
72	2540-01-577-3987 	Adapter, Towbar M1240/M1245 Only 3834756 (45152)		EA	2
73	2540-01-577-3988 	Adapter, Towbar, M1240/M1245 Only 2512-100-002 (1SC69)		EA	2
74	4010-01-577-4959 	Chain, Recovery ASSY 3829510 (45152)		EA	1
75	5995-00-772-8813 	Harness, Intervehicular 24V 64297CX (45152)		EA	1
76	4720-01-582-5006 	Hose ASSY, Intervehicular 3410504 (45152)		EA	1
77	4720-01-582-5003 	Hose ASSY, Intervehicular 3410503 (45152)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

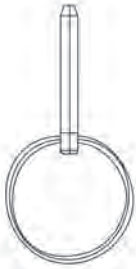
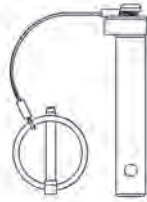
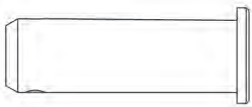
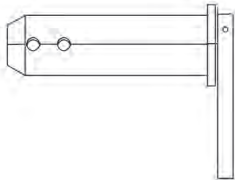
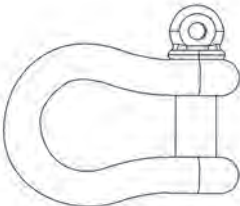
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
78	5310-01-490-7325 	Pin, Quick Release 34072 (99984)		EA	4
79	5315-01-520-6541 	Pin, Straight, Headed 3379668 (45152)		EA	2
80	5315-01-500-5324 	Pin, Straight, Headed 3390992 (45152)		EA	2
81	5315-01-228-0416 	Pin, Straight, Headed 1476010W (45152)		EA	2
82	4030-01-504-7788 	Shackle 3442534 (45152)		EA	2

Table 2. Basic Issue Items For M-ATV. (Continued)

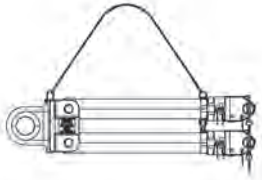

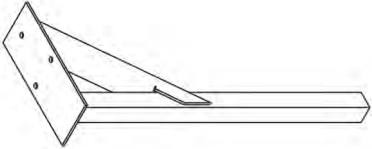
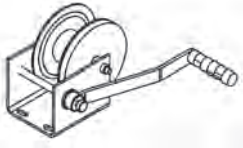


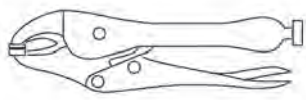
(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
83	2540-01-577-3683 	Towbar, Medium-Duty, IBISTEK (M1245 Only) 2512-100-001 (1SC69)		EA	1
84	9905-01-480-0644 	Warning Kit, Highway 182-04-620 (20984)		EA	1
85	2590-01-577-3992 	Winch Bracket (Attached to Rear of Vehicle) 3838929 (45152)		EA	1
86	3950-01-154-6794 	Winch, Drum, Hand Operated 3320108 (45152)		EA	1
87	5120-00-264-3796 	Wrench, Adjustable, 12 in. 11655778-5 (19207)		EA	1

Table 2. Basic Issue Items For M-ATV. (Continued)

(1) Item Number	(2) National Stock Number (NSN) and Illustration	(3) Description, Part Number (CAGEC)	(4) Usable on Code UOC	(5) U/I	(6) Qty Rqr
88	5120-00-240-5328 	Wrench, Adjustable, 8 in. 3819329 (45152)		EA	1
89	5120-00-494-1911 	Wrench, Plier, Curve 0502L3 (1JU00)		EA	1

END OF WORK PACKAGE

ADDITIONAL AUTHORIZATION LIST (AAL)

SCOPE

This work package lists additional items that are authorized for the support of the M-ATV vehicle.

GENERAL

This list identifies items that do not have to accompany the M-ATV vehicle and that do not have to be turned in with it.

EXPLANATION OF COLUMNS IN THE AAL

The following provides an explanation of columns found in the tabular listings:

1. **Column (1) - National Stock Number (NSN).**

Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

2. **Column (2) - Description.**

Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The description is followed by the Part Number (in parenthesis).

3. **Column (3) - Unit of Issue (U/I).**

Indicates the quantity issued when ordering the component. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR).

4. **Column (4) - Quantity Required (Qty Rqr).**

Indicates the quantity of the item authorized to be used with/on the equipment.

Table 1. Additional Authorization List (M1240 and M1240A1).

(1) NSN	(2) Description	(3) U/I	(4) Qty Rqr
4010-01-520-7142	Chain (3440352)	1	1
5120-01-435-6719	Mirror, Inspection (577)	1	1
5340-01-577-2673	Strap, Tiedown (FDC 3700-220)	1	1

Table 2. Additional Authorization List (M1245).

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(4) U/I	(5) Qty Rqr
2540-01-587-3708	Armor, Dyneema Panel, Litter Door, 3906720 (04HN8)	EA	2
2540-01-587-3712	Armor, Dyneema Panel, Rear Cargo Door, LH, 3906723 (04HN8)	EA	1
2540-01-587-3710	Armor, Dyneema Panel, Rear Cargo Door, RH, 3906722 (04HN8)	EA	1
2540-01-587-3695	Armor, Dyneema Panel, Rear Wall, 3906719 (04HN8)	EA	2
2540-01-587-3692	Armor, Dyneema Panel, Side Wall, 3906718 (04HN8)	EA	2
2540-01-587-3716	Armor, Sidewing, LH, 3901947 (04HN8)	EA	1
2540-01-587-3714	Armor, Sidewing, RH, 3901948 (04HN8)	EA	1
2540-01-586-5809	BIl Stowage Box, 3899299 (04HN8)	EA	2
2540-01-587-3843	Blackout Cover, Front Driver Side, J103113-101(3DYM9)	EA	1
2540-01-587-3858	Blackout Cover, Front Pass. Side, J103113-102 (3DYM9)	EA	1
2540-01-587-3855	Blackout Cover, Rear Driver Side, J103114-101 (3DYM9)	EA	1
2540-01-587-3861	Blackout Cover, Rear Pass. Side, J103114-102 (3DYM9)	EA	1
2540-01-587-3833	Blackout Cover, Windshield Driver Side, J103112-101 (3DYM9)	EA	1
2540-01-587-3840	Blackout Cover, Windshield Passenger Side, J103112-102 (3DYM9)	EA	1
2590-01-587-3724	Can, Ammo, 3-Bay, M3378 (04HN8)	EA	2
6545-01-537-7904	CASEVAC Kit w/TCCC Litter, SK-1200, (7Z446)	KIT	1
TBD	Combat Lock Key, 3868101 (45152)	EA	2
4220-01-535-4740	Cylinder, Air, Diving Equipment, 300YEL (49537)	EA	5
5325-01-587-5525	D-Ring, 40340-21 (04HN8)	EA	16
5325-01-587-5534	D-Ring, Large, 47556-11 (04HN8)	EA	16
4030-01-589-6348	D-Ring Shackle, 3888750 (45152)	EA	4
2540-01-589-6212	Floor, Quicklock, 3890635 (45152)	EA	1
2540-01-589-6209	Floor, Quicklock, LH, 3893814 (45152)	EA	1
2540-01-589-6207	Floor, Quicklock, RH, 3893813 (45152)	EA	1
4010-01-573-8973	Kinetic Rope, MP8000K (3HYB7) (45152)	KIT	1
TBD	Lighting, Emergency Egress, HaLO, TBD	SET	1
2590-01-587-3862	Litter Arm, Mounting Plate, 50-424 (515E6)	EA	2
2590-01-587-3866	Litter Arm, Pivot Assembly, 50-423 (515E6)	EA	2
2590-01-587-3869	Litter Arm, Universal, 50-422 (515E6)	EA	2
5340-01-587-4627	Missile Mount, Velcro, M4558 (04HN8)	EA	8
1005-01-587-3794	Mount, Arm, Machine Gun, Rear, SA10-01 (0DDW5)	EA	1

Table 2. Additional Authorization List (M1245). (Continued)

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(4) U/I	(5) Qty Rqr
1005-01-587-9018	Mount, Gun, Rear, M1972 (04HN8)	EA	2
1005-01-587-3796	Mount, Machine Gun, Rear, K24-095 (0DDW5)	SET	1
5310-01-155-1905	Nut, Flg, LKSP .31-18 G8 PO, 115303A (45152)	EA	12
2540-01-586-5825	Push Bumper, 3865776 (45152)	EA	1
2590-01-587-3787	Rack, Ammo, 3-Bay, M1936 (04HN8)	EA	1
2590-01-587-3719	Rack, Ammo, Outside, 3-Bay, M4649 (04HN8)	EA	1
5305-01-485-3136	Screw, Cap, Hex .31-18X1.25 G8 PO, 3278917 (45152)	EA	12
TBD	Screw, Cap, Hex .31-18X.50 G8 ZY, 2CH374 (TBD)	EA	213
5306-00-226-4837	Screw, Hex, Mounting, 5/16 -18 x 1/2 G8 ZY, MS90728-44 (96906)	EA	24
5340-01-587-8972	Strap, Ammo, M1562 (04HN8)	EA	2
5340-01-587-4879	Strap Assembly, M4532 (04HN8)	EA	10
5310-01-587-4883	Tracknut Assembly, Single, M4430 (04HN8)	EA	24
2590-01-589-6313	Track, Tie Down 21 x Ø, 3902307 (45152)	EA	5
2590-01-589-6316	Track, Tie Down 11 x Ø, 3902306 (45152)	EA	4
2590-01-589-6319	Track, Tie Down 20 x Ø, 3902158 (45152)	EA	1
2590-01-589-6243	Track, Tie Down 23 x Ø, 3898006 (45152)	EA	13
2590-01-589-6322	Track, Tie Down 28 x Ø, 3898005 (45152)	EA	27
2590-01-589-6212	Track, Tie Down 15 x Ø, 3898004 (45152)	EA	23
2590-01-589-6314	Track, Tie Down 13 x Ø, 3898003 (45152)	EA	15
2590-01-589-6317	Track, Tie Down, 3891928 (45152)	EA	6

END OF WORK PACKAGE

EXPENDABLE AND DURABLE ITEMS LIST

SCOPE

This work package lists expendable and durable items needed to operate and maintain the M-ATV.

EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to the entry in the listing and may be referenced in Initial Setup area to identify the material.

b. Column (2) - National Stock Number. This is the National Stock Number assigned to the item; use it to request or requisition the item.

c. Column (3) - Description. Indicates the Federal Item name, part number, and the Commercial and Government Entity (CAGE) Code.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by two-character alphabetical abbreviations (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table 1. Expendable and Durable Items List.

(1) Item Number	(2) National Stock Number	(3) Description	(4) U/M
1	6850-00-926-2275	Cleaning Compound, Windshield 0854-000, (0FTT5), 16 oz Bottle	PT
2	6850-01-474-2319 6850-01-474-2317 6850-01-474-2317	Cleaning Compound, MIL-PRF-680 Degreasing Solvent Type II MIL-PRF-680-TY-II (81349) 1 GL BT05 (0K209) 5 GL BT05 (0K209) 55 GL	GL CO CO
3	9150-01-197-7693 9150-01-197-7690 9150-01-197-7689 9150-01-197-7692 9150-01-197-7691	Grease, Automotive and Artillery (GAA) (MIL-G-10924) M-10924-B, (81349), 14-ounce cartridge M-10924-C, (81349), 1 ¾-ounce can M-10924-D, (81349), 6 ½-pound can M-10924-E, (81349), 35-pound can M-10924-F, (81349), 120-pound drum	CA CN CN CN DR
4	9150-00-186-6668	Lubricating, Oil, Engine, Grade 10 M21260-3-10W, (81349), 5 GL	5 GL
5	9150-00-191-2772	Lubricating, Oil, Engine, Grade 10 MIL-PRF-21260, (81349)	55 GL
6	9150-00-188-9858	Lubricating, Oil, Engine, Grade 30 M21260-3-30W, (81349)	5 GL

Table 1. Expendable and Durable Items List. (Continued)

(1) Item Number	(2) National Stock Number	(3) Description	(4) U/M
7	9150-00-189-6729	Lubricating, Oil, Engine, Grade 30 M21260-4-30W, (81349)	55 GL
8	7930-01-585-0017	Lubricant 8T-2998, (11083)	
9	9150-01-421-1424	Oil, Lubricating, OE/HDO 15W-40 (SAE 40) (MIL-L-2104) MIL-PRF-2104, (81349), 55-gallon drum	DR
10	6810-00-252-1345	Solution, Soap MILW15000ClassC, (81349), 1-quart bottle	QT

END OF WORK PACKAGE

<p>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</p> <p>For use of this form, see AR 25-30; the proponent agency is ODISC4.</p>	<p>Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).</p>	<p>DATE Date you filled out this form. 21 OCT 2011</p>
--	--	--

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, MS 727
 6501 E. 11 MILE ROAD, WARREN, MI 48397-5000

FROM: (Activity and location) (Include ZIP Code)
 Your mailing address

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

<p>PUBLICATION/FORM NUMBER TM 9-2355-335-10</p>	<p>DATE 17 August 2012</p>	<p>TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)</p>
---	--------------------------------	--

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible.)
1	24-1			1		Item shown incorrectly

SAMPLE

**Reference to line numbers within the paragraph or subparagraph.*

<p>TYPED NAME, GRADE OR TITLE <i>Your Name</i></p>	<p>TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION</p>	<p>SIGNATURE <i>Your Signature</i></p>
--	---	--

TO: (Forward direct to addressee listed in publication) U.S. ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS, MS 727 6501 E. 11 MILE ROAD, WARREN, MI 48397-5000	FROM: (Activity and location) (Include ZIP Code) Your Address	DATE Date you filled out this form
---	---	--

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 9-2355-335-10	DATE 17 August 2012	TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)
---	-------------------------------	--

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	SIGNATURE <i>Your Signature</i>
---	---	---

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 ODISC4.							
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, MS 727 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 TWO 9-2355-335-10				DATE 17 August 2012		TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)	
ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible.)	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: (Forward direct to addressee listed in publication) U.S. ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS, MS 727 6501 E. 11 MILE ROAD, WARREN, MI 48397-5000	FROM: (Activity and location) (Include ZIP Code)	DATE
---	---	-------------

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 9-2355-335-10	DATE 17 August 2012	TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)
---	-------------------------------	---

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
----------------------------	--	-----------

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 ODISC4.							
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, MS 727 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 TWO 9-2355-335-10				DATE 17 August 2012		TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)	
ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible.)	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: (Forward direct to addressee listed in publication) U.S. ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS, MS 727 6501 E. 11 MILE ROAD, WARREN, MI 48397-5000	FROM: (Activity and location) (Include ZIP Code)	DATE
---	---	-------------

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 9-2355-335-10	DATE 17 August 2012	TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)
---	-------------------------------	---

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
----------------------------	--	-----------

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 ODISC4.							
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, MS 727 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 TWO 9-2355-335-10				DATE 17 August 2012		TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)	
ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible.)	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

TO: (Forward direct to addressee listed in publication) U.S. ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS, MS 727 6501 E. 11 MILE ROAD, WARREN, MI 48397-5000	FROM: (Activity and location) (Include ZIP Code)	DATE
---	---	-------------

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 9-2355-335-10	DATE 17 August 2012	TITLE Operator Manual for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV)
---	-------------------------------	---

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

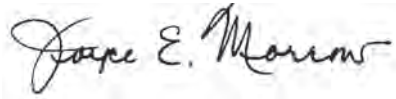
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
----------------------------	--	-----------

By order of the Secretary of the Army:

RAYMOND T. ODIERNO
General in Chief of Staff

Official:

A handwritten signature in black ink that reads "Joyce E. Morrow". The signature is written in a cursive style with a large, stylized 'J' and 'M'.

JOYCE E. MORROW
*Administrative Assistant to the
Secretary of the Army*
1220202

Distribution: To be distributed in accordance with the initial distribution number (IDN) 381251, requirements for TM 9-2355-335-10.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

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

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
 1 Kilogram=1000 Grams=2.2 Lb
 1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
 1 Liter=1000 Milliliters=33.82 Fluid Ounces

SQUARE MEASURE

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

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
 1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

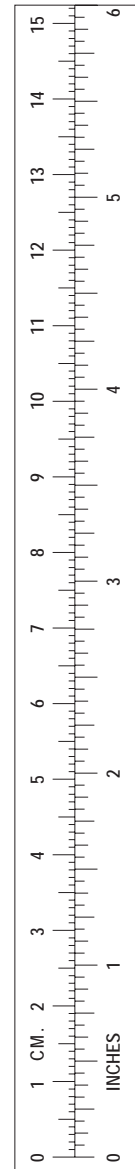
TEMPERATURE

$5/9 (°F - 32) = °C$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 (°C + 32) = °F$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square 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/Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square 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
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



PIN: 085907