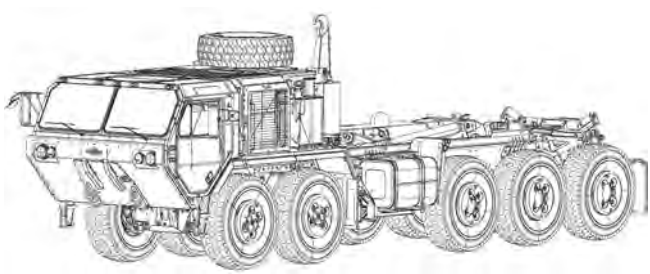
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TECHNICAL MANUAL
OPERATOR'S MANUAL
FOR

TRUCK, TRACTOR, M1074A1 AND M1075A1 PALLETIZED LOAD SYSTEM
M1074A1
NSN 2320-01-544-2244
M1075A1
NSN 2320-01-544-2251



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HEADQUARTERS, DEPARTMENT OF THE ARMY
31 MARCH 2010

WARNING SUMMARY

GENERAL SAFETY CAUTION/WARNING SUMMARY

- This list summarizes critical warnings. They are repeated here to let you know how important they are.
- Study these warnings carefully.
- They can save your life and the lives of personnel you work with.
- If there is any doubt about handling tools, materials, equipment, and procedures, see TB 43-0216, Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment.

FOR INFORMATION ON FIRST AID:

Reference FM 4-25.11. (Volume 2, WP 0146)

Table 1. Warning Icons Used In This Manual.

WARNING ICON	DESCRIPTION
	AIR PRESSURE - human hand blocking air gun shows the need to reduce air pressure before use, or debris may injure user and/or damage equipment.
	BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.
	CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

Table 1. Warning Icons Used In This Manual. - Continued

	ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.
	EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.
	EXTREMELY COLD SURFACE - hand touching object with ice formed on both shows that surface is extremely cold and can damage human tissue.
	EYE PROTECTION - person with goggles shows that the material will injure the eyes.
	FIRE - flame shows that material may ignite and cause burns.

Table 1. Warning Icons Used In This Manual. - Continued

	FIRE EXTINGUISHER - shows that material may ignite and a fire extinguisher should be within easy reach.
	HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential for improper lifting technique and/or need of aid of assistant(s) and/or need for lifting device (as required).
	HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm.
	HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.
	HOT AREA - hand over object radiating heats shows that part is hot and can burn.

Table 1. Warning Icons Used In This Manual.

	MOVING PARTS - hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.
	PRESSURE/TENSION HAZARD - human body being impacted by rotating projectile shows that equipment is under pressure or tension, presenting a danger to life or limb if pressure or tension is not carefully released.
	PROJECTILE HAZARD - human body with object passing through it shows that a projectile hazard exists.
	RADIATION - three circular wedges shows that the material emits radioactive energy and can injure human tissue.
	ROLLOVER HAZARD - vehicle indicating direction of human figure shows that vehicle may roll over presenting a danger to life or limb if hazardous conditions are not avoided.

Table 1. Warning Icons Used In This Manual.

	RUN OVER HAZARD - vehicle running over human body shows hazard.
	SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to life or limb.
	SKIN IRRITATION - hand radiating shows that material can cause skin irritation.
	SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger for falling.
	STEAM HAZARD - human engulfed in steam cloud shows steam hazard exists that could injure/burn human tissue.

Table 1. Warning Icons Used In This Manual.

	TIRE BLOWOUT - tire with hole shows that an over or under inflated tire may rupture, presenting a danger to life or limb.
	VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.
	WARNING/CAUTION - triangle with exclamation point within shows that a WARNING or CAUTION is present that indicates a potential hazard, which may cause injury or death to personnel (warning) or damage to equipment (caution).
	WIRE CABLE/ROPE - human hand with frayed wire cable/rope running across shows injury to unprotected (bare) hands may result.

WARNING



MODIFICATION HAZARD

- Unauthorized modifications to, alterations to, or installations on this equipment are prohibited and are in violation of AR 750-10.

- Failure to comply may result in injury or death to personnel or damage to equipment.

WARNING



HIGH-PRESSURE HYDRAULIC SYSTEM

- Hydraulic systems can cause serious injuries if high-pressure lines or equipment fails.
- Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and can give first aid. Failure to comply may result in injury or death to personnel.
- Never disconnect any hydraulic hose or component while the engine is running. Allow several minutes to elapse after shutting off engine, to allow pressure to relieve itself, before attempting to remove hoses. Failure to comply may result in injury or death to personnel.
- The Palletized Load System (PLS) vehicles contain hydraulic systems operating at oil pressures up to 3,700 psi (25,512 kPa). Never disconnect any hydraulic line or fitting without first dropping the pressure to zero. Failure to comply may result in serious injury or death to personnel.
- Be sure to wear eye protection when working around hydraulic pressurized systems. Failure to comply may result in serious injury or death to personnel.

WARNING



ELECTRICAL SYSTEM

- Remove all jewelry, such as rings, ID tags, bracelets, etc. If jewelry or tools contact electrical circuits, a direct short may result. Failure to comply may result in serious injury or death to personnel.

- Do not smoke, use open flame, make sparks or other ignition sources around batteries. A battery giving off gas could explode. Failure to comply may result in serious injury or death to personnel.
- Be careful when working on or with electrical equipment. Do not be misled by the term "low voltage". Voltages as low as 50 volts can cause death. For artificial respiration, refer to FM 4-25.11.
- When working inside the vehicle with power off, be sure to ground every capacitor likely to hold a dangerous voltage potential. Failure to comply may result in injury or death to personnel.
- Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment. Failure to comply may result in injury or death to personnel.

WARNING



SOLVENT CLEANING COMPOUND

- Solvent cleaning compound MIL-PRF-680 Type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in a well-ventilated area. Use respirator as needed. Accidental ingestion can cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage. Can be fatal if swallowed. Inhalation of high/massive concentrations can cause coma or be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. Failure to follow this warning may result in injury or death to personnel.
- The flashpoint for Type II solvent cleaning compound is 141-198°F (61-92°C), and Type III is 200-241°F (93-116°C).
- Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.

- Fire extinguishers should be placed nearby when using solvent cleaning compound. Failure to follow this warning may result in injury or death.
- Cloths or rags saturated with solvent cleaning compound must be disposed of IAW authorized facilities' procedures. Failure to follow this warning may result in injury.
- Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

WARNING



POLYURETHANE COATING (CARC)

- Eye and hearing protection must be worn at all times when using power tools for grinding, cutting, sawing, and drilling. Failure to do so may result in injury to personnel. Chemical Agent Resistant Coating (CARC) paint contains isocyanate which is highly irritating to skin and respiratory system. High concentrations of isocyanate can produce symptoms of itching and reddening of skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, isocyanate can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention.
- The following precautions must be taken whenever using CARC paint:
- Protective equipment (gloves, goggles, ventilation mask) must be worn when using CARC paint.
- NEVER cut CARC-coated materials without high-efficiency, air-purifying respirators in use.
- DO NOT grind or sand painted equipment without high-efficiency, air-purifying respirators in use.

- BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.
- Use only in well-ventilated area. Check with local environmental office for methods and locations approved for painting in accordance with local and state environmental regulations.
- Always use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.

WARNING



ADHESIVE

- Adhesive, solvents and sealing compounds can burn easily and are harmful causing immediate bonding on contact with eyes, skin, or clothing and gives off harmful vapors.
- If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.
- If adhesive gets in your eyes, try to keep them open; flush them with water for 15 minutes and get immediate medical attention.
- Wear protective goggles and use in a well-ventilated area.
- Keep away from open fire and use in well-ventilated area to avoid injury or death.

WARNING



FLAMMABLE LIQUID AND COMBUSTIBLE VAPOR

- Gasoline, fuel oil, lubricating oil, grease, paint, paint thinner, cleaning solvents, and other combustible liquids present a serious fire hazard.
- Combustible liquids must ALWAYS be stored in their approved containers and designated compartments or deck storage locations.

- Ensure exhaust and ventilation fans are operating while using cleaning solvents or paint products.
- Never store or charge batteries in a confined space without ventilation or near electrical equipment.
- Fuel is very flammable and can explode easily.
- To avoid serious injury or death, keep fuel away from open fire 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. Failure to comply may result in injury or death to personnel.
- When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET OF VEHICLE. Failure to comply may result in injury or death to personnel.
- Starting fluid is toxic and flammable. Do not store in cab and do not breathe fumes. Do not puncture or burn containers. Dispose of container following manufacturer's recommendations on the container. Failure to comply may result in injury or death to personnel.

WARNING



LIFTING OPERATIONS

- All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury or death to personnel.
- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Failure to comply may cause injury or death to personnel.
- Keep clear of equipment when it is being raised or lowered. Failure to comply may cause injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Failure to comply may result in injury or death to personnel.
- Do not lift a load greater than the rated load capacity of the crane or materiel handling equipment. Failure to comply may result in injury or death to personnel or damage to equipment.

- Do not allow heavy components to swing while hanging by lifting device. Failure to comply may cause injury or death to personnel.
- Any part or component that weighs between 50 lbs (23 kg) and 75 lbs (34 kg) must be removed with the aid of an assistant. Any part or component that weighs over 75 lbs (34 kg) must be removed with the aid of an assistant and a lifting device. Failure to comply may cause injury or death to personnel.
- Ensure all chains, hooks, and slings are in good condition and are of correct capacity. Ensure hooks are positioned correctly. Failure to comply may result in injury or death to personnel.

WARNING



MOVING MACHINERY

- Use extreme care when operating or working near moving machinery including running engine, rotating shafts, and other moving parts. Failure to comply may result in injury or death to personnel.
- Use extreme care when measuring voltage while engine is running around rotating fan blade and hot engine parts. Failure to comply may result in injury or death to personnel.

WARNING



HEAVY-DUTY WINCH OPERATION

- All personnel must stand clear during winching operations from possible snapping cable or shifting load. Failure to comply may result in injury or death to personnel.
- When hooking up for winching operations, position throat (open part) of hook upward in case overloading straightens out hook. Failure to comply may result in injury or death to personnel.

- The cable drum requires a minimum of three or four wraps of wire rope (cable) for safety. Failure to comply may result in injury or death to personnel.
- Be careful when handling the winch cable. Ensure cut ends are taped. Ensure cut ends of cable on winch assembly are securely fastened down. Failure to comply may result in injury or death to personnel.
- Always wear leather gloves when handling winch cable. Failure to comply may result in injury or death to personnel.

WARNING



LOAD HANDLING SYSTEM OPERATION

- Check for overhead power lines, ground condition for firmness, and other obstructions before attempting LHS operation. Failure to comply may result in injury or death to personnel.
- LHS hook maximum lifting height is 18 ft (5.5 m). Failure to comply can result in injury or death to personnel and/or damage to equipment.

WARNING



PARTS UNDER PRESSURE

- Wear safety goggles and use caution when removing or installing springs, snap rings, retaining rings, and other parts under spring tension. These parts can act as projectiles. Failure to comply may result in injury or death to personnel.
- The radiator is very hot and pressurized during vehicle operation. Let radiator cool before removing cap. Failure to do so can result in serious burns.
- During pressure tests, ensure air pressure is drained to 0 psi (0 kPa) before taking off any components. If pressure is not released, plates or line could blow off and harm personnel. Do not drain air from tank

with any part of body in air spray path. Skin embolisms and/or debris in eyes can occur from released pressure.

- High air pressure may be released from valve stem when valve core is removed. Stay clear of valve stem after core is removed. Ensure all personnel wear suitable eye protection. Failure to comply may result in injury to personnel.
- Stand clear of trajectory area during deflation or personal injury or death may result.
- Lock-ring is under tension. If lock-ring breaks loose it could cause injury to personnel. Keep hands and fingers away from lock-ring when removing.
- Never adjust relief valve so that personnel must stand on strongback to operate latch.
- If there is any residual pressure in tank when relief valve is open, personnel may lose their balance and fall. Failure to comply may result in injury or death to personnel.
- Use extreme care when removing or installing spring retainers. Spring retainers are under tension and can act as projectiles when released suddenly. Ensure proper eye protection is worn to prevent injury to personnel.
- Use extreme care when removing or installing springs. Springs are under tension and can act as projectiles when released. Ensure proper eye protection is worn to prevent injury to personnel. Eye protection is required during all grinding operations. Failure to comply may result in serious injury to personnel.
- Failure to relieve tank pressure may result in sudden, unexpected loss of pressure. Failure to comply may result in personal injury or death.
- Do not remove the radiator cap when the engine is hot, as steam and hot coolant can escape. Failure to comply may result in personal injury or death.

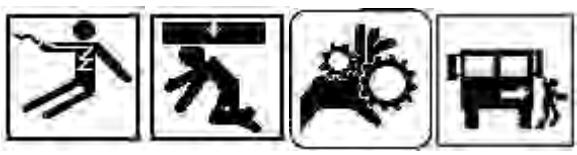
WARNING



HEAVY PARTS

Any part or component that weighs over 50 lbs (23 kg) must be removed with the aid of an assistant and a lifting device. Failure to comply may result in personal injury or death.

WARNING



CRANE SYSTEM

- Always refer to the range diagram BEFORE making any lift. It is extremely important that the crane is properly leveled to prevent overstressing. Failure to comply may result in injury or death to personnel.
- Do not operate crane unless outriggers are set up. Always chock front wheels when using outriggers. Failure to comply may result in injury or death to personnel.
- When using crane on any vehicle, park vehicle clear of all overhead powerlines. If operating crane under power lines, do not allow vehicle to contact high-voltage connections. Failure to comply will result in death to personnel.
- Do not stand under crane. Failure to comply may result in injury or death to personnel.
- Never work with worn, frayed, or damaged wire rope. Always wear heavy gloves when handling winch cables; never let cable run through hands. Frayed cables can cut. Never operate winch with less than five wraps of cable on winch drum. Failure to comply may result in injury or death to personnel.
- When using crane on any vehicle, park vehicle clear of all overhead power lines. Do not operate crane near overhead power lines. Failure to comply may result in injury or death to personnel.

- Keep boom clear of electrical powerlines and other obstacles. Do not operate crane near overhead powerlines. Failure to comply will result in death to personnel.
- Avoid quick, jerking, winch operation. Keep other personnel well away from vehicles involved in winching operations. A snapped cable or shifting load can cause serious injury or death.
- If possible, keep one hand away from equipment to reduce the hazard of current flowing through vital organs of the body. Failure to comply may result in injury or death to personnel.
- Keep fingers clear of top of lift hook. Failure to comply could result in injury or death to personnel.

WARNING



CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH

- Carbon monoxide does not have color or smell and can cause death.
- Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling and coma. Brain damage or death can result from heavy exposure.
- Carbon monoxide is in exhaust fumes of fuel-burning heaters and internal combustion engines.
- Carbon monoxide can become dangerously concentrated under conditions of no ventilation.
- Precautions must be taken to ensure crew safety when the personnel heater or engine of any vehicle is operated for any purpose. Failure to comply may result in injury or death to personnel.
- DO NOT operate vehicle engine in a closed place unless the place has proper ventilation. Failure to comply may result in injury or death to personnel.
- DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment covers removed unless necessary for maintenance purposes. Failure to comply may result in injury or death to personnel.
- BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either odor or exposure symptoms are

present, IMMEDIATELY VENTILATE personnel compartments. If symptoms continue, remove affected crew to fresh air and keep warm. DO NOT PERMIT PHYSICAL EXERCISE. If necessary, give artificial respiration and get immediate medical attention. For artificial respiration, refer to FM 4-25.11 . Failure to comply may result in injury or death to personnel.

- BE AWARE that the gas particulate filter unit or the field protection mask for nuclear-biological-chemical protection WILL NOT offer safety from carbon monoxide poisoning.

WARNING



EXTREME HEAT

If required to remain inside the vehicle during extreme heat, occupants should follow the water intake, work/rest cycle, and other heat stress preventive medicine measures contained in FM 21-10, Field Hygiene and Sanitation.

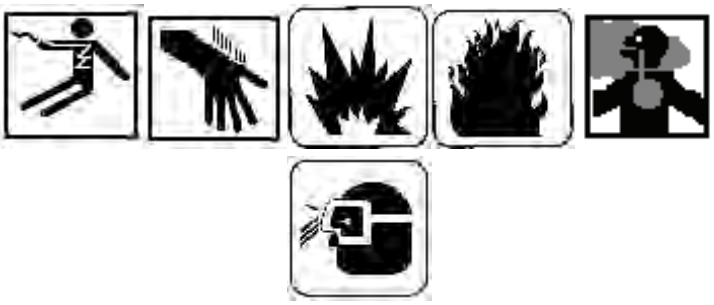
WARNING



CABLES

- Always wear heavy gloves when handling winch cables; never let cable run through hands. Frayed cables can cut. Failure to comply may result in injury or death to personnel.
- Never operate winch with less than five wraps of cable on winch drum. Frayed cables can cut. Failure to comply may result in injury or death to personnel.

WARNING



BATTERY

- Battery acid is harmful to skin and eyes. Be careful not to short out battery terminals. Failure to comply may result in injury or death to personnel.
- Do not smoke or use open flame near batteries. Batteries may explode from a spark. Failure to comply may result in injury or death to personnel.

WARNING



NBC

- NBC-contaminated air filters must be handled and disposed of only by authorized and trained personnel.
- The unit commander or senior officer in charge of maintenance personnel must ensure that prescribed protective clothing (FM 3-11.4) is used, and prescribed safety measures and decontamination procedures (FM 3-11.5) are followed.
- The local unit SOP is responsible for final disposal of contaminated air filters. Failure to comply may cause severe injury or death to personnel.

WARNING



TIRE OPERATION

- Operating a vehicle with a tire in an overinflated or underinflated condition, or with a questionable defect, may lead to premature tire failure. Ensure tire has proper tire pressure. Failure to comply may result in injury or death to personnel.
- When inflating tires mounted on the vehicle, all personnel must remain out of trajectory of the side ring and lock-ring as shown by the areas indicated. Failure to follow proper procedures may result in serious injury or death to personnel.
- Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated or damage or personal injury or death may result.
- No heat shall be applied to a multi-piece wheel or wheel component or damage or injury or death may result.
- Failure to place wheel/tire assembly in safety cage prior to initial inflation could result in serious injury or death to personnel.
- When a wheel/tire is in a restraining device, do not rest or lean any part of body or equipment on or against the restraining device, or injury or death could result.
- While changing tires or while performing tire maintenance, stay out of the trajectory path. Failure to comply may result in injury or death to personnel.
- Always use an inflation hose with an in-line gauge and a clip-on chuck when inflating tires. The gauge and valve must be mounted a minimum of 10 feet (3.10 m) away from air chuck.
- High air pressure may be released from valve stem when valve core is removed. Stay clear of valve stem after core is removed. Ensure all personnel wear suitable eye protection. Failure to comply may result in injury to personnel.
- Tire is heavy. Brace tire to ensure tire will not fall over on you or on others. Failure to comply may result in injury or death to personnel.

WARNING



VEHICLE OPERATION

- Speed limits posted on curves reflect speeds that are considered safe for automobiles. Heavy trucks with a high center of gravity can roll over at these speed limits. Use caution and reduce your speed below the posted limit before entering a curve. Failure to comply may result in vehicle crash and injury or death to personnel.
- Use caution and reduce your speed below the posted limit before entering a curve. Failure to comply may result in vehicle crash and injury to personnel.
- Always use seatbelts when operating vehicle. Failure to use seatbelt can result in serious injury or death to personnel.
- When towing another vehicle, speeds over 15 mph (24 kph) on paved roads can be achieved when the operator determines that the vehicle being towed and the terrain allow safe operation.
- When towing another vehicle, under no condition can speeds over 35 mph (55 kph) on paved road and 15 mph (24 kph) off-road be allowed. Loss of control can cause serious injury or death. Excessive speed can cause damage to vehicle being towed.

WARNING



BRAKES

- Ensure all personnel are clear from front of truck before performing brake stall check. Be ready to apply service brake. Operator must remain in cab while performing this check. Failure to comply could result in personnel injury.
- Never use parking brake for normal braking or wheels will lock up causing severe skid. Skidding vehicle may result in serious personal injury or death.

- Do not use trailer brakes as a parking brake. Trailer brakes may not hold loaded vehicle and trailer on a grade. A runaway vehicle may cause severe personal injury or death.
- Engine must be shut OFF and parking brake set before performing PMCS walkaround. Failure to comply may result in injury or death to personnel.

WARNING



BURNS

The exhaust pipe and muffler can become very hot during vehicle operation. Be careful not to touch these parts with bare hands, or allow body to come in contact with exhaust pipe or muffler. Exhaust system parts can become hot enough to cause serious burns.

WARNING



HEARING PROTECTION

- Excessive noise levels are present any time the heavy-duty winch or crane is operating.
- Wear single hearing protection (earplugs or equivalent) while working around equipment while it is running. Failure to do so could result in damage to your hearing.
- Seek medical aid should you suspect a hearing problem.

WARNING



COMPRESSED AIR

- Brake shoes may be coated with dust. Breathing this dust may be harmful to your health.
- Do not use compressed air to clean brake shoes. Wear a filter mask approved for use against brake dust. Failure to comply may result in injury or death to personnel.
- Compressed air used for cleaning and air drying purposes must not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.
- Use compressed air only with effective chip guarding and proper protective equipment (goggles, shield, gloves, etc.). Failure to comply may result in injury or death to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE:

Zero in the "Change No." column indicates an original page or work package.

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 166 AND TOTAL NUMBER OF WORK PACKAGES IS 149, CONSISTING OF THE FOLLOWING:

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Original 31 March 2010

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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 31 MARCH 2010

TECHNICAL MANUAL

OPERATOR'S MANUAL
TRUCK, TRACTOR, M1074A1 AND M1075A1 PALLETIZED LOAD SYSTEM (PLS)

M1074A1
NSN 2320-01-544-2244
M1075A1
NSN 2320-01-544-2251

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HOW TO USE THIS MANUAL

USABLE ON CODE (UOC) INFORMATION

Usable On Code (UOC) - the user should be aware that the M1074A1 Palletized Load System (PLS) with crane UOC is "741" and the M1075A1 PLS without crane UOC is "751". The Container Handling Unit (CHU) can only be used with the M1075A1 PLS without crane. Depending on the format used for printing this manual, the user may not see instructions printed in the manual stating what information is applicable to which model PLS series vehicle by UOC.

WARNINGS, CAUTIONS, AND NOTES

Read all WARNINGS, CAUTIONS, and NOTES before performing any procedure.

Warnings, cautions, notes, subject headings, and other essential information are printed in **BOLD** type, making them easier for the user to see.

GENERAL INFORMATION

This manual is designed to help operate and maintain the Palletized Load System (PLS). Listed below are some features included in this manual to help locate and use the required information:

- Chapter 1 of this manual includes PLS series vehicle general information, theory of operation, differences between models, etc.
- Chapter 2 of this manual provides operating procedures for both the PLS Series vehicle, and its accompanying operating systems.
- Chapter 3 of this manual provides operator troubleshooting procedures for both the PLS series vehicle, and its accompanying operating systems.
- Chapter 4 of this manual provides operator Preventive Maintenance Checks and Services (PMCS) for the PLS series vehicle.

In addition to text, there are illustrations showing:

1. Components, controls, and indicators.
2. How to take a component off, and put it back on.
3. Cleaning and inspection criteria are also listed when necessary.

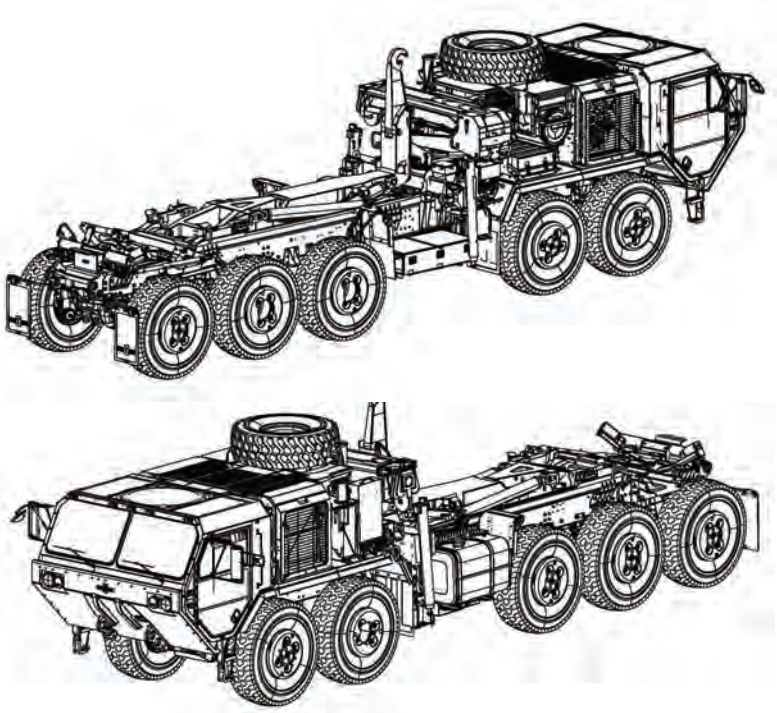
CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

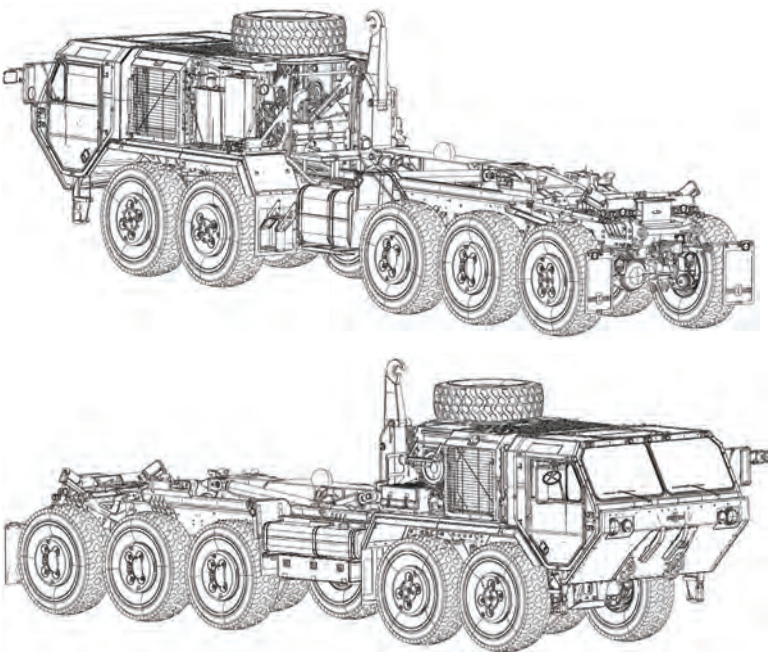
OPERATOR MAINTENANCE
GENERAL INFORMATION

SCOPE

This manual is used for operation and operator-performed maintenance of Palletized Load System M1074A1 and M1075A1 series vehicles, M1076 PLS Trailers, M1077 Flatracks, and M1 ISO Compatible Flatracks. M1074A1 series vehicles are similar to M1075A1 except for the addition of a Material Handling Crane (MHC) and Self-Recovery Winch (SRW) kit. Models are as follows:

MODEL	DESCRIPTION
M1074A1	Cargo vehicle equipped with a Load Handling System (LHS) capable of self-loading and unloading. The vehicle is also equipped with a Material Handling Crane (MHC). 

SCOPE - Continued

MODEL	DESCRIPTION
M1075A1	Cargo vehicle equipped with a Load Handling System (LHS) capable of self-loading and unloading. 

MAINTENANCE FORMS AND RECORDS

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) User Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Volume 2, WP 0146) (Recommended Changes to Equipment Technical Publications and Blank Forms) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is https://aeps.ria.army.mil. The DA Form 2028 (Volume 2, WP 0146) is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) - Continued

to your comments and better manage the DA Form 2028 program. You may also mail, fax or e-mail your letter or DA Form 2028 (Volume 2, WP 0146) direct to: TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP / TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is tacomlcmc.daform2028@us.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

HAND RECEIPT (HR) INFORMATION

The TM 9-2320-319-10-HR (Hand Receipt) is a companion document to this manual, which consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (COEI, BII, (Volume 2, WP 0147) and AAL (Volume 2, WP 0148)) which must be accounted for. As an aid to property accountability, additional Hand Receipt (-HR) Manuals may be requisitioned from the following source in accordance with procedures in DA PAM 25-30, Consolidated Index of Army Publications and Blank Forms; Commander US Army Distribution Operation Facility, 1655 Woodson Road, St Louis, MO 63114-6181.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army material is a continuing concern. It is important that any corrosion problems be reported so they can be corrected and improvements can be made to prevent problems in the future. While corrosion is typically associated with the rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368 (Volume 2, WP 0146). The use of key words, such as "corrosion", "rust", "deterioration", and "cracking" will ensure that the information is identified as a CPC problem.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Command decision, according to the tactical situation, will determine when the destruction of the equipment will be accomplished. A destruction plan will be prepared by the using organization unless one has been prepared by a higher authority. Refer to TM 750-244-6, (Volume 2, WP 0146) Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use, for general destruction procedures.

PREPARATION FOR STORAGE OR SHIPMENT

Notify Field Maintenance to prepare the PLS series vehicles, trailers, and flatracks for storage or shipment.

WARRANTY INFORMATION

The PLS is warranted by Oshkosh Corporation for 12 months. For complete information covering this warranty refer to TM 9-2320-319–13&P, (Volume 2, WP 0146) Warranty Procedures for Vehicle, Tractor, M1074A1 and M1075A1, Palletized Load System (PLS) NSN 2320-01-544-2244 and 2320-01-544-2251. Trailer and flatrack warranty starts on the date found in block 23, DA Form 2408-9, (Volume 2, WP 0146) in logbook. Report all defects in materiel or workmanship to the supervisor, who will take appropriate action.

NOMENCLATURE CROSS-REFERENCE LIST

Table 1. Nomenclature Cross-Reference List.

Common Name	Official Nomenclature
Cable	Wire rope
Cold Start System	Ether quick start system
Engine Coolant	Antifreeze, ethylene glycol mixture
Glad Hand	Quick disconnect air coupling
Jackstand	Trestle
Jake Brake	Engine brake
Service Brake Pedal	Brake pedal
Throttle Pedal	Throttle control
Towing Eye	Drawbar lunette
Towing Pintle	Self-guiding coupler

LIST OF ABBREVIATIONS

Table 2. List of Abbreviations.

AAL	Additional Authorization List
AC	Alternating Current
amp	Amperes

LIST OF ABBREVIATIONS - Continued

Table 2. List of Abbreviations. - Continued

AOAP	Army Oil Analysis Program
BII	Basic Issue Item
BOI	Basis of Issue
C	Centigrade
CAGEC	Commercial and Government Entity Code
CAT	Caterpillar
CBR	Chemical, Biological, Radiological
CCA	Cold Cranking Amps
CCW	Counterclockwise
CHU	Container Handling Unit
CID	Cubic Inch Displacement
CKT	Circuit
cm	Centimeter
COEI	Components of End Item
CTA	Common Table of Allowances
CTIS	Central Tire Inflation System
CTS/ICE	Contact Test Set/Internal Combustion Engine
cu in.	Cubic Inch
CW	Clockwise
DA	Department of the Army

LIST OF ABBREVIATIONS - Continued

Table 2. List of Abbreviations. - Continued

DAC	Direct Access Card
DC	Direct Current
ECU	Electronic Control Unit
EIR	Equipment Improvement Recommendation
F	Fahrenheit
FCRD	Fault Code Retrieval Device
FR	Flatrack
ft	Foot
GAWR	Gross Axle Weight Rating
GCWR	Gross Combination Weight Rating
GFM	Government Furnished Material
GPFU	Gas Particulate Filter Unit
GPM	Gallons per Minute
GVW	Gross Vehicle Weight
Hcg	Horizontal Location of Center of Gravity
HD	Heavy Duty
hp	Horsepower
ICSC	International Convention For Safe Containers
IETM	Interactive Electronic Technical Manual
in.	Inch

LIST OF ABBREVIATIONS - Continued

Table 2. List of Abbreviations. - Continued

IPF	ISO-Compatible Palletized Flatrack
ISO	International Standards Organization
JTA	Joint Table of Allowances
kg	Kilogram
km/h	Kilometer Per Hour
kPa	Kilopascal
kw	Kilowatt
L	Liter
lb-ft	Pound-Foot
lb-in	Pound-Inch
lb	Pound
LF	Lifting Frame
LHS	Load Handling System
m	Meter
MHC	Material Handling Crane
ml	Milliliters
ml/rev	Milliliter per Revolution
MLRS	Multiple Launch Rocket System
mm	Millimeter
mph	Miles Per Hour

LIST OF ABBREVIATIONS - Continued

Table 2. List of Abbreviations. - Continued

MTOE	Modified Table of Equipment and Allowances
N·m	Newton Meter
NBC	Nuclear, Biological, Chemical
NSN	National Stock Number
OTC	Oshkosh Truck Corporation
Pk	Package
PLS	Palletized Load System
PLST	Palletized Load System Trailer
PMCS	Preventive Maintenance Checks and Services
Pr	Pair
psi	Pound-Force Per Square Inch
pt	Pint
PTO	Power Takeoff
QA/QC	Quality Assurance/Quality Control
Qt	Quart
QTY	Quantity
RPSTL	Repair Parts and Special Tools List
RFI	Radio-Frequency Interference
RPC	Rocket Pod Containers
rpm	Revolutions Per Minute

LIST OF ABBREVIATIONS - Continued

Table 2. List of Abbreviations. - Continued

SAE	Society of Automotive Engineers
SMR	Source, Maintenance, and Recoverability
SRW	Self-Recovery Winch
STD	Standard
STE/ICE	Simplified Test Equipment/Internal Combustion Engine
TAMMS	The Army Maintenance Management System
TDA	Tables of Distribution and Allowance
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
U/I	Unit Of Issue
U/M	Unit Of Measure
Vcg	Vertical Location of Center of Gravity
vdc	Volts Direct Current
XHD	Extra Heavy-Duty

SAFETY, CARE, AND HANDLING

Beware of payload movement during normal loading/unloading operations. Ensure tiedown straps and cargo net are correctly installed. Flatrack should be loaded on vehicle or trailer using Load Handling System (LHS), Material Handling Crane (MHC), or other suitable lifting device. Never walk under flatrack while it is being lifted, loaded, or unloaded.

For M1 flatrack, ensure sideboard kit is also correctly installed. The M1 flatrack should be loaded on vehicle or trailer using Load Handling System (LHS). M1 flatracks should be stacked using a forklift. When lifting loaded M1 flatrack, the forklift pockets located nearest the ends of the M1 flatrack must be used.

METRIC SYSTEM

The equipment described herein contains metric components and requires metric, common, and special tools. Metric units and English units will be used throughout this publication.

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

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeter = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeter = 10.76 Sq Feet
1 Sq Kilometer = 1,000,00 Sq Meters = 0.386 Sq 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

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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

Table 3. Approximate Conversion Factors.

To Change	To	Multiply By
Inches	Millimeter	25.4
Feet	Meters	0.305

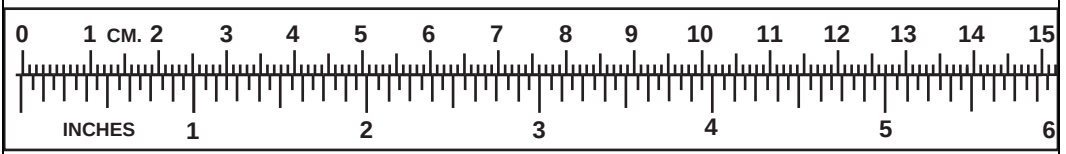
METRIC SYSTEM - Continued

Table 3. Approximate Conversion Factors. - Continued

To Change	To	Multiply By
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 per Square Inch	Kilopascals	6.895
Pounds per Square Inch	Bar	0.068948
Miles per Gallon	Kilometers per Liter	0.425

METRIC SYSTEM - Continued

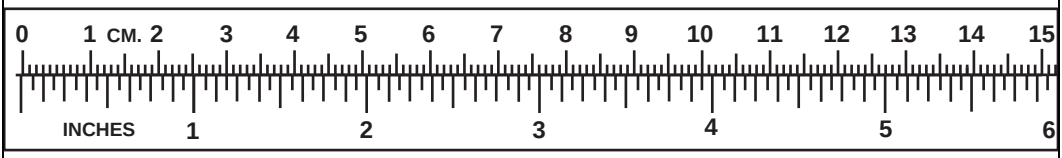
Table 3. Approximate Conversion Factors. - Continued

To Change	To	Multiply By
Miles per Hour	Kilometers per Hour	1.609
 RULER NOT TO SCALE *Figure 1.*		
Millimeter	Inches	0.0394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square 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

METRIC SYSTEM - Continued

Table 3. Approximate Conversion Factors. - Continued

To Change	To	Multiply By
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 Square Inch	0.145
Bar	Pounds per Square Inch	14.504
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



RULER NOT TO SCALE

Figure 2.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The PLS is an ammunition-hauling tactical wheeled vehicle and trailer combination with integral self-load/unload capability using PLS Flatrack (FR). There are two PLS configurations, both with duplicate payload capacity and towing capability. One design incorporates a Material Handling Crane (MHC). The other design does not have a MHC. Both vehicles may have an accompanying towed PLS Trailer (PLST). The trailer carries a flatrack payload of up to 33,000 lbs (14,969 kg). The flatrack is loaded onto the trailer using the vehicle Load Handling System (LHS). Major subsystems of vehicle are: cab, engine, transmission, drive train, suspension, electrical system, hydraulic system, pneumatic system, MHC, Load Handling System (LHS) and Central Tire Inflation System (CTIS).

Vehicle Capabilities

1. All models are capable of operating in temperatures from -25 to 120°F (-32 to 49°C) and to -50°F (-46°C) with the arctic kit installed.
2. All models can ford water up to 48 in. (1219 mm) deep for 5 minutes without damage or requiring maintenance before operation can continue.
3. Normal operating range for vehicle is 225 miles (362 km) based on 100 gallons (379 L) of fuel and 137,250 lb GCWR, traveling over mixed terrain. Varying loads, prolonged idle, use of the MHC, use of the LHS, off-road driving and climatic conditions affect operating range.
4. All models are provided with sufficient tiedown points located so that the vehicle can be restrained in all directions during air transport. All models are capable of transport by highway, rail, and sea.

Vehicle Features

1. Six-cylinder, in-line-diesel, four-cycle, fuel-injected, electronically-controlled, turbocharged diesel engine.
2. Push-button-automatic transmission with one reverse speed and five forward speeds.
3. High/low range transfer case.
4. CTIS with four preset tire air pressures for positive traction in areas of unimproved road surfaces.
5. Power steering system consists of basic steering system with a hydraulic boost. An emergency hydraulic steering pump is provided in case of primary system failure.
6. Fuel system includes one fuel tank, auxiliary fuel tank (if equipped), fuel lines, electric priming fuel pump, fuel water separator, fuel pump, secondary fuel filter, and fuel injectors.
7. Two front and two rear towing eyes.

8. Manual-release-type rear self-guided coupler allows towing of trailer.
9. Radio frequency interference suppression to permit voice radio communications during all phases of operation.
10. LHS enables a single operator to load a flatrack to a vehicle and or a trailer.
11. MHC enables a single operator to load/unload the flatrack on or off the vehicle. A remote control is provided for ease of use.
12. The sideboard kit and tiedowns on the flatrack allow the vehicle to carry bulk loads.
13. Multiple warning lights, gauges, and buzzers protect the systems from damage by warning the operator about unsafe operating conditions.
14. Cab-mounted circuit breakers protect electrical system from damage and can be reset from cab.
15. In the event of hydraulic failure, the PLS hydraulic system may be operated by connecting it to another PLS hydraulic system.
16. MHC and LHS have backup systems in the event of hydraulic or electrical system failure.
17. Each vehicle is fitted for a Gas Particulate Filter Unit (GPFU) that is mounted in the cab.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Major components and accessories found on PLS A1 are illustrated and described below.

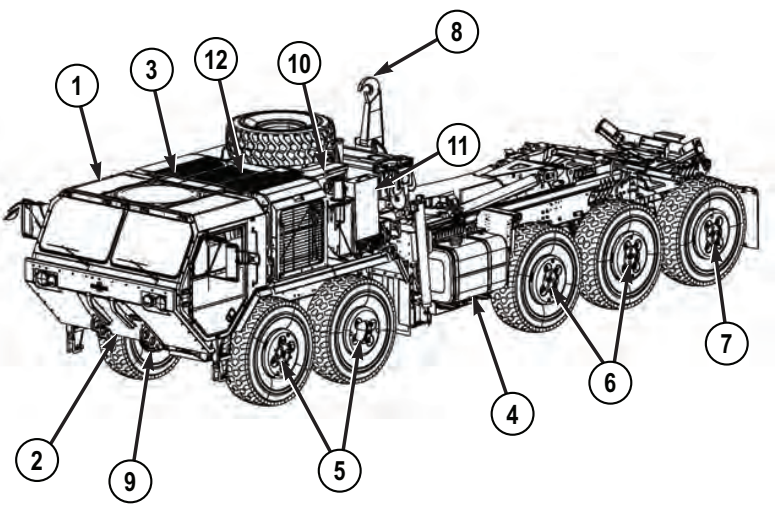


Figure 1.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Item Number	Description	Use
1	PERSONNEL CAB	Provides protection from weather for crew, vehicle controls, gauges and indicators.
2	FRONT ACCESS COVER	Provides access to cab air manifold.
3	ENGINE	Engine supplies power to move vehicle and operate equipment and accessories.
4	MAIN FUEL TANK	Stores fuel used to operate engine. Receives excess fuel not used by engine's fuel injection system.
5	AXLES NO. 1 AND 2	Controls direction of vehicle when in motion. Transmits power to hubs to turn wheels.
6	AXLES NO. 3 AND 4	Transmits power to hubs to turn wheels.
7	AXLE NO. 5	Controls direction of vehicle when in motion. Transmits power to hubs to turn wheels.
8	LOAD HANDLING SYSTEM (LHS)	Loads/unloads flatrack on vehicle and Palletized Load System Trailer (PLST).
9	TOWING EYES	Attachment points for safety chains, towing shackles, and towing.
10	SPARE TIRE DAVIT	Used to raise/lower spare tire to ground.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Item Number	Description	Use
11	HYDRAULIC RESERVOIR	Stores, cools, and filters oil in hydraulic systems.
12	ARCTIC HEATER (NOT SHOWN)	Pumps coolant from engine, heats coolant, and returns coolant to engine.

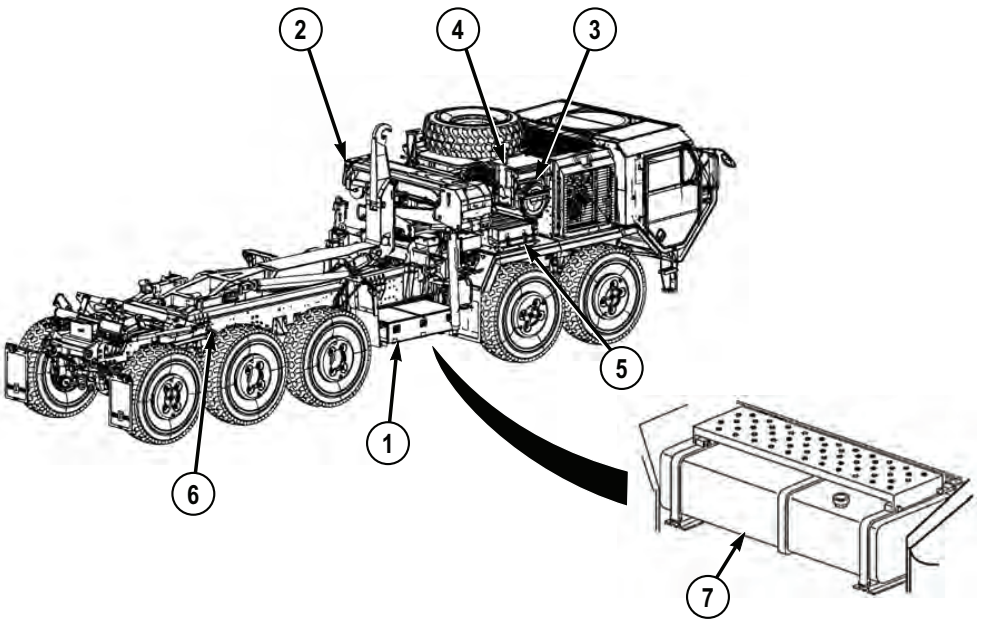


Figure 2.

Item Number	Description	Use
1	STOWAGE BOXES	Used to stow Basic Issue Items (BII).
2	MATERIAL HANDLING CRANE (MHC)	If equipped, used to load and unload cargo.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Item Number	Description	Use
3	AIR CLEANER	Filters out dust and debris from air entering air induction system.
4	SPARE TIRE DAVIT BRACKET	Used to support spare tire davit.
5	BATTERY BOX	Houses and protects four storage batteries.
6	ACCESS LADDER	Used by crew to check oil or perform other tasks requiring access to parts of vehicle out of normal reach.
7	AUXILIARY FUEL TANK	If equipped, stores additional fuel to increase vehicle's operational range.

Equipment Data

Refer to the following tables for specific equipment data.

Table 1. Dimensions.

ITEM	SPECIFICATION	
Width		96 in. (2,438 mm)
Height	(max hook height)	129 in. (3,277 mm)
	(with ISO container)	174 in. (4,420 mm)
Curb Weight	M1075A1 w/o Material Handling Crane and w/ Self-Recovery Winch	50,000 lb (22,680 kg)
	M1074A1 w/ Material Handling Crane and Self-Recovery Winch	55,000 lb (24,948 kg)

Equipment Data - Continued

Table 1. Dimensions. - Continued

ITEM	SPECIFICATION	
Gross Truck Weight		88,000 lb (39,916 kg)
Gross Combination Weight		137,520 lb (62,378 kg)
Length		
	w/o Flatrack	35 ft (10.7 m)
	w/ Flatrack	36 ft (11 m)
	w/ Flatrack and ISO container	36 ft 8 in. (11.2 m)
	Wheelbase	224 in. (5,690 mm)
Ground Clearance		24 in. (610 mm)
Center of Gravity		See shipping data plate on left rear outside of cab.
	w/ Material Handling Crane and Self-Recovery Winch	Hcg 97 in. (2,464 mm)
		Vcg 48.0 in. (1,219 mm)
	w/ Container Handling Unit	Hcg 103 in. (2,616 mm) Vcg 48 in. (1,219 mm)
	Container Handling Unit Stowed	Hcg 102 in. (2,591 mm) Vcg 48 in. (1,219 mm)

Equipment Data - Continued

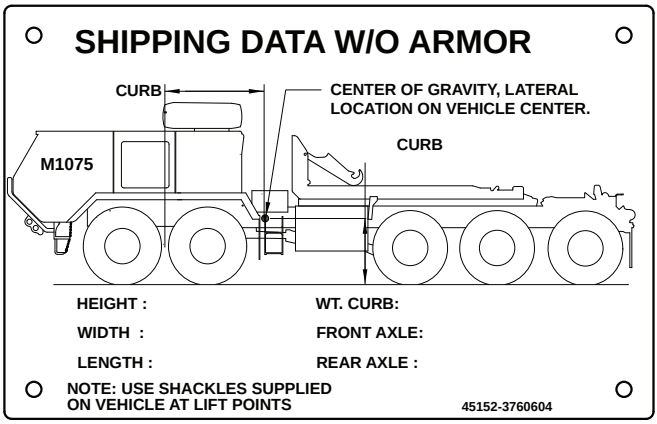


Figure 3.

Table 2. Weight Distribution.

Item	M1075 w/o Crane w/ Self-Recovery Winch	M1074 w/ Crane and Self-Recovery Winch	TBD w/ Container Handling Unit and Self-Self Recovery Winch
Front Tandem Axles - Curb	26,670 lb (12,097 kg)	30,200 lb (13,699 kg)	27,560 lb (12,501 kg)
Front Tandem Axles - Loaded	28,560 lb (12,955 kg)	32,110 lb (14, 565 kg)	32,320 lb (14,660 kg)
Rear Tridem Axles - Curb	23,330 lb (10,582 kg)	24,800 lb (11,249 kg)	25,440 lb (11,539 kg)
Rear Tridem Axles - Loaded	54,440 lb (24,694 kg)	55,890 lb (25,351 kg)	55,680 lb (25,256 kg)

Table 3. Performance.

Item	Specification
Cruising range at GCWR	225 miles (362 km)

Equipment Data - Continued

Table 3. Performance. - Continued

Item	Specification
Cruising range at GCWR with auxiliary fuel tank	400 miles (644 km)
Maximum sustained forward speed (at 2100 rpm)	
5th Gear	55 mph (89 km/h)
4th Gear	39 mph (63 km/h)
3rd Gear	27 mph (43 km/h)
2nd Gear	17 mph (27 km/h)
1st Gear	10 mph (16 km/h)
Speed on 2 percent grade at	
GCWR	35 mph (56 km/h)
GVW	50 mph (80 km/h)
Speed on 30 percent grade at (20 percent grade with EMM)	
GCWR	3 mph (5 km/h)
GVW	4 mph (6 km/h)
Maximum grade at	
GCWR	30 percent
GCWR (with EMM)	20 percent
GVW	50 percent
Maximum side slope with adequate traction surface (20 percent grade with EMM)	30 percent

Equipment Data - Continued

Table 3. Performance. - Continued

Item	Specification
Maximum towed speed (level tow) (for up to 100 miles on level, paved road)	35 mph (56 km/h)
Maximum limp home speed	5 mph (8 km/h)
Maximum ford depth	4 ft (1.2 m)
Approach angle	40 degrees
Departure angle	60 degrees

Table 4. Load Classification Chart.

Vehicle Condition	M1075A1	M1074A1
Unloaded vehicle	22	25
w/ unloaded M1076 trailer	28	30
Loaded vehicle	39	41
w/ loaded M1076 trailer	62	66
w/ unloaded M1076 trailer	43	46

Table 5. Capacities.

Item	Specification
Engine Oil w/ Filter	32 qt (30 L)
Cooling System	100 qt (95 L)
4500 SP Transmission w/Filter	39 qt (37 L)
Front Tandem Axle No. 1 Carrier	17 qt (16 L)
Axle No. 2 Carrier	17.5 qt (16.6 L)

Equipment Data - Continued

Table 5. Capacities. - Continued

Item	Specification
Rear Tridem Axle No. 3 Carrier	22 qt (21 L)
Axle No. 4 Carrier	19 qt (18 L)
Axle No. 5 Carrier	15 qt (14 L)
Wheel Ends	1.55 qt (1.47 L)
Hydraulic Reservoir w/ Filters	234 qt (221 L)
Power Steering Reservoir	33.5 qt (31.7 L)
Fuel Tank (main)	100 gal. (379 L)
Fuel Tank (auxiliary)	85 gal. (322 L)
Transfer Case	10.5 qt (9.9 L)
Radiator	96 qt (91 L)
Windshield Wiper Fluid	3 qt (2.8 L)
On and Off Road w/ Arctic Kit	-50 to 120°F (-46 to 49°C)
w/o Arctic Kit	-25 to 120°F (-32 to 49°C)

Table 6. Engine Configuration.

Item	Specification
Make	Caterpillar
Model	C–15 (on-highway)
Type	4 stroke, in-line diesel
Cylinders	6

Equipment Data - Continued

Table 6. Engine Configuration. - Continued

Item	Specification
Bore	5.4 in. (137.2 mm)
Stroke	6.75 in. (171.5 mm)
Displacement	927.6 CID (15.2 L)
Torque (at 2100 rpm)	1850 lb-ft (2508 N·m)
Maximum Horsepower (at 1800 rpm)	600 BHP (447.4 kw)
Maximum Governed Engine Speed	
Loaded	2050 to 2150 rpm
Unloaded	2070 to 2170 rpm
Oil Filter	
Type	Full-flow, replaceable element
Quantity	1

Table 7. Fuel System Configuration.

Item	Specification
Type	Diesel injection (electronically-controlled)
Tank Quantity	1 (or 2, if equipped with auxiliary fuel tank)
Air Cleaner Type	60 hr Military
Element Quantity	1 primary, 1 secondary

Equipment Data - Continued

Table 8. Cooling System.

Item	Specification
Radiator Working Pressure	7 psi (48 kPa)

Table 9. Electrical System.

Item	Specification
Voltage	12/24 dual voltage
Alternator	14–volts
System Amps	
Amperage	200
Ground	14/28 Neg
Rotation	Reversible
Standard Rated Output	5000 rpm
Maximum Rated Output	8000 rpm
Drive Type	Pulley
Regulator, Cycling, External	14/28 volts
RFI Suppression Ability	Yes
Batteries	
Quantity	4
Voltage (each)	12-volts
Connection	Series – parallel
Capacity (at 20 hour rate)	900 amp

Equipment Data - Continued

Table 9. Electrical System. - Continued

Item	Specification
Reserve Capacity (each, at 80°F (27°C))	180 minutes
Cold Cranking Amps (each, at 0°F (-18°C))	575 CCA
Amp Hours (each, at 20 hour rate)	100 amp
Starter	12–volts, solenoid attached

Table 10. Transmission.

Item	Specification
Make	Allison
Model	4500 SP
Type	Automatic
Forward	5
Reverse	1

Table 11. Transfer Case.

Item	Specification
Make	OSK
Model	36000 Series
Type	Automatic
Ratios	0.958:1, 2.464:1

Equipment Data - Continued

Table 12. Axles.

Item	Front Tandem	Rear Tridem
Make	Rockwell SVI 5 MR Hub Reduction	Rockwell SVI 5 MR Hub Reduction
Maximum Load Capacity	16.5 k GAWR	18.25 k GAWR

Table 13. Brake System.

Item	Specification
Actuation	Air
Number of Brake Chambers	14
Pressure Range	60 to 125 psi (414 to 862 kPa)

Table 14. Wheels.

Item	Specification
Type	2 piece bolt together with beadlock
Quantity	10
Spare Wheel Quantity	1
Rim Size	10 by 20 in.
Stud Quantity Per Wheel	10

Table 15. Tires.

Item	Specification
Type	Tubeless
Quantity	10

Equipment Data - Continued

Table 15. Tires. - Continued

Item	Specification
Spare Wheel Quantity	1
Tread Type	Radial traction, non-directional
Size	16.00 R20
Load Range	M
Tire Pressure	Controlled by CTIS

Table 16. Tire Pressure (Cold)

Driving Condition	Front	Rear
Highway	65 psi (448 kPa)	68 psi (469 kPa)
Cross-country	44 psi (303 kPa)	46 psi (317 kPa)
Mud, sand, and snow	22 psi (152 kPa)	25 psi (172 kPa)
Emergency	17 psi (117 kPa)	19 psi (131 kPa)
Spare	68 psi (469 kPa)	

Table 17. Steering System.

Specification
Three gears with integrated hydraulic power assist

Table 18. Self-Guided Coupler.

Item	Specification	
Maximum Load Capacity	Pulling	Vertical
	100,000 lb (45,359 kg)	20,000 lb (9,072 kg)

Equipment Data - Continued

Table 19. Towing Eyes.

Item	Specification
Quantity	4 (2 front, 2 rear)
Maximum Load Capacity (each)	60,000 lb (27,216 kg)

Table 20. Cab.

Item	Specification
Windshield	Tinted, 2–piece, safety glass
Personnel Capacity	2

Table 21. Material Handling Crane (MHC) (M1074A1 Only).

Item	Specification
Make	Grove
Model	PLS
Maximum Capacity	
At boom length of 22.5 ft (6.86 m)	3,900 lb (1,769 kg)

Table 22. Load Handling System (LHS).

Item	Specification
Make	OSK
Model	MK V

Equipment Data - Continued

Table 23. Hydraulic Pump and Auxiliary Drive.

Item	Specification
Pump Model	PVE35
Rated Speed	2,200 rpm
Maximum Speed	2,400 rpm
Rated Outlet Pressure Maximum	3,625 psi (24,994 kPa)
Rated Temperature	225°F (107°C)
Theoretical Displacement	73.7 ml/rev

Table 24. Air System.

Item	Specification
Air Compressor	
Model	Bendix TU-FLO 1400
Number of Cylinders	4
Cylinder Configuration	In-line
Stroke	1.810 in.
Displacement Rotating at 1250 rpm	31 CFM
Maximum rpm Water Cooled	3000 rpm
Max discharge air temp	400°F (204°C)
Minimum Pressure Required to Unload (Naturally aspirated)	60 psi (414 kPa)
Minimum Oil Pressure Required at:	
Engine Idling Speed	15 psi (103 kPa)

Equipment Data - Continued

Table 24. Air System. - Continued

Item	Specification
Maximum Governed Engine Speed	15 psi (103 kPa)
Air Dryer	Midland
Vehicle Air System	
Total Volume	7,577 cu. in. (124,165 cc)
Air Pressure	125 ± 4 psi (862 kPa ± 28 kPa)

Table 25. Auxiliary Equipment.

Item	Manufacturer
Container Handling Unit	OSK
Material Handling Crane	Grove Model PLS
Flatrack	OSK Model - PLS US Army
Side Board Kit	OSK
Trailer	OSK
Arctic Heater	Espar
Chemical Alarm	GFM
Decontamination Unit	GFM
Gas Particulate Filter Unit	GFM
Machine Gun Kit	OSK
Radio Installation Kit	OSK

Equipment Data - Continued

Table 26. Container Handling Unit (CHU) (M1075 Only).

Item	Specification
Make	OSK
Model	CHU
Maximum Capacity	35,000 lb (15,876 kg)

NOTE

- These are guidelines for operation and may not be applicable under all circumstances. Refer to applicable paragraph in this manual for specific operating procedures to avoid damage to equipment.
- Vehicle is operated at full payload.
- Grades are off road.

Table 27. Recommended Modes of Operation.

	CTIS Setting				Transfer Case Setting			Resulting Axle Lockup		
Road Condition	**Hwy**	**CC**	**M/S/S**	**Emer**	**High**	**Low**	**Locked**	**Open**	**Side - Side**	**Axle - Axle**
Highway	X				X			X		
Gravel/Dirt		X			X			X		
Mud/ Sand/ Snow No Wheel Spin			X			X				X
Mud/ Sand/ Snow				X		X	X			X

Equipment Data - Continued

Table 27. Recommended Modes of Operation. - Continued

	CTIS Setting				Transfer Case Setting			Resulting Axle Lockup		
Road Condition	**Hwy**	**CC**	**M/S/S**	**Emer**	**High**	**Low**	**Locked**	**Open**	**Side - Side**	**Axle - Axle**
With Wheel Spin										
Fording-Hard Bottom		X				X		X		
Fording-Soft Bottom No Wheel Spin				X		X	X			X
Fording-Soft Bottom With Wheel Spin				X		X	X		X	X
Grade - Slight		X				X		X		
Grade - Mode		X				X		X		

Equipment Data - Continued

Table 27. Recommended Modes of Operation. - Continued

	CTIS Setting				Transfer Case Setting			Resulting Axle Lockup		
Road Condition	**Hwy**	**CC**	**M/S/S**	**Emer**	**High**	**Low**	**Locked**	**Open**	**Side - Side**	**Axle - Axle**
rate <15%										
Grade - Steep >15%			X			X	X			X
Grade - Steep With Wheel Spin				X		X	X		X	X

END OF WORK PACKAGE

OPERATOR MAINTENANCE
THEORY OF OPERATION

SYSTEMS INTRODUCTION

This section provides a basic explanation of major systems on the PLS A1.

ELECTRICAL SYSTEM

The 24 vdc electrical system is waterproof, has reverse polarity protection and incorporates a 12 vdc lighting subsystem. Manual resetting circuit breakers (1) are used throughout system and all circuits are identified. Voltage for the electrical system is indicated on the LCD display (2) located on the speedometer. Circuit breakers located in the cab protect the main circuits.

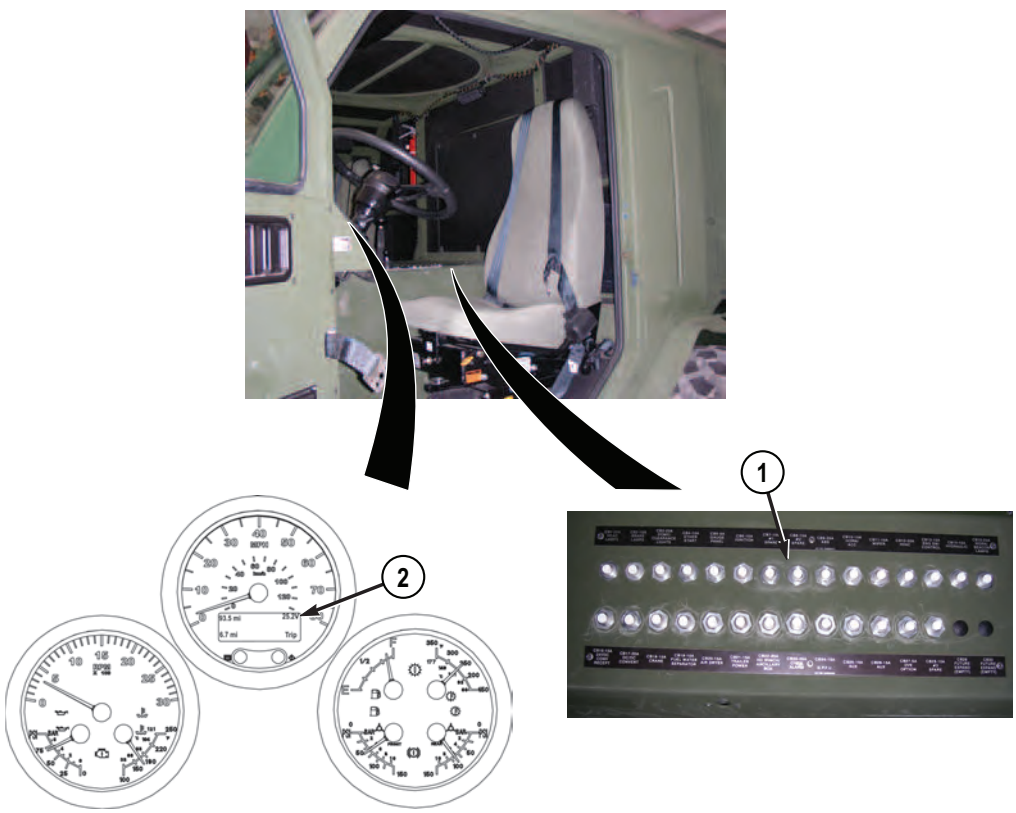


Figure 1.

Electrical power is provided by four 12-volt series-parallel connected batteries (3) located on the passenger side fender. A heavy duty starting motor (4) is mounted on the engine flywheel housing and provides cranking power necessary for starting the engine. The 260 amp alternator (5) maintains battery charging and electrical equipment operation.

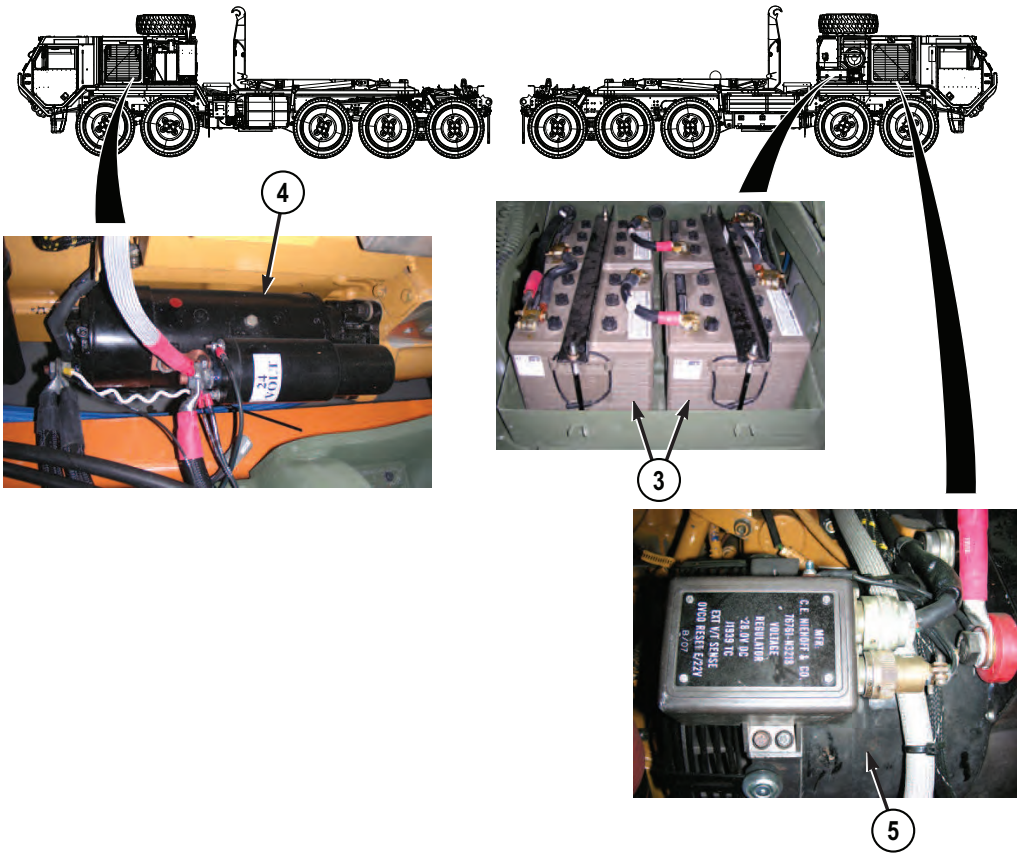


Figure 2.

Vehicle exterior lights are mounted in protected locations or are protected to prevent damage. Protection is provided for lights during cross-country travel. The PLS A1 electrical system supplies all of the electrical power needed to operate the vehicle and trailer. The complete electrical system is made up of the following sub-systems:

- Power Storage and Generating
- Engine Starting and Stopping
- Service Lighting
- Blackout Lighting
- Accessory Lighting
- Instruments

- Warning Lights and Buzzers

POWER STORAGE AND GENERATING

Power storage for the vehicle consists of four 12-volt batteries. The four batteries are divided into two sets. Two batteries in each set are wired in parallel to produce higher amperage. The two sets are then wired in series to produce 24 volts. While the batteries can power all of the systems for a limited time, their primary purpose is to supply power to the engine's starting system. Once the engine is running, the generating system provides the electrical power for all of the systems. The engine driven alternator generates alternating current (AC) which is passed through a set of rectifiers that change it into direct current (DC). The direct current is used to charge the batteries and is distributed to the other systems of the PLS A1.

ENGINE STARTING AND STOPPING

The engine starting system uses the stored electrical energy of the batteries to turn the starter motor. When the ignition switch (1) is turned to the ON position and the start switch (2) is pressed, electrical power is passed through the neutral safety switch to the starter relay. The starter relay, when energized, draws electrical power directly from the batteries and sends it to the starter motor solenoid. When the solenoid is energized, the starter motor draws electrical power from the batteries and turns the engine. To stop the engine, shut off ignition switch.

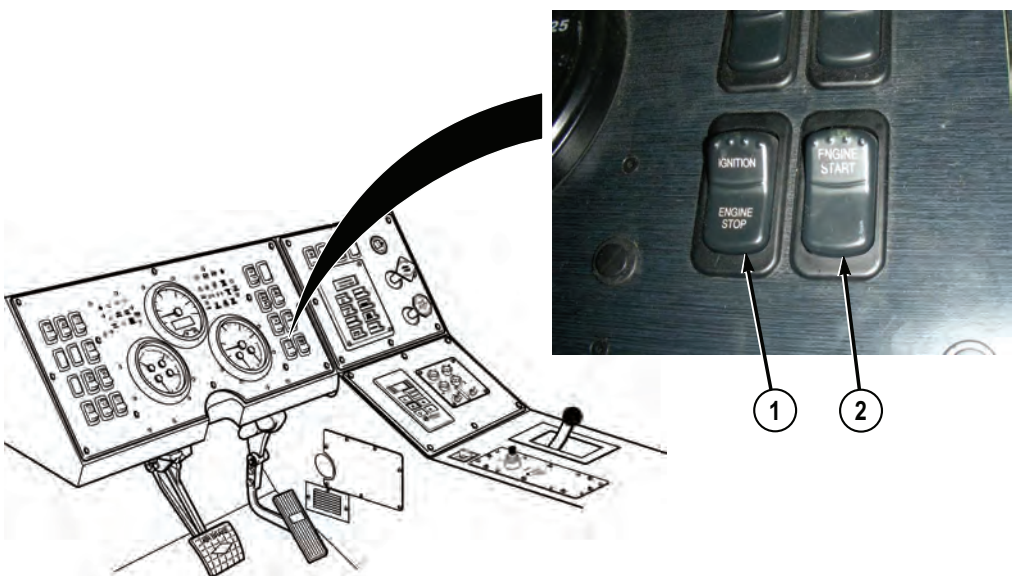


Figure 3.

SERVICE LIGHTING SYSTEM

The service lighting system includes the headlights (1), tail lights (2), and clearance marker lights (3). They are energized by pressing the blackout light selector switch to the OFF position. The stop lights, clearance marker lights, panel lights, turn signals, and emergency flashers are then controlled by separate switches located in the cab.

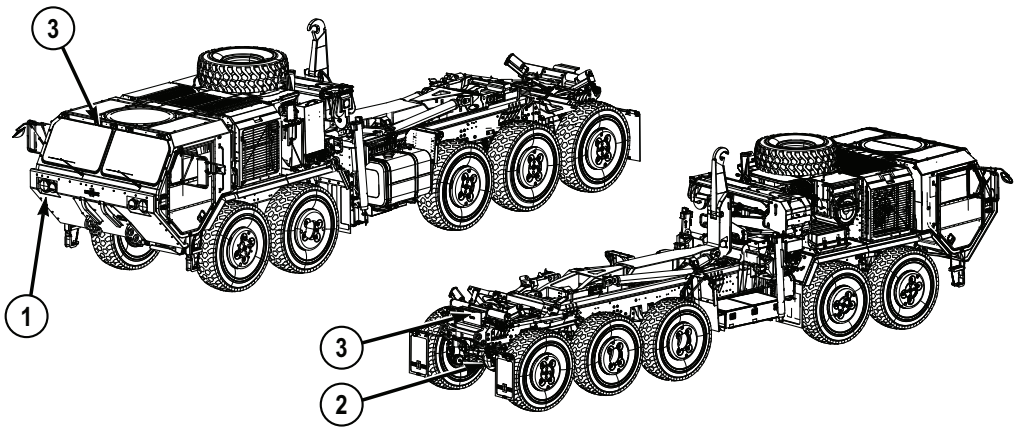


Figure 4.

BLACKOUT LIGHTING SYSTEM

The blackout lighting system includes the front blackout marker lights (1), rear blackout marker lights (2), blackout stop lights (3), and panel lights. These are energized by turning on the blackout light selector switch and either the blackout marker switch or the blackout drive switch. The blackout stop lights and the panel lights are then controlled by other switches located in the cab.

BLACKOUT LIGHTING SYSTEM - Continued

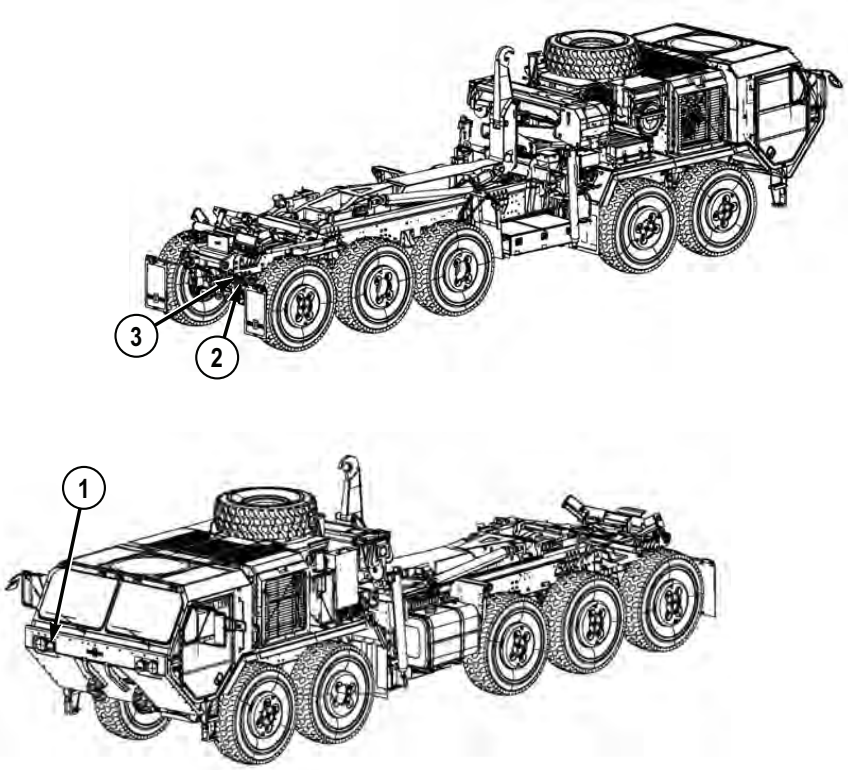


Figure 5.

ACCESSORY LIGHTING

The accessory lighting system includes the dome light, beacon light, and worklights. These are energized by turning the blackout light switch to the OFF position. The dome light, beacon light, and worklights are then controlled by separate switches in the cab. The worklights also have switches built into the light assemblies themselves.

INSTRUMENT SYSTEM

The instrument system includes all gauges that give the operator information. The speedometer (1) receives signals from a sending unit mounted on the transfer case. Tachometer (2) input is provided from the engine controller. The fuel gauge (3), oil pressure gauge (4), water temperature gauge (5), and transmission oil temperature gauge (6) all receive electrical signals from sending units. These sending units monitor fluid level, pressure, and temperature, and send this information to the gauges.

INSTRUMENT SYSTEM - Continued

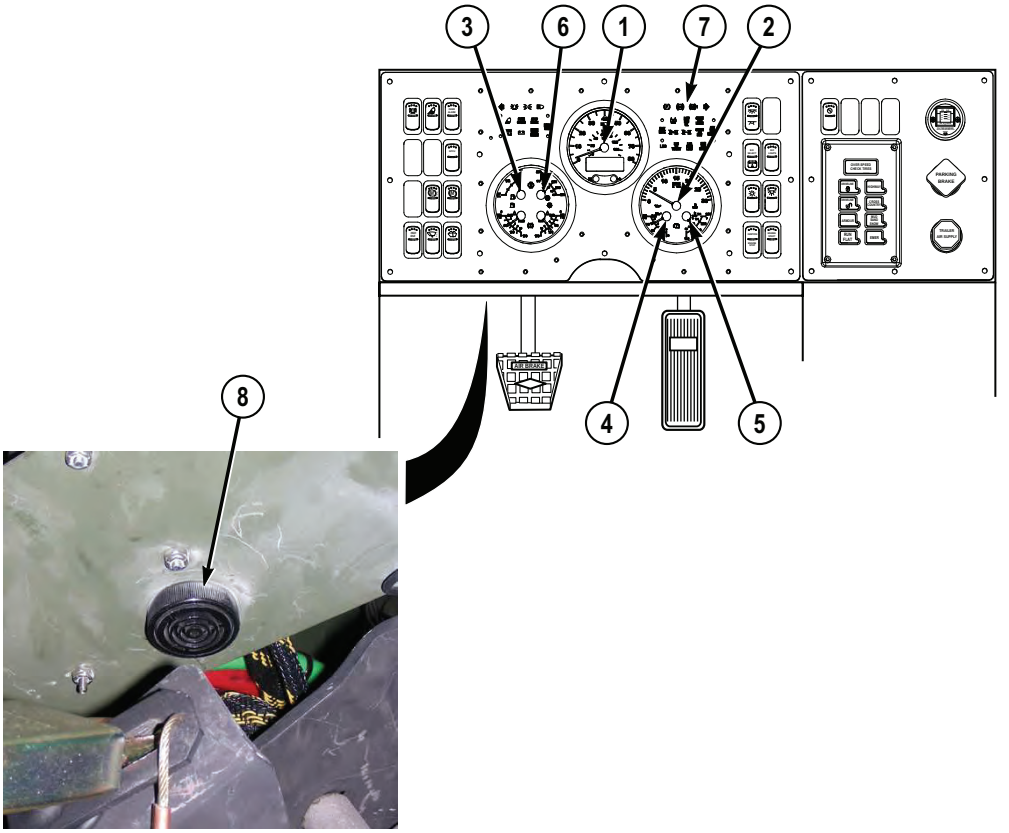


Figure 6.

WARNING LIGHTS AND BUZZERS

The warning lights (7) and buzzers (8) in the cab are activated by sensors located in different systems. These include low air pressure, low engine oil pressure, low hydraulic oil level, and high water temperature. When one or more of these sensors are activated, they energize the proper light and/or buzzer, informing the operator of a problem.

ENGINE AND DRIVETRAIN

The vehicle is equipped with a six-cylinder, in-line diesel, four-cycle, fuel injected, electronically controlled, turbocharged diesel engine (1). This engine is rated at 600 HP and has a five-speed push button automatic transmission (2).

ENGINE AND DRIVETRAIN - Continued

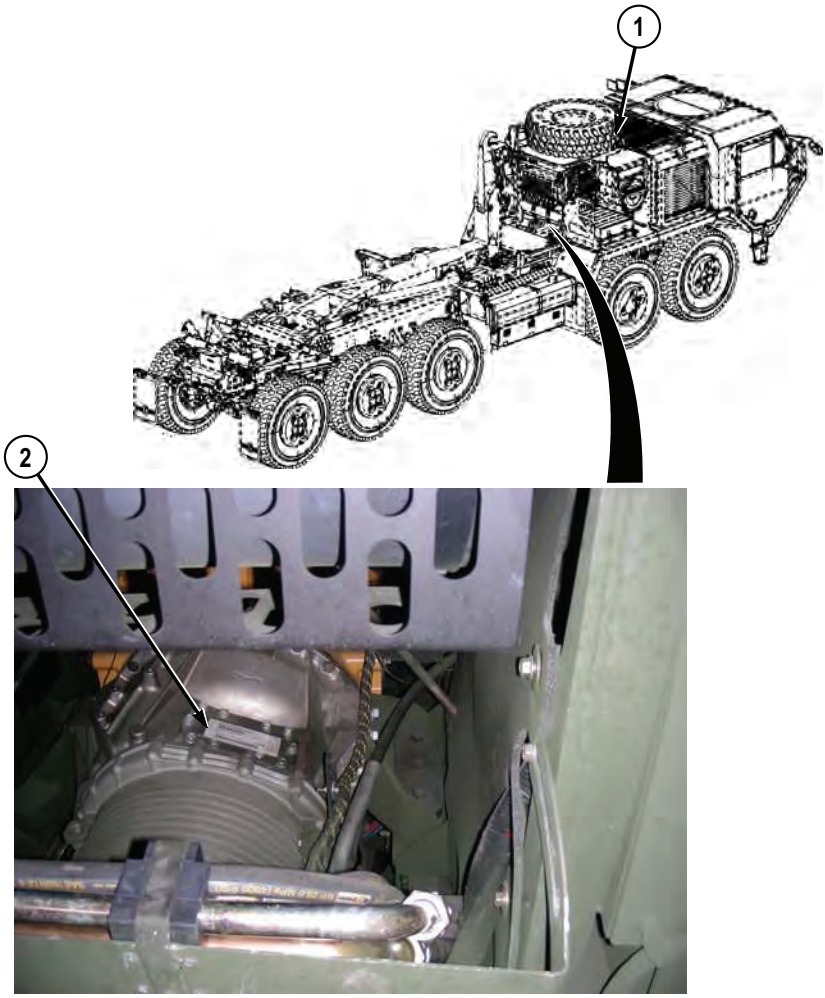


Figure 7.

The vehicle transfer case (3) has two speeds and a 30/70 differential. The vehicle has ten-wheel-drive capability with five driving axles. Axles No. 1, 2, and 5 (4), drive and steer. Axles No. 3 and 4 (5) are drive axles only.

ENGINE AND DRIVETRAIN - Continued

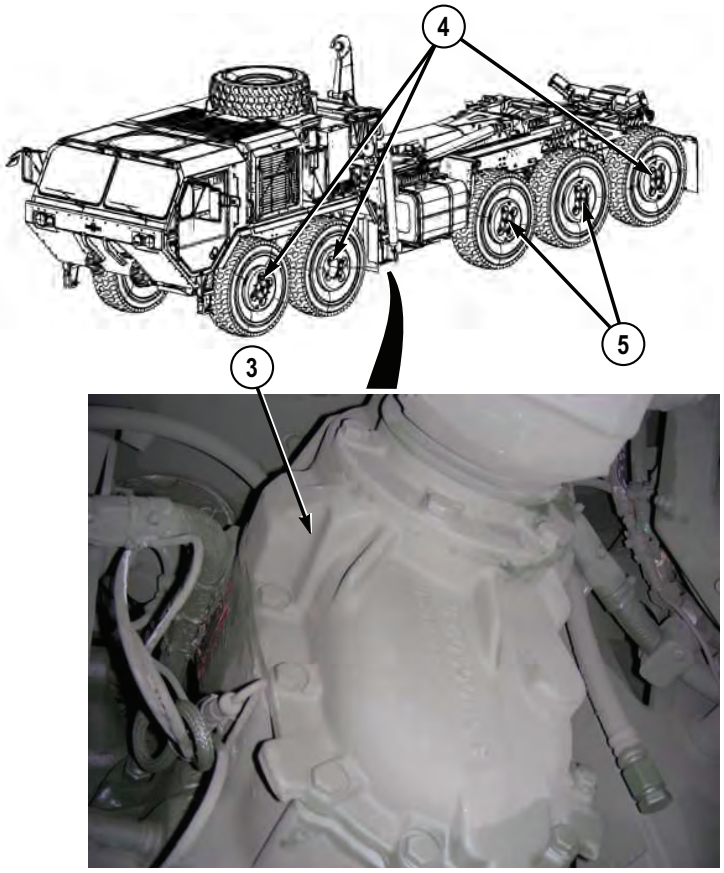


Figure 8.

HYDRAULIC SYSTEM

Two hydraulic pumps (1) and (2), driven by the PTO, provide power for two separate hydraulic systems. The front pump (1) provides power cooling fans (3), MHC (4), and LHS (5). The rear pump (2) provides power for the steering system. The pumps are connected and appear like one unit. A manually operated selector switch in the cab is used to select the auxiliary hydraulics.

HYDRAULIC SYSTEM - Continued

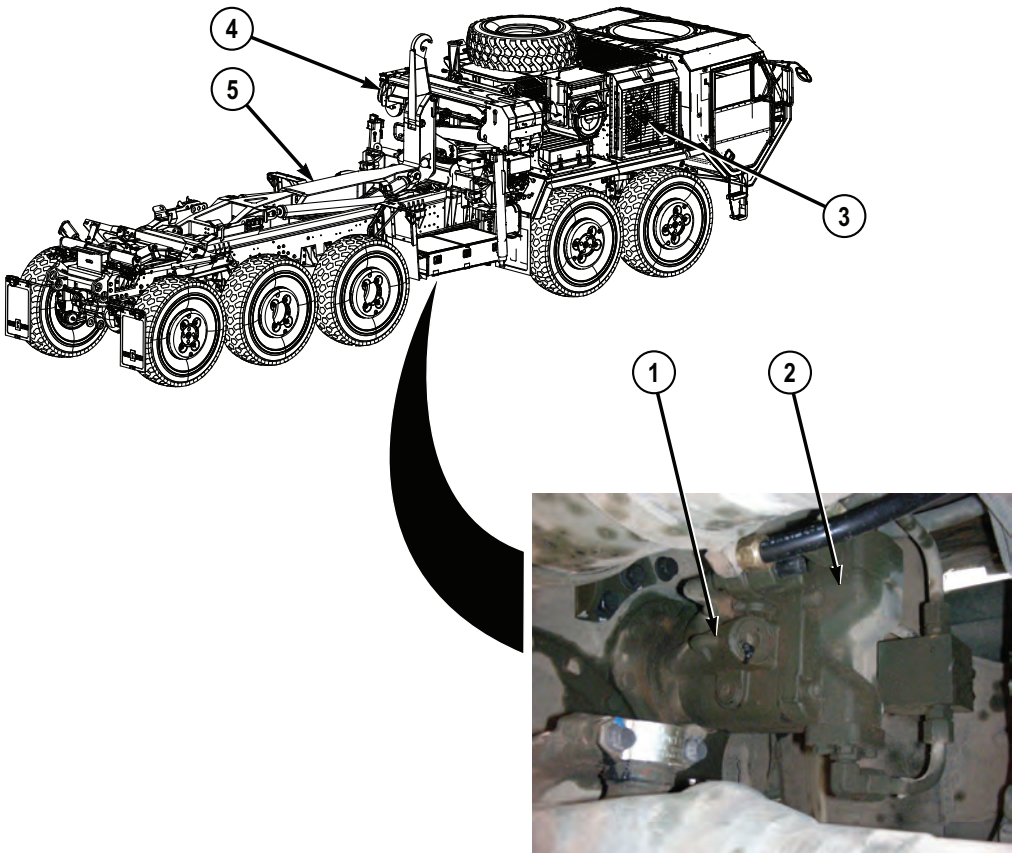


Figure 9.

AIR SYSTEM

AIR INTAKE SYSTEM

The air intake system consists of a dry-type air cleaner (1), ducts (2), high pressure turbocharger (3), and low pressure turbochargers (4).

AIR INTAKE SYSTEM - Continued

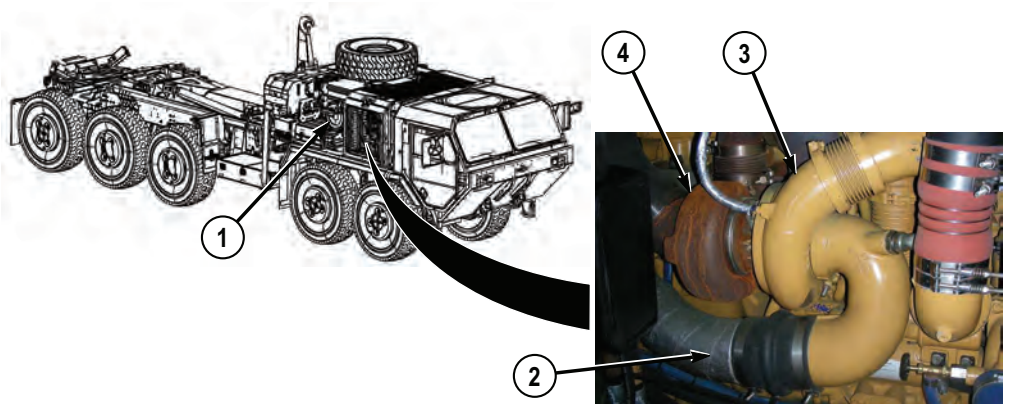


Figure 10.

AIR SYSTEM

The air system consists of an engine-driven air compressor (1) and five air reservoirs (2). The air dryer (3) removes dirt and moisture from pressurized air. The brakes (4), CTIS, and Axle No. 3 axle air suspension are operated by the air system. Air from one reservoir goes to the brake treadle valve. This air passes to the rear brake chambers, located on axles No. 3, 4, and 5, which control the axle rear service brakes. Air pressure in this system is shown by the red needle on the front and rear air pressure gauges. Air from another reservoir goes to the brake treadle valve. This air passes to the front brake chambers, located on axles No. 1 and No. 2, which control the front axle service brakes. The PARKING BRAKE valve applies or releases the rear axle (parking) brakes. The reservoirs are interconnected in such a way that if one reservoir fails, air will be supplied to release the rear axle (parking) brake from whichever reservoir is functioning. If air pressure falls below 60 to 70 psi (4.1 to 4.8 bar) in either system, a buzzer will sound, the LOW AIR indicator will light and the rear axle brakes will be applied.

AIR SYSTEM - Continued

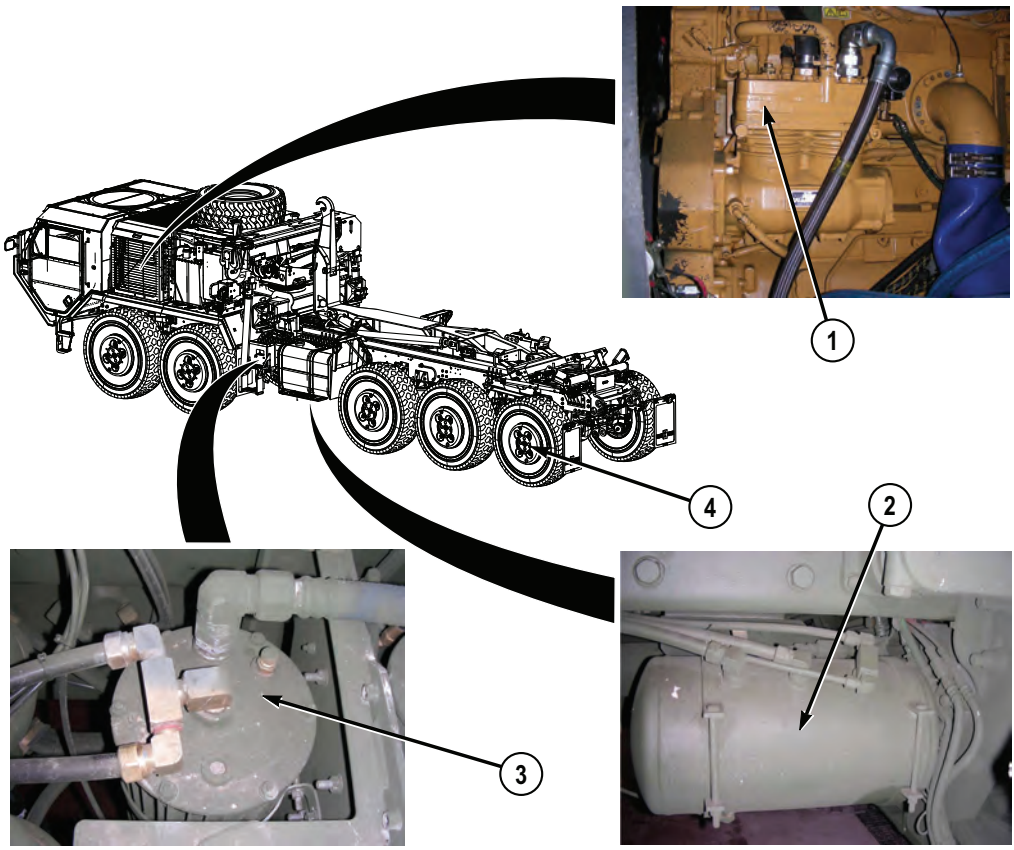


Figure 11.

CENTRAL TIRE INFLATION SYSTEM (CTIS)

The CTIS controller (1) is designed to adjust the pressure of all ten tires on the vehicle and control axle lock-up for different traction conditions. The CTIS controller has four pressure settings, which the operator selects and activates in the cab. The CTIS consists of a control valve for air supply and distribution, a dash-mounted electrical controller that adjusts tire pressure, along with required air tubing, electrical cables, air dryer, and air compressor. The drive-line lock-up controls, with the exception of the TRANSFER CASE LOCKUP, are integrated with the CTIS to simplify operation of the vehicle.

CENTRAL TIRE INFLATION SYSTEM (CTIS) - Continued

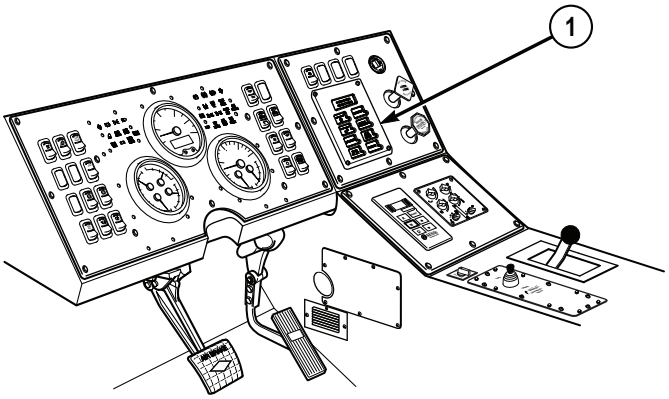


Figure 12.

BRAKE SYSTEM

The main brake system components consist of the service brake pedal (1), six brake chambers (2) on axles No. 3, 4, and 5, eight brake chambers (3) on axles No. 1, 2, and a parking brake valve (4). When the service brake pedal (1) is depressed, air is supplied to all the brake chambers (2) and (3), applying the service brakes. The parking brake valve (4) applies or releases the rear axle (parking) brakes. When air pressure on the brake system drops below 30 psi (2.1 bar), the rear brake chambers (2) automatically apply.

BRAKE SYSTEM - Continued

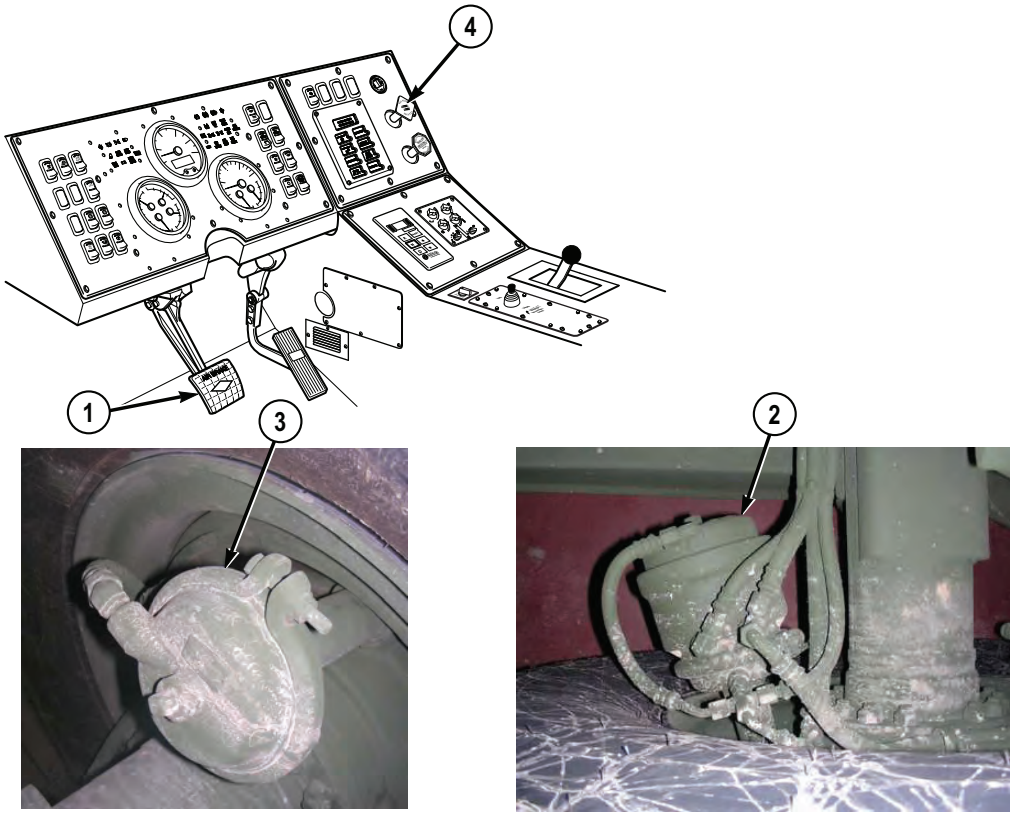


Figure 13.

COOLING SYSTEM

The pressure-type cooling system protects the engine by removing the heat generated during combustion process. Pressure within the cooling system is limited by a pressure release in the radiator filler cap (1). The hot coolant flows from the engine (2) to the radiator tank (3) and through the radiator core where a stream of air removes heat. This stream of air is drawn through the core by the fan. A water pump (4) draws coolant from the radiator and pushes it through the engine, repeating the cooling process. Thermostats (5) mounted in each coolant outlet elbow remain closed until the coolant approaches a predetermined temperature when they open. When coolant temperature drops below thermostat rating, the thermostats close. An air vent line between the radiator and water pump inlet removes any air trapped in the engine when the cooling system is being filled. A heat exchanger is mounted in the charge air cooler for cooling the transmission oil. An air-to-oil cooler (6), mounted on the charge air cooler, cools the hydraulic oil.

COOLING SYSTEM - Continued

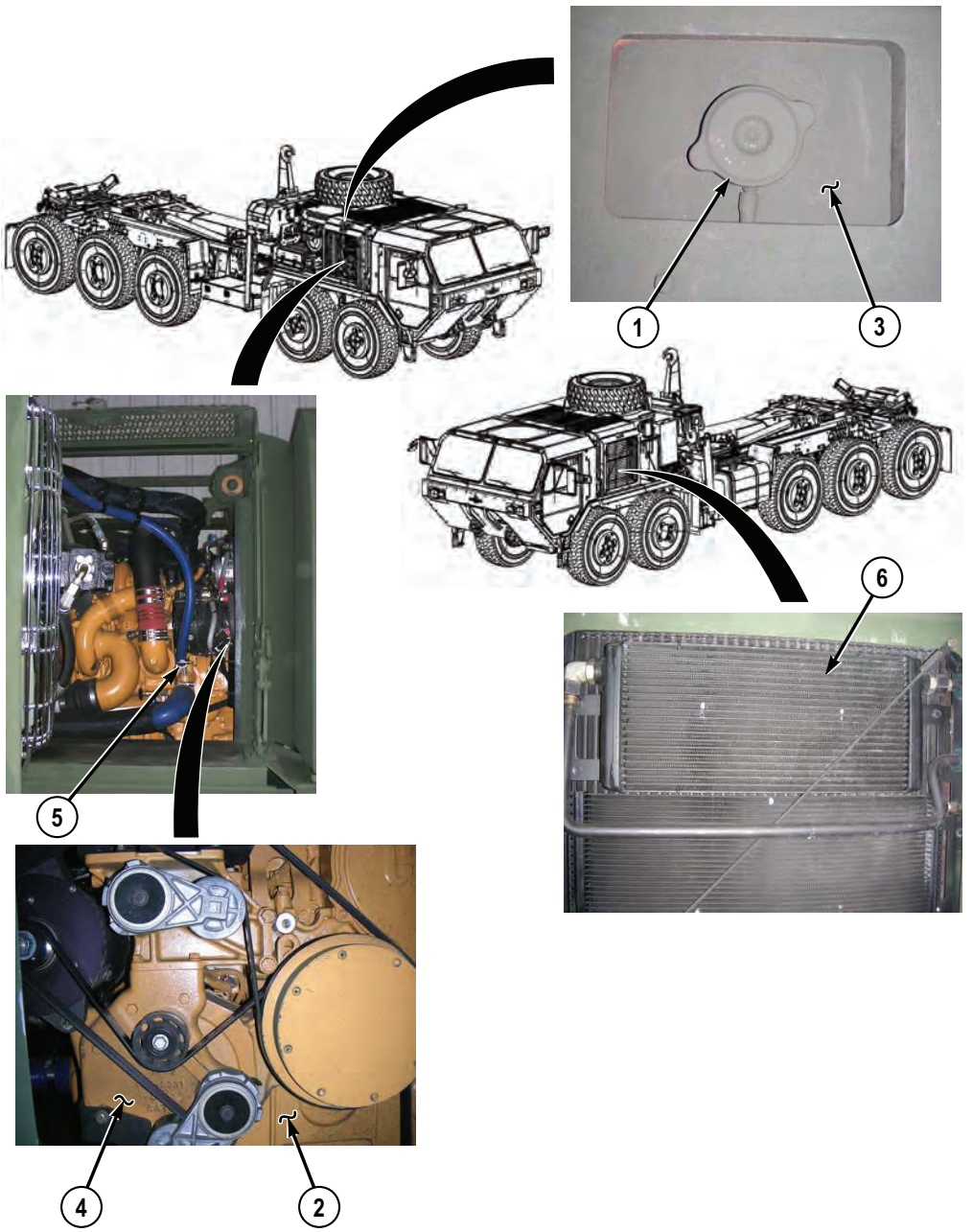


Figure 14.

FUEL SYSTEM

Fuel is drawn from the fuel tank (1), passes through the electrical priming fuel pump (2) and the fuel/water separator (3). A fuel shut-off valve (4) controls the flow of fuel to the auxiliary fuel tank, if equipped. A mechanical fuel pump (5) pumps the fuel through the secondary filter (6) to the engine (7). Excess fuel from the engine is returned to the fuel tank through the return line. The fuel/water separator removes water and large solid particles from the fuel. The smaller particles are removed by a secondary filter before they can enter the engine fuel injectors.

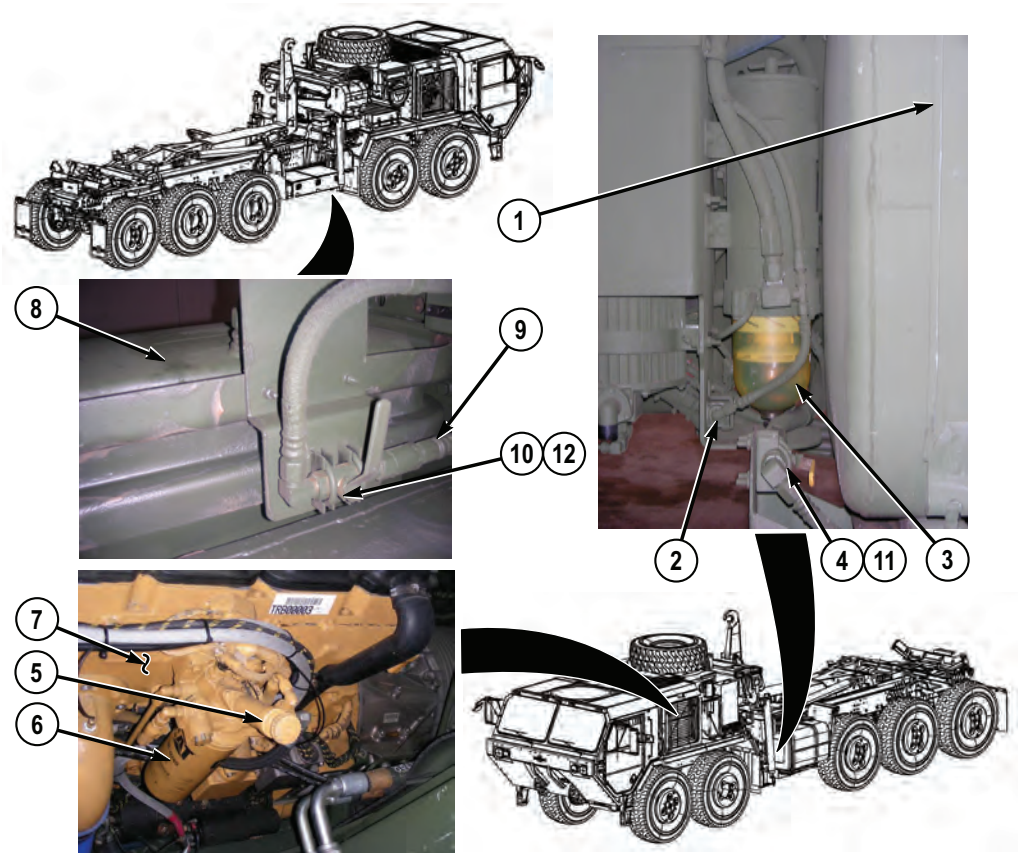


Figure 15.

Vehicles equipped with an auxiliary fuel tank (8) will bottom fill the main fuel tank (1) though a crossover fuel line (9) found under the vehicle. The shutoff valve (10) between the tanks shuts off fuel flow during filling and side slope operations. Check valves (11) and (12) prevent fuel spilling if crossover line is damaged.

STEERING SYSTEM

Steering system power is supplied to steering gears (1), (2), and (3) by fluid from the hydraulic reservoir and a PTO-driven pump. The steering wheel, which is mechanically linked to the steering gear, rotates a gear that positions a spool in the front steering gear (1). This motion is hydraulically transmitted to a piston in the intermediate steering gear (2) causing it to follow the pitman arm and transmit rotary motion to the rear steering gear (3). These pitman arms move the steering mechanism on the axles left or right causing the vehicle to steer left or right. An emergency backup hydraulic pump, driven by the transfer case middle shaft, supplies limited emergency steering.

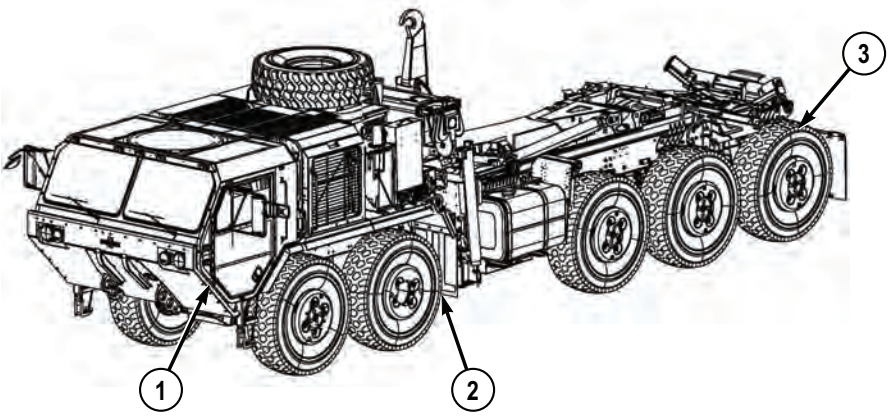


Figure 16.

CAB

The vehicle cab features a full width configuration and is positioned forward of the first axle. The cab controls and operating mechanisms are designed to accommodate a crew of two wearing the full range of clothing. Heating, ventilation, lighting, noise, vibration, and shock control are provided for personnel use. The cab contains all of the driving controls and gauges and some operating controls for the mounted equipment.

POWER TRAIN

Power for the vehicle is provided by a diesel engine (1), which is coupled directly to an automatic transmission (2). Power from the transmission is transferred to the transfer case (3), and onto the drive-and-steering axles (4), and to the drive-only axles (5) through a series of drive shafts and universal joints. The vehicle drivetrain is enhanced through the use of the Caterpillar C15 engine controller and the Allison electronic transmission controller. The primary components of the Allison GEN IV system are a Transmission Control Module (TCM) and push button shifter in the vehicle cab, an electrohydraulic valve module beneath the transmission gearing section that contains solenoid valves for clutch control, a throttle

sensor that is activated by the accelerator pedal, and an output speed sensor that relays the transmission output speed to the ECU for shifting and control functions.

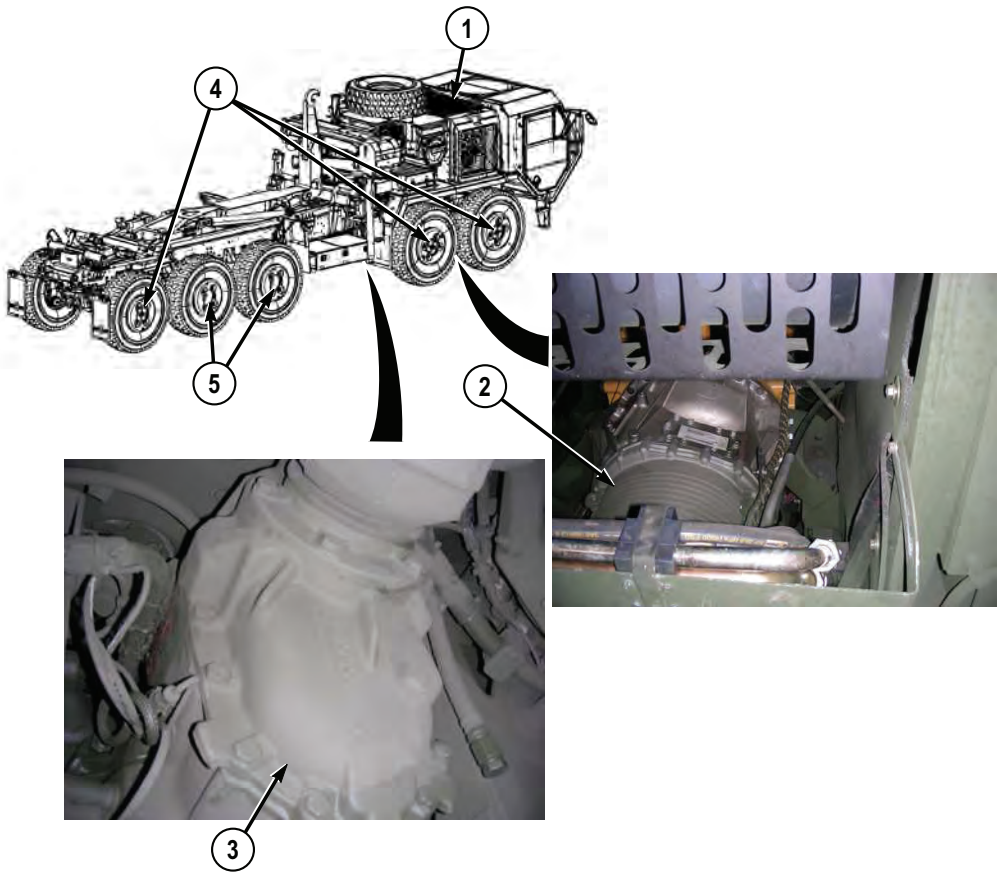


Figure 17.

ENGINE

The vehicle is equipped with a Caterpillar (CAT) Model C15 engine rated at 600 hp. The drivetrain control system consists of the engine and transmission systems. The Caterpillar C15 contain a microprocessor-based electronic control module to regulate the electronic distributor unit. This distributor unit controls the individual or unit injectors that regulate both the amount and timing of fuel delivery. The Caterpillar C15 electronically governs engine speed and can be programmed to accommodate configuration changes. The Caterpillar C15 is electronically linked with the transmission, through the Allison GEN IV controls, to improve vehicle performance.

ENGINE - Continued

The Caterpillar C15 and Allison GEN IV systems perform self diagnostics, engine/ transmission system diagnostics, and vehicle performance diagnostics. Self diagnostics includes personnel initiated checks of main electronic components such as solenoids, wiring, sensors, and control modules. System diagnostics monitor critical engine and transmission parameters such as oil temperature, oil pressure, coolant temperature, voltage, and gear range attained. Vehicle performance diagnostic capabilities aid the mechanic in isolating problems outside of the electronic control system. Operating data is stored in the Caterpillar C15's memory for display at a later time. Stored data includes total engine hours and fuel consumed.

TRANSMISSION

PLS A1 vehicles use an Allison 4000 Series Transmission, Model 4500 SP. This hydrokinetic-type transmission has an integral-locking torque converter, lock-up clutch, constant mesh planetary gearing, the Allison GEN IV Controls, a speedometer, and a control valve body assembly.

The Transmission Control Module (TCM), which contains the microprocessor-based electronics, is located in a protected area within the vehicle. The TCM receives information, in the form of signals from switches and sensors, processes the information, and sends electrical signals to the appropriate solenoids, which control the transmission operation. The TCM features diagnostics, which can sense many electronic system malfunctions and identify them with a displayed code. The TCM also protects the transmission from cold weather start-ups by inhibiting normal shifting functions until a minimum sump oil temperature of 20° F (-7° C) is attained.

The push-button range selector is totally electronic. Range selection is achieved by means of five snap dome switches. To select a range, touch the pad. The pad will light up, a beep will be heard, and a click will be felt. The transmission will be ready to operate in the selected range. The maximum gear range available and current gear will be digitally displayed.

Select the Drive position and the vehicle will start in first (low range only) or second range and automatically upshift to a higher range as output speed increases. As the vehicle slows down, output speed decreases, and the transmission automatically downshifts to the correct range. If a locked brake or a slick-surface condition should occur, the TCM will command converter operation and inhibit downshifts for a period of time or until normal wheel speed has been restored. Drive (4) should be selected for moderate loads, grades, and over-the-road operation with restrictive speed limits. Drive (3) is appropriate for operating in rough terrain or in heavy traffic. Drive (2) should be selected when need for speed control requires a second gear hold condition such as descending steep grades where additional engine braking is required, for operation on rough terrain, or greater retarder action. Selecting Drive (1) permits the driver to operate the vehicle in areas where maximum performance in extremely rough terrain is required.

TRANSMISSION - Continued

NOTE

Do not allow a vehicle to coast in neutral. Engine braking is nullified and the transmission will not receive adequate lubrication.

Select the Neutral (N) pad when checking vehicle accessories and for extended periods of engine idle operation. The push-button range selector will automatically select neutral when the master switch is turned on.

Stop the vehicle before shifting from Forward (F) to Reverse (R) or from Reverse (R) to Forward (F). Touch the Reverse (R) pad on the selector. The light under the Reverse (R) pad will light and the reverse warning signal on rear of vehicle will be activated.

When the TCM detects a serious problem in the system, a beeper tone is produced for 10 seconds and a DO NOT SHIFT light is activated to warn the driver that the transmission is held-in-gear. Selecting another pad will have no affect or change, nor will a tone sound be produced.

All lubricating and clutch-applied oil is provided by an engine-driven pump (in the transmission). Because of the pump location ahead of the transmission gearing and clutches, the engine cannot be started by pushing or towing the vehicle. Therefore, anytime the vehicle must be towed or pushed, the drive-line must be disconnected.

TRANSFER CASE

The vehicle transfer case has two speeds and a 30/70 differential. The transfer case 30/70 differential provides full-time, all-wheel drive and proportions approximately 30% of the torque to the front tandem and 70% of the torque to the rear tridem. The differential has a driver-controlled air-actuated lock-up mechanism, which consists of a sliding lockout collar that locks the differential housing to the output shaft. This differential lock-up provides increased mobility in adverse conditions.

SUSPENSION

The front suspension is a TAK-4 suspension. The third axle suspension is an air-ride suspension. The rear suspension is a walking beam suspension with a special low-friction spring.

The suspension system design maintains tire/ground contact under adverse terrain profiles and conditions. The design equalizes loads between axles and provides the necessary roll stability to operate on a 30-degree side slope. The vehicle uses 16.00R20 tires of a tubeless radial design.

The vehicle uses three steering axles. The front tandem axle wheels and the last axle wheels steer. Power steering controls the steering gear at each steering axle. The power steering pump is direct driven at the engine. The cab steering wheel provides directional input to the first and second axle steering gears. A control link from the first axle master steering gear provides a mechanical link to the second axle slave steering gear. The second

SUSPENSION - Continued

axle slave gear provides directional control from a rotary output shaft to the steering gear on the fifth axle. The steering gears are sized to turn the wheels when the vehicle is fully loaded.

AXLES

The vehicle uses a three drive/steer hub reduction axle and two hub reduction axle design.

WHEELS AND TIRES

Each vehicle has eleven wheel/tire assemblies, ten installed on the vehicle axles plus a spare. The components of each wheel/tire assembly are the wheel, tire, valve stem, Central Tire Inflation System (CTIS), wheel valve, bead lock, and wheel cover.

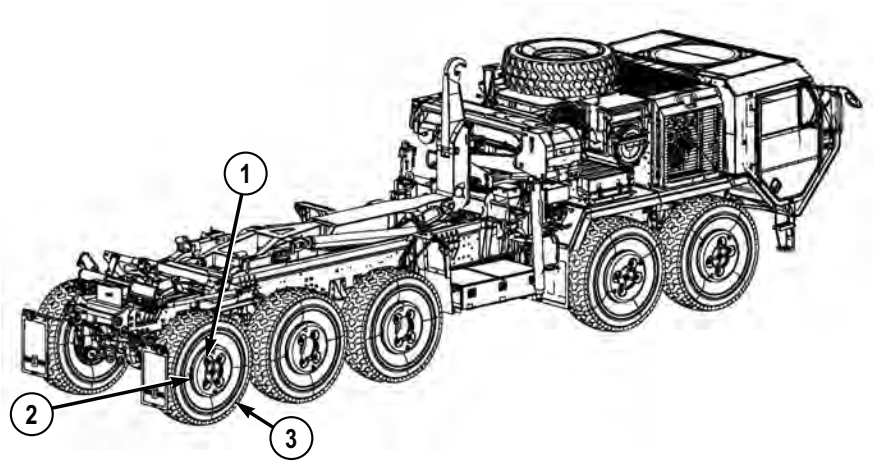


Figure 18.

WHEEL

The 20 by 10 inch wheel is manufactured in two pieces. Twelve studs (1) that protrude from the rear wheel half are used to bolt the two halves together. These studs are also used to mount the CTIS wheel valve bracket and secure the wheel cover (2).

TIRE

The 16.00R20 tires (3) are tubeless.

BEAD LOCK

The bead lock is installed inside the assembled wheel and tire. It ensures that the tire stays pressurized when tire pressure is low. It is manufactured in two halves that are bolted together.

CTIS WHEEL VALVE

The wheel valve assembly allows air flow in and out of the tire during CTIS inflation/deflation cycles. It is mounted to the wheel and secured by a bracket assembly. The input and output ports are fitted with two flexible, steel tubes in parallel.

VALVE STEM

The valve stem connects inside the wheel and is routed to the CTIS wheel valve.

WHEEL COVER

The entire wheel end contains a wheel cover to protect the CTIS valve and air lines from physical damage. This cover always must be in place whenever the vehicle is in operation. It is secured to the wheel via four of the wheel studs.

MATERIAL HANDLING CRANE (MHC) (M1074A1 ONLY)

The vehicle Material Handling Crane (MHC) is a fully hydraulic, load-moment sensing crane (1) powered by the vehicle hydraulic system. The crane is mounted behind the cab, bolt-attached to the vehicle frame, and is capable of lifting a 3,900 lb (1769 kg) pallet from any location on the flatrack. The crane can load/unload pallets to either side of the vehicle. Vehicle stability and leveling are accomplished with left- and right-side hydraulically operated stabilizers (2) that are fabricated as a part of the crane substructure. These stabilizers/outrigger jacks can be controlled from either side of the vehicle by individual hydraulic controls. The jacks can level the vehicle when it is inclined up to 7 degree side slope. Check valves are used to hold the outriggers in position. Safety switches are installed in the outrigger jacks to prevent crane operation unless the outriggers are in place. The outrigger pads (3) are attached to the outrigger jacks by means of quick pins (4) and are stowed on the crane base. The pads swivel 360° when installed on the jacks.

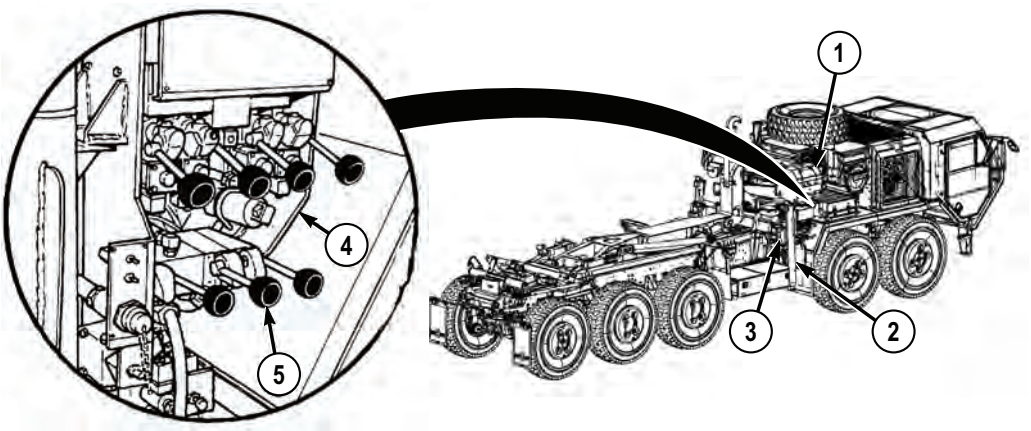


Figure 19.

MHC HYDRAULIC SYSTEM

The hydraulic filters and strainers are located to provide direct access and to allow removal without causing damage to the vehicle. Bypasses are furnished, where necessary, to protect filters during cold-temperature operation. All cylinder rods exposed during operations have a hard chromium plating. Integral mounted or cartridge-type holding valves prevent sudden cylinder collapse in the event of hose burst or major hydraulic failure. If a hydraulic system failure occurs, a hydraulic hand pump (5) located at the operator station permits the operator to lower any load to the ground and stow the crane. The MHC is operated by two hydraulic valve banks, located approximately 60 inches (1524 mm) above ground on the passenger side of the vehicle. Four electro-proportional control valves with manual handles connected to spools are used to control crane proper function. Three additional proportional manual control valves are used for erection and outrigger control. The outrigger manual control valves are also duplicated on the driver side of the vehicle.

MHC FIXED CONTROLS

All crane controls and indicators (1) are located at the crane position on the passenger side of the vehicle. Controls (2) on the driver side will also operate the outriggers. The controls are accessible to the operator while standing on the ground. Control valves, both crane and outrigger, automatically return to the neutral position should the operator inadvertently or intentionally release the control.

MHC FIXED CONTROLS - Continued

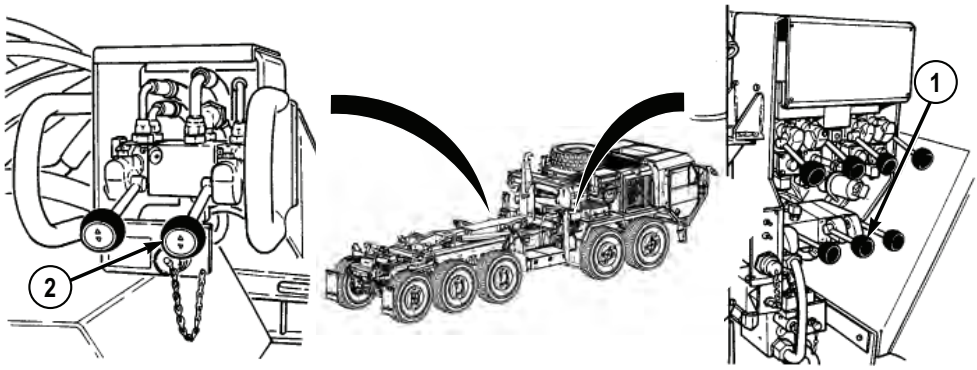


Figure 20.

MHC REMOTE CONTROLS

The remote-control system is designed to operate the spools of the directional control valve. Remote control is proportionally variable. Remote control (1) is provided with an emergency shutdown capability and designed so that, when activated, all remote-control crane functions cease and vehicle speed is reduced to idle. The operator can operate the remote control anywhere within 35 ft (10.7 m) of the crane base. The controller has multiple functions to match control levers on the control except for the mast and outrigger controls.

MHC REMOTE CONTROLS - Continued

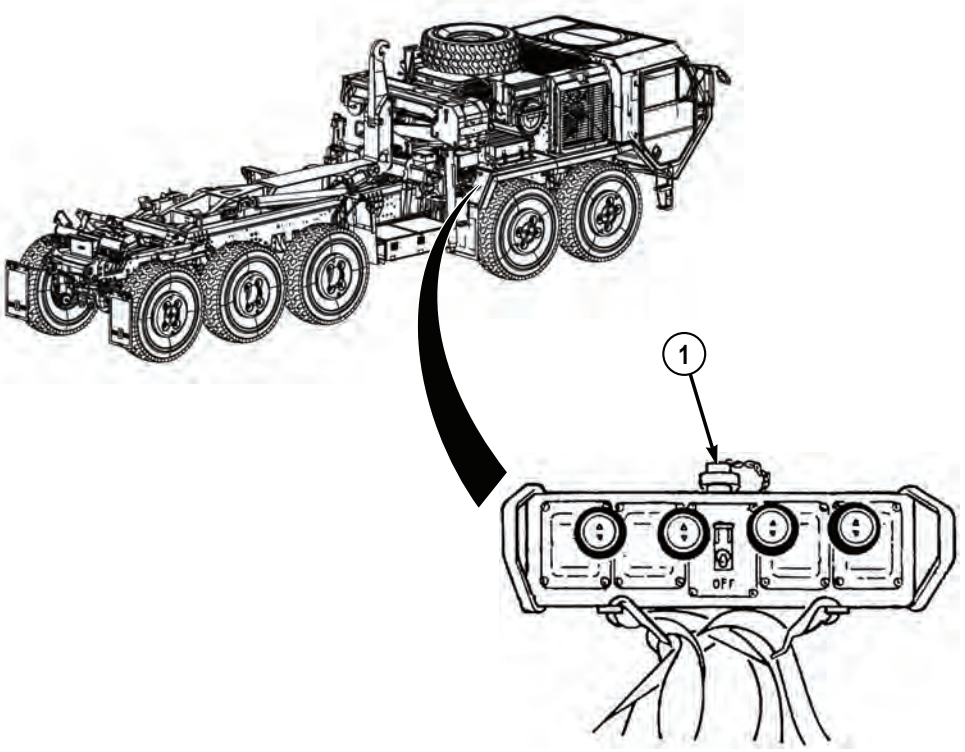


Figure 21.

MHC OVERLOAD SHUTDOWN

The crane is provided with an overload shutdown, which precludes structural overloading. Two-block and overload conditions are sensed through line-pull of the hoist. A preprogrammed micro-processor that is constantly comparing boom angle, boom length, and hoist line-pull activates solenoid in the telescope-out, lift-up, lift-down and hoist-up circuits when the unit is overloaded or two-blocked. During an overload condition, the crane’s functions cease. Hoist down, telescope in, and swing in either direction can be used manually to bring the crane to a safe position.

MHC HOIST

The crane provides lift of a 3,900 lb (1769 kg) load at 22.5 ft (6.86 m) by means of a hoist (1) with a 5.8 cu. in. (95 cc) motor. The hoist is controllable by manual control at the fixed operator's station, or at the remote control. The hoist has a spring-applied, hydraulically

MHC HOIST - Continued

released multi-disk pack brake, hydraulically coupled to the hoist circuit, which applies automatically when the hoist control is released.

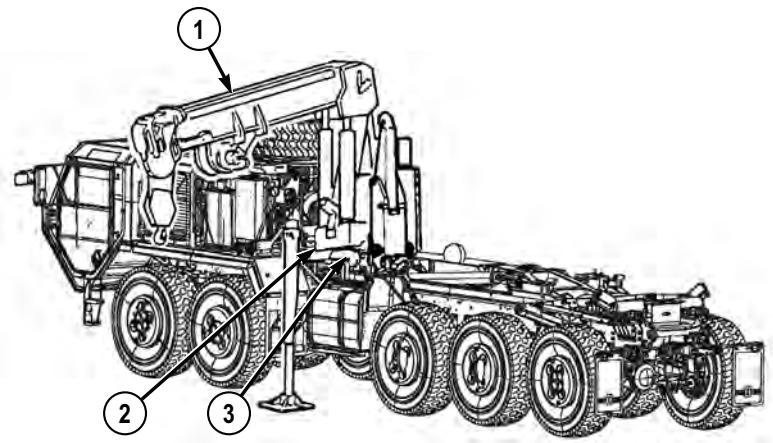


Figure 22.

MHC SWING DRIVE AND BRAKES

The swing drive (2) is a planetary gear box driven by a hydraulic motor to give a swing speed of 0.8 rpm. Mechanical stops limit the rotation to 180°. The swing brake (3) is a spring-applied, hydraulically released multi-disc pack, hydraulically coupled to the swing circuit, applying automatically when the swing control is released.

LOAD HANDLING SYSTEM (LHS)

The vehicle is equipped with a Load Handling System (LHS). The LHS (1) is fully hydraulic, powered by the vehicle hydraulic system and is operated by hydraulic selector switch (2) and joystick (3) located on the driver right in the vehicle cab. With the flatrack (FR) loaded with 33,000 lb (15 metric ton) nominal payload, the LHS is capable of the following:
Loading/unloading the FR from the vehicle to 12 in. (304.8 mm) below ground level and any intermediate level,
Loading/unloading from uneven ground slopes of 10° from the vehicle's lateral and horizontal axis,
Loading/unloading to/from the trailer or ramps in which the height is equal to or less than the height from the ground to the bottom of the FR (while on the vehicle).

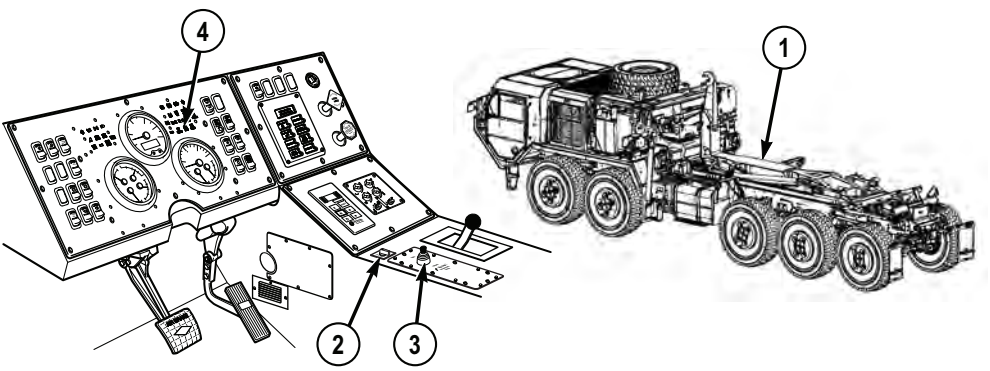


Figure 23.

LHS FLATRACK LOCKING

The LHS is designed with automatic locking features that secure the FR for all modes of transportation. The LHS can automatically guide, center, and secure a FR to the vehicle so that, even during rough trail operations, the FR remains safely secured.

LHS OVERLOAD

The LHS will not function when the payload exceeds 36,300 lbs (16,465 kg) maximum. A warning light (4), located in the cab in plain view of the driver, activates when a FR with a payload between 34,500 and 35,500 lbs (15,649-16,103 kg) is being loaded by the LHS while under the worst conditions.

HYDRAULIC SYSTEM

Hydraulic filters are located to provide direct access and to allow removal without damage to the vehicle. Bypasses are furnished where necessary to protect filters during cold temperature operation. All cylinder rods exposed during operation have a hard chromium plating.

SLAVE HYDRAULIC

Self-sealing, quick, disconnect-hydraulic coupling, and a hose with appropriate connectors are provided so that one PLS vehicle can readily hydraulically power the LHS of another PLS vehicle.

CONTAINER HANDLING UNIT (CHU) (M1075 ONLY)

The CHU (1) utilizes the LHS (2) to load and unload ISO containers into the vehicle (3). The CHU consists of a lifting frame (4) which is hooked by the LHS and is attached to an ISO container. The rear slider assembly (5) guides the container onto the vehicle. Operation

between container mode and flatrack is available. Safety switches are installed to prevent opposing operations. Maximum permissible gross container weight is 35,000 lb (15,878 kg).

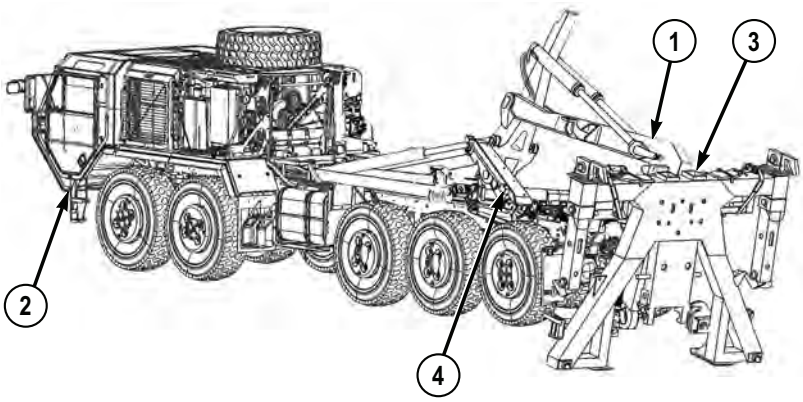


Figure 24.

CHU FIXED CONTROLS

CHU controls for storing and unstowing lifting frame (4) are located on both sides of vehicle (3). Flipper lock pin handles (6) are located on the lifting frame (4) and allow locking the flipper brackets (7) in open and closed position. Air control valves (8), located on front support assemblies (9), rotate flipper brackets and flipper bracket lock plates (10) from the open and closed position.

CHU FIXED CONTROLS - Continued

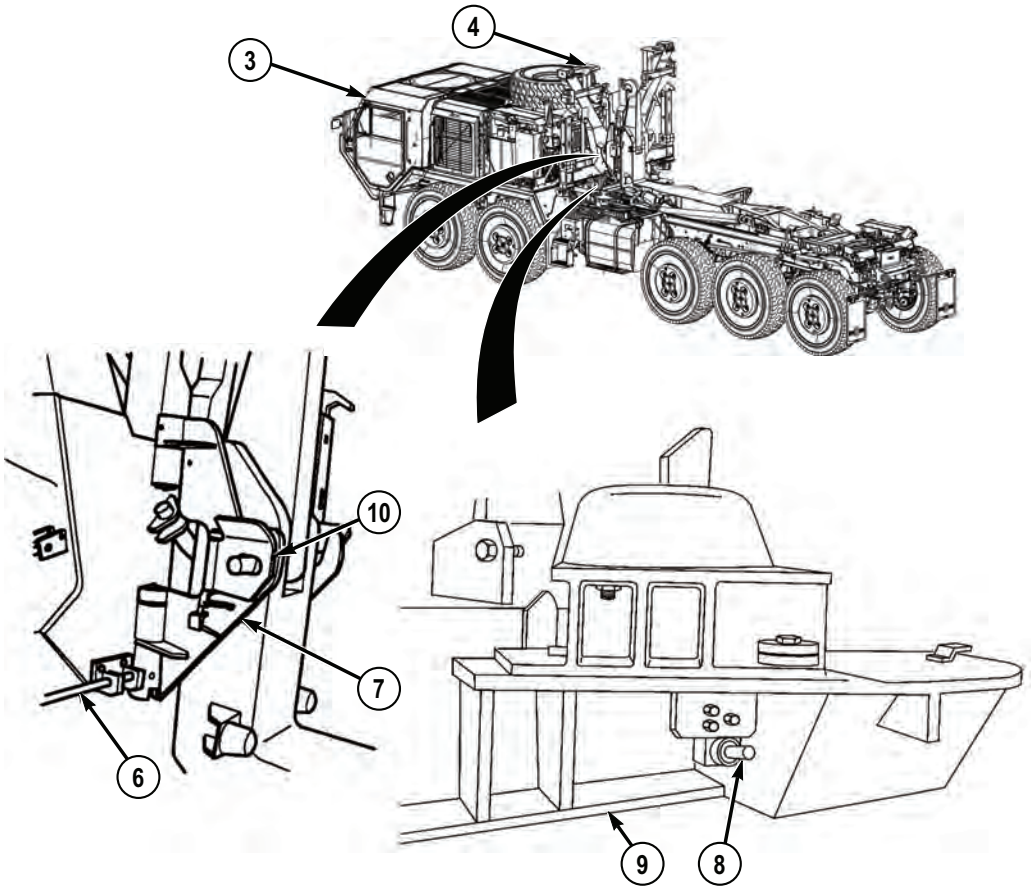


Figure 25.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS

OPERATOR MAINTENANCE
CAB-MOUNTED FOOT CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

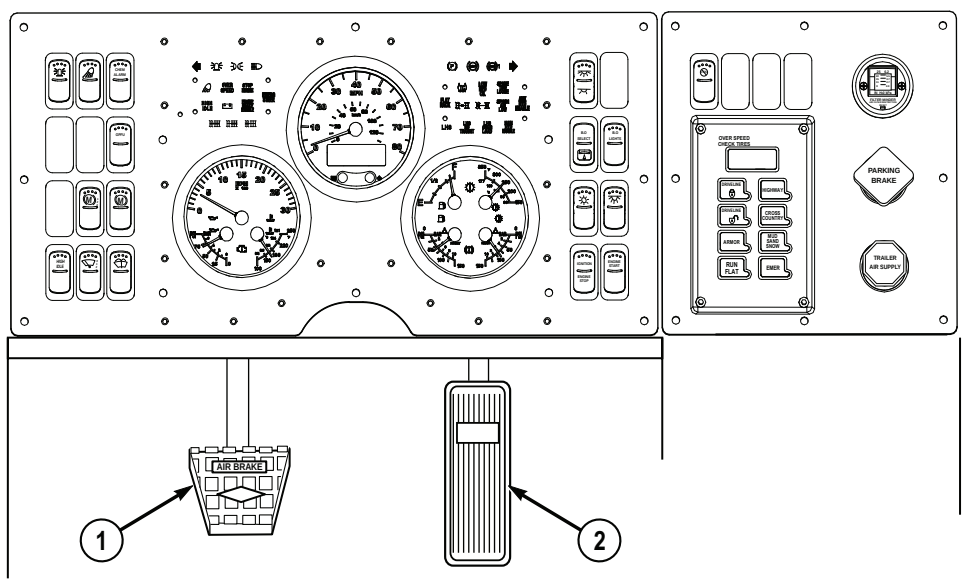
This section displays the location and describes the use of Cab-Mounted Foot Controls, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Cab-Mounted Foot Controls.

Table 1. CAB-MOUNTED FOOT CONTROLS

Key	Control/ Indicator	Function



STEERING WHEEL SHOWN REMOVED FOR CLARITY

Figure 1.

Table 1. CAB-MOUNTED FOOT CONTROLS - Continued

Key	Control/ Indicator	Function
1	Service Brake Pedal	Applies service brakes. If vehicle is properly coupled to a trailer, trailer service brakes will operate when vehicle service brakes are applied.
2	Throttle Control	Controls engine speed.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CAB - DOOR CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Cab-Door Controls which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Cab-Door Controls.

Table 1. CAB - DOOR CONTROLS

Key	Control/ Indicator	Function

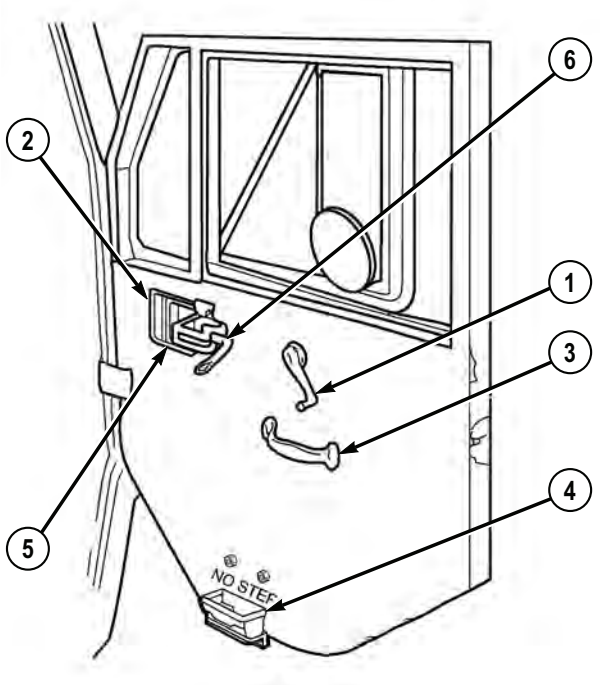


Figure 1.

Table 1. CAB - DOOR CONTROLS - Continued

Key	Control/ Indicator	Function
1	Cab Door Window Glass Crank	Rotate left crank counterclockwise to lower left window glass; clockwise to raise left window glass. Rotate right crank clockwise to lower right window glass; counterclockwise to raise right window glass.
2	Cab Door Inside Handle	Pull to open cab door from inside of cab.
3	Cab Door Pull Handle	Pull to close cab door from inside of cab.
4	Lower Rifle Mount	Holds butt of rifle.
5	Top Rifle Mount	Holds hand guard of rifle.
6	Rifle Mount Handle	Secures upper hand guard of rifle.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
STEERING COLUMN MOUNTED CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Steering Column Mounted Controls which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Steering Column Mounted Controls.

Table 1. Steering Column Mounted Controls.

Key	Control/ Indicator	Function

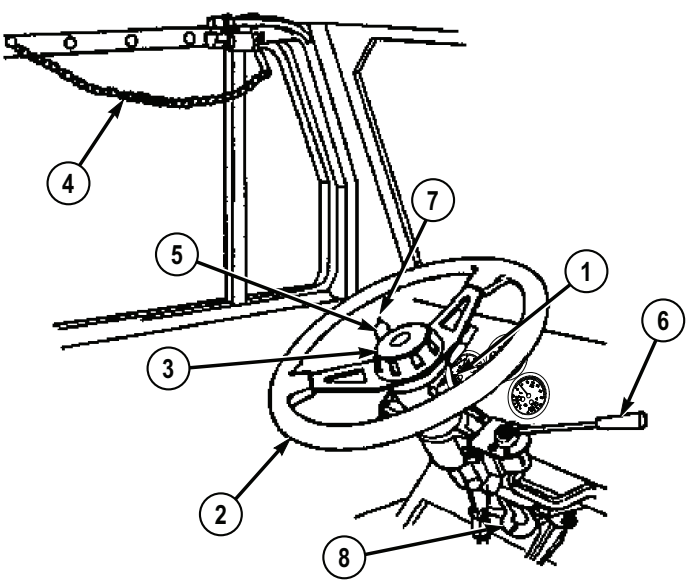


Figure 1.

1	Emergency Flasher Control	To turn on hazard warning flashers, push button in. To turn hazard warning flashers off, pull button out.

Table 1. Steering Column Mounted Controls. - Continued

Key	Control/ Indicator	Function
2	Steering Wheel	Controls direction of vehicle.
3	Horn Button	Sounds electric horn when pressed.
4	Horn Chain (if equipped)	Sounds air horn when pulled.
5	Turn Signal Lever	Push up to signal right turn. Pull down to signal left turn. When turn is completed the lever will automatically return to off position.
6	Trailer Handbrake Control	Applies and releases trailer service brakes only (separate from vehicle service brakes). Not used during normal operation. Can be used for coupling and uncoupling trailers without spring brakes.
7	Dimmer Button	Press button to raise or lower headlight beams. High beam indicator on dash will light (blue) when high beams are on.
8	Steering Wheel Lock	Provides attachment point for padlock to prevent steering.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CTIS PANEL CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of CTIS Panel Controls and Indicators, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about CTIS Panel Controls and Indicators.

Table 1. CTIS PANEL CONTROLS AND INDICATORS

Key	Control/ Indicator	Function

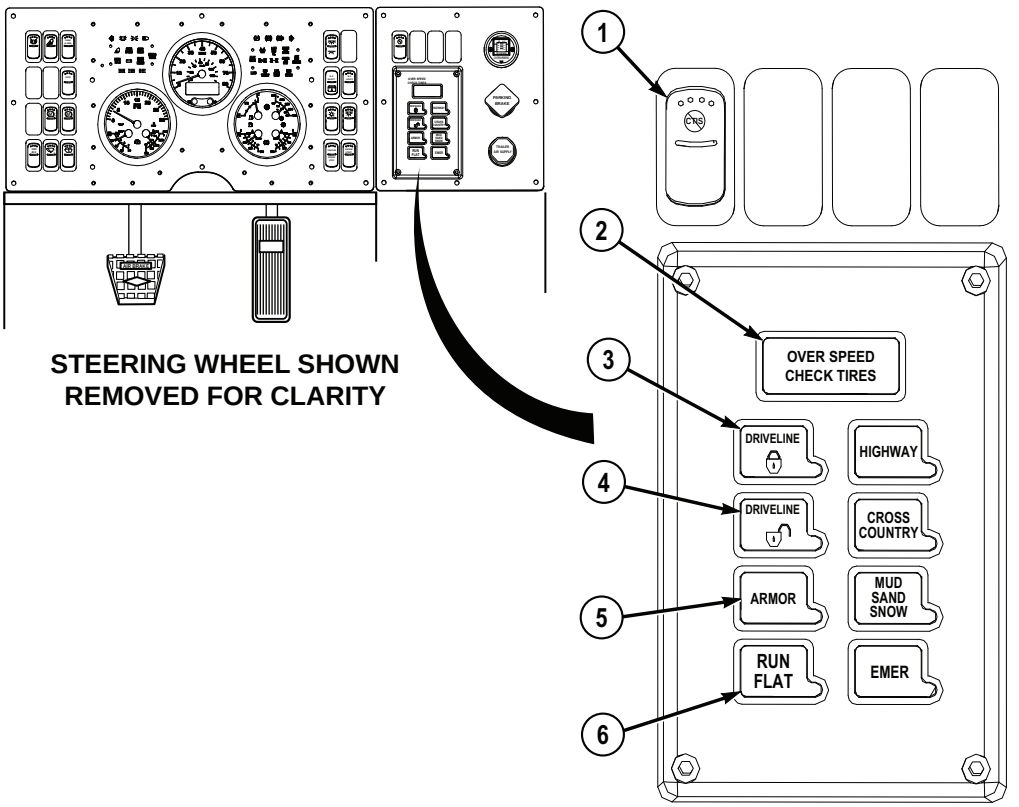


Figure 1.

1	CTIS On/Off Switch	This switch is used to partially disable the CTIS when operating in temperatures 0°F (-18°C). Refer to Operating Vehicle in Cold Environment. The switch should normally be in the down or OFF position. Animation.
2	OVERSPEED CHECK TIRES Indicator	When OVERSPEED indicator illuminates (amber), indicator alerts operator when speed exceeds maximum allowable speed as determined by CTIS. An audible alarm will also sound with OVERSPEED indicator. When CHECK TIRES

Table 1. CTIS PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
		indicator illuminates, indicator alerts operator substantial damage may have occurred to one or more tires.
3	DRIVELINE Lock Button	Locks driveline.
4	DRIVELINE Unlock Button	Unlocks driveline.
5	ARMOR Button	Selects preset tire pressure for armored vehicle.

Table 1. CTIS PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
6	RUN FLAT Button	Used when vehicle has sustained minor tire damage.

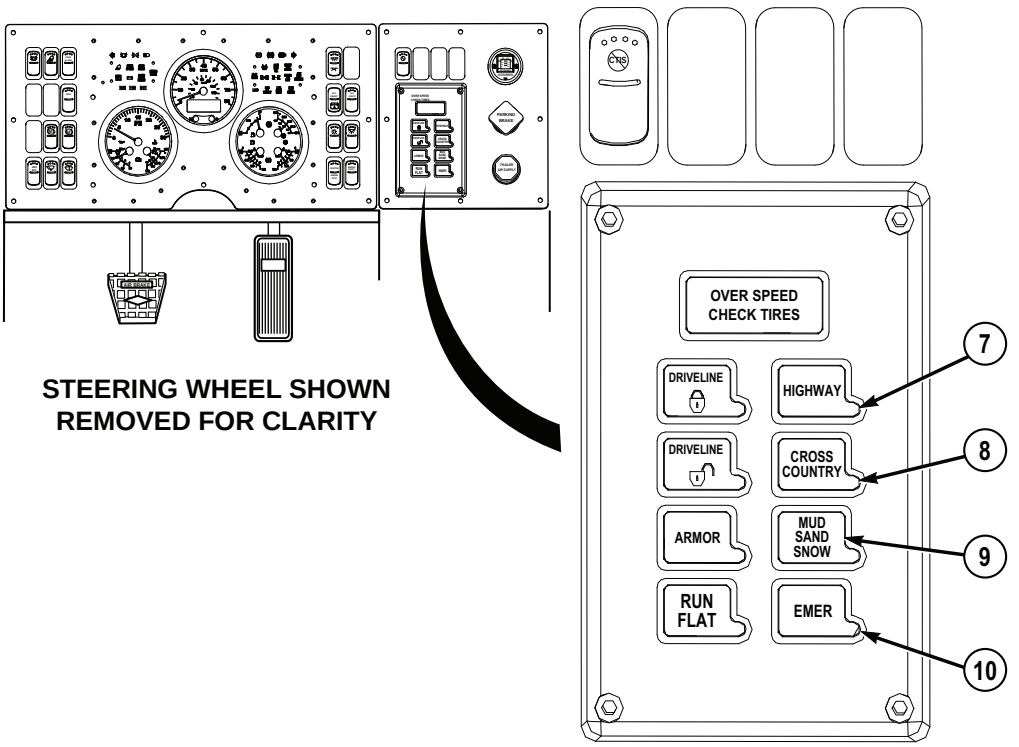


Figure 2.

7	HIGHWAY Button	Adjusts tire pressure to HIGHWAY setting for travel over improved paved roads.
8	CROSS COUNTRY Button	Adjusts tire pressure to CROSS COUNTRY setting for travel over non-paved, secondary, and hard-packed surfaces.

Table 1. CTIS PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
9	MUD, SAND, and SNOW Button	Adjusts tire pressure to MUD, SAND, AND SNOW setting for travel on soft surface trails and other unimproved surfaces.
10	EMER Button	Adjusts tire pressure to EMERGENCY setting for extremely low tire pressure used when vehicle is stuck or to travel short distances over terrain requiring low tire pressure.

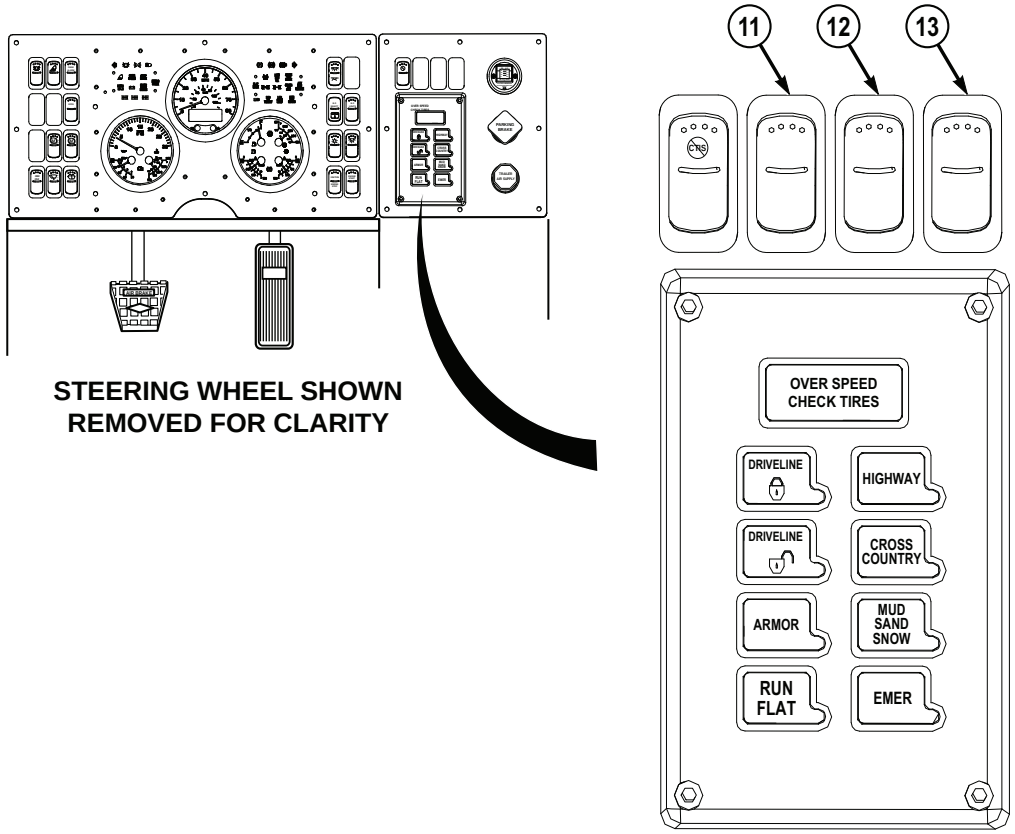


Figure 3.

Table 1. CTIS PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
11	WINCH IN/ OUT Switch	Press the switch to control SRW operation from inside the cab when the vehicle is equipped with the SRW kit. IN position pulls the cable in. OUT position feeds the cable out.
12	WINCH/ CRANE Switch	Allow the operator to select SRW or Crane individually when the vehicle is equipped with both kits.
13	ARCTIC HEATER Switch	Turns arctic heater on or off when the vehicle is so equipped.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
AIR PANEL CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Air Panel Controls and Indicators which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Air Panel Controls and Indicators.

Table 1. AIR PANEL CONTROLS AND INDICATORS

Key	Control/ Indicator	Function

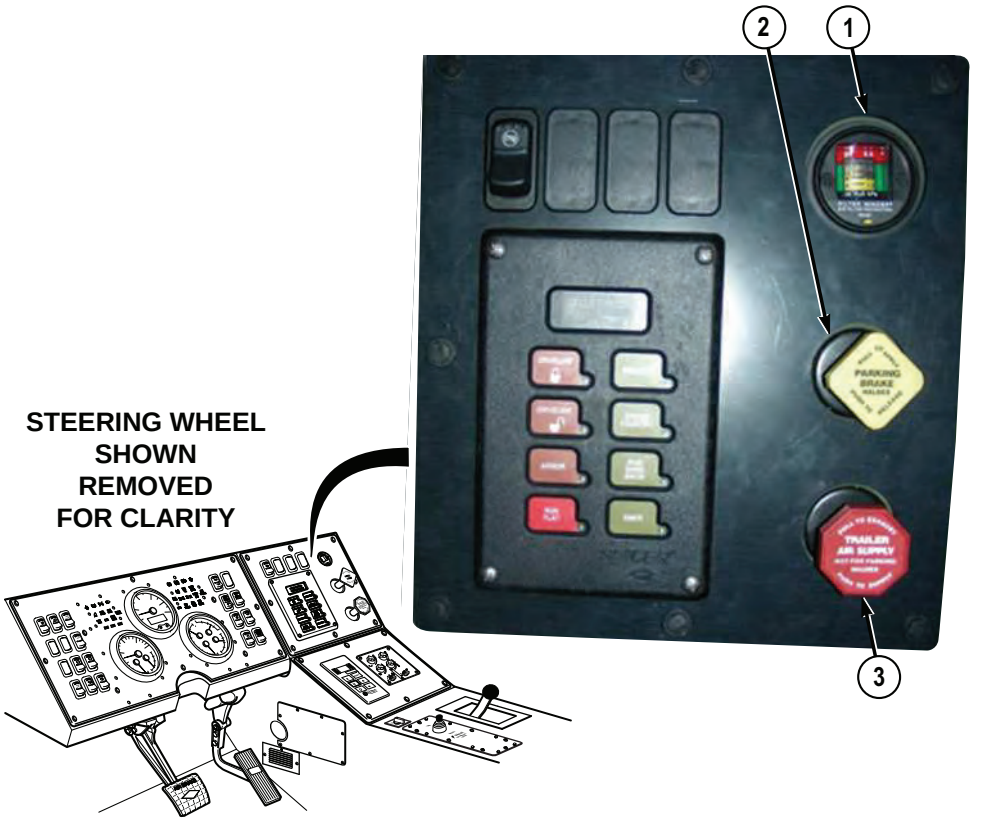


Figure 1.

1	Air Filter Restriction Indicator	Shows the condition of the air filter. Vacuum in H20 window shows degree of restriction. Indicator should read less than 20 in. (5.0 kPa) for normal operation. If indicator latches at 20 in. (5.0 kPa) during operation, vehicle may continue to operate until mission is completed. Air filter must be replaced prior to next mission. Push the button to reset.

Table 1. AIR PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
2	PARKING BRAKE Control	Push to release the vehicle brakes, pull to apply the vehicle brakes. Automatically applies the parking brakes if air pressure goes below 35 psi (241 kPa).
3	TRAILER AIR SUPPLY Control	Push to supply air to the trailer air system. Pull to shut off the trailer air.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TRANSMISSION RANGE SELECTOR CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Transmission Range Selector Controls which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Transmission Range Selector Controls.

Table 1. TRANSMISSION RANGE SELECTOR CONTROLS

Key	Control/ Indicator	Function

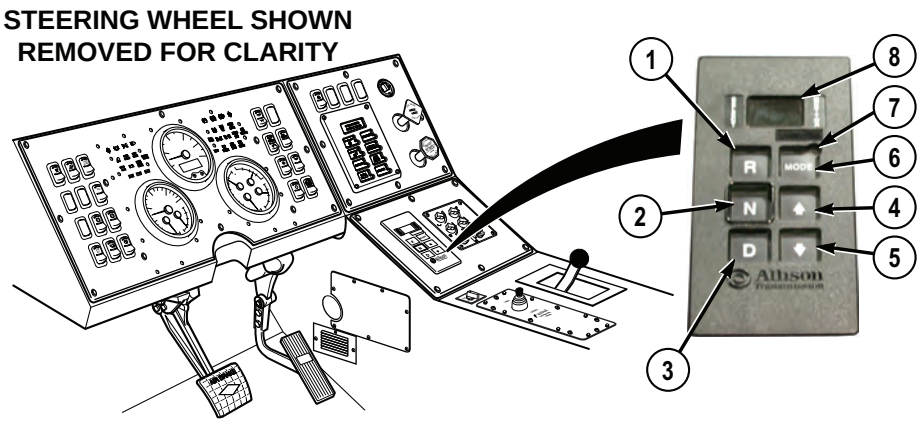


Figure 1.

1	R (Reverse)	Used to back up vehicle.
2	N (neutral)	Used when starting vehicle, parking vehicle, or if vehicle controls are left unattended while engine is running.

Table 1. TRANSMISSION RANGE SELECTOR CONTROLS - Continued

Key	Control/ Indicator	Function
3	D (Drive)	Used for all normal driving conditions. When vehicle is in motion, transmission will upshift/downshift automatically.
4	Up Arrow	Depress when in Drive to request the next higher speed range. Continuously pressing arrow will result in highest range available.
5	Down Arrow	Depress when in Drive to request the next lower speed range. Continuously pressing arrow will result in lowest range available.
6	MODE	This button is used to allow the driver to enable a secondary shift schedule, PTO, or other special functions. In Diagnostic Display Mode, button is used to page through diagnostic codes logged.
7	MODE Indicator	LED that illuminates if the secondary shift schedule, PTO, or other special function is selected.
8	Digital Display	This display shows highest attainable and current speed range, diagnostic codes logged, and transmission fluid level.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TUNNEL PANEL CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Tunnel Panel Controls, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Tunnel Panel Controls.

Table 1. TUNNEL PANEL CONTROLS

Key	Control/ Indicator	Function

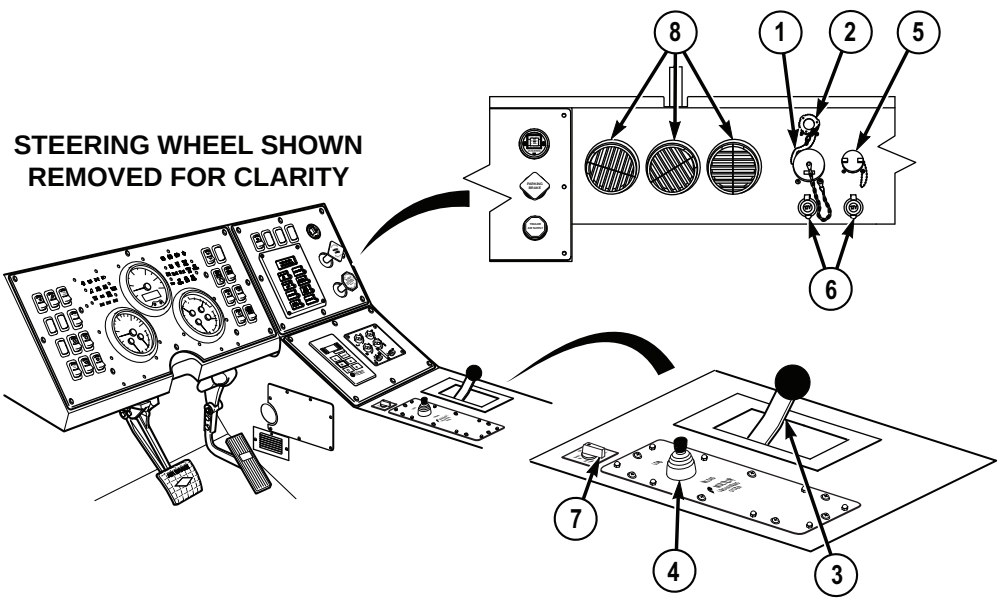


Figure 1.

Table 1. TUNNEL PANEL CONTROLS - Continued

Key	Control/ Indicator	Function
1	STE/ICE – R Receptacle	For connecting Simplified Test Equipment / Internal Combustion Engine – Reprogrammable (STE/ICE – R).
2	Electronic Diagnostic Receptacle	Used to connect diagnostic equipment for troubleshooting vehicle systems.
3	TRANSFER CASE Shift Lever	Used to select high (HIGH) or low (LOW) range. Center position is neutral.
4	LHS Load/ Unload Joystick	Operates the LHS for loading and unloading.
5	24–Volt Receptacle	Supplies 24 V electrical power to cab.
6	12–Volt Receptacle	Supplies 12 V electrical power to cab.
7	Hydraulic Selector Switch	OFF position: Joystick (13) not operational (LHS transit mode). AUTO position: For normal loading/unloading operations. MANUAL HOOK ARM (MAN H.A.) position: For loading/ unloading operations to/from trailer and docks, or if automatic hook arm electronic circuits fail.

Table 1. TUNNEL PANEL CONTROLS - Continued

Key	Control/ Indicator	Function
		MANUAL MAIN FRAME (MAN M.F.) position: For loading/ unloading operations to/from trailer and docks, or if automatic main frame electronic circuits fail. MANUAL TRANSIT (MAN TRANS) position: Used when automatic circuits have failed and MAN H.A. and MAN M.F. are operated. This position must be selected if vehicle is to travel. CRANE/SRW position: Used when switching from land handling mode to self-recovery winch mode.
8	Operator/Crew Air Vents	Rotate to direct as desired.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CIRCUIT BREAKERS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of circuit breakers, which are used in the operation of PLS series vehicles. Circuit breakers described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CIRCUIT BREAKERS

Know the location and proper use of every circuit breaker before operating PLS series vehicles.

Table 1. CIRCUIT BREAKERS

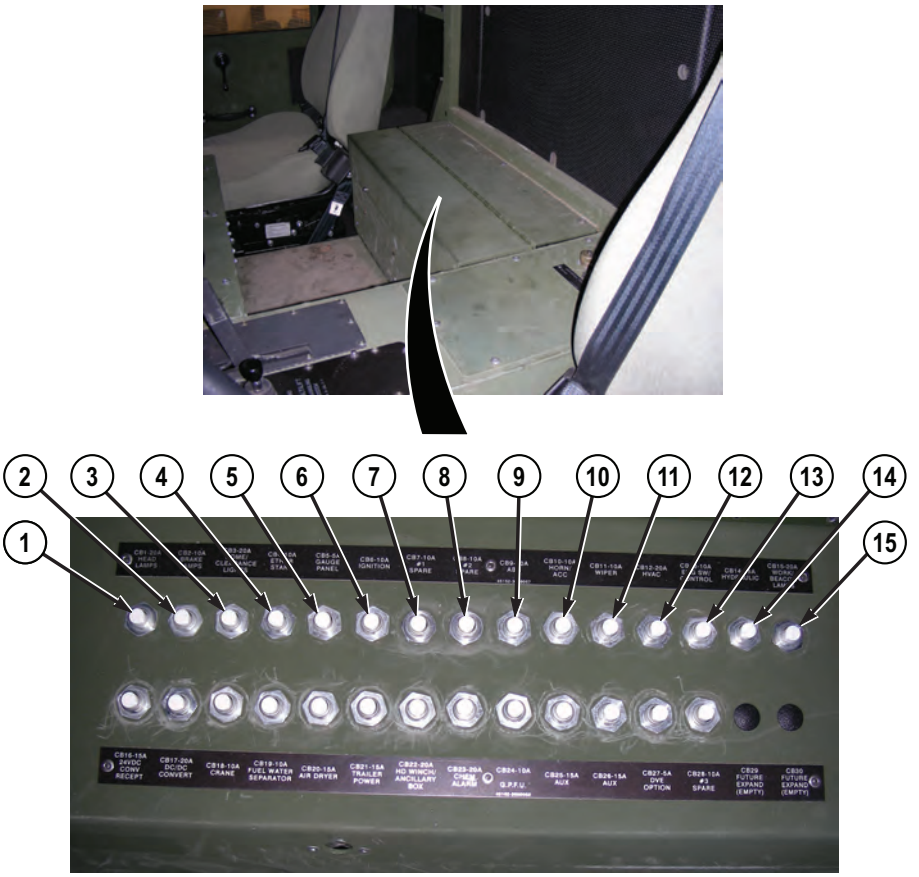
Key	Control/ Indicator	Function
		
		Figure 1.
		Circuit breakers pop out when tripped. Push breakers in to reset.
1	12 volts	Headlights
2	12 volts	Brake Lamps

Table 1. CIRCUIT BREAKERS - Continued

Key	Control/ Indicator	Function
3	12 volts	Dome/Clearance Lights
4	12 volts	Ether Start
5	12 volts	Gauge Panel
6	12 volts	Ignition
7	12 volts	AUX
8	12 volts	AUX
9	12 volts	ABS
10	12 volts	Horn/ACC
11	12 volts	Wiper
12	12 volts	HVAC
13	12 volts	ENG SW/Control
14	12 volts	Hydraulic

Table 1. CIRCUIT BREAKERS - Continued

Key	Control/ Indicator	Function
15	24 volts	Work/Beacon Lamps



Figure 2.

Circuit breakers pop out when tripped. Push breakers in to reset.

Table 1. CIRCUIT BREAKERS - Continued

Key	Control/ Indicator	Function
16	24 volts	24 VDC CONV RECPT
17	24 volts	DC/DC Convert
18	24 volts	Crane/SRW
19	24 volts	Fuel Water Separator/Fuel Pump
20	24 volts	Air Dryer/Cooler
21	24 volts	Trailer Power
22	12 volts	HD Winch/Ancillary Box
23	12 volts	CHEM ALARM
24	24 volts	G.P.F.U.
25	12 volts	#1 Spare
26	24 volts	#2 Spare
27	12 volts	DVE OPTION
28	24 volts	#3 Spare

END OF WORK PACKAGE

OPERATOR MAINTENANCE
HEATER CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Heater Controls and Indicators which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about Heater Controls and Indicators.

Table 1. HEATER CONTROLS AND INDICATORS

Key	Control/ Indicator	Function

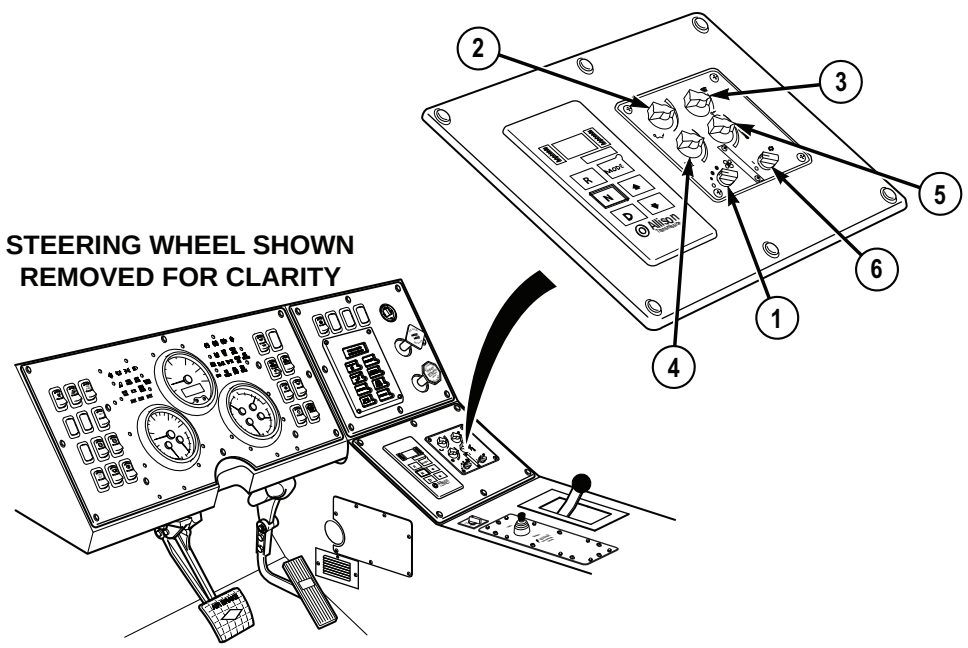


Figure 1.

Table 1. HEATER CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
1	Fan Control	Regulates fan output: Off – Turn control to the full left position. Low – One position to the right of off. Medium – Two positions to the right of off. High – Turn control to the full right position.
2	Cabin Floor Vent Control	Regulates amount of airflow directed to the floor vents. This is a rheostat-type control. Turning control clockwise gradually lessens airflow until it stops. Turning control counterclockwise gradually increases airflow to the cabin floor until the vents are completely open.
3	Cabin Air Directional Control	Directs airflow within the cabin between the midsection and defroster vents. This is a rheostat-type control with the midpoint position equally distributing airflow between the midsection and defroster vents.
4	Vent Control	Regulates amount of outside air allowed through the cabin fresh air vents. This is a rheostat-type control with full counterclockwise completely closing, and full clockwise completely opening the cabin fresh air vents.
5	Heater Temperature Control	Regulates temperature level of the cabin heater. This is a rheostat-type control with full counterclockwise the lowest (coolest) setting and full clockwise the highest (hottest) setting.

Table 1. HEATER CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
6	Air Conditioning Control	OFF - Full left position. ON - Full right position.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATOR AND CREW FOUR-POINT SEAT BELT/AIR-RIDE SEAT ADJUSTMENT CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Operator and Crew Four-Point Seat Belt / Air-Ride Seat Adjustment Controls, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about Operator and Crew Four-Point Seat Belt/Air-Ride Seat Adjustment Controls.

Table 1. OPERATOR AND CREW FOUR-POINT SEAT BELT/AIR-RIDE SEAT ADJUSTMENT CONTROLS

Key	Control/ Indicator	Function

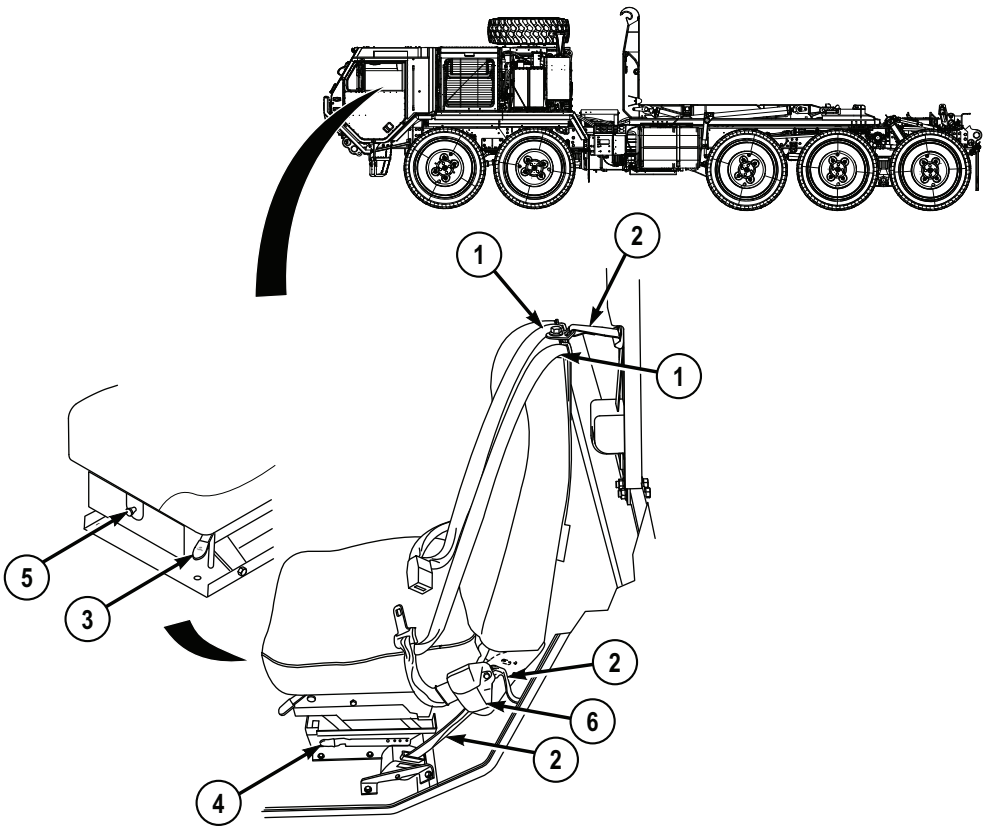


Figure 1.

1	Seat Belt	Secures personnel in the seat.
2	Seat Connector Strap	Secures seat to the cab frame.

Table 1. OPERATOR AND CREW FOUR-POINT SEAT BELT/AIR-RIDE SEAT ADJUSTMENT CONTROLS - Continued

Key	Control/ Indicator	Function
3	Height Adjustment Control	Use to adjust the seat height.
4	Forward/ Backward Adjustment Control	Use to move the seat forward or backward on slides.
5	Ride Adjustment Control	Use to adjust the seat tension and ride firmness.
6	Retractor	Locks seat belt in event of accident; stows seat belt when not in use.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PASSENGER SIDE CRANE AND OUTRIGGER JACK CONTROL

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Passenger Side Crane and Outrigger Jack Control, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about the Passenger Side Crane and Outrigger Jack Control.

Table 1. PASSENGER SIDE CRANE AND OUTRIGGER JACK CONTROL

Key	Control/ Indicator	Function

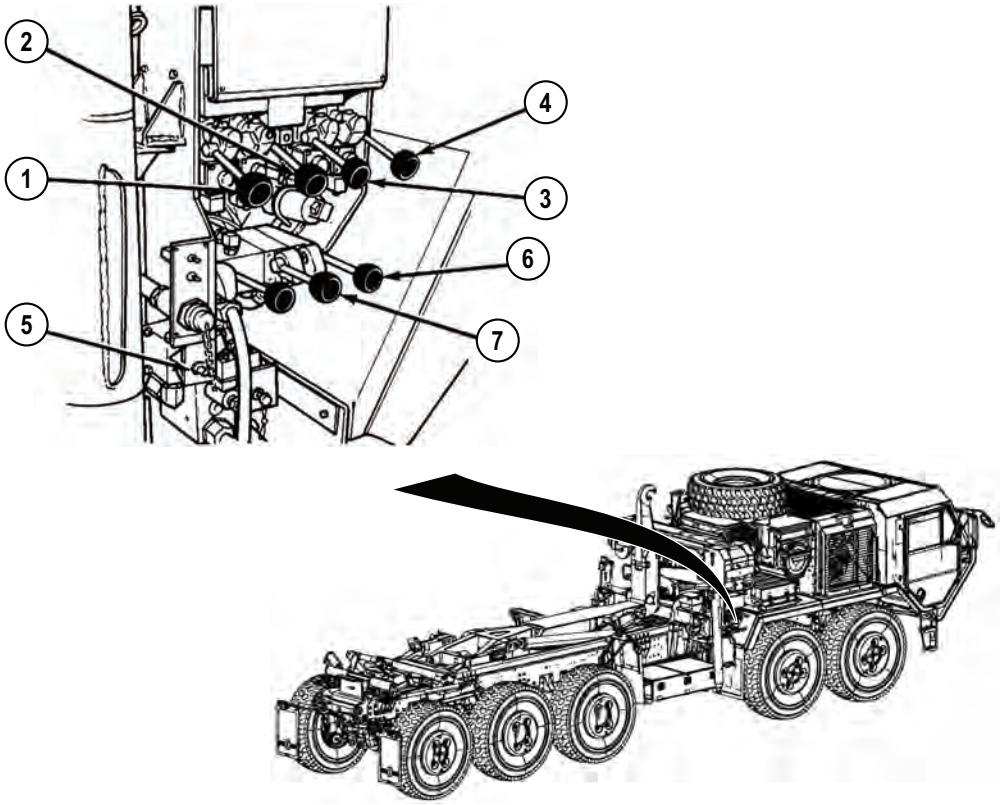


Figure 1.

1	SWING Control Lever	Moves boom clockwise and counterclockwise.

NOTE

TELESCOPE and HOIST control levers should be operated at the same time or hook block will contact boom tip and cause damage.

Table 1. PASSENGER SIDE CRANE AND OUTRIGGER JACK CONTROL - Continued

Key	Control/ Indicator	Function
2	TELESCOPE Control Lever	Move TELESCOPE control lever to OUT position to extend the boom. Move TELESCOPE control lever to IN position to retract the boom.
3	BOOM Lift Control Lever	Raises and lowers the boom.
4	HOIST Control Lever	Reels in and pays out the cable.
5	MHC MAIN HYDRAULIC PRESSURE MANUAL OVERRIDE	Supplies emergency hydraulic power when electrical power fails resulting in loss of outrigger jack and crane function.
6	RH O/R JACK Control Lever	Lowers and raises the passenger side outrigger jack.

Table 1. PASSENGER SIDE CRANE AND OUTRIGGER JACK CONTROL - Continued

Key	Control/ Indicator	Function
7	MAST Control Lever	Raises the mast to operating position and lowers the mast to stowage position.

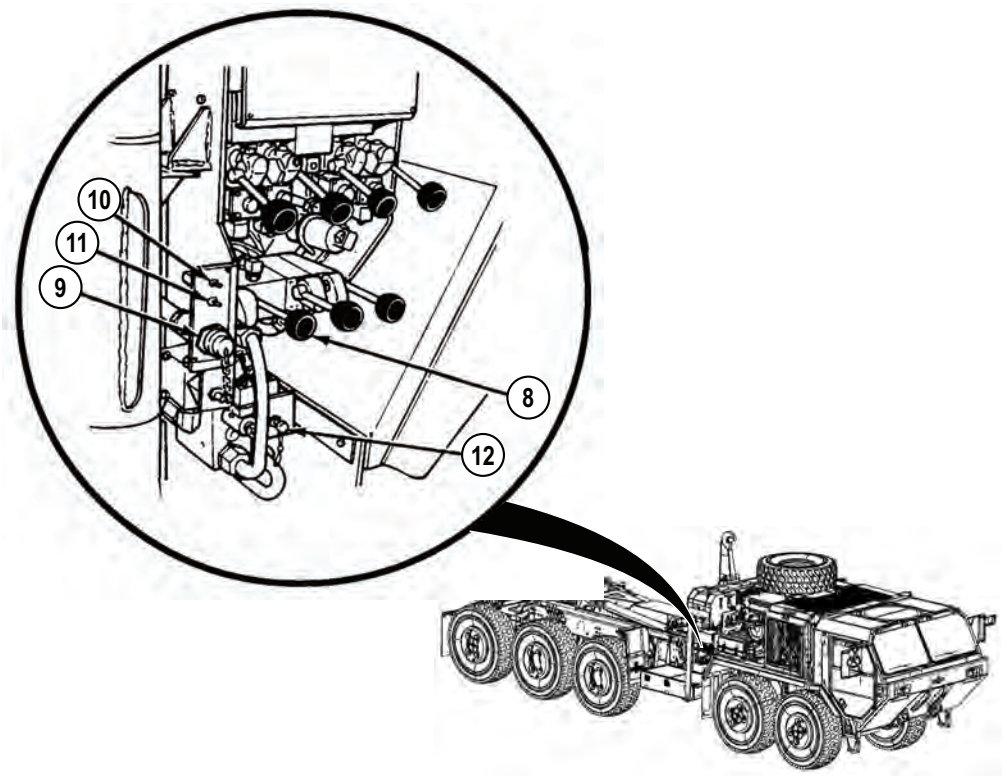


Figure 2.

8	LH O/R JACK Control	Lowers and raises the driver side outrigger jack.
9	RH Remote Control Hookup	Connection for the remote control when used on RH side.

Table 1. PASSENGER SIDE CRANE AND OUTRIGGER JACK CONTROL - Continued

Key	Control/ Indicator	Function
10	Main Power Switch	Supplies electrical power to the crane and outrigger jacks. Protects crane electrical systems.
11	High Idle Switch	Raises and latches the vehicle engine speed at high idle for crane operation.
12	MHC SYSTEM HYDRAULIC PRESSURE MANUAL OVERRIDE	Remove safety wire, then push in and hold to allow manual override to function when the outrigger jack safety circuit has failed. (Outrigger jacks are deployed but crane boom, telescope, swing, and hoist functions do not operate).

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVER SIDE OUTRIGGER JACK CONTROL PANEL

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Drivers Side Outrigger Jack Control Panel, which is used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Drivers Side Outrigger Jack Control Panel.

Table 1. DRIVER SIDE OUTRIGGER JACK CONTROL PANEL

Key	Control/ Indicator	Function

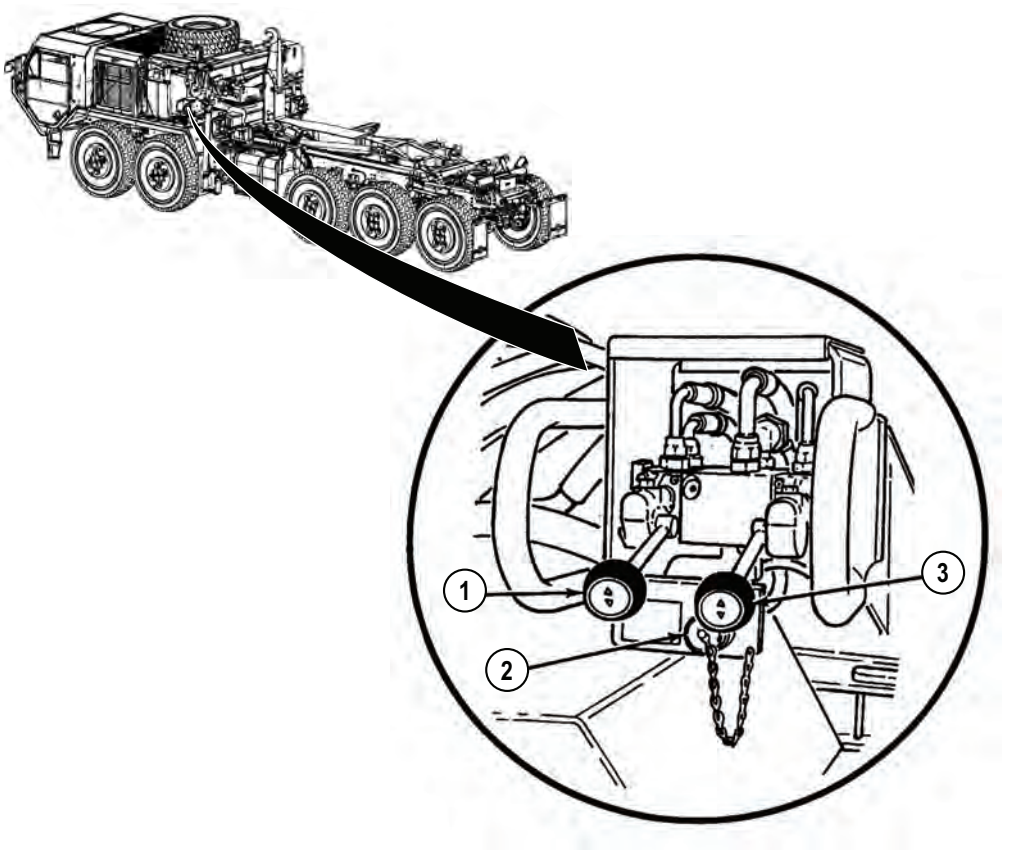


Figure 1.

1	LH O/R JACK Control	Lowers and raises the left outrigger jack.
2	LH Remote Control Hookup	Connection for the remote control when used on LH side.

Table 1. DRIVER SIDE OUTRIGGER JACK CONTROL PANEL - Continued

Key	Control/ Indicator	Function
3	RH O/R JACK Control Lever	Lowers and raises the right outrigger jack.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CRANE REMOTE CONTROL UNIT

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Crane Remote Control Unit, which is used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Crane Remote Control Unit.

Table 1. CRANE REMOTE CONTROL UNIT

Key	Control/ Indicator	Function

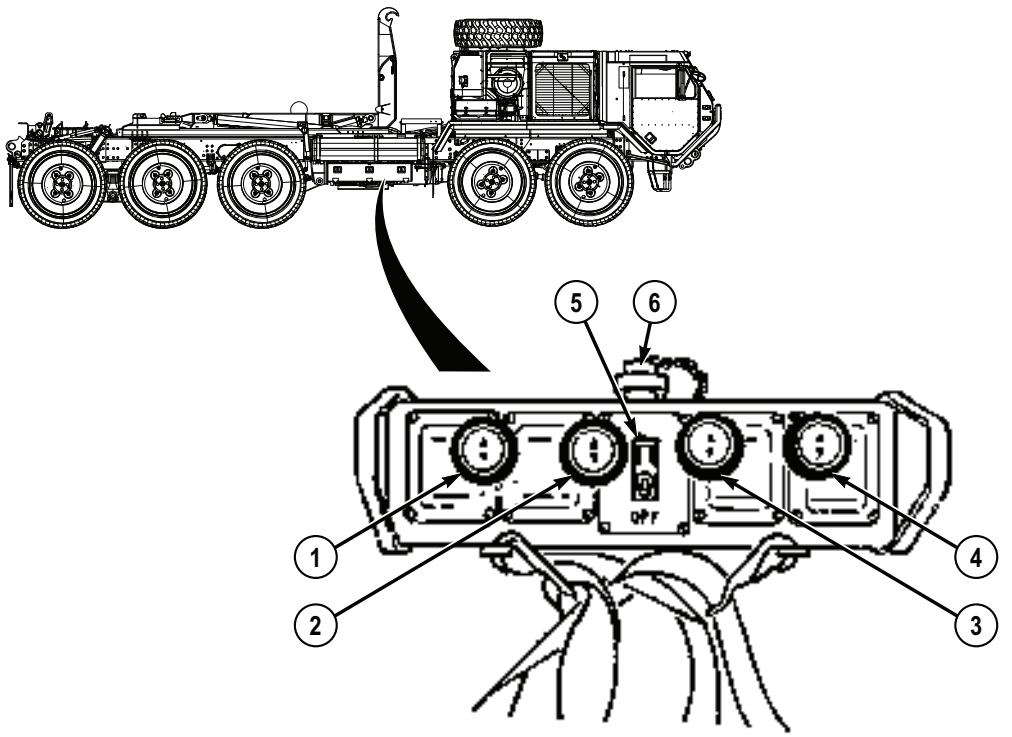


Figure 1.

1	SWING Control Lever	Moves the crane clockwise and counterclockwise.

NOTE

TELESCOPE and HOIST control levers should be operated at the same time or hook block will contact boom tip and cause damage.

2	TELESCOPE Control Lever	Moves TELESCOPE control lever to OUT position to extend the boom. Move the TELESCOPE control lever to IN position to retract the boom.

Table 1. CRANE REMOTE CONTROL UNIT - Continued

Key	Control/ Indicator	Function
3	BOOM Control Lever	Raises and lowers the boom.
4	HOIST Control Lever	Reels in and pays out the cable.
5	REMOTE CONTROL UNIT ON/OFF/ EMERGENCY STOP Switch	Supplies and shuts off electrical power to the crane and controls vehicle engine speed from REMOTE CONTROL UNIT. Also provides crane EMERGENCY STOP/VEHICLE IDLE CONDITION.
6	REMOTE Hookup Wire Outlet	Allows cable hookup between the crane and remote.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PASSENGER SIDE CONTAINER HANDLING UNIT CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Passenger Side Container Handling Unit Controls, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Passenger Side Container Handling Unit Controls.

Table 1. PASSENGER SIDE CONTAINER HANDLING UNIT CONTROLS

Key	Control/ Indicator	Function

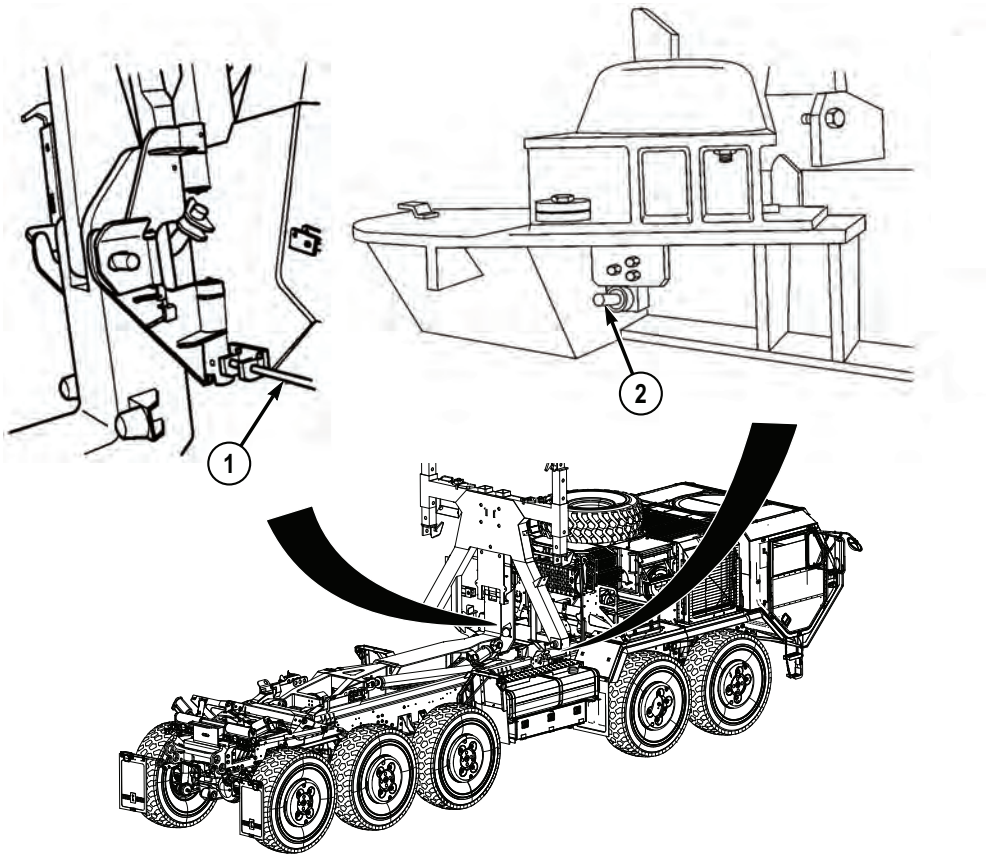


Figure 1.

1	Flipper Lock Pin Handle (RH)	Locks flipper bracket in locked or unlocked position.

Table 1. PASSENGER SIDE CONTAINER HANDLING UNIT CONTROLS - Continued

Key	Control/ Indicator	Function
2	Air Control Valve (RH)	Operates air cylinder to paddle that rotates flipper bracket when lifting frame is in stowed position.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVER SIDE CONTAINER HANDLING UNIT CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Driver Side Container Handling Unit Controls, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Driver Side Container Handling Unit Controls.

Table 1. DRIVER SIDE CONTAINER HANDLING UNIT CONTROLS

Key	Control/ Indicator	Function

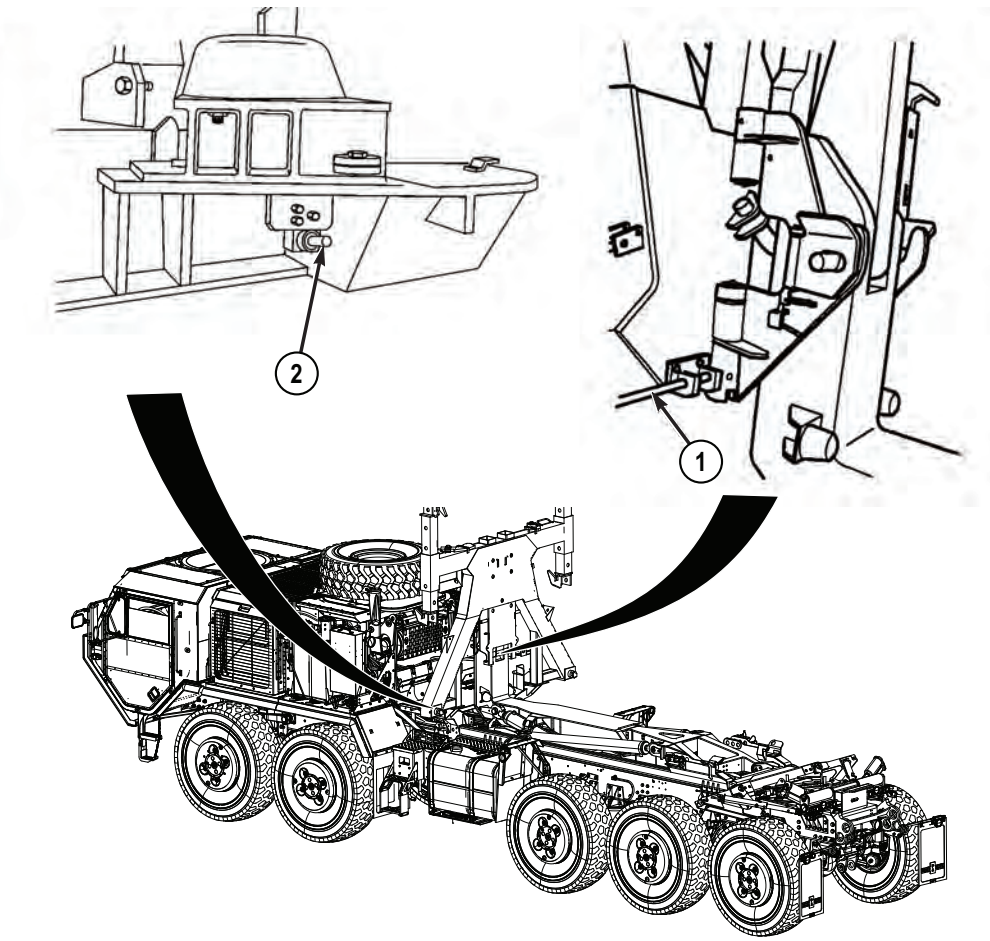


Figure 1.

1	Flipper Lock Pin Handle (LH)	Locks flipper bracket in locked or unlocked position.

Table 1. DRIVER SIDE CONTAINER HANDLING UNIT CONTROLS - Continued

Key	Control/ Indicator	Function
2	Air Control Valve (LH)	Operates air cylinder to paddle that rotates flipper bracket when lifting frame is in stowed position.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GAS PARTICULATE FILTER UNIT (GPFU) KIT

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Gas Particulate Filter Unit (GPFU) Kit which is used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Gas Particulate Filter Unit (GPFU) Kit.

Table 1. GAS PARTICULATE FILTER UNIT (GPFU) KIT

Key	Control/ Indicator	Function

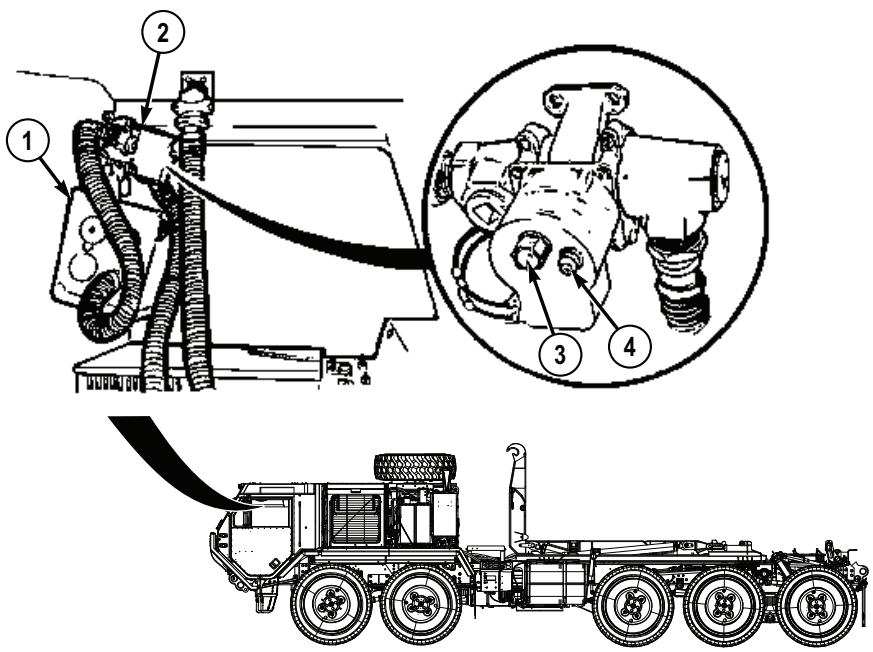


Figure 1.

Table 1. GAS PARTICULATE FILTER UNIT (GPFU) KIT - Continued

Key	Control/ Indicator	Function
1	Gas Particulate Filter Unit (GPFU)	Filters nuclear, biological, and chemical (NBC) contaminants from the air.
2	M-3 Heater	Warms the air entering protective mask.
3	M-3 Heater Control Knob	Turn clockwise for warmer air. Turn counterclockwise for cooler air. Turn to OFF to shut off heater.
4	M-3 Heater Indicator Light	Lights when the heater is operating.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
M-8 CHEMICAL ALARM AND DECONTAMINATION UNIT

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the M-8 Chemical Alarm and Decontamination Unit, which is used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the M-8 Chemical Alarm and Decontamination Unit.

Table 1. M-8 CHEMICAL ALARM AND DECONTAMINATION UNIT

Key	Control/ Indicator	Function

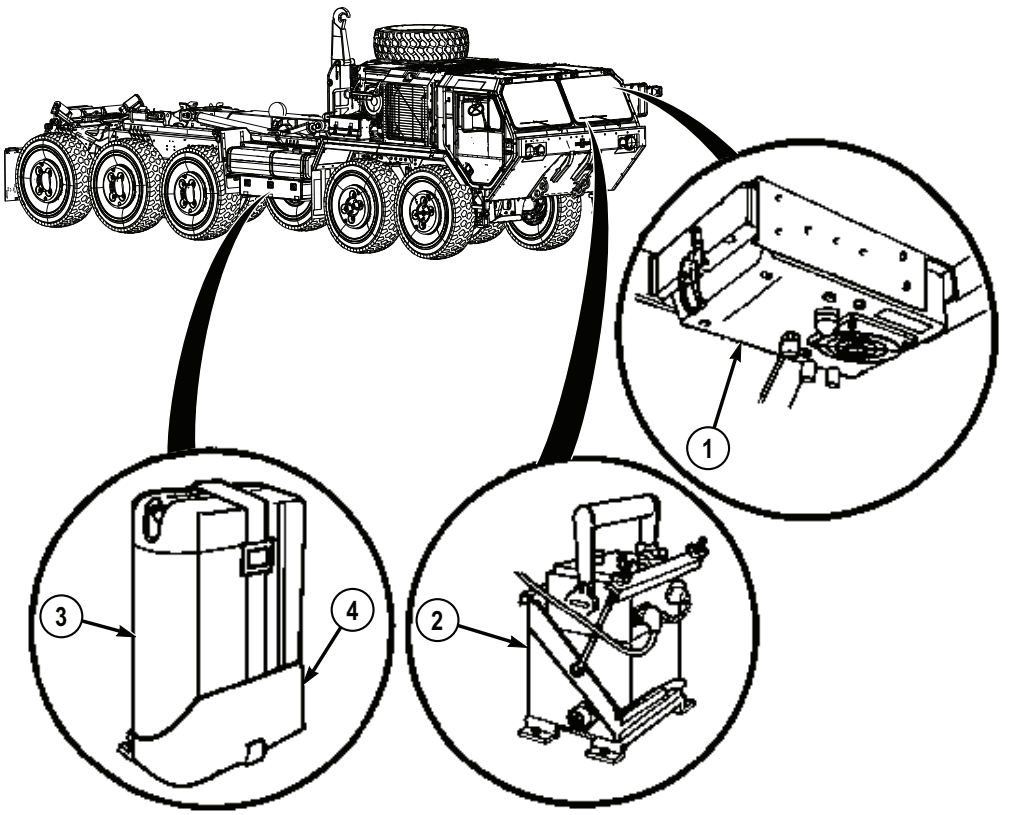


Figure 1.

1	M-8 Chemical Alarm	Sounds the alarm when chemicals are detected.
2	Chemical Detector	Detects the presence of chemicals in air.

Table 1. M-8 CHEMICAL ALARM AND DECONTAMINATION UNIT - Continued

Key	Control/ Indicator	Function
3	M-13 Decontaminati on Unit	Holds and dispenses the decontaminate. M-13 Decontamination Unit and mount are located on left side of vehicle on air dryer mounting bracket if vehicle is equipped with an auxiliary fuel tank.
4	Decontaminati on Unit Mount	Holds the decontamination unit.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
EXTERIOR MOUNTED CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Exterior Mounted Controls and Indicators, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about the Exterior Mounted Controls and Indicators.

Table 1. EXTERIOR MOUNTED CONTROLS AND INDICATORS

Key	Control/ Indicator	Function

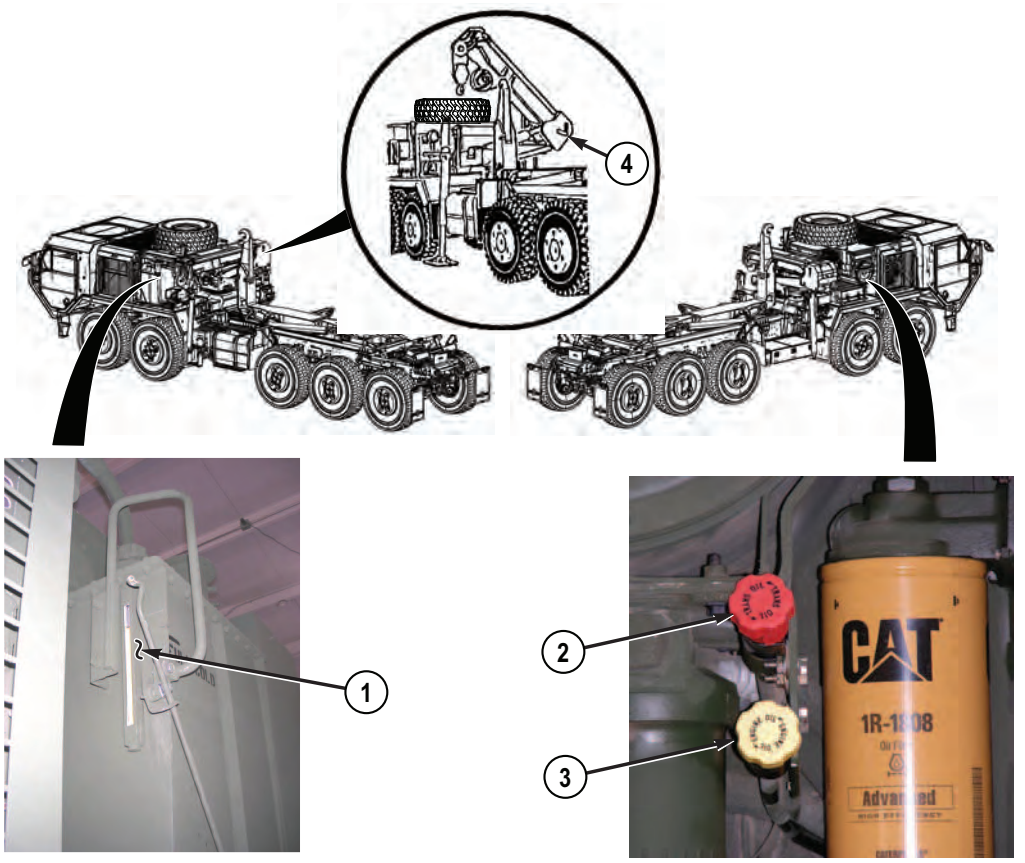


Figure 1.

1	Hydraulic Reservoir Gauge	Indicates hydraulic oil level in the main reservoir.
2	Transmission Oil Dipstick	Indicates the transmission oil level.

Table 1. EXTERIOR MOUNTED CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
3	Engine Oil Dipstick	Indicates the engine oil level.
4	Boom Angle Indicator	Indicates the angle of boom inclination.

Table 1. EXTERIOR MOUNTED CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
5	Battery Disconnect Switch	Disconnects the batteries prior to long-term storage and during maintenance actions.



Figure 2.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
POWER INTERFACE KIT (IF EQUIPPED)

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of the Power Interface Kit, which is used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. An illustration with keys is provided for learning about the Power Interface Kit.

Table 1. POWER INTERFACE KIT (IF EQUIPPED)

Key	Control/ Indicator	Function

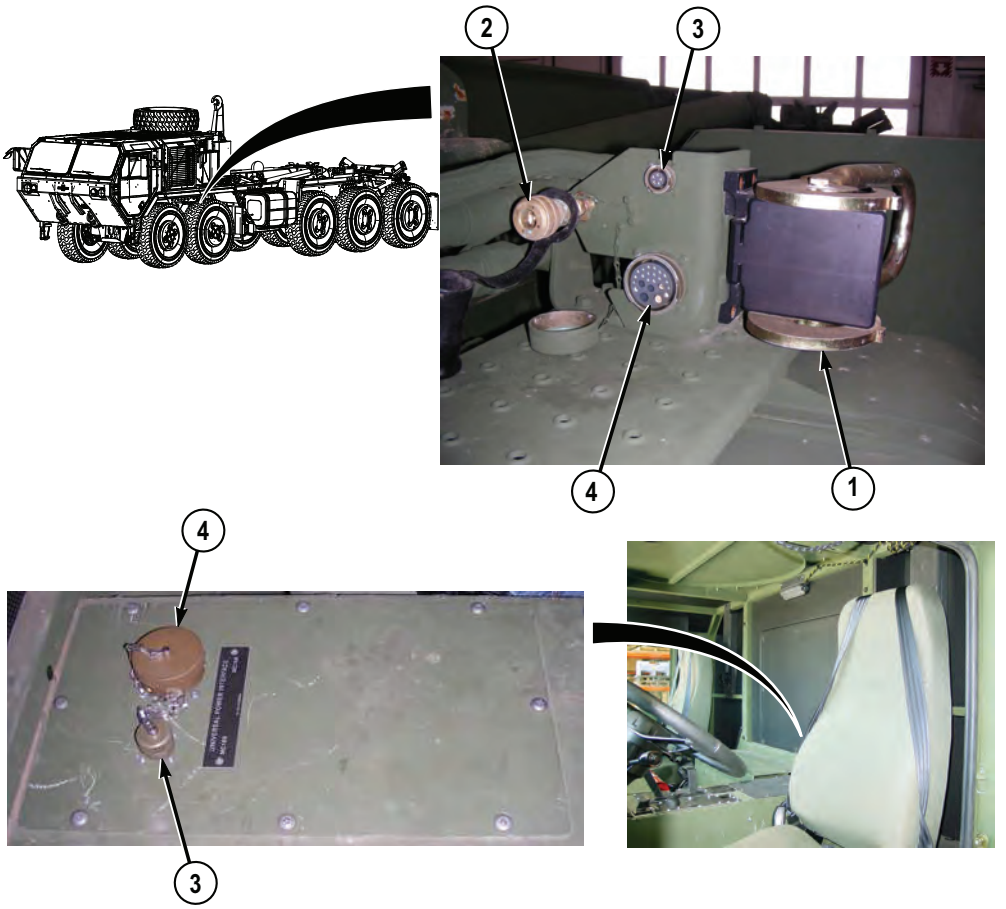


Figure 1.

1	Power Interface Hydraulic Quick Disconnect	Connection that supplies hydraulic fluid pressure to an engineering mission module.

Table 1. POWER INTERFACE KIT (IF EQUIPPED) - Continued

Key	Control/ Indicator	Function
2	Power Interface Air Quick Disconnect	Connection that supplies air pressure to an engineering mission module.
3	Power Interface Electrical Connector (5 pin)	Connection to auxiliary equipment high idle circuit of an engineering mission module.
4	Power Interface Electrical Connector (23 pin)	Connection that supplies electrical power to an engineering mission module.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
INSTRUMENT PANEL CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

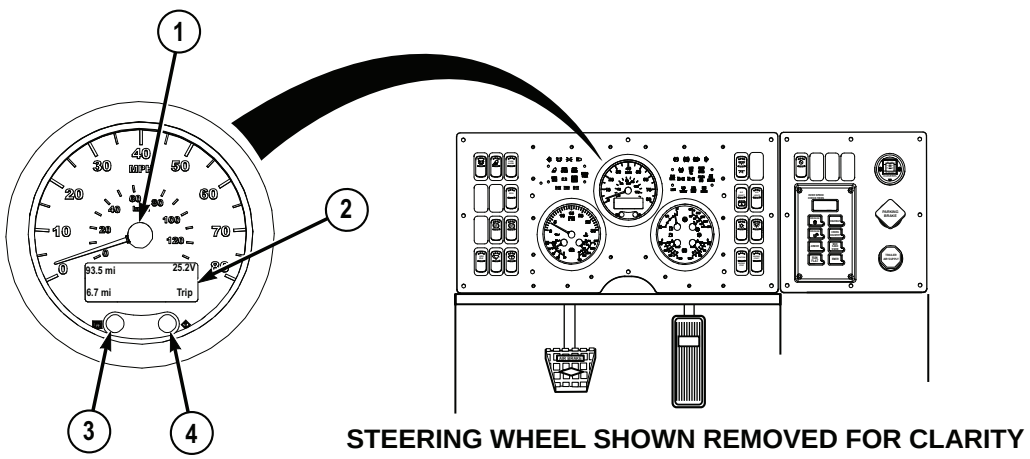
This section displays the location and describes the use of instrument panel controls and indicators, which are used in the operation of PLS series vehicles. Controls and indicators described in this section are the same for all vehicles, except where otherwise indicated.

LOCATION AND USE OF CONTROLS AND INDICATORS

Know the location and proper use of every control and indicator before operating PLS series vehicles. Separate illustrations with keys are provided for learning about instrument panel controls and indicators.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS

Key	Control/ Indicator	Function



STEERING WHEEL SHOWN REMOVED FOR CLARITY

Figure 1.

1	Speedometer	Displays vehicle speed in miles per hour (MPH) and kilometer per hour (kmh). Animation.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
2	Liquid Crystal Display (LCD)	Displays performance and diagnostic information.
3	Mode (M) Button	Cycles and selects displays on the LCD.
4	Trip (T) Button	Cycles and selects displays on the LCD.

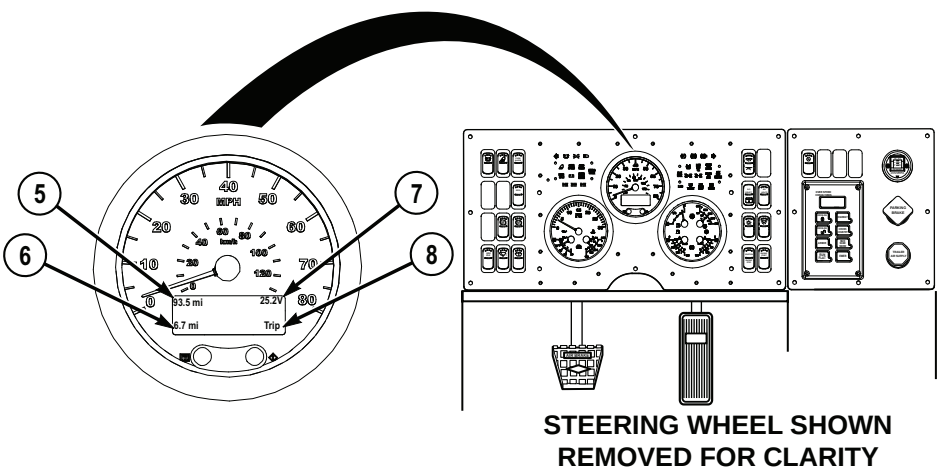


Figure 2.

5	Odometer	Displays total vehicle miles since production. Animation.
6	Trip/Hrs Display	Displays either of two drive mode displays (trip display shown):

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
		1) Trip - distance vehicle was driven since trip display was reset. 2) Hrs - total vehicle operating hours. Trip display can be reset to "0.0" by pressing and holding (T) button for two or more seconds while in "Trip" display. Vehicle operating hours (Hrs display) cannot be reset.
7	Battery Voltage	Displays battery output in volts (V).
8	Drive Mode Display	Operator may choose between either drive mode display option by momentarily pressing and releasing (T) button. Displays "Trip" or "Hrs" dependent on drive mode selected.

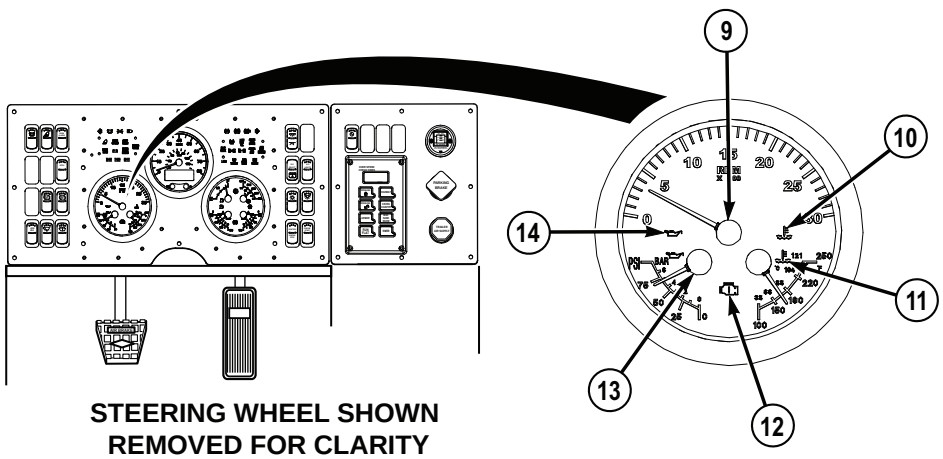


Figure 3.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
9	Tachometer	Displays engine speed in revolutions per minute (RPM x 100). Animation.
10	High Engine Coolant Temperature Indicator	Illuminates (red) when the engine monitoring system logs a high coolant temperature fault code and will also cause the check engine indicator (12) to illuminate.
11	Engine Coolant Temperature Gauge	Displays engine coolant temperature in degrees Fahrenheit (°F) and Celsius (°C).
12	Check Engine Indicator	Illuminates (amber) when the engine monitoring system logs an engine fault code.
13	Engine Oil Pressure Gauge	Displays engine oil pressure in pounds per square inch (psi) and bar.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
14	Low Engine Oil Pressure Indicator	Illuminates (red) when the engine monitoring system logs a low oil pressure fault code and will also cause the check engine indicator (12) to illuminate.

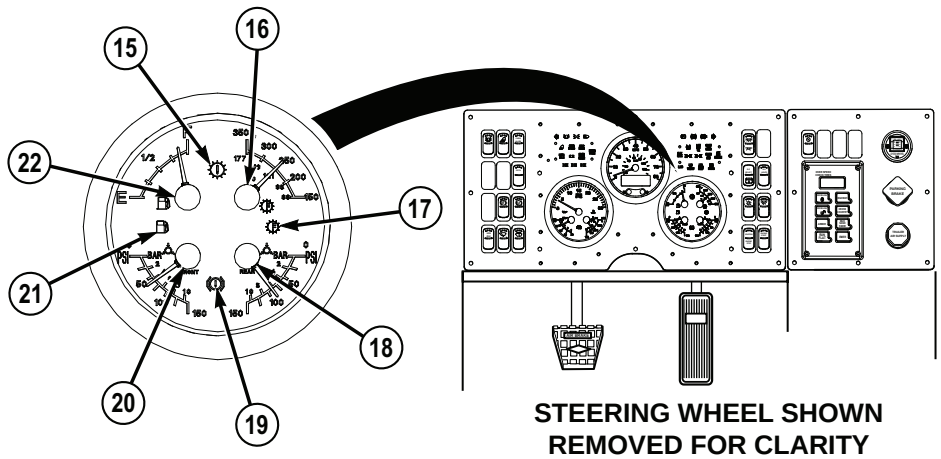


Figure 4.

15	Check Transmission Indicator	Illuminates (amber) when the transmission monitoring system indicates a problem. Animation.
16	Transmission Oil Temperature Gauge	Displays transmission oil temperature in degrees Fahrenheit (°F) and Celsius (°C).
17	High Transmission Temperature Indicator	Illuminates (red) when transmission pump temperature is above 482°F (250°C) or torque converter temperature is above 350°F (177°C).

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
18	REAR Air Pressure Gauge	Displays rear air system pressure in pounds per square inch (psi) and bar.
19	Brake System Failure (LOW AIR) Indicator	Illuminates (red) when either FRONT or REAR Air Pressure Gauge falls below 70 psi (5 bar), or the brake system controller indicates a problem. A buzzer will sound until indicator goes out.
20	FRONT Air Pressure Gauge	Displays front air system pressure in pounds per square inch (psi) and bar.
21	Low Fuel Indicator	Illuminates (amber) when fuel quantity falls below 1/8 of a full tank.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
22	Fuel Gauge	Displays fuel remaining in tank.

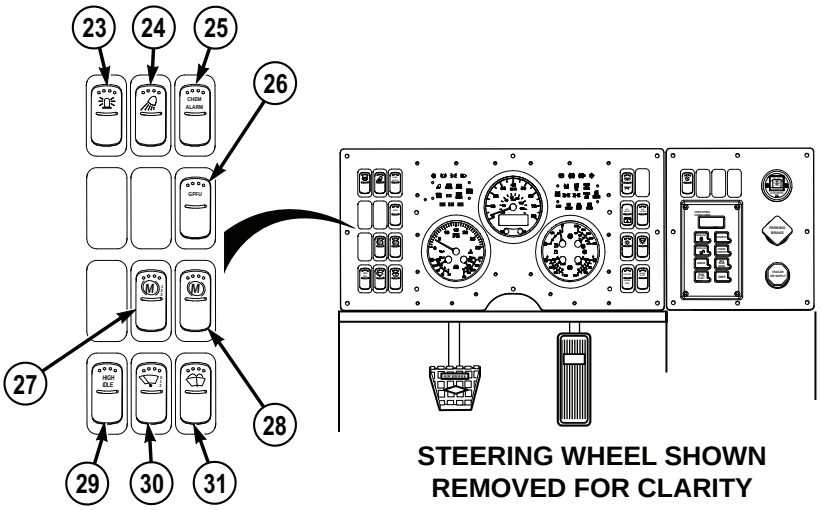


Figure 5.

23	Beacon Light Switch	Turns beacon lights on/off.
24	Work Light Switch	Turns work lights on/off.
25	CHEM ALARM Switch	Turns M-8 chemical alarm on/off. Switch only active if M-8 chemical alarm option installed.
26	GPFU	Turns gas particle filter unit (GPFU) on/off.
27	Engine Brake High/Medium/ Low Switch	The engine brake high/medium/low switch becomes active when the engine brake ON/OFF Switch is set to on position.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
	(Three-Position)	The amount of engine braking provided is dependant on the position of the engine brake high/medium/low switch: (1) - High position (full up) provides maximum engine braking. (2) - Medium position (center) provides less engine braking. (3) - Low position (full down) provides least amount of engine braking.
28	Engine Brake On/Off Switch	Turns the engine retarder on/off, which provides engine braking to the vehicle. The amount of engine braking provided is dependant on the position of the Engine Brake High/ Medium/Low Switch.
29	HIGH IDLE Switch	Turns engine high idle on/off.
30	Windshield Wiper Switch (Three-Position)	The Windshield Wiper Switch is a three-position switch: DOWN - off. CENTER (middle) - low speed. UP - high speed.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
31	Windshield Washer Switch (Two-Position Momentary)	With windshield wipers at desired speed, press and hold Windshield Washer Switch to clean windshield. Release switch to stop fluid flow.

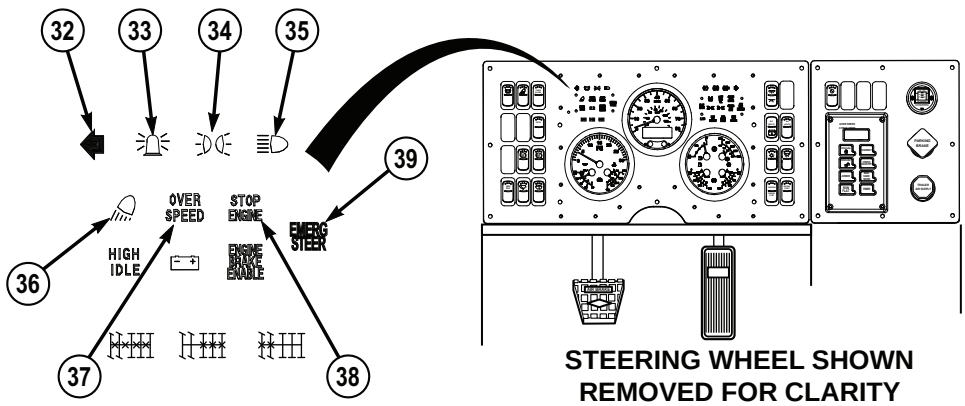


Figure 6.

32	Left Turn Indicator	Flashes (green) when left turn signal or emergency flasher control is activated.
33	Beacon Light Indicator	Illuminates (green) when Beacon Light Switch is set to on position.
34	Clearance Light Indicator	Illuminates (green) when Master Lighting Switch is set to on position.
35	High Beam Indicator	Illuminates (blue) when headlight high beams are activated.
36	Work Light Indicator	Illuminates (green) when Work Light Switch is set to on position.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
37	OVER SPEED Indicator	Illuminates (red) when engine speed exceeds 2,450 RPM.
38	STOP ENGINE Indicator	Illuminates (red) when engine oil pressure, manifold air temperature, and/or engine coolant temperature/fluid level is outside safe operating limits.
39	Emergency Steering Indicator	Lights (red) when emergency steering system is activated.

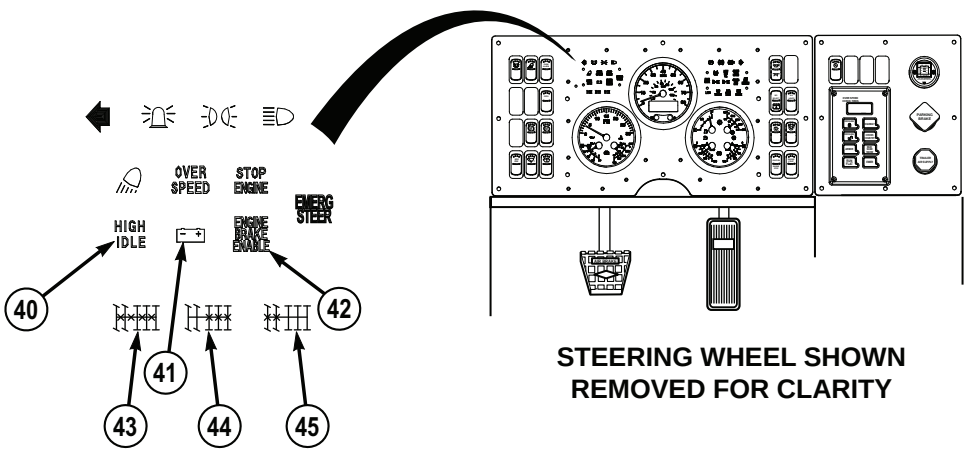
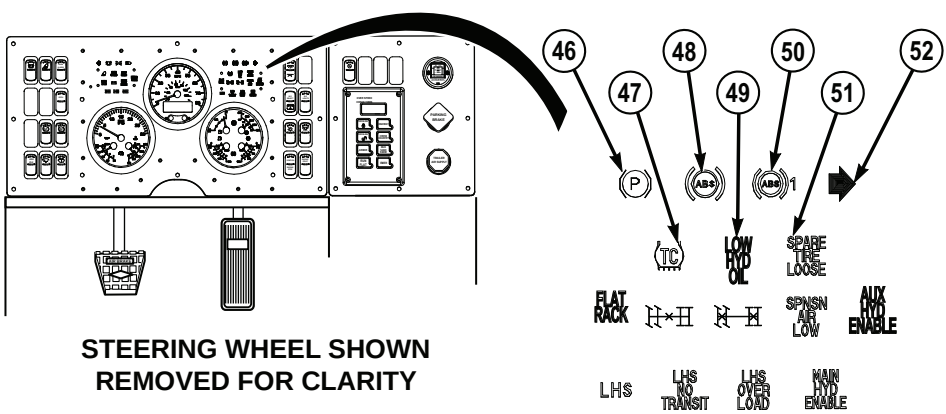


Figure 7.

40	HIGH IDLE Indicator	Illuminates (green) when HIGH IDLE Switch is set to on position.
41	Charging System Indicator	Illuminates (amber) when alternator indicates a charging system problem.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
42	ENGINE BRAKE ENABLE Indicator	Illuminates (green) when Engine Brake On/Off Switch is set to on position.
	NOTE:	Higher lock level is inclusive of previous level.
43	Lock Level Indicator 1	Locks transfer case and interaxle.
44	Lock Level Indicator 2	Adds rear side-to-side locks to lock level 1.
45	Lock Level Indicator 3	Adds front side-to-side locks to lock level 2.



STEERING WHEEL SHOWN REMOVED FOR CLARITY

Figure 8.

46	PARKING BRAKE Indicator	Illuminates (red) when PARKING BRAKE Control is applied (pulled out).

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
47	Automatic Traction Control Indicator (ATC)	Flashes (amber) when traction control system is automatically activated during vehicle operation. Illuminates steady (amber) when traction control is experiencing a fault and/or ABS Disable Switch (50) is set to on position.
48	Vehicle ABS Indicator	Illuminates (amber) when vehicle anti-lock braking system (ABS) experiences a failure.
49	LOW HYD OIL	Lights (red) and buzzer sounds when the auxiliary hydrulic fluid is below 25.75 gal. (97.5 L).
50	Trailer ABS Indicator	Illuminates (amber) when trailer anti–lock braking system (ABS) experiences a failure.
51	SPARE TIRE LOOSE Indicator	Illuminates (amber) when spare tire carrier is unlatched.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
52	Right Turn Indicator	Flashes (green) when right turn signal or emergency flasher control is activated.

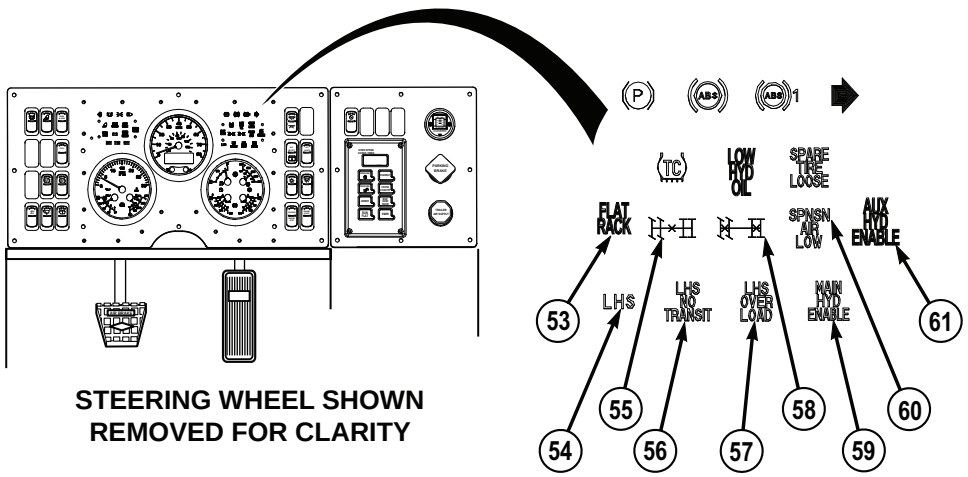


Figure 9.

53	Flatrack	Lights (red) when trailer flatrack is not locked.
54	LHS Indicator	Illuminates (green) when vehicle load handling system (LHS) is activated.
55	8X8 Indicator	Not applicable for this model.
56	LHS NO TRANSIT Indicator	Illuminates (amber) when hook arm assembly is not in the completely stowed position. The vehicle is not to be driven except in the immediate loading and unloading area when LHS NO TRANSIT indicator is illuminated.
57	LHS OVER LOAD Indicator	Illuminates (amber) when vehicle Load Handling System (LHS) detects an overload condition.

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
58	Inter-Axle Indicator	Not applicable for this model.
59	MAIN HYD ENABLE	Illuminates (green) when HYD ENABLE Switch is set to on position.
60	SPNSN AIR LOW Indicator	Illuminates (amber) when suspension system air is low.
61	AUX HYD ENABLE	Lights (green) when the auxiliary hydraulic is in use.

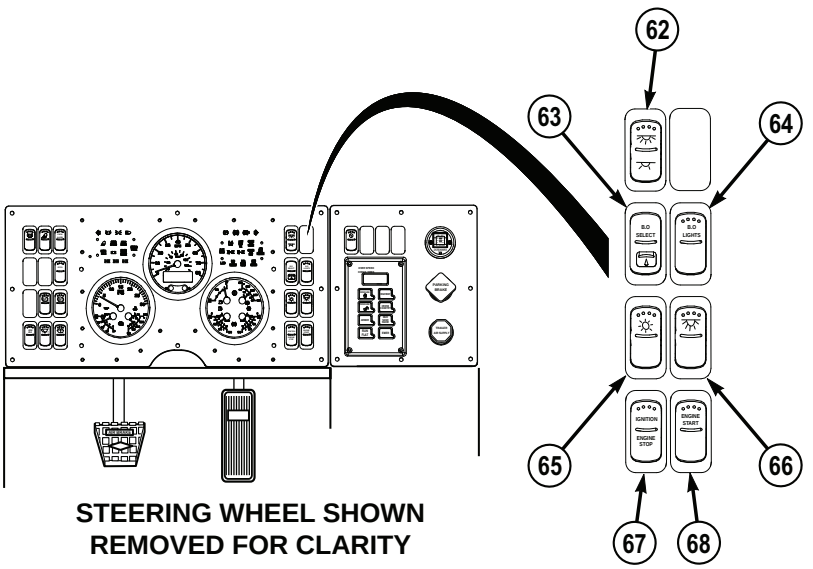


Figure 10.

62	Dimmer Switch (Two-Position Momentary)	Adjusts brightness of backlighting for instrument panel switches and gauges, transmission range selector, an HVAC panel. Each upward/downward momentary depression of the

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
		switch will increase/decrease panel light intensity by 5%. Depressing the dimmer switch upward for 3+ seconds will increase panel light intensity to 100%. Depressing the dimmer switch downward for 3+ seconds will decrease panel light intensity to 10%.
63	B.O. SELECT Switch	Setting the blackout service select switch to on position disables the master lighting switch (all functions including brake lights, turn signals, and emergency flashers), work light switch, beacon light switch, dome light switch, electric horn, and reverse alarm.
64	B.O. LIGHTS Switch (Three-Position)	The blackout lights switch is a three-position switch: DOWN - off. CENTER (middle) - Blackout markers located in the composite lights illuminate. UP - Blackout markers and blackout driving light illuminate. Blackout stop lights illuminate when Service Brake Pedal is applied.
65	Master Lighting Switch (Three-Position)	The Master Lighting Switch is a three-position switch: DOWN - off

Table 1. INSTRUMENT PANEL CONTROLS AND INDICATORS - Continued

Key	Control/ Indicator	Function
		CENTER (middle) - clearance lights and parking lights illuminate. UP - clearance lights, parking lights, and headlights illuminate.
66	Dome Light Switch	Turns dome light in cab overhead on/off.
67	Ignition Switch	This switch provides electrical power to the cab and must be positioned on to energize the engine start switch.
68	Engine Start Switch (Two-Position Momentary)	Push switch until engine starts, then release. Animation.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DECALS AND INSTRUCTION PLATES

INITIAL SETUP:

Not Applicable

DECALS AND INSTRUCTION PLATES

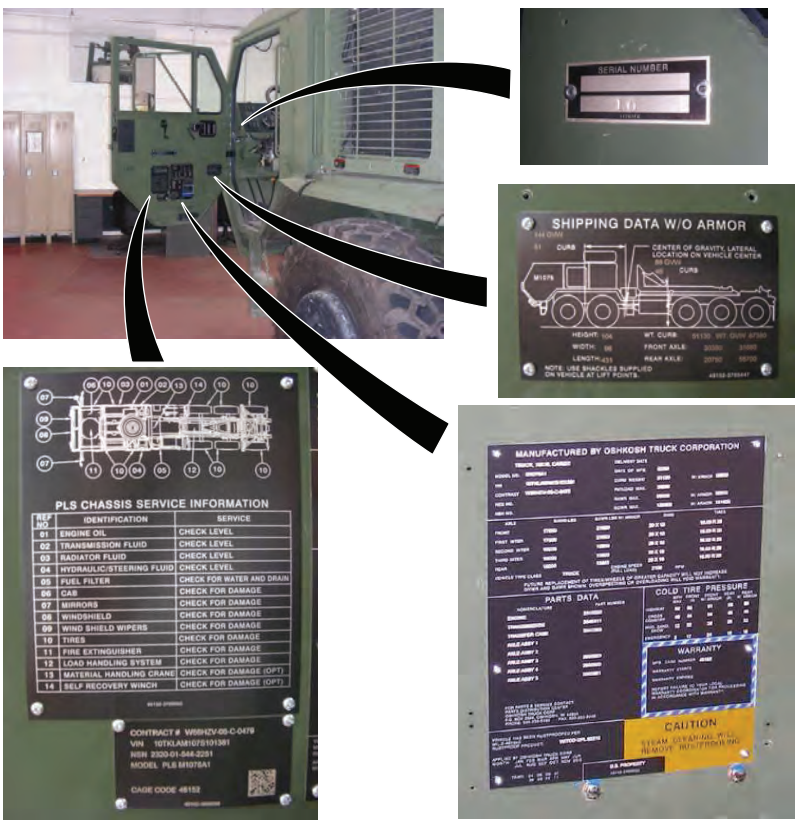
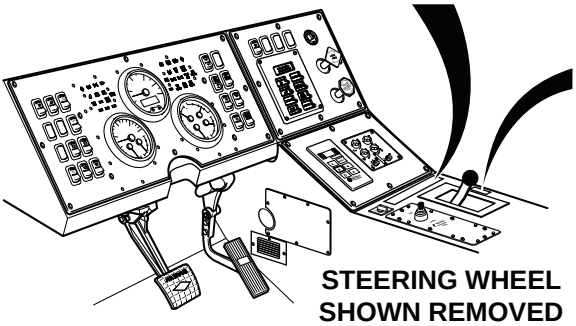


Figure 1.

DECALS AND INSTRUCTION PLATES - Continued





STEERING WHEEL SHOWN REMOVED FOR CLARITY



Figure 2.

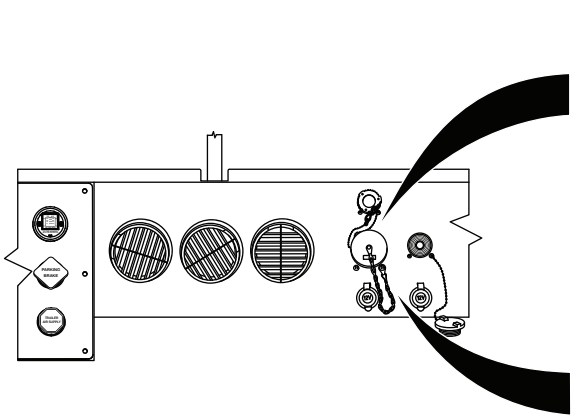






Figure 3.

DECALS AND INSTRUCTION PLATES - Continued

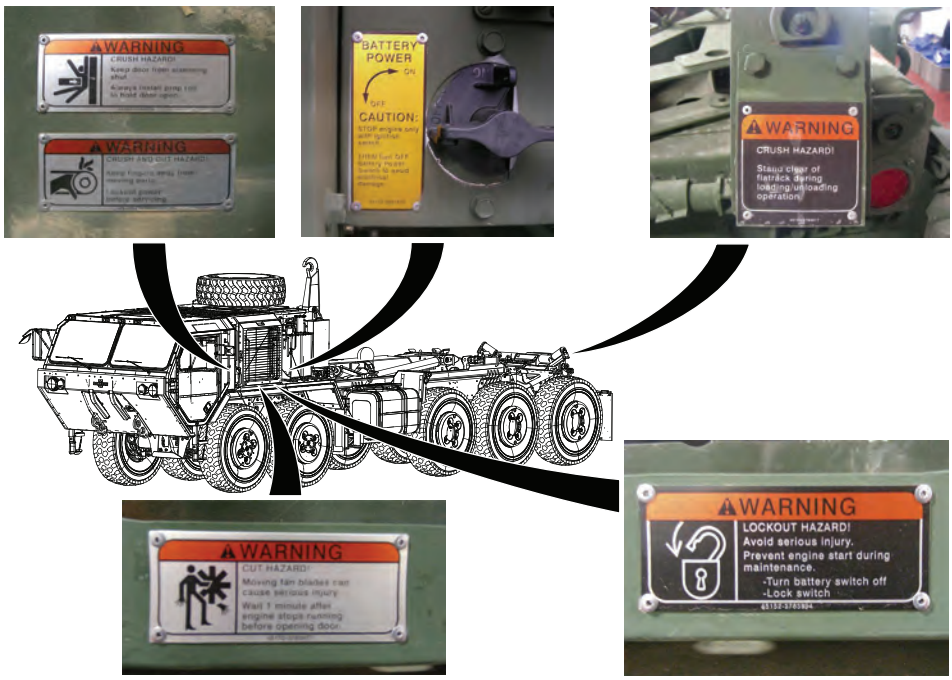


Figure 4.

DECALS AND INSTRUCTION PLATES - Continued

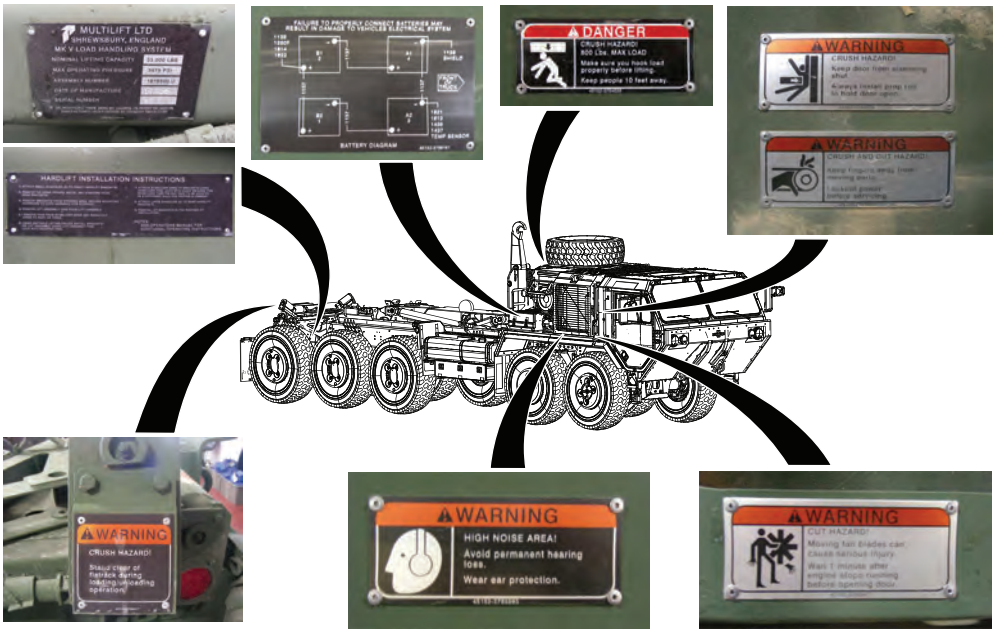


Figure 5.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PREPARATION FOR OPERATION

INITIAL SETUP:

Not Applicable

CHANGE VEHICLE WEIGHT INDICATOR

NOTE

- There are five number plates on each side.
- Refer to Equipment Description and Data (WP 0002) for information as to the correct numbers to place in the indicator.

1. Press in on number plates (1).

CHANGE VEHICLE WEIGHT INDICATOR - Continued

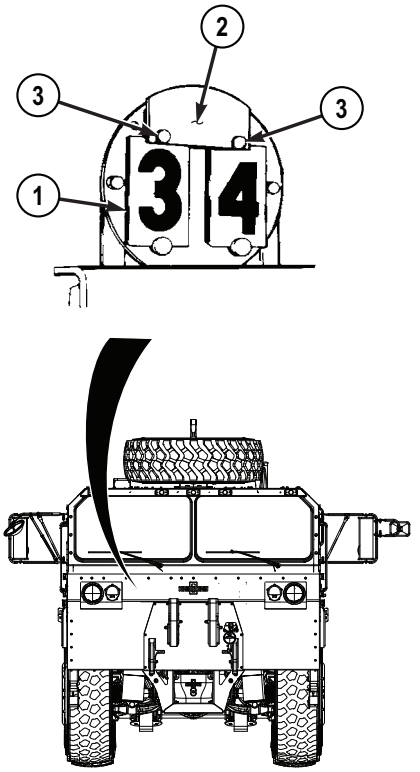


Figure 1.

2. Push lockplate (2) up and off of one lockpin (3).
3. Remove number plates (1).
4. Select new numbers.
5. Install number plates (1). Slide lockplate (2) on lockpin (3).
6. Push down number plates (1). Slide lockplate (2) on lockpin (3).

END OF TASK

INSTALL FOOT REST

1. Lift foot rest (1) up.

INSTALL FOOT REST - Continued

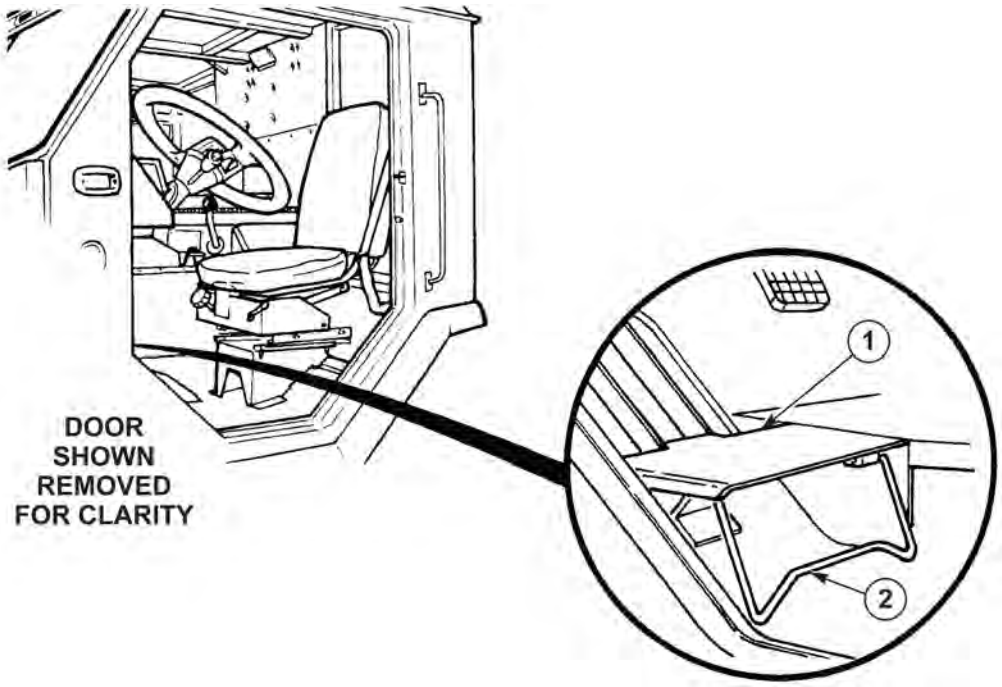


Figure 2.

2. Pull foot rest leg (2) outward until it contacts the bottom of foot rest.
3. Lower foot rest (1) to floor.

END OF TASK

STOW FOOT REST

1. Lift foot rest (1) up.

STOW FOOT REST - Continued

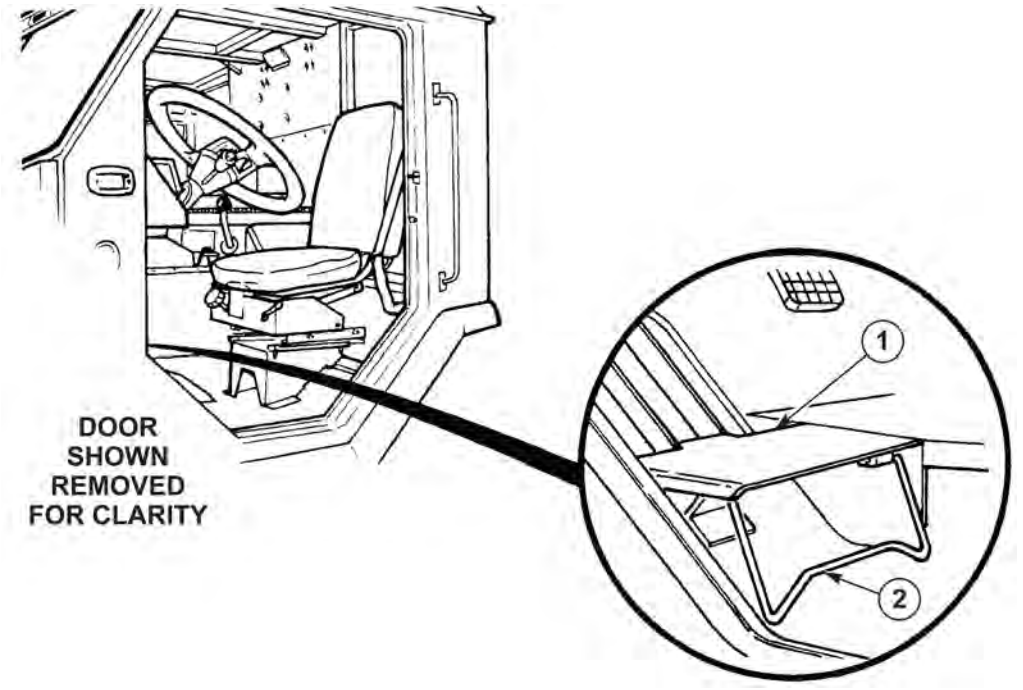


Figure 3.

2. Push foot rest leg (2) under foot rest (1) until it contacts bottom of the foot rest.
3. Lower foot rest (1) to floor.

END OF TASK

ADJUST AIR-RIDE SEAT

WARNING

When adjusting seat ride firmness, keep fingers out from under seat. Failure to comply may result in injury or death to personnel.

NOTE

- Sit in seat and perform Steps (1) through (6) as necessary.
- Driver and crew (passenger side) side seats are adjusted the same way.

1. Pull out (increase) or push in (decrease) knob (1) to adjust seat ride firmness.

ADJUST AIR-RIDE SEAT - Continued

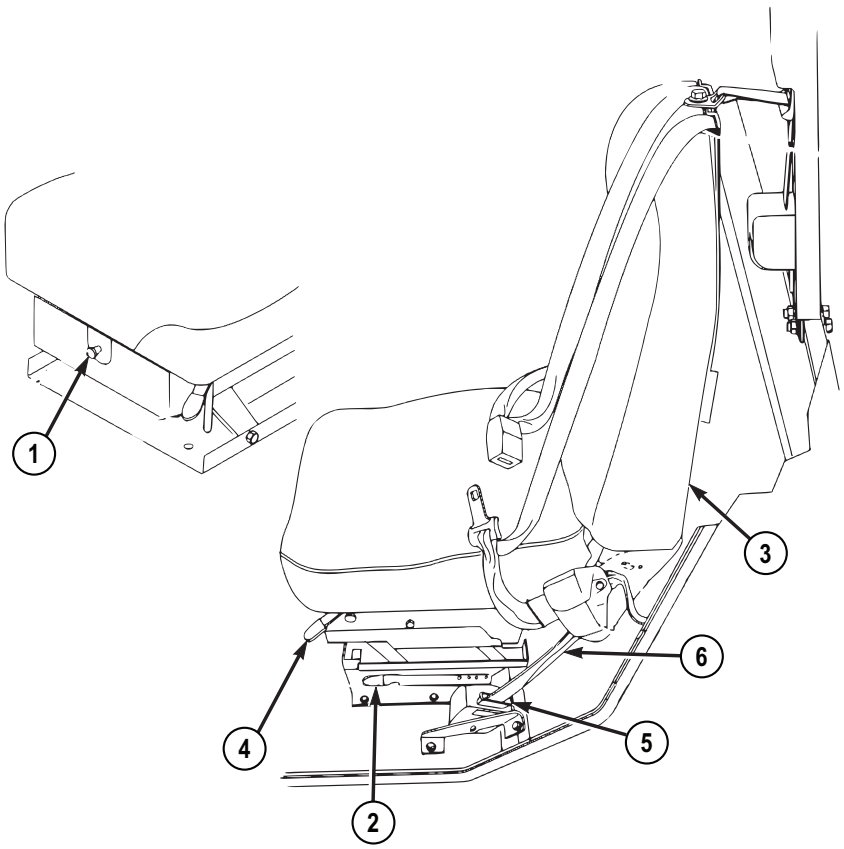


Figure 4.

2. Move lever (2) away from seat (3) and slide seat (3) forward or backwards.
3. Move lever (2) towards seat (3) to lock seat (3) in place.
4. Pull up lever (4) and lift self off seat (3) to raise, or pull up lever (4) and push down on seat (3) to lower.
5. Release lever (4) to lock seat (3) in place.
6. Adjust all vehicle mirrors as necessary once driver's seat is properly adjusted.

NOTE

If vehicle bounces too hard, seat tether may lock seat in down position. Park vehicle (WP 0036) and perform Steps (7) through (10) to free seat.

7. Push in knob (1) to decrease seat ride firmness.

ADJUST AIR-RIDE SEAT - Continued

8. Move lever (2) away from seat (3), and slide seat (3) backwards to relieve tension on retractor (5).
9. Feed some seat tether (6) into retractor (5) until it releases.
10. Perform Steps (1) through (5) as required to reset seat (3) to desired position.

END OF TASK

OPERATE FOUR-POINT SEATBELT

1. Insert seat belt flat metal end (1) into buckle (2) until click is heard.

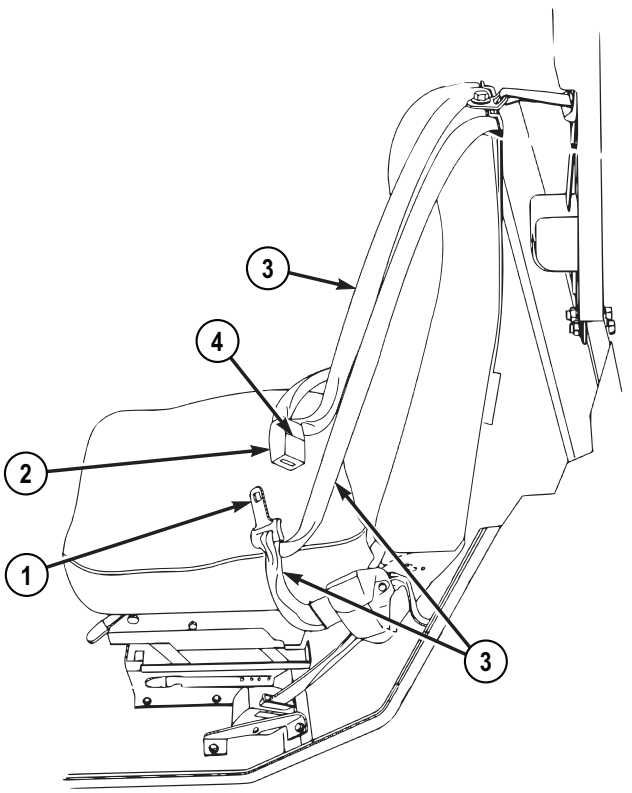


Figure 5.

OPERATE FOUR-POINT SEATBELT - Continued

2. To release seat belt (3), push in button (4) on buckle (2).

END OF TASK

END OF WORK PACKAGE

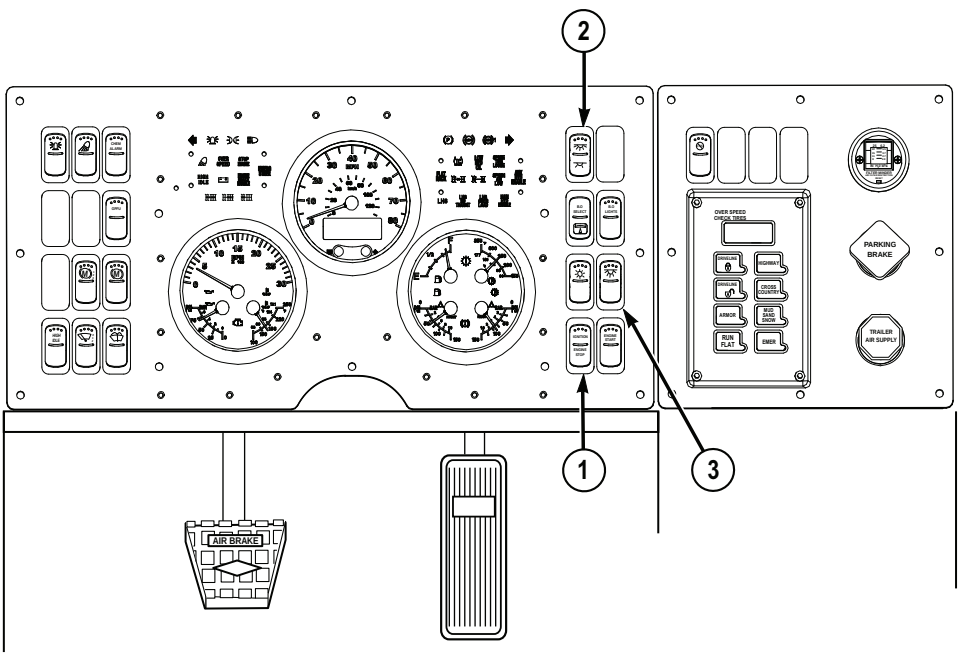
OPERATOR MAINTENANCE
OPERATING LIGHTS

INITIAL SETUP:

Not Applicable

OPERATING LIGHTS

1. Turn ignition switch (1) to ON position.



STEERING WHEEL SHOWN REMOVED FOR CLARITY

Figure 1.

NOTE

- The blackout lights switch must be in OFF position for internal and external lights to operate.

OPERATING LIGHTS - Continued

- Use the rocker switches on the instrument panel to check the operation of the lights in Steps (2) through (11).
- Battery disconnect switch must be ON to supply power to the electrical system WP 0021.

2. Push dimmer switch (2) up or down to adjust brightness of instrument panel lights.
3. Push the dome light switch (3) up to turn dome light (4) ON and down to turn dome light OFF.

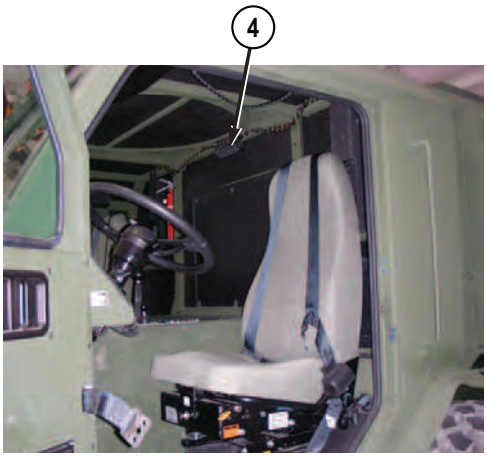


Figure 2.

NOTE

The master light switch has three positions: OFF is the top part of rocker switch pushed in, clearance lights is the middle position, and headlights with clearance lights is the bottom part of rocker switch pushed in.

4. Push master light switch (5) to middle position to turn clearance lights (6) on and down to turn clearance lights off.

OPERATING LIGHTS - Continued

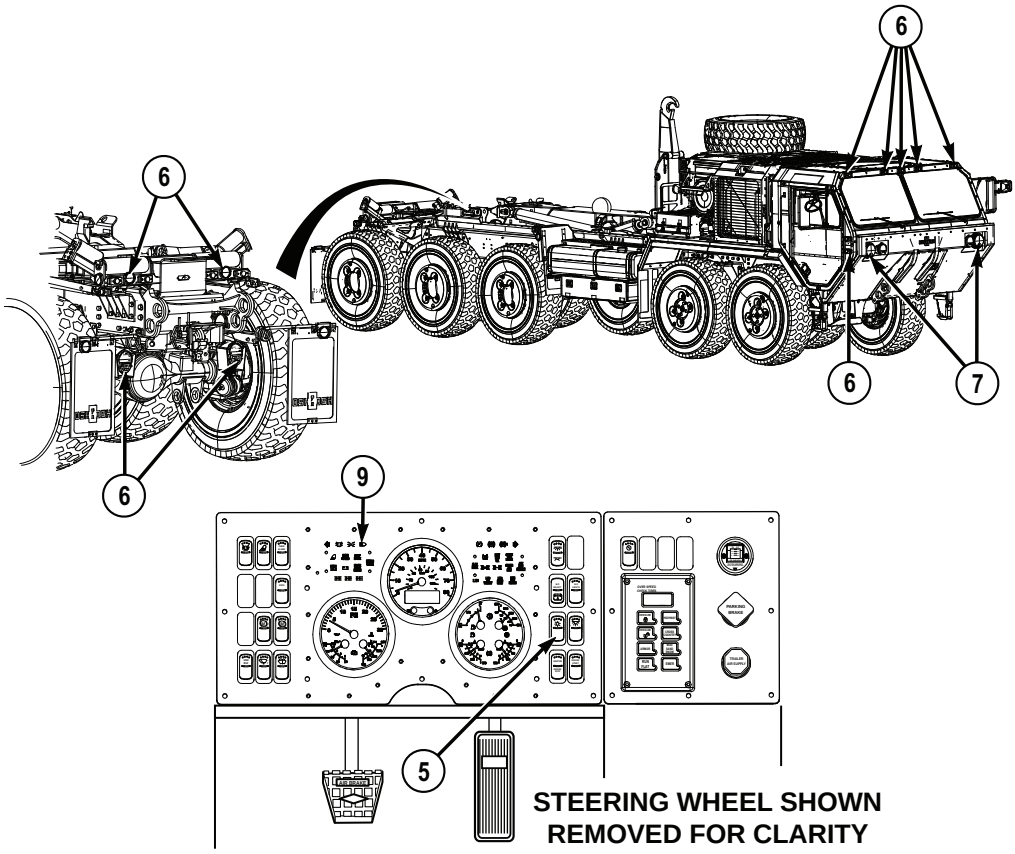


Figure 3.

5. Push the headlight/clearance lights switch (5) all the way up to turn headlights/clearance lights on. Push switch all the way down to turn headlights/clearance lights off. With headlights (7) on, press dimmer switch (located on end of signal lever) to select high or low beam. High beam indicator (9) will light when high beam is on.

NOTE

Work light switch should be in the ON position.

6. Push work light switch (10) up to turn work lights (11) on. Push work light switch down to turn work lights off.

OPERATING LIGHTS - Continued

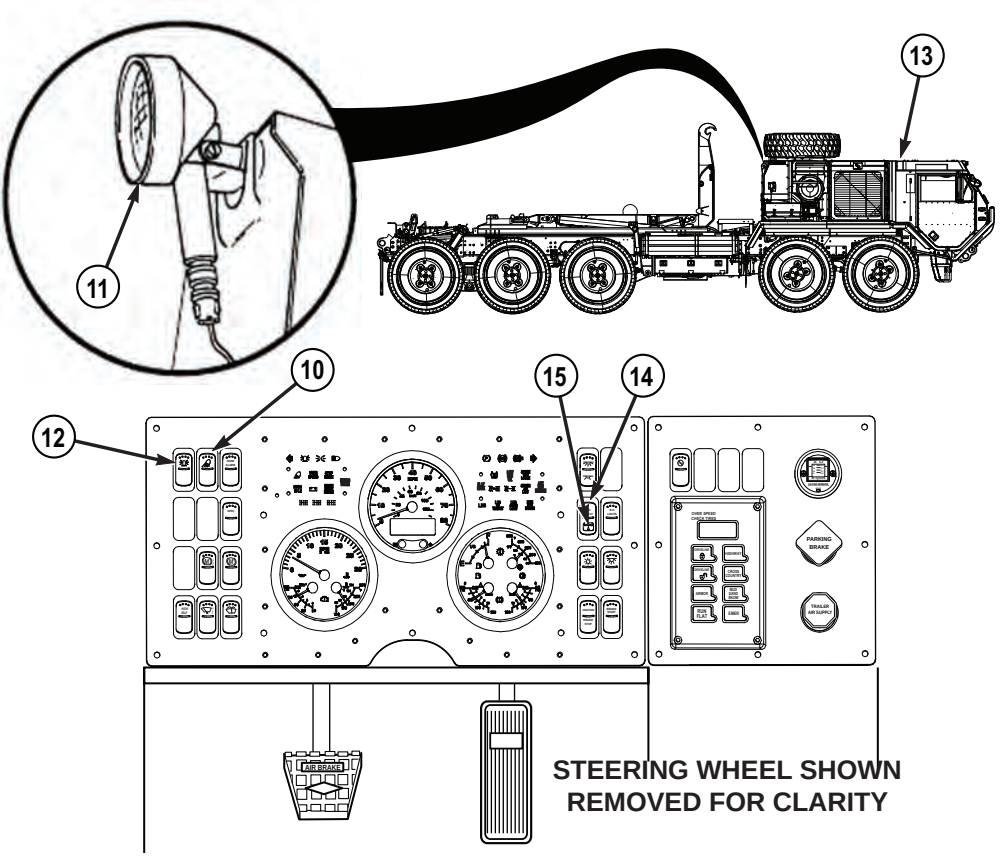


Figure 4.

7. Push beacon light switch (12) up to turn beacon light (13) (if equipped) on. Push beacon light switch down to turn beacon light off.

NOTE

Backup alarm can be locked out by having blackout selector switch in on position for daylight tactical situations.

8. Push blackout selector switch (14) up to put lighting system into blackout mode.
9. Push switch lock (15) on lower part of blackout selector switch (14) up while pushing lower part of blackout selector switch down to take lighting system out of blackout mode.
10. Push blackout marker light switch (16) down to turn blackout off blackout lights (17). Push blackout marker light switch to middle position to turn on blackout marker lights.

OPERATING LIGHTS - Continued

Push blackout marker light switch to upper position to turn on blackout marker lights and blackout drive light (18).

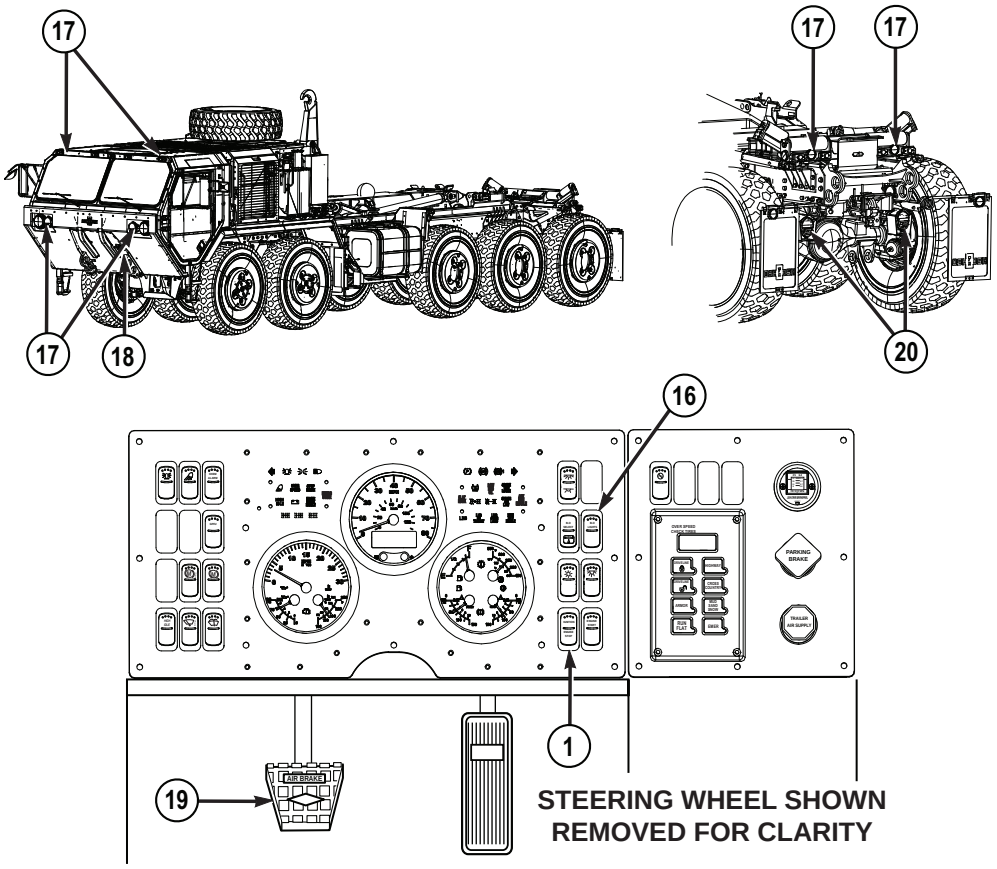


Figure 5.

NOTE

Vehicle may or may not be equipped with upper blackout marker lights.

11. Press service brake pedal (19) and check operation of stoplights (20).

OPERATING LIGHTS - Continued

12. Turn ignition switch (1) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
NORMAL STARTING

INITIAL SETUP:

Not Applicable

NORMAL STARTING

CAUTION

Hydraulic selector switch must be in OFF position before driving or hydraulic system could overheat causing damage to equipment.

NOTE

For cold weather starting, select one of the following conditions:

1. Operate Vehicle in Cold Environment +45°F to -25°F (7°C to -32°C) (WP 0075).
2. Operate Vehicle in Extreme Cold Environment Below -26°F (-32°C) (WP 0068).

CAUTION

CHECK GAUGES indicator will light (Red) to warn driver when a potential engine failure (e.g., low oil pressure, low coolant, coolant overheating, etc.) has occurred while operating vehicle.

NOTE

Battery disconnect switch must be turned clockwise for power to be supplied to electrical system.

3. Pull out PARKING BRAKE control (1).

NORMAL STARTING - Continued

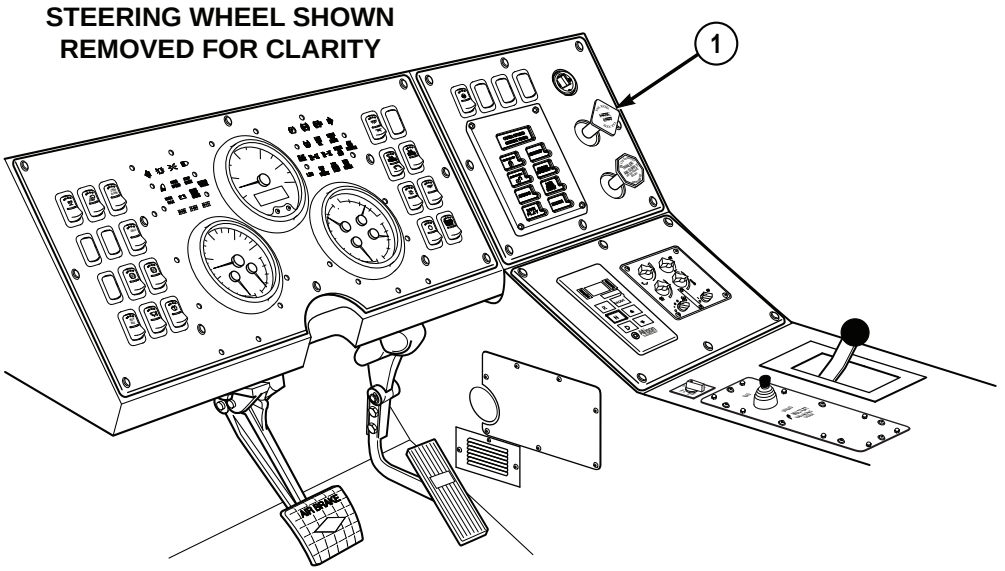


Figure 1.

If indicator light is illuminated (Red), notify Field Maintenance.

CAUTION

- CHECK ENGINE indicator will light (Red) to warn driver of failures that will not critically damage engine. Vehicle should be serviced as soon as possible. Failure to comply may result in damage to equipment.
- CHECK GAUGES and CHECK ENGINE indicators will light and warning alarm will sound for approximately 5 seconds when ENGINE switch is positioned to ON. Do not attempt to start engine if CHECK GAUGES or CHECK ENGINE indicators remain lit after approximately 5 seconds. Failure to comply may result in damage to equipment.
- DO NOT SHIFT indicator will flash red to warn driver of a potentially serious problem with the transmission. Shift selection is limited. If DO NOT SHIFT indicator is ignored, damage to equipment may result.

NOTE

DO NOT SHIFT indicator will flash for approximately 5 seconds when ENGINE switch is positioned to ON, then go off.

NORMAL STARTING - Continued

4. Turn IGNITION switch (2) to ON. Observe CHECK ENGINE indicators (3). If CHECK ENGINE indicator remains lit after approximately 5 seconds Notify Supervisor.

STEERING WHEEL SHOWN REMOVED FOR CLARITY

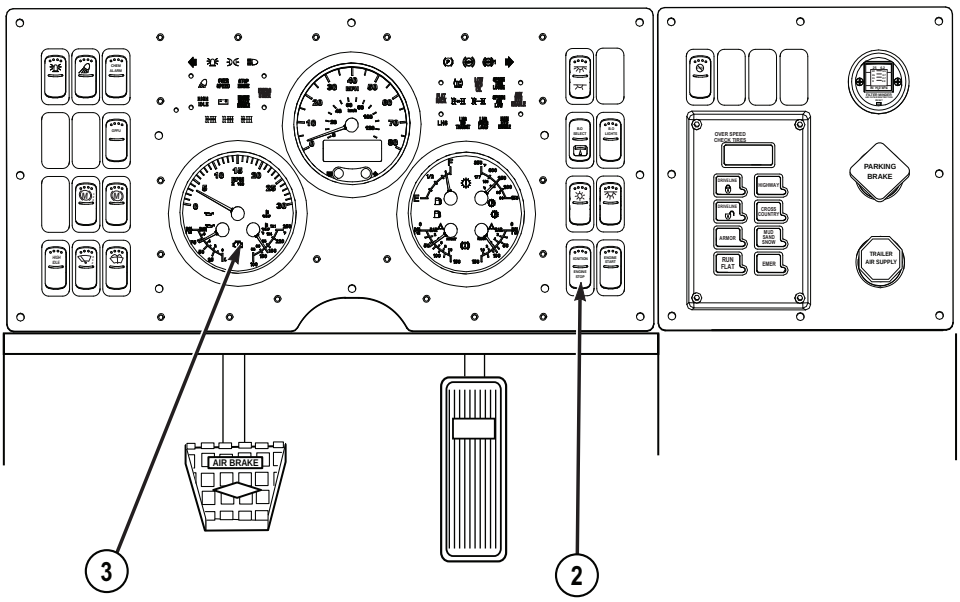


Figure 2.

5. Check that TRANS CHECK indicator (4) remains on. Notify Field Maintenance if indicator is not on.

NORMAL STARTING - Continued

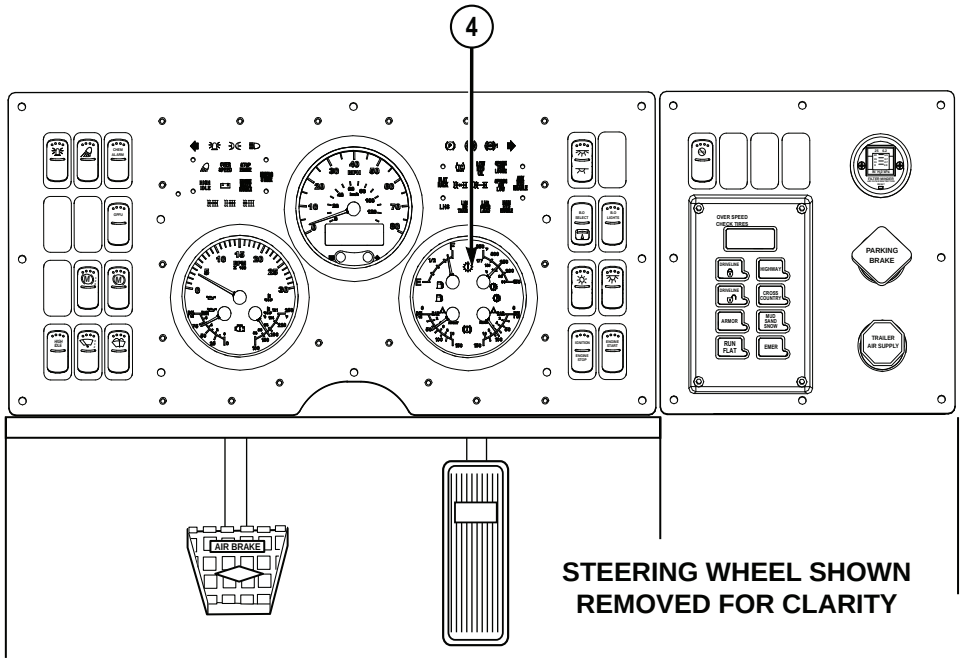


Figure 3.

WARNING



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

CAUTION

- If engine fails to start after five (15–seconds) start attempts, refer to Troubleshooting or equipment damage may occur.
- Do not turn ENGINE switch to START position while engine is rotating, or damage to equipment may result.

NORMAL STARTING - Continued

NOTE

- CHECK ENGINE lamp will illuminate for 10 to 15 seconds after start-up.
- If engine fails to start, the ENGINE switch must be turned to OFF position, prior to the next start attempt. This will disengage an Engine Restart Interlock, which prevents starter engagement from the ON position.

6. Press ENGINE START switch (5) to START for about 15 seconds or until engine starts. When engine starts, release switch. ENGINE switch will spring back to ON position. If engine fails to start, wait 15 seconds before next start attempt to allow starter to cool. Air pressure indicator (6) and oil pressure lamp (7) may light and buzzer may sound briefly.

STEERING WHEEL SHOWN
REMOVED FOR CLARITY

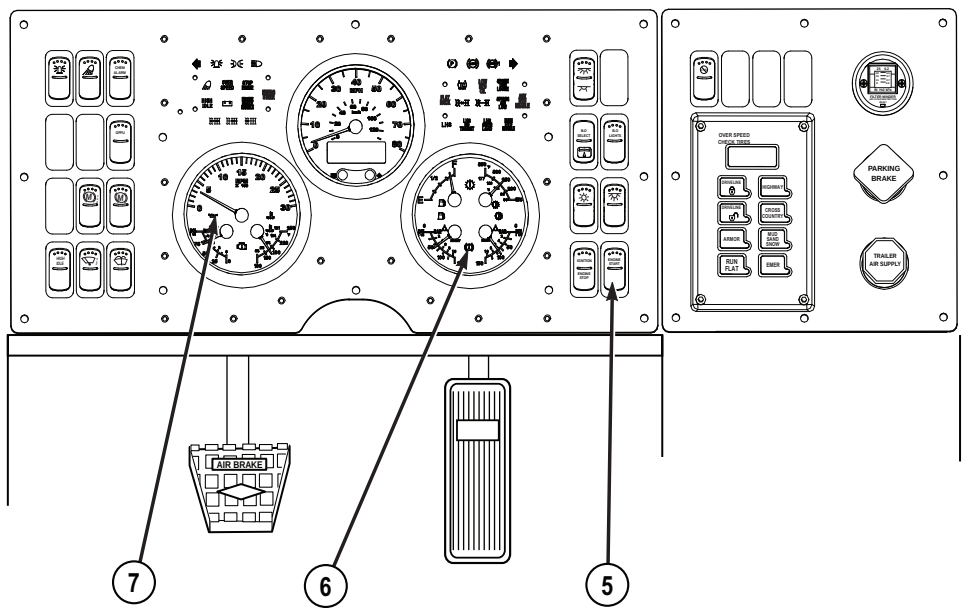


Figure 4.

CAUTION

TRANS CHECK indicator will go off at engine start-up. If TRANS CHECK indicator remains on, transmission has a problem that will not critically damage the transmission.

NORMAL STARTING - Continued

7. Observe TRANS CHECK (4) indicators. Notify Supervisor if DO NOT SHIFT or TRANS CHECK indicators remain lit after engine is running.

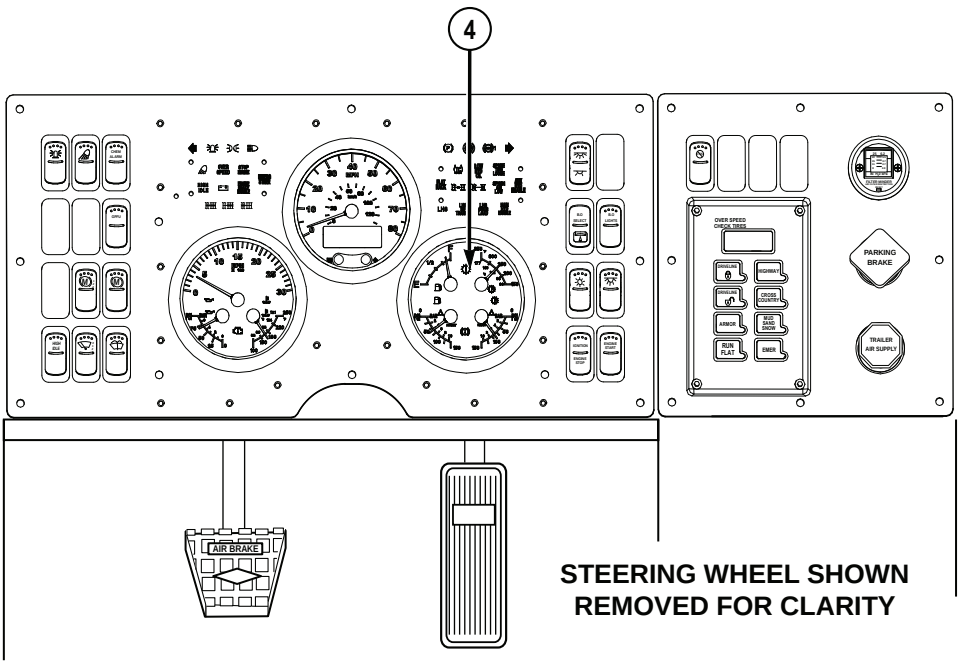


Figure 5.

CAUTION

If OIL PRESS gauge does not show engine oil pressure within 10 to 15 seconds after starting engine, shut down engine immediately and refer to Troubleshooting. Lack of lubrication may damage engine.

8. Check that OIL PRESS gauge (8) reads 5 to 10 psi (34 to 69 kPa) during idle and 40 to 88 psi (276 to 606 kPa) during normal operation.

NORMAL STARTING - Continued

STEERING WHEEL SHOWN
REMOVED FOR CLARITY

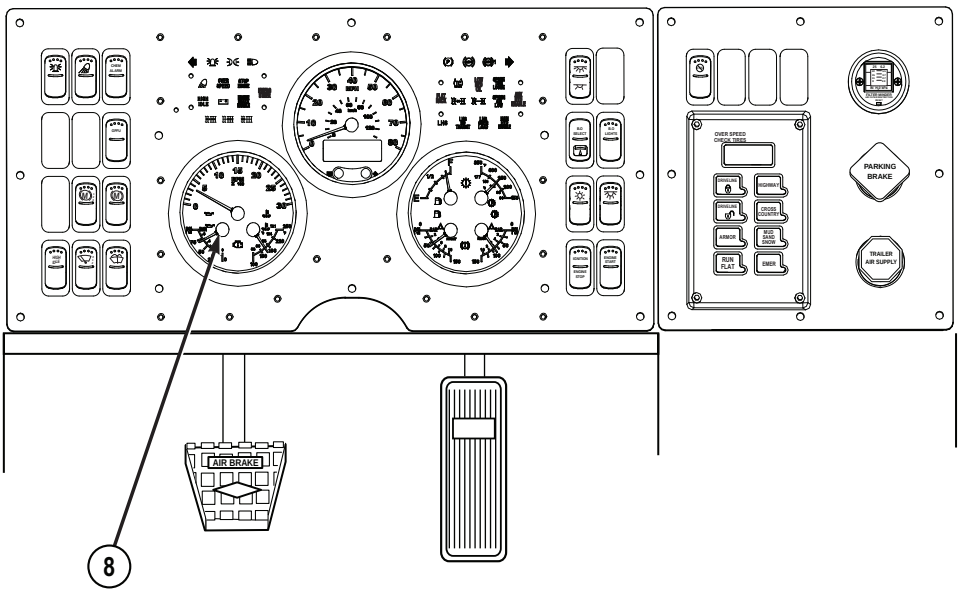


Figure 6.

CAUTION

Do not operate engine above 1,000 rpm during warm-up until OIL PRESS gauge indicates 25 to 30 psi (172 to 207 kPa) at 800 to 1,000 rpm. OIL PRESS gauge should indicate 50 to 70 psi (345 to 483 kPa) when engine operates at 1,800 to 2,100 rpm. Lack of lubrication may damage engine.

9. Run engine at 800 to 1,000 rpm for about 3 minutes.

   If needles on AIR PRESS gauge do not read 60 to 125 psi (414 to 862 kPa) after warm-up, shut off engine and notify Field Maintenance.

10. Check that AIR PRESS gauges (9) reads 60 to 125 psi (414 to 862 kPa). Air pressure indicator (6) will light and buzzer will sound until air pressure is greater than 60 psi (414 kPa).

NORMAL STARTING - Continued

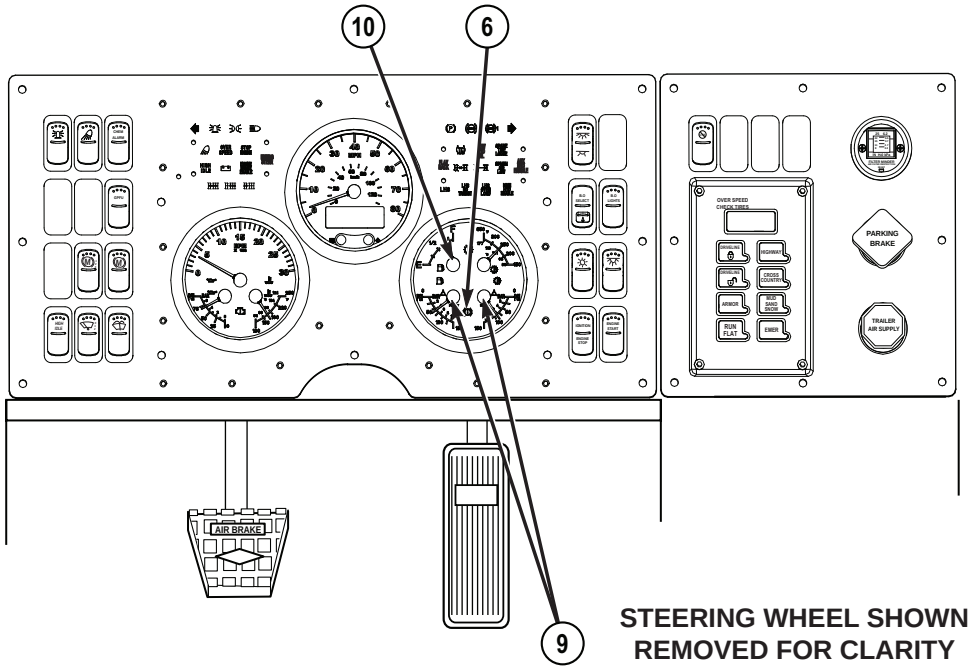


Figure 7.

11. Check that FUEL gauge (10) shows enough fuel to complete mission.

NOTE

WATER TEMP gauge may not show reading at engine idle.

12. Check that WATER TEMP gauge (11) does not read over 210°F (99°C).

NORMAL STARTING - Continued

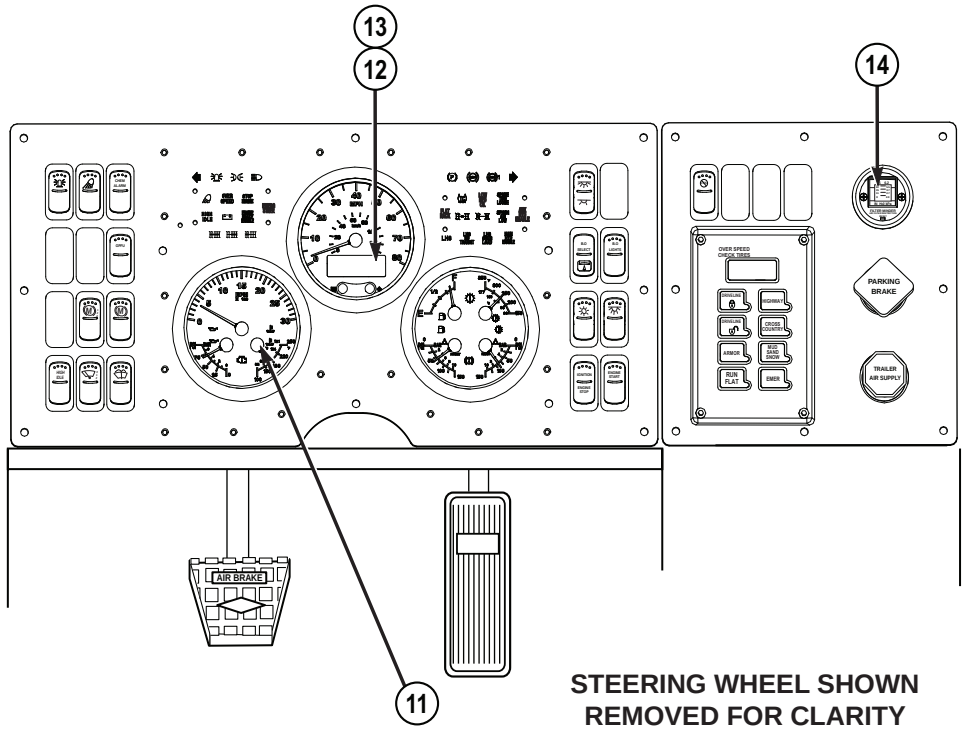


Figure 8.

13. Check that 24-volt BATTERY gauge (12) reads between 26 to 28 volts.
14. Check that 12-volt BATTERY gauge (13) reads between 13 to 14 volts.
15. Check that air filter restriction indicator (14) reads less than 17 in. (4.2 kPa).

NOTE

Vehicle may be operated until AIR FILTER RESTRICTION indicator reads up to a maximum of 20 in. (5.0 kPa) with a loss of performance and fuel economy. If indicator reads above 20 in. (5.0 kPa), it will cause a loss of performance and fuel economy.

16. If AIR FILTER RESTRICTION indicator (14) reads 17 in. (4.2 kPa) or more, notify Field Maintenance to change air filter element.

NORMAL STARTING - Continued

WARNING



CTIS ON/OFF switch should be in ON position at all times. Overspeed protection will not operate if switch is in OFF position and tire pressures may not match driving speeds. Failure to follow these instructions may result in unsafe driving conditions or tire failure. Failure to comply may result in injury or death to personnel.

NOTE

CTIS lights will briefly flash and then extinguish when the CTIS is turned on. A steady green light will remain at the position the CTIS is set.

17. Check that CTIS ON/OFF switch (15) is set to ON.

NORMAL STARTING - Continued

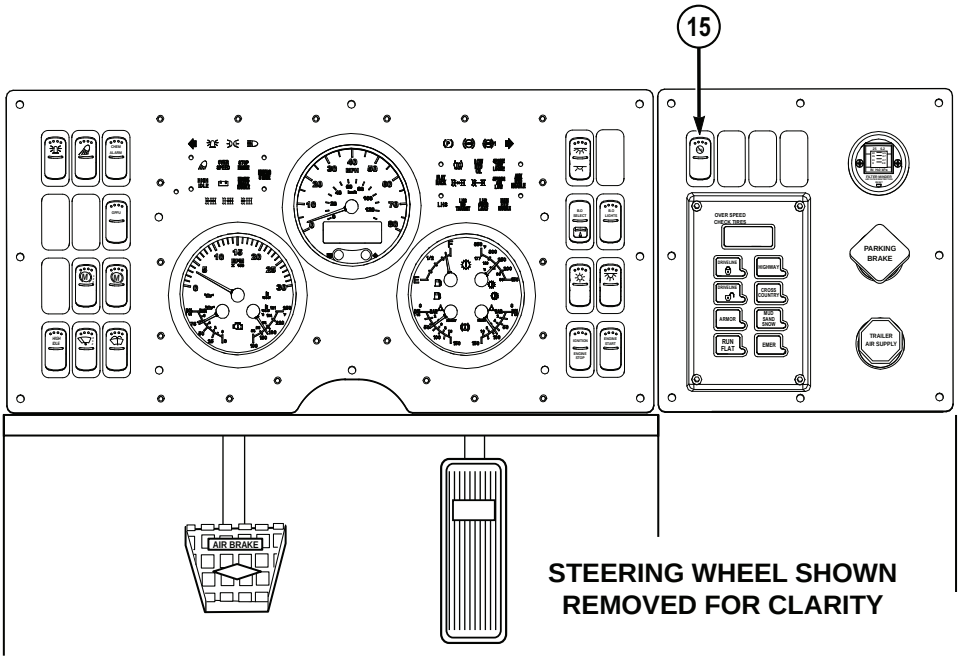


Figure 9.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE INSTRUMENT PANEL

INITIAL SETUP:

Not Applicable

GENERAL

Instrument panel on PLS A1 series vehicle incorporates electronic gauges, indicator lights, and liquid crystal display (LCD) to communicate information to operator. LCD has multiple modes and functions.

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

END OF TASK

INSTRUMENT PANEL MODES

Sleep Mode: Instrument panel is normally in sleep mode when ignition switch (1) is turned off. No gauges, indicator lights, or LCD screen (2) will operate in this mode.

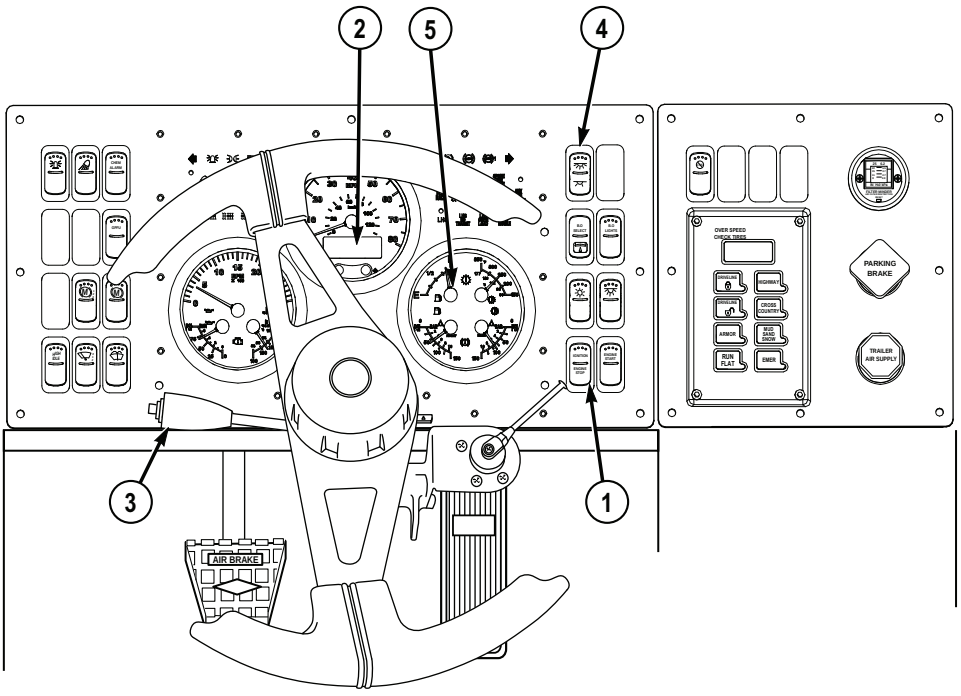


Figure 1.

Limited Mode: If turn signal lever (3) or panel headlight switch (4) is actuated, instrument panel goes into limited mode. In limited mode, turn signals, indicators on LCD (2), and fuel gauge (5) are active. Remaining gauges will go to zero.

Start-up Mode: Instrument panel enters start-up mode when ignition switch (1) is positioned on. After ignition on, an optional gauge start-up self test (SST) may be performed. Operator can enable or disable SST by pressing and holding both M (mode) button (6) and T (trip) button (7) while setting ignition switch (1) to ON position. A screen will be displayed that allows operator to enable SST (Yes) or disable SST (No).

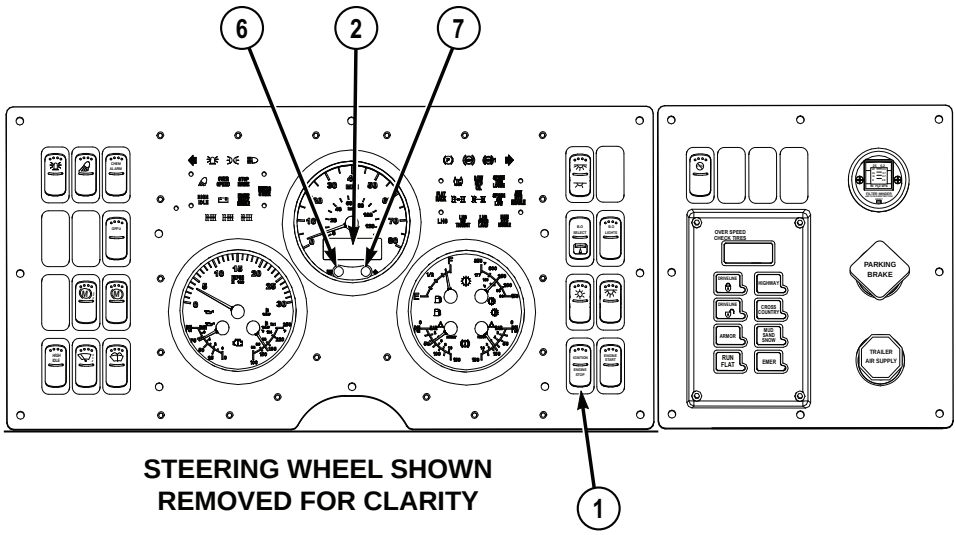


Figure 2.

During start-up mode:

- With SST disabled, gauges will go to zero and move to current status positions. With SST enabled, gauges move upscale, pausing at half scale before going to full scale. Gauges will go to zero before moving to current status positions.
- LCD (2) will display any warning messages and will then display odometer, trip odometer, engine hour meter, and battery voltage readings. LCD (2) will revert to normal drive mode screen. If SST is enabled, LCD (2) will also turn on and off, followed by OSHKOSH logo, and finally, display software information before going to normal drive mode screen.
- Warning lights will turn on and off, followed by active warning lights (if any) coming back on.
- With SST disabled, there is no alarm at start-up. With SST enabled, a 1-second alarm will sound at start-up.

Ignition Mode: Instrument panel will be in ignition mode whenever ignition switch (1) is positioned on. Instrument Panel is fully active in this mode.

Diagnostic Mode: From ignition mode with vehicle speed at zero, pressing M button (6) for more that two seconds allows instrument panel to enter diagnostic mode. This mode provides following functions:

- Set units.
- Adjust contrast.

- Instrument diagnostics.

END OF TASK

LCD MESSAGE CENTER

NOTE

LCD will display warning as dictated by various control systems on vehicle. Warning will remain on screen until warning is no longer valid or until operator pushes T (trip) button.

Drive Mode Screen. This is normal display screen when operating vehicle. In drive mode, LCD (1) will display odometer reading, system voltage reading, and either operating hours or trip odometer reading. To toggle back and forth between these two options, operator must press and release M (mode) button (2) in less than two seconds.

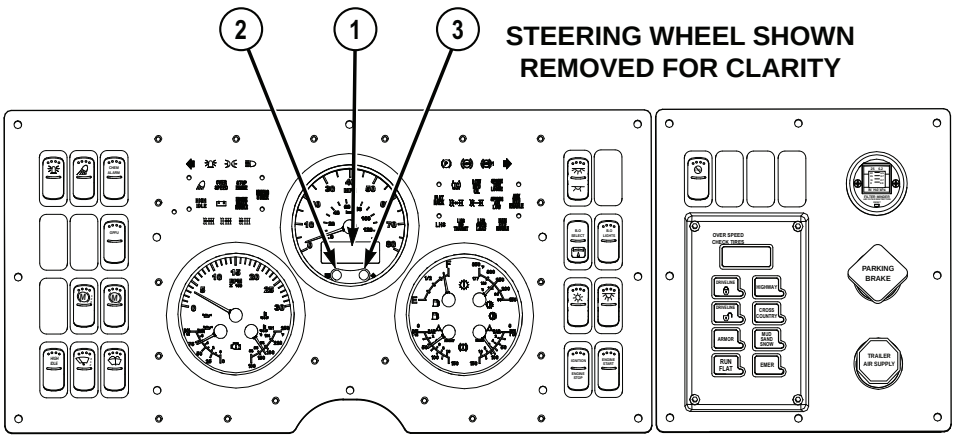


Figure 3.

Settings and diagnostics. Operator can enter settings and diagnostics menu from drive mode screen when engine is running and vehicle speed is zero. To enter settings and diagnostics menu, operator must push M button (2) for more than two seconds. Item highlighted will be item selected when both M button (2) and T button (3) are pressed together. Pressing M button (2) or T button (3) separately will scroll through various selections.

1. **To change measurement units.**

   a. Enter LCD (1) settings and diagnostics screen.

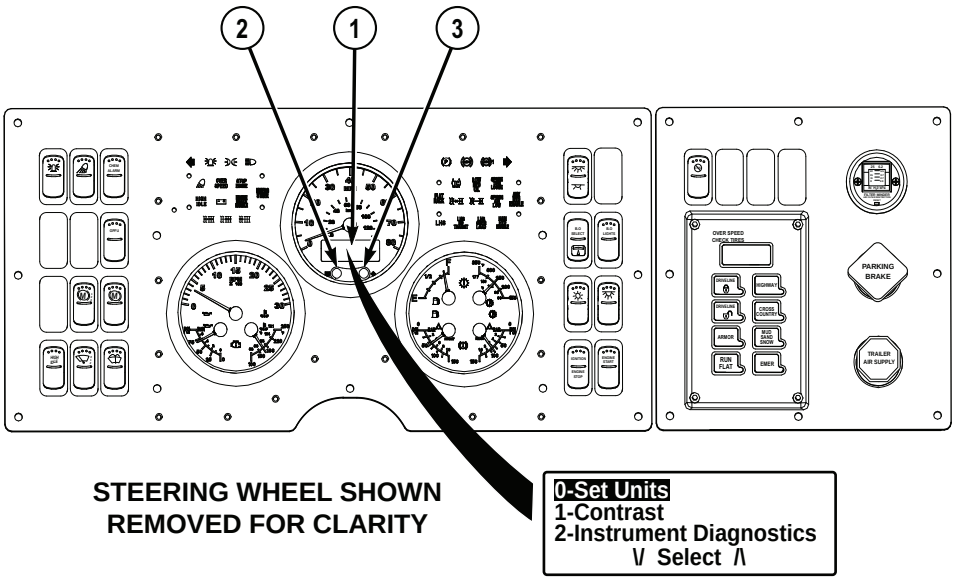


Figure 4.

b. Scroll down using M button (2) or up using T button (3) until '0-Set Units' is selected (shown).

c. Press M button (2) and T button (3) at same time. Current Units screen will appear.

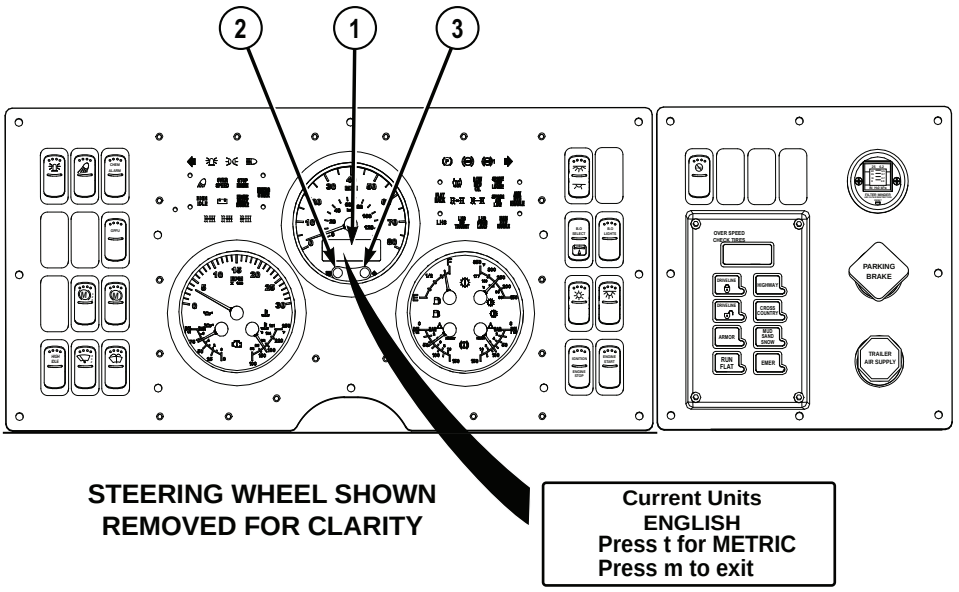


Figure 5.

d. Press T button (3) to change measurement units to English or Metric.

e. Press M button (2) to return LCD (1) to drive mode screen.

2. **To change LCD screen contrast setting.**

a. Enter LCD (1) settings and diagnostics screen.

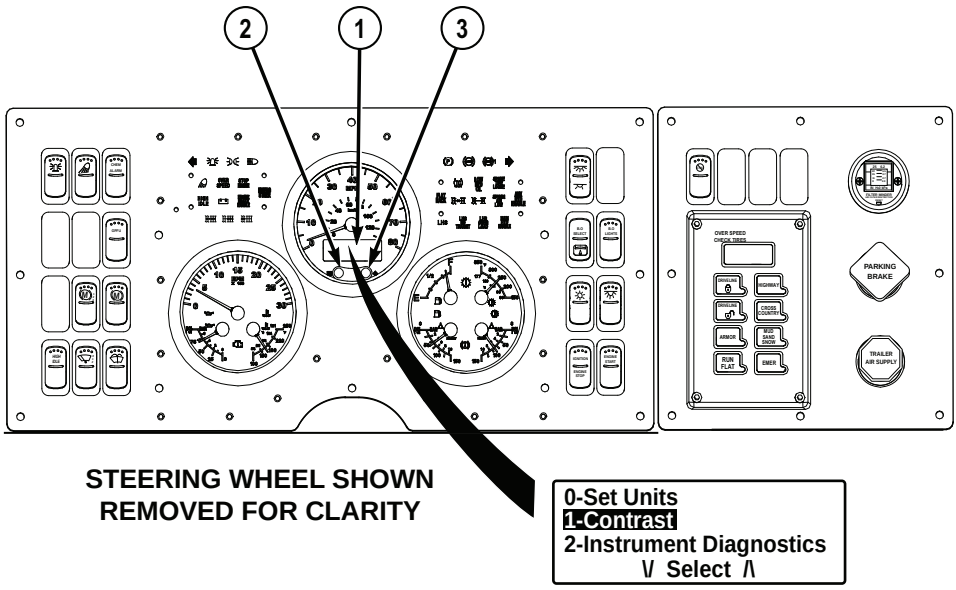


Figure 6.

b. Scroll down using M button (2) or up using T button (3) until '1-Contrast' is selected (shown).

c. Press M button (2) and T button (3) at same time. CONTRAST ADJUST screen will appear.

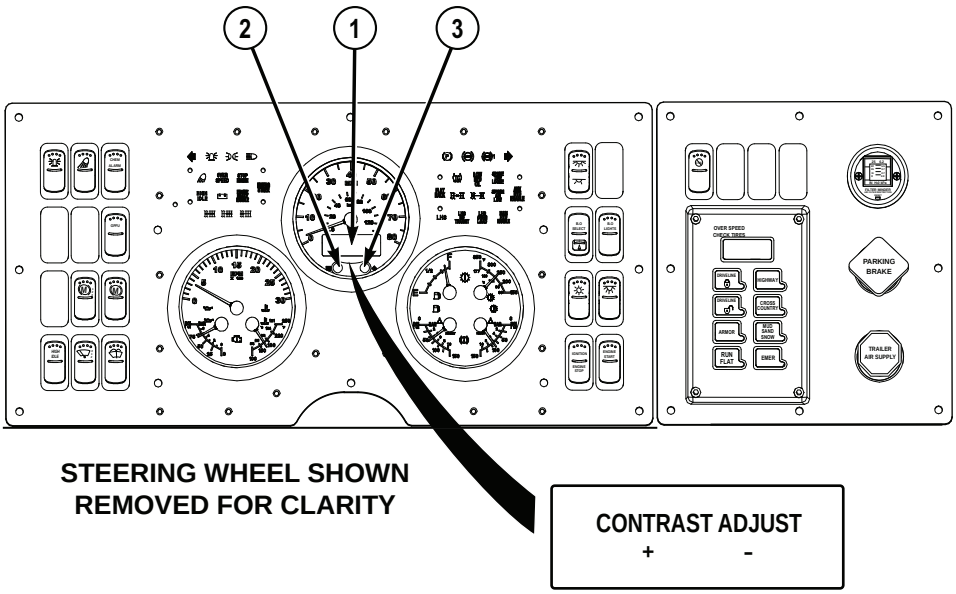


Figure 7.

d. Press M button (2) to increase LCD (1) contrast.

e. Press T button (3) to decrease LCD (1) contrast.

f. LCD (1) will automatically return to drive mode screen.

3. **Instrument Panel Gauges Testing.**

a. Enter LCD (1) settings and diagnostic screen.

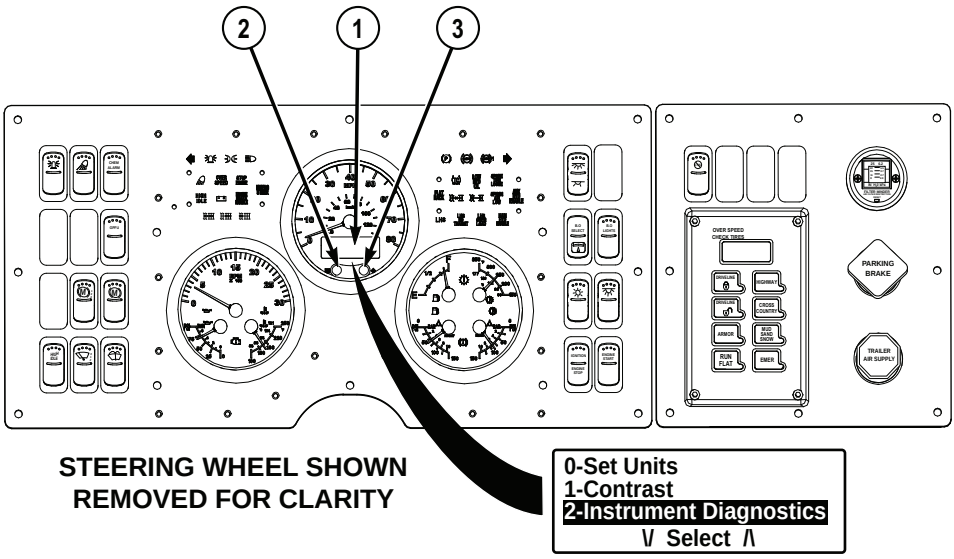


Figure 8.

b. Scroll down using M button (2) or up using T button (3) until '2-Instrument Diagnostics' is selected (shown).

c. Press M button (2) and T button (3) at same time. Instrument diagnostic screen will appear.

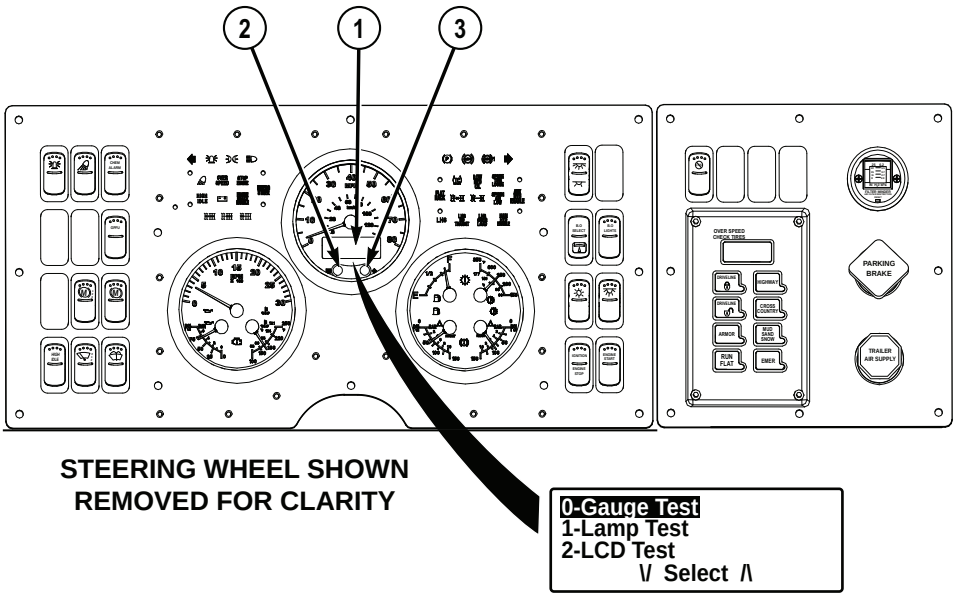


Figure 9.

d. Scroll down using M button (2) or up using T button (3) until '0-Gauge Test' is selected (shown).

e. Press M button (2) and T button (3) together to begin testing gauges (fuel gauge test shown). Each gauge is tested in turn at 0%, 50%, and 100%. LCD (1) displays corresponding percentage.

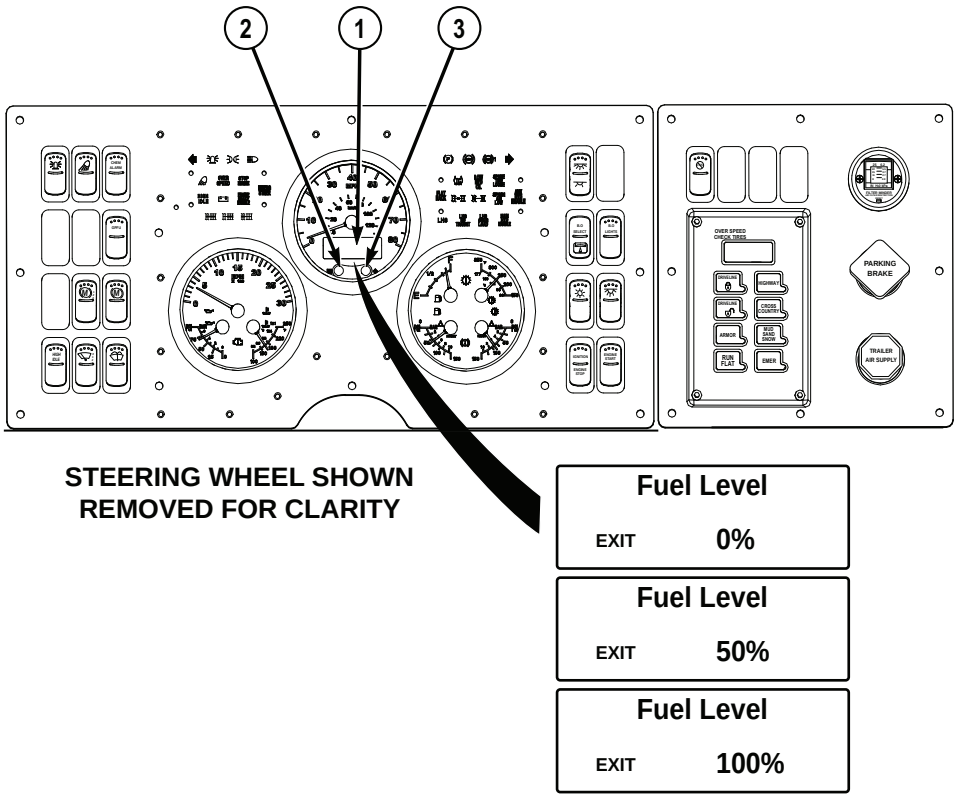


Figure 10.

f. Press M button (2) to end test and return LCD (1) to drive mode screen.

g. Contact Field Maintenance to replace gauge/instrument panel if corresponding gauge does not reflect reading on LCD (1).

4. **Instrument Panel Indicator Lamps Testing.**

a. Enter LCD (1) settings and diagnostic screen.

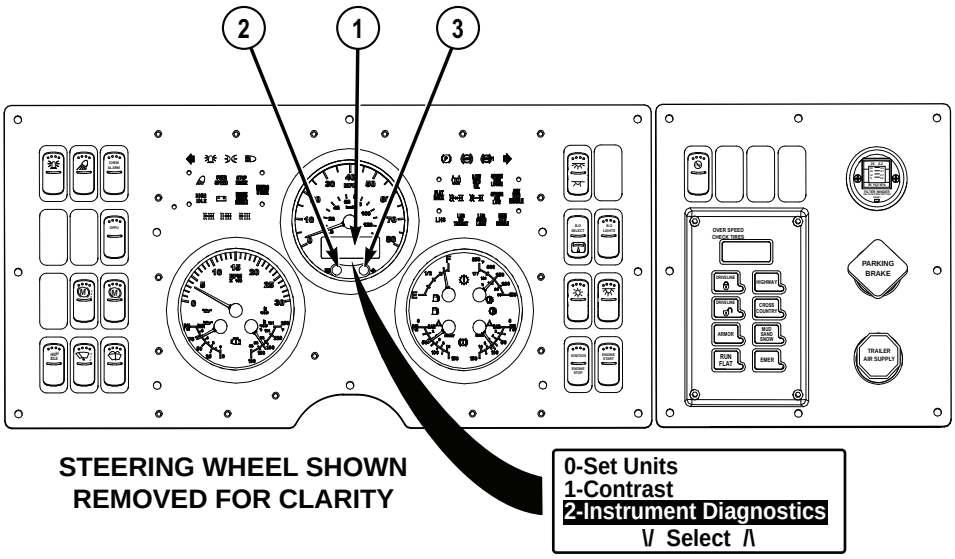


Figure 11.

b. Scroll down using M button (2) or up using T button (3) until '2-Instrument Diagnostics' is selected (shown).

c. Press M button (2) and T button (3) at same time. Instrument diagnostic screen will appear.

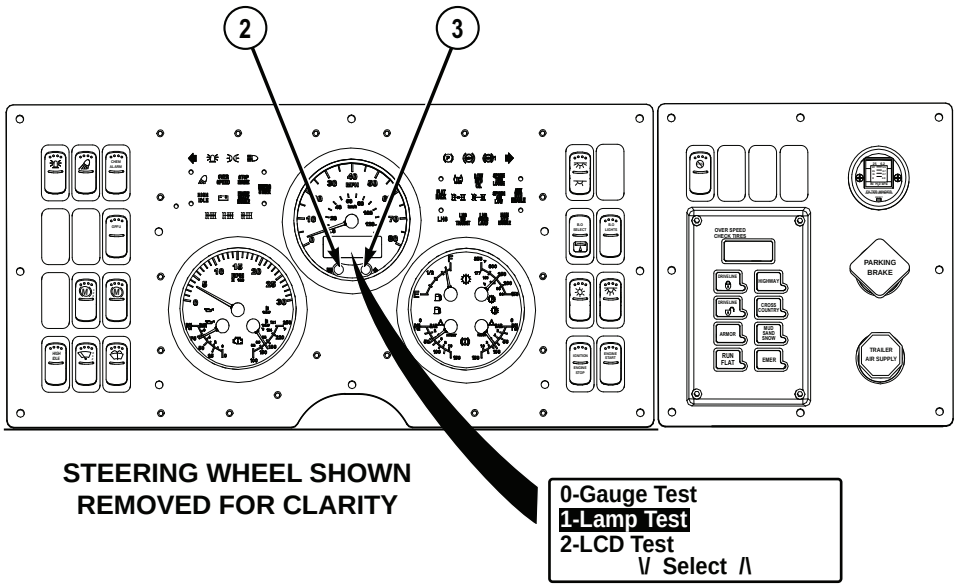


Figure 12.

d. Scroll down using M button (2) or up using T button (3) until '1-Lamp Test' is selected (shown).

e. Press M button (2) and T button (3) together to begin testing warning and indicator lamps. Each warning and indicator lamp on main gauge/instrument panel is turned on and off in turn. LCD (1) displays corresponding warning or indicator lamp under test (high beam indicator test shown).

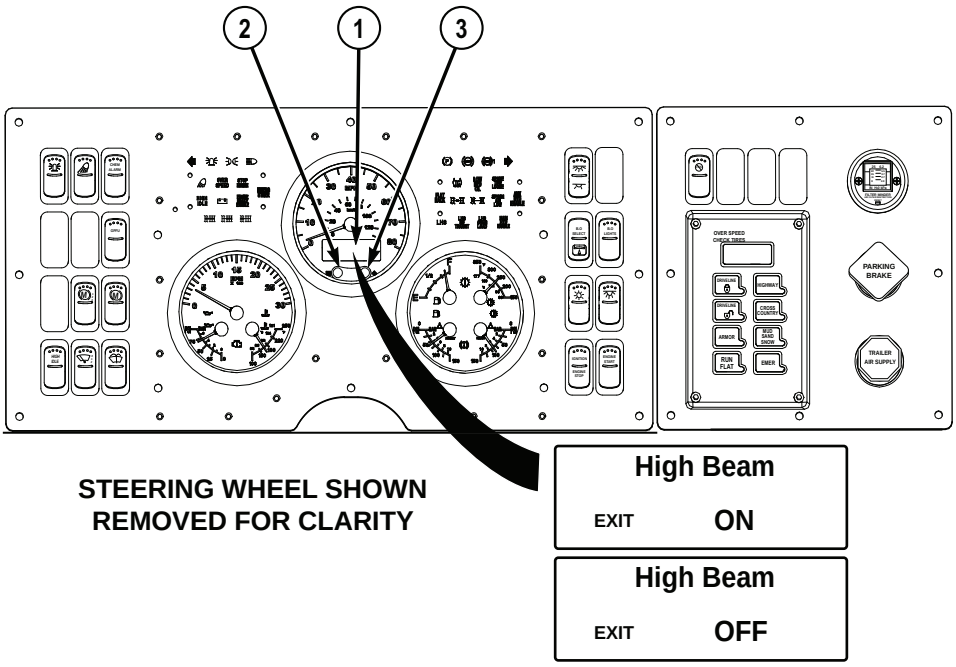


Figure 13.

f. Press M button (2) to end test and return LCD (1) to drive mode screen.

g. Contact Field Maintenance to replace main gauge/instrument panel if warning or indicator lamp fails to illuminate as indicated by LCD (1).

NOTE

Instrument panel LCD is used as part of test procedure. If LCD is unreadable during any part of test, instrument panel should be replaced.

5. **Instrument Panel Liquid Crystal Display (LCD) Testing.**

a. Enter LCD (1) settings and diagnostic screen.

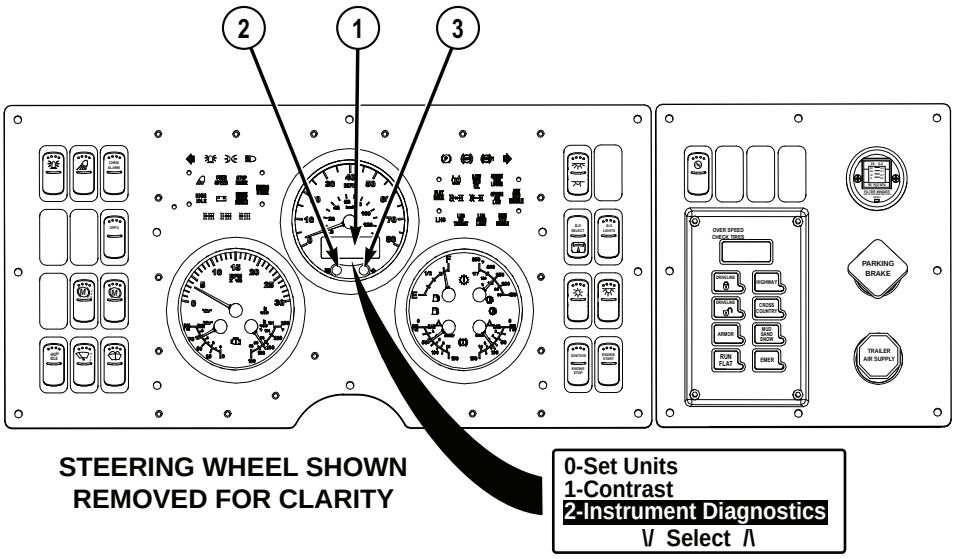


Figure 14.

b. Scroll down using M button (2) or up using T button (3) until '2-Instrument Diagnostics' is selected (shown).

c. Press M button (2) and T button (3) at same time. Instrument diagnostic screen will appear.

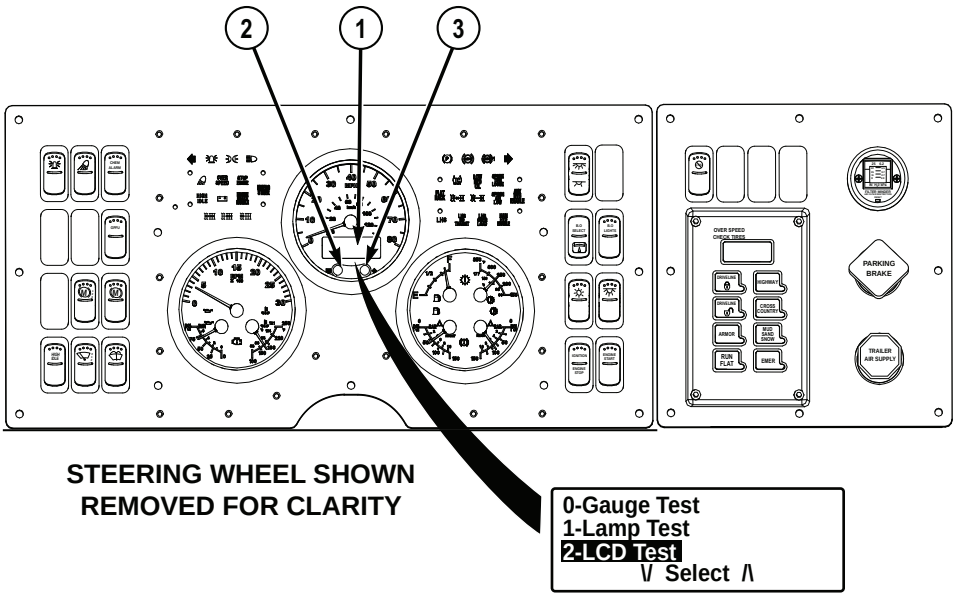


Figure 15.

d. Scroll down using M button (2) or up using T button (3) until '2-LCD Test' is selected (shown).

e. Press M button (2) and T button (3) together to begin testing LCD (1). Display should alternate between normal (shown-top) and negative (shown-bottom) mode three times before returning to drive mode screen.

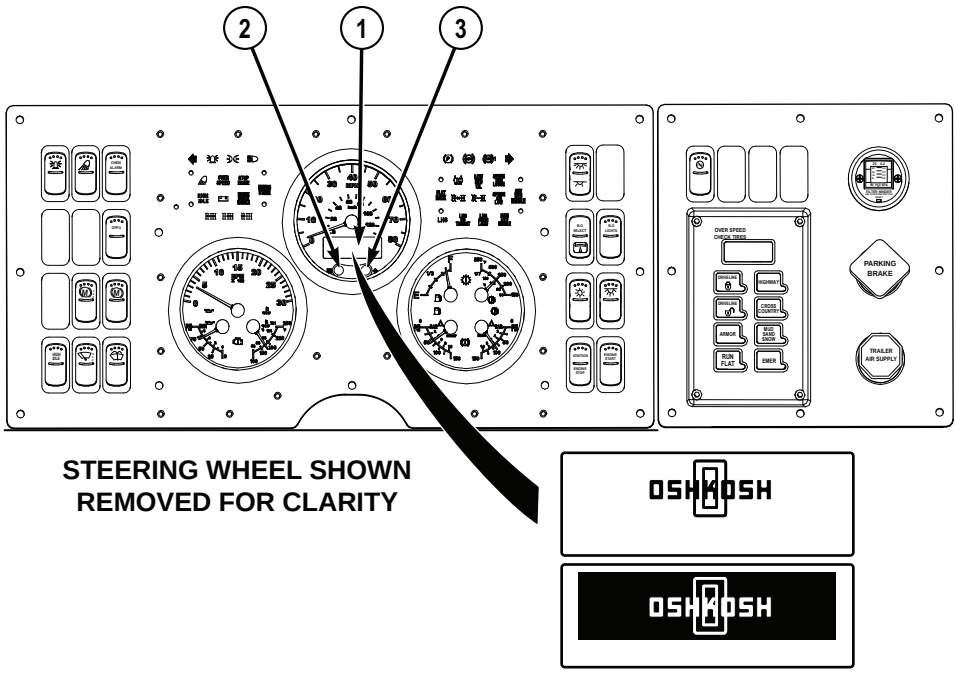


Figure 16.

f. Contact Field Maintenance to replace main gauge/instrument panel if LCD (1) fails to illuminate as shown in previous Step.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
BRAKES

INITIAL SETUP:

Not Applicable

OPERATE SERVICE BRAKES

WARNING



Do not press service brake treadle hard three or four times in a row. Air supply will be used up and service brakes will not work until air is built up again. Failure to comply may result in injury or death to personnel.

1. Ensure AIR PRESS gauges (1) and (2) read at least 100 psi (690 kPa).

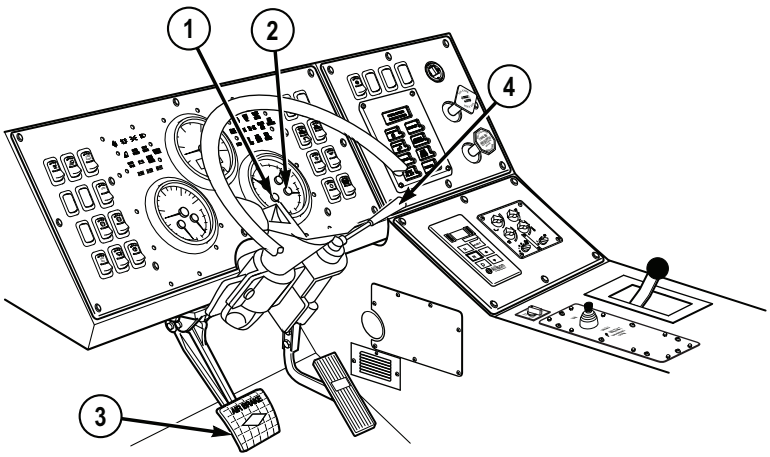


Figure 1.

OPERATE SERVICE BRAKES - Continued

2. Push down and hold service brake pedal (3) as needed to slow or stop vehicle.

END OF TASK

OPERATE TRAILER HANDBRAKE

NOTE

When service brake pedal is pressed, both vehicle and trailer brakes will be applied.

Pull down trailer handbrake control (4) during trailer connect/disconnect operations, if required, to apply trailer brakes only. Release trailer handbrake control to release trailer brakes.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
FILLING MAIN FUEL TANK WHEN EQUIPPED WITH AUXILIARY FUEL TANK

INITIAL SETUP:

Not Applicable

FILLING MAIN FUEL TANK WHEN EQUIPPED WITH AUXILIARY FUEL TANK

WARNING



- Fuel is very flammable and can explode easily. Keep fuel away from open fire 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 when engine is hot. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET OF VEHICLE. Failure to comply may result in injury or death to personnel.
- Clean fuel tank to purge any flammable liquid or vapors before welding, grinding, or using any heat producing device near the fuel tank. Failure to comply may result in injury or death to personnel.
- When refueling, stop vehicle, shut down engine, and apply parking brake. Ensure no open flame in near area. Never smoke. Never add fuel with engine running. Do not have driver seated when adding fuel. After fuel is added, securely close reservoir cap; a loose cap can cause a fuel leak or be a fire hazard. Before starting vehicle, check that no fuel is spilled on or around vehicle. Failure to comply may result in injury or death to personnel.

1. Shut OFF engine. (WP 0037)
2. Close shutoff valves (1) on main fuel tank (2) and on auxiliary fuel tank (3).

FILLING MAIN FUEL TANK WHEN EQUIPPED WITH AUXILIARY FUEL TANK - Continued

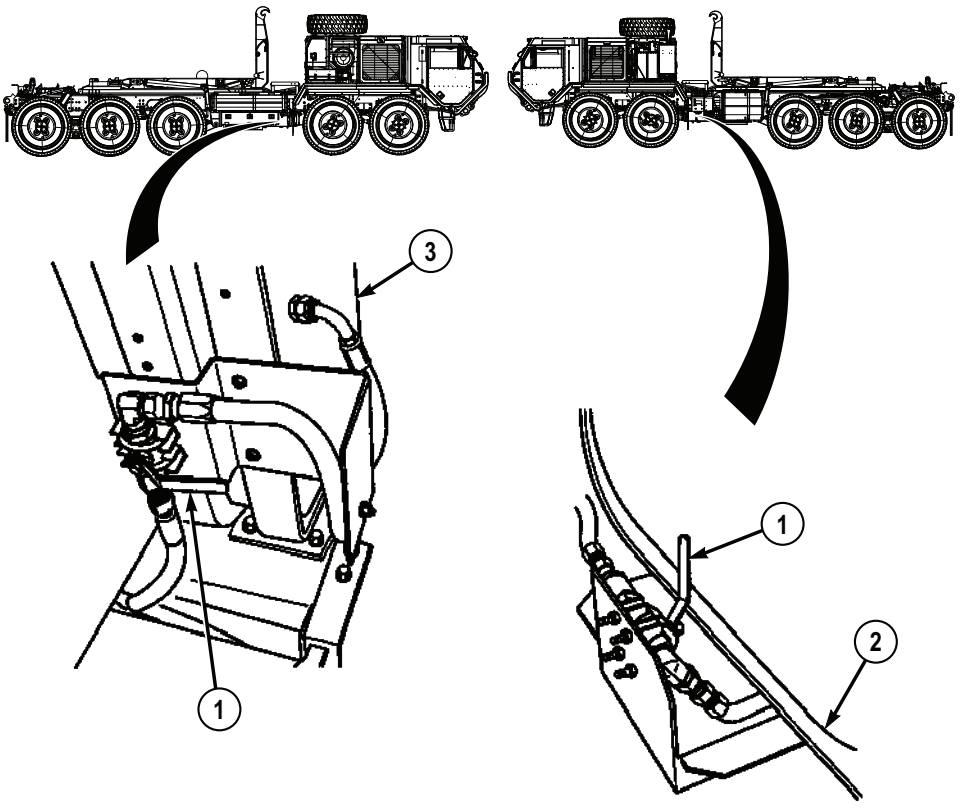


Figure 1.

WARNING

Ensure vehicle is grounded prior to filling fuel tank. Failure to comply may result in injury or death to personnel.

NOTE

Both main fuel tank and auxiliary fuel tank are filled the same way. Main fuel tank shown.

3. Clean away debris on/near fuel filler cap (4) of main fuel tank (2).

FILLING MAIN FUEL TANK WHEN EQUIPPED WITH AUXILIARY FUEL TANK - Continued

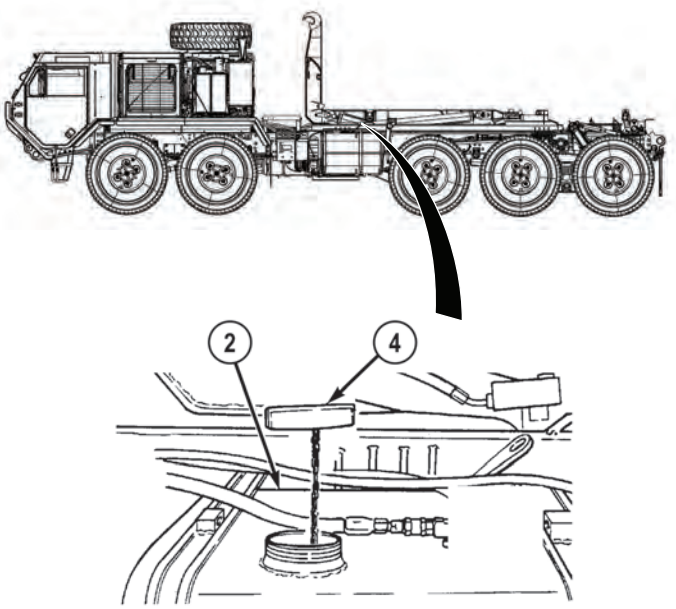


Figure 2.

4. Remove fuel filler cap (4) from main fuel tank (2) slowly.
5. Fill main fuel tank (2).
6. Remove ground from vehicle.
7. Repeat Steps (3) through (7) for filling auxiliary fuel tank.
8. Replace fuel filler cap (4) on main fuel tank (2).
9. Open fuel shutoff valves (1) on main fuel tank (2) and on auxiliary fuel tank (3).

FILLING MAIN FUEL TANK WHEN EQUIPPED WITH AUXILIARY FUEL TANK - Continued

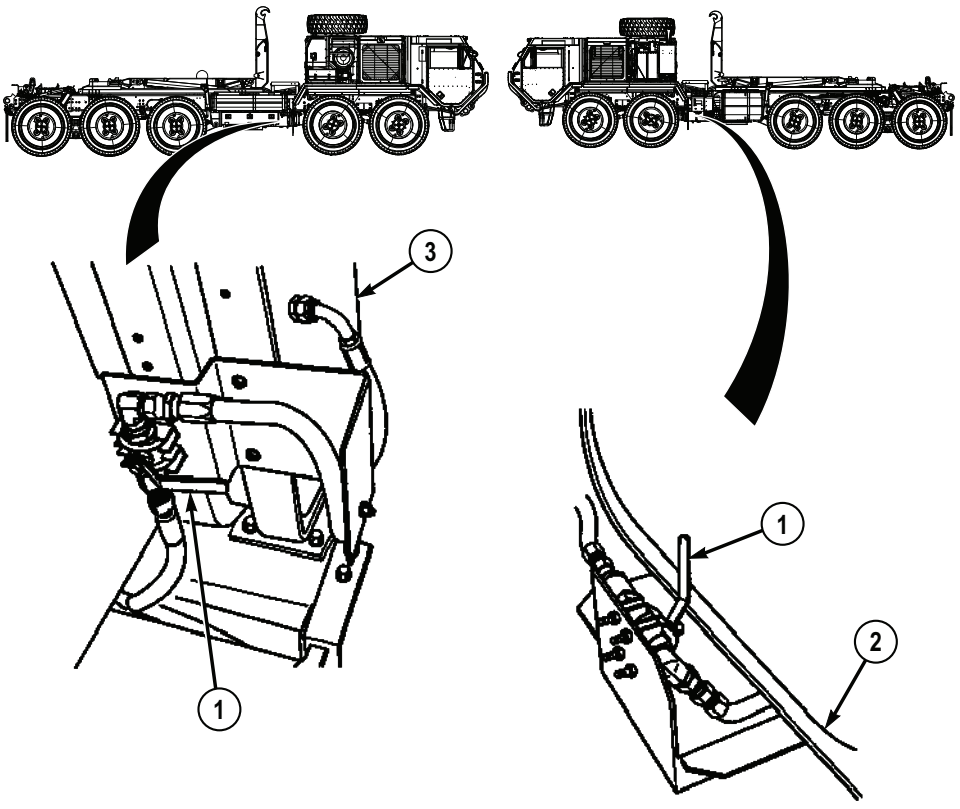


Figure 3.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING TRANSMISSION AND TRANSFER CASE

INITIAL SETUP:

Not Applicable

OPERATING TRANSMISSION AND TRANSFER CASE

1. Start engine. (WP 0027)
2. Ensure transmission range selector (1) is set to Neutral (N).

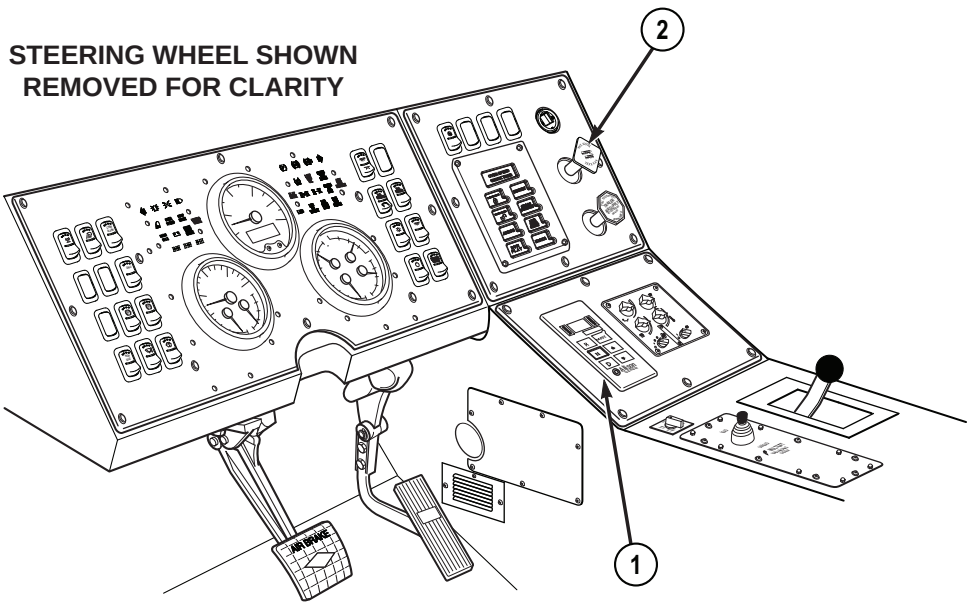


Figure 1.

3. Ensure PARKING BRAKE control (2) is pushed in.

OPERATING TRANSMISSION AND TRANSFER CASE - Continued

CAUTION

- Do not force TRANSFER CASE shift lever. Lever may be difficult to shift if there is tension on the drive line. Using excessive force on shift lever may cause damage to shift linkage or change linkage adjustment.
- Do not move TRANSFER CASE shift lever when vehicle is moving, or when transmission is in gear. Severe damage to drive line may result.
- The operator must ensure the transfer case is in the proper range before proceeding. Failure to comply may result in damage to equipment.

NOTE

- Transfer case has High, Neutral and Low ranges.
- If TRANSFER CASE shift lever is hard to move, push button and set transmission range selector to Drive (D) then back to Neutral (N). If transfer case will not shift, select Reverse (R) then Neutral (N) and try to shift the TRANSFER CASE lever again. If transfer case will still not shift, select Drive (D) then back to Neutral (N).

4. Select transfer case range. Refer to Equipment Description and Data (WP 0002) for additional information.
   a. Set TRANSFER CASE shift lever (3) to H (HI) for highway driving (CTIS set to HIGHWAY) and for secondary roads (CTIS set to CROSS-COUNTRY).

OPERATING TRANSMISSION AND TRANSFER CASE - Continued

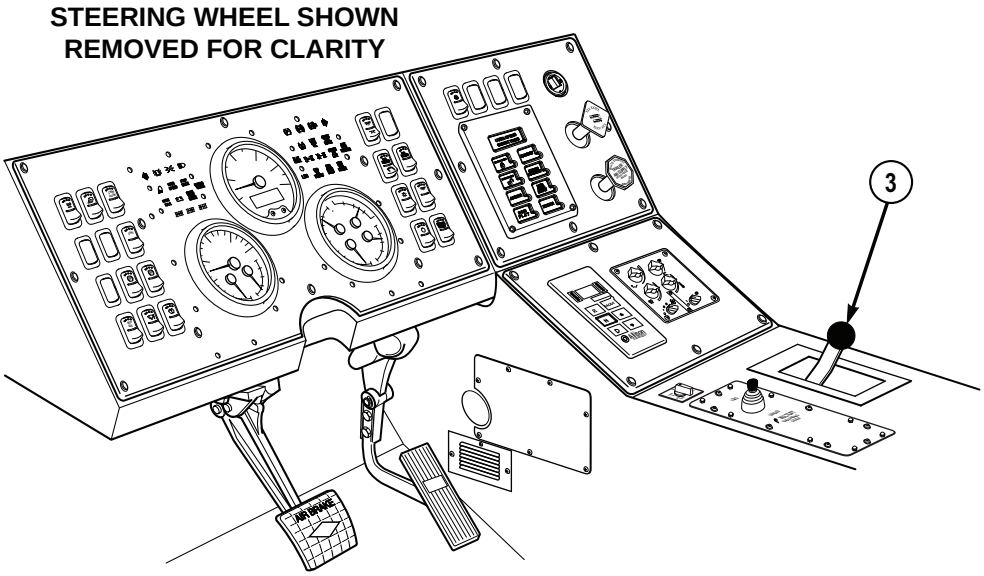


Figure 2.

b. Set TRANSFER CASE shift lever (3) to L (LO) for adverse off-road driving and for steep grades (CTIS set to MUD, SAND, and SNOW or EMERGENCY).

5. Push in buttons to set the transmission range selector (2) to desired position.

a. Use Reverse (R) to move vehicle backwards.

b. Use Neutral (N) to:

(1) Start engine.

(2) Park vehicle.

(3) Shift transfer case.

(4) Operate the LHS.

(5) Operate auxiliary equipment.

c. Use Drive (D) to:

(1) Drive in normal conditions.

(2) Move forward from a stop.

(3) Drive in off-road conditions.

d. Use 4, 3, or 2 (Fourth, Third, or Second range) to:

(1) Drive in off-road conditions.

OPERATING TRANSMISSION AND TRANSFER CASE - Continued

(2) Drive in city traffic.

(3) Drive in other conditions as needed. Refer to engine brake operation.

NOTE

Selection of first range limits speed.

e. Use 1 (First range) when:

(1) Maximum pulling power is required.

(2) Negotiating steep grades.

6. Select transfer case range:

a. Set TRANSFER CASE shift lever (3) to H (HI) for highway driving and secondary roads.

b. Set TRANSFER CASE shift lever (3) to L (LO) for adverse off-road driving and steep grades.

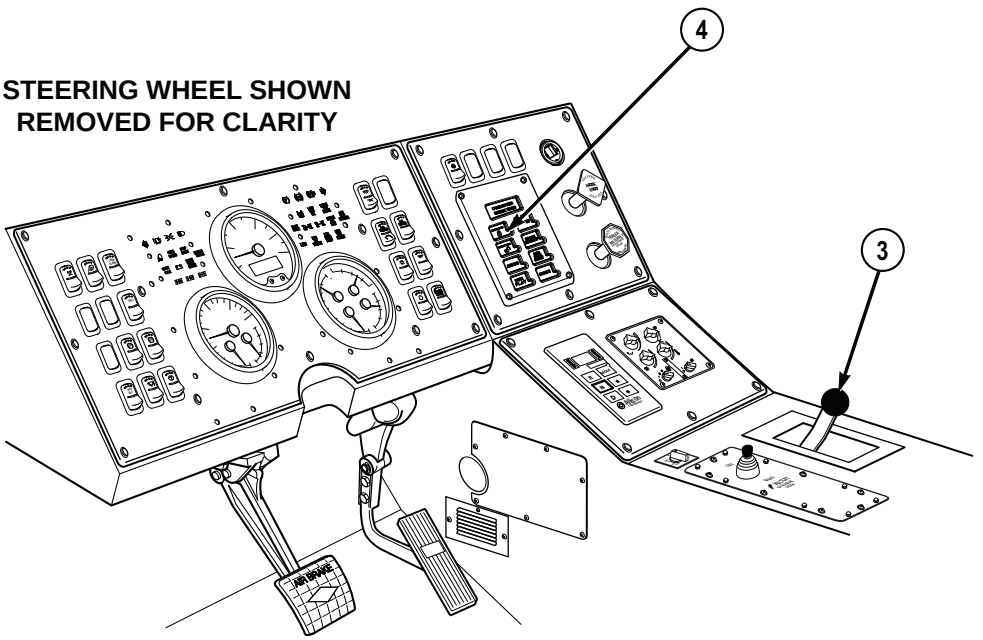


Figure 3.

7. Select transfer case lockup. Refer to Equipment Description and Data. (WP 0002)

OPERATING TRANSMISSION AND TRANSFER CASE - Continued

CAUTION

Do not engage transfer case lockup while wheels are slipping or when turning a corner. Damage to driveline may result.

a. Push TRANSFER CASE LOCKUP switch (4).

b. Decelerate for approximately 2 seconds to allow transfer case lockup to engage.

c. To disengage TRANSFER CASE LOCKUP, push in TRANSFER CASE LOCKUP switch (4) to allow transfer case lockup to disengage.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING ENGINE BRAKE

INITIAL SETUP:

Not Applicable

OPERATING ENGINE BRAKE

WARNING



Do not use engine brake when vehicle is on slippery surface. If engine brake is used incorrectly, vehicle may skid out of control. Failure to comply may result in injury or death to personnel.

WARNING

Wheel brakes must be used in addition to engine brakes for maximum braking. Failure to comply may result in injury or death to personnel.

NOTE

- Use engine brake only when additional braking is required (for example, descending grades).
- The engine brake switch has three positions: Low (Bottom Position), Medium (Center Position), and High (Top Position).

1. Set ENGINE BRAKE High/Medium/Low switch (1) to Low (full down) position.

OPERATING ENGINE BRAKE - Continued

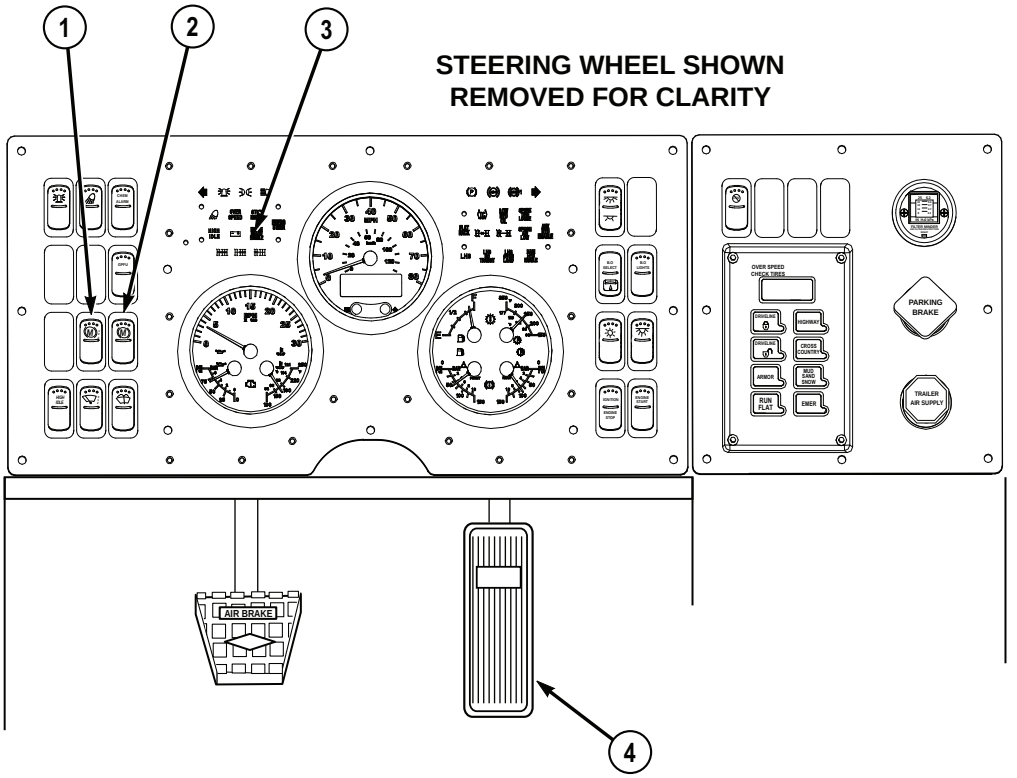


Figure 1.

NOTE

Engine brake does not operate below 1,000 rpm.

2. Set engine brake ON/OFF switch (2) to ON (up) position, engine brake enable indicator (3) will illuminate.
3. Lift foot off throttle control (4). Engine brake will automatically slow vehicle.
4. The transmission will select the optimum gear when using the engine brake. It should keep the rpm between 1,650 and 2,100. At 2,100 rpm, the engine brake will give its peak retarding horsepower.

CAUTION

Do not over "rev" (over 2,100 rpm) engine during braking. Failure to comply may result in damage to equipment.

OPERATING ENGINE BRAKE - Continued

5. Optimum braking occurs with engine between 1,650 and 2,100 rpm. Select appropriate transmission range and engine brake to maintain desired effect.
6. If more braking is required, set ENGINE BRAKE switch (1) to HIGH.

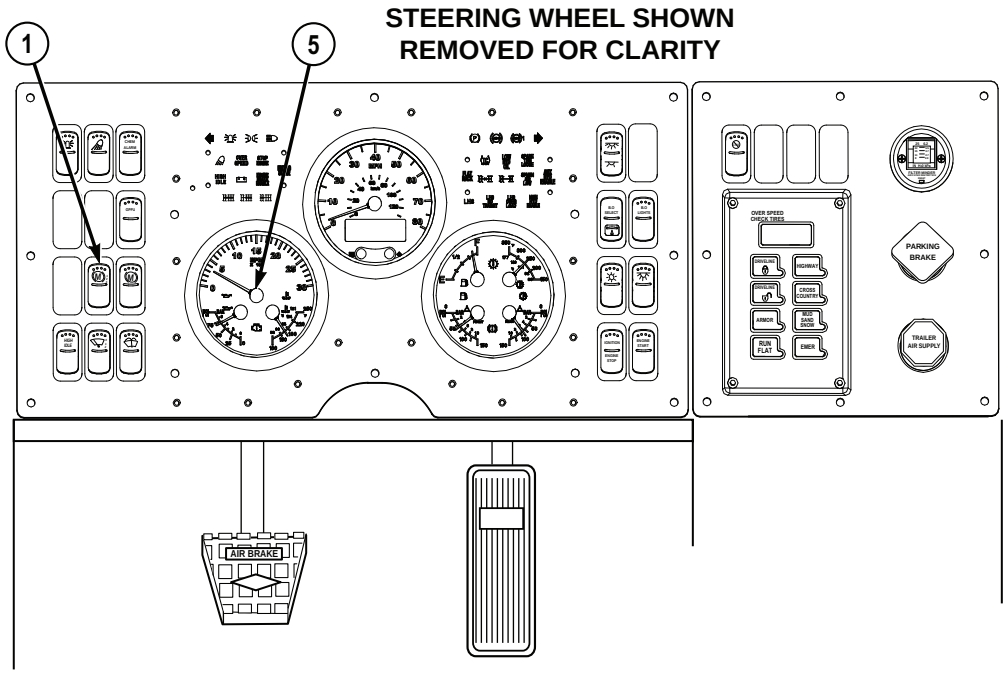


Figure 2.

7. Check that tachometer (5) reads between 1,650 and 2,100 rpm whenever engine brake is used.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ON-ROAD DRIVING PROCEDURES

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

DRIVE

WARNING



Speed limits posted on curves reflect speeds that are considered safe for automobiles. Heavy vehicles with a high center of gravity can roll over at these speed limits. Use care and reduce your speed below the posted limit prior to entering a curve. Failure to comply may result in injury or death to personnel.

WARNING



When operating vehicle at speeds in excess of 55 mph (89 km/hr), or when operating crane, hearing protection must be worn. Failure to comply may result in injury or death to personnel.

NOTE

If vehicle has less than 500 miles (805 km), check controls and indicators more often during operation and listen for unusual noises or vibrations. Refer to Troubleshooting if you encounter any problems.

1. Remove wheel chocks (1) and stow in stowage box.

DRIVE - Continued

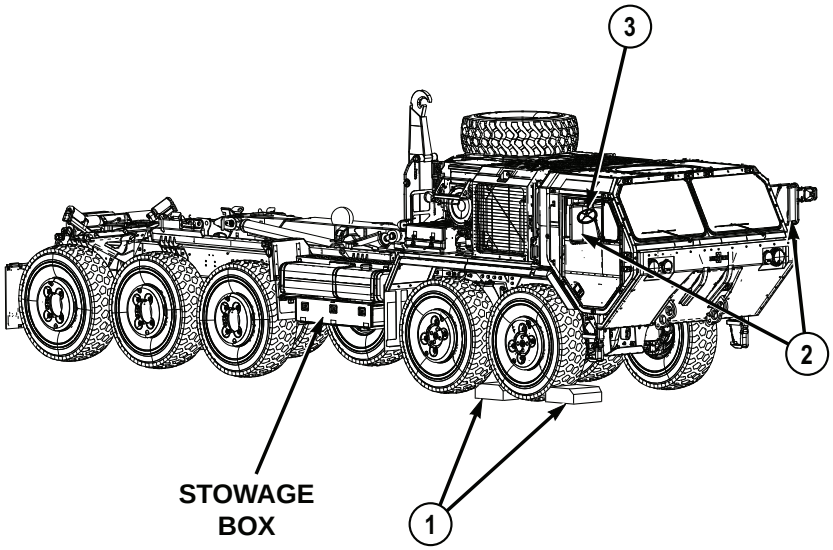


Figure 1.

2. Ensure Material Handling Crane (MHC) (WP 0054) and outrigger jacks (WP 0054) are secured in stowed position.
3. Adjust each rear view mirror (2) so back of vehicle and view of road can be seen.

NOTE

- Vehicle may or may not be equipped with spotter mirror.
- Spotter mirror is located on passenger door only.

4. Adjust spotter mirror (3) so it gives maximum frontal viewing so that the marker lights on the roof of the cab cannot be seen.
5. Adjust foot rest (WP 0025) if required.
6. Adjust seat (WP 0025) as needed.

WARNING



CTIS ON/OFF switch should be in ON position at all times. Overspeed protection will not operate if switch is in OFF position and tire pressures

DRIVE - Continued

may not match driving speeds. Failure to follow these instructions may result in unsafe driving conditions or tire failure. Failure to comply may result in injury or death to personnel.

7. Adjust seat belt (WP 0025) as needed.

CAUTION

During driving operations, LHS mode selector must be placed in OFF position or hydraulic system overheating will result. Failure to comply may result in damage to equipment.

8. Set CTIS start button (4) to ON position.

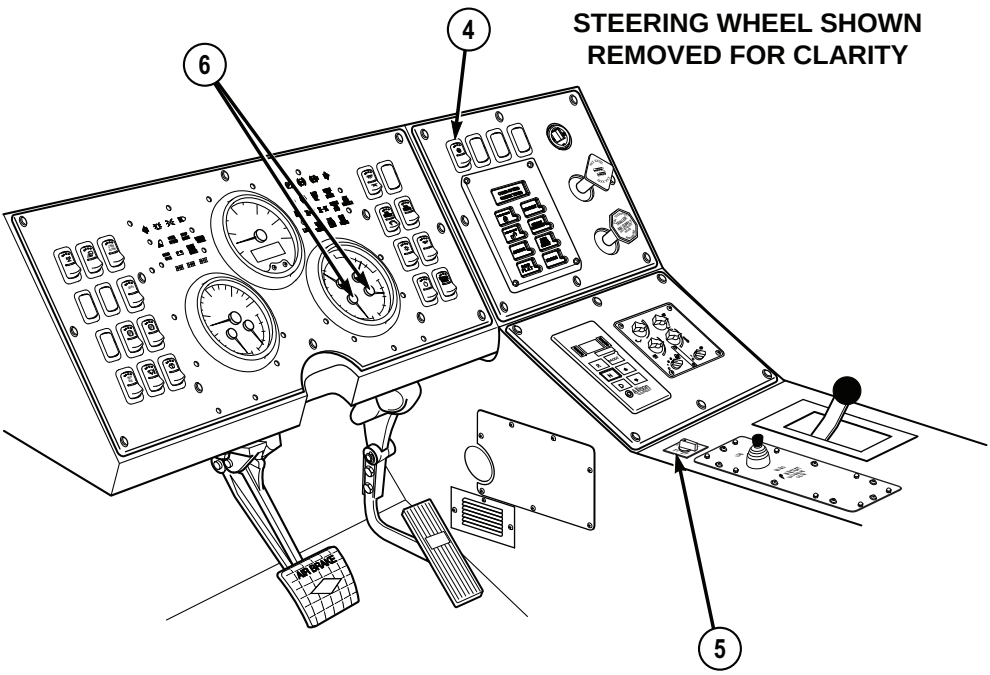


Figure 2.

9. Ensure hydraulic selector switch (5) is in the OFF position.

10. Start engine (WP 0027).

DRIVE - Continued

WARNING



Do not press service brake treadle hard three or four times in a row. Air supply will be used up and service brakes will not work until air is built up again. Failure to comply may result in injury or death to personnel.

11. Turn on lights (WP 0026) as needed.
12. Ensure needles in AIR PRESS gauge (6) read at least 100 psi (690 kPa) before driving vehicle.

NOTE

- Allow time for CTIS adjustment.
- For detailed explanation refer to CTIS (WP 0038).

13. Set TRANSFER CASE shift lever (7) to the appropriate range (WP 0031).

DRIVE - Continued

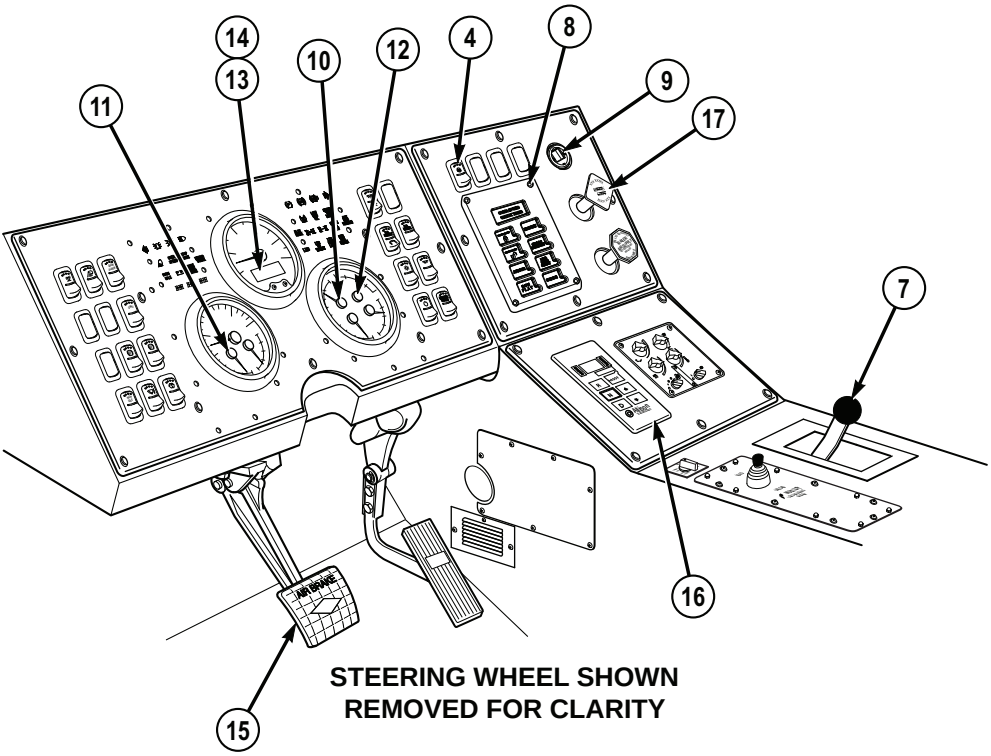


Figure 3.

14. Set CTIS (8) to the appropriate position.
15. Check that air filter restriction indicator (9) reads less than 17 in. (4.2 kPa).
16. Check that FUEL gauge (10) shows enough fuel to complete mission.
17. Check that OIL PRESS gauge (11) reads 5 to 10 psi (34 to 69 kPa) during idle or 40 to 60 psi (276 to 414 kPa) above idle.
18. Check that TRANS TEMP (transmission temperature) gauge (12) reads 180 to 220 degrees F (82 to 104 degrees C) after transmission has warmed up.
19. Check that 24-volt battery gauge (13) reads 26 to 30 volts.
20. Check that 12-volt battery gauge (14) reads 13 to 15 volts.
21. Apply service brake pedal (15) and press transmission range selector (16) button to appropriate range. Use Drive (D) for normal highway and use 4, 3, 2, or 1 for off road, steep grades, or slippery conditions.
22. Push in parking brake control (17) to release brakes.

DRIVE - Continued

23. If trailer is attached to vehicle, push in trailer air supply control (18).

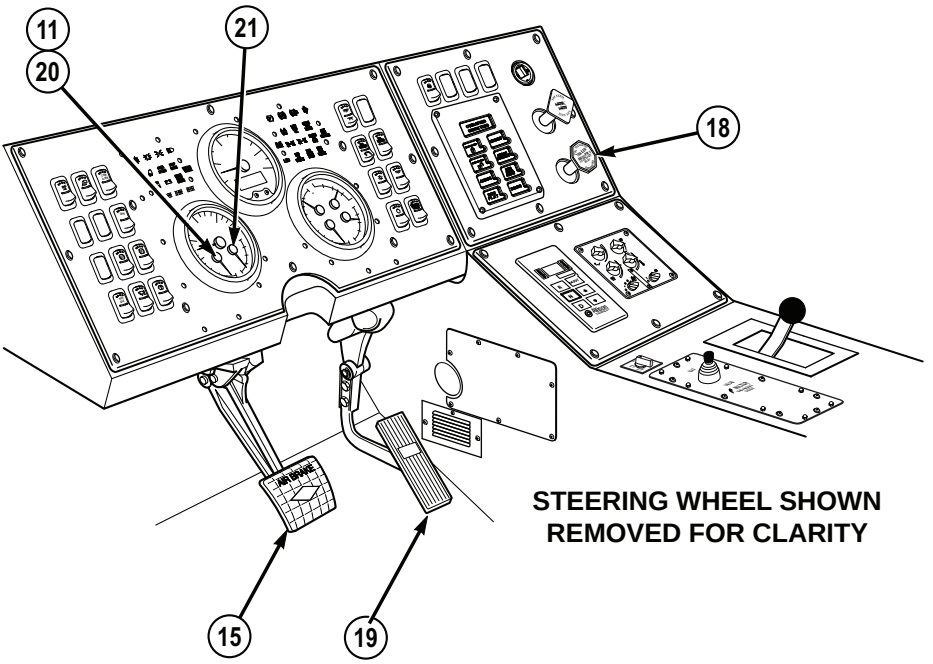


Figure 4.

CAUTION

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

NOTE

Check controls and indicators often during vehicle operation.

24. Release service brake pedal (15) and slowly press down on throttle control (19) until vehicle reaches desired speed.

DRIVE - Continued

NOTE

Engine oil pressure has three monitoring systems (oil light, CHECK GAUGES light, and oil pressure gauge). If two of the three systems indicate a problem, park vehicle, shut down 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.

25. Accelerate, brake, and steer as required.

NOTE

- Engine coolant temperature has three monitoring systems. (water light, CHECK GAUGES light, and WATER TEMP gauge). If two of the three systems indicate a problem, park vehicle and idle engine at 800 to 1,000 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. Notify Field Maintenance at completion of mission.

26. Check the engine oil pressure by monitoring oil light (20), CHECK GAUGES light (21), and OIL PRESS gauge (11).

27. Check the engine coolant temperature by monitoring water light (22), CHECK GAUGES light (21), and WATER TEMP gauge (23).

DRIVE - Continued

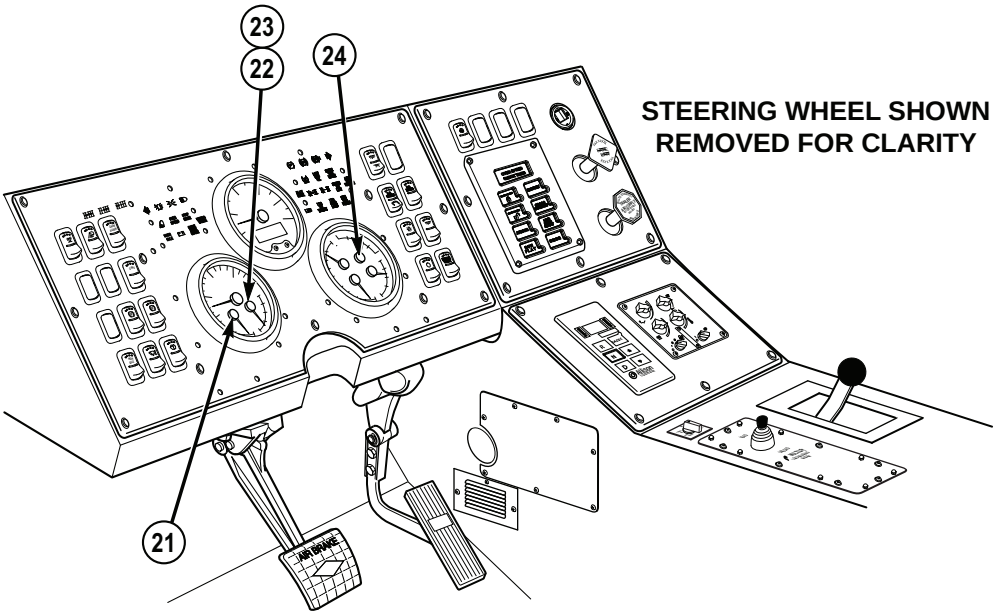


Figure 5.

CAUTION

If transmission range selector flashes current range selection while operating vehicle (shift selection is inhibited), DO NOT SHUT DOWN ENGINE OR FURTHER ATTEMPT TO CHANGE TRANSMISSION RANGE SELECTION. Shutting down engine may result in inability of selecting a drive range at engine startup (vehicle will be unable to move), and diagnostic data will be lost. Move vehicle to safe place for maintenance or perform limp home/transmission fault emergency procedures

28. If CHECK GAUGES light (21) 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 indicators are normal, continue the mission. Notify Field Maintenance at completion of mission.

DRIVE - Continued

WARNING



If EMERGENCY STEER light illuminates when driving, immediately pull vehicle over to side of road and stop. Failure to comply may result in injury or death to personnel.

29. If EMERGENCY STEER light (26) illuminates, there is a problem in the primary hydraulic steering system and the emergency steering back up hydraulic system has been activated. As vehicle speed gets below 15 mph (24 km/hr), increased effort will be required to steer vehicle, notify Field Maintenance.

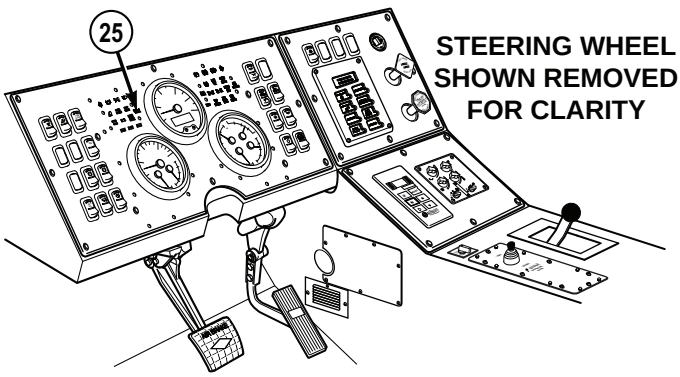


Figure 6.

END OF TASK

REVERSE

WARNING

Backing the vehicle and trailer for minor repositioning is permitted without locking the turntable, provided caution is used when backing up. Failure to keep the trailer and vehicle aligned while backing up could result in the trailer jackknifing, possibly causing severe drawbar and vehicle damage and/or injury or death to personnel.

REVERSE - Continued

CAUTION

Trailer turntable must be unlocked after completing backing operations. Failure to unlock turntable will result in a sheared pin or damaged trailer.

1. If trailer is attached to vehicle, lock turntable on trailer TM 9-2330-385-14 (Volume 2, WP 0146).

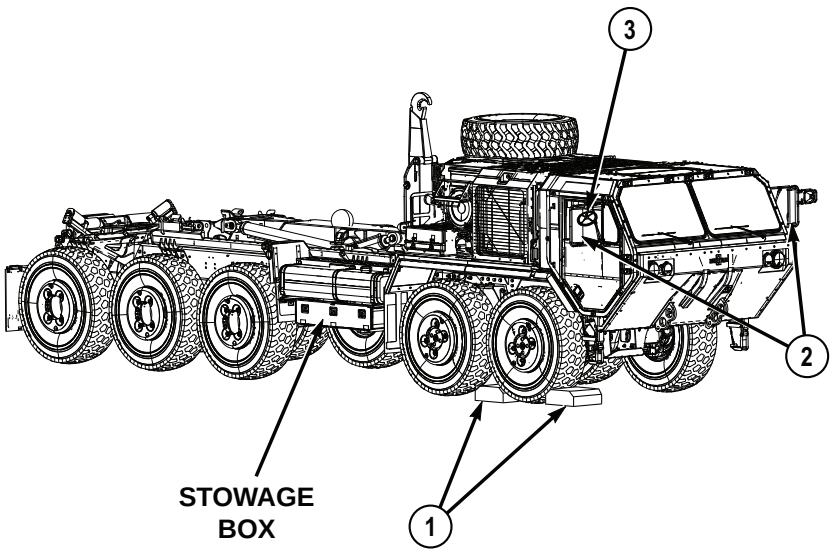


Figure 7.

CAUTION

Mirrors should be folded in before backing out of an enclosed area. Failure to comply my result in damage to equipment.

2. Remove wheel chocks (1) and stow in stowage box.
3. Turn each rear view mirror (2) so back of vehicle and view of road can be seen.
4. Adjust spotter mirror (3) so it gives maximum frontal viewing do that the marker lights on the roof of the cab cannot be seen.
5. Adjust foot rest (WP 0025) if required.
6. Adjust seat (WP 0025) as needed.
7. Adjust seat belt (WP 0025) as needed.

REVERSE - Continued

CAUTION

CTIS ON/OFF switch should be in ON position at all times. Overspeed protection will not operate if switch is in OFF position and tire pressures may not match driving speeds, resulting in unsafe driving conditions or tire damage.

NOTE

If it becomes necessary to disable the CTIS, the tires will have to be manually inflated or deflated (WP 0076).

8. Start engine (WP 0027).

NOTE

Allow time for CTIS adjustment.

9. Ensure CTIS start button (4) is in the ON position (WP 0038).

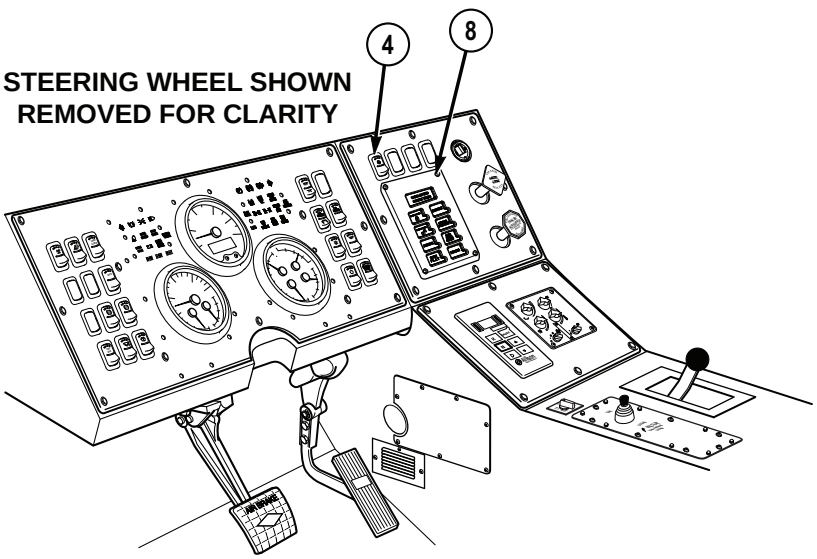


Figure 8.

10. For a detailed explanation of the CTIS, refer to CTIS (WP 0038).

11. Set CTIS (8) to the appropriate position. Press and hold CTIS terrain button for approximately 1 second.

REVERSE - Continued

WARNING



Driver has limited vision to rear. Ground guide is required when driving vehicle in reverse. Failure to comply may result in injury or death to personnel.

12. Turn on lights (WP 0026) as required.
13. Check gauges and indicators for normal readings (WP 0027).

WARNING



If EMERGENCY STEER light illuminates when driving, immediately pull vehicle over to side of road and stop. Failure to comply may result in injury or death to personnel.

CAUTION

Do not move TRANSFER CASE shift lever when vehicle is moving or when transmission is in gear. Severe damage to drive line will result.

14. Check that AIR PRESS gauge (6) reads at least 100 psi (690 kPa).

REVERSE - Continued

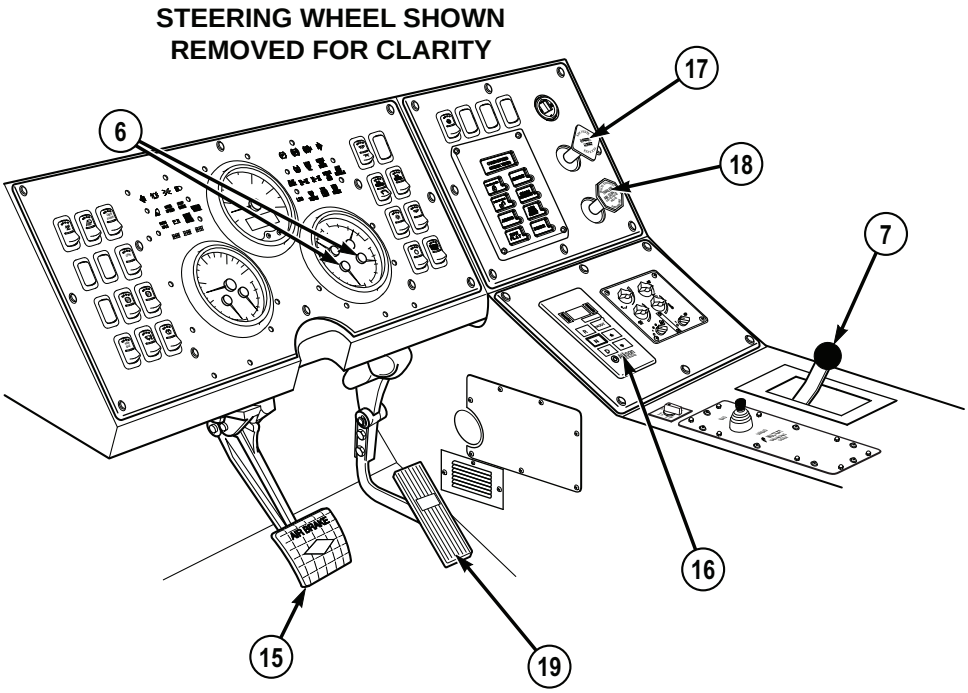


Figure 9.

15. Set TRANSFER CASE shift lever (7) to desired range (WP 0031).
16. Apply service brake pedal (15) and press transmission range selector (16) Reverse (R) button.
17. Push in parking brake control (17).
18. If trailer is attached to the vehicle, push in trailer air supply control (18).
19. Release service brake pedal (15) and slowly press down on throttle control (19).

CAUTION

Do not hold steering wheel at full left or full right position for longer than 10 seconds. Oil overheating and pump damage can result.

20. Follow direction from ground guide.
21. Accelerate, brake, and steer as required.

END OF TASK

SLIPPERY CONDITIONS ON ROAD OR OFF ROAD

WARNING



Do not use engine brake when vehicle is on slippery surface. If engine brake is used incorrectly, vehicle may skid out of control. Failure to comply may result in injury or death to personnel.

CAUTION

- Do not change setting of the CTIS while the wheels are in a slip condition. Severe damage to drive train will result.
- When using EMERGENCY position on CTIS, top speed should not exceed 5 mph (8 km/h) and distance traveled should not exceed 5 miles (8 km). Care must be exercised as steering response is limited due to full drive line lockup or damage to equipment may result.

NOTE

A lower range will give better control on slick or icy roads as well as on steep downgrades.

1. Manually downshift transmission range selector (16) to match driving conditions.

SLIPPERY CONDITIONS ON ROAD OR OFF ROAD - Continued

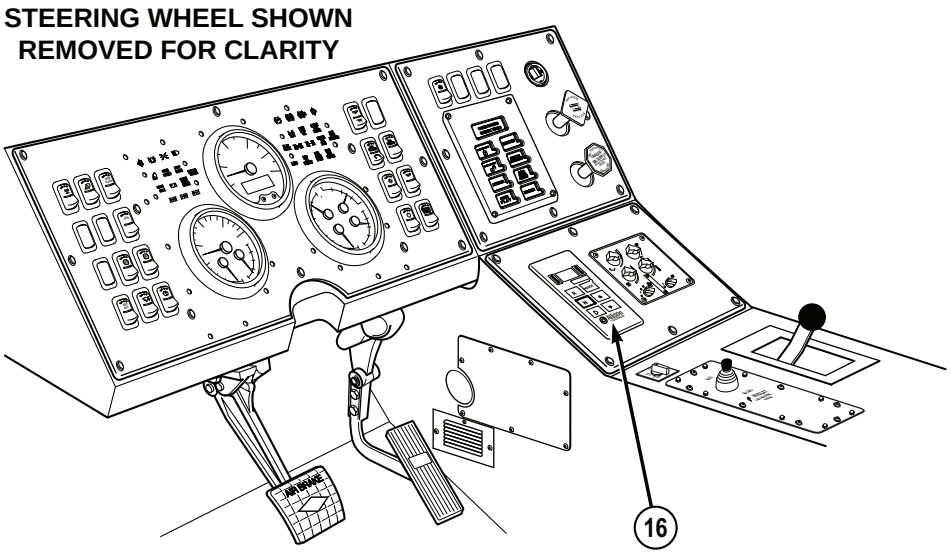


Figure 10.

2. Refer to Equipment Description and Data (WP 0002) for additional information.

CAUTION

Do not engage transfer case lockup while wheels are slipping or when turning a corner. Damage to drive line may result.

3. For maximum traction under adverse conditions, set CTIS (8) to MUD, SAND, and SNOW position, or if conditions warrant, to the EMERGENCY position.

SLIPPERY CONDITIONS ON ROAD OR OFF ROAD - Continued

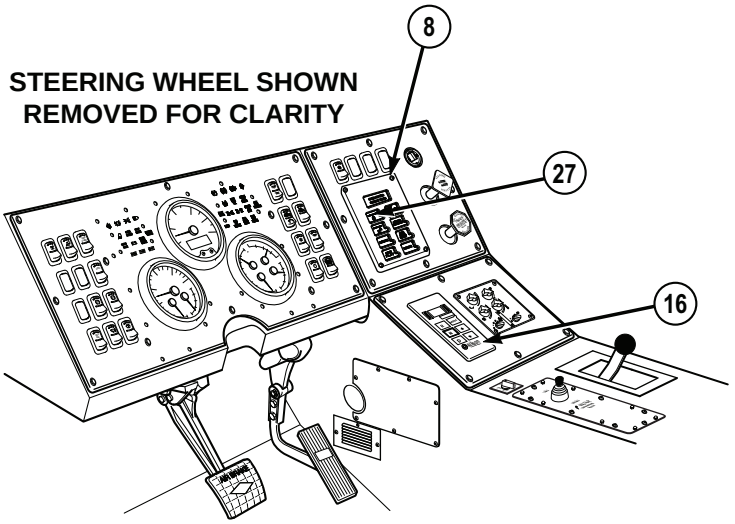


Figure 11.

CAUTION

Increased tire and drive line wear may occur when the vehicle is operated for extended periods with the TRANSFER CASE LOCKUP engaged.

4. Engage TRANSFER CASE LOCKUP (27) as required. Refer to Equipment Description and Data (WP 0002).
5. When conditions improve or grade is crested, return transmission range selector (16) to normal position and push TRANSFER CASE LOCKUP switch (27) to the unlock position.
6. If CTIS EMERGENCY was selected, back vehicle up approximately 5.0 to 10.0 ft (1.5 to 3 m) to relieve drive line loading.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OFF-ROAD DRIVING PROCEDURES

INITIAL SETUP:

Not Applicable

OFF-ROAD DRIVING PROCEDURES

WARNING



The PLS center of gravity (CG) can be higher during Container Handling Unit (CHU) or Engineering Mission Module (EMM) operations than for other PLS operations. A higher CG limits cornering and side-slope capabilities. Limit side-slope operation and transportation to no more than a 20 percent grade. Use extreme caution during cornering and side-slope operations when an EMM or CHU is loaded onto PLS vehicle. Failure to comply may result in injury or death to personnel.

CAUTION

Before operating off-road, mud flaps need to be pinned on storage hook located on mud flap bracket. If a steep slope is encountered and mud flaps are not pinned, damage to equipment may result.

1. Place transfer case lever (1) in proper range (WP 0031).

OFF-ROAD DRIVING PROCEDURES - Continued

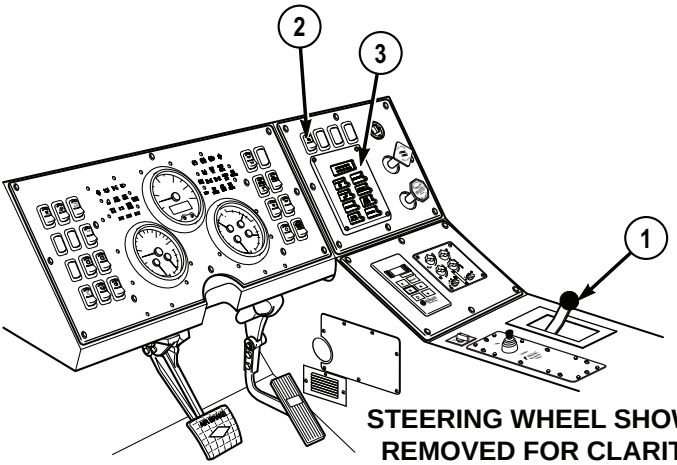


Figure 1.

WARNING



CTIS ON/OFF switch should be in ON position at all times. Overspeed protection will not operate if switch is in OFF position and tire pressures may not match driving speeds. Failure to follow these instructions may result in unsafe driving conditions or tire failure. Failure to comply may result in injury or death to personnel.

NOTE

If it becomes necessary to disable the CTIS, the tires will have to be manually inflated or deflated. (WP 0076)

2. Push CTIS ON/OFF switch (2) to ON position.

NOTE

- CTIS range button should be pressed firmly to engage.
- Allow time for CTIS adjustment.

3. For a detailed explanation of the CTIS refer to CTIS detailed explanation. (WP 0038)

OFF-ROAD DRIVING PROCEDURES - Continued

4. Set CTIS (3) to desired position. Refer to Equipment Description and Data (WP 0002).
5. Check that FUEL gauge (4) shows enough fuel to complete mission.
6. Check that OIL PRESS gauge (5) reads 5 to 10 psi (34 to 69 kPa) during idle or 40 to 60 psi (276 to 414 kPa) above idle.

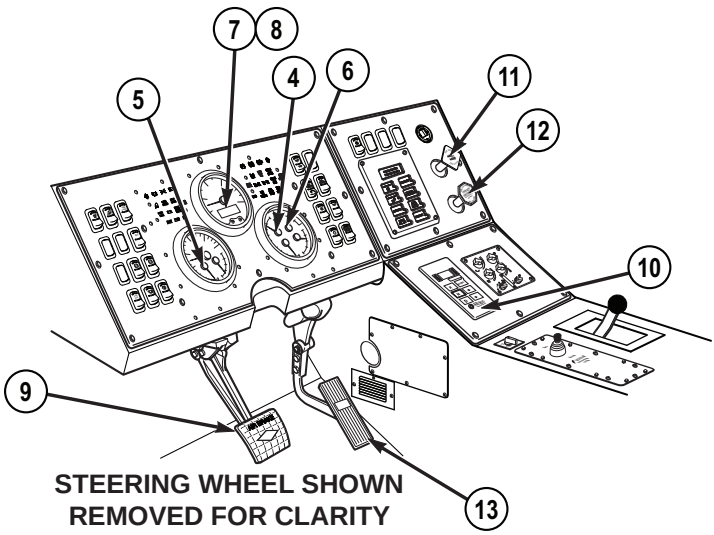


Figure 2.

7. Check that TRANS TEMP (transmission temperature) gauge (6) reads 180 to 220°F (82 to 104°C) after transmission has warmed up.
8. Check that 24-volt battery gauge (7) reads 26 to 30 volts.
9. Check that 12-volt battery gauge (8) reads 13 to 15 volts.
10. Apply service brake pedal (9) and press transmission range selector (10) button to appropriate range. Drive (D) for normal highway and 4, 3, 2, or 1 for off–road, steep grades, or slippery conditions.
11. Push in parking brake control (11) to release brakes.
12. If the trailer is attached to vehicle, push in trailer air supply control (12).
13. Release service brake pedal (9) and slowly press down on throttle control (13) until vehicle reaches desired speed.

OFF-ROAD DRIVING PROCEDURES - Continued

CAUTION

- Do not hold steering wheel at full left or full right for longer than 10 seconds. Oil overheating and pump damage can result.
- The CTIS increases tire inflation pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until the tires are reinflated to the correct pressure to prevent damage to tire.

NOTE

Check controls and indicators often during vehicle operation.

14. Accelerate, brake, and steer as required.
    a. Engine oil pressure has three monitoring systems, oil light, CHECK GAUGES light, and oil pressure gauge. If two of the three systems indicate a problem, park vehicle, shut down engine, and notify Field Maintenance.
    b. If only one system indicates a problem and the other two indicate normal, proceed with mission and then notify Field Maintenance.
15. Check engine oil pressure by monitoring oil light (14), CHECK GAUGES light (15), and OIL PRESS gauge (5).

OFF-ROAD DRIVING PROCEDURES - Continued

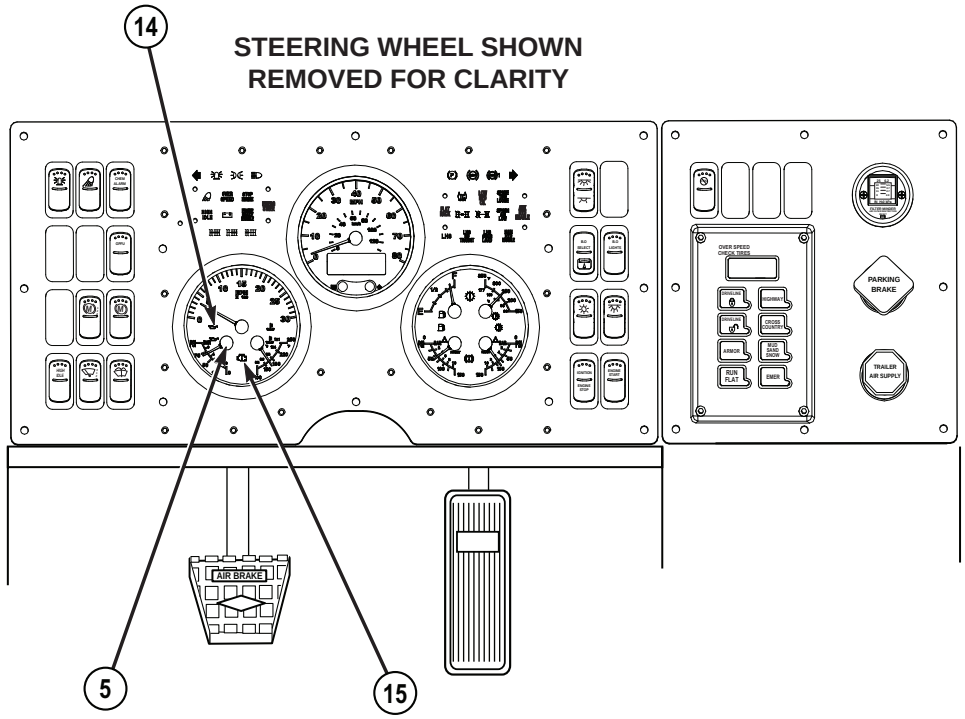


Figure 3.

a. Engine coolant temperature has three monitoring systems, water light, CHECK GAUGES light, and water temperature gauge. If two of the three systems indicate a problem, park vehicle and idle engine at 800 to 1,000 rpm until water temperature cools down. If water temperature does not cool down notify Field Maintenance.

b. If only one system indicates a problem and the other two indicate normal, proceed with mission and then notify Field Maintenance.

16. Check engine coolant temperature by monitoring water light (16), CHECK GAUGES light (17), and WATER TEMP gauge (18).

OFF-ROAD DRIVING PROCEDURES - Continued

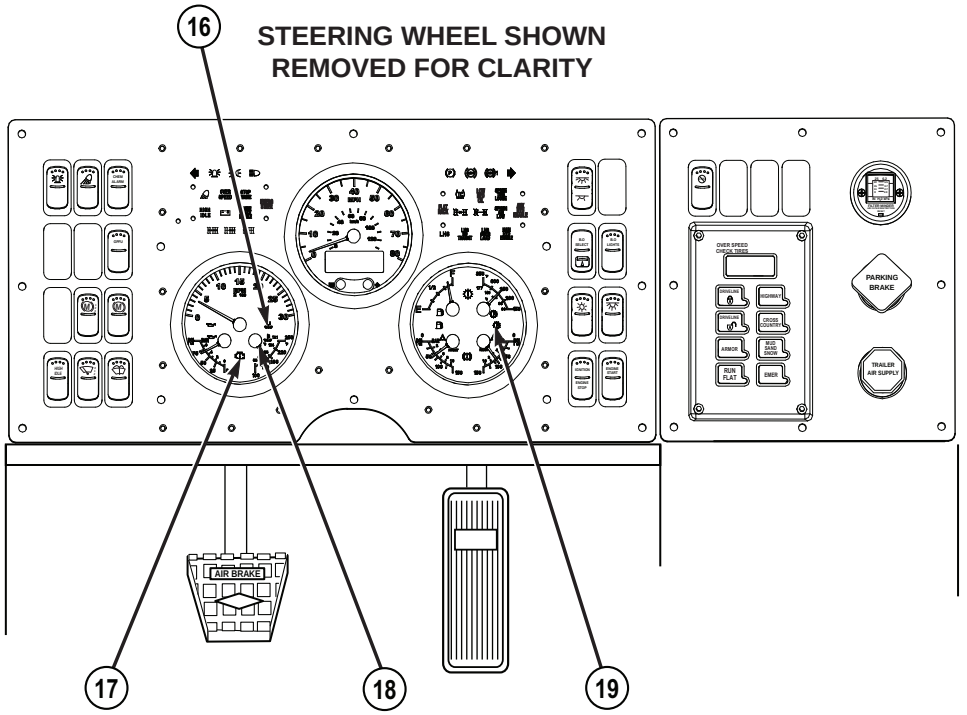


Figure 4.

17. If CHECK GAUGES light (17) 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 mission. Notify Field Maintenance at completion of mission.

CAUTION

If transmission range selector flashes current range selection while operating vehicle (shift selection is inhibited), DO NOT SHUT DOWN ENGINE OR FURTHER ATTEMPT TO CHANGE TRANSMISSION RANGE SELECTION. Shutting down engine may result in inability of selecting a drive range at engine startup (vehicle will be unable to move), and diagnostic data will be lost. Move vehicle to safe place for maintenance or perform limp home/transmission fault emergency procedures. Failure to comply may result in damage to equipment.

18. If TRANS CHECK light (19) illuminates other than at startup, there is a potential problem in the transmission and transmission may need to be serviced. Check for

OFF-ROAD DRIVING PROCEDURES - Continued

correct oil level or high transmission oil temperature. If indicators are normal, continue the mission. Notify Field Maintenance at completion of mission.

WARNING



If EMERGENCY STEER light illuminates when driving, immediately pull vehicle over to side of road and stop. Failure to comply may result in injury or death to personnel.

19. If EMERGENCY STEER light (20) illuminates, there is a problem in the primary hydraulic steering system, and the emergency steering backup hydraulic system has been activated. When vehicle speed gets below 15 mph (24 km/hr), increased effort will be required to steer vehicle. Notify Field Maintenance.

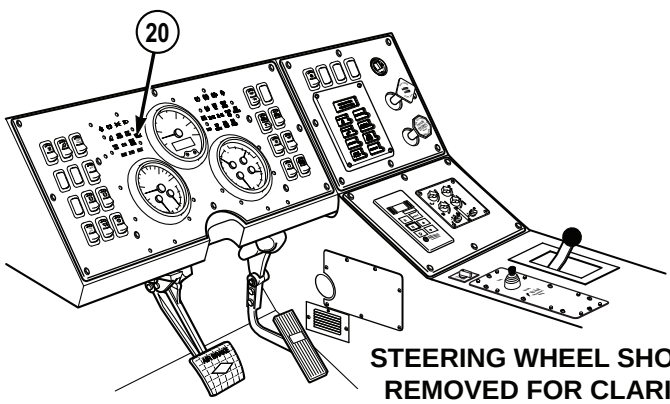


Figure 5.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING ON STEEP GRADES

INITIAL SETUP:

Not Applicable

DRIVING UP MODERATE TO STEEP GRADES

WARNING



Speed limits posted on curves reflect speeds that are considered safe for automobiles. Heavy vehicles with a high center of gravity can roll over at these speed limits. Use care and reduce your speed below the posted limit prior to entering a curve. Failure to comply may result in injury or death to personnel.

WARNING



The PLS center of gravity (CG) can be higher during Container Handling Unit (CHU) or Engineering Mission Module (EMM) operations than for other PLS operations. A higher CG limits cornering and side-slope capabilities. Limit side-slope operation and transportation to no more than a 20 percent grade. Use extreme caution during cornering and side-slope operations when an EMM or CHU is loaded onto PLS vehicle. Failure to comply may result in injury or death to personnel.

CAUTION

Before operating on off-road conditions, mud flaps need to be pinned on storage hook located on mud flap bracket. If a steep slope is encountered and mud flaps are not pinned, damage to the equipment may result.

DRIVING UP MODERATE TO STEEP GRADES - Continued

NOTE

If performing side-slope operations, close fuel shutoff valves (WP 0030) between main fuel tank and auxiliary fuel tank.

1. Check that CTIS (1) and transfer case shift lever (2) settings match terrain conditions (WP 0038) and Refer to Equipment Description and Data (WP 0002).

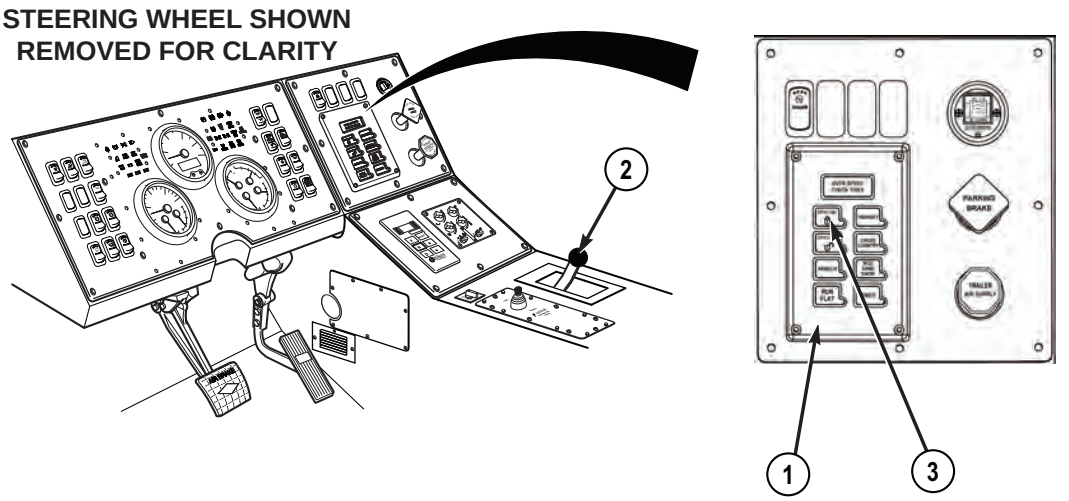


Figure 1.

CAUTION

Do not engage DRIVELINE LOCK while wheels are slipping or when turning a corner. Damage to driveline may result.

2. Engage DRIVELINE LOCK (3) on approaching the grade and decelerate for approximately 2 seconds to allow DRIVELINE LOCK to engage.

CAUTION

Do not shift transmission into first gear while vehicle is moving. Severe damage to driveline will result.

3. Apply service brake pedal (4) and place transmission selector (5) in first gear if encountering an extreme grade (greater than 15 percent). If grades are less than 15 percent, all other gear selections are acceptable while climbing.

DRIVING UP MODERATE TO STEEP GRADES - Continued

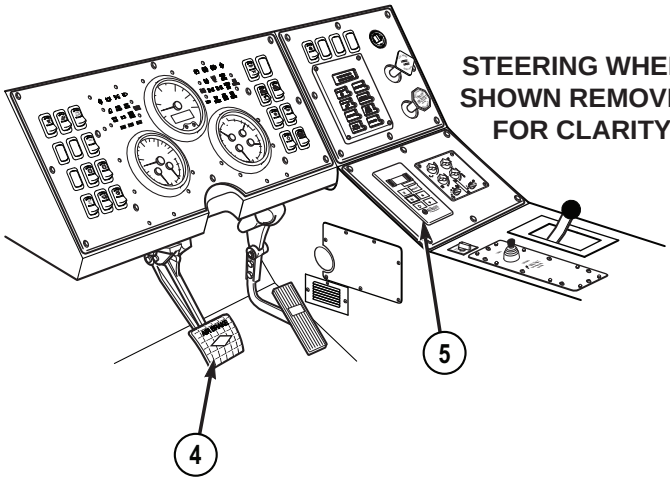


Figure 2.

CAUTION

Excessive wheel slippage while traveling up a steep upgrade could cause driveline damage. When wheel slippage is detected, immediately stop the vehicle. Failure to comply may result in damage to equipment.

4. Proceed up the grade by releasing service brake pedal (4) and gradually applying throttle as traction allows. If wheels start to slip, stop vehicle and go to Step (7).
5. After reaching the top of the grade, stop the vehicle and unlock driveline (6). Select appropriate transmission gear, transfer case range, and CTIS setting for the terrain.

DRIVING UP MODERATE TO STEEP GRADES - Continued

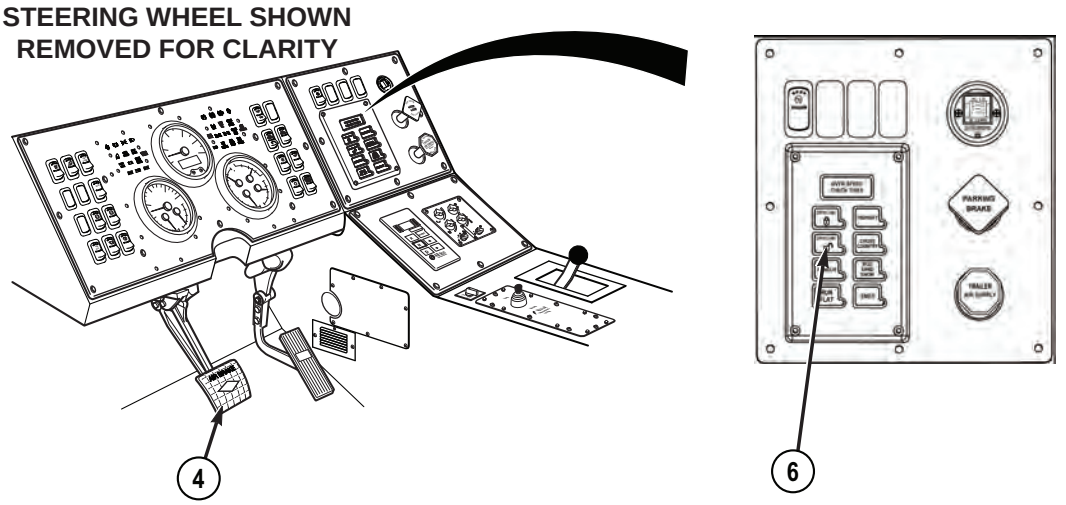


Figure 3.

6. If CTIS EMERGENCY was selected, back vehicle up approximately 5 to 10 ft (1.5 to 3 m) to relieve driveline loading.
7. For a CTIS detailed explanation refer to CTIS detailed explanation (WP 0038).
8. With vehicle stopped, switch CTIS (1) to MUD, SAND, AND SNOW (7). When CTIS indicator light remains solid green, gradually apply the throttle and release brakes as traction allows. If wheels start to slip, stop the vehicle and go to Step (9).



Figure 4.

DRIVING UP MODERATE TO STEEP GRADES - Continued

CAUTION

When using EMERGENCY position on CTIS, top speed should not exceed five mph and distance traveled should not exceed five miles. Care must be exercised, as steering response is limited due to full driveline lock-up, or damage to equipment may result.

9. With the vehicle stopped, switch CTIS (1) to EMERGENCY. Do not press the START button. Gradually apply the throttle control and release brakes as traction allows.
10. After reaching the top of the grade, stop the vehicle and disengage DRIVELINE LOCK (3). Select the appropriate transmission gear and the CTIS setting for the terrain.

END OF TASK

DRIVING DOWN STEEP GRADES

WARNING



Do not press service brake treadle hard three or four times in a row. Air supply will be used up and service brakes will not work until air is built up again. Failure to comply may result in injury or death to personnel.

CAUTION

Do not allow speed to go above 2100 rpm when driving downhill or damage to engine may result.

1. Adjust transmission range selector (5) as needed.

DRIVING DOWN STEEP GRADES - Continued

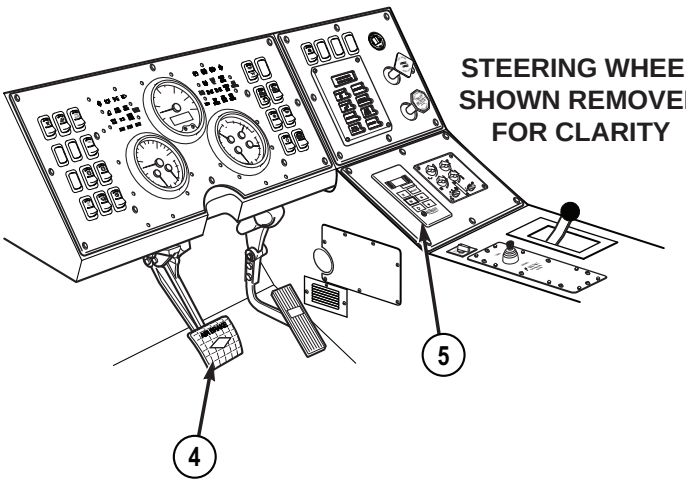


Figure 5.

2. If pulling trailer during periods of heavy braking, trailer brakes may over adjust and cause trailer brakes to drag when brake drums cool down. If this occurs, notify Field Maintenance. Failure to comply may result in damage to equipment.
3. Use service brake (4) as needed to control vehicle speed.
4. Use engine brake (WP 0032) as needed.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PARKING VEHICLE

INITIAL SETUP:

Not Applicable

PARKING VEHICLE

WARNING



Use caution when parking vehicle on steep grades. Failure to comply may result in injury or death to personnel.

WARNING



Do not press service brake treadle hard three or four times in a row. Air supply will be used up and service brakes will not work until air is built up again. Failure to comply may result in injury or death to personnel.

1. Lift foot off of throttle control (1). Let transmission automatic downshift slow vehicle.

PARKING VEHICLE - Continued

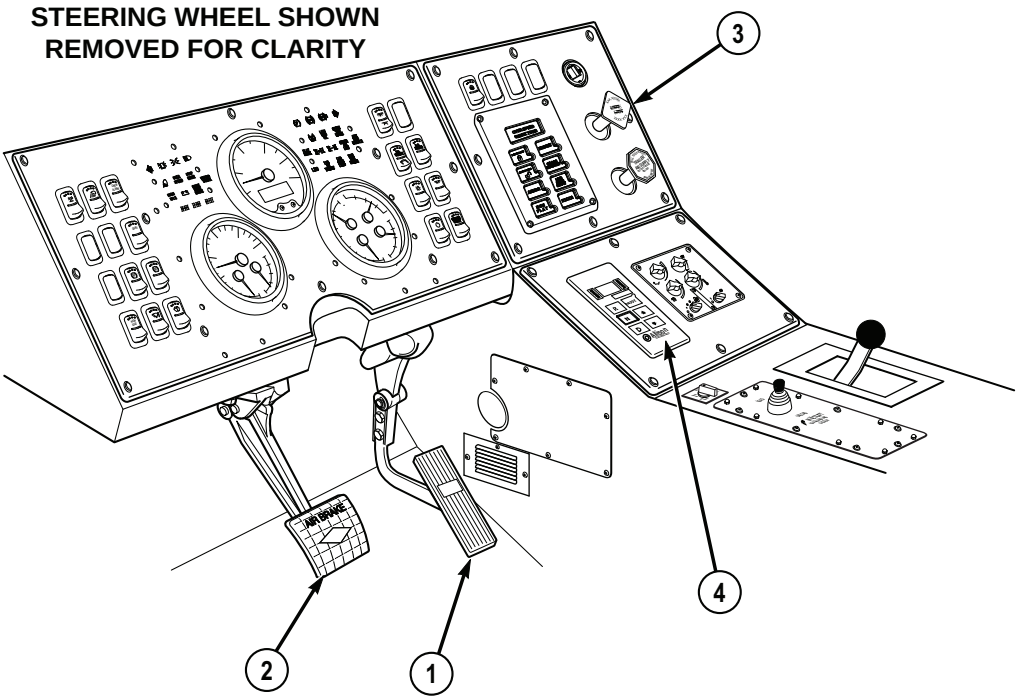


Figure 1.

2. Push down on service brake pedal (2) until vehicle comes to complete stop.

WARNING



Use caution when parking vehicle on steep grades. Failure to comply may result in injury or death to personnel.

3. Pull out PARKING BRAKE control (3).
4. Press transmission range selector button (4) to Neutral (N).
5. Align the front tires in straight-ahead position.

PARKING VEHICLE - Continued

NOTE

If parking vehicle on steep grade, chock blocks should be placed on downward side of axle No. 3 tires.

6. Place one wheel chock (5) snugly against both front and rear of tire (No. 1 axle passenger side tire shown).

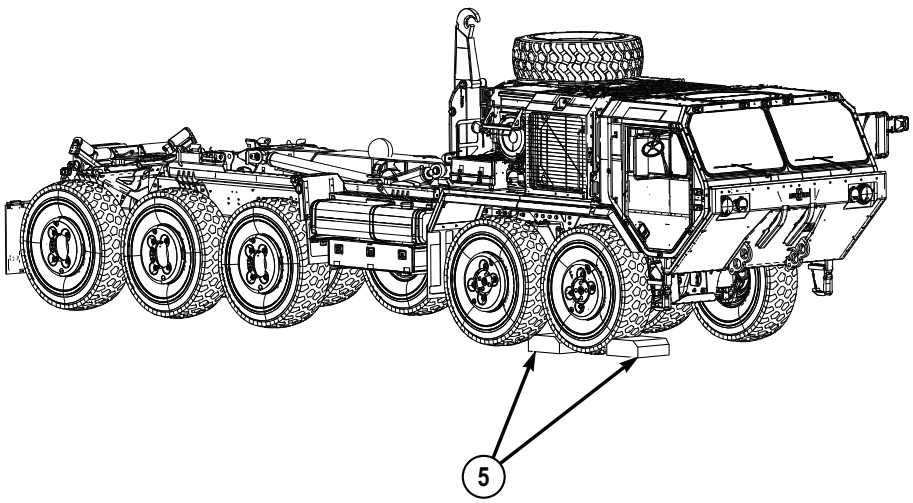


Figure 2.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SHUTTING OFF ENGINE

INITIAL SETUP:

Not Applicable

SHUTTING OFF ENGINE

1. Park vehicle (WP 0036).

CAUTION

Before shutting down engine, increase tachometer to 800 to 1,000 rpm at no-load for 3 to 5 minutes to allow turbocharger to slow down and cool off. Turbocharger may be damaged if not allowed to cool off.

2. Push down and hold throttle control (1) until tachometer (2) reads 800 to 1,000 rpm.

SHUTTING OFF ENGINE - Continued

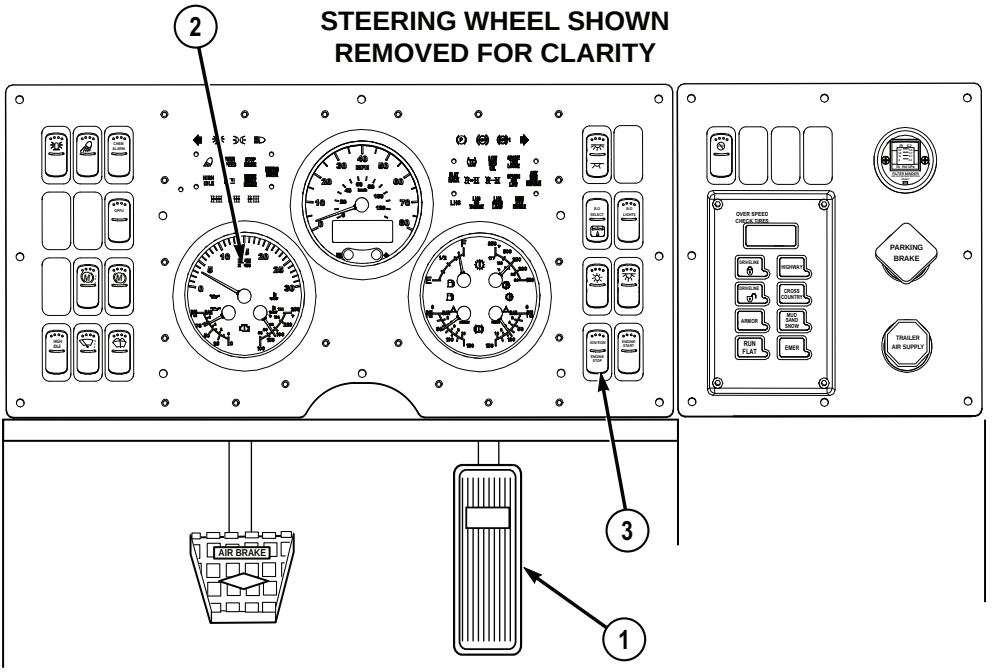


Figure 1.

3. Run engine at 800 to 1,000 rpm for 3 to 5 minutes.
4. SET ignition switch (3) to OFF (down) position.
5. Turn battery disconnect switch (4) counterclockwise to OFF position.

SHUTTING OFF ENGINE - Continued

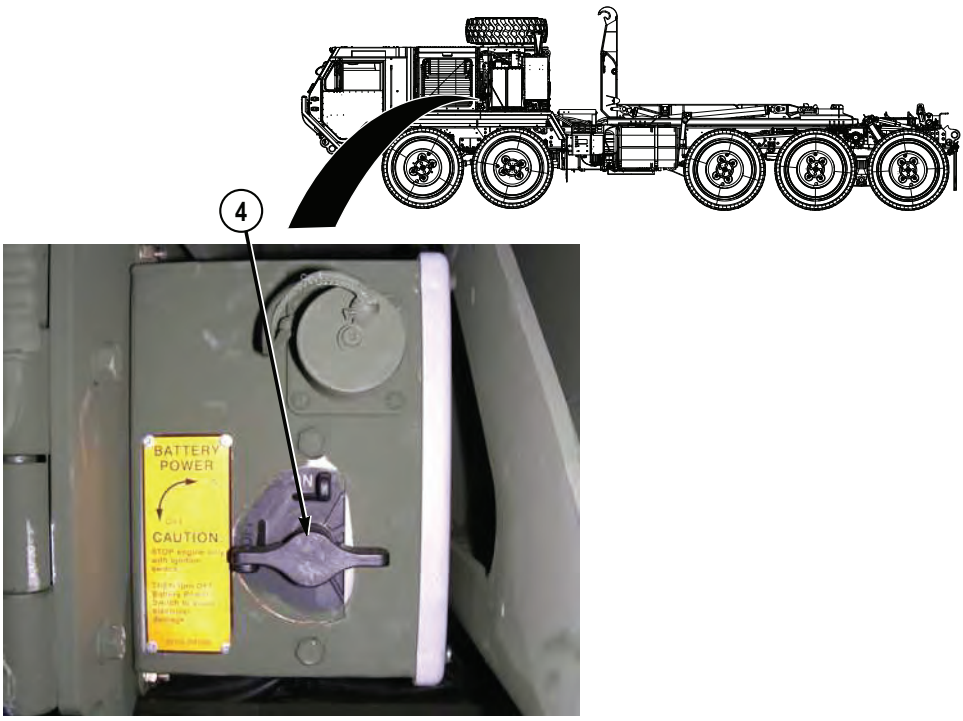


Figure 2.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CENTRAL TIRE INFLATION SYSTEM (CTIS)

INITIAL SETUP:

Not Applicable

GENERAL

CAUTION

- The CTIS should not be used indefinitely to maintain tire pressure in a leaking tire.
- Do not use compressed air from sources other than the vehicle air system. Moisture and/or contaminants entering system will affect reliability.
- Do not operate vehicle if hub cap is removed from wheel assembly; damage to wheel valves or hoses may result.

NOTE

If the CTIS system can maintain tire pressure in one or more leaking tires, the mission can be completed before repairs are made.

1. The PLS Central Tire Inflation System (CTIS) (1) is designed to improve traction under different driving conditions and to maximize mobility without sacrificing tire life. It will automatically adjust the pressure in all the tires to correspond to the terrain and cargo settings selected by the operator.

GENERAL - Continued

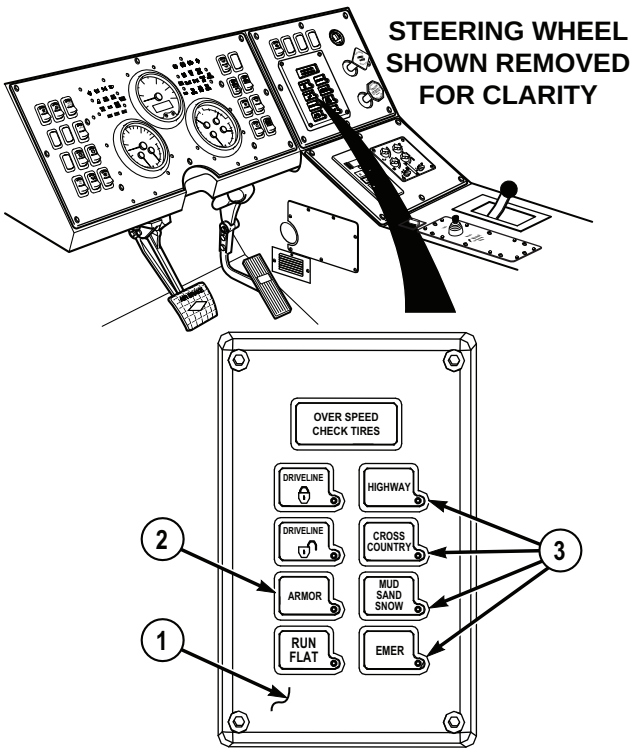


Figure 1.

2. The CTIS controller has four terrain settings and two load settings. These settings will effect the tire inflation pressure on both front and rear tires. Refer to table below.

Table 1. CTIS Tire Pressure, Maximum Allowable Speeds, and Bump Times.

Terrain Selection	Max. Speed	Tire Pressure				Warn Delay (sec.)	Bump Delay (sec.)
		NO ARMOR		ARMOR			
		Front Wheels	Rear Wheels	Front Wheels	Rear Wheels		
1. HIGHWAY	55 mph (88 km/h)	65 psi (448 kPa)	68 psi (469 kPa)	81 psi (558 kPa)	67 psi (462 kPa)	0	N/A

GENERAL - Continued

Table 1. CTIS Tire Pressure, Maximum Allowable Speeds, and Bump Times. - Continued

Terrain Selection	Max. Speed	Tire Pressure				Warn Delay (sec.)	Bump Delay (sec.)
		NO ARMOR		ARMOR			
		Front Wheels	Rear Wheels	Front Wheels	Rear Wheels		
2. CROSS COUNTRY	40 mph (64 km/h)	42 psi (290 kPa)	46 psi (317 kPa)	54 psi (372 kPa)	45 psi (310 kPa)	90	30
3. MUD, SAND AND SNOW	12 mph (19 km/h)	26 psi (179 kPa)	30 psi (207 kPa)	29 psi (200 kPa)	23 psi (159 kPa)	30	30
4. EMERGENCY	5 mph (8 km/h)	17 psi (117 kPa)	19 psi (131 kPa)	24 psi (165 kPa)	18 psi (124 kPa)	15	30

WARNING



If vehicle is equipped with armor, activate CTIS armor setting for vehicle. Failure to comply may cause severe injury or death to personnel.

3. Activate armor setting by pressing and holding the armor button (2) for 10 seconds if vehicle is equipped with armor.
4. Tire pressure is immediately checked and adjusted, if necessary, upon activating one of the terrain or cargo setting buttons (3). The CTIS automatically checks tire pressure every 15 minutes and adjusts the pressure if needed.
5. 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).

GENERAL - Continued

6. The four terrain settings have maximum allowable speeds. If operator exceeds the maximum allowable speed for the terrain setting, the system will start a timer for the "warn delay". After the "warn delay" time expires, the system warns the operator the vehicle is exceeding the maximum terrain setting.
7. A "bump delay" is built into the CTIS system that allows the operator a set time after the "warn delay" to slow down or select an appropriate setting. In the Highway setting, the system will only warn the operator when the vehicle exceeds the maximum operating speed, but will not adjust tire pressure as shown in Table 1.
8. The CTIS increases tire inflation pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until the tires are reinflated to the correct pressure.

END OF TASK

TERRAIN SETTINGS

1. The CTIS controller (1) has four terrain settings. The terrain setting buttons (3) are: HIGHWAY, CROSS COUNTRY, MUD/SAND/SNOW, and EMERGENCY. Each has a maximum allowable speed.

CAUTION

- Do not change CTIS setting while the wheels are slipping or turning a corner. Damage to driveline may result.
- The CTIS increases tire inflation pressure when vehicle speed exceeds the allowable speed for each setting. When an increase in speed is required, maintain the lower speed until the tires are reinflated to the correct pressure.

NOTE

- Select the proper CTIS setting before entering an area where poor traction conditions are likely to occur.
- To allow faster inflation time when vehicle is parked with engine running, transmission in neutral, and parking brake applied, it may be necessary to increase engine speed to approximately 1200 rpm.
- If the CTIS malfunctions, turn the ON/OFF switch to OFF, then turn to ON. This action will reset the controller and may eliminate the problem.
- If it becomes necessary to disable the CTIS, the tires will have to be manually inflated or deflated.

TERRAIN SETTINGS - Continued

2. The CTIS controller (1) setting may be changed by the operator with the vehicle stationary or moving. This action will engage a new driveline axle lockup mode. To change the CTIS setting while moving, drive the vehicle in a straight line and momentarily let up on the throttle control (3). This allows driveline axle lockups to engage. The CTIS ON/OFF switch (4) is used to turn the CTIS ON/OFF. Normally the CTIS will be left in the ON position. CTIS ON/OFF switch should be turned to OFF position when a CTIS system failure occurs.

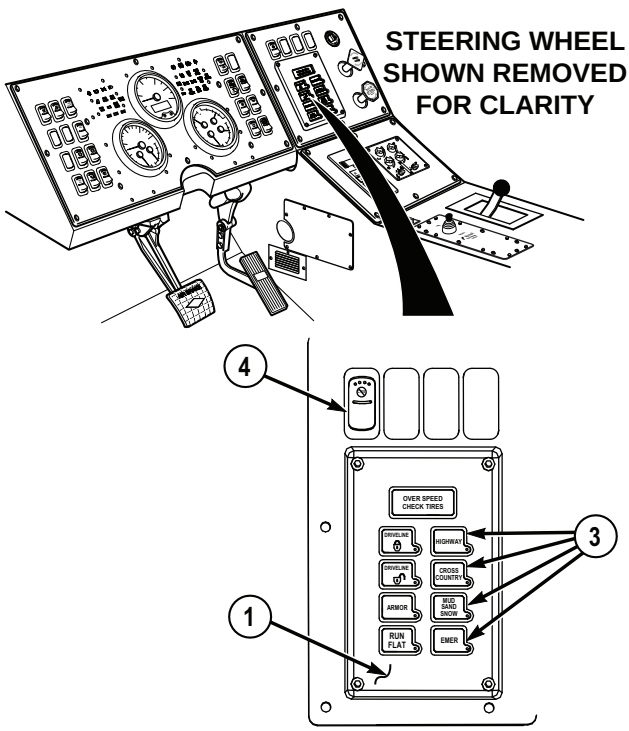


Figure 2.

3. The CTIS controller performs a speed sensing operation, which computes the average vehicle speed during a 1 minute period. The average speed is compared to the maximum speed allowed for the current setting and, if the average speed exceeds the allowed maximum speed, the CTIS is automatically engaged to inflate the tires to the next higher setting. Driveline axle lockup is not affected by automatic CTIS engagement. Driveline axle lockup for interaxle differential and side to side axle lockup is engaged through the CTIS controller. The driveline axle lockup function will still work when the CTIS ON/OFF switch (4) is turned to the OFF position. Transfer case lockup is controlled by a separate switch located on the side panel. Refer to CTIS Tire Pressure, Maximum Allowable Speeds, and Bump Times table.

TERRAIN SETTINGS - Continued

4. A steady green light (5) at the initial switch setting is normal when the CTIS is inflated to selected level. Also, the driveline lockup selection is engaged for this setting. If no changes in the CTIS setting occur during a 15 minute period, a check cycle is initiated by the controller to check the air pressure in the tires and adjust the pressure as required.

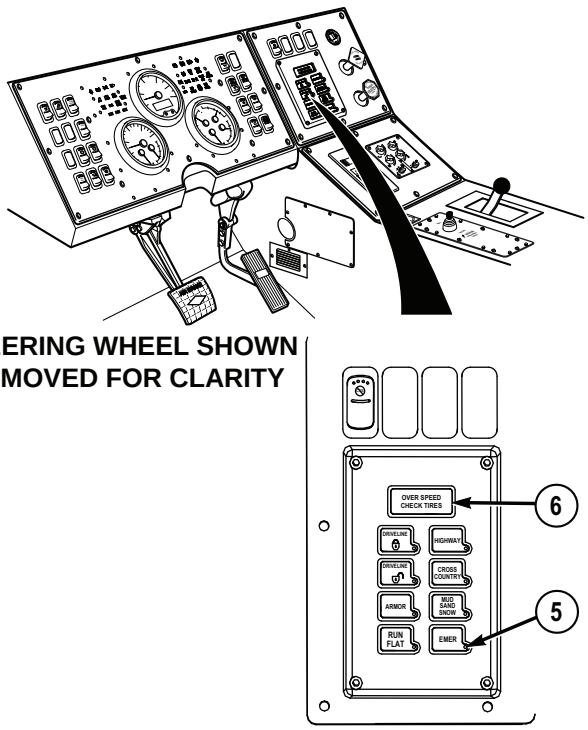


Figure 3.

5. If the average vehicle speed exceeds the speed limit of the setting for a period of 1 minute, the amber overspeed/check tire light (6) will begin to flash slowly. At the same time the amber overspeed light starts to flash, the CTIS will be activated to inflate the vehicle tires to the next higher setting.

   a. While the CTIS is inflating, the green light at the next higher level setting will also flash slowly until the next higher setting is reached.

   b. When the next higher CTIS setting is reached, the amber overspeed light will stop flashing and be extinguished. The green light indicating the new CTIS setting will begin to flash rapidly. This indicates to the operator that the CTIS setting and driveline lockup setting no longer match.

TERRAIN SETTINGS - Continued

c. If CTIS setting and driveline lockup do not match, operator must reduce speed and press the lighted CTIS button setting to match driveline lockup to tire pressure.

6. If the average vehicle speed is allowed to exceed the new CTIS setting for another minute, the CTIS will again activate to inflate the tires to next higher setting.
7. If the vehicle continues to overspeed, the CTIS will automatically adjust the tire pressure up to the next higher setting until highway setting is achieved.
8. If the vehicle has been overspeeding and the CTIS has engaged to inflate to the next higher setting, decreasing the speed will not automatically lower the tire pressure. The operator must reduce speed using the terrain setting buttons (3).
9. The CTIS will automatically turn off and the red LOW AIR light will light solid if the vehicle air pressure drops below a predetermined level (approximately 90 psi [621 kPa]) to provide priority to the brake system. The CTIS will automatically resume operation when the air pressure increases to a higher setting (approximately 110 psi [758 kPa]). The driveline lockup setting is not affected when the CTIS shuts off due to a low air pressure condition.

END OF TASK

OPERATING PROCEDURES

CAUTION

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

NOTE

- Select the proper CTIS setting before entering an area where poor traction conditions are likely to occur.
- If vehicle is stopped during CTIS mode change, an increase in engine rpm is required to provide adequate air supply. An increase in rpm is generally not required during normal operation.

1. Set CTIS (1) for correct driveline lockup and tire pressure to match anticipated driving conditions.

OPERATING PROCEDURES - Continued

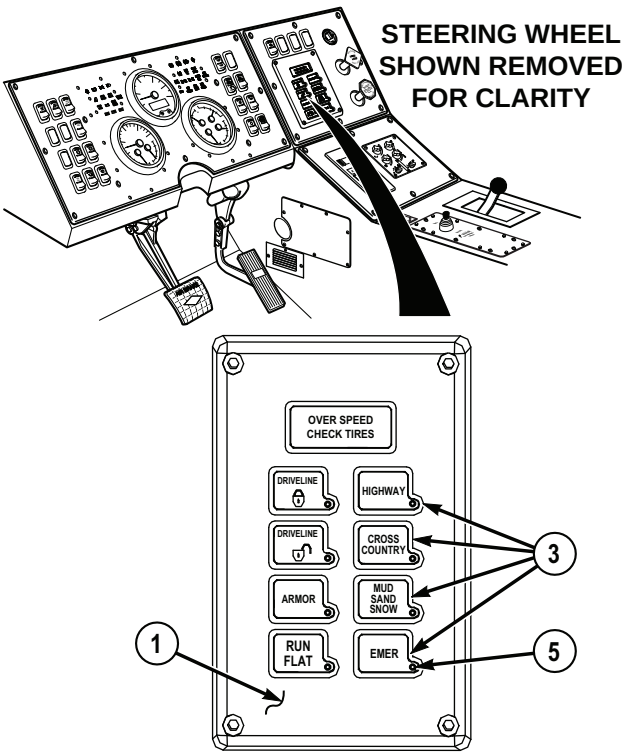


Figure 4.

2. Start vehicle (WP 0027).
3. Press and hold terrain setting button (3) on the controller for approximately 1 second to activate the CTIS system.
4. Observe green lights (5) on controller to check system operation.

CAUTION

The CTIS setting should always correspond to the lighted setting. If the light and switch positions do not match, the operator must take steps to correct the situation. Failure to comply may result in damage to equipment.

a. A continuous green light (5) indicates the CTIS and driveline lockup are both in proper operating mode and CTIS pressure check/adjustment cycle has been completed.

b. A flashing green light (5) indicates the CTIS is in the process of checking/ adjusting the tire pressure.

OPERATING PROCEDURES - Continued

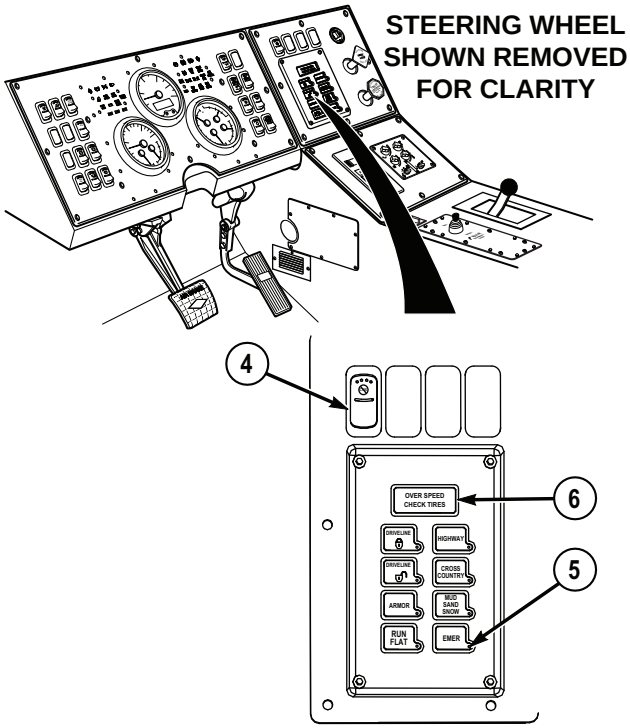


Figure 5.

CAUTION

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

c. A rapidly flashing green light (5) indicates the CTIS controller settings and tire pressure do not match and requires the operator to take corrective action.

d. The amber overspeed/check tire light (6) begins to flash when an overspeed condition has been present for 1 minute and continues to flash along with the green light until the new CTIS setting is reached.

OPERATING PROCEDURES - Continued

NOTE

The CTIS automatically checks for moderate to large leaks or air loss. This will safeguard against all of the tires going flat when one of the tires has blown and the CTIS is turned ON.

e. If a moderate to large leak is detected after about 30 seconds, overspeed/check tire light (6) will flash to confirm the leak. Turn CTIS ON/OFF switch (4) to OFF and check entire system for air leak. If no leak is found, restart the CTIS.

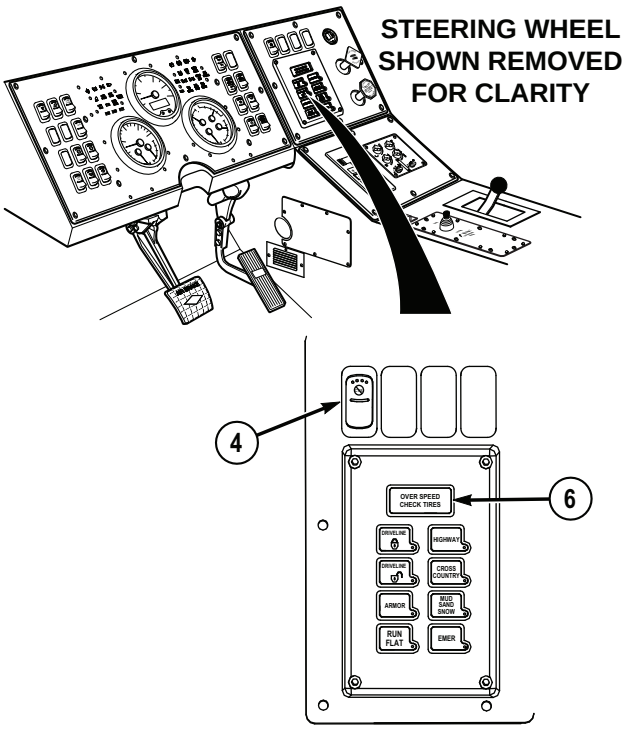


Figure 6.

NOTE

- If the CTIS malfunctions, turn the ON/OFF switch (4) to OFF, then to ON. This action will reset the controller and may eliminate the problem.
- With the CTIS manually disabled, the vehicle can still be operated (as if the vehicle were not CTIS equipped) to complete the mission before repairs are made.

OPERATING PROCEDURES - Continued

- Intermittent manual ON/OFF operation of the CTIS system to inflate or deflate tires may still be available to the operator and can be used to complete the mission before repairs are made.
- If it becomes necessary to disable the CTIS, the tires will have to be manually inflated or deflated.

5. If a Class III oil leak develops from a wheel valve, turn CTIS ON/OFF switch (4) to OFF position and complete the mission. Notify Field Maintenance.

6. If it becomes necessary to disable the CTIS, turn ON/OFF switch (4) to OFF.

CAUTION

When using EMERGENCY position on the CTIS, top speed should not exceed 5 mph (8 km/h) and distance traveled should not exceed 5 miles (8 km). Care must be exercised since steering response is limited due to full driveline lockup. Failure to comply may cause damage to equipment.

7. When changing setting from EMERGENCY to any other CTIS setting, the vehicle must be stopped, driveline loading may need to be relieved.
   a. Stop vehicle.
   b. Set transmission range selector (7) to Neutral (N).
   c. Press and hold terrain setting button on CTIS (1) controller for approximately 1 second to activate CTIS system.

OPERATING PROCEDURES - Continued

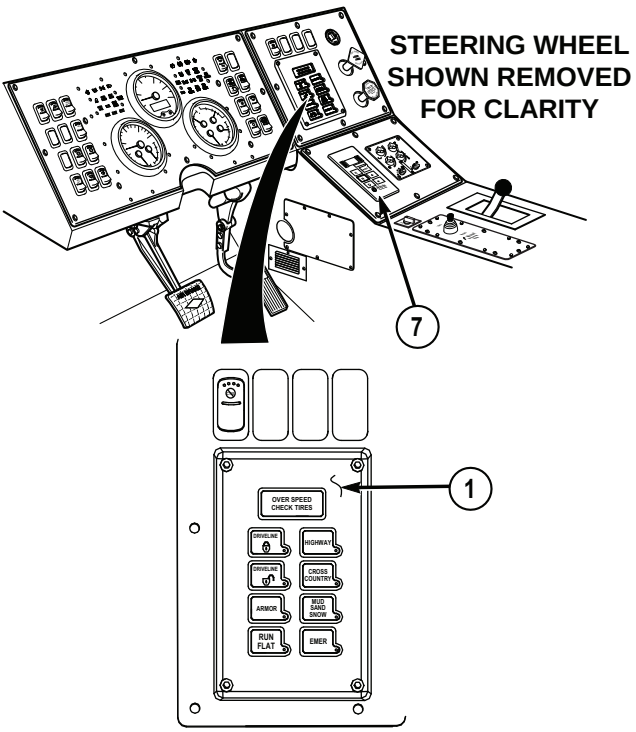


Figure 7.

NOTE

Perform Steps d through f to relieve driveline load only if driveline lockout does not disengage.

d. Set transmission range selector (7) to Reverse (R).

e. Back up approximately 5 to 10 ft (1.5 to 3 m) to relieve driveline loading, and then bring vehicle to stop.

f. Press transmission range selector (7) to Neutral (N) and then to 3, 2, or 1 depending on ground conditions.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
WINDSHIELD WIPERS

INITIAL SETUP:

Not Applicable

WINDSHIELD WIPERS

1. Start vehicle (WP 0027).

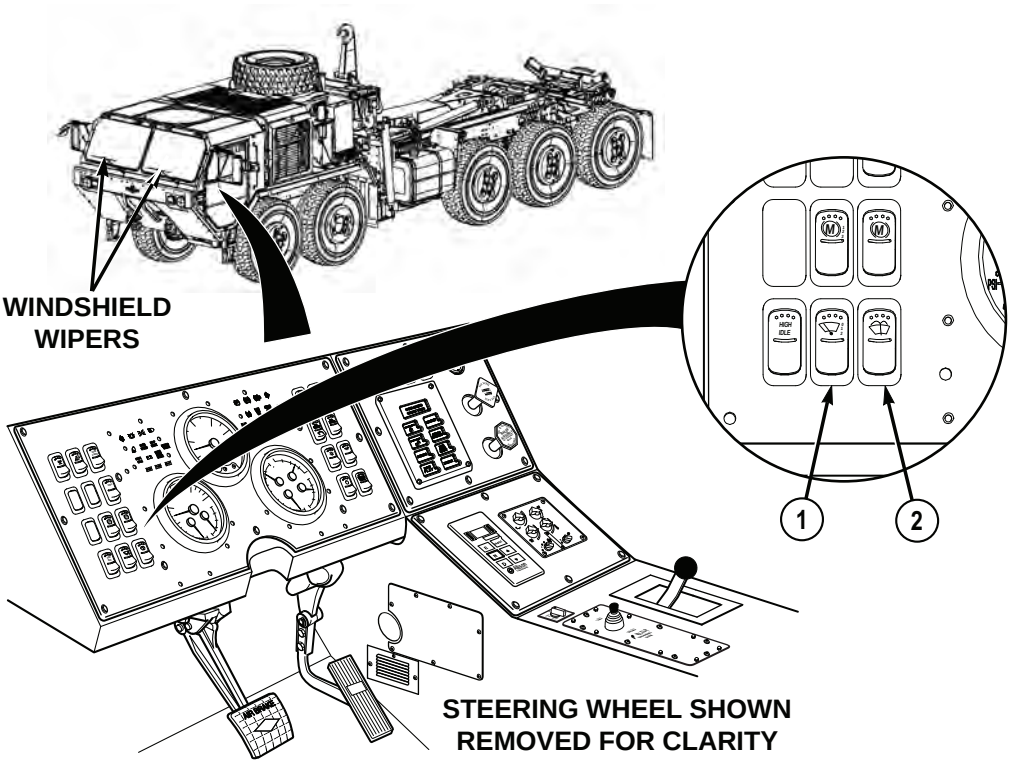


Figure 1.

2. Turn windshield wipers ON/OFF.

WINDSHIELD WIPERS - Continued

a. Press WIPER switch (1) to middle position for low speed and up position for high speed.

b. Press WIPER switch (1) to down position to stop windshield wipers.

3. Operate windshield washer.

a. Press and hold WASHER switch (2) down to spray cleaning fluid on windshield.

b. Release WASHER switch (2) to stop washer spray.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
FIRE EXTINGUISHER

INITIAL SETUP:

Not Applicable

FIRE EXTINGUISHER

1. Release two clamps (1) and open straps (2).

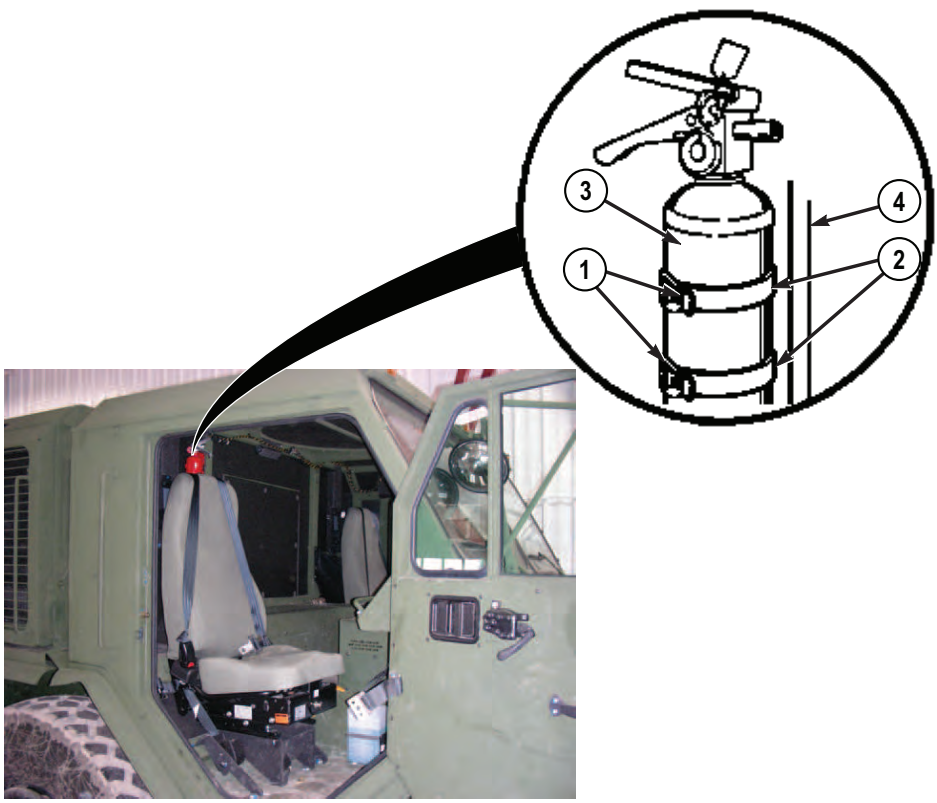


Figure 1.

2. Pull fire extinguisher (3) straight out and off bracket (4).

FIRE EXTINGUISHER - Continued

3. Hold fire extinguisher (3) upright and pull safety pin (5) to break plastic tie (6).

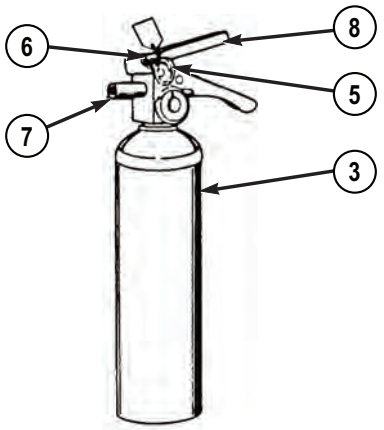


Figure 2.

4. Point nozzle (7) at base of fire.
5. Press down on stop lever (8) and spray in a side-to-side motion at base of fire.
6. Replace fire extinguisher (3) after use.
7. Put the neck (9) of fire extinguisher (3) on bracket (4).

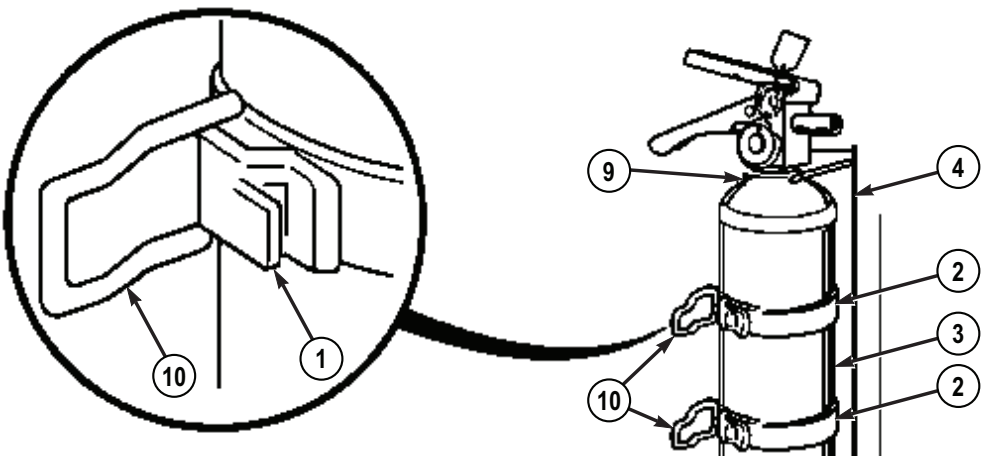


Figure 3.

8. Put two clamps (1) on hooks (10).

FIRE EXTINGUISHER - Continued

9. Push down on two clamps (1) to two secure straps (2).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
AUXILIARY EQUIPMENT

INITIAL SETUP:

Not Applicable

ARCTIC HEATER

WARNING



CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH.

- Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas that, when breathed, deprives body of oxygen and causes SUFFOCATION. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Permanent BRAIN DAMAGE or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no ventilation. Precautions MUST be followed to ensure personnel are safe whenever personnel heaters or engine is operated for any purpose. Failure to comply may result in injury or death to personnel.
- DO NOT operate engine in a closed place without proper ventilation. Failure to comply may result in injury or death to personnel.
- DO NOT drive vehicle with inspection plates, cover plates, or engine compartment covers removed unless necessary for maintenance purposes. Failure to comply may result in injury or death to personnel.
- BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected personnel to fresh air and keep warm. DO NOT PERMIT PHYSICAL EXERCISE. If necessary, give artificial respiration and get immediate

ARCTIC HEATER - Continued

medical attention. For artificial respiration, refer to FM 21-11. Failure to comply may result in injury or death to personnel.

- BE AWARE that the gas particulate filter unit or field protection mask for nuclear-biological-chemical protection WILL NOT offer safety from carbon monoxide poisoning.
- THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

WARNING



The arctic heater must be OFF when filling any fuel tank on vehicle. Failure to comply may result in injury or death to personnel.

WARNING



Attempting to operate heater with frozen or slushy coolant could cause coolant hose to burst or separate from heater. Make sure proper mixture of water and antifreeze (refer to lubrication table) is maintained at all times. Failure to comply may result in damage to engine and/or injury to personnel.

CAUTION

- Do not attempt to operate arctic engine heater if arctic engine heater fails to start during normal startup, or shutdown occurs during normal operation. System shutdown may indicate an arctic engine heater system fault. Failure to comply may cause system lockout.
- Do not operate arctic engine heater if arctic engine heater light flashes intermittently during normal operation. Arctic engine heater indicator light flashing indicates an arctic engine heater system fault. Failure to comply may cause system lockout.

ARCTIC HEATER - Continued

NOTE

- The arctic engine heater will attempt to start two times per start cycle. After the second failed start attempt, the arctic engine heater will not operate until the arctic engine heater on/off switch is turned OFF and back ON.
- If arctic engine heater flameout occurs during operation, arctic engine heater will attempt one restart. If unsuccessful, arctic engine heater will shut down.
- During operation, arctic engine heater continually monitors input voltage. If the arctic engine heater input voltage decreases below 20V or increases above 30V, arctic engine heater will automatically shut down.

1. To start arctic engine heater, place arctic engine heater on/off switch in ON position.
2. Observe arctic engine heater indicator light for steady illumination.
3. Observe arctic engine heater for proper operation.
4. Operate arctic engine heater for 35 minutes to warm engine.
5. After 35 minutes, start engine (WP 0027).
6. After engine is started, place arctic engine heater on/off switch in OFF position to shut down arctic engine heater.

END OF TASK

GAS PARTICULATE FILTER UNIT (GPFU)

WARNING



If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to comply may result in injury or death to personnel.

GAS PARTICULATE FILTER UNIT (GPFU) - Continued

NOTE

- Perform Steps (1) through (9) only when under Nuclear, Biological, or Chemical (NBC) attack or when ordered to do so.
- There are two M-3 heaters, hoses, and air duct sockets.

1. For detailed operation concerning protective mask refer to TM 3-4240-280-10 (Volume 2, WP 0146).
2. Remove protective mask (1) and canister (2) from pouch (3).

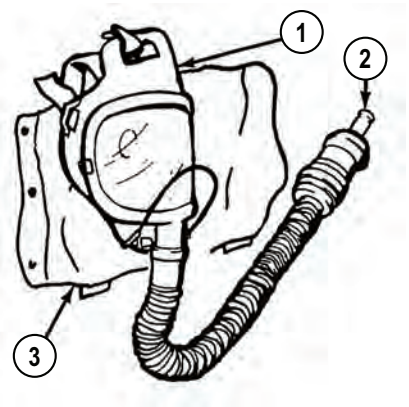


Figure 1.

3. Put on protective mask (1).
4. Clear and seal protective mask (1).

WARNING



Spring clip on filter assembly air intake must be pulled so intake holes are open for gas particulate filter system to work. Failure to comply may result in injury or death to personnel.

GAS PARTICULATE FILTER UNIT (GPFU) - Continued

NOTE

Spring clip must be repositioned on filter assembly air intake so intake holes are open for gas particulate filter system to work. Clip is repositioned through bottom of bracket.

5. Pull down on spring clip (4) to uncover intake holes (5).

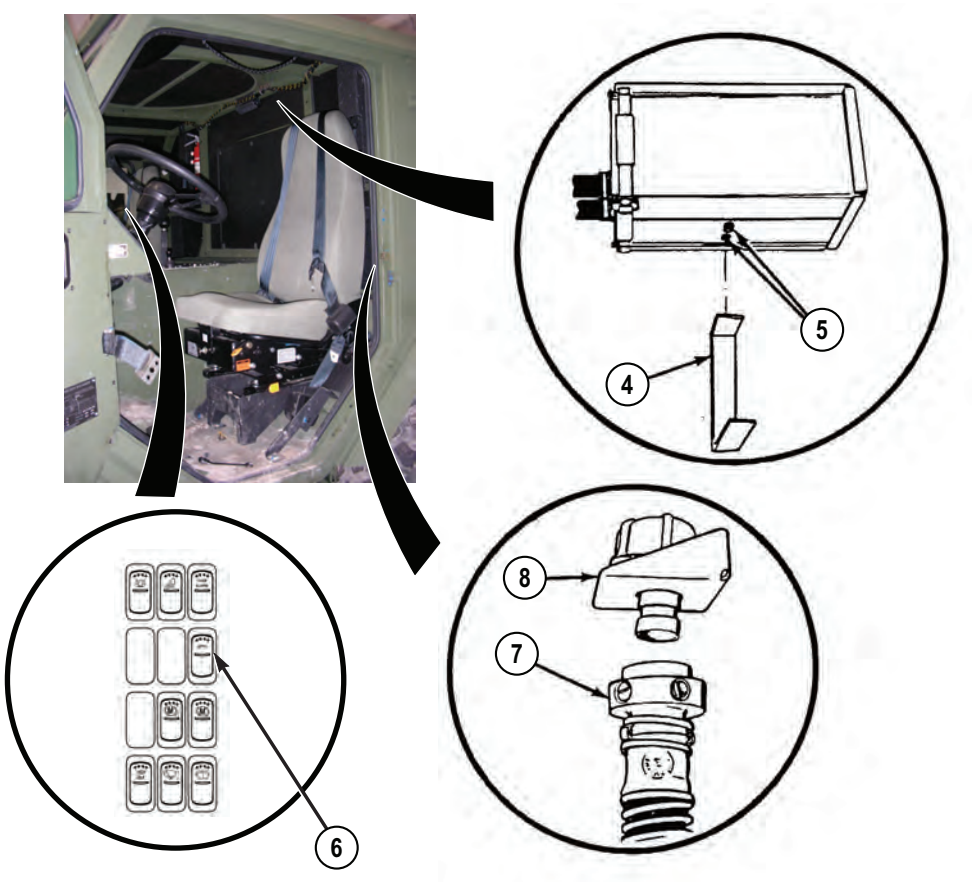


Figure 2.

6. Set gas particulate filter switch (6) to ON position.

NOTE

One mount is located to left of driver's seat at roof brace. Second mount is located on middle cab roof brace to left of passenger seat.

GAS PARTICULATE FILTER UNIT (GPFU) - Continued

7. Disconnect two air duct hose breakaway sockets (7) from mounts (8).

WARNING



Under arctic conditions, danger of frostbite exists. Mask can be put on, but air duct hose socket shall not be connected to mask canister until M-3 heater has been on for 15 minutes. Failure to comply may result in injury or death to personnel.

8. Connect two air duct hose breakaway sockets (7) to canisters (2) of protective masks (1) and breathe through masks.

NOTE

- There are two M-3 heaters. Both are the same.
- Heater indicator light will go off and on during normal heater operation.

9. If air is too cold to breathe comfortably, turn knob (9) clockwise until heater indicator (10) lights.

GAS PARTICULATE FILTER UNIT (GPFU) - Continued

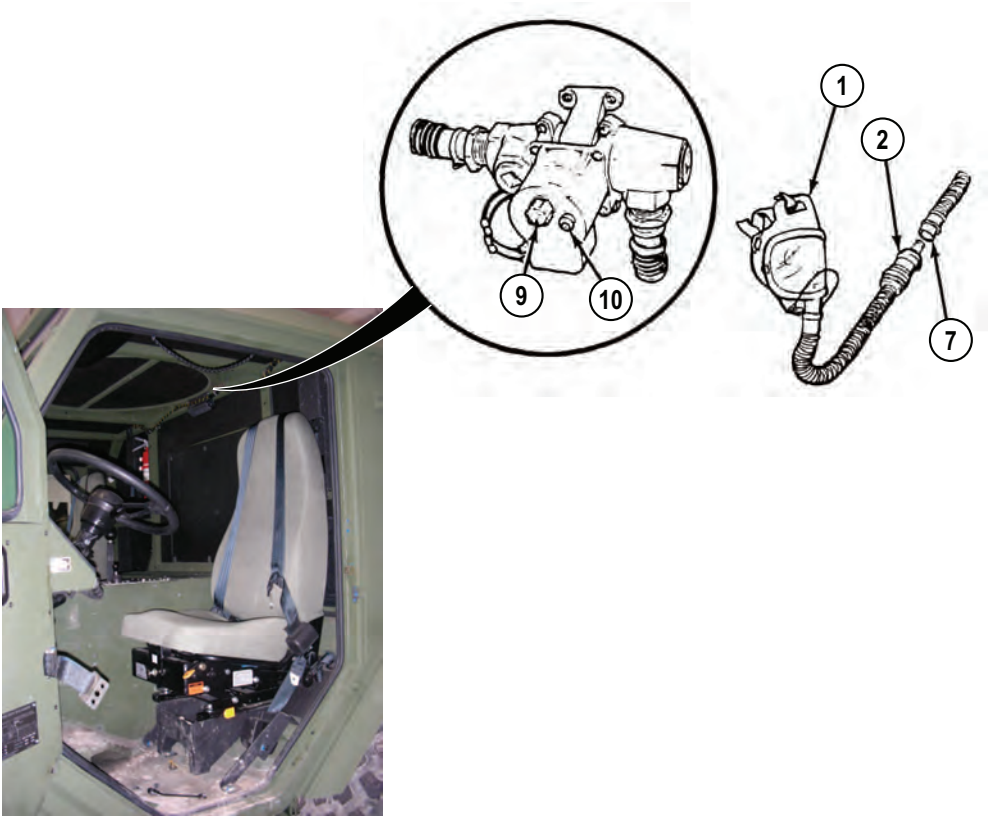


Figure 3.

10. To adjust temperature:
    a. Turn knob (9) clockwise for warmer air.
    b. Turn knob (9) counterclockwise for cooler air.
11. When heater is no longer needed, turn control knob (9) counterclockwise to OFF position.

NOTE

Perform Steps (11) through (15) only when NBC attack is over or when ordered to do so.

12. When heater is no longer needed, turn control knob (9) counterclockwise to OFF position.

GAS PARTICULATE FILTER UNIT (GPFU) - Continued

13. When protective masks (1) are no longer needed, disconnect air duct hose breakaway sockets (7) from canisters (2).
14. Connect two air duct hose breakaway sockets (7) to mounts (8).
15. Press gas particulate filter switch (6) to OFF position.
16. Push up on spring clip (4) to cover intake holes (5).

END OF TASK

RIFLE MOUNT

NOTE

Vehicle may be equipped with door or cab rifle mount. Door mount shown, cab mount is similar.

1. Stow rifle in stowage mount.
   a. Position butt (1) of M-16 rifle (2) in lower mount (3) with trigger guard (4) toward rear of vehicle.

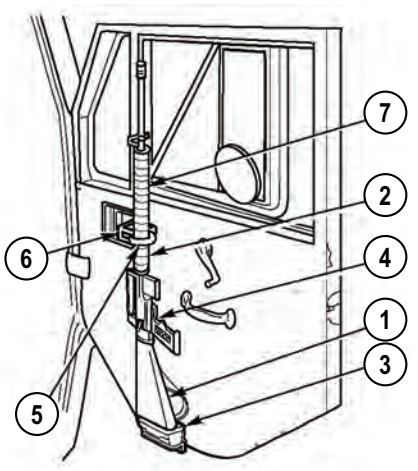


Figure 4.

   b. Pull handle (5) of top mount (6) toward middle of cab.
   c. Place heat guard (7) of M-16 rifle (2) in top mount (6).
   d. Push handle (5) across heat guard (7).
   e. Check that M-16 rifle (2) is held tightly.

RIFLE MOUNT - Continued

2. Remove rifle from stowage mount.
   a. Pull handle (5) of top mount (6) down and toward middle of cab.
   b. Remove heat guard (7) of M-16 rifle (2) from top mount (6).
   c. Remove butt (1) of M-16 rifle (2) from lower mount (3).

END OF TASK

CHEMICAL ALARM

Refer to TM 3-6665-225-12 (Volume 2, WP 0146) for operating instructions.

END OF TASK

DECONTAMINATION UNIT

Refer to TM 3-4230-214-12&P (Volume 2, WP 0146) for operating instructions.

END OF TASK

RADIO

Refer to TM 11-5820-498-12 (Volume 2, WP 0146) for operating instructions.

END OF TASK

MACHINE GUN MOUNT

Refer to TM 9-1005-245-13&P (Volume 2, WP 0146) for operating instructions.

END OF TASK

POWER INTERFACE KIT

WARNING



- Hydraulic fluid is under great pressure. Engine on vehicle must be shut off while connecting hydraulic lines. Failure to comply may result in injury or death to personnel.
- Hot hydraulic oil may cause serious burns.
- The vehicle's hydraulic system is highly pressurized. Be sure to wear proper eye protection and proceed with caution. Failure to comply may result in injury or death to personnel.

CAUTION

To prevent hydraulic contamination, keep hydraulic quick disconnects clean, or damage to hydraulic system may result.

NOTE

Air, electric, and hydraulic connections are shown. Not all modules will require all three hookups.

1. Connect to power interface kit.
   a. Shut OFF engine (WP 0037).
   b. Open dust cover (1) on female quick disconnect (2).

POWER INTERFACE KIT - Continued

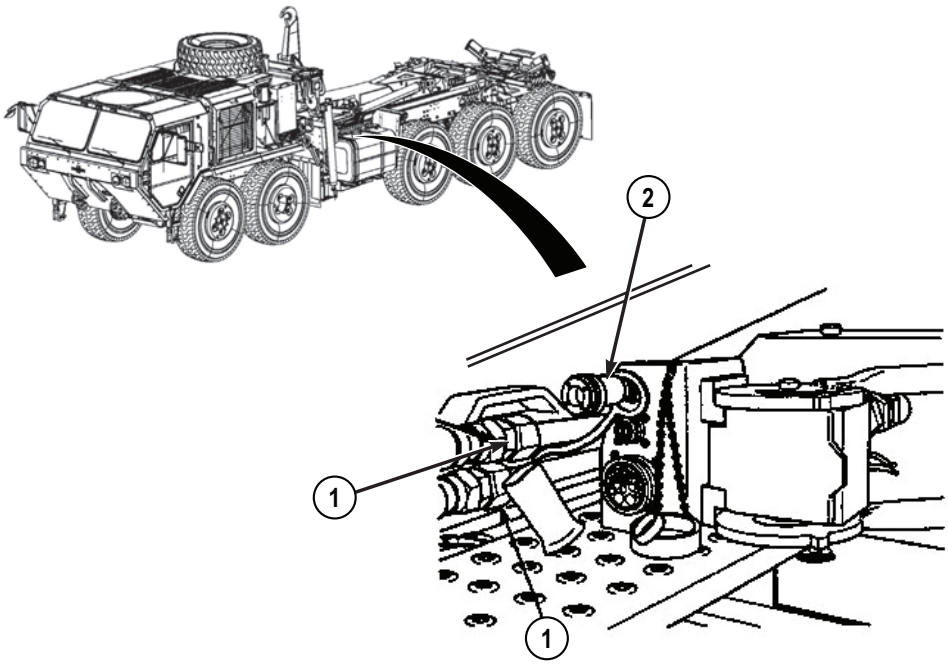


Figure 5.

c. Push in safety lock button (3) and rotate lever (4) to open (forward) position.

POWER INTERFACE KIT - Continued

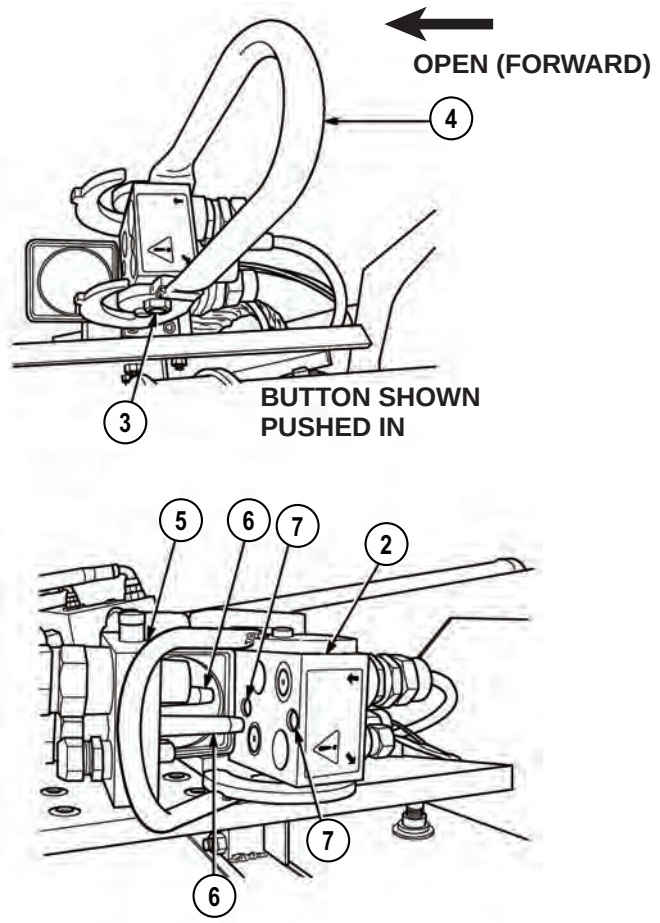


Figure 6.

d. Position male quick disconnect (5) with female quick disconnect (2) and slide two guide pins (6) into guide pin slots (7).

e. Align pins (8) in hook (9) of lever (4).

POWER INTERFACE KIT - Continued

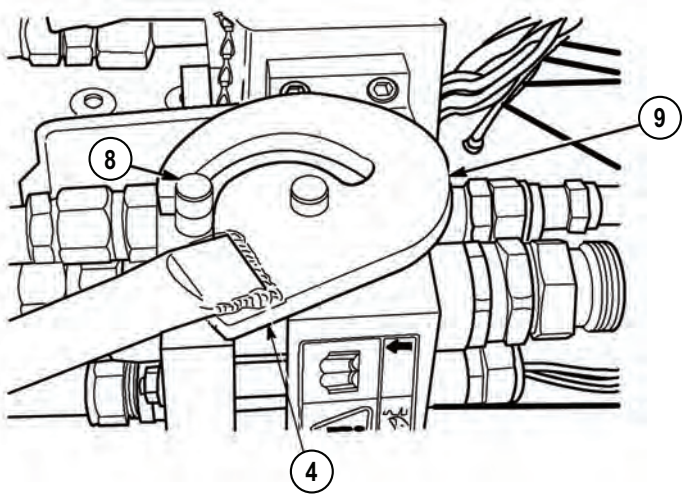


Figure 7.

NOTE

There is not a power interface kit on/off switch. The power interface kit is operative when lever is rotated to the locked position, connecting male quick disconnect to female quick disconnect with safety lock button locked and when hydraulic selector switch is set to CRANE/SRW.

f. Rotate lever (4) to locked (rear) position until safety lock button (3) locks.

POWER INTERFACE KIT - Continued

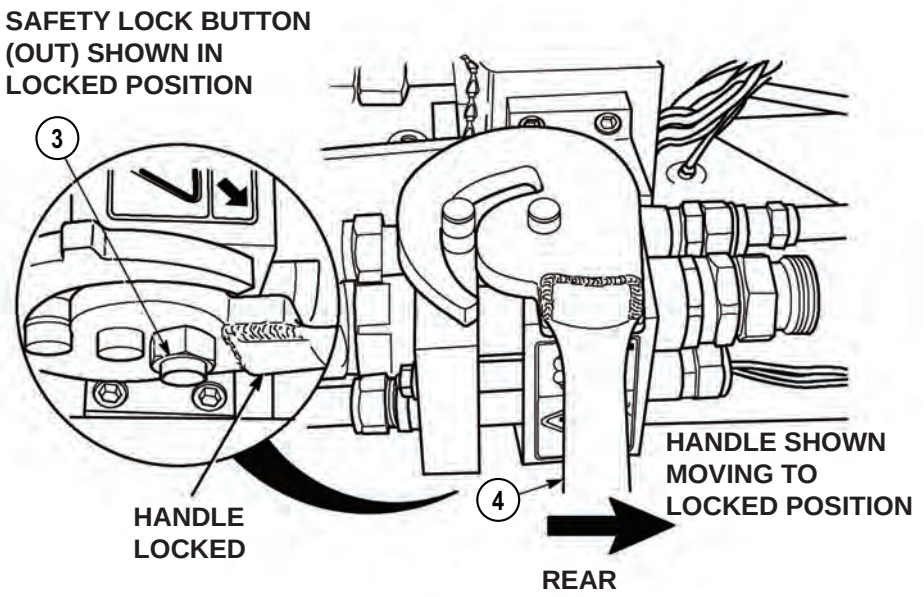


Figure 8.

g. Start engine (WP 0027).

h. Set hydraulic selector switch (10) to CRANE/SRW position.

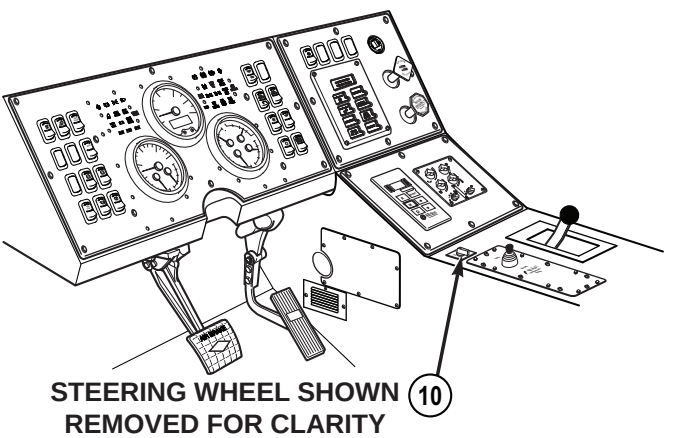


Figure 9.

2. Disconnect power interface kit.

POWER INTERFACE KIT - Continued

WARNING



- Hydraulic fluid is under great pressure. Engine on vehicle must be shut off while connecting hydraulic lines. Failure to comply may result in injury or death to personnel.
- Hot hydraulic oil may cause serious burns.
- When disconnecting block, the hydraulic fluid will be under great pressure. Keep a firm grip on female quick disconnect and lever to avoid an uncontrolled disconnect. Failure to comply may result in injury or death to personnel.
- Hydraulic Systems are under pressure. Be sure to wear the proper eye protection to avoid injury or death.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

a. Set hydraulic selector switch (10) to OFF position.

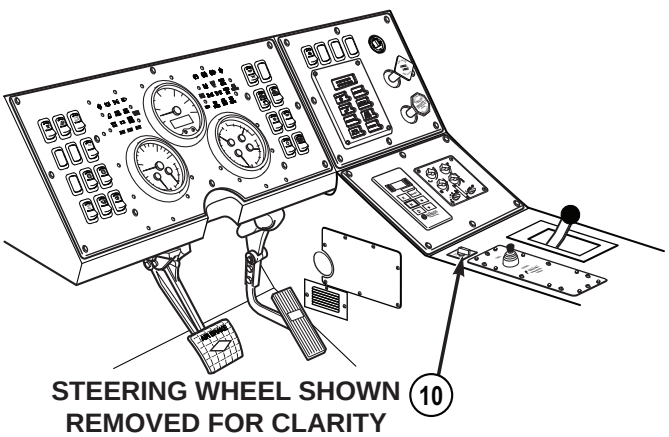


Figure 10.

b. Shut OFF engine (WP 0037).

POWER INTERFACE KIT - Continued

NOTE

Male quick disconnect will be loose when pins clear the hook of lever.

c. Push in safety lock button (3) and rotate lever (4) to the open (forward) position to release pins (8) from hook (9) of lever (4).

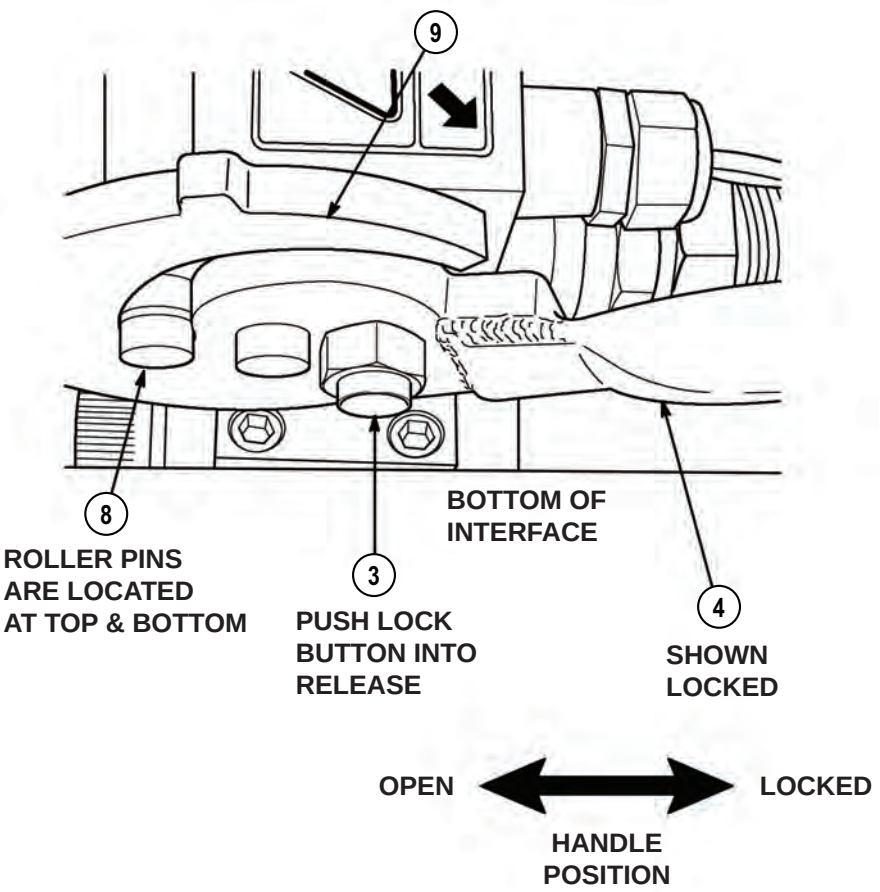


Figure 11.

d. Remove male quick disconnect (5) from female quick disconnect (2) and position out of way.

POWER INTERFACE KIT - Continued

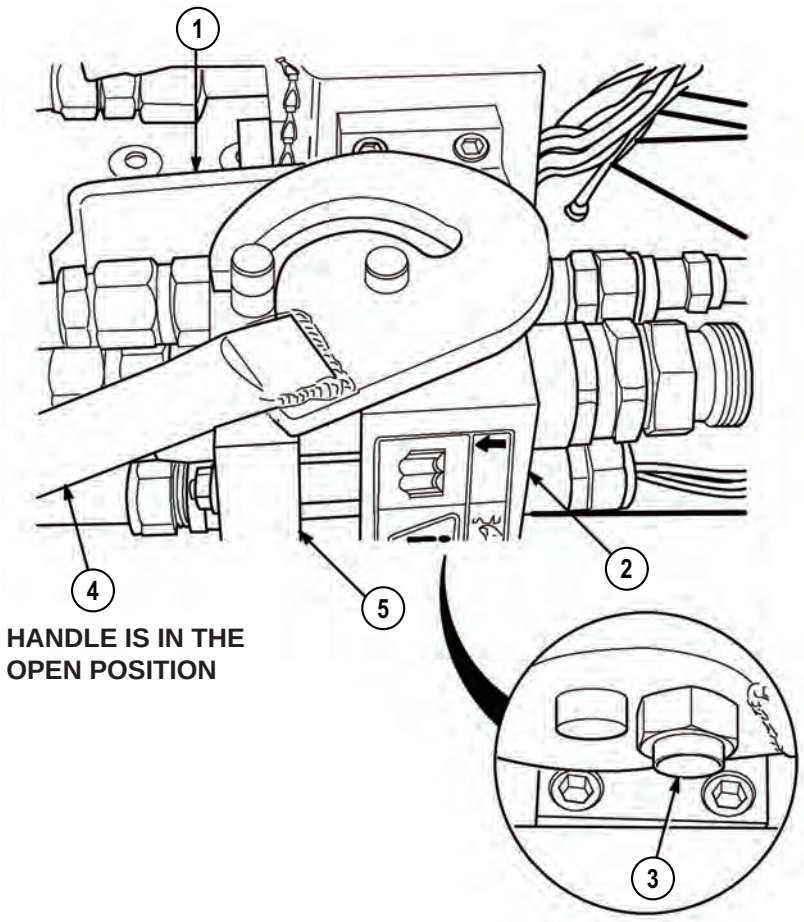


Figure 12.

e. Close dust cover (1) on female quick disconnect (2).

f. Rotate lever (4) to locked (rear) position until safety lock button (3) locks.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOAD HANDLING SYSTEM (LHS)

INITIAL SETUP:

Not Applicable

CONTROLS AND INDICATORS

CAUTION

- Before starting any LHS operations, clean any snow, ice, sand, or mud from all operating components, or damage to equipment may result.
- Before starting any LHS operations, adjust extension mirror to monitor LHS operations, or damage to equipment may result.
- If terrain is deeply rutted, soft soil, etc., mud flaps must be pinned up before beginning LHS operations, or damage to mud flaps may result.
- If LHS had previously been used in Manual Mode and not completely stowed in Auto Mode, the hook arm cylinders must be completely extended or the LHS must be completely stowed using Auto Mode before the flatrack can be loaded. Failure to comply may result in damage to the vehicle and flatrack.

1. Joystick (1) controls operations of loading (LOAD) and unloading (UNLOAD) of flatracks.

CONTROLS AND INDICATORS - Continued

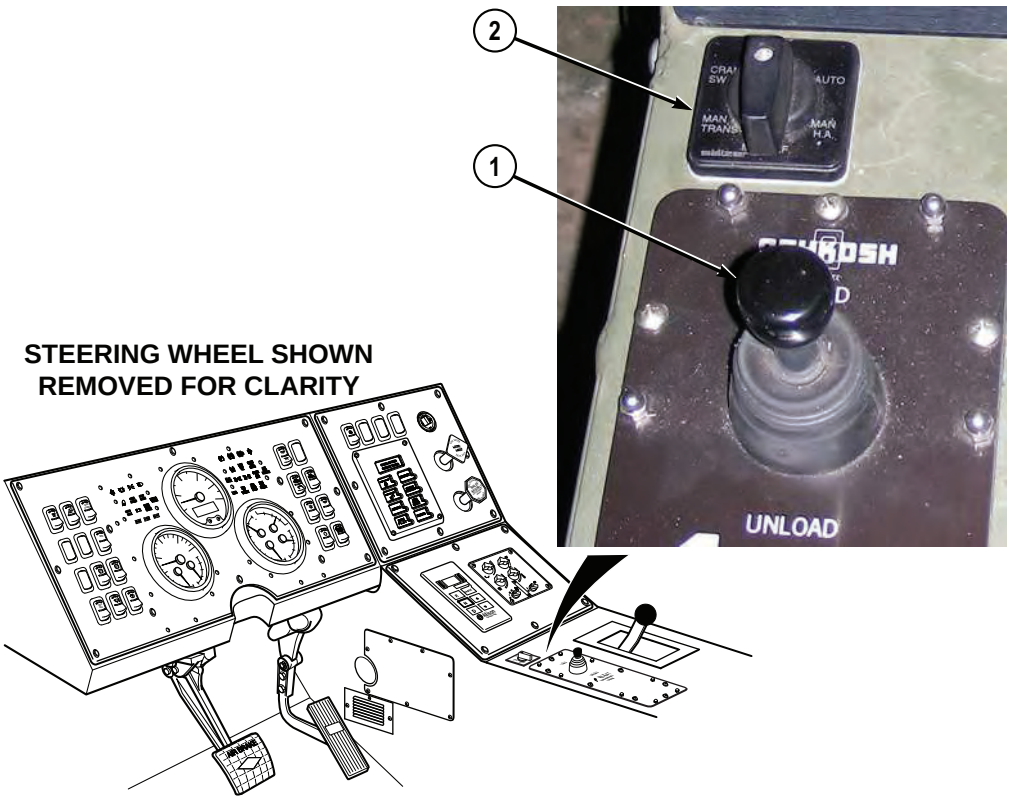


Figure 1.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

2. Hydraulic Selector Switch (2).
   a. OFF POSITION: Joystick (1) not operational (LHS transit mode).
   b. AUTO POSITION: For normal pickup and off-loading sequence of flatrack.
   c. MANUAL HOOK ARM (MAN H.A.) POSITION: For picking up and off-loading use on trailer, docks, or in the event of failure of automatic hook arm electronic circuits.
   d. Manual MAIN FRAME (MAN M.F.) POSITION: For picking up and off-loading on trailers, docks, or in the event of failure of automatic main frame electronic circuits.

CONTROLS AND INDICATORS - Continued

e. MANUAL TRANSIT (MAN TRANS) POSITION: Used when automatic circuits have failed and MAN H.A. and M.F. are operated. This position must be selected if vehicle is to travel.

f. CRANE SW: Used to switch hydraulic power to crane. In this position the LHS free flow valve is closed and the LHS section of the hydraulic system is isolated.

3. Warning Lights.

CAUTION

After loading operations using CHU kit and container and the LHS NO TRANSIT indicator goes off, operator must release the joystick from the LOAD position. Failure to release the joystick may cause LHS OVERLOAD indicator to illuminate and hydraulic cylinders to remain active, forcing a temporary bow in the LHS frame, resulting in contact between LHS and container.

a. LHS NO TRANSIT light (3) illuminates when LHS is not correctly stowed in transport position.

CONTROLS AND INDICATORS - Continued

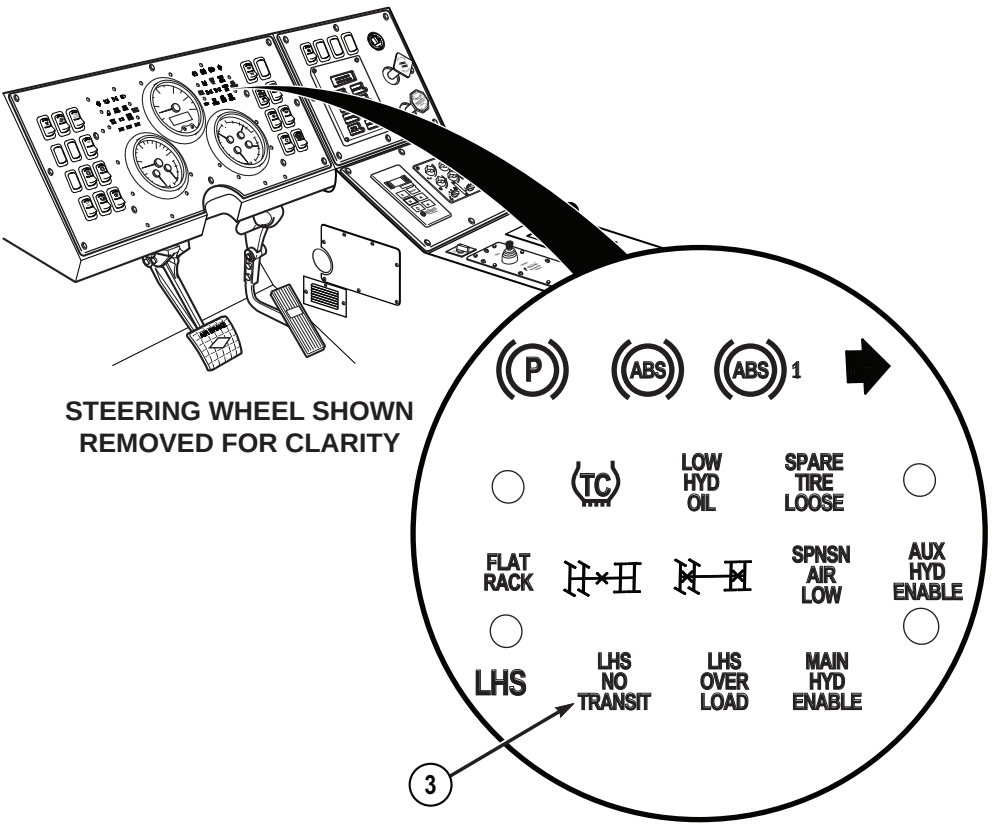


Figure 2.

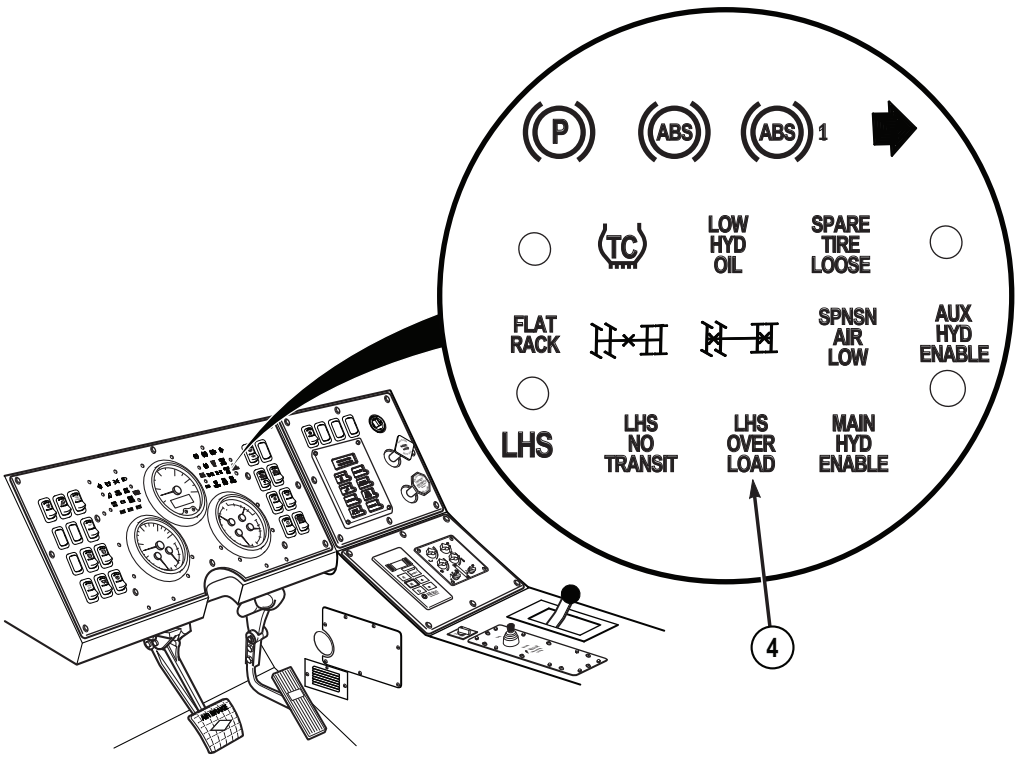
NOTE

To reset LHS Overload, return load to start position and release joystick switch.

b. LHS OVERLOAD light (4) (yellow) is located on the driver's dash panel and illuminates whenever main hydraulic relief valve is opened during loading or unloading. When light illuminates, driver will be warned that LHS has reached an overload condition or that hydraulic system is lifting very near maximum capacity. LHS OVERLOAD light will come on anytime main relief valve is open; therefore, load or unload operation may not come to a complete stop, but light will come on momentarily. This situation would indicate that system is lifting near maximum capacity. If the LHS is overloaded, the light illuminates and the system is automatically blocked out. Offload/onload flatrack and attempt second

CONTROLS AND INDICATORS - Continued

operation. If, during this second attempt, the LHS shuts down, stop operation and redistribute weight or reduce payload before attempting load or unload.



STEERING WHEEL SHOWN REMOVED FOR CLARITY

Figure 3.

CAUTION

- Overload protection system on PLS protects LHS and flatrack from structural damage during loading and unloading. This system does not protect vehicle chassis from being overloaded by means of crane, forklift, or excessively loaded flatracks.
- Vehicle chassis is designed to carry an evenly distributed 16.5 ton (14, 969 kg) payload. Operator is responsible to know what payload weighs.

CONTROLS AND INDICATORS - Continued

c. LHS (5): Illuminates when rotary hydraulic selector switch (2) is in AUTO, MAN H.A., or MAN M.F. position.

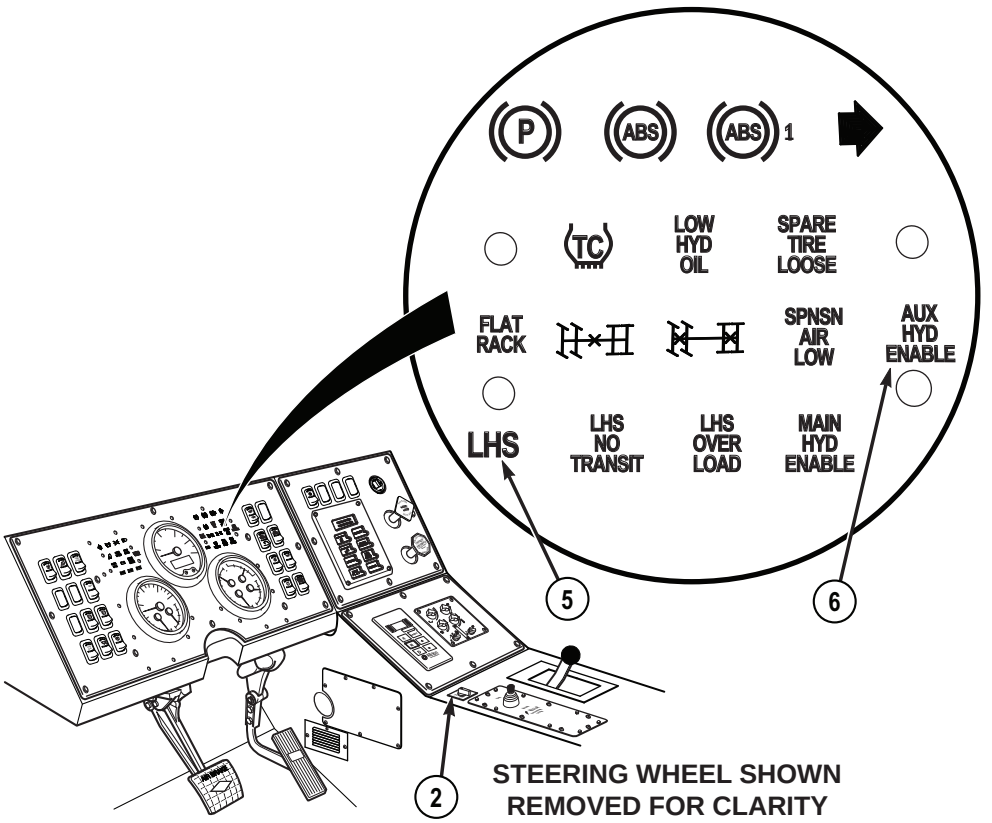


Figure 4.

d. AUX HYD ENABLE (6): Illuminates when hydraulic selector switch (2) is in CRANE SW position.

END OF TASK

PICKING UP A FLATRACK IN AUTO MODE

CAUTION

If LHS had previously been used in Manual Mode and not completely stowed in Auto Mode, the hook arm cylinders must be completely extended, or the LHS must be completely stowed using Auto Mode,

PICKING UP A FLATRACK IN AUTO MODE - Continued

before the flatrack can be loaded. Failure to comply may result in damage to the vehicle and flatrack.

1. Start vehicle (WP 0027).

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

2. Set transmission range selector (7) to Reverse (R) and back vehicle up to flatrack. Stop at approximately 5 ft (1,524 mm) from hook-bar (8). Check for overhead obstructions and firmness of the ground.

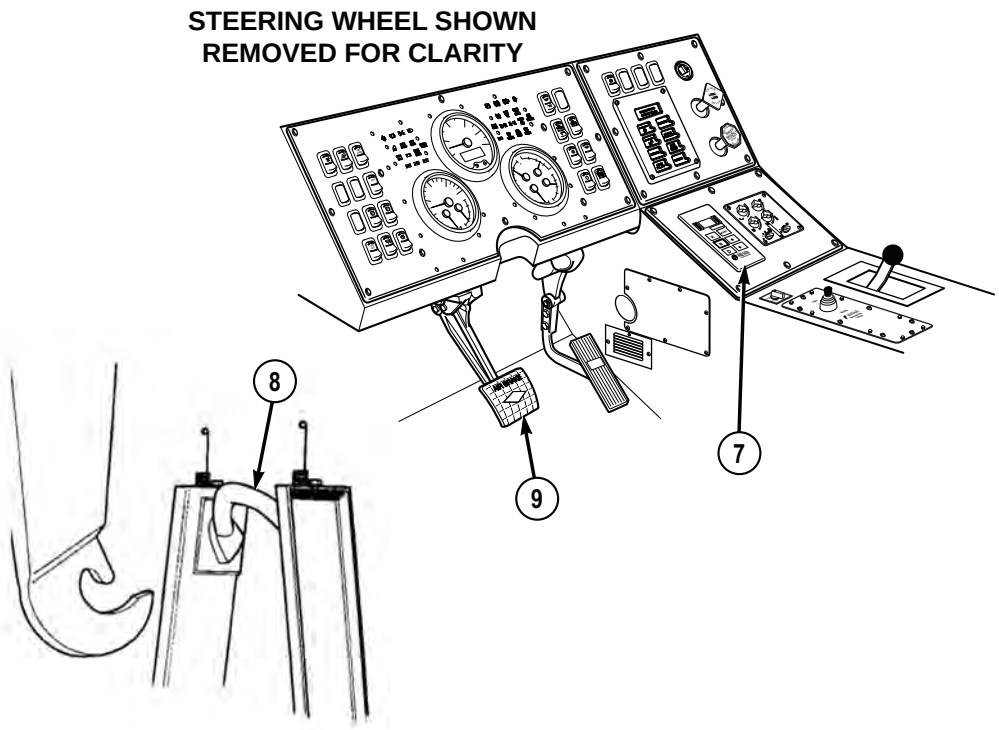


Figure 5.

3. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

PICKING UP A FLATRACK IN AUTO MODE - Continued

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

4. Turn hydraulic selector switch (2) to AUTO.

PICKING UP A FLATRACK IN AUTO MODE - Continued

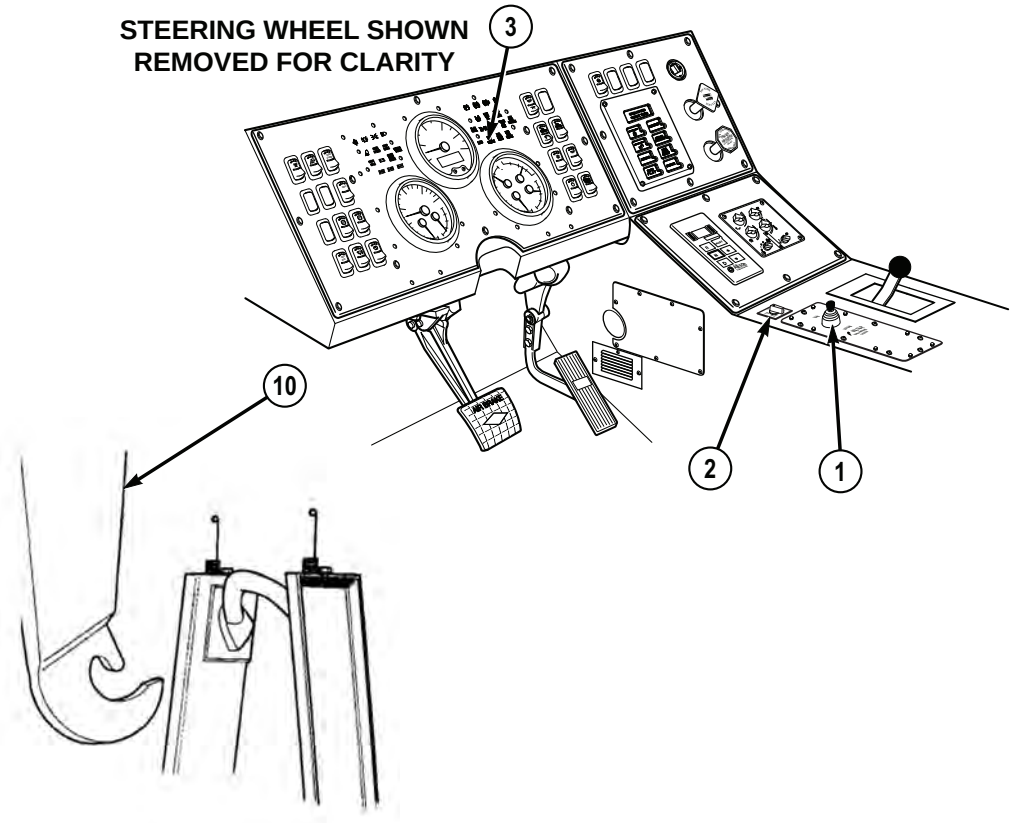


Figure 6.

5. Move joystick (1) to UNLOAD. Lift-hook (10) will raise and begin to move rearwards. LHS NO TRANSIT light (3) will illuminate to indicate hook arm is up and load lock has been cleared.

NOTE

To fully view lift-hook relation to hook-bar, it may be necessary to observe position from outside the cab.

6. Continue to unload until lift-hook (10) has moved to below level of flatrack hook-bar (8).

PICKING UP A FLATRACK IN AUTO MODE - Continued

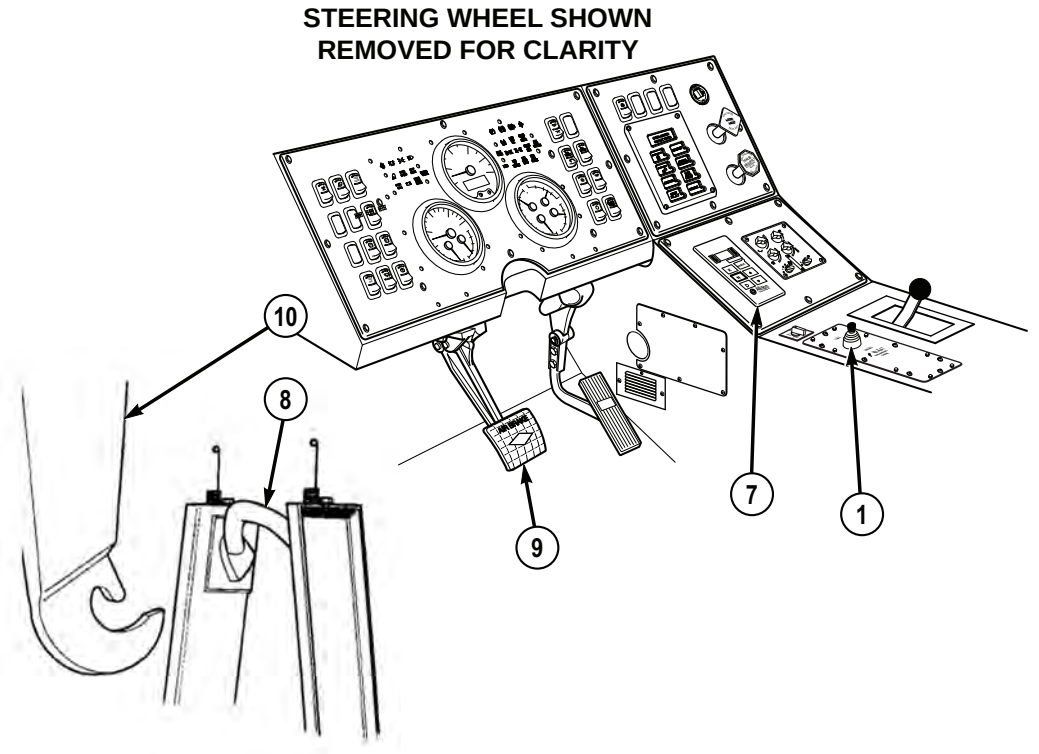


Figure 7.

7. Release joystick (1).
8. Set transmission range selector (7) to Reverse (R) and back vehicle up to flatrack, aligning vehicle and flatrack as straight as possible with lift-hook (10) to middle of hook-bar (8) until lift-hook (10) contacts hook-bar. Be sure lift-hook tip is positioned below bottom of hook-bar (8).

WARNING

Do not use Reverse (R) to back up vehicle while hook arm is attached to flatrack. Failure to comply may result in damage to equipment and/or injury or death to personnel.

9. Move joystick (1) to LOAD to raise lift-hook (10) and engage hook-bar (8).
10. If lift-hook (10) fails to engage hook-bar (8):
    a. Release joystick (1).

PICKING UP A FLATRACK IN AUTO MODE - Continued

b. Set transmission range selector (7) to Drive (D), release service brake pedal (9), and move vehicle forward to clear flatrack.

c. Move joystick (1) to UNLOAD until lift-hook (10) is below level of hook-bar (8).

d. Repeat Steps (6) through (9).

11. When correctly engaged, set transmission range selector (7) to Neutral (N) and release service brake pedal (9).

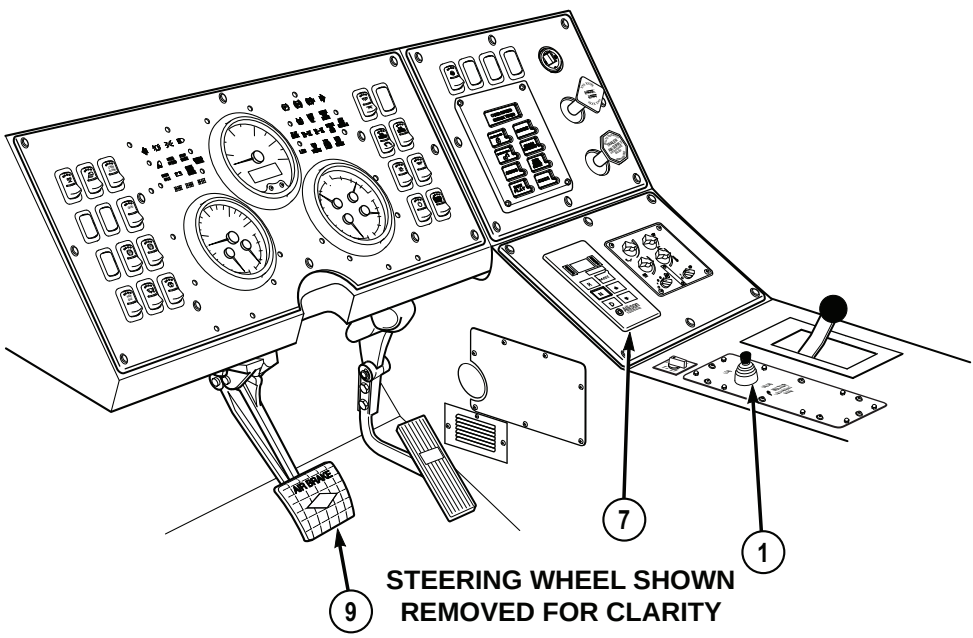


Figure 8.

WARNING



When loading or unloading flatracks on uneven ground (downgrades up to 10 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle roll away. Failure to comply may result in injury or death to personnel.

PICKING UP A FLATRACK IN AUTO MODE - Continued

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

CAUTION

- If LHS OVERLOAD light illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation, operator should determine if payload is evenly distributed on flatrack or if flatrack load exceeds 16.5 tons (14,969 kg). If any of these conditions exist, operator must redistribute or reduce the payload or damage to equipment may occur.
- Load must be evenly distributed on the pallet. Uneven load distribution may cause LHS OVERLOAD indicator to give false signals and cause LHS to operate incorrectly. Damage to equipment may result.
- If LHS OVERLOAD light illuminates and normal operation stops, return load to original position and redistribute or reduce payload weight, or equipment damage may occur.
- Ensure that parking brake is not applied before starting load sequence or damage to equipment may occur.

12. Move joystick (1) to LOAD, allowing vehicle to be pulled under flatrack.

WARNING



Ensure that flatrack/FRS runners contact LHS rear rollers correctly. Failure to comply may result in injury or death to personnel and damage to equipment.

PICKING UP A FLATRACK IN AUTO MODE - Continued

NOTE

LHS OVERLOAD light may illuminate when lifting flatrack from unusual conditions.

13. As load is lifted, vehicle will be pulled under flatrack. Some steering wheel adjustment may have to be made to ensure that flatrack runners (11) will contact rear rollers (12).

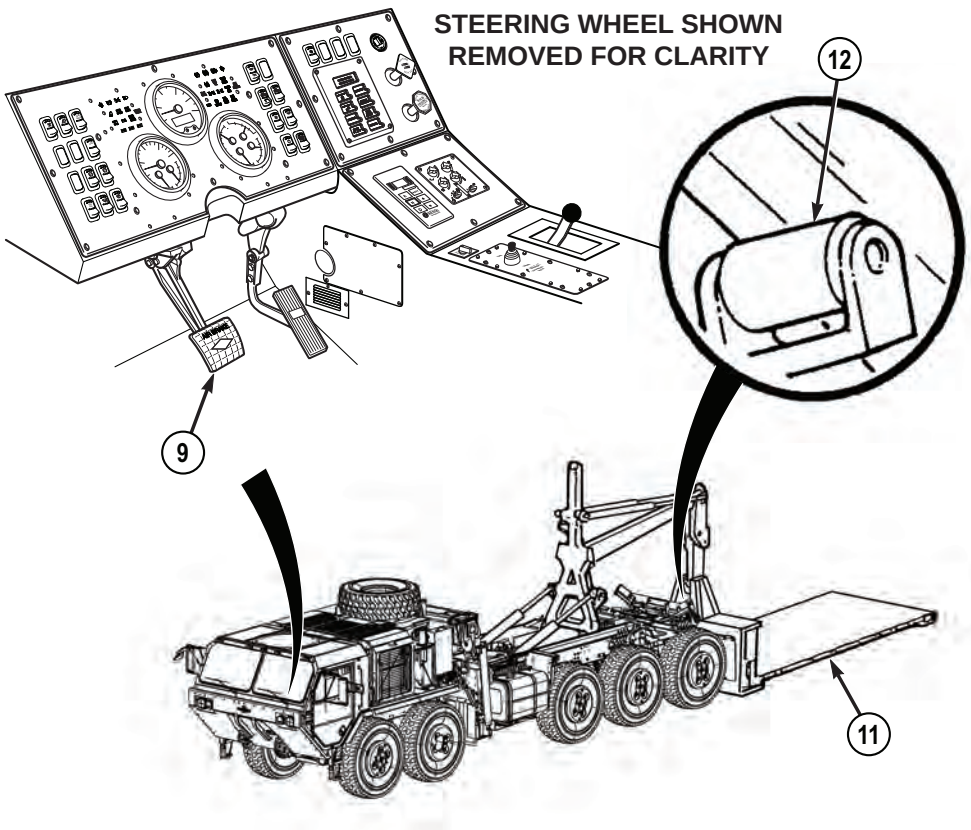


Figure 9.

CAUTION

Reduce engine speed to idle before flatrack main rails contact rear rollers or damage to flatrack may result.

14. As flatrack contacts rear rollers (12), reduce engine speed and apply service brake pedal (9).

PICKING UP A FLATRACK IN AUTO MODE - Continued

NOTE

If flatrack is being loaded in soft soil conditions, perform Steps (14) a through (14) c, then continue with Step (15).

a. Release joystick (1). Set hydraulic selector switch (2) to MAN H.A.

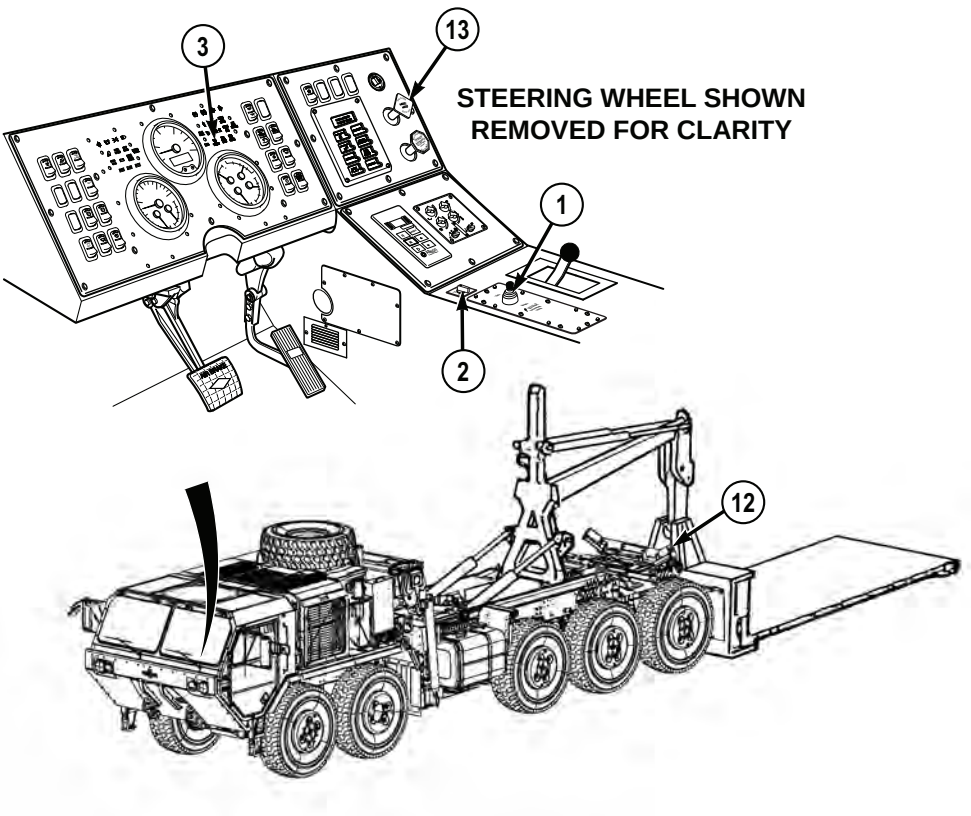


Figure 10.

b. Move joystick (1) to LOAD until flatrack is approximately 2 ft (609.6 mm) off the ground. Release joystick.

c. Set hydraulic selector switch (2) to AUTO. Resume normal AUTO operations.

NOTE

Engine speed will require increasing and decreasing in following steps to facilitate performance.

PICKING UP A FLATRACK IN AUTO MODE - Continued

15. After flatrack contacts rear rollers (12), increase engine speed to approximately 1,500 rpm until flatrack is nearly loaded. Reduce engine speed to idle.
16. Continue loading until engage flatrack is fully loaded and LHS NO TRANSIT light (3) extinguishes.
17. Release joystick (1).
18. Apply parking brake (13).

NOTE

If flatrack is not engaged in load locks, raise flatrack slightly and lower again. Flatrack should set completely and engage load locks.

19. Inspect that both load locks (14) have engaged and flatrack is completely down on vehicle.

PICKING UP A FLATRACK IN AUTO MODE - Continued

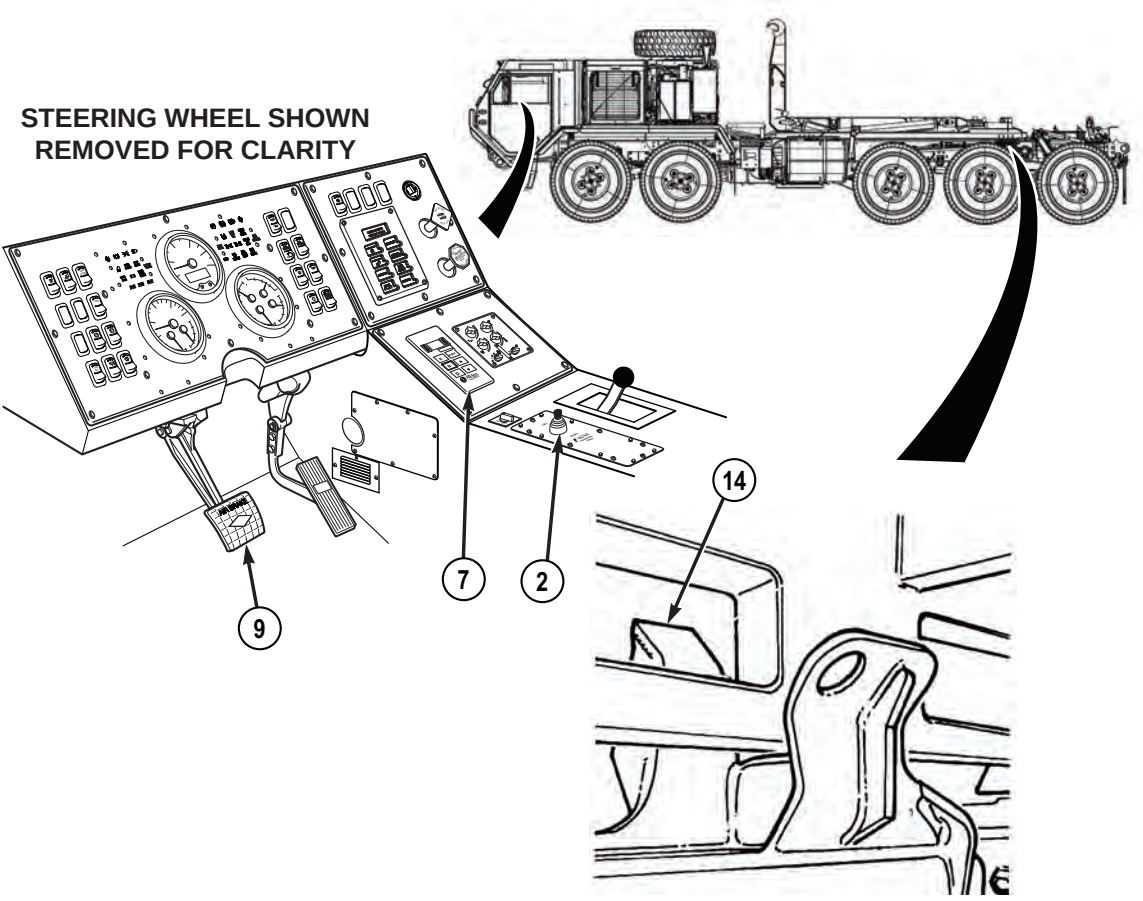


Figure 11.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Hydraulic selector switch must be in OFF position before driving, or hydraulic system could overheat.

20. Turn hydraulic selector switch (2) to OFF.

END OF TASK

OFF-LOADING FLATRACK IN AUTO MODE

1. Check area for sufficient operating room at front and rear of vehicle. Check overhead clearance and ground conditions.
2. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

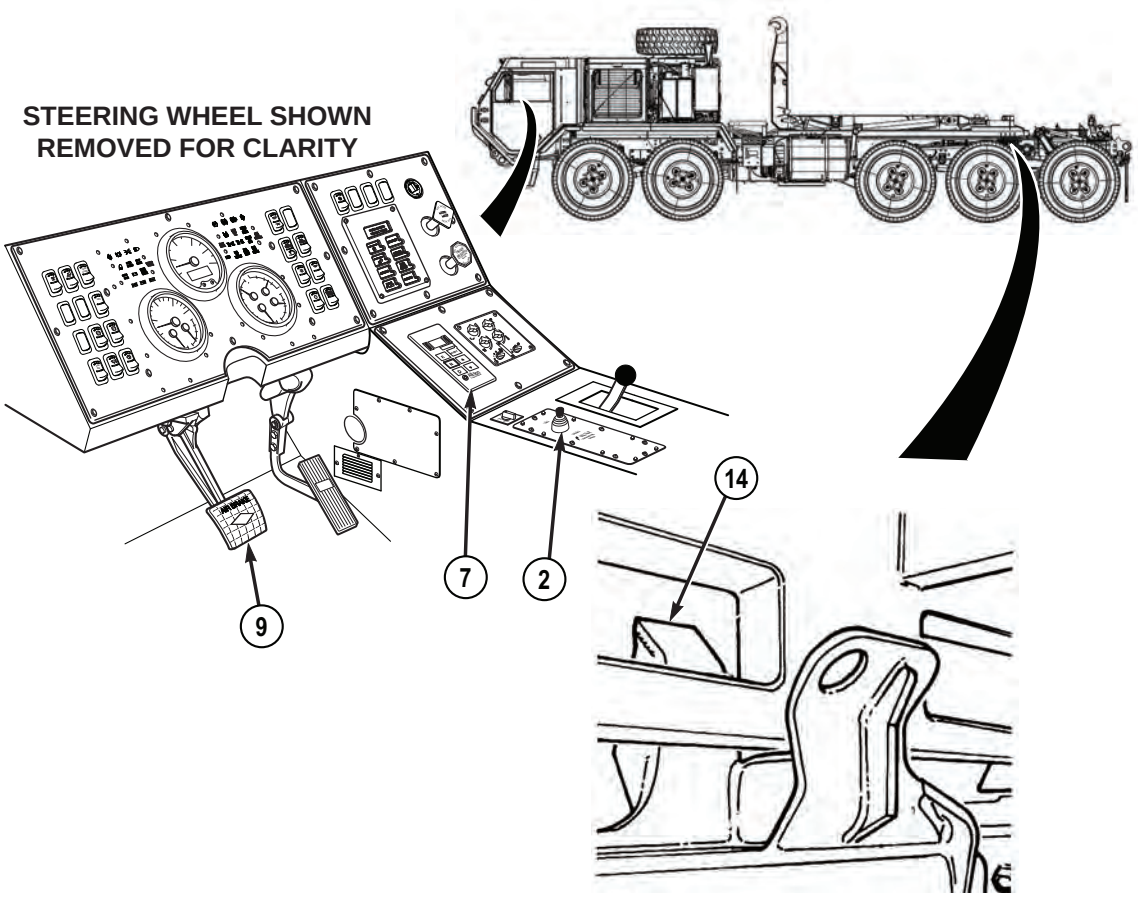


Figure 12.

CAUTION

Ensure parking brake is not applied during unload sequence, or damage to equipment may result.

3. Set hydraulic selector switch (2) to AUTO.

OFF-LOADING FLATRACK IN AUTO MODE - Continued

WARNING



When loading or unloading flatracks on uneven ground (downgrades up to 10 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle roll away. Failure to comply may result in injury or death to personnel.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

OFF-LOADING FLATRACK IN AUTO MODE - Continued

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

CAUTION

- Check that ground conditions where flatrack will be placed can support the flatrack weight, or damage to flatrack or LHS may result.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

4. Move joystick (1) to UNLOAD. Flatrack will start to move rearwards. LHS NO TRANSIT light (3) will illuminate. Maintain engine speed at idle until front of flatrack raises approximately 1 ft (305 mm).

OFF-LOADING FLATRACK IN AUTO MODE - Continued

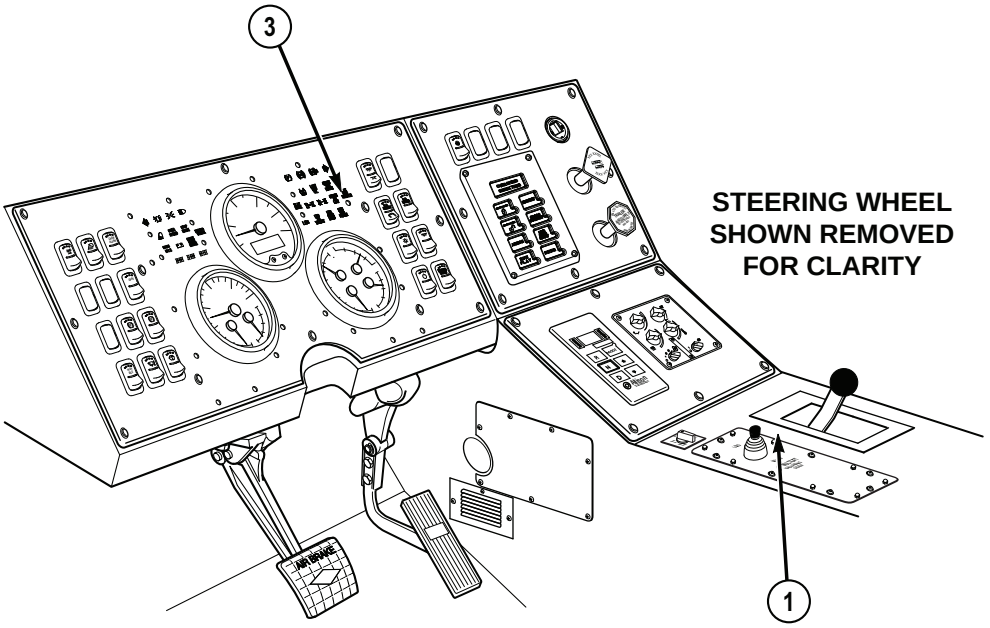


Figure 13.

NOTE

Loading and unloading times are controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

5. Continue to unload until rear suspension starts to lift and back edge of flatrack touches ground.
6. Release service brake pedal (9) and allow grounded flatrack to push the vehicle straight forward from under flatrack and clear.

OFF-LOADING FLATRACK IN AUTO MODE - Continued

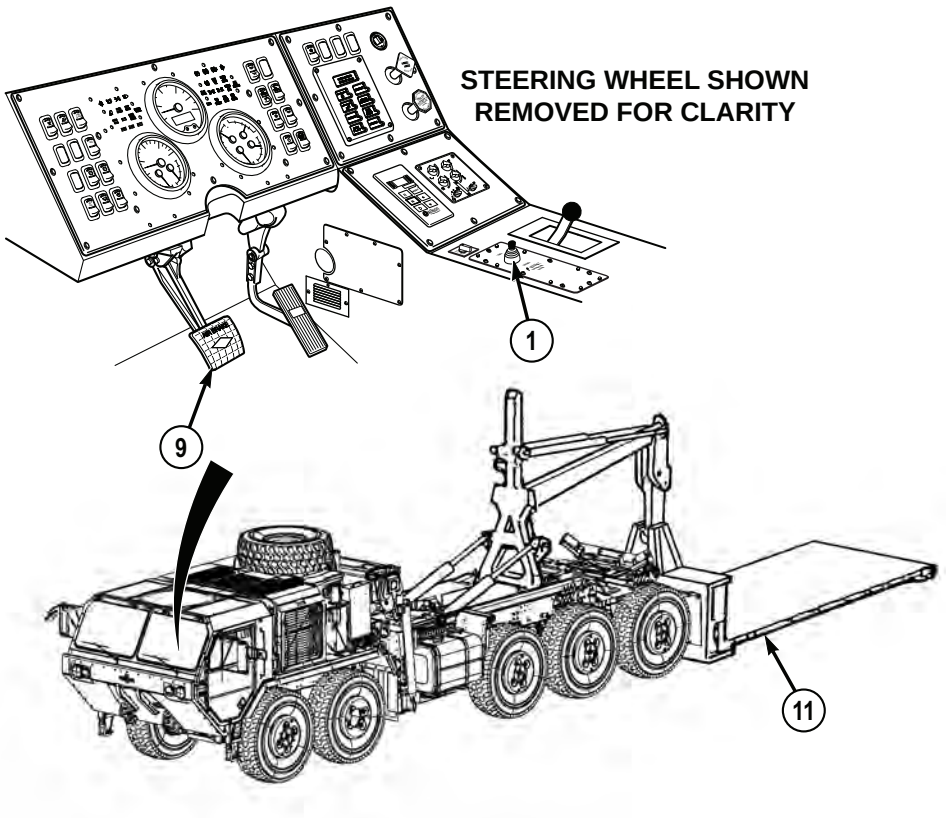


Figure 14.

7. When front of flatrack is within approximately 8.0 in. (203 mm) of ground, decrease engine speed to idle and apply service brake pedal.

CAUTION

Once vehicle's rear suspension has been relieved of flatrack load, do not continue in UNLOAD position as possibility of jacking up rear of vehicle with hook arm may occur and damage to equipment may result.

NOTE

If flatrack is extremely light or empty, it may be necessary to set transmission range selector to Drive (D) to allow vehicle to move out from under flatrack.

OFF-LOADING FLATRACK IN AUTO MODE - Continued

8. Continue off-loading until flatrack runners (11) are on ground and rear suspension is unloaded.
9. Release joystick (1) when flatrack runners (11) are resting on ground.

CAUTION

Do not use Reverse (R) to back up vehicle while hook arm is attached to flatrack, or damage to LHS will occur.

NOTE

Engine speed should be set at idle. However, slight increase in engine speed may be necessary depending on terrain.

10. Set transmission range selector (7) to Drive (D) and release service brake pedal (9).

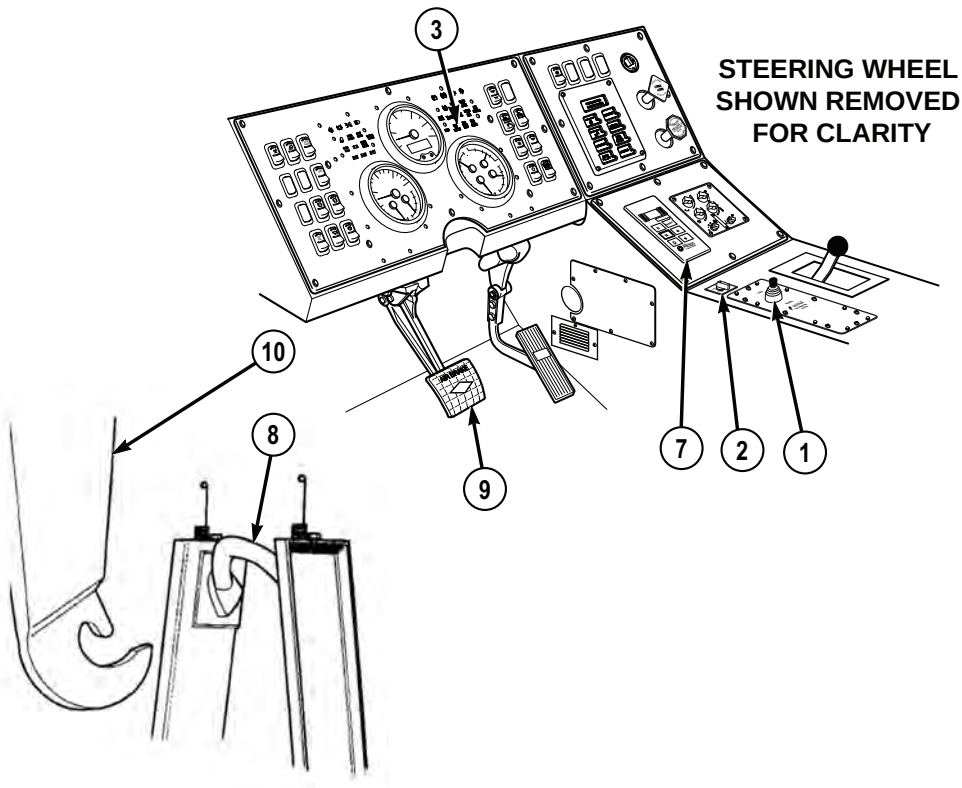


Figure 15.

OFF-LOADING FLATRACK IN AUTO MODE - Continued

11. Move joystick (1) to LOAD momentarily and then to UNLOAD to let lift-hook (10) disengage from hook-bar (8). Repeat Step (11) until hook disengages.
12. Move vehicle forward approximately 5 ft (1,524 mm).
13. Stop vehicle and set transmission range selector (7) to Neutral (N).

CAUTION

Never drive with LHS NO TRANSIT light illuminated. An illuminated light means load locks are not engaged and LHS is not fully stowed. Failure to comply may result in damage to equipment.

NOTE

Hook arm does not need to be fully stowed if more transfer operations are going to be made.

14. Move joystick (1) to LOAD until LHS is in transit position. LHS NO TRANSIT light (3) will extinguish indicating LHS is in transport position.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Hydraulic selector switch must be in OFF position before driving, or hydraulic system could overheat causing damage to equipment.

15. Release joystick (1) and turn hydraulic selector switch (2) to OFF.

END OF TASK

PICKING UP A FLATRACK IN MANUAL MODE

1. Set transmission range selector (7) to Reverse (R) and back vehicle up to the flatrack. Stop approximately 5 ft (1,524 mm) from hook-bar (8). Check for overhead obstructions and firmness of ground.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

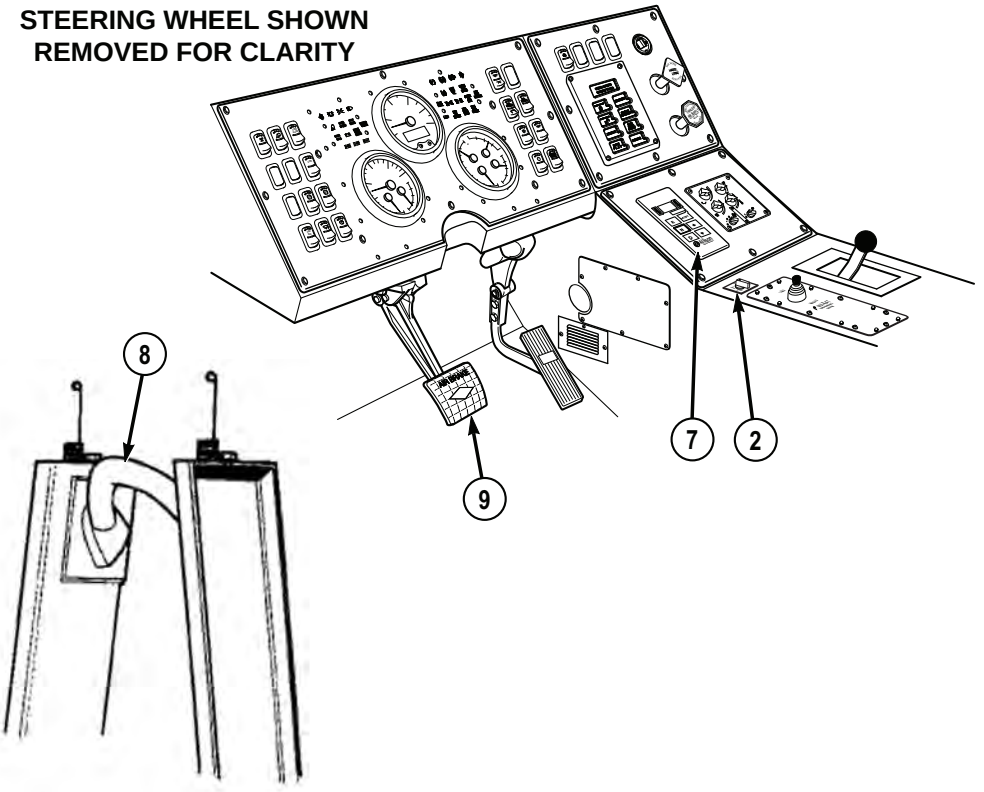


Figure 16.

2. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

CAUTION

- To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speeds above idle. Failure to comply may result in damage to equipment.
- Manual mode is used mainly in event of a failure of control electrical system. Greater care must be exercised during operation of MANUAL mode for correct cycle of events to occur or damage to equipment may result.

3. Turn hydraulic selector switch (2) to MAN H.A.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

NOTE

- LHS OVERLOAD light will come on when hook arm cylinders are fully extended and joystick is activated.
- Loading and unloading times are controlled by engine speed. Engine speed can be increased to 1,500 rpm to reduce loading and unloading times.

4. Move joystick (1) to UNLOAD and hold until hook arm cylinders (15) are fully extended.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

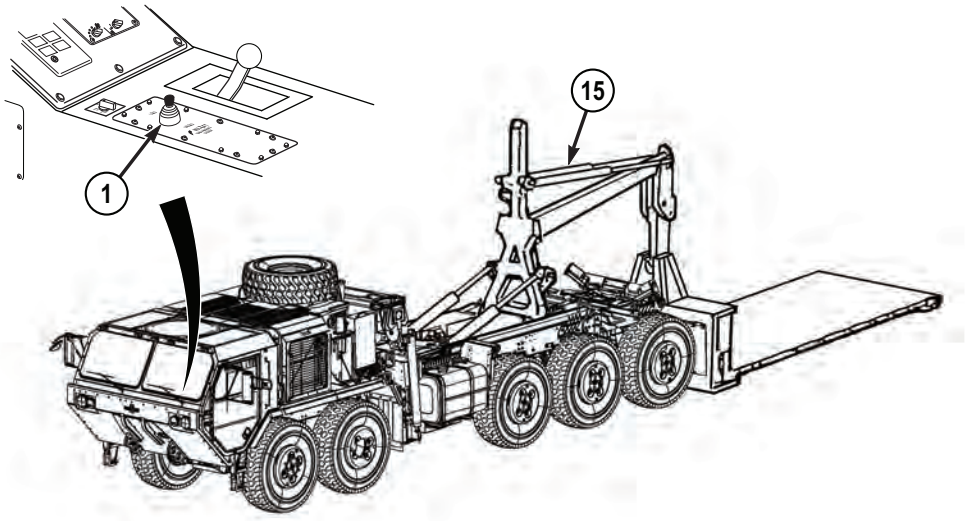


Figure 17.

5. Release joystick (1).

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- To avoid equipment damage, ensure that main frame cylinders do not complete full extension while operating at engine speeds above idle.
- Manual mode is used mainly in event of a failure of control electrical system. Greater care must be exercised during operation of MANUAL mode for correct cycle of events to occur or damage to equipment may result.
- If LHS had previously been used in Manual Mode and not completely stowed in Auto Mode, the hook arm cylinders must be completely extended or the LHS must be completely stowed using Auto Mode before the flatrack can be loaded. Failure to comply may result in damage to the vehicle and flatrack.

6. Turn hydraulic selector switch (2) to MAN M.F.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

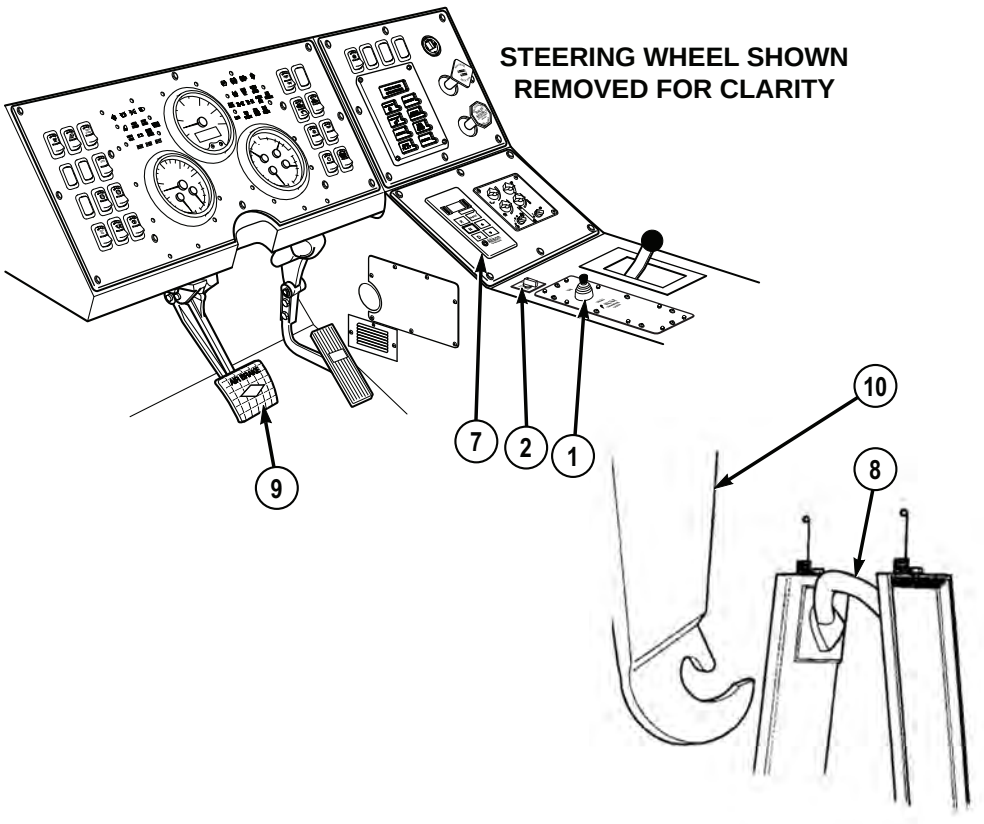


Figure 18.

7. Move joystick (1) to UNLOAD and hold until lift-hook (10) has moved below level of flatrack hook-bar (8).
8. Apply service brake pedal (9) and set transmission range selector (7) to Reverse (R) and back vehicle up to flatrack, aligning vehicle and flatrack as straight as possible with lift-hook (10) to the middle of hook-bar (8).
9. Stop vehicle when lift-hook (10) touches flatrack.
10. Leave vehicle in reverse gear with engine at idle.

CAUTION

- Ensure parking brake is not applied during unload sequence, or damage to equipment may result.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

- Do not use Reverse (R) to back up vehicle while hook arm is attached to flatrack or damage to LHS will occur.

11. Move joystick (1) to LOAD to engage lift-hook (10) and hook-bar (8).

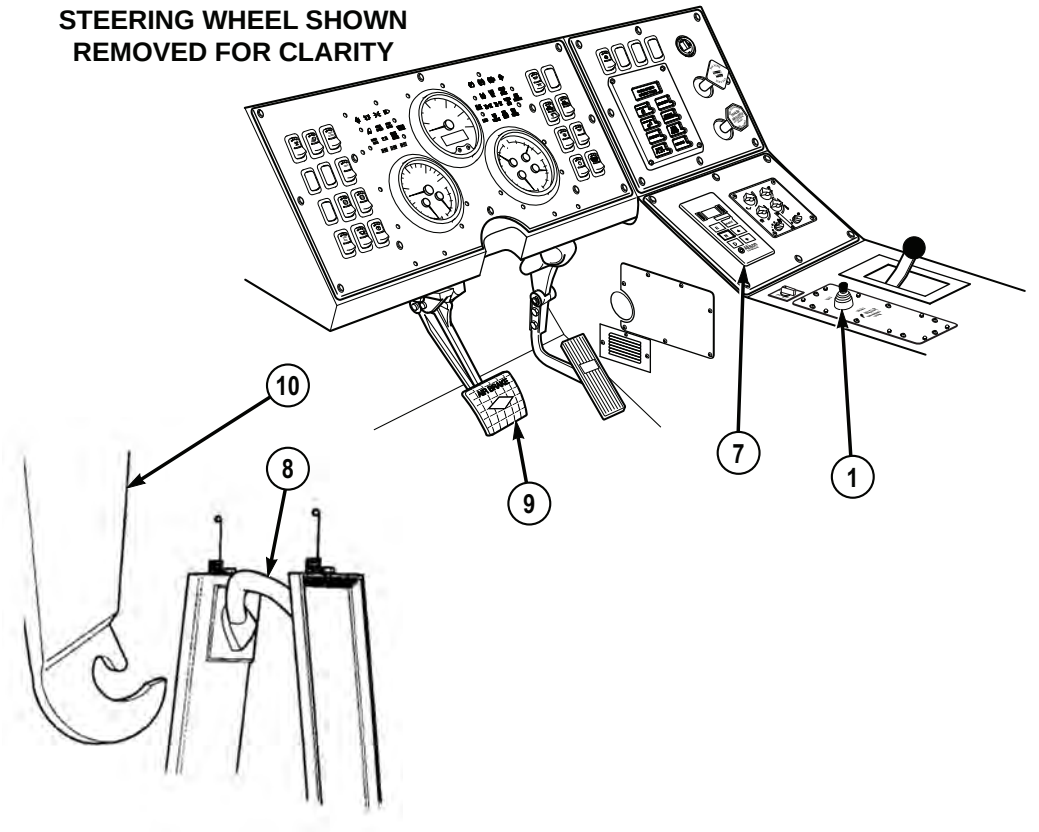


Figure 19.

12. If lift-hook (10) fails to engage hook-bar (8):
    a. Release joystick (1).
    b. Set transmission range selector (7) to Drive (D), release service brake pedal (9) and move vehicle forward just clear of flatrack.
    c. Move joystick (1) to UNLOAD until lift-hook (10) is below level of hook-bar (8).
    d. Repeat Steps (8) through (11).

PICKING UP A FLATRACK IN MANUAL MODE - Continued

WARNING



When loading or unloading flatracks on uneven ground (downgrades up to 10 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle roll away. Failure to comply may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

13. Set transmission range selector (7) to Neutral (N) and release service brake pedal (9).

CAUTION

- If LHS OVERLOAD light illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation, operator should determine if payload is evenly distributed on flatrack or if flatrack load exceeds 16.5 tons (14,969 kg). If any of these conditions exist, operator must redistribute or reduce payload or damage to equipment may result.
- Ensure that parking brake is not applied before starting load sequence, or damage to equipment may result.

14. Move joystick (1) to LOAD, allowing vehicle to be pulled under flatrack.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

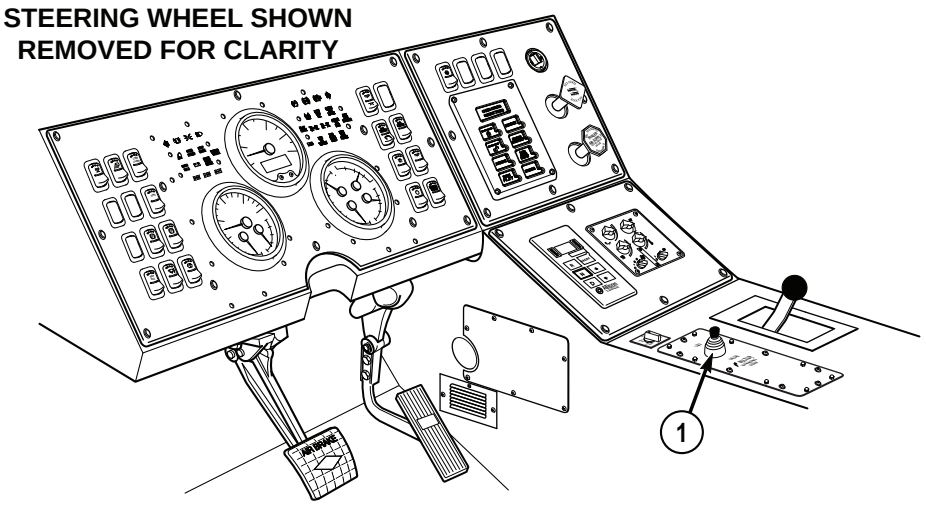


Figure 20.

WARNING



Ensure that flatrack/FRS runners contact LHS rear rollers correctly. Failure to comply may result in injury or death to personnel and damage to equipment.

CAUTION

Reduce engine speed to idle before flatrack main rails contact rear rollers. Damage to flatrack may result.

NOTE

- As load is lifted, vehicle will be pulled under the flatrack. Some steering adjustment may have to be made to ensure that flatrack runners will contact rear rollers.
- If flatrack is being loaded in soft soil conditions, perform Steps (15) a through (15) c, then continue with Step (16).

15. Before flatrack contacts rear rollers (12), reduce engine speed and apply service brake pedal (9).

PICKING UP A FLATRACK IN MANUAL MODE - Continued

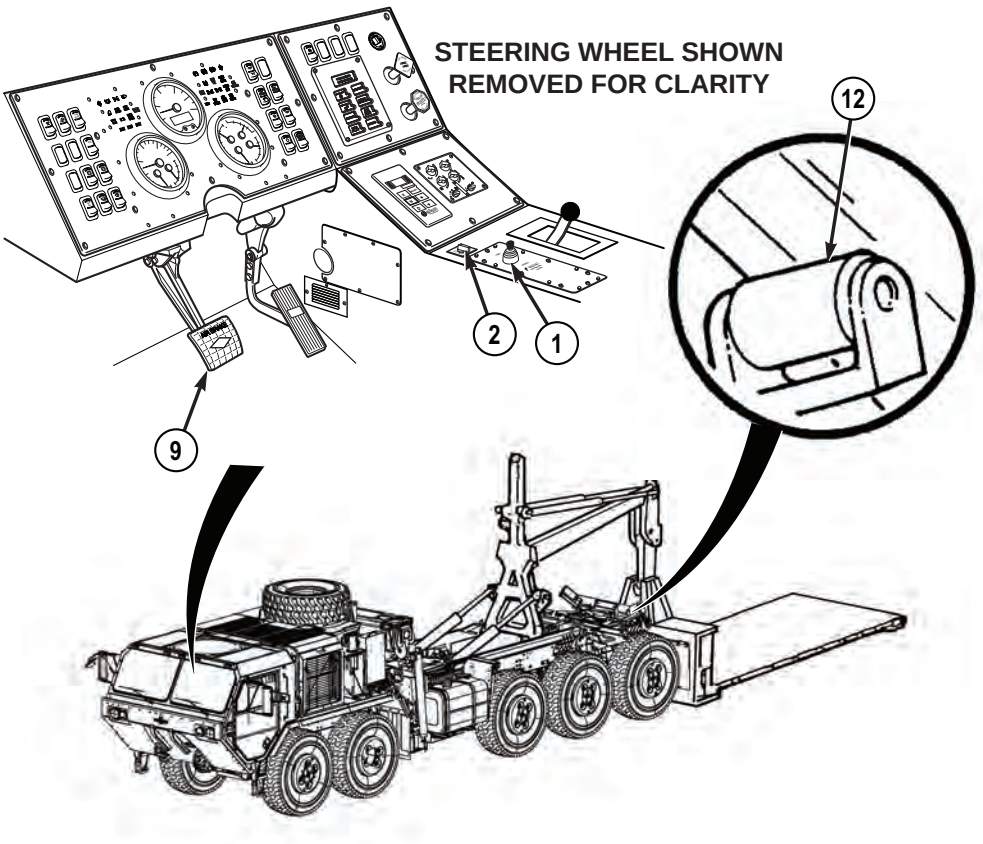


Figure 21.

a. Release joystick (1). Set hydraulic selector switch (2) to MAN H.A.

b. Move joystick (1) to LOAD until flatrack is approximately 2 ft (610 mm) off the ground. Release joystick.

c. Set hydraulic selector switch (2) to MAN M.F. operations.

CAUTION

To avoid equipment damage, visually check that main frame cylinders do not complete full retraction while operating at engine speeds above idle.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

NOTE

Engine speed will require increasing and decreasing in the following steps.

16. After flatrack contacts rear rollers (12), increase engine speed to approximately 1,500 rpm until main frame cylinders (16) have nearly completed full retraction.

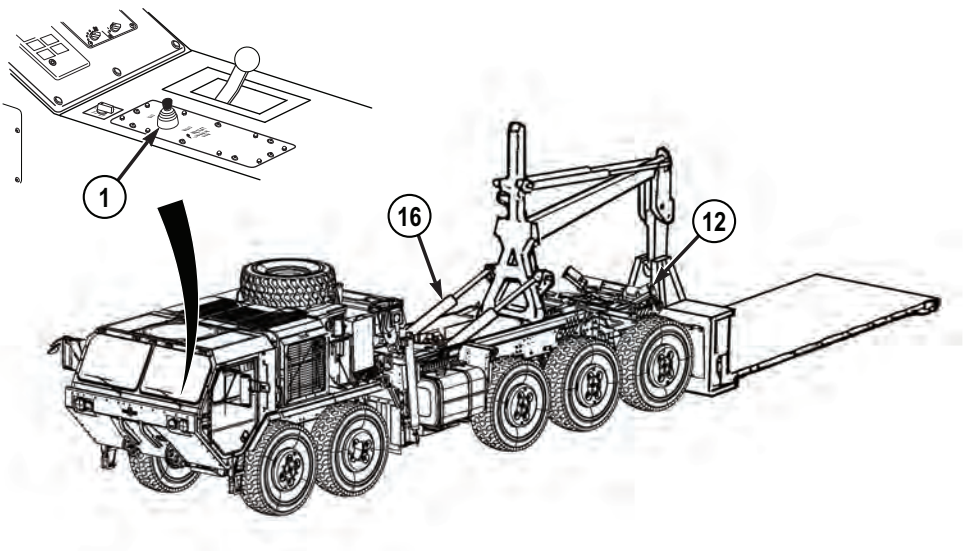


Figure 22.

CAUTION

Failure to reduce engine speed to idle could result in severe damage to LHS components.

17. Reduce engine speed to idle and continue loading until main frame cylinders are fully retracted.

NOTE

LHS OVERLOAD light will come on when main frame cylinders are fully retracted and joystick is activated.

18. Release joystick (1).

PICKING UP A FLATRACK IN MANUAL MODE - Continued

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Failure to reduce engine speed to idle could result in severe damage to LHS components.

19. Turn hydraulic selector switch (2) to MAN H.A.

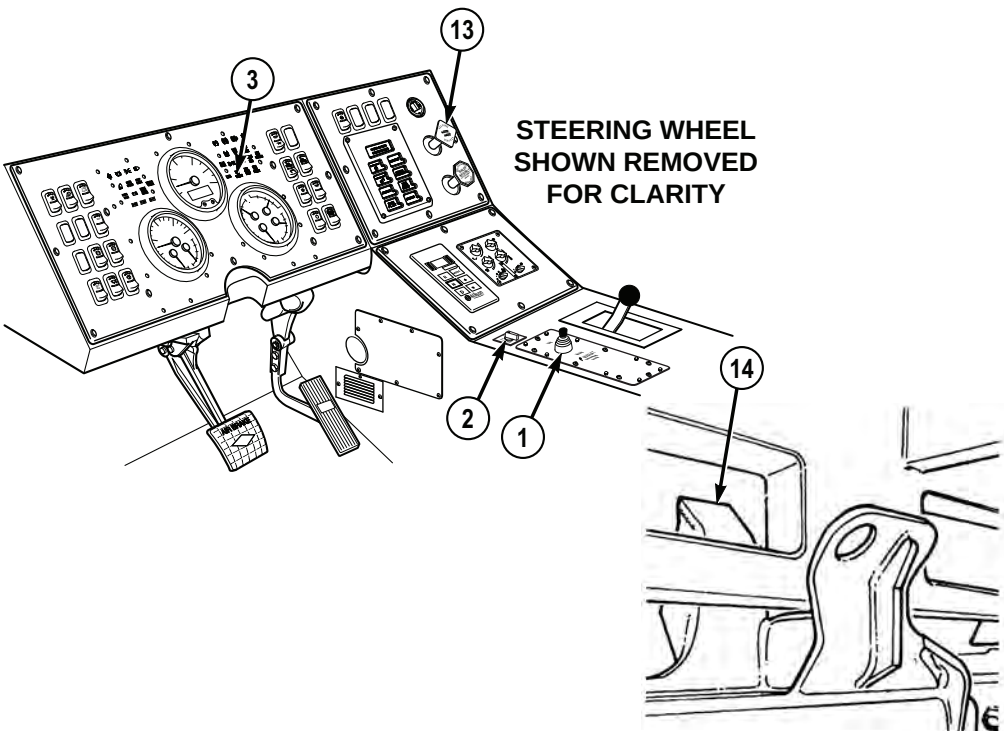


Figure 23.

20. Move joystick (1) to LOAD position and increase engine speed until flatrack is nearly loaded, then reduce speed to idle.
21. Continue to load until LHS and flatrack is in transit position. LHS NO TRANSIT light (3) will extinguish.
22. Release joystick (1).
23. Apply parking brakes (13).
24. Ensure that load locks (14) have engaged and flatrack is fully down on vehicle.

PICKING UP A FLATRACK IN MANUAL MODE - Continued

CAUTION

- Hydraulic selector switch must remain MAN TRANS while vehicle is travelling or damage to equipment may result.
- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

25. Turn hydraulic selector switch (2) to MAN TRANS.

END OF TASK

OFF-LOADING FLATRACK IN MANUAL MODE

1. Check for sufficient operating room at front and rear of vehicle. Check overhead clearance and ground conditions.
2. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

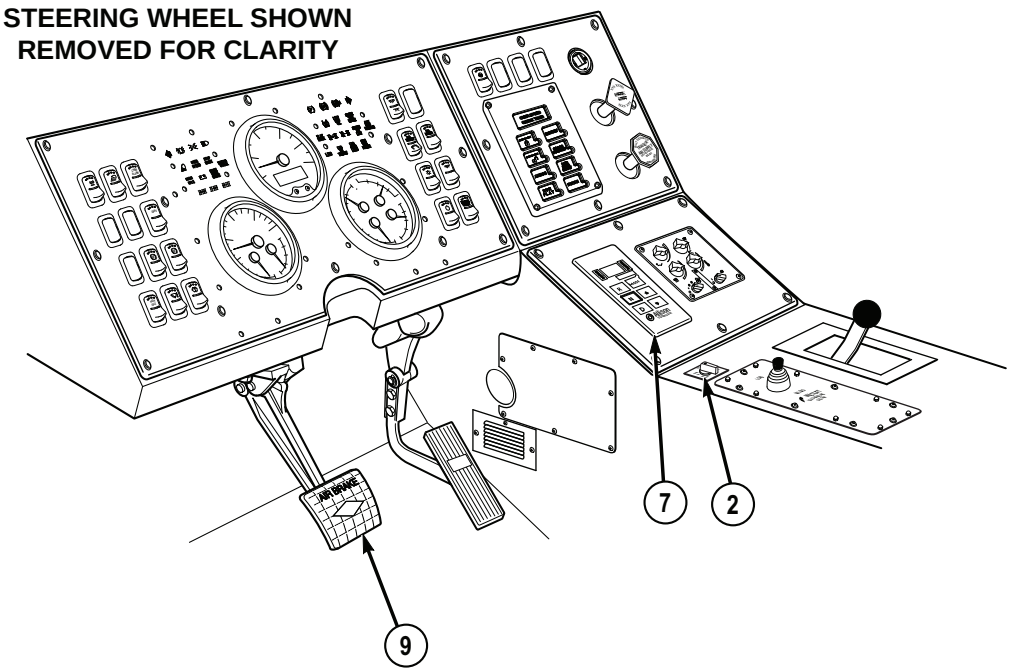


Figure 24.

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

CAUTION

Manual mode is used mainly in event of a failure of control electrical system. Greater care must be exercised during operation of MANUAL mode for correct cycle of events to occur or damage to equipment may result.

3. Turn hydraulic selector switch (2) to MAN H.A.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

CAUTION

- Reduce speed to idle in last 12.0 in. (30 cm) of travel to prevent damage to cylinder.
- To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speeds above idle.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

4. Move joystick (1) to UNLOAD until hook arm cylinders (15) have fully extended. Maintain engine speed at idle for approximately the first 18.0 in. (457 mm) and last 6.0 in. (152 mm) of movement.

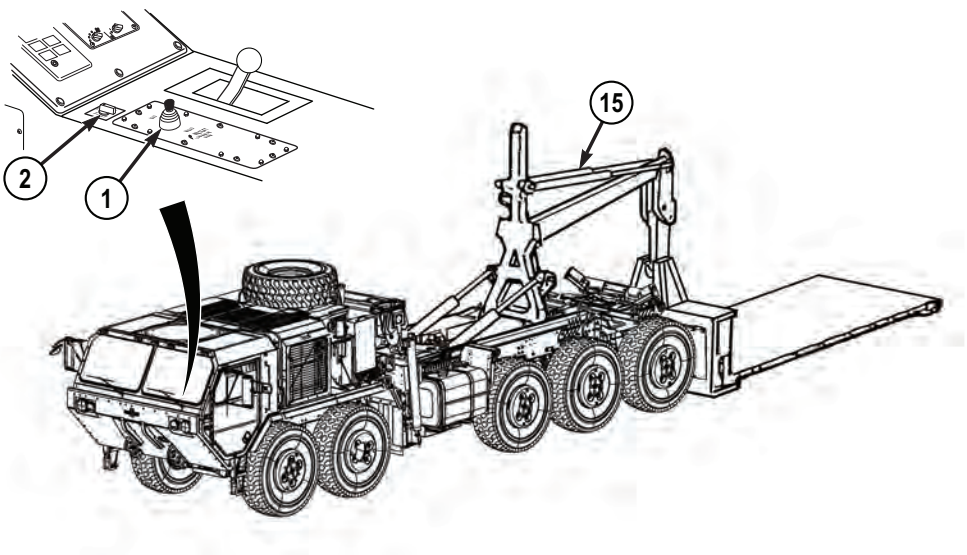


Figure 25.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Ensure parking brake is released before starting the unload sequence, or damage to equipment may result.

5. Release joystick (1).

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

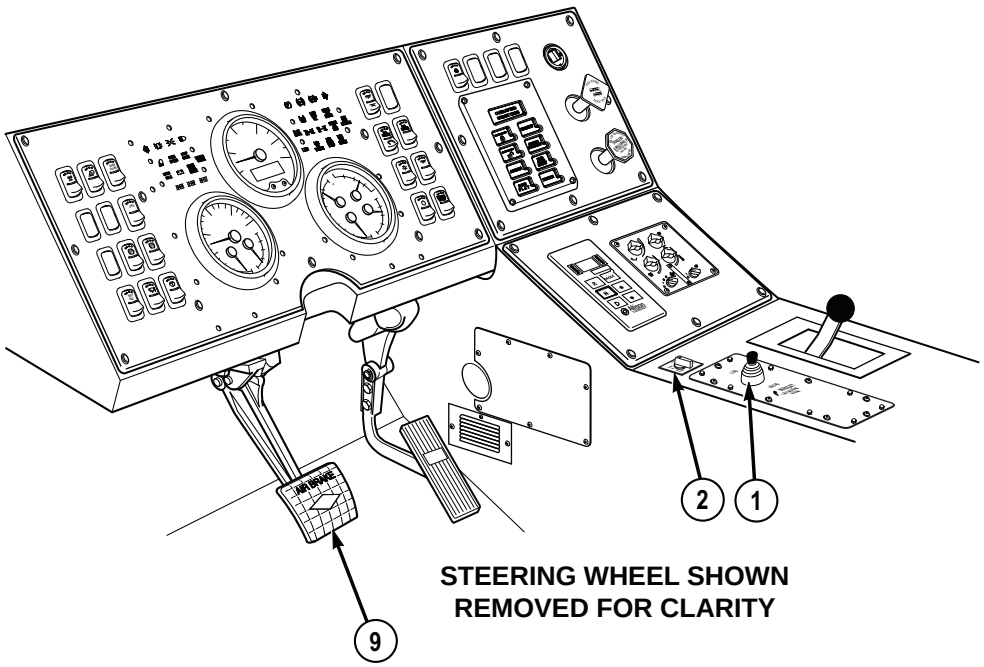


Figure 26.

6. Turn hydraulic selector switch (2) to MAN M.F.
7. Move joystick (1) to UNLOAD.

WARNING



When loading or unloading flatracks on uneven ground (downgrades up to 10 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle roll away. Failure to comply may result in injury or death to personnel.

NOTE

If flatrack is extremely light or empty, it may be necessary to set transmission range selector to Drive (D) to allow vehicle to move out from under flatrack.

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

8. When back edge of flatrack touches ground, release service brake pedal (9) allowing vehicle to be pushed straight from under flatrack.
9. Continue off-loading until front of flatrack is within 8.0 in. (203 mm) of ground, decrease engine speed to idle and apply service brake pedal (9).

CAUTION

Once suspension has been relieved of flatrack load, do not continue in UNLOAD position or rear of vehicle could jack up with hook arm and equipment damage may result.

10. Continue off-loading until flatrack is on ground and rear suspension is unloaded.
11. Release joystick (1).

NOTE

Engine speed should be set at idle. However, slight increase in engine speed may be necessary depending on terrain.

12. Set transmission range selector (7) to Drive (D) and release service brake pedal (9).

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

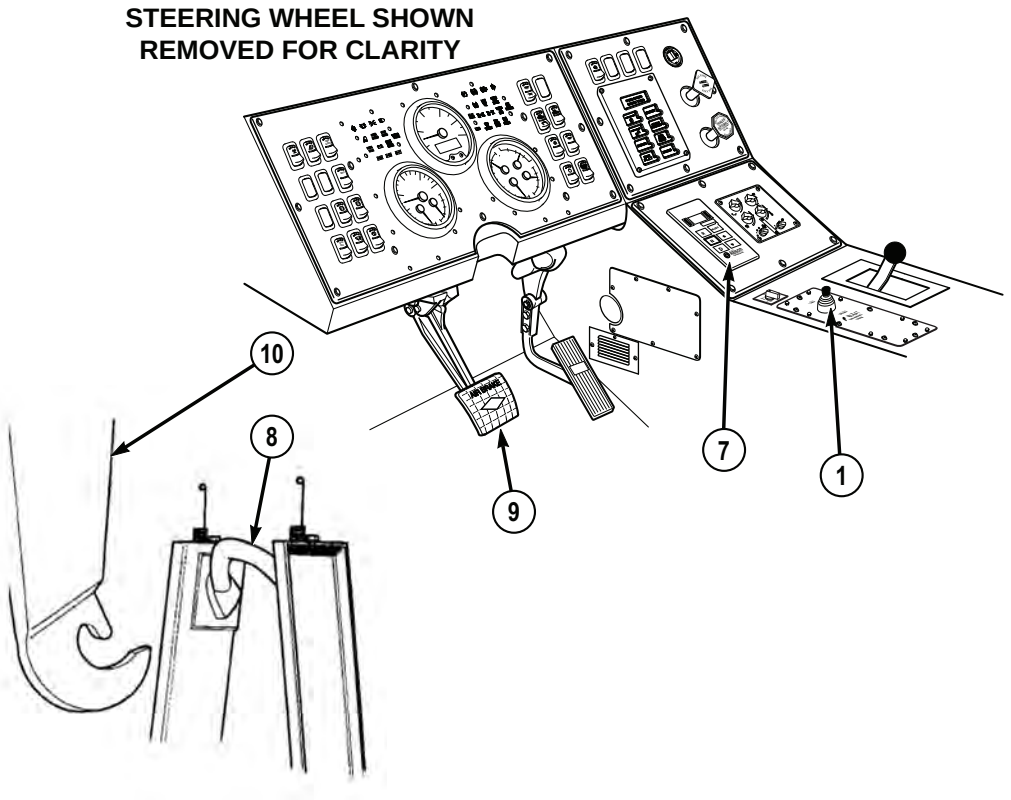


Figure 27.

13. Move joystick (1) to LOAD momentarily and then to UNLOAD to let lift-hook (10) disengage from hook-bar (8). Repeat Step (13) until lift-hook disengages.
14. Move vehicle forward approximately 5 ft (1,524 mm).
15. Stop vehicle and set the transmission range selector (7) to Neutral (N).

NOTE

- To avoid equipment damage, visually check that main frame cylinders have completed full retraction.
- Reduce speed to idle in last 12.0 in. (30 cm) of travel to prevent damage to cylinders.

16. Move joystick (1) to LOAD and hold in this position until main frame cylinders are fully retracted.

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

17. Turn hydraulic selector switch (2) to MAN H.A.

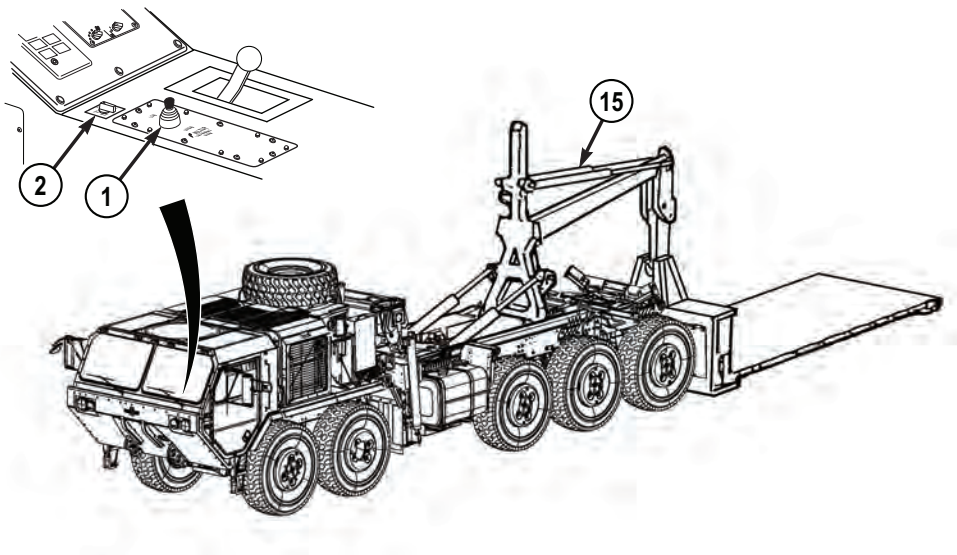


Figure 28.

18. Hold joystick (1) in LOAD position until hook arm cylinders (15) are fully retracted.
19. Release joystick (1).

WARNING



Never drive with LHS NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose. Failure to comply may result in injury or death to personnel and damage to equipment.

OFF-LOADING FLATRACK IN MANUAL MODE - Continued

CAUTION

Hydraulic selector switch must remain in MAN TRANS while vehicle is traveling or hydraulic system will overheat.

20. Turn hydraulic selector switch (2) to MAN TRANS.

END OF TASK

NORMAL TRANSFER OF FLATRACK TO TRAILER

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

WARNING



Trailer wheels must be chocked during transfer operations. Refer to TM 9-2330-385-10. Failure to comply may result in injury or death to personnel.

CAUTION

- Ensure that trailer drawbar is down against the ground during transfer operations, or damage to equipment may result.
- If trailer is equipped with trailer drawbar extension kit, drawbar extension must be in stowed position or damage to equipment may result.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

- Both of the trailer bumper points must be under the vehicle bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the vehicle bumper stop cannot exceed 0.5 in. (12.7 mm) or flatrack will miss main rail guides and equipment damage may result.

1. Ensure air lines and cables are properly stowed to prevent damage to equipment. Refer to TM 9-2330-385-14 (Volume 2, WP 0146).

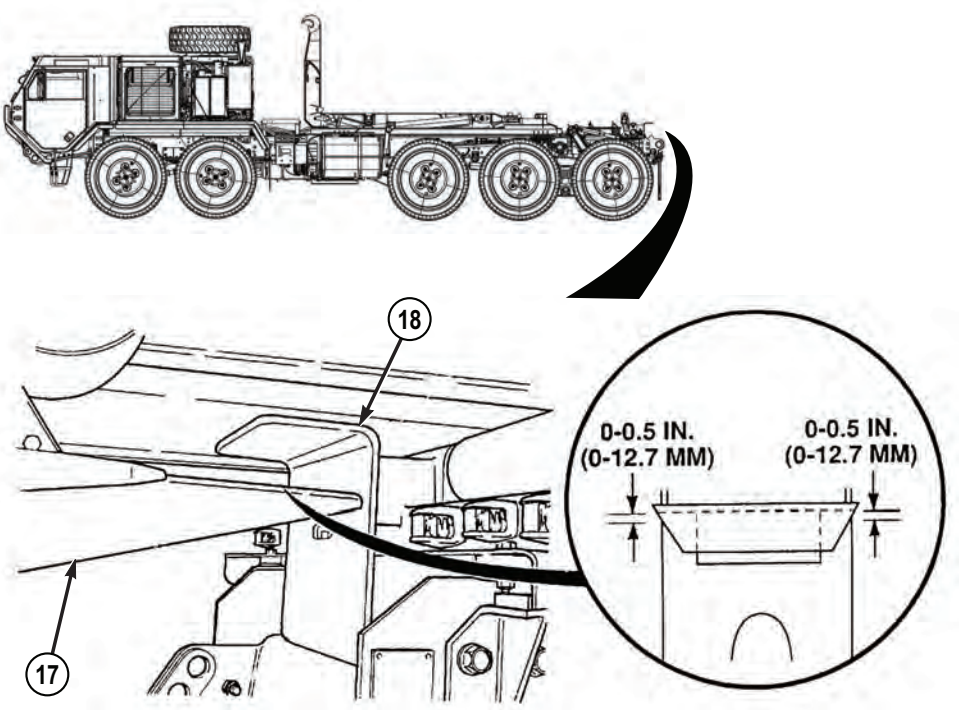


Figure 29.

2. Back up vehicle so that trailer bumper (17) is under flange and contacts vehicle bumper stop (18).
3. Apply parking brakes (13) and set transmission range selector (7) to Neutral (N).

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

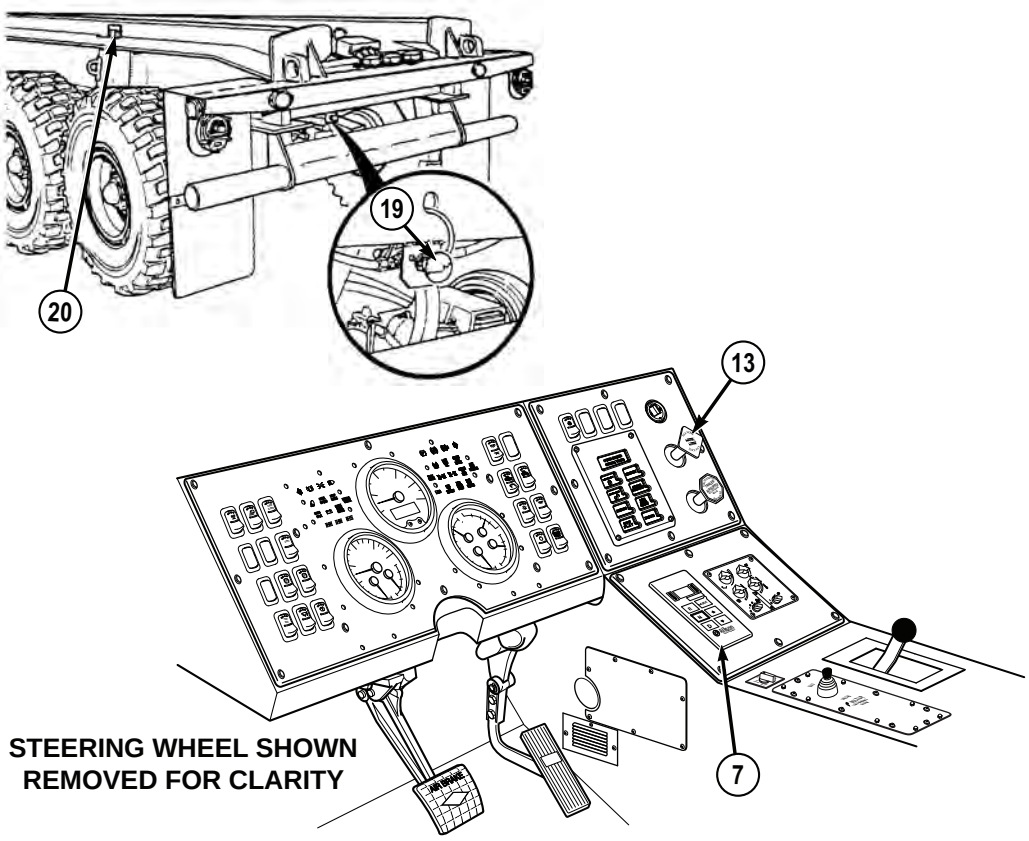


Figure 30.

WARNING



When operating vehicle with M1076 trailer, the heaviest loaded flatrack must always be placed on the vehicle, otherwise adverse handling and/or braking may result. Failure to comply may result in injury or death to personnel.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

WARNING



Ensure trailer air system is pressurized prior to beginning transfer or flatrack locks may not properly engage/disengage. Failure to comply may result in injury or death to personnel.

CAUTION

There must be sufficient air pressure in trailer air system to retract flatrack locks or damage to flatrack locks can occur while attempting to load flatrack or trailer. If not, use vehicle to charge trailer air system using trailer air charging hose. If air system cannot retract flatrack locks, use manual flatrack lock retract procedure (TM 9-2330-385-14) (Volume 2, WP 0146).

4. Push in on knob (19) and retract flatrack locks (20) on trailer. See TM 9-2330-385-14 (Volume 2, WP 0146).

CAUTION

Ensure both flatrack locks are fully retracted, or damage to equipment may result.

5. Inspect that both flatrack locks (20) are fully retracted.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

6. Turn hydraulic selector switch (2) to AUTO.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

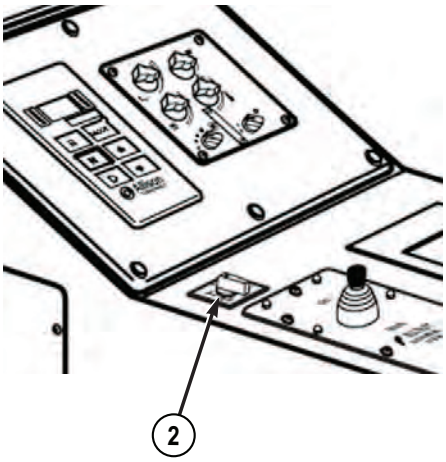


Figure 31.

WARNING



When loading or unloading flatracks on uneven ground (downgrades up to 10 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle roll away. Failure to comply may result in injury or death to personnel.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

WARNING



Trailer wheels must be chocked during transfer operations. Refer to TM 9-2330-385-10. Failure to comply may result in injury or death to personnel.

CAUTION

- Load must be evenly distributed on flatrack. Uneven load distribution may cause LHS Overload indicator to give false signals and cause LHS to operate incorrectly.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

7. Move joystick (1) to UNLOAD until flatrack rollers (21) contact trailer.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

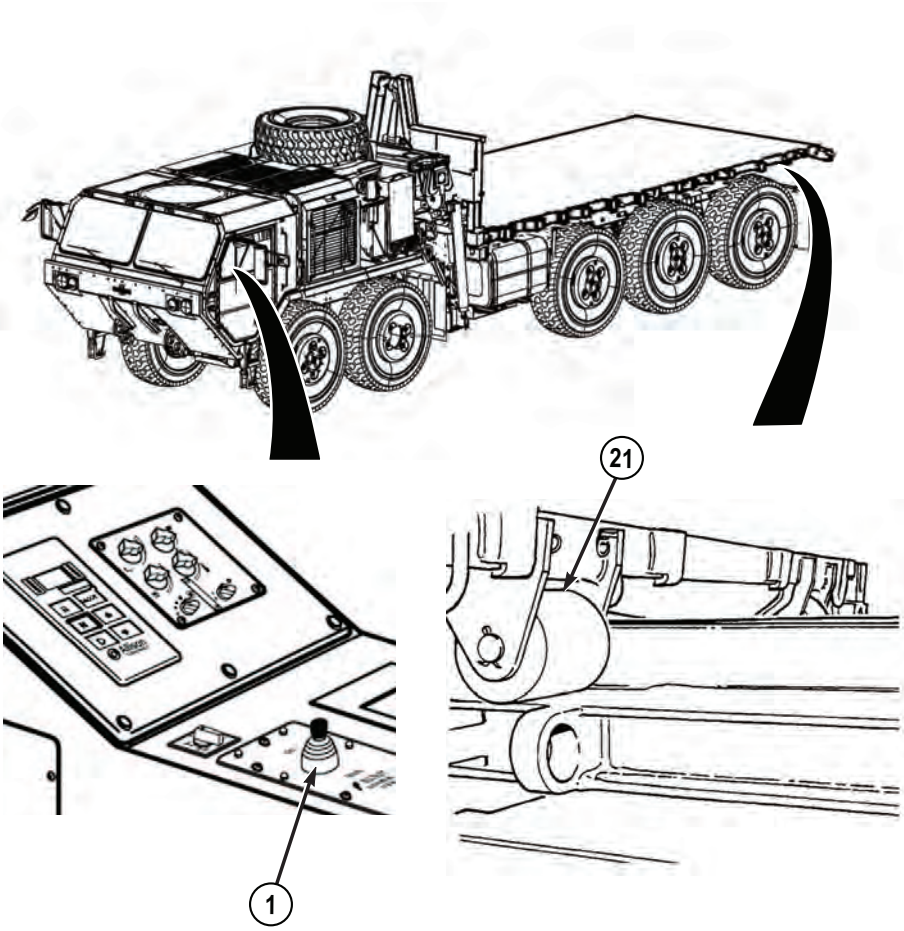


Figure 32.

8. Release joystick (1).
9. Inspect and verify trailer guides (22) are lined up between flatrack main rails (23).

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

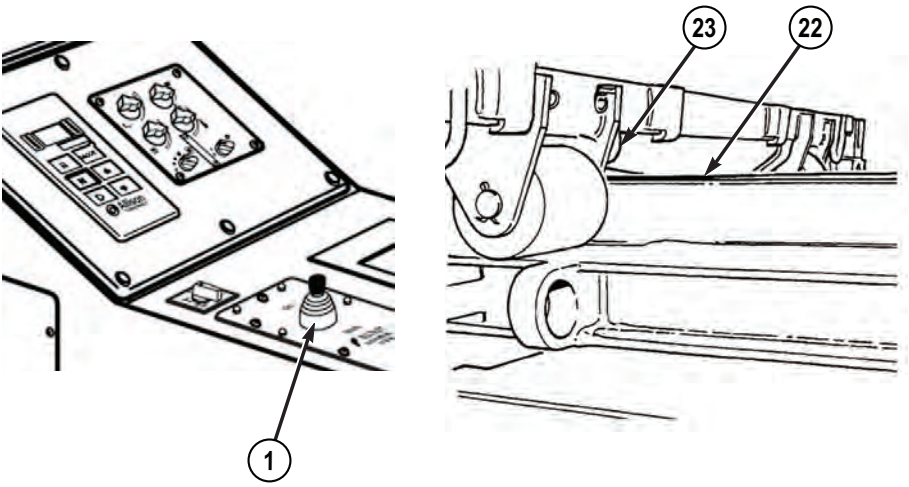


Figure 33.

NOTE

If not aligned, perform Step (10). If aligned, go to Step (11).

10. If not aligned:
    a. Move joystick (1) to LOAD.
    b. When flatrack is fully reloaded, release joystick (1).
    c. Repeat Steps (6) through (8).
11. Move joystick (1) to UNLOAD until flatrack is seated on trailer.
12. Release joystick (1).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

13. Turn hydraulic selector switch (2) to MAN H.A.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

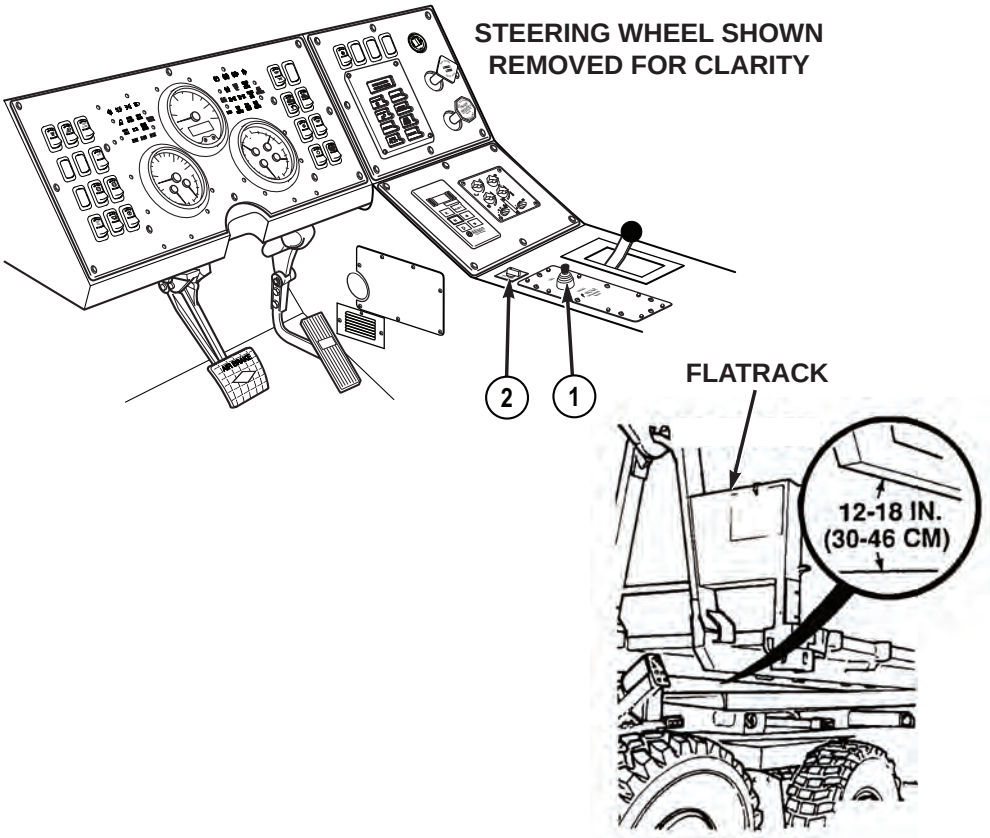


Figure 34.

14. Move joystick (1) to LOAD until front of flatrack is raised approximately 12.0 to 18.0 in. (305 to 457 mm) above trailer deck height.
15. Turn hydraulic selector switch (2) to MAN M.F.
16. Move joystick (1) to UNLOAD until flatrack rollers (21) contact rear trailer stops (24) and front of flatrack guides are seated on trailer.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

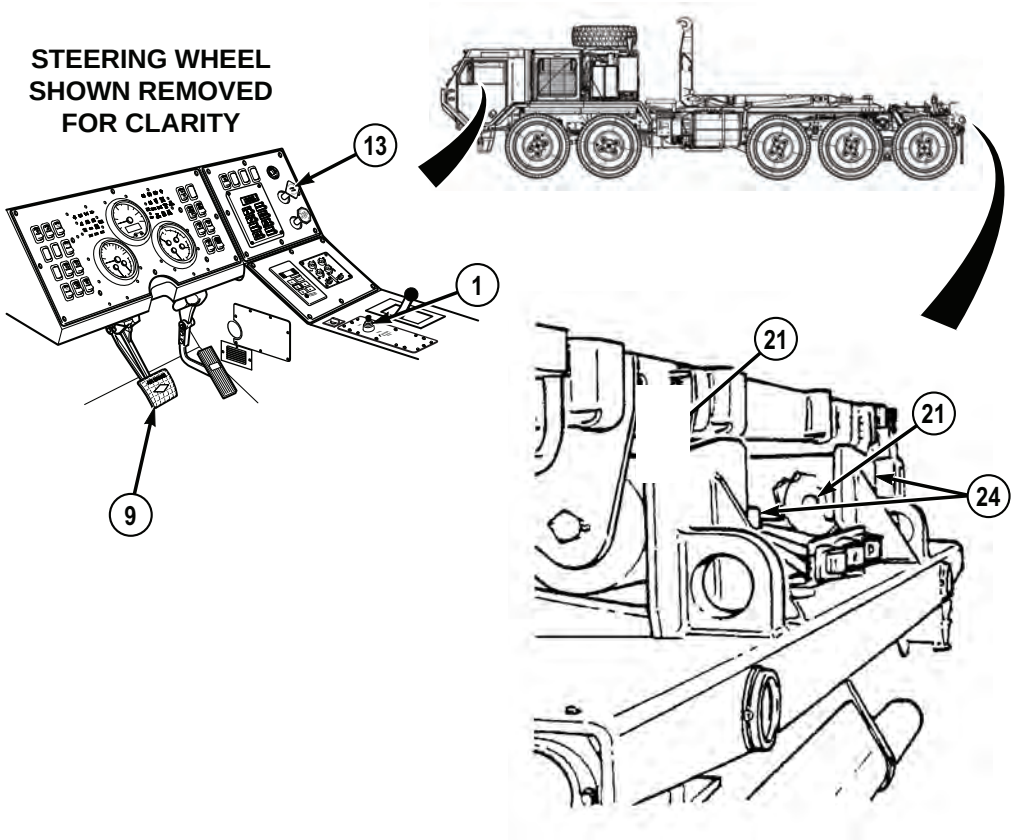


Figure 35.

17. Release joystick (1).
18. Inspect that rear rollers (21) on flatrack have contacted rear trailer stops (24).
19. Apply service brake pedal (9).
20. Release vehicle parking brakes (13).

NOTE

It may be necessary to repeat Steps (21) through (23) several times to clear hook arm from hook-bar.

21. Move joystick (1) to LOAD to allow top of lift-hook (10) to clear hook-bar (8).

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

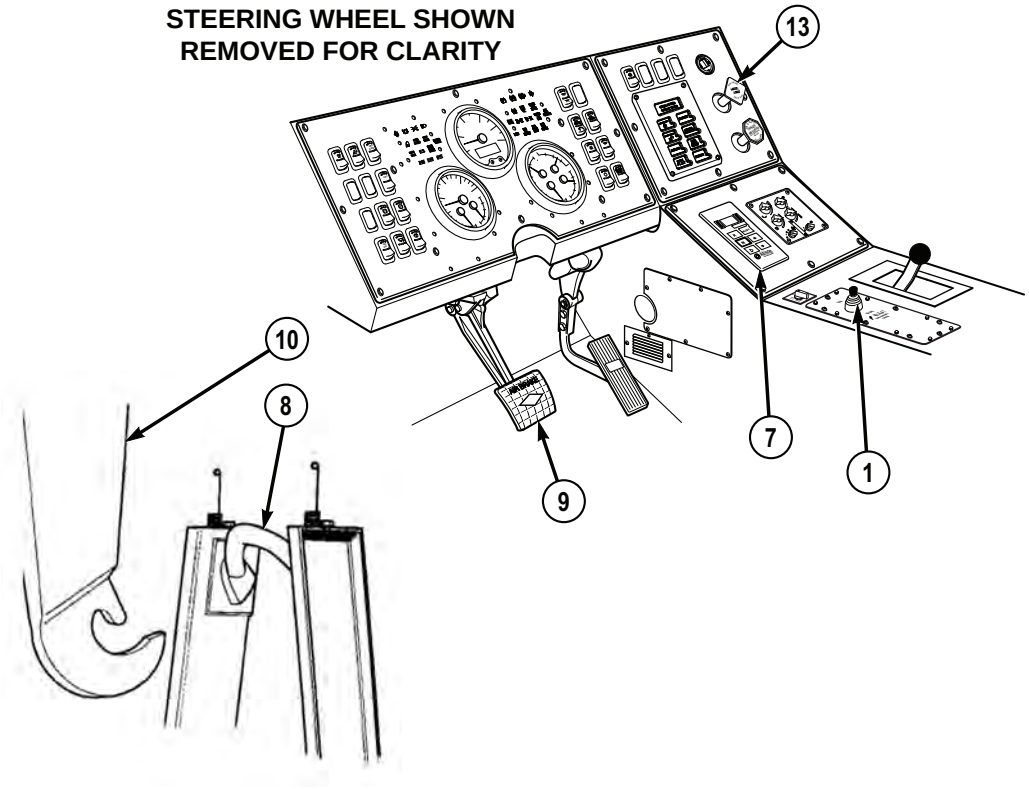


Figure 36.

22. Move joystick (1) to UNLOAD to disengage lift-hook (10) from hook-bar (8).
23. Set transmission range selector (7) to Neutral (N) and apply vehicle parking brakes (13).
24. Inspect that rear flatrack rollers (21) have contacted trailer stops (24).

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

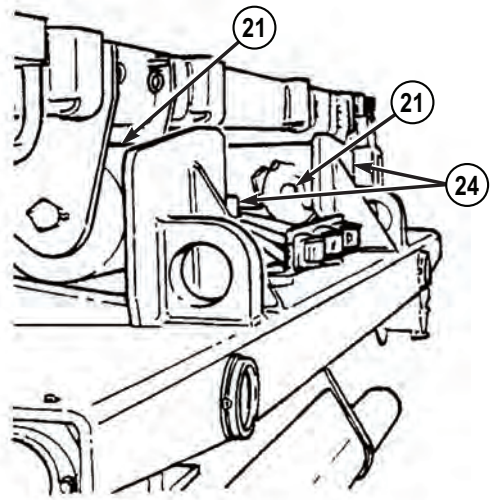


Figure 37.

25. Pull knob (19) and engage flatrack locks (20).

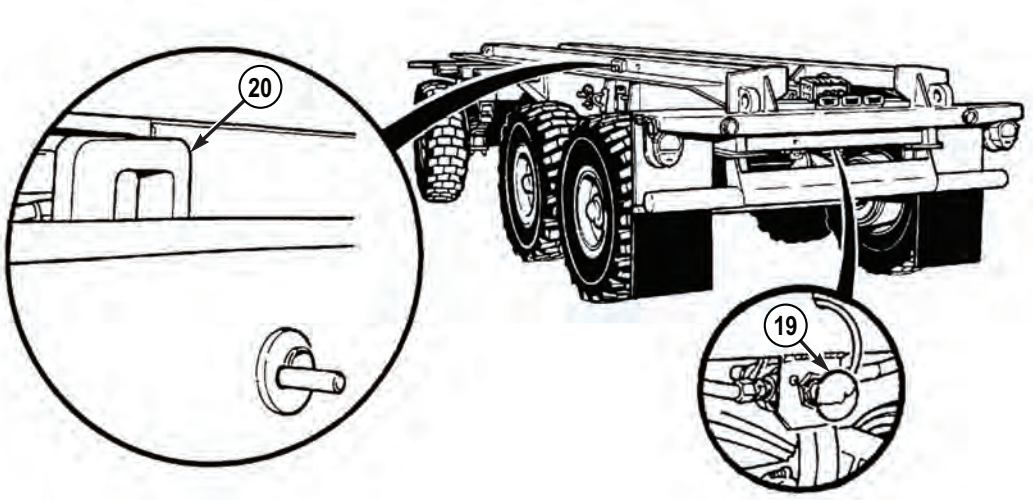


Figure 38.

26. Inspect that flatrack locks (20) are engaged.
27. Release parking brake (13).

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

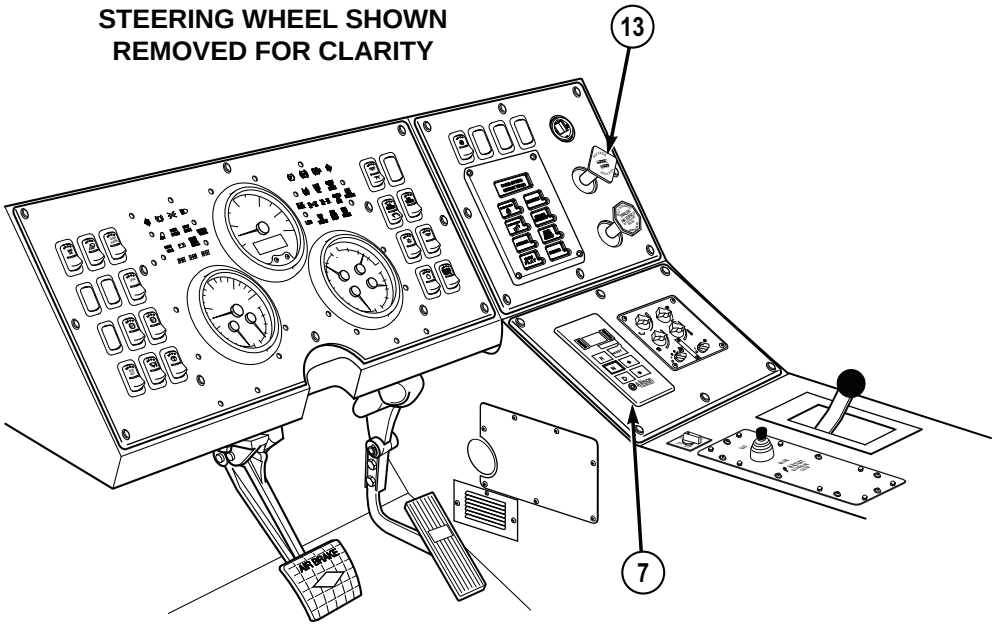


Figure 39.

28. Set transmission range selector (7) to Drive (D).
29. Move vehicle forward approximately 5 ft (1,524 mm).
30. Apply vehicle parking brakes (13) and set transmission range selector (7) to Neutral (N).

WARNING



Never drive with LHS NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose. Failure to comply may result in injury or death to personnel and damage to equipment.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

NOTE

Hook arm does not need to be fully stowed if more transfer operations are going to be made.

31. Turn hydraulic selector switch (2) to AUTO.

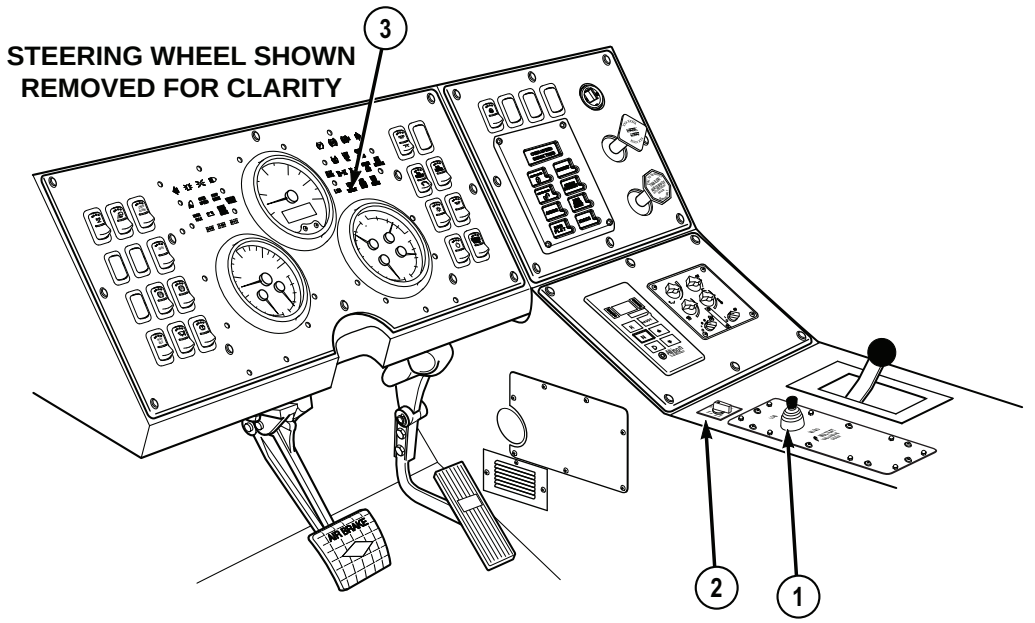


Figure 40.

32. Move joystick (1) to LOAD and retract LHS until LHS NO TRANSIT light (3) is extinguished.

NORMAL TRANSFER OF FLATRACK TO TRAILER - Continued

CAUTION

Hydraulic selector switch must be in OFF position before driving, or hydraulic system can overheat causing damage to equipment.

33. Turn hydraulic selector switch (2) to OFF.

END OF TASK

NORMAL REMOVAL OF FLATRACK FROM TRAILER

CAUTION

Load must be evenly distributed on pallet. Uneven load distribution may cause LHS Overload indicator to give false signals and cause LHS to operate incorrectly. Damage to equipment may result.

1. Back the vehicle up in line with trailer and stop approximately 5 ft (1,524 mm) from trailer.
2. Apply parking brake (13) and set transmission range selector (7) to Neutral (N).

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

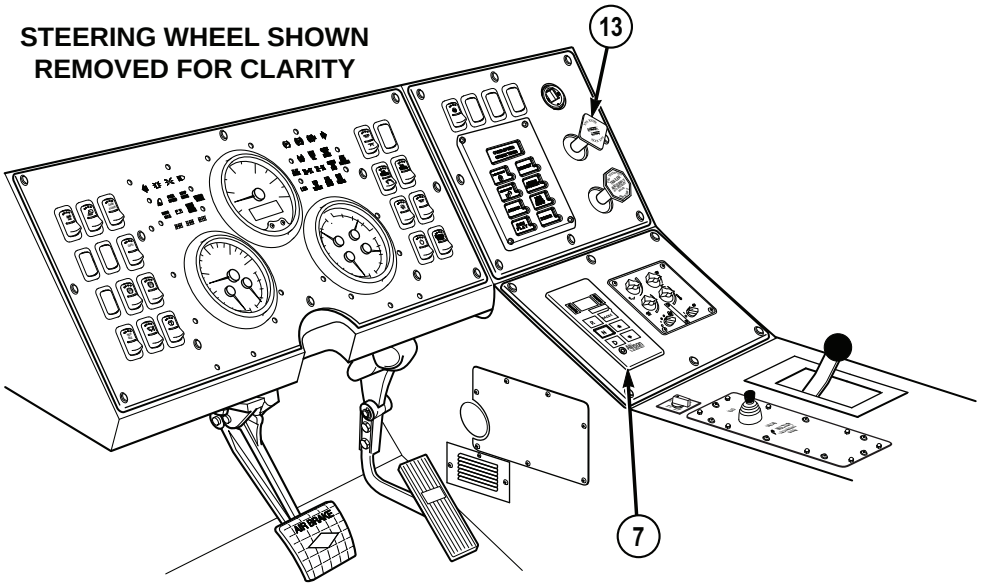


Figure 41.

CAUTION

- There must be sufficient air pressure in trailer air system to retract flatrack locks or damage to flatrack lock can occur while attempting to remove flatrack from trailer. If not, use vehicle to charge trailer air system using trailer air charging hose. If air system cannot retract flatrack locks use manual flatrack lock retract procedure in TM 9-2330-385-14 (Volume 2, WP 0146).
- Ensure air lines and cables are properly stowed to prevent damage to equipment.
- Ensure that trailer drawbar is down against the ground during transfer operations, or damage to equipment may result.
- If trailer is equipped with trailer drawbar extension kit, drawbar extension must be in stowed position or damage to equipment may result.

3. Push knob (19) on trailer to retract flatrack locks (20).

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

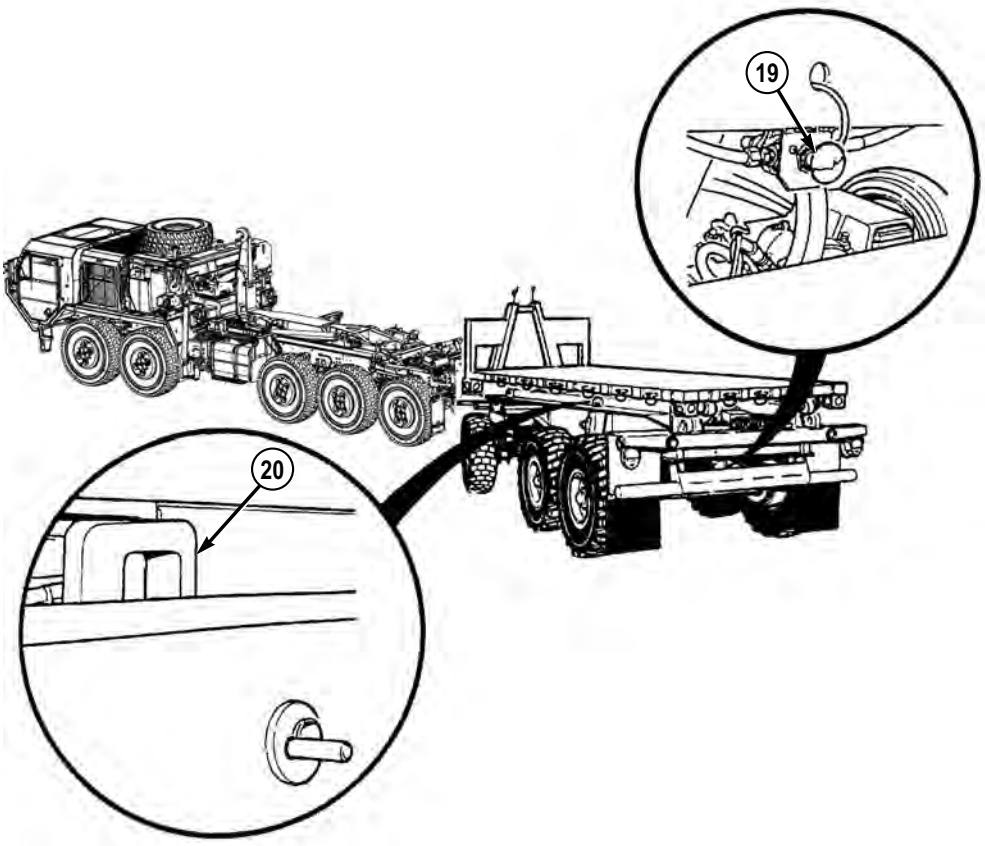


Figure 42.

4. Inspect that both flatrack locks (20) are fully retracted.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

WARNING



Trailer wheels must be chocked during transfer operations. Refer to TM 9-2330-385-10. Failure to comply may result in injury or death to personnel.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

5. Turn hydraulic selector switch (2) to AUTO.

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

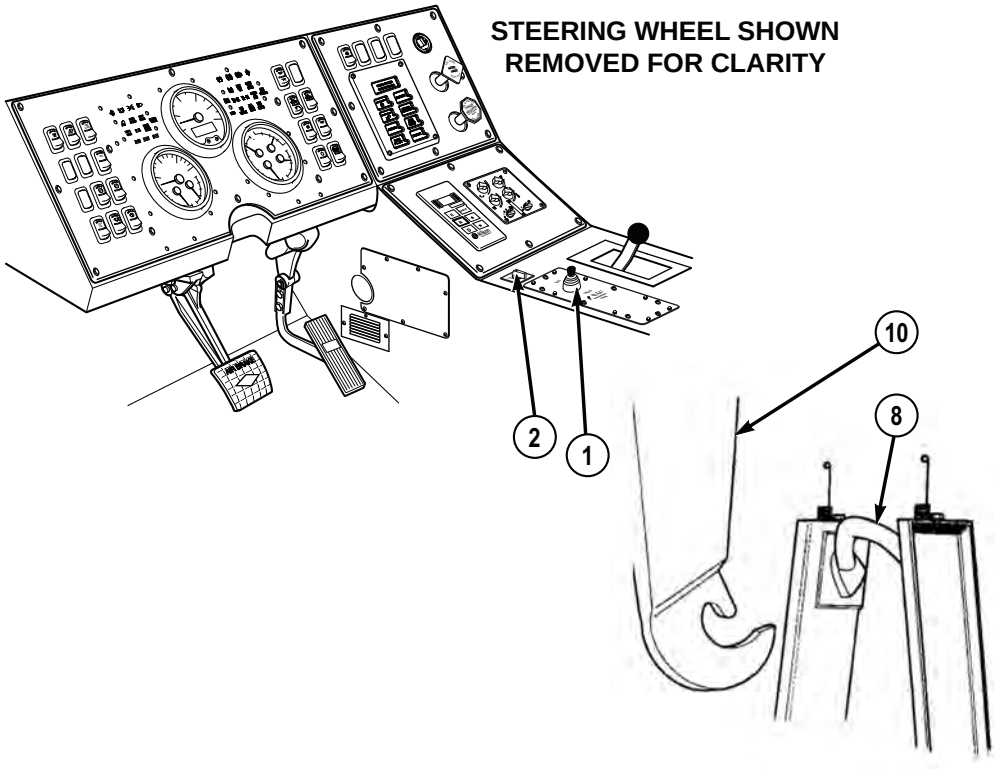


Figure 43.

6. Move joystick (1) to UNLOAD until lift-hook (10) has moved just below level of flatrack hook-bar (8).
7. Apply service brake pedal (9) and release parking brake (13).

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

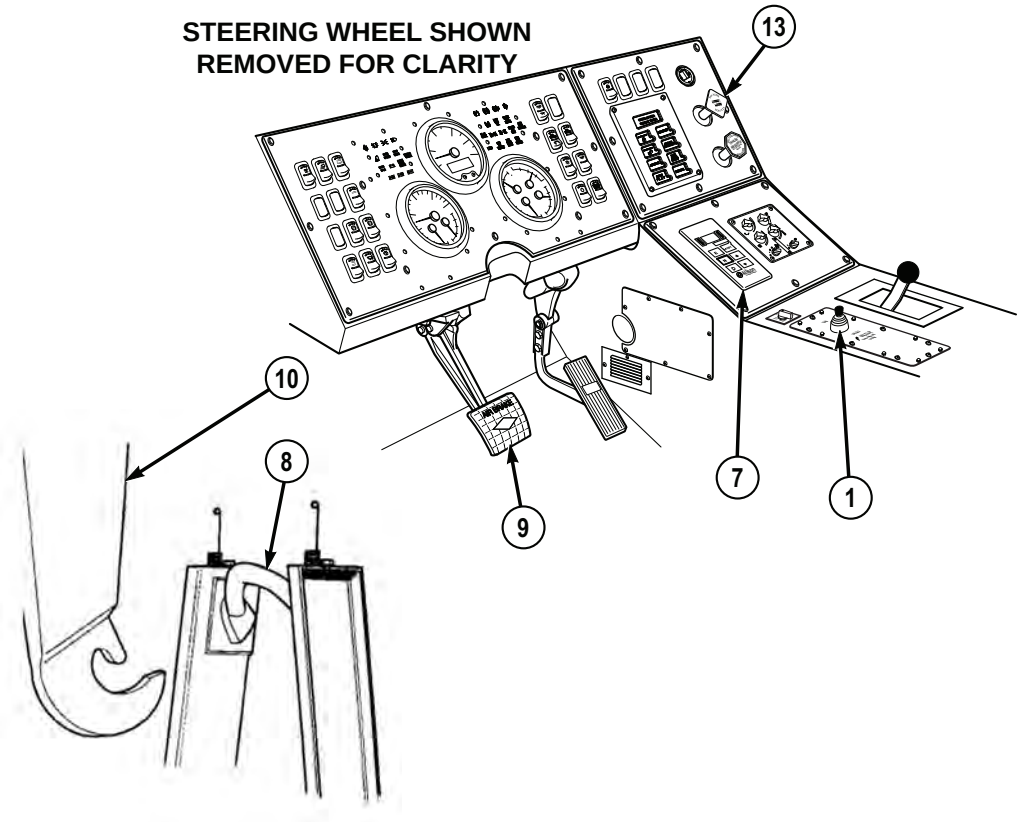


Figure 44.

8. Set transmission range selector (7) to Reverse (R), release service brake pedal (9), and back vehicle up until lift-hook (10) contacts hook-bar (8).
9. Set transmission range selector (7) to Neutral (N) and apply vehicle parking brake (13).

NOTE

Loading and unloading times are controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

10. Move joystick (1) to LOAD and engage lift hook (10) into hook-bar (8).
11. Continue loading flatrack onto vehicle until the LHS NO TRANSIT light (3) is extinguished indicating LHS is in the transport position.

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

12. Apply parking brake (13) and set transmission range selector (7) to neutral (N).

NOTE

If load locks do not engage, raise flatrack slightly and lower again. Flatrack should seat completely and engage load locks.

13. Inspect that load locks (14) are engaged and flatrack is completely down on vehicle.

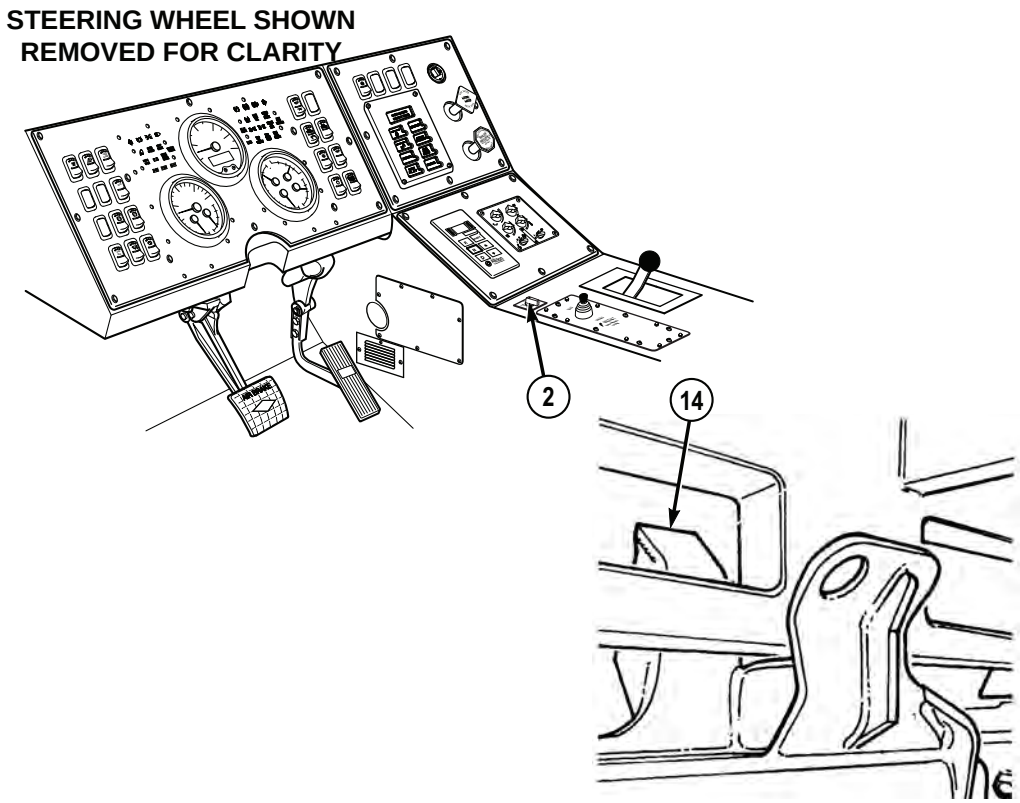


Figure 45.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

NORMAL REMOVAL OF FLATRACK FROM TRAILER - Continued

14. Turn hydraulic selector switch (2) to OFF.

END OF TASK

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE

WARNING



Trailer wheels must be chocked during transfer operations. Refer to TM 9-2330-385-10. Failure to comply may result in injury or death to personnel.

CAUTION

- Ensure that trailer drawbar is down against the ground during transfer operations, or damage to equipment may result.
- If trailer is equipped with trailer drawbar extension kit, drawbar extension must be in stowed position or damage to equipment may result.
- Ensure air lines and cables are properly stowed to prevent damage to equipment.
- Both of the trailer bumper points must be under the vehicle bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the vehicle bumper stop cannot exceed 0.5 in. (12.7 mm) or flatrack will miss main rail guides. Failure to comply may result in damage to equipment.

1. Back up vehicle so that trailer bumper (17) is under flange and contacts vehicle bumper stop (18).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

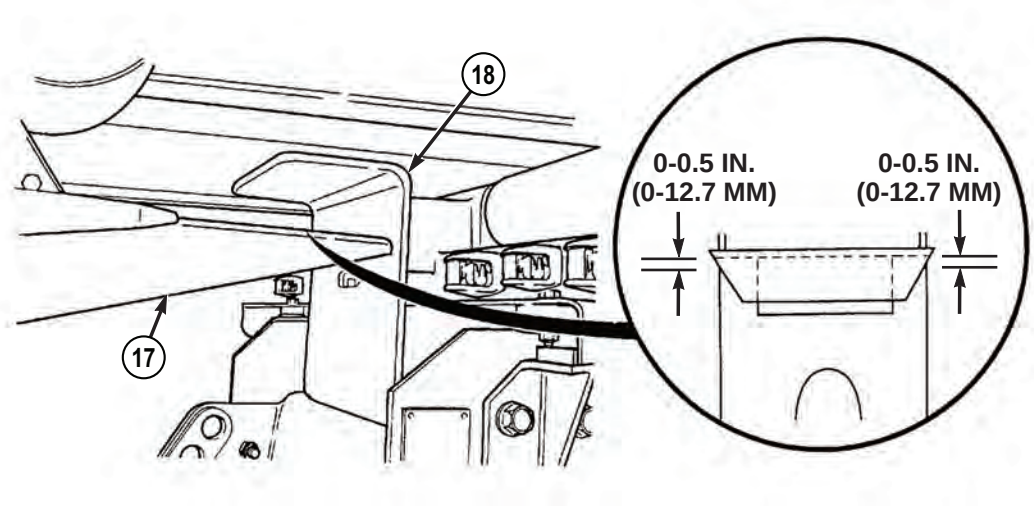


Figure 46.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

2. Set parking brake (13) and set transmission range selector switch (7) to Neutral (N).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

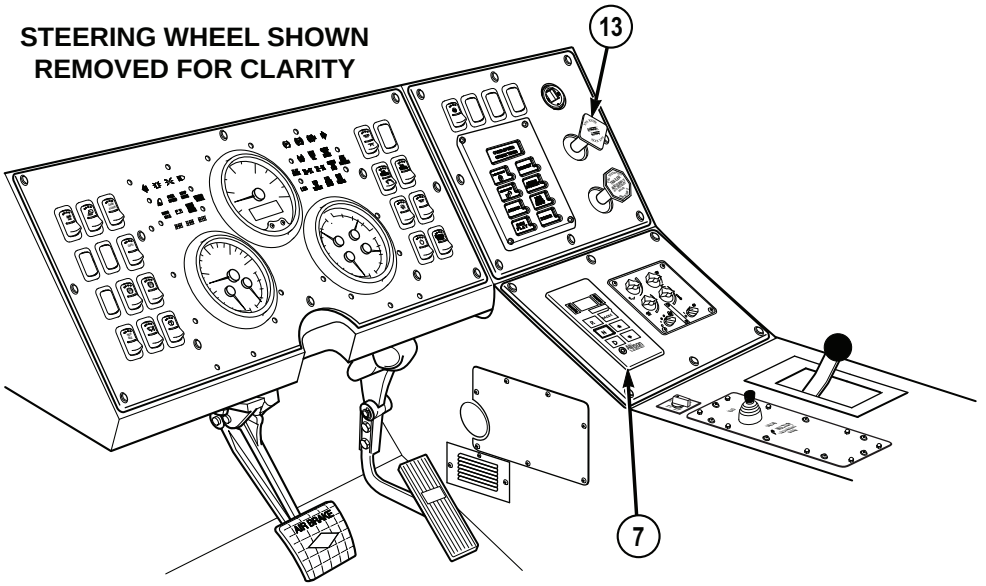


Figure 47.

WARNING



Ensure trailer air system is pressurized prior to beginning transfer or flatrack locks may not properly engage/disengage. Failure to comply may result in injury or death to personnel.

3. Push in knob (19) and retract flatrack locks (20).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

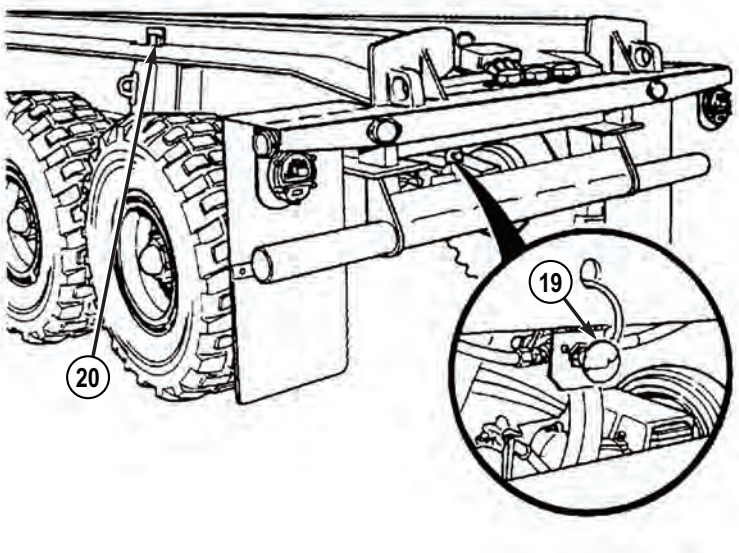


Figure 48.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Load must be evenly distributed on flatrack pallet. Uneven load distribution may cause LHS OVERLOAD indicator to give false signals and cause LHS to operate incorrectly.

NOTE

The time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

4. Turn hydraulic selector switch (2) to MAN H.A.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

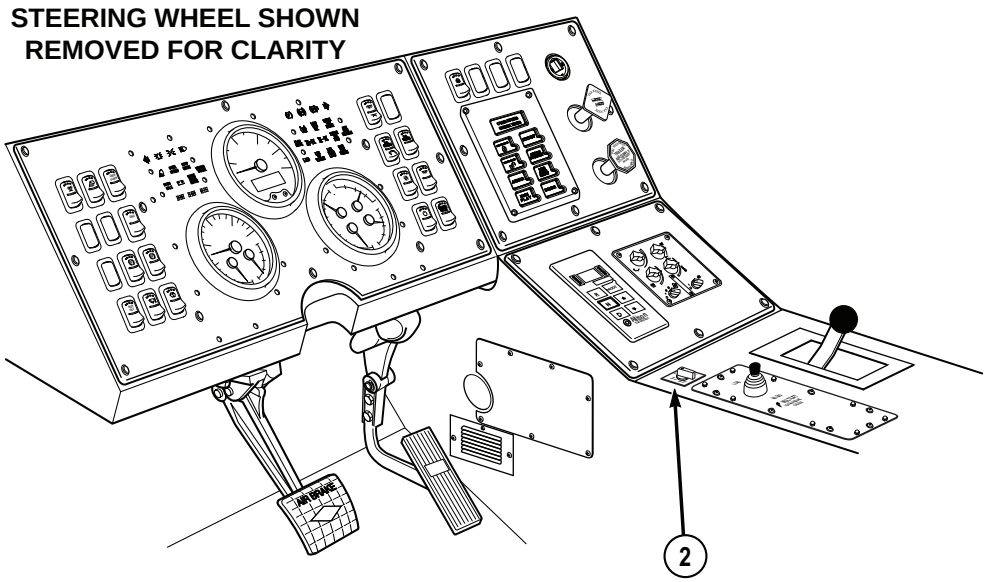


Figure 49.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

WARNING



Ensure rail transport locking pins are disengaged prior to unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in injury or death to personnel and damage to equipment.

5. Move joystick (1) to UNLOAD until flatrack rollers (21) contact trailer.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

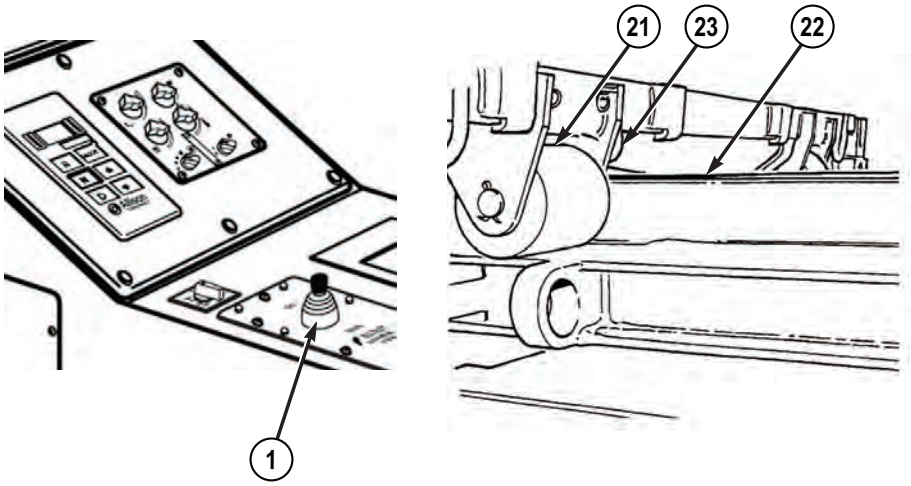


Figure 50.

6. Release joystick (1).
7. Inspect and verify that trailer guides (22) are between flatrack main rails (23).
8. If not aligned:
   a. Move joystick (1) to LOAD.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

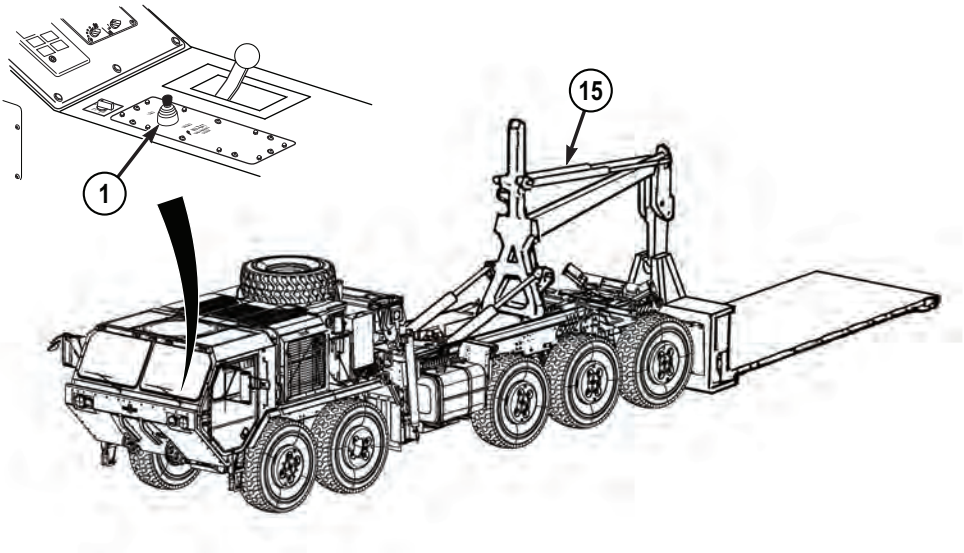


Figure 51.

b. When flatrack is completely reloaded onto vehicle, release joystick (1).

c. Repeat Steps (4) through (6).

CAUTION

- To avoid equipment damage, visually check that hook arm cylinders have fully extended.
- To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speeds above idle.

NOTE

LHS OVERLOAD light will come on when hook arm cylinders are fully extended and joystick is activated.

9. Move joystick (1) to UNLOAD and hold until hook arm cylinders (15) are fully extended.
10. Release joystick (1).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

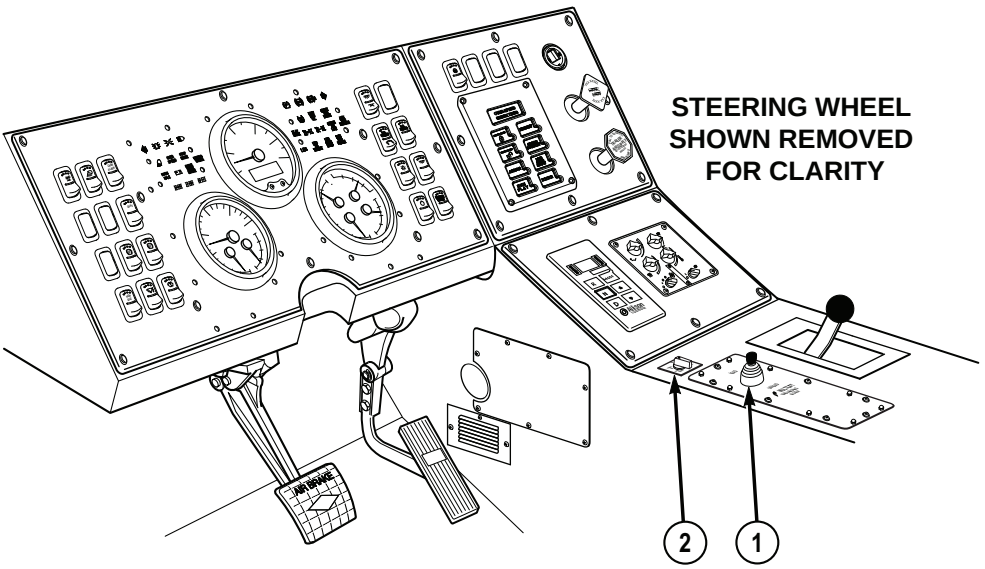


Figure 52.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

11. Turn hydraulic selector switch (2) to MAN M.F.
12. Move joystick (1) to UNLOAD until front of flatrack is completely seated on trailer.
13. Release joystick (1).

CAUTION

Do not use Reverse (R) to back up vehicle while hook arm is attached to flatrack or damage to LHS will occur.

14. Turn hydraulic selector switch (2) to MAN H.A.
15. Move joystick (1) to LOAD until front of flatrack is raised approximately 12.0 to 18.0 in. (305 to 457 mm) above trailer deck height.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

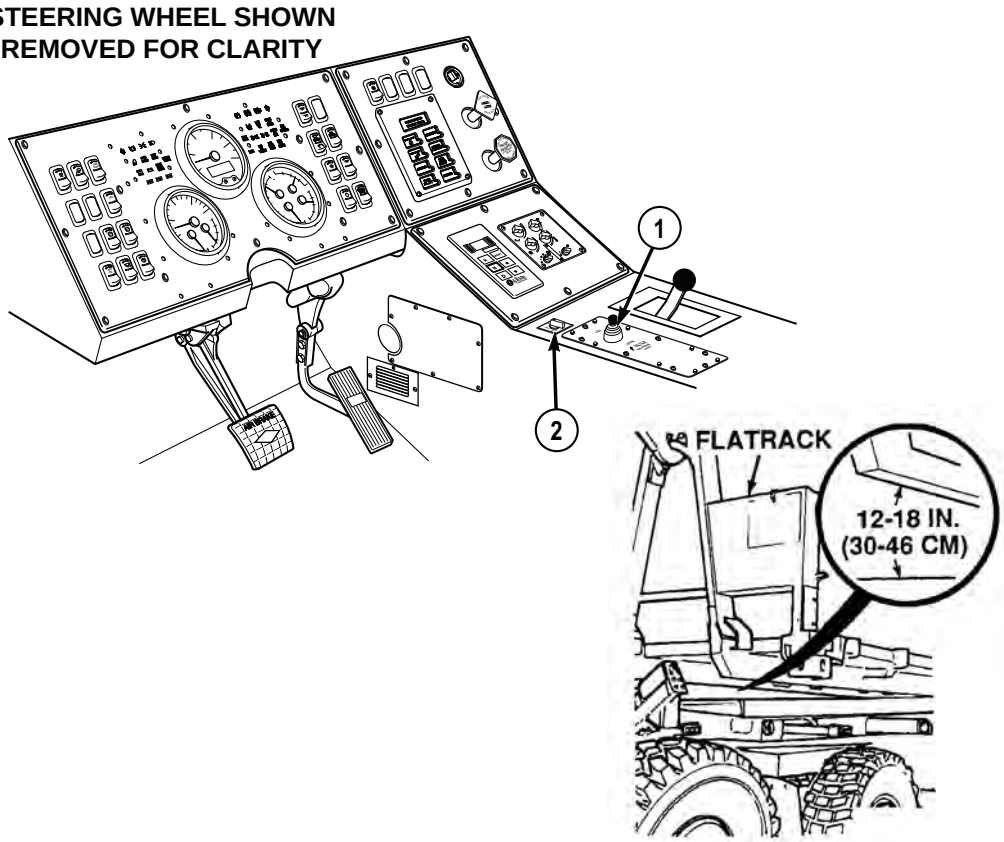


Figure 53.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

16. Turn hydraulic selector switch (2) to MAN M.F.
17. Move joystick (1) to UNLOAD until flatrack rollers (21) contact trailer stops (24) and front of flatrack guides are seated on trailer.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

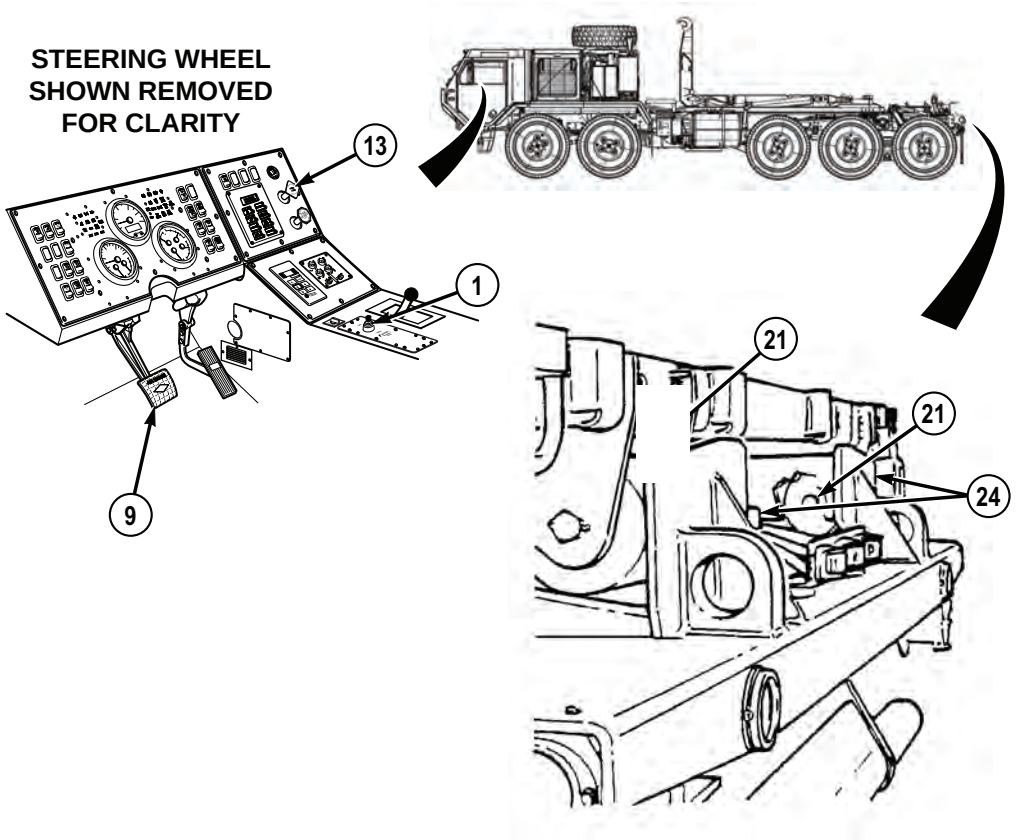


Figure 54.

18. Release joystick (1).
19. Inspect that rear flatrack rollers (21) on flatrack have contacted trailer stops (24).
20. Apply service brake pedal (9).
21. Release vehicle parking brakes (13).

NOTE

It may be necessary to repeat the following step several times to clear lift-hook from hook-bar.

22. Move joystick (1) to LOAD to allow top of lift-hook (10) to clear hook-bar (8).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

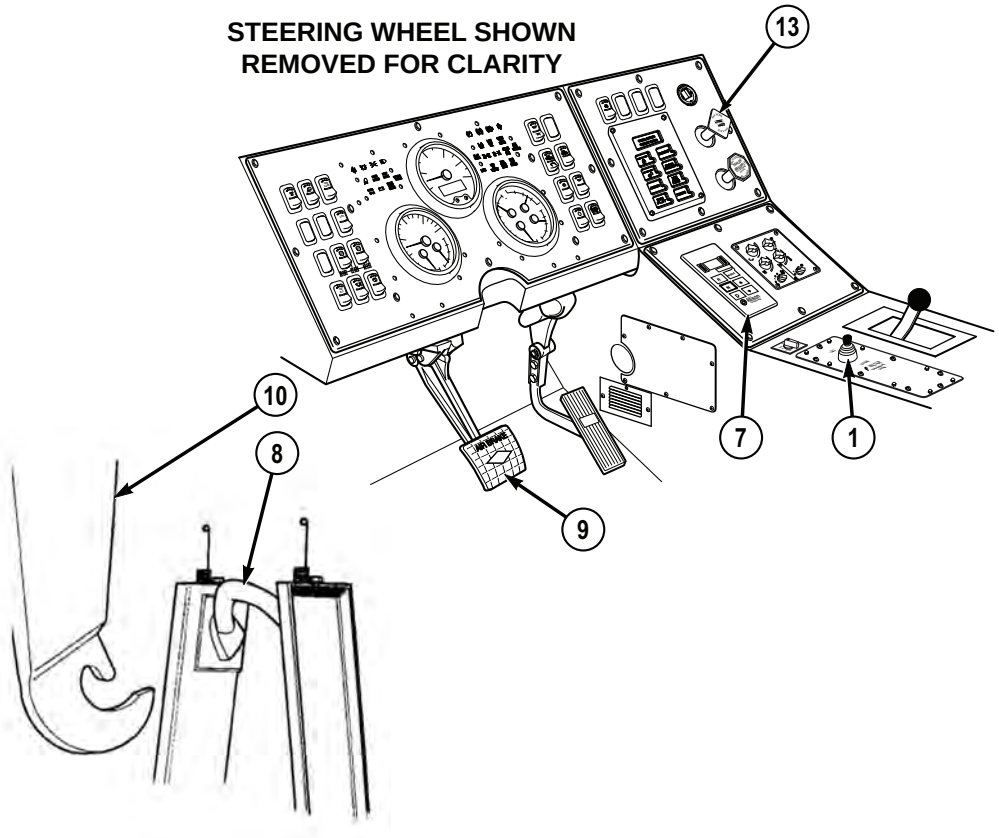


Figure 55.

NOTE

Do not move vehicle forward more than 3.0 in. (76.2 mm) to prevent flatrack from pulling away from stops.

23. Release service brake pedal (9) and set transmission range selector (7) to Drive (D) and move vehicle forward approximately 3.0 in. (76.2 mm). Apply service brake pedal (9).
24. Move joystick (1) to UNLOAD to disengage lift-hook (10) from hook-bar (8).
25. Set transmission range selector (7) to Neutral (N) and apply the parking brakes (13).
26. Inspect that rear flatrack rollers (21) have contacted trailer stops (24).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

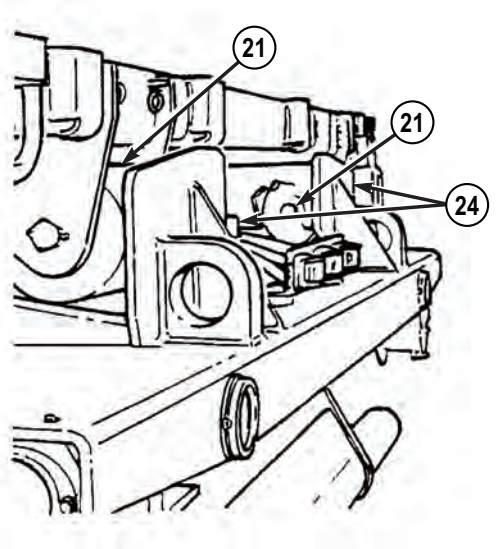


Figure 56.

27. Pull knob (19) and engage flatrack locks (20).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

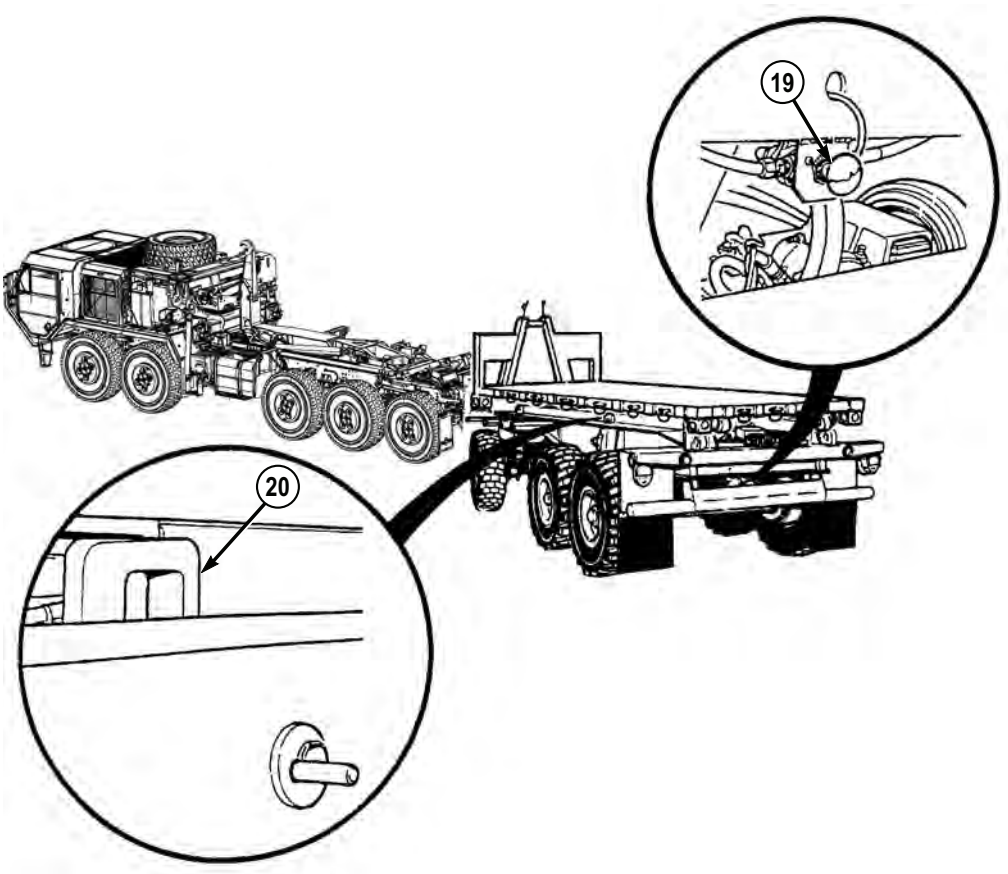


Figure 57.

28. Inspect that flatrack locks (20) are engaged.
29. Release parking brake (13).

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

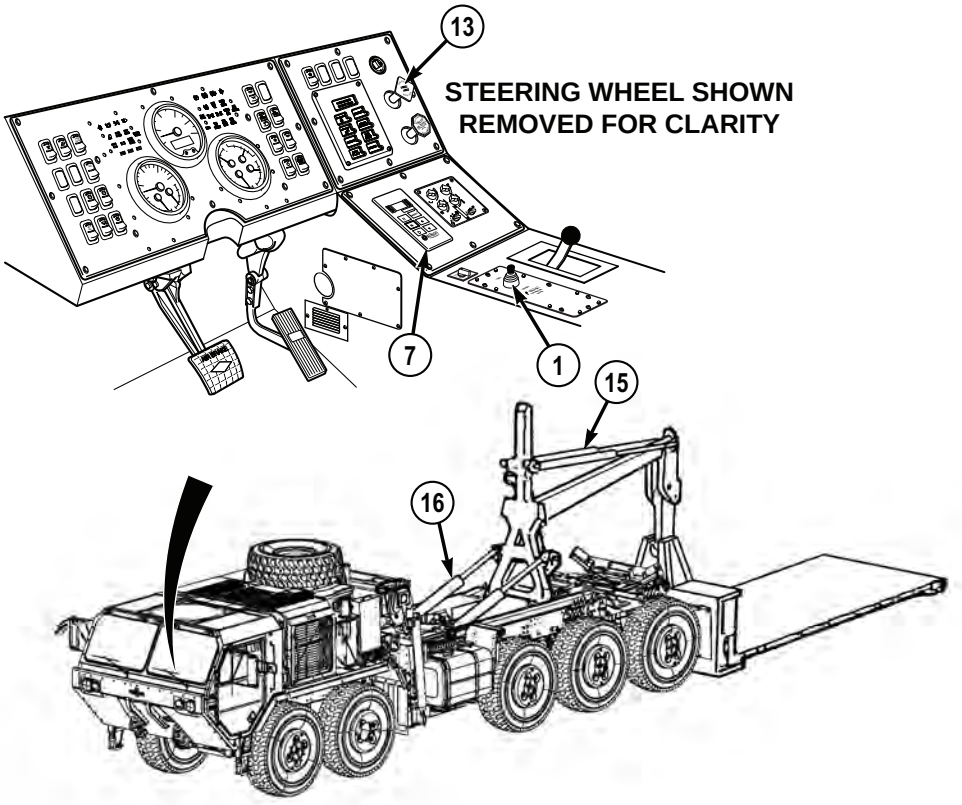


Figure 58.

30. Set transmission range selector (7) to Drive (D).
31. Move vehicle forward approximately 5 ft (1,524 mm).
32. Move joystick (1) to LOAD and hold in this position until main frame cylinders (16) are fully retracted.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

WARNING



Never drive with LHS NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose. Failure to comply may result in injury or death to personnel and damage to equipment.

NOTE

LHS OVERLOAD light will come on when main frame cylinders are fully extended or fully retracted and joystick is being activated.

33. Move joystick (1) to LOAD and hold in this position until main frame cylinders (16) are fully retracted.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

34. Turn hydraulic selector switch (2) to MAN H.A.

NOTE

LHS OVERLOAD light will come on when hook arm cylinders are fully extended or retracted and joystick is being activated.

35. Hold joystick (1) in LOAD position until the hook arm cylinders (15) are fully retracted.

CAUTION

- Hydraulic selector switch must remain in MAN TRANS while vehicle is traveling or hydraulic system will overheat causing damage to vehicle.
- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

36. Turn hydraulic selector switch (2) to MAN TRANS.

37. Inspect that flatrack is completely seated and load locks (20) are engaged.

TRANSFER OF FLATRACK TO TRAILER IN MANUAL MODE - Continued

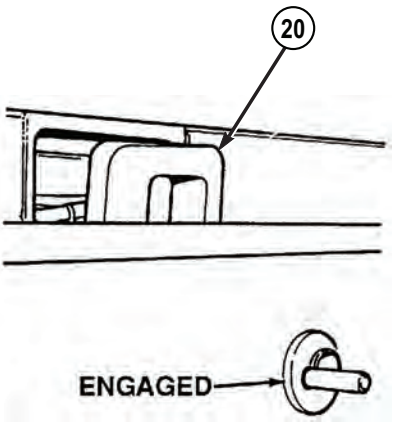


Figure 59.

END OF TASK

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE

CAUTION

- There must be sufficient air pressure in trailer air system to retract flatrack locks or damage to flatrack lock can occur while attempting to remove flatrack from trailer. If not, use vehicle to charge trailer air system using trailer air charging hose. If air system cannot retract flatrack locks, use manual flatrack lock retract procedure in TM 9-2330-385-14 (Volume 2, WP 0146).
- Ensure air lines and cables are properly stowed to prevent damage to equipment. Refer to TM 9-2330-385-14 (Volume 2, WP 0146).
- Ensure that trailer drawbar is down against the ground during transfer operations or damage to equipment may result.
- If trailer is equipped with trailer drawbar extension kit, drawbar extension must be in stowed position or damage to equipment may result.

1. Push knob (19) on trailer to retract flatrack locks (20).

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

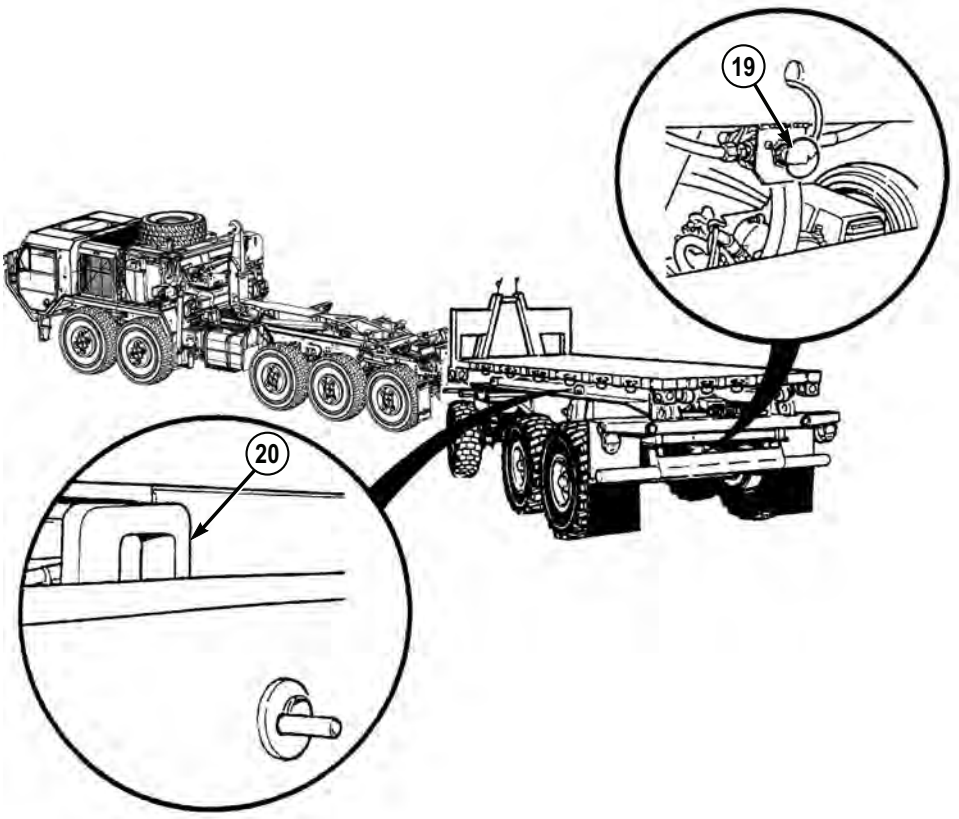


Figure 60.

CAUTION

Ensure both flatrack locks are fully retracted, or damage to equipment may result.

2. Inspect that both flatrack locks (20) are fully retracted.
3. Back vehicle up in line with trailer and stop approximately 5 ft (1,524 mm) from trailer.
4. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

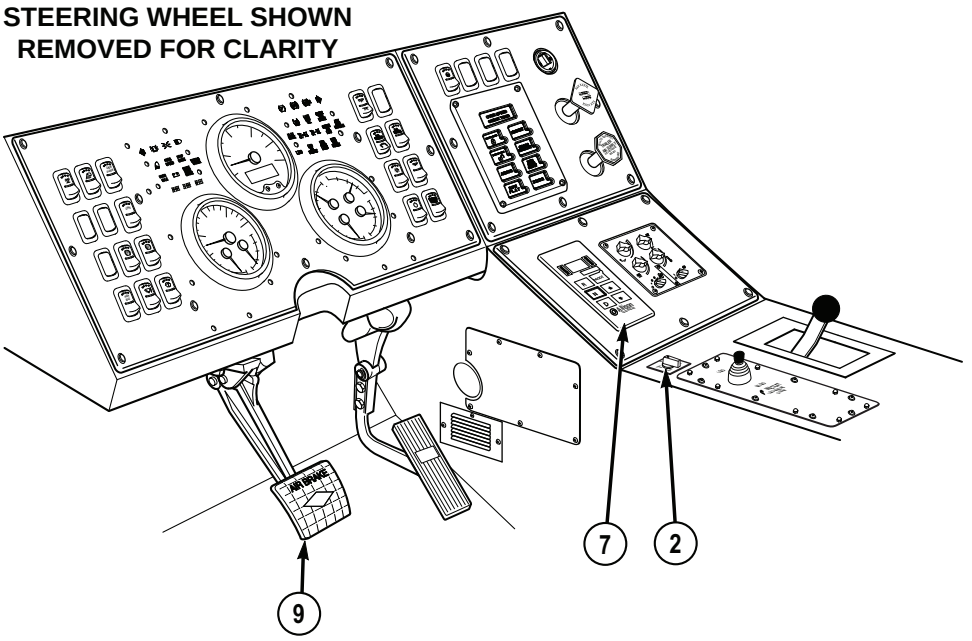


Figure 61.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

5. Turn hydraulic selector switch (2) to MAN H.A.

CAUTION

- To avoid equipment damage, visually check that hook arm cylinders have completed full extension.
- To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speeds above idle.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

NOTE

- LHS OVERLOAD light will come on when arm cylinders are fully extended and joystick is activated.

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

- The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

6. Move joystick (1) to UNLOAD and hold until hook arm cylinders (15) are fully extended.

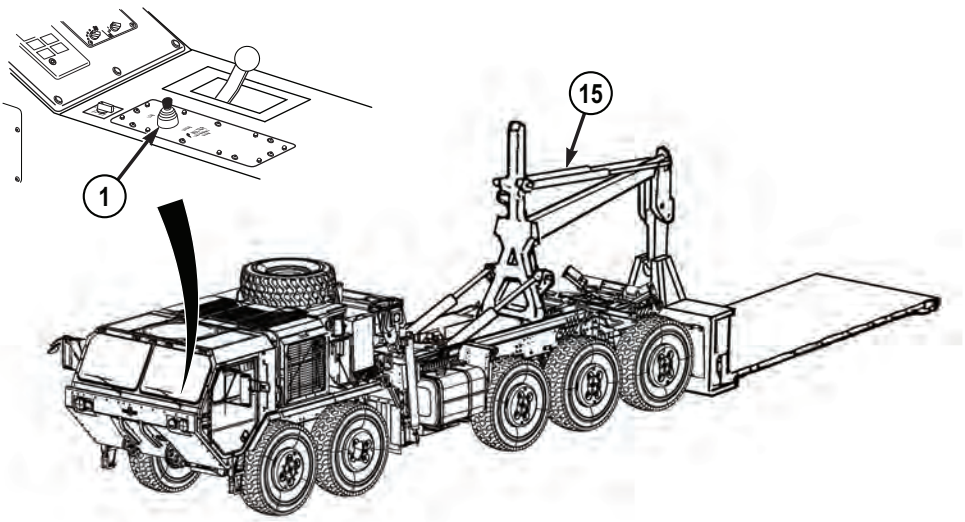


Figure 62.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Release joystick (1) and turn hydraulic selector switch (2) to MAN M.F.
8. Move joystick (1) to UNLOAD and hold until lift-hook (10) has moved below level at flatrack hook-bar (8).

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

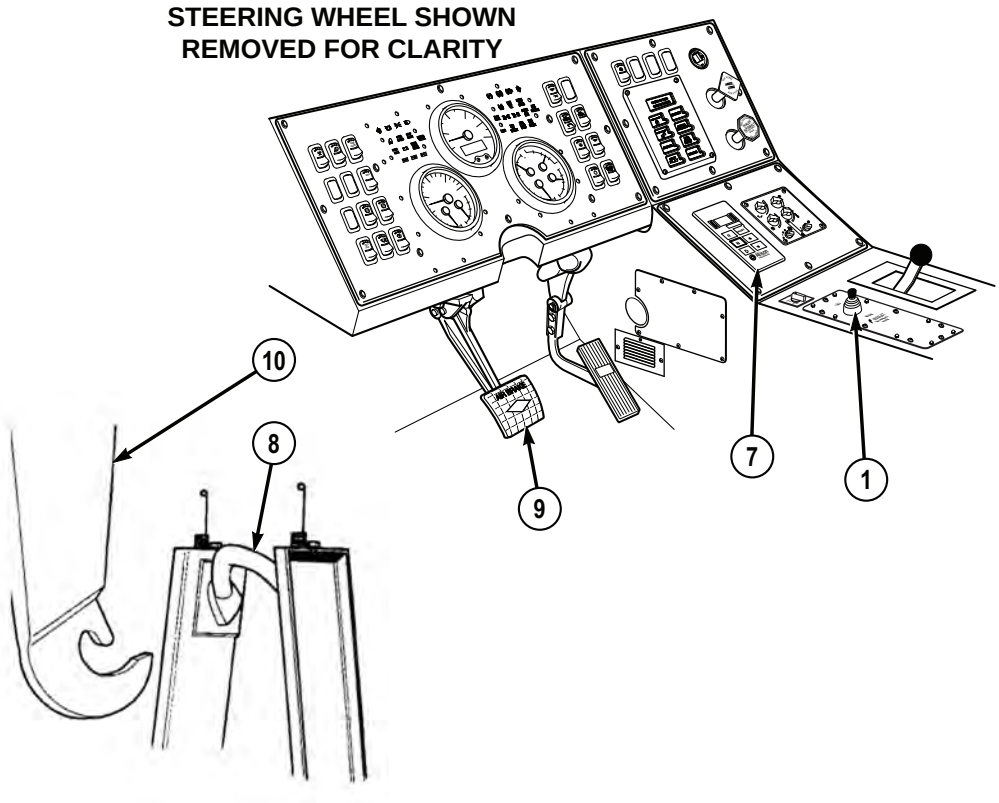


Figure 63.

9. Set transmission range selector (7) to Reverse (R) and release service brake pedal (9). Back vehicle up until lift-hook (10) contacts hook-bar (8).

10. Apply parking brake (13).

CAUTION

- Ensure that trailer drawbar is down against the ground, or damage to equipment may result.
- If trailer is equipped with trailer drawbar extension kit, drawbar extension must be in stowed position or damage to equipment may result.

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

- Both of the trailer bumper points must be under the vehicle bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the vehicle bumper stop cannot exceed 0.5 in. (12.7 mm) or flatrack will miss main rail guides and equipment damage may result.

11. Check that trailer bumper (17) is under flange of vehicle bumper stop (18).

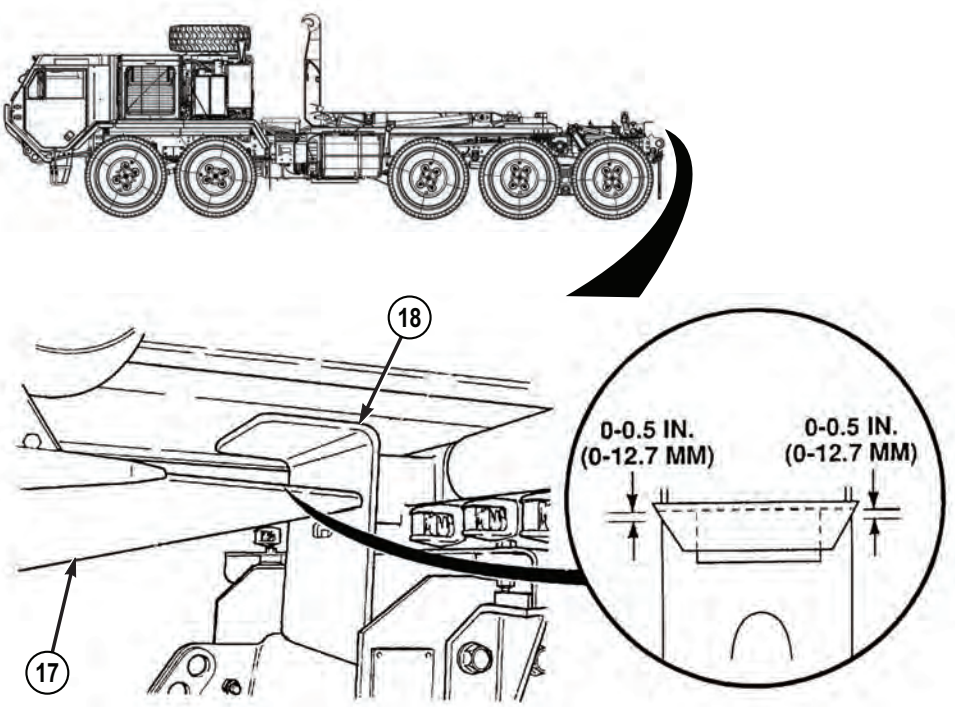


Figure 64.

12. Move joystick (1) to LOAD and engage hook-bar (8).

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

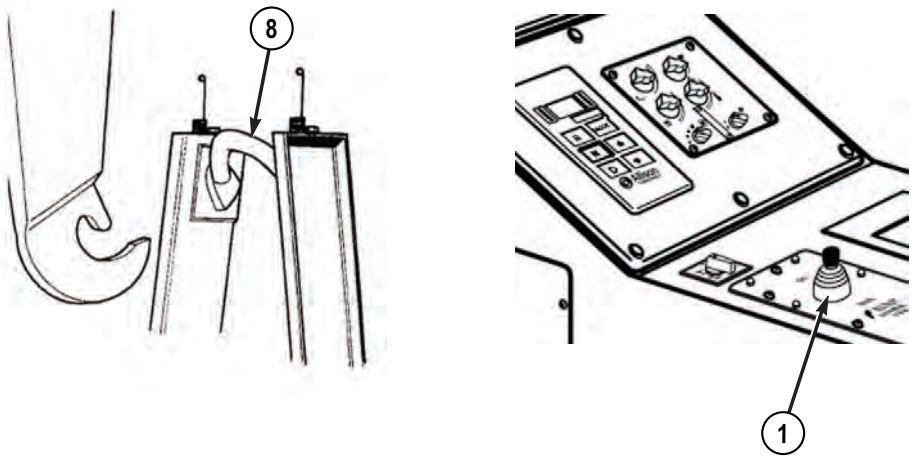


Figure 65.

CAUTION

- To avoid equipment damage, visually check that hook arm cylinders have completed full movement.
- To avoid equipment damage, ensure that hook arm cylinders do not complete full movement while operating at engine speeds above idle.

NOTE

LHS OVERLOAD light will come on when main frame cylinders are fully extended and joystick is being activated.

13. Continue to load in MAN M.F. mode until main frame cylinders (16) are fully retracted.

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

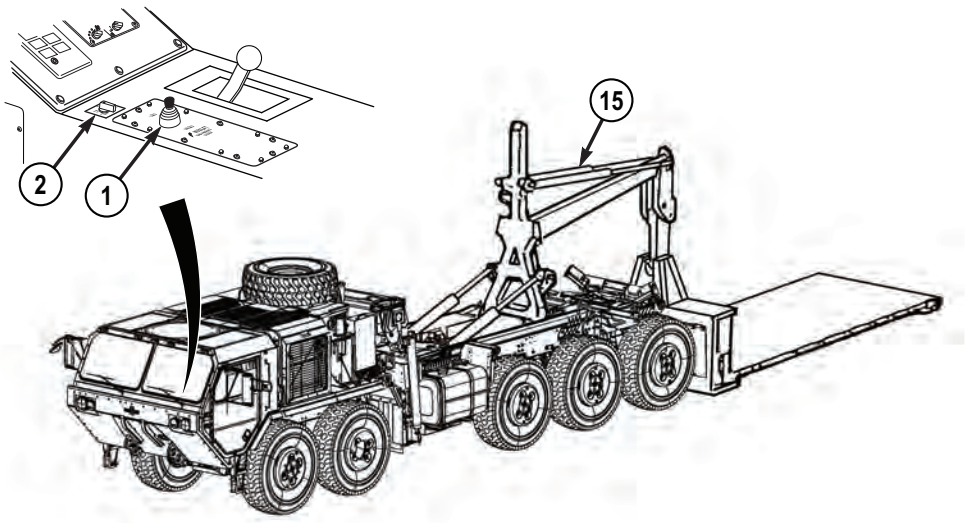


Figure 66.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

14. Turn hydraulic selector switch (2) to MAN H.A.

WARNING



Never drive with LHS NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose. Failure to comply may result in injury or death to personnel and damage to equipment.

NOTE

LHS OVERLOAD light will come on when hook arm cylinders are fully extended and retracted and joystick is being activated.

15. Hold joystick (1) in LOAD position until hook arm cylinders (15) are fully retracted.

REMOVING FLATRACK FROM TRAILER IN MANUAL MODE - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

NOTE

Hydraulic selector switch must remain in MAN TRANS while vehicle is traveling.

16. Turn hydraulic selector switch (2) to MAN TRANS.

NOTE

If load locks do not engage, raise flatrack slightly and lower again. Flatrack should seat completely and engage load locks.

17. Inspect that load locks (14) are engaged and flatrack is fully loaded on vehicle.

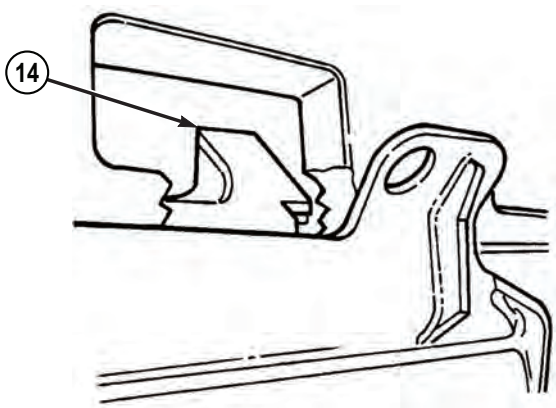


Figure 67.

END OF TASK

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY

CAUTION

Do not back up to loading docks where the height of the dock exceeds the height of bottom of the flatrack on the vehicle, or damage to equipment may result.

1. Position vehicle approximately 5 ft (1,524 mm) from front of flatrack.

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

2. Apply service brake pedal (9) and set transmission range selector (7) to Neutral (N).

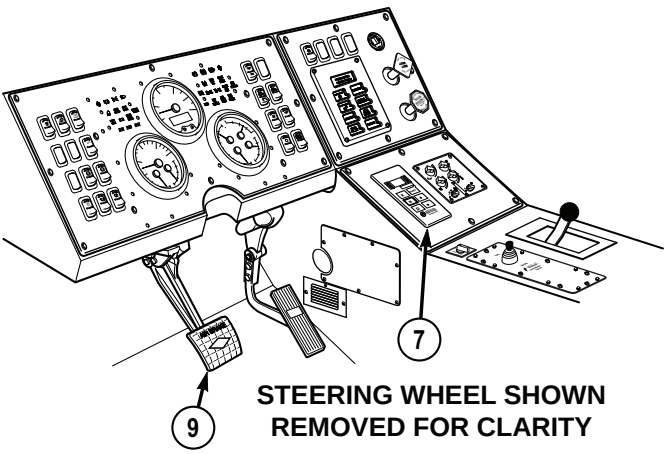


Figure 68.

CAUTION

Set engine speed at idle before selecting LHS mode or damage to equipment may result.

NOTE

When loading or unloading flatrack from dock or bay area, presence of rollers on rear of flatrack will aid in operation. Procedure can be accomplished using hydraulic selector switch in AUTO or MAN H.A. and MAN M.F. operation. Refer to PICKING UP A FLATRACK IN MANUAL MODE and OFF-LOADING FLATRACK IN MANUAL MODE, in this procedure, for movement of LHS in MANUAL mode.

3. Turn hydraulic selector switch (2) to MANUAL or AUTO as required.

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

STEERING WHEEL SHOWN REMOVED FOR CLARITY

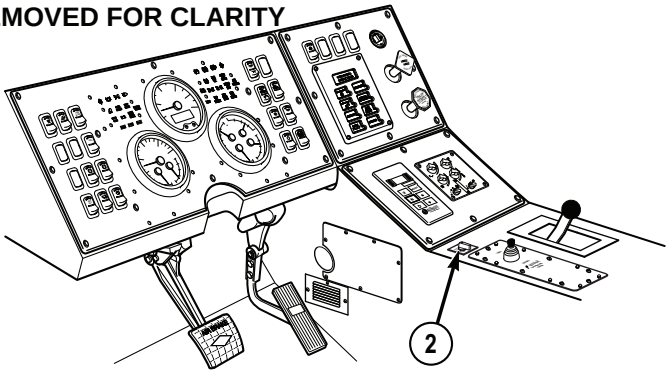


Figure 69.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

4. Move joystick (1) to UNLOAD. Lift-hook (10) will raise and begin to move rearwards. LHS NO TRANSIT light (3) will illuminate to indicate load locks have been cleared.

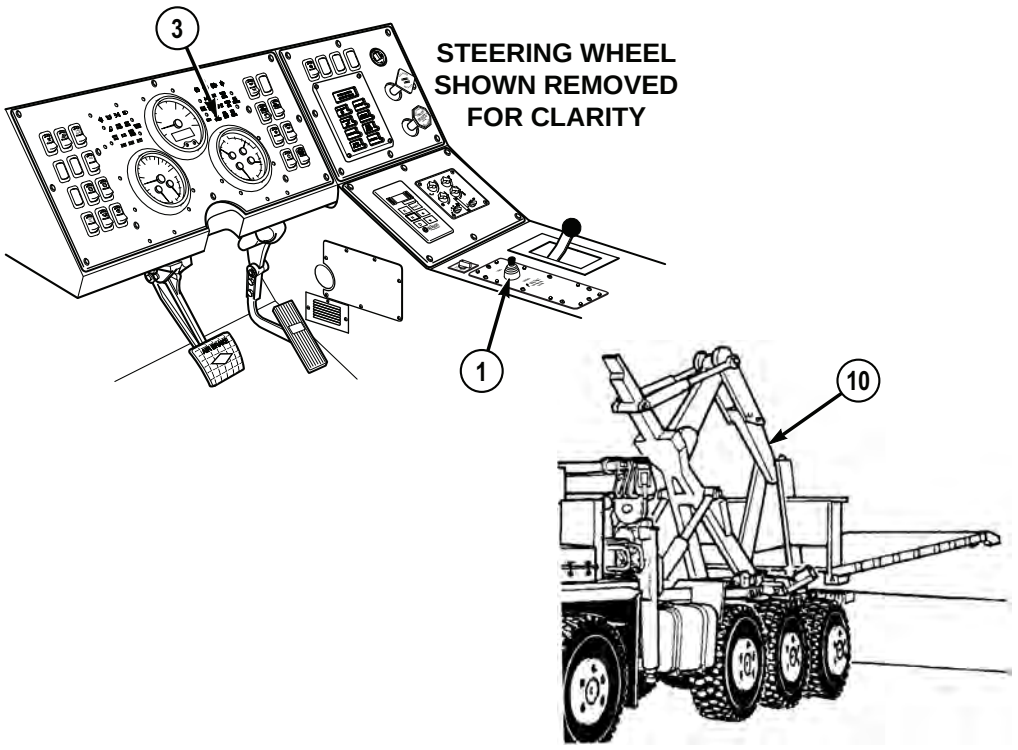


Figure 70.

5. When lift-hook (10) has moved below level of flatrack hook-bar (8), set transmission range selector (7) to Reverse (R) and back vehicle to flatrack while aligning vehicle

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

to flatrack as straight as possible (± 10 degrees) with lift-hook (10) in middle of hook-bar (8) until lift-hook contacts hook-bar.

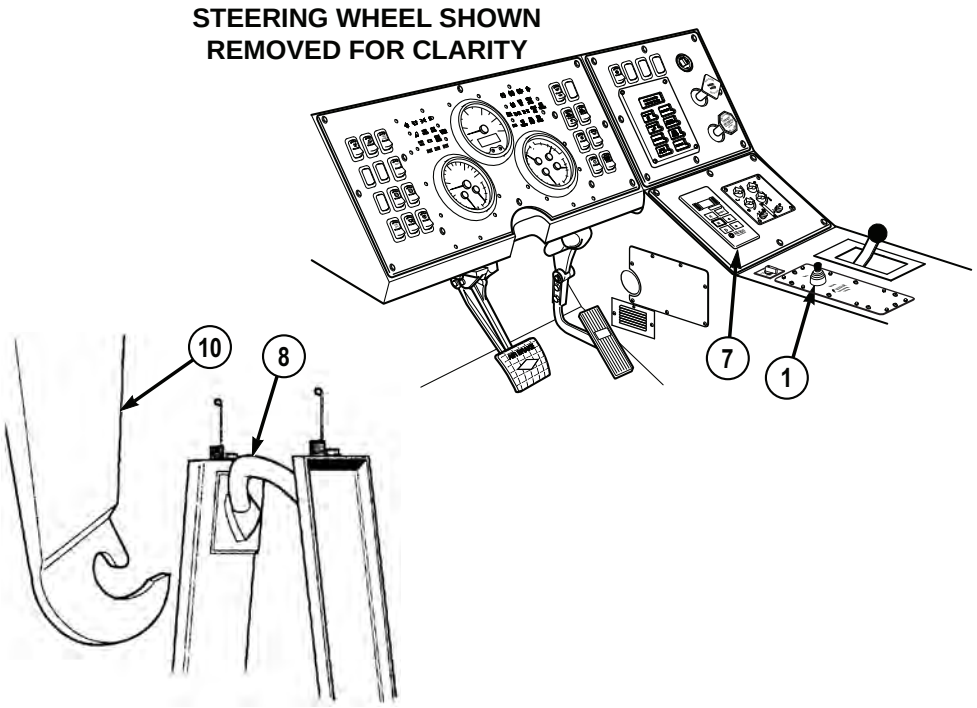


Figure 71.

6. Set transmission range selector (7) to Neutral (N).

CAUTION

Load must be evenly distributed on the pallet. Uneven load distribution may cause LHS OVERLOAD indicator to give false signals and cause LHS to operate incorrectly. Damage to equipment may result.

NOTE

Slight misalignment (up to 10 degrees) will not prevent hook from attaching to flatrack.

7. Move joystick (1) to LOAD, engaging lift-hook (10) in hook-bar (8) and lift slightly.

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

CAUTION

If flatrack does not move freely, do not attempt to drag any further, or damage to equipment may occur.

NOTE

If flatrack is misaligned, perform Step (8).

8. Lift flatrack 6.0 to 12.0 in. (152 to 305 mm) and attempt to drag flatrack forward 6 to 8 ft (1,829 to 2,438 mm) until aligned with vehicle.

CAUTION

Flatrack must be in contact with rear roller assembly on rear of vehicle before flatrack rear edge comes off loading bay or dock. Failure to contact rear roller assembly will overload LHS components and may damage vehicle.

9. Release service brake pedal (9) and allow vehicle to be pulled toward dock or bay until approximately 6.0 in. (152 mm) away.

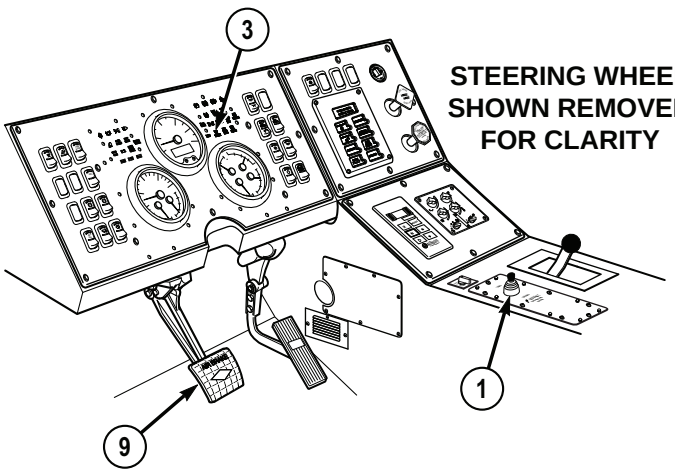


Figure 72.

10. Apply service brake pedal (9) and move joystick (1) to LOAD.

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

CAUTION

- If LHS OVERLOAD light illuminates but loading operation continues, operator is cautioned that LHS is nearing its maximum capacity. In this situation, operator should determine if payload is evenly distributed on flatrack or if flatrack load exceeds 16.5 tons (14,969 kg). If any of these conditions exist, operator must redistribute or reduce payload or damage to equipment may result.
- If LHS OVERLOAD light illuminates and, normal operation has stopped. Return load to original position and redistribute or reduce payload weight or damage to equipment may result.
- Load must be evenly distributed on the pallet. Uneven load distribution may cause LHS OVERLOAD indicator to give false signals and cause LHS to operate incorrectly. Damage to equipment may result.

11. Continue loading until LHS NO TRANSIT light (3) is extinguished indicating LHS load locks have engaged.

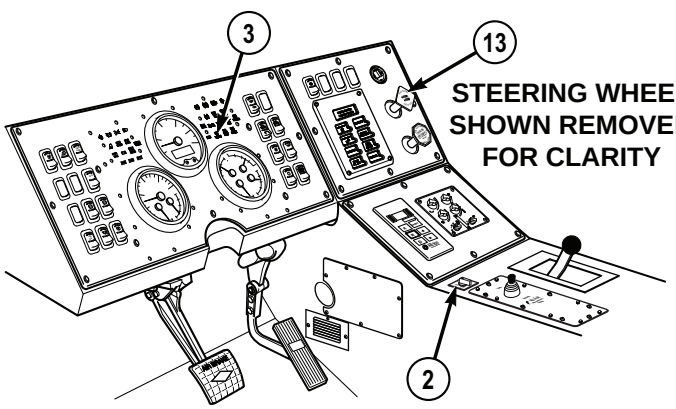


Figure 73.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

12. Turn hydraulic selector switch (2) to OFF or MAN TRANS as required.
13. Apply parking brake (13).

LOADING FLATRACK WITH OR WITHOUT ROLLERS FROM DOCK AREA OR BAY - Continued

NOTE

If load locks do not engage, raise flatrack slightly and lower again. Flatrack should seat fully and engage load locks.

14. Ensure that load locks (14) are engaged and flatrack is fully seated on vehicle.

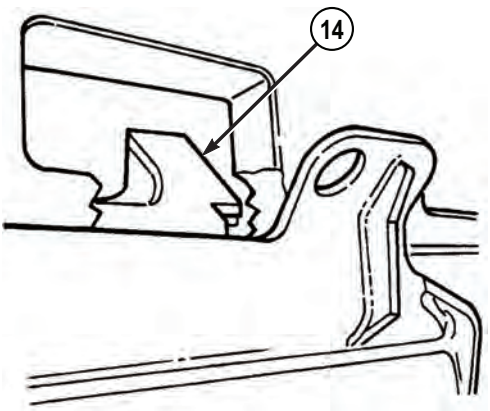


Figure 74.

END OF TASK

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY

CAUTION

Do not back up to loading docks in which the height of the dock exceeds the height of bottom of the flatrack on the vehicle, or damage to equipment may result.

NOTE

When loading or unloading flatrack from dock or bay area, presence of rollers on rear of flatrack will aid in operation. Procedure can be accomplished using hydraulic selector switch in AUTO or MAN H.A. and MAN M.F. operation. Refer to PICKING UP A FLATRACK IN MANUAL MODE and OFF-LOADING FLATRACK IN MANUAL MODE, in this procedure, for movement of LHS in MANUAL mode.

1. Set transmission range selector (7) to Reverse (R) and back vehicle to dock. Stop vehicle when rear tires (25) are approximately 6.0 in. (152 mm) from dock.

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

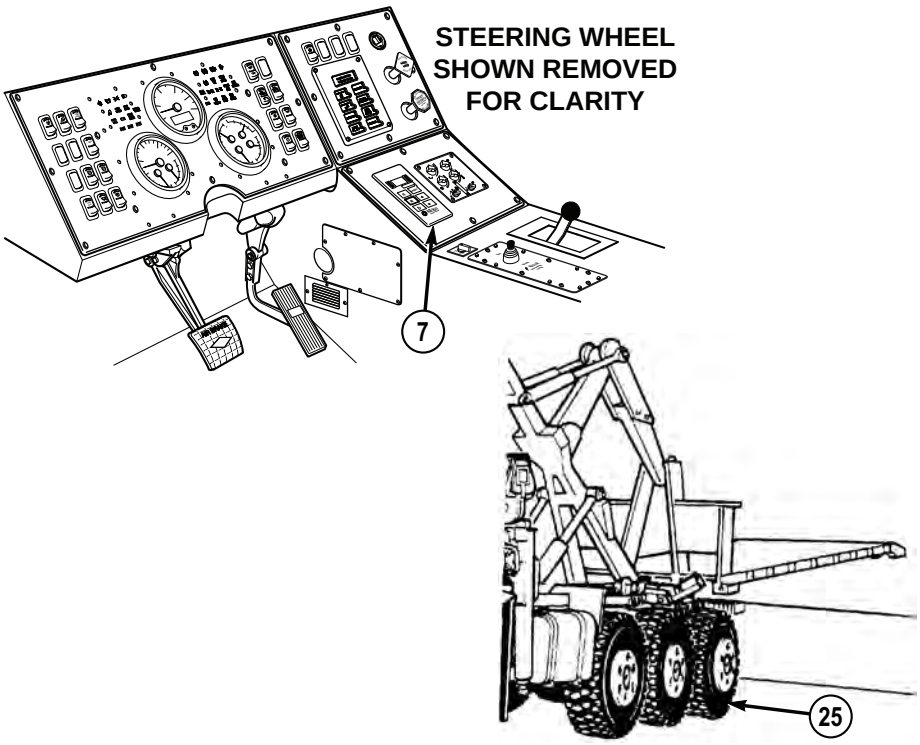


Figure 75.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a system height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

WARNING



Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Any ground instability beneath road wheels may result in injury or death to personnel.

WARNING



Prior to and during any load or unload cycle, all personnel should stay clear of LHS, flatrack, front lift adapter, and container. Failure to comply may result in injury or death to personnel.

2. Apply the service brake pedal (9) and set transmission range selector (7) to Neutral (N) and apply parking brake (13).

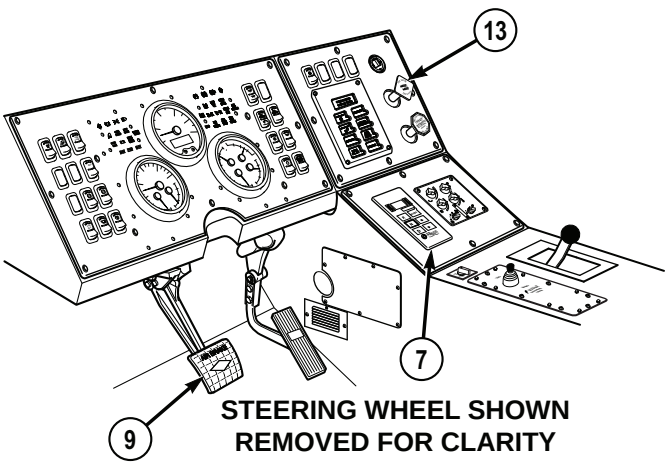


Figure 76.

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Ensure rail transport locking pins are disengaged before unloading flatrack. Rail transport locking pins are used for rail transport only. Failure to comply may result in damage to equipment.

3. Turn hydraulic selector switch (2) to AUTO or MANUAL mode.

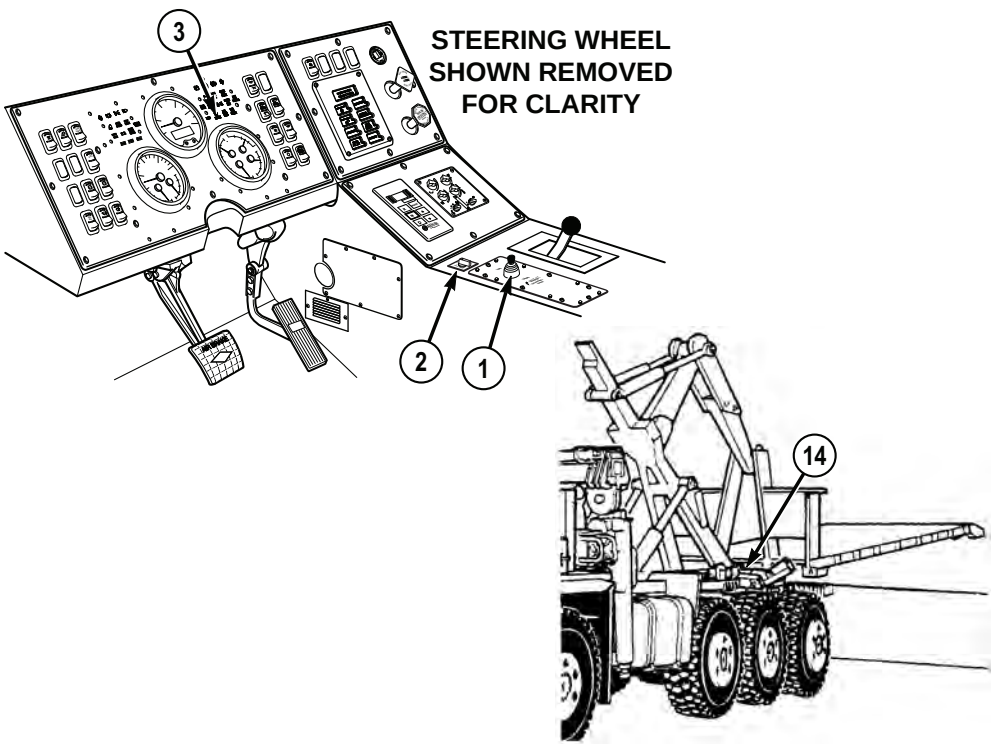


Figure 77.

4. Move joystick (1) to UNLOAD. Flatrack will raise and begin to move rearwards. LHS NO TRANSIT light (3) will illuminate to indicate load locks (14) have been cleared.

CAUTION

- Do not back vehicle to push flatrack onto dock or bay. Damage to equipment will result.

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

- Do not use Reverse (R) to back up vehicle while hook arm is attached to flatrack or damage to LHS will occur.

5. As load continues rearward, flatrack will contact dock and flatrack will be pushed rearward onto dock or bay.
6. Release joystick (1).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Turn hydraulic selector switch (2) to MAN H.A.

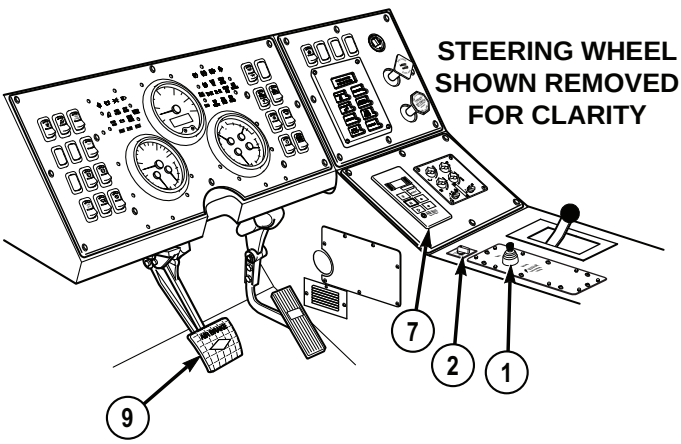


Figure 78.

8. Move joystick (1) to LOAD until front of flatrack is raised approximately 15.0 in. (381 mm) above dock or bay.
9. Turn hydraulic selector switch (2) to MAN M.F.
10. Move joystick (1) to UNLOAD until flatrack is positioned on dock or bay.
11. Release joystick (1).

CAUTION

Before moving vehicle ensure hook is not engaged to hook-bar, or damage to equipment may result.

12. Apply service brake pedal (9).

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

13. Set transmission range selector (7) to Drive (D).

NOTE

- It may be necessary to repeat Steps (14) through (17) several times to clear hook arm from hook-bar.
- Do not move vehicle forward more than 3.0 in. (76.2 mm) to prevent flatrack from pulling over edge of dock.

14. Move joystick (1) to LOAD to allow top of lift-hook (10) to clear hook-bar (8).

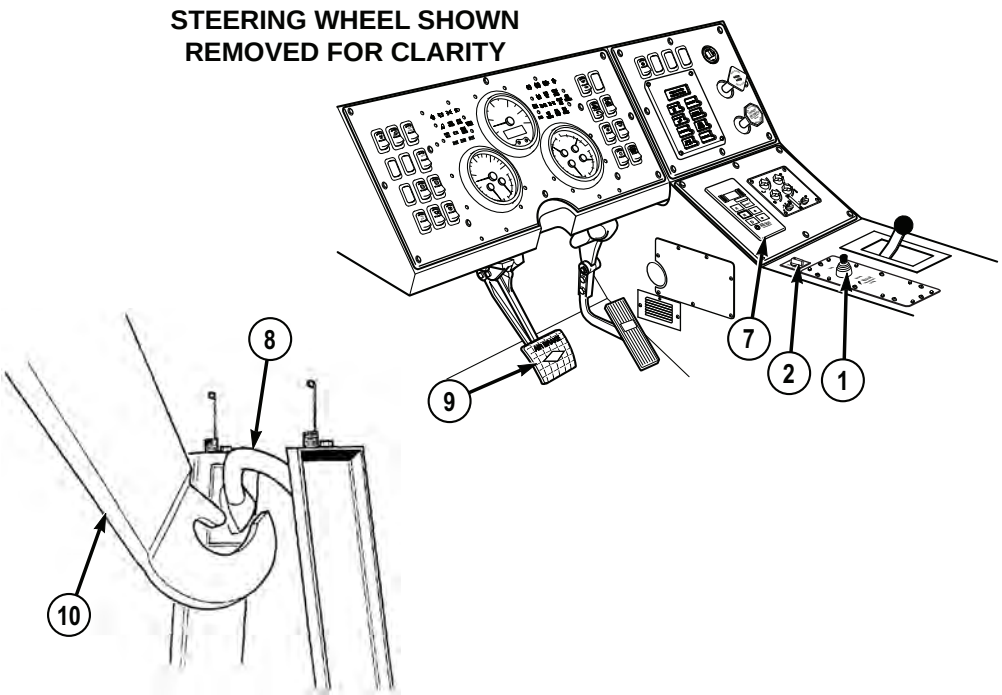


Figure 79.

15. Release service brake pedal (9) and set transmission range selector (7) to Drive (D).
16. Move vehicle forward approximately 3.0 in. (76.2 mm) and apply service brake pedal (9).
17. Move joystick (1) to UNLOAD to disengage hook from hook-bar (8).
18. Release service brake pedal (9) and move the vehicle forward approximately 5 ft (1,524 mm).

UNLOADING FLATRACK WITH OR WITHOUT ROLLERS ONTO DOCK AREA OR BAY - Continued

19. Apply service brake pedal (9).
20. Move joystick (1) to LOAD until LHS NO TRANSIT light (3) is extinguished indicating LHS is completely stowed.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

21. Turn hydraulic selector switch (2) to OFF.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PREPARING PLS VEHICLE FOR CONTAINER MODE

INITIAL SETUP:

Not Applicable

PREPARATION FOR CONTAINER MODE

WARNING



- Check for overhead power lines or other obstructions before attempting CHU operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Ensure engine is OFF and vehicle parking brake is ON before preparing PLS vehicle for container mode. Failure to comply may result in injury or death to personnel.

NOTE

There are two straps and flipper lock assemblies on lifting frame. Left side is shown.

1. Remove strap (1) from rod on front support assembly (2).

PREPARATION FOR CONTAINER MODE - Continued

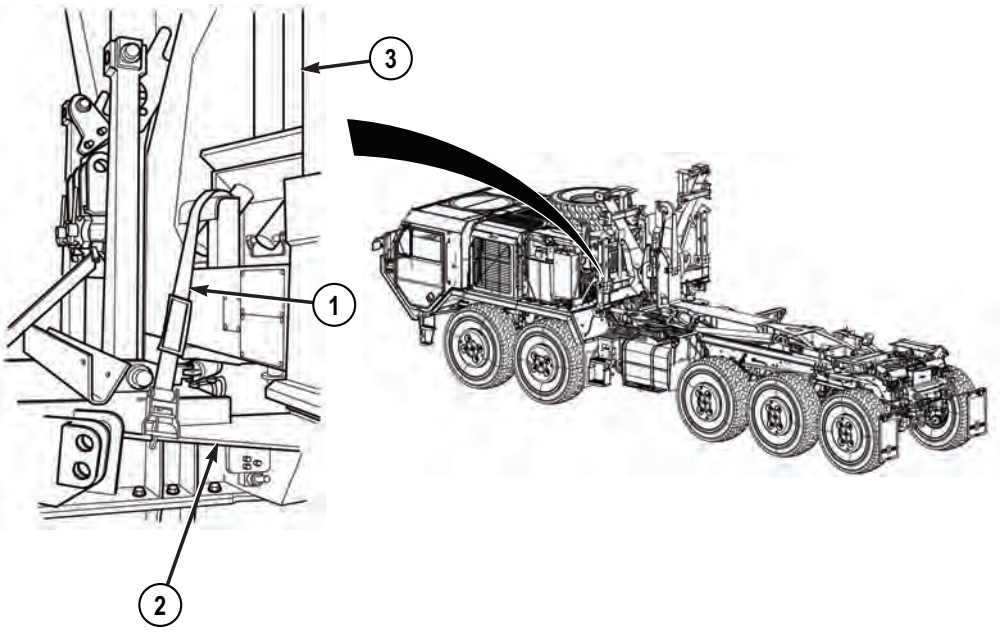


Figure 1.

2. Stow strap (1) on lifting frame (3) stowbar.
3. Pull flipper lock pin handle (4) out and lift air valve lever (5) up to rotate flipper bracket (6) and flipper bracket lock plate (7) on pivot pin (8).

PREPARATION FOR CONTAINER MODE - Continued

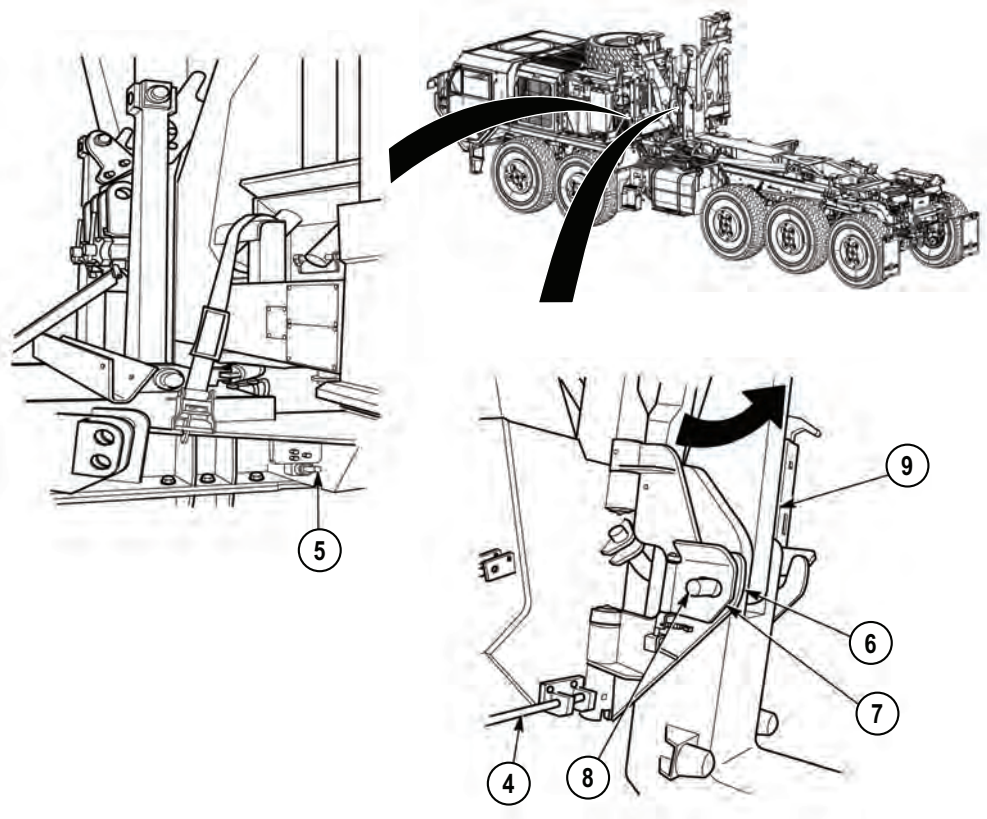


Figure 2.

4. Release flipper lock pin handle (4).
5. Ensure flipper bracket (6) is positioned over pivot pin (8) on hook arm (9).
6. Ensure flipper lock pin handle (4) is engaged in flipper bracket (6).
7. Repeat Steps (3) through (6) if flipper bracket (6) and flipper bracket lock plate (7) are not completely positioned over pivot pin (8).
8. Repeat Steps (1) through (7) for right side flipper lock.

NOTE

There are two strut and slider assemblies. Left side is shown.

9. Pull down pivot lock pin handle (10) and rotate rear slider (11) over tire (12) until pivot lock pin locks.

PREPARATION FOR CONTAINER MODE - Continued

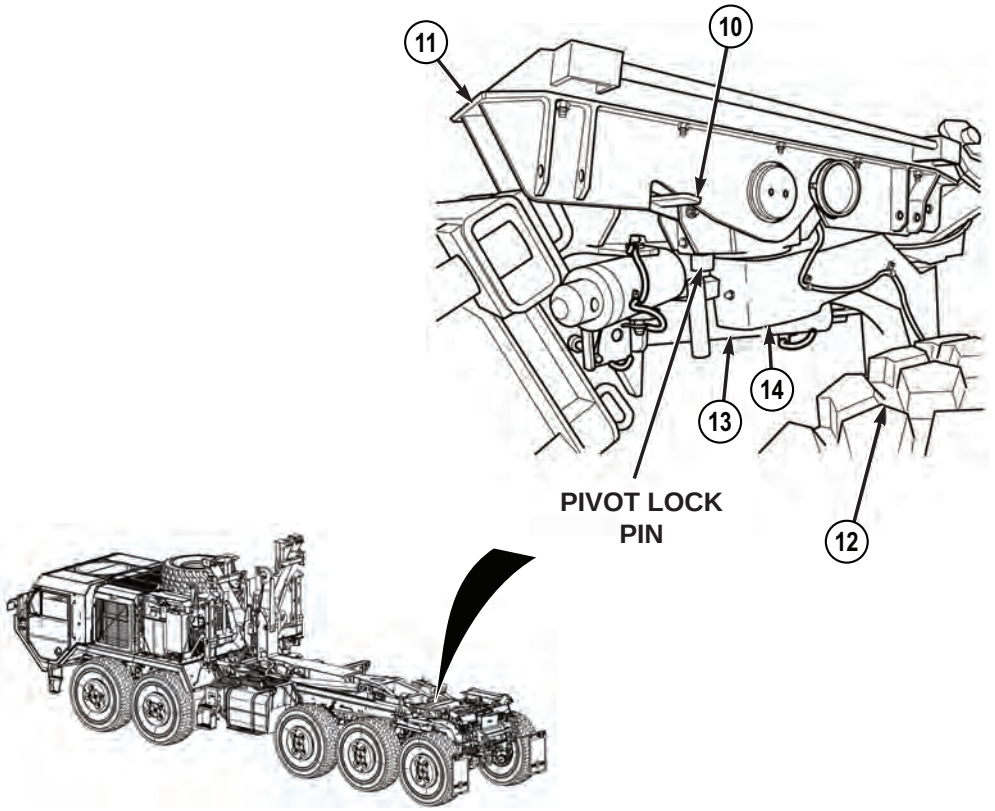


Figure 3.

10. Lift rear of slider (11) and, using handle (13), rotate slider arm (14) outward.

WARNING



Ensure fingers and hands are not between strut front and rear halves. Fingers and hands could become pinched during assembly. Failure to comply may result in injury or death to personnel.

11. Rotate flip lock (15) up to hold slider arm (14). Release slider arm.

PREPARATION FOR CONTAINER MODE - Continued

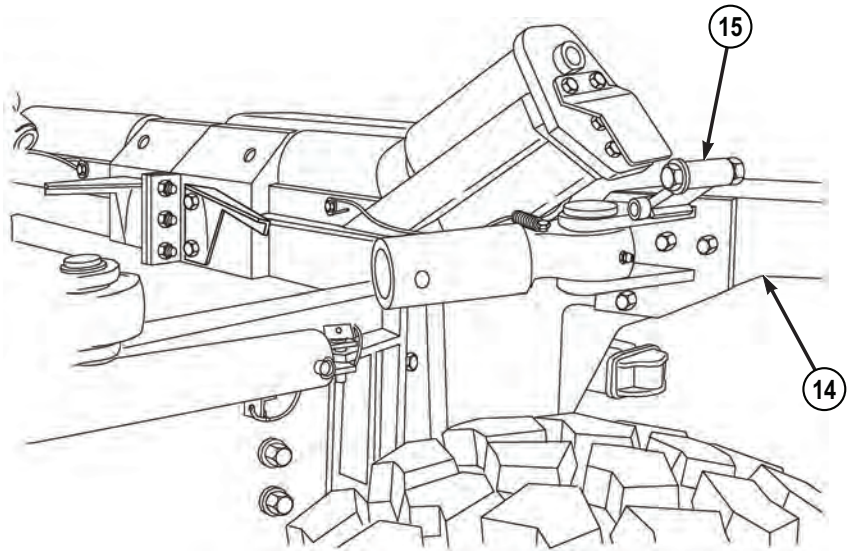


Figure 4.

12. Remove lock pin (16) and pin (17) from long strut (18) and strut bracket (19).

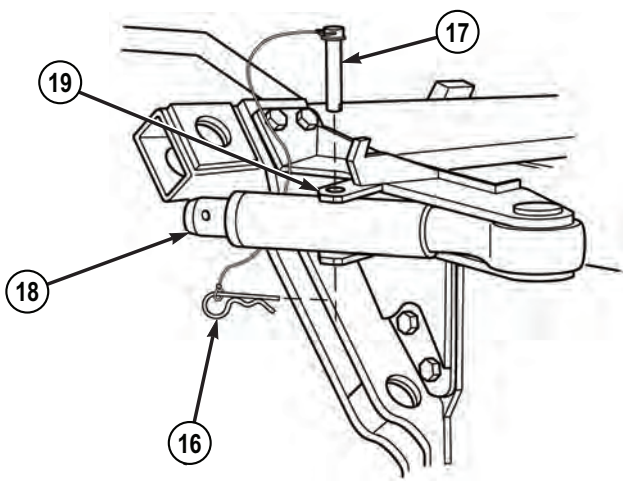


Figure 5.

13. Align long strut (18) with short strut (20).

PREPARATION FOR CONTAINER MODE - Continued

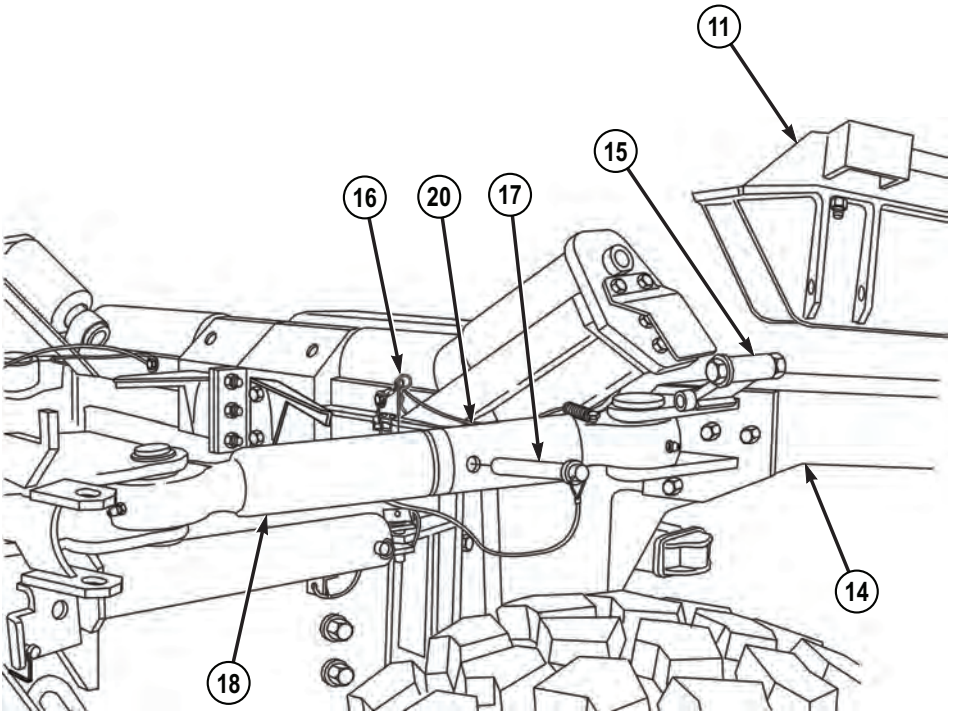


Figure 6.

14. Rotate slider arm (14) out with handle and disengage flip lock (15) by rotating it down.
15. Insert long strut (18) into short strut (20) and install pin (17) and lock pin (16). Ensure slider (11) is in straight ahead position.
16. Repeat Steps (9) through (15) for right side.

WARNING



- Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.
- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm

PREPARATION FOR CONTAINER MODE - Continued

extending too far and front lift adapter may contact rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in injury or death to personnel.

- Front lift adapter must be unloaded on a flat level surface. Failure to comply may result in front lift adapter tipping over unexpectedly causing injury or death to personnel.
- Both right and left side flipper brackets and flipper bracket lockplates must engage pivot pin on hook arm. Failure to comply will result in front lift adapter falling off of hook arm. Failure to comply may result in injury or death to personnel.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

17. Turn hydraulic selector switch (21) to AUTO.

PREPARATION FOR CONTAINER MODE - Continued

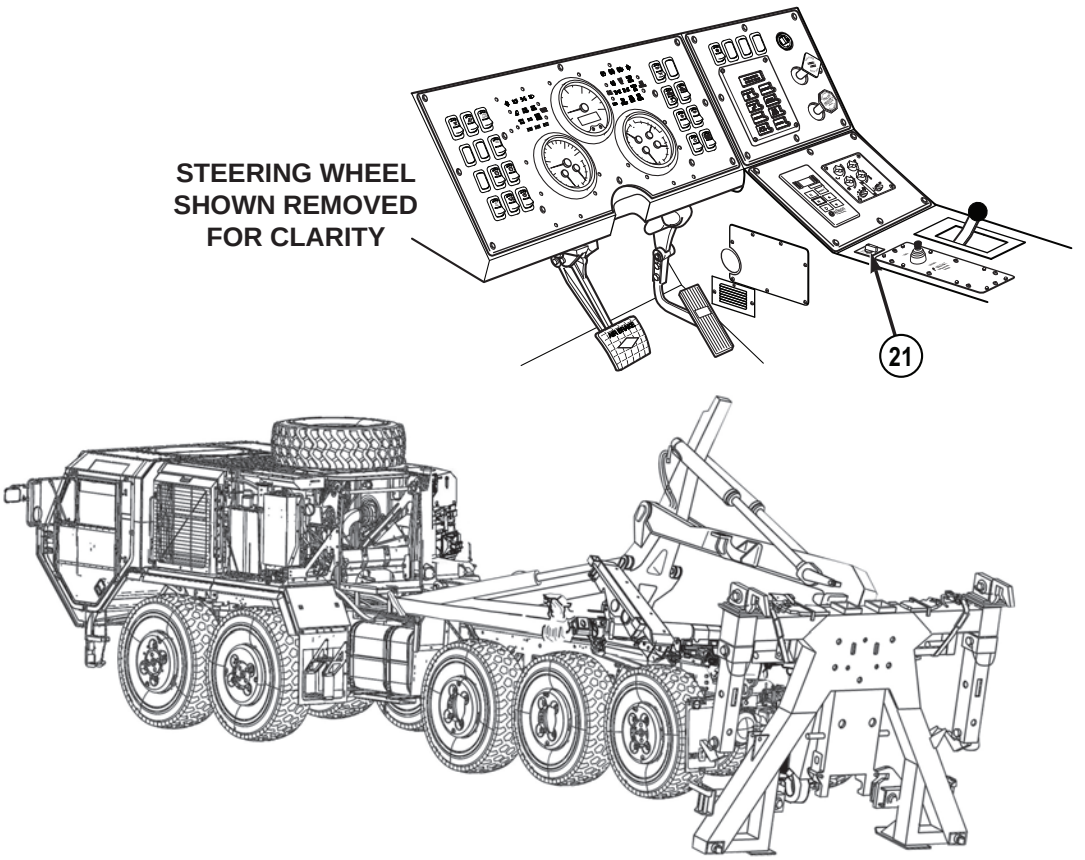


Figure 7.

18. Operate LHS in AUTO mode until lifting frame (3) stops.
19. Turn hydraulic selector switch (21) to MAN H.A. mode and lower until lifting frame is approximately 12.0 in. (305 mm) from the ground.
20. Remove two lock pins (22) and pins (23) from upper support leg (24).

PREPARATION FOR CONTAINER MODE - Continued

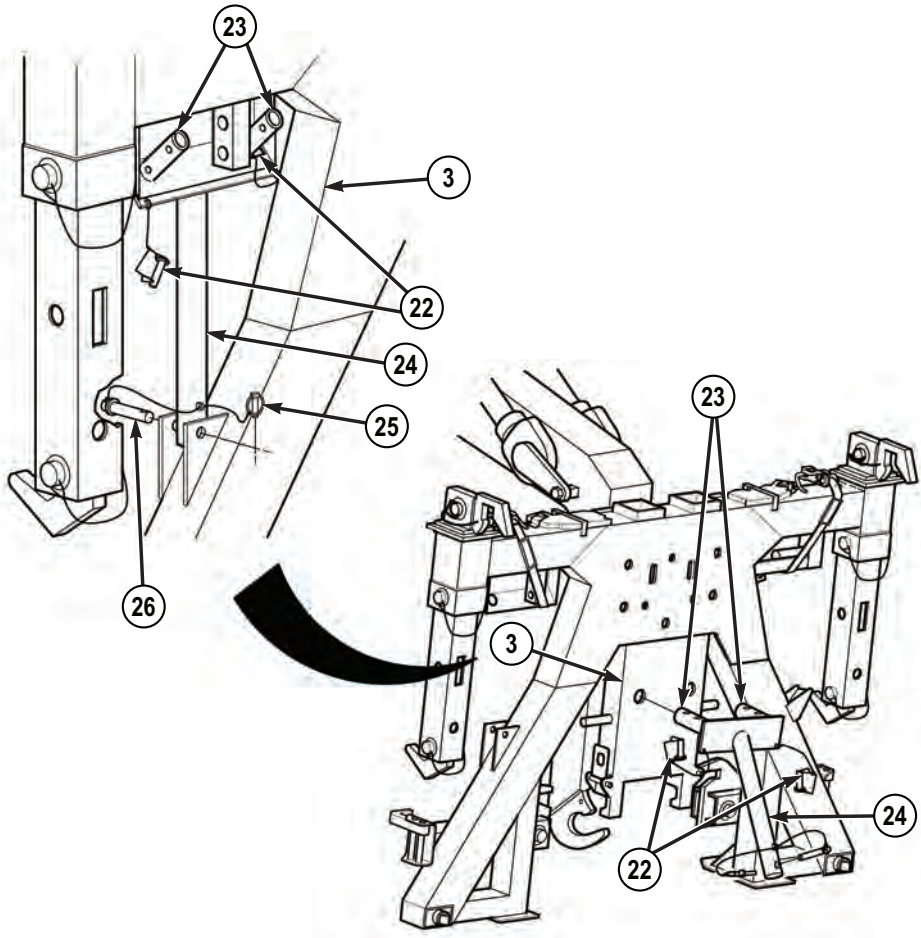


Figure 8.

21. Remove lock pin (25), pin (26), and upper support leg (24) from stowage bracket on lifting frame (3).
22. Position two pins (23) on upper support leg (24) through two lower holes on lifting frame (3).
23. Install two lock pins (22) in pins (23) on upper support leg (24) and front side of lifting frame (3).
24. Remove lock pin (27) and lower support leg (28) from stowage bracket on lifting frame (3).

PREPARATION FOR CONTAINER MODE - Continued

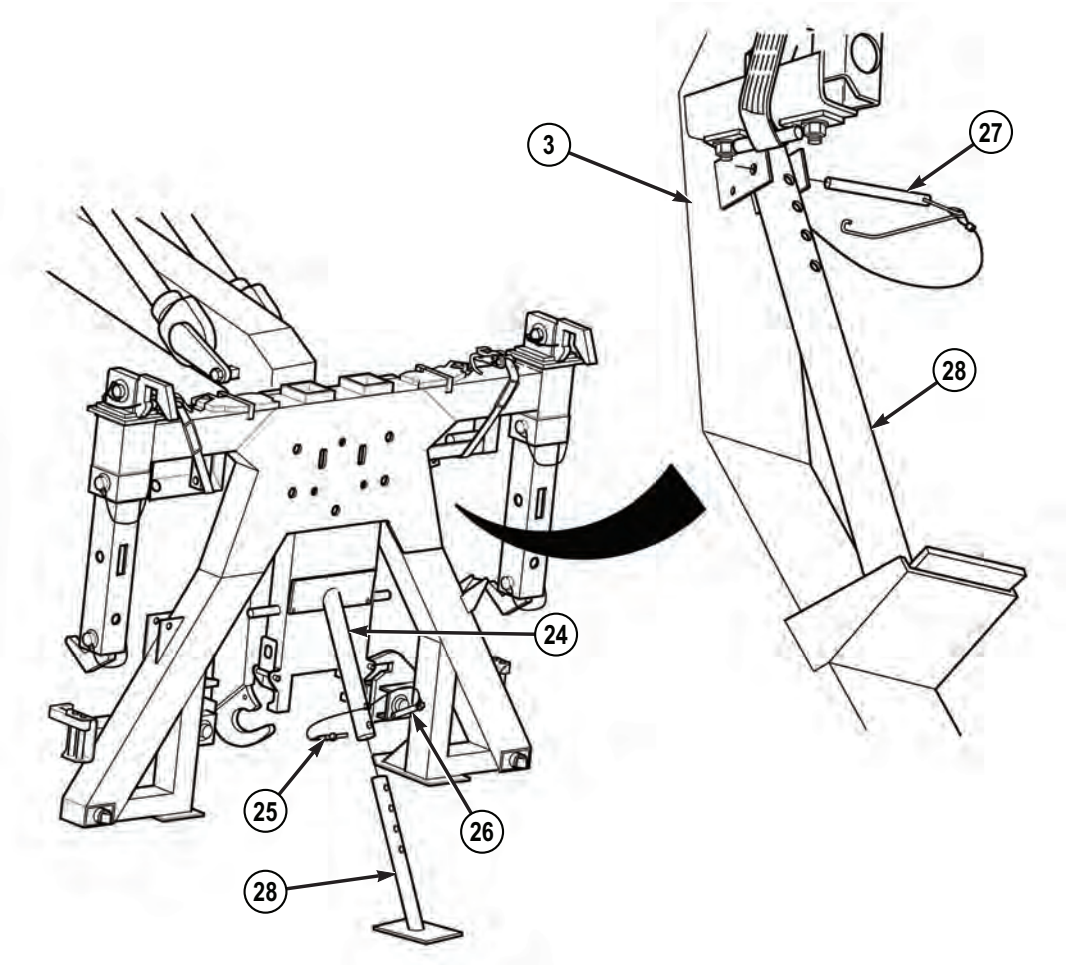


Figure 9.

25. Insert lower support leg (28) into upper support leg (24).

NOTE

Other support leg pin hole positions may be used if ground is uneven.

26. Align hole in upper support leg (24) with second hole from bottom on lower support leg (28) and install pin (26) and lock pin (25).

27. Install lock pin (27) in stowage bracket on lifting frame (3).

PREPARATION FOR CONTAINER MODE - Continued

NOTE

- If ground is soft, jacking plate from vehicle BII or similar item may be positioned under support leg pad to prevent lifting frame from sinking in ground.
- There are two flipper bracket lock plates on lifting frame. Left side is shown.

28. Lift pin handle (29) and release pin (30).

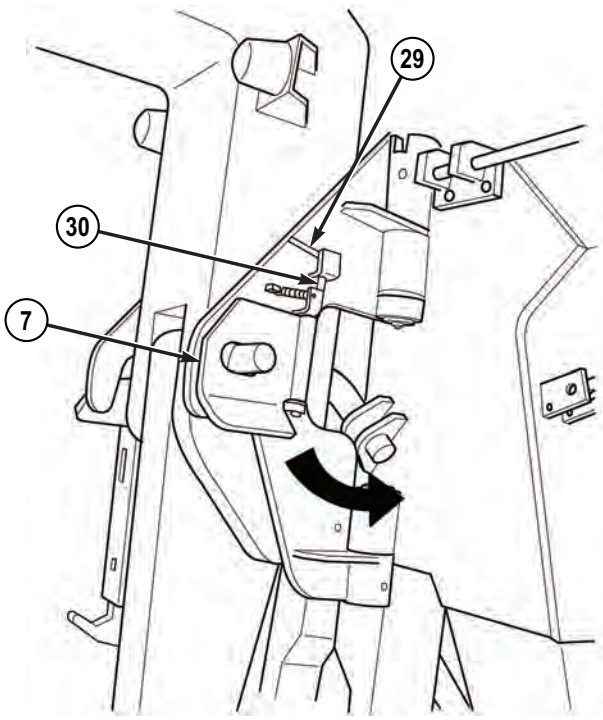


Figure 10.

29. Rotate flipper bracket lock plate (7) out to unlocked position and release pin handle (29).
30. Ensure pin (30) is locked in flipper bracket lock plate (7).
31. Repeat Steps (28) through (30) for right side.
32. With hydraulic selector switch still in MAN H.A. mode, move joystick (31) to UNLOAD until LHS stops and pivot pin (8) is below flipper bracket (6).

PREPARATION FOR CONTAINER MODE - Continued

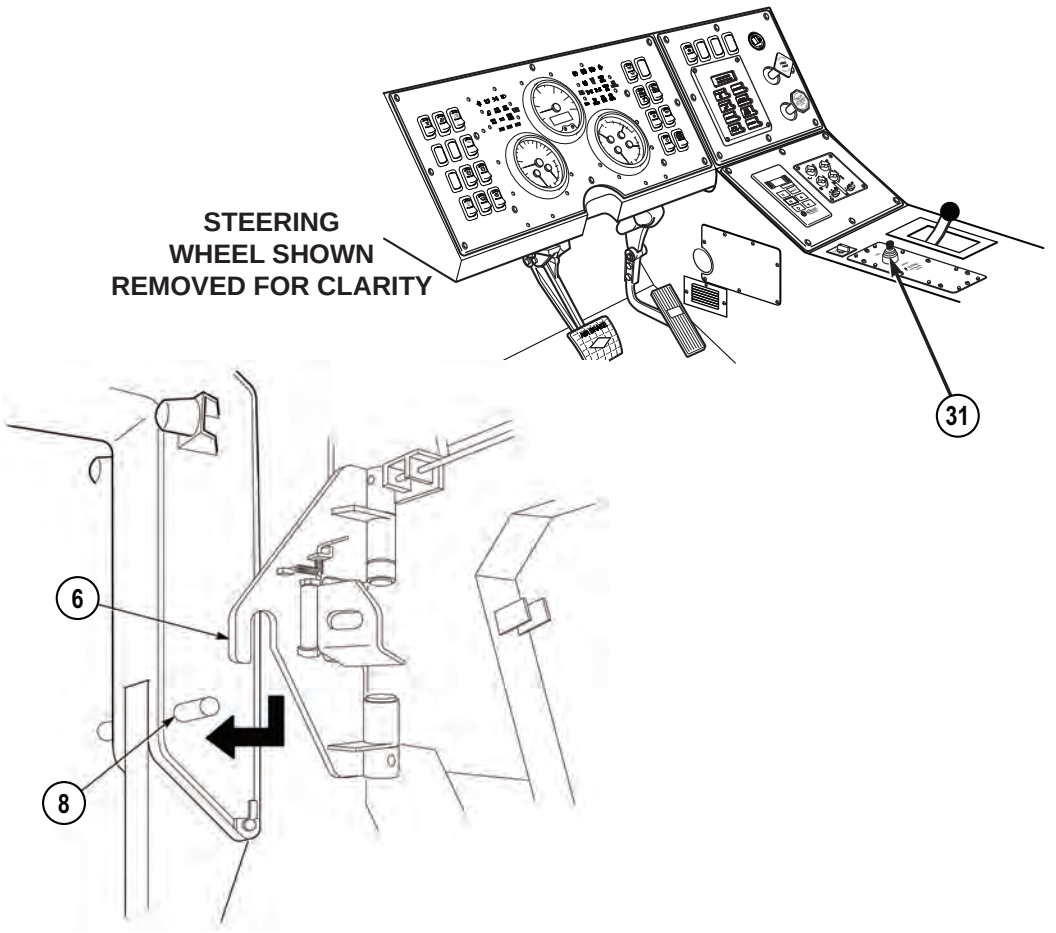


Figure 11.

33. Drive vehicle ahead approximately 12.0 in. (305 mm).

NOTE

- There are two bumper supports and container guides. Left side is shown.
- Bumper support is in container mode when bumper support is positioned completely over bracket, toward rear of vehicle.

34. Remove lock pin (32) from bumper support (33).

PREPARATION FOR CONTAINER MODE - Continued

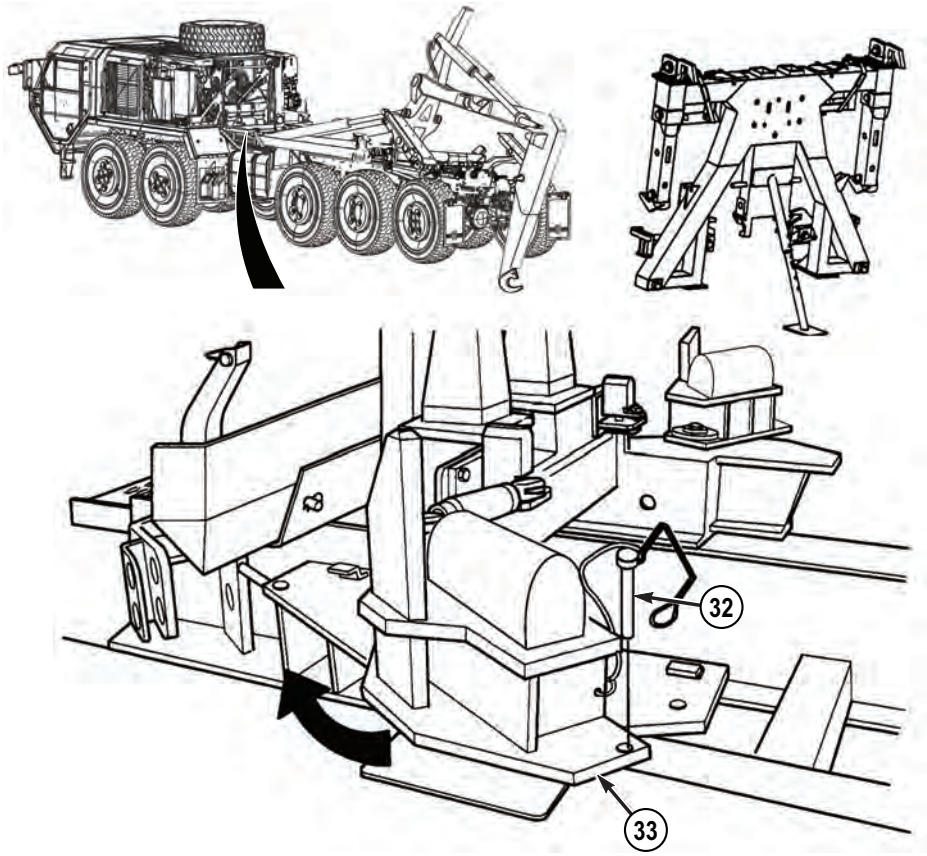


Figure 12.

35. Rotate bumper support (33) approximately 180 degrees toward rear of vehicle.
36. Install lock pin (32) in bumper support (33).
37. Remove lock pin (34), pin (35), and container guide (36) from stowage bracket (37).

PREPARATION FOR CONTAINER MODE - Continued

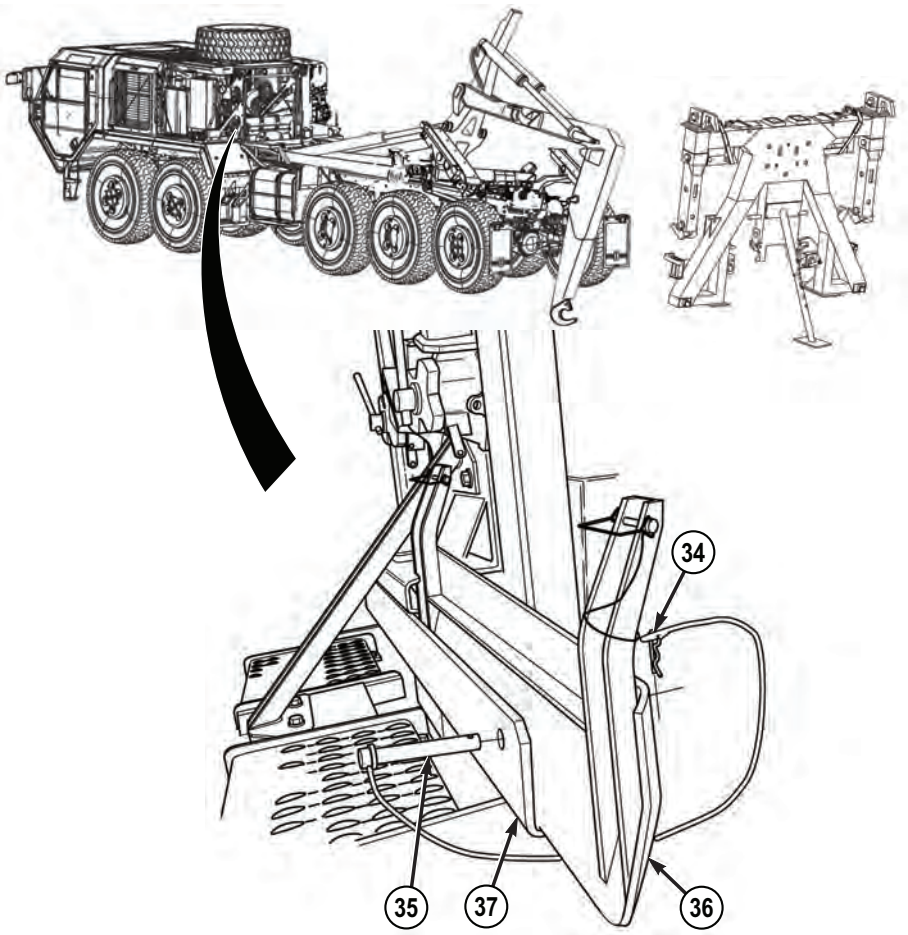


Figure 13.

38. Install pin (35) and lock pin (34) in stowage bracket (37).

WARNING



Hands may get pinched when installing container guide into slider. Hold container guides by outer edges of plate to avoid pinching between

PREPARATION FOR CONTAINER MODE - Continued

container guides and slider. Failure to comply may result in injury to personnel.

39. Remove two lock pins (38) from container guide (36).

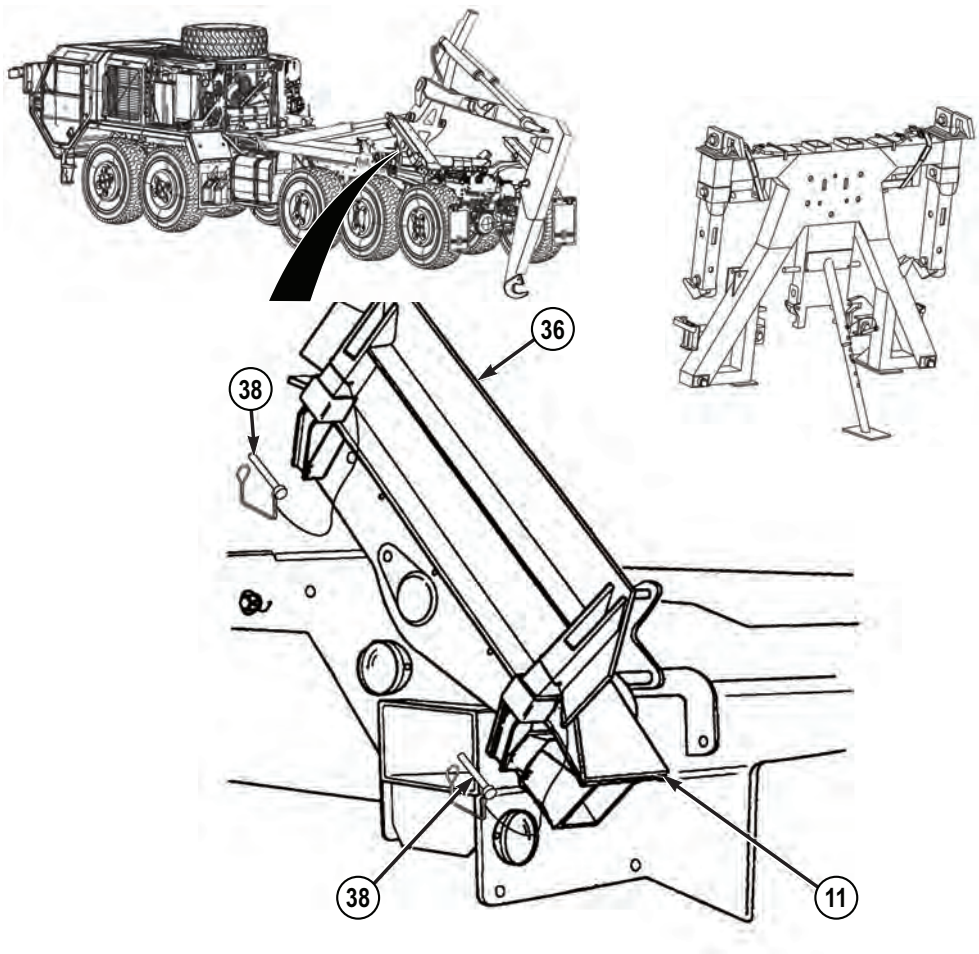


Figure 14.

40. Position container guide (36) in slider (11) and install two lock pins (38).
41. Repeat Steps (34) through (40) for right side.

NOTE

There are two rear container locks on lifting frame. Left side is shown.

PREPARATION FOR CONTAINER MODE - Continued

42. Remove lock pin (39), pin (40), and rear container lock (41) from stowage bracket on lifting frame (3).

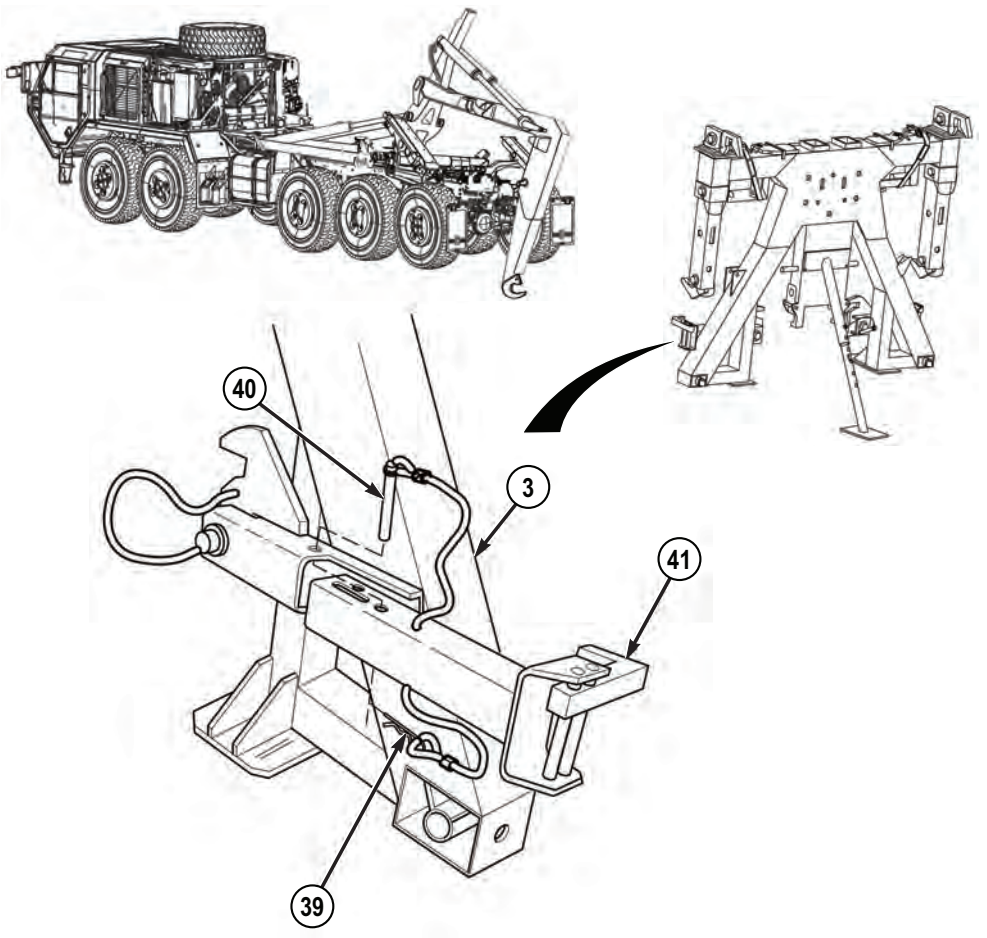


Figure 15.

43. Turn lock handle (42) on slider (11) forward to unlock position.

PREPARATION FOR CONTAINER MODE - Continued

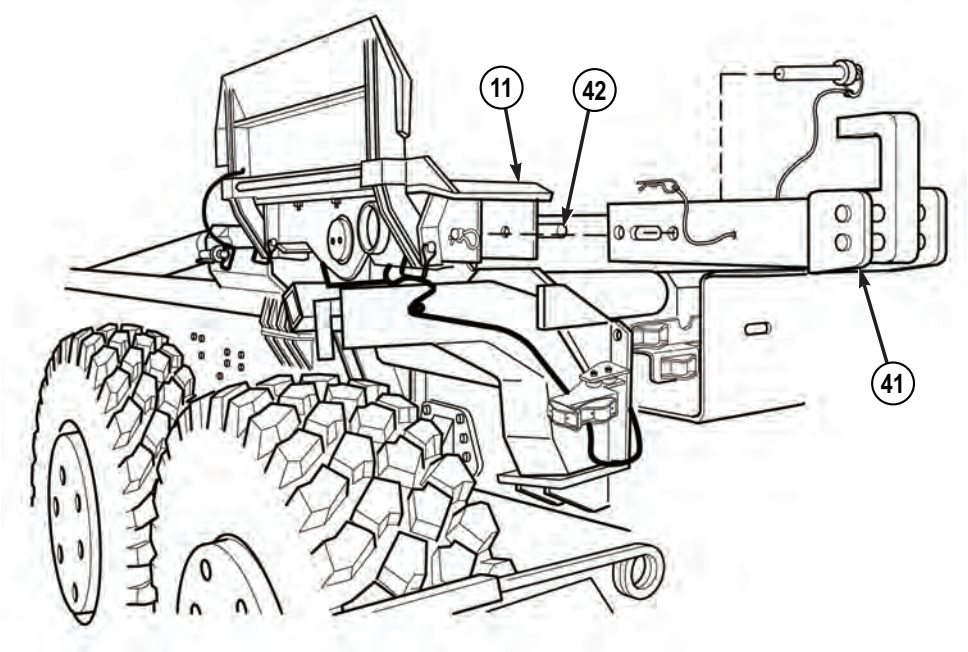


Figure 16.

NOTE

Hook in rear container lock faces up.

44. Position rear container lock (41) in opening of slider (11).

NOTE

Ensure rear container lock pivot pin is in slot of rear container lock.

45. Turn lock handle (42) on slider (11) back to locked position.
46. Pull rear container lock (41) out to ready mode (down position).

PREPARATION FOR CONTAINER MODE - Continued

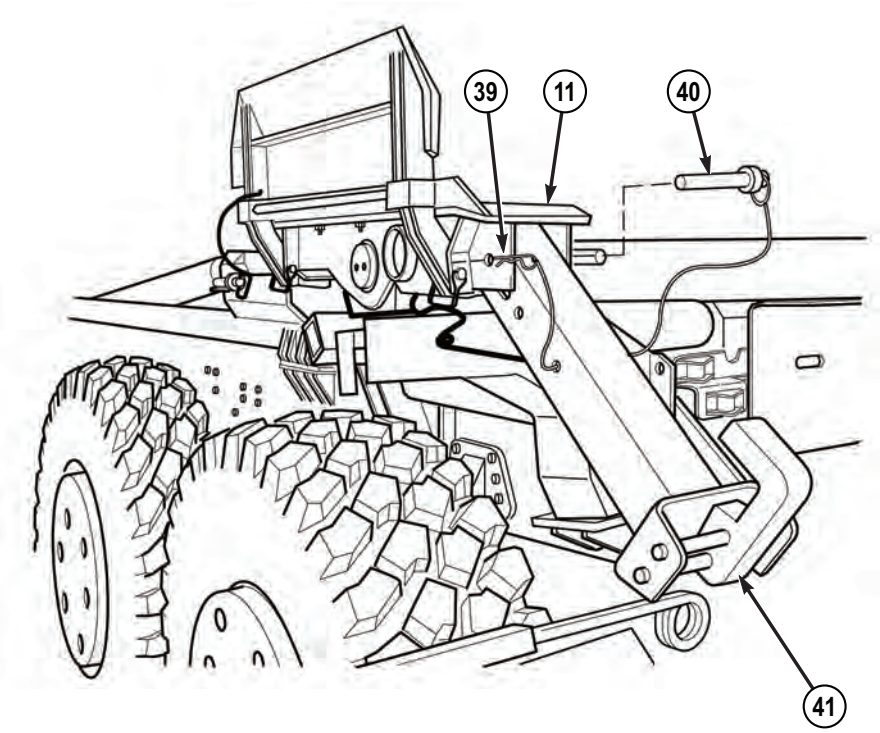


Figure 17.

NOTE

Pin is properly installed in hole farthest back on slider.

47. Install pin (40) and lock pin (39) in slider (11) and rear container lock (41).
48. Repeat Steps (42) through (47) for right side.

WARNING



- Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

PREPARATION FOR CONTAINER MODE - Continued

- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter may contact rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in injury or death to personnel.
- Ensure lift adapter is free of snow, ice, and mud when installing on LHS. Lift adapter may be unbalanced and may cause injury or death to personnel.

CAUTION

Ensure hydraulic selector switch is in MAN H.A. when performing Step (49). Failure to comply may result in damage to equipment.

NOTE

For detailed instructions on how to operate the LHS on the PLS vehicle, refer to Load Handling System (WP 0042).

49. With hydraulic selector switch still in MAN H.A. mode, move joystick (31) to LOAD until hook (43) is below hook bar (44). Release joystick.

PREPARATION FOR CONTAINER MODE - Continued

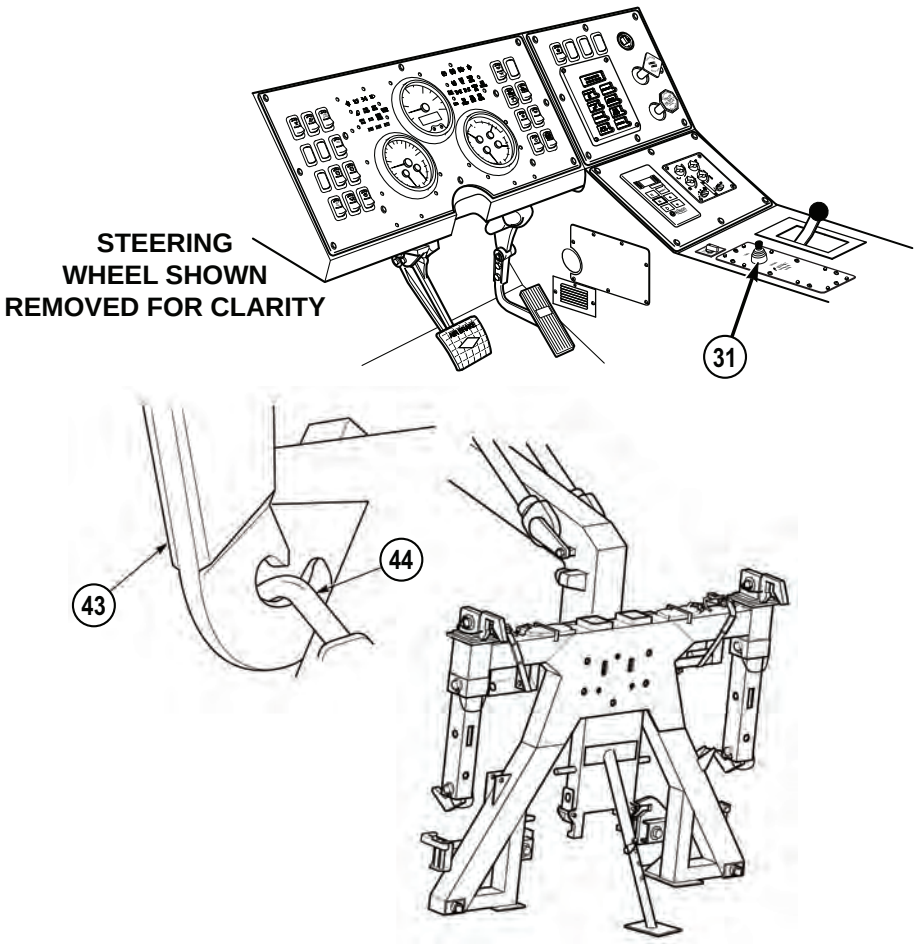


Figure 18.

50. Back up vehicle and engage hook bar (44) with hook (43).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

51. Turn hydraulic selector switch (21) to AUTO mode.

PREPARATION FOR CONTAINER MODE - Continued

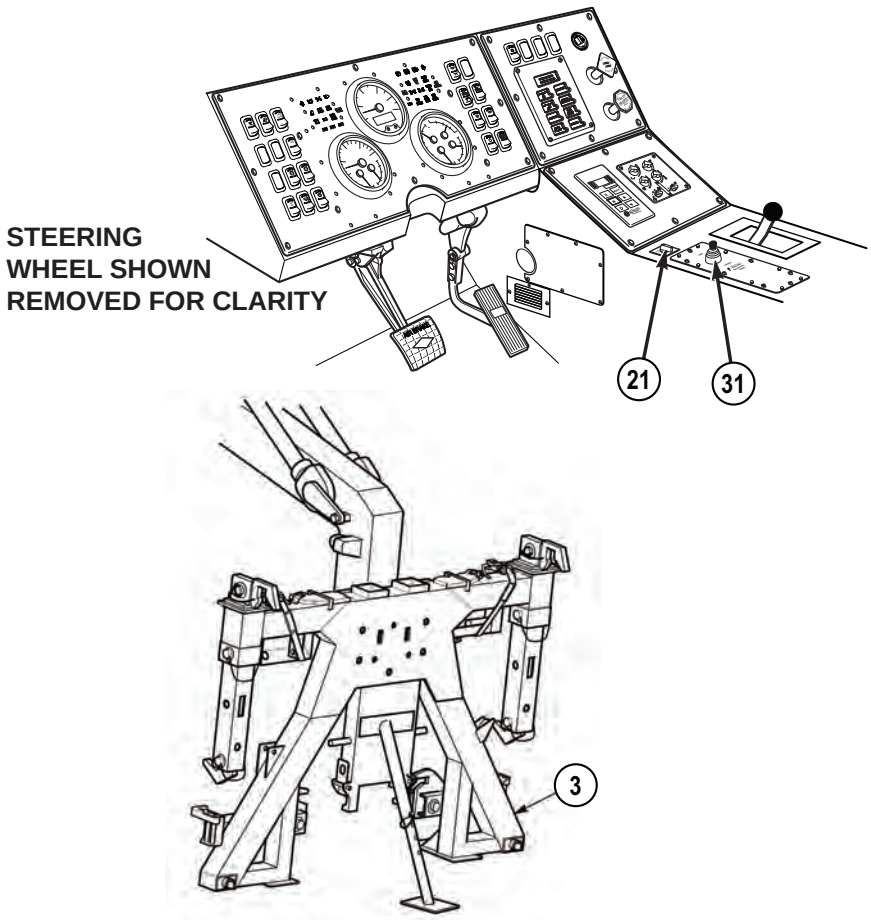


Figure 19.

52. Move joystick (31) to LOAD and raise lifting frame (3) approximately 12 in. (305 mm) off of ground. Release joystick.

53. Remove lock pin (45), pin (46), and bail bar lock (47) from stowage bracket on lifting frame (3).

PREPARATION FOR CONTAINER MODE - Continued

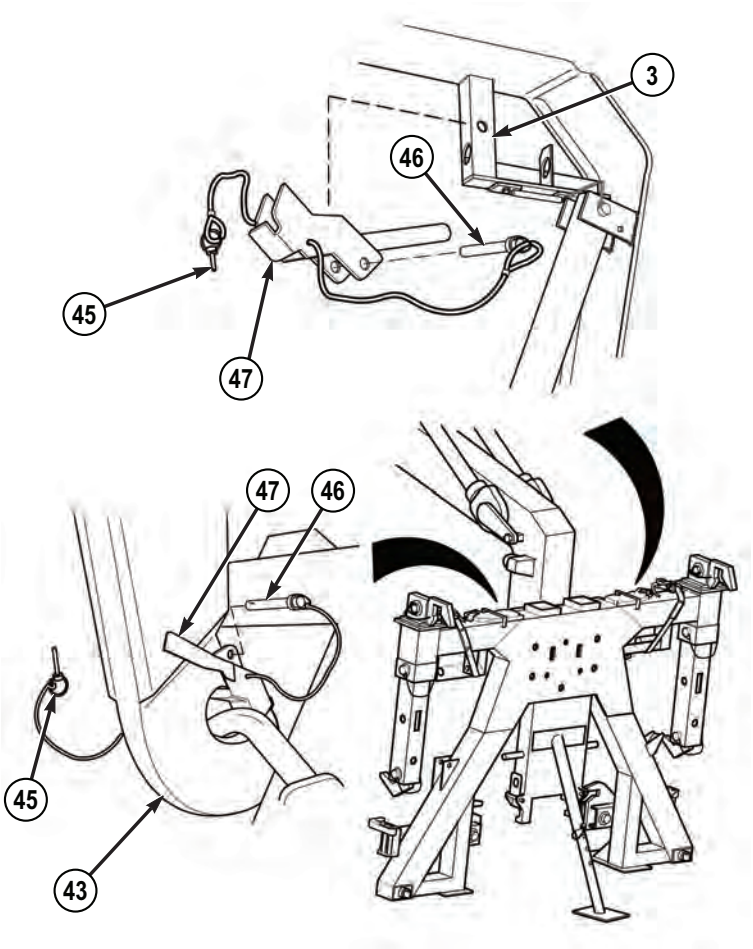


Figure 20.

54. Install bail bar lock (47) on hook (43) with pin (46) and lock pin (45).
55. Support lower support leg (28) and remove lock pin (25) and pin (26).

PREPARATION FOR CONTAINER MODE - Continued

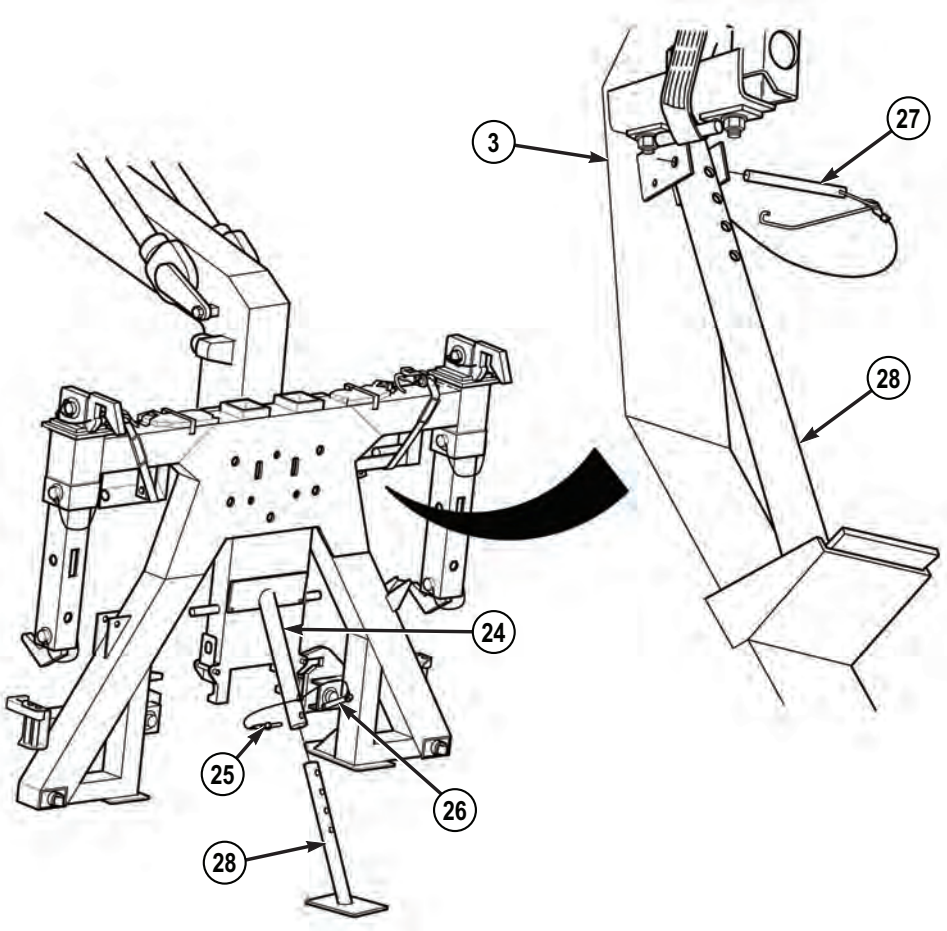


Figure 21.

56. Remove lower support leg (28) from upper support leg (24).
57. Remove lock pin (27) from stowage bracket on lifting frame (3).
58. Position lower support leg (28) in stowage bracket on lifting frame (3) and install lock pin (27).
59. Support upper support leg (24) and remove two lock pins (22) from pins (23).

PREPARATION FOR CONTAINER MODE - Continued

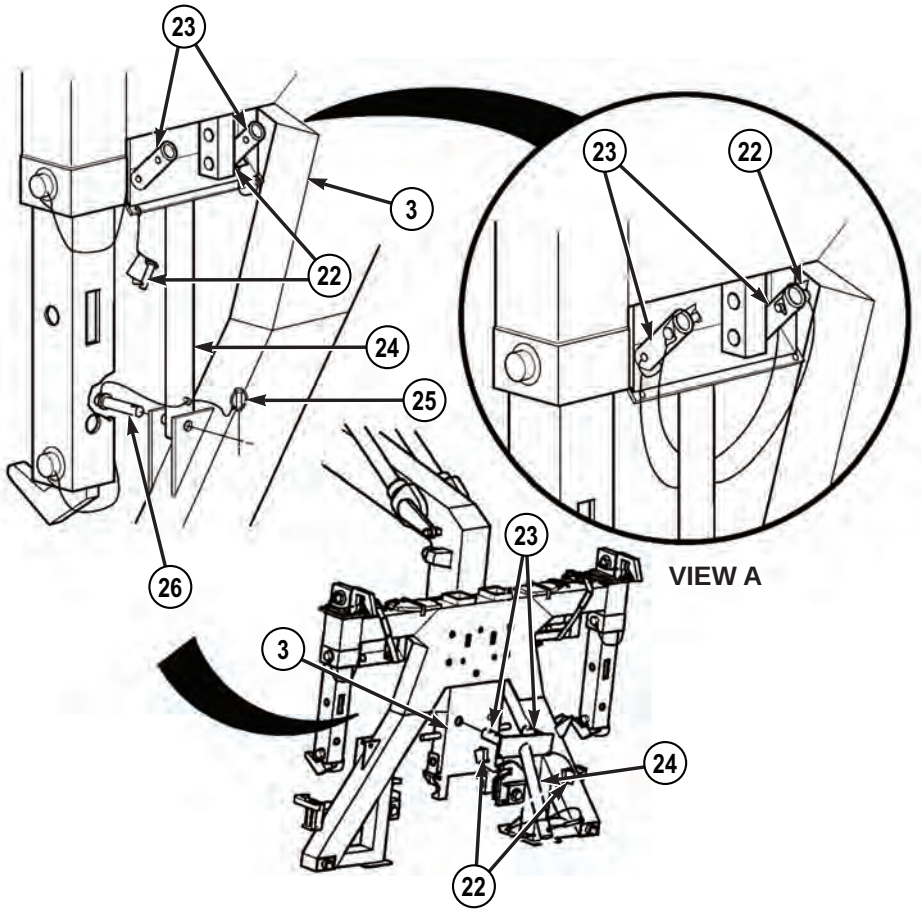


Figure 22.

60. Remove upper support leg (24) from lifting frame (3).

CAUTION

Ensure tethers of two lock pins installed in Step (61) are routed behind upper support leg and are installed on opposite pins. Failure to comply may allow tethers to catch on lift hook, causing damage to equipment.

61. Position upper support leg (24) in stowage bracket on lifting frame (3), and install two lock pins (22) on pins (23). Criss-cross tethers by routing lower right lock pin to upper left hole in upper strut and lower left lock pin to upper right hole in upper strut, as shown in View A.

PREPARATION FOR CONTAINER MODE - Continued

62. Install pin (26) and lock pin (25) and upper support leg (24) in stowage bracket on lifting frame (3).

CAUTION

LHS must be completely stowed before attaching lifting frame to container. This resets LHS cycle for container mode. Failure to comply may result in damage to equipment.

63. Move joystick (31) to LOAD until LHS NO TRANS light (48) goes out and lifting frame (3) is positioned on bumper supports (33).

PREPARATION FOR CONTAINER MODE - Continued

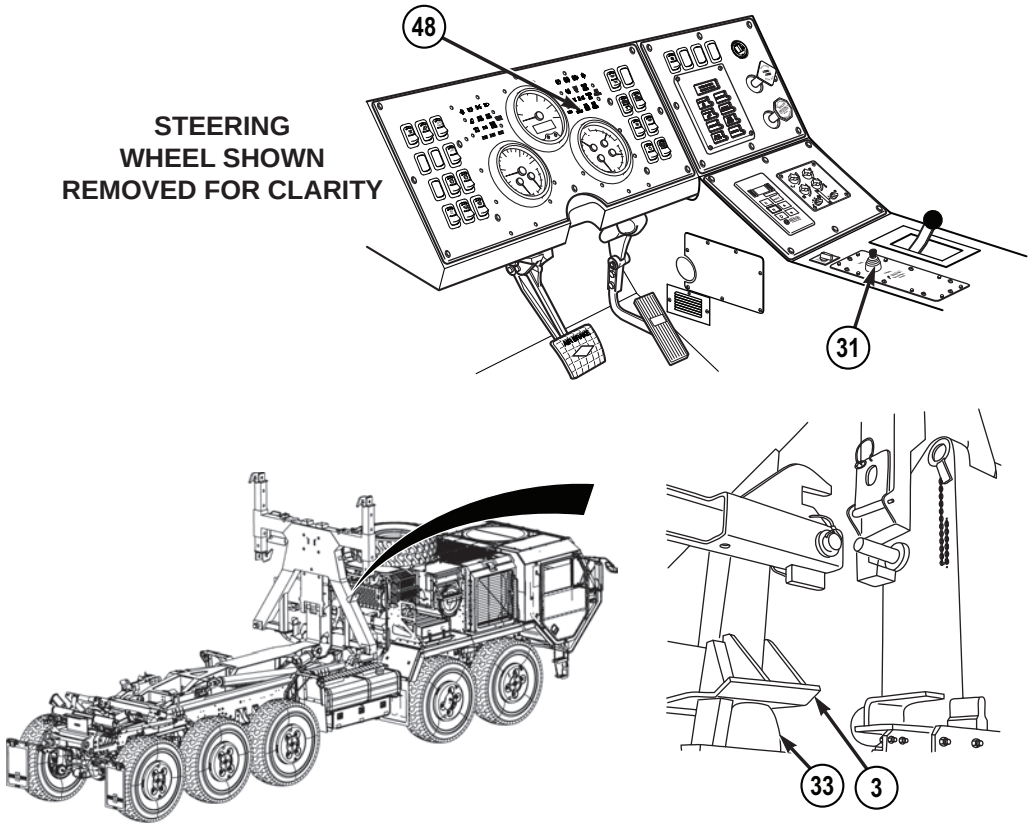


Figure 23.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOADING AND UNLOADING CONTAINER (82.0 IN. [2082.8 MM] OR TALLER) TO PLS VEHICLE USING LIFTING FRAME (LF)

INITIAL SETUP:

Not Applicable

LOADING

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure lifting frame is in the unlocked position before attempting to load a container on vehicle. Failure to comply will result in damage to equipment.

1. Ensure lifting frame (1) is in container mode (WP 0043) and unlocked (WP 0048).

LOADING - Continued

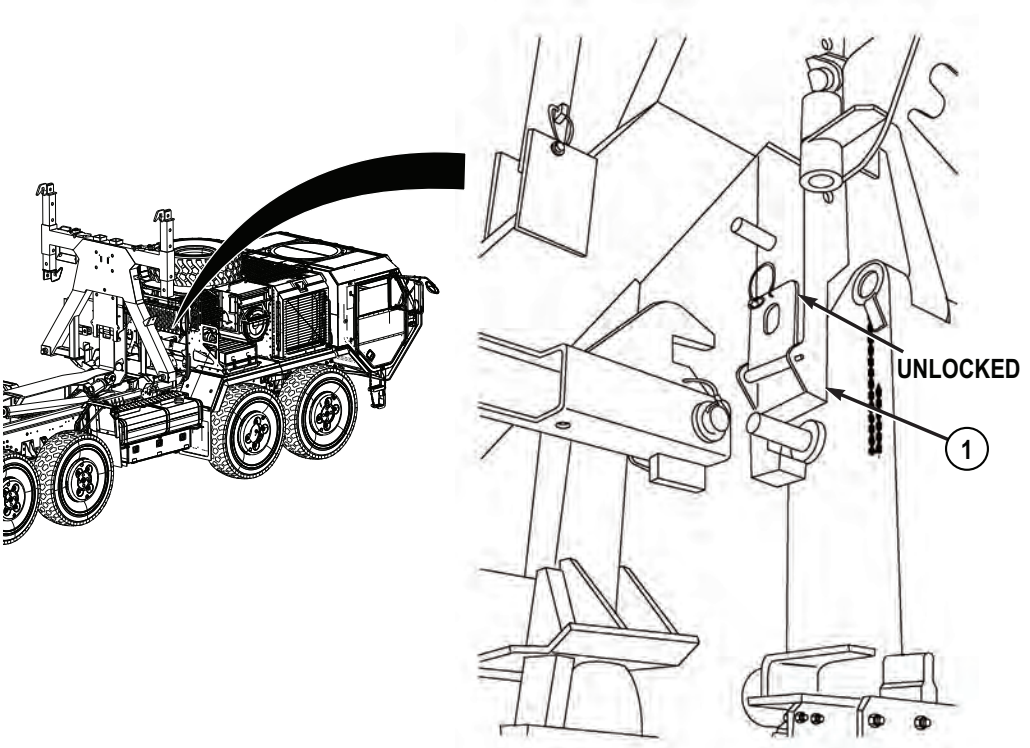


Figure 1.

CAUTION

Ensure vehicle is in container mode before attempting to load a container on vehicle. Failure to comply will result in damage to equipment.

2. Ensure vehicle is in container mode (WP 0043).
3. Ensure rear container lock (2) is in ready mode (WP 0043).

LOADING - Continued

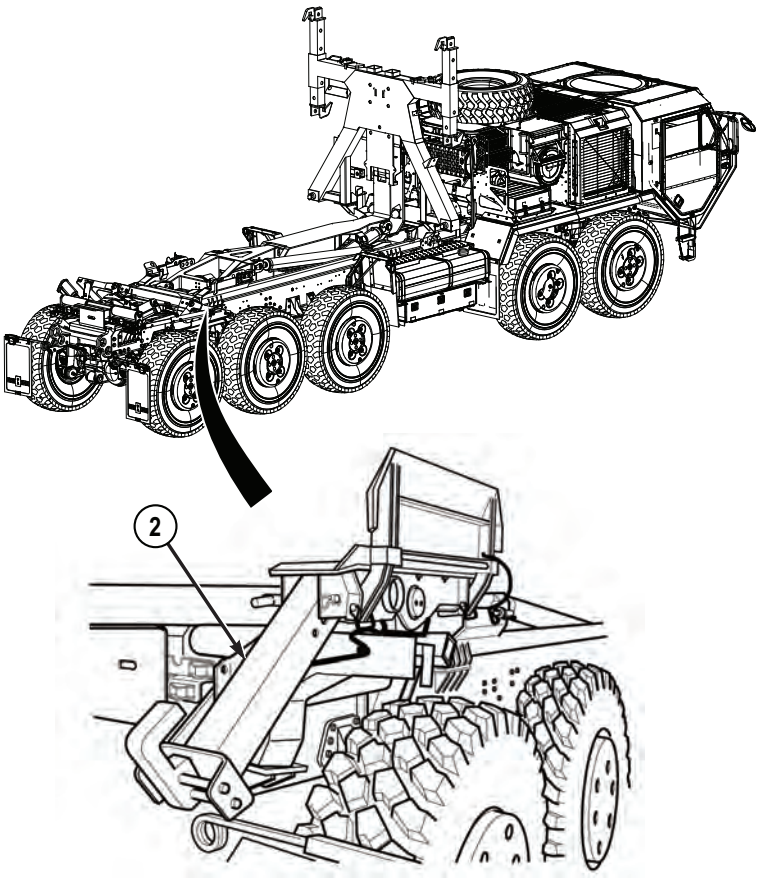


Figure 2.

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).

LOADING - Continued

- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

CAUTION

- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading or flanges on side may be damaged and/or door hinges may make hard contact with guides.
- When operating CHU with non-standard, end-opening, 20 ft (6096 mm) long shipping containers, operator needs to take extra care to ensure that sliders and guides contact container properly, container slides on sliders properly, and container loads centered on vehicle. Failure to comply can result in container getting hung up or making hard contact with sliders and guides, causing damage to CHU or container.

NOTE

- For detailed instructions on how to operate the LHS on the PLS vehicle, refer to Load Handling System (WP 0042).
- Rear mud flaps may be pinned up to provide better visibility of lifting frame lower container locks.
- Multiple connected containers cannot be used with CHU. This includes Six CONS and Quad CONS.
- It is recommended that two personnel be used to ease operation (Driver and Spotter to position lifting frame).

4. Start engine (WP 0027).
5. Push in parking brake knob (3), apply service brake pedal (4), and set transmission range selector (5) to Reverse (R).

LOADING - Continued

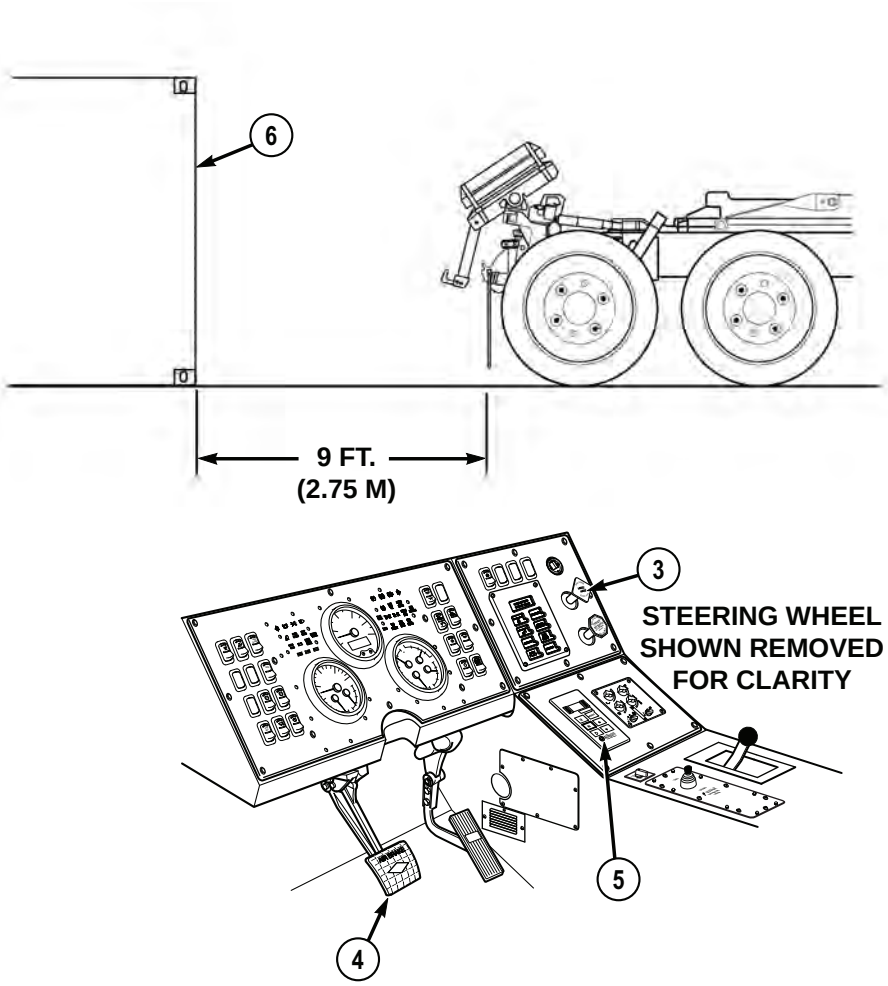


Figure 3.

6. Release service brake pedal (4) and position rear of vehicle within 9 ft (275 mm) of front of container (6), aligning centerline of vehicle within 2 in. (50.8 mm) of container centerline.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

7. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

LOADING - Continued

CAUTION

On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Return hydraulic selector to AUTO and continue (UNLOAD) operation. Repeat as required. Failure to comply may result in damage to equipment.

8. Turn hydraulic selector switch (7) to AUTO.

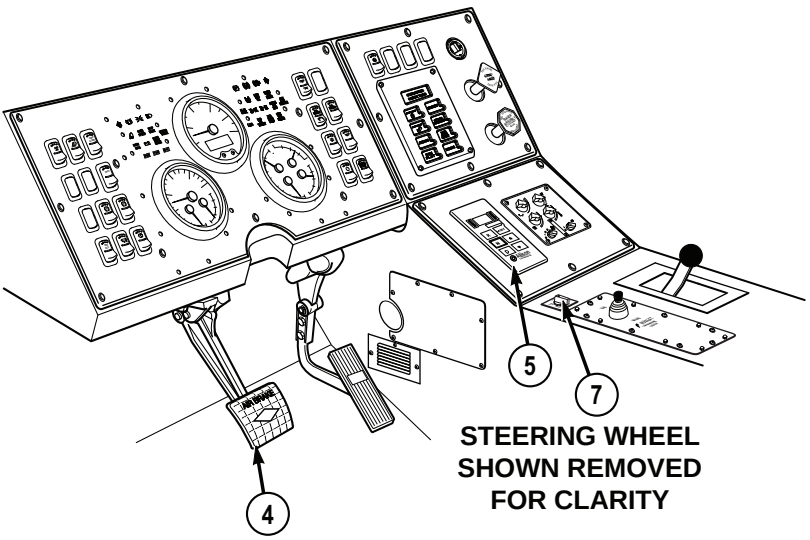


Figure 4.

9. Move joystick (8) to UNLOAD position until lifting frame (1) is positioned in front of container (6).

LOADING - Continued

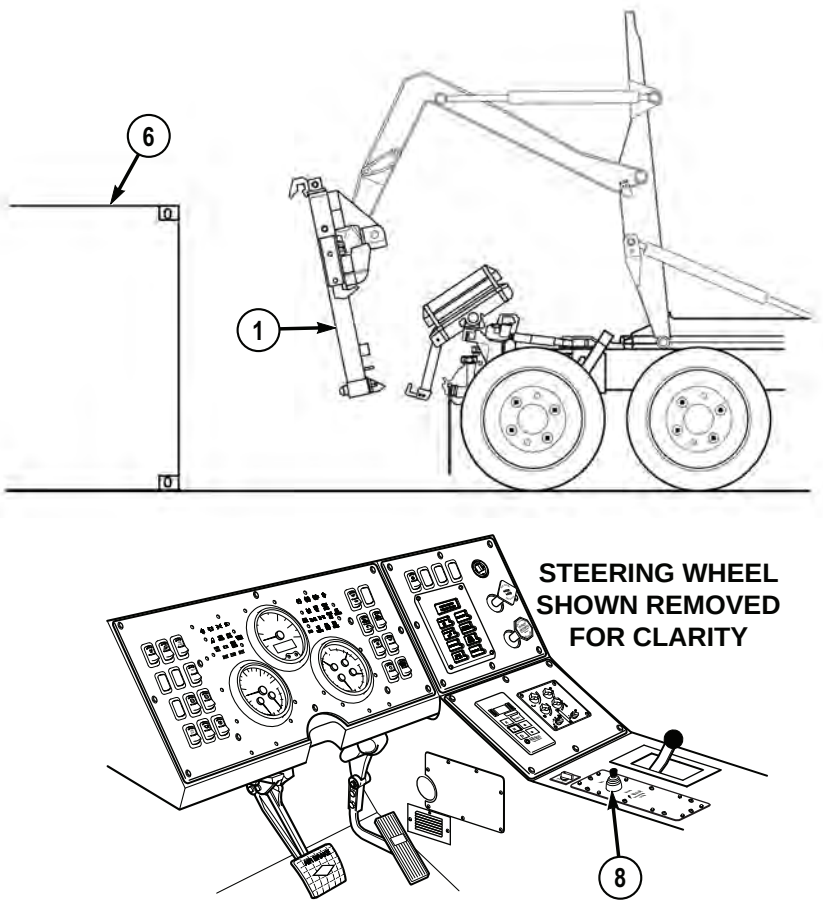


Figure 5.

10. Operate LHS in AUTO mode until lifting frame (1) is approximately 12.0 in. (304.8 mm) off of ground.

LOADING - Continued

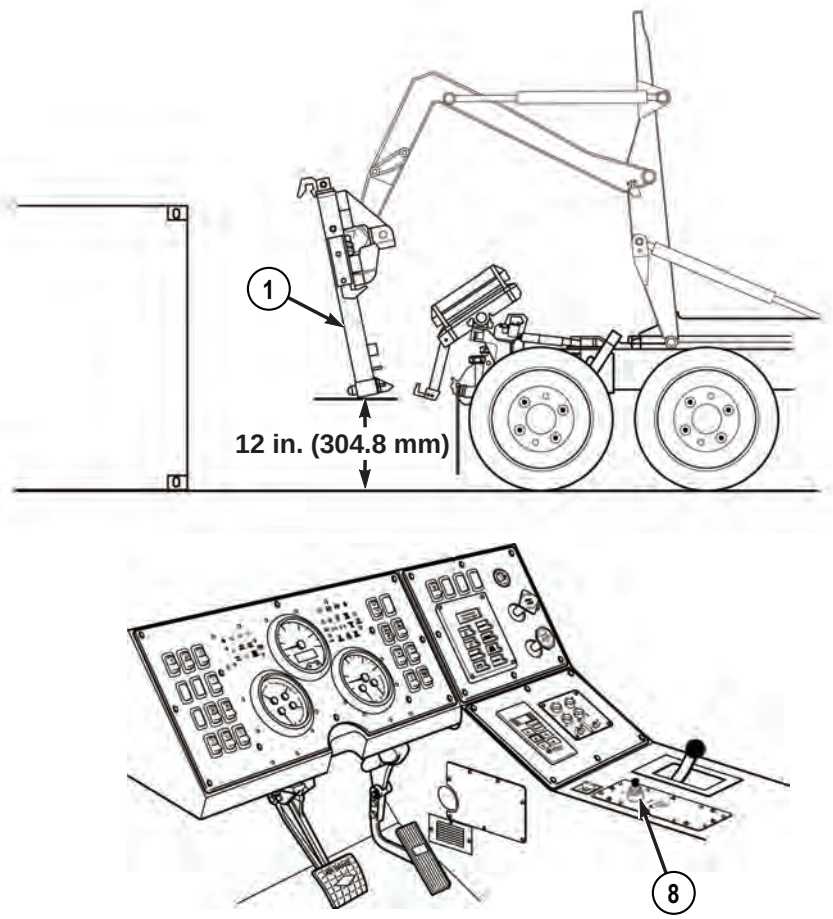


Figure 6.

11. Release joystick (8).
12. Shut OFF engine (WP 0037).

NOTE

- Refer to the lifting frame data plate for the proper configuration needed for the height of each container being loaded.
- There are two slide arms. Right side shown.

13. Remove lock pin (9) and pin (10) from lifting frame (1) and slide arm (11) to upper hole.

LOADING - Continued

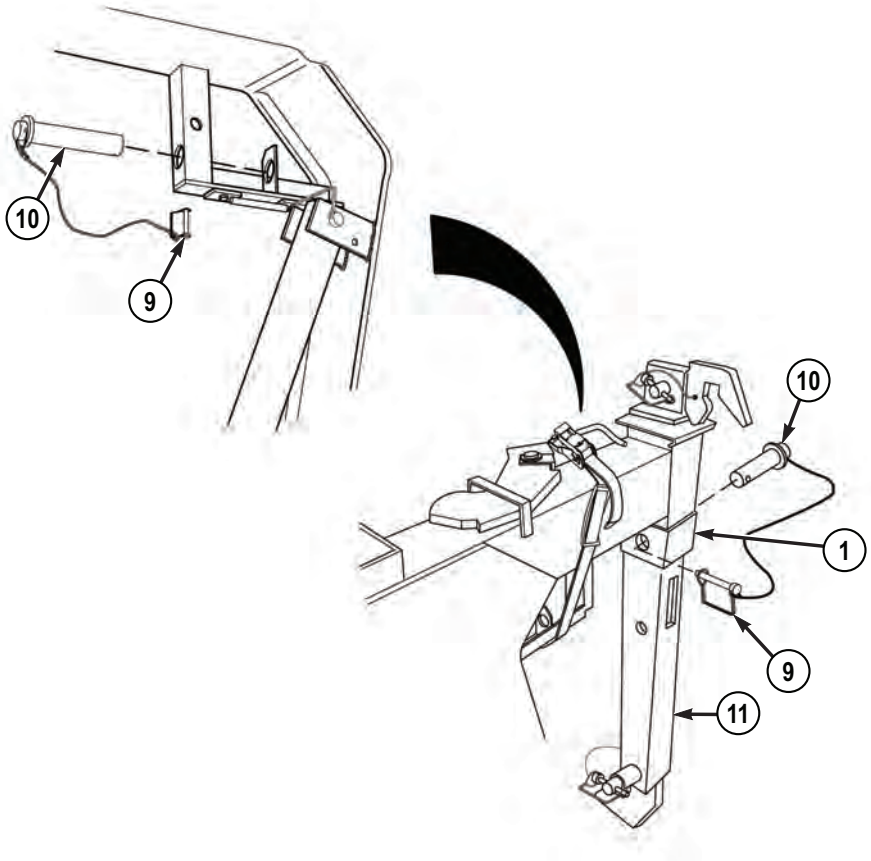


Figure 7.

14. Repeat Steps (12) and (13) for left side.
15. Install pin (10) and lock pin (9) in stow position on lifting frame (1).

NOTE

- There are two lifting frame lower container locks and rear sliders. Right side shown.
- Ensure lifting frame lower container lock handle is positioned in slot on handle lock plate.
- Ensure tab on handnut faces up.

LOADING - Continued

16. Raise handle lock plate (12) and rotate lower container lock handle (13) towards center of lifting frame (1) to unlocked position.

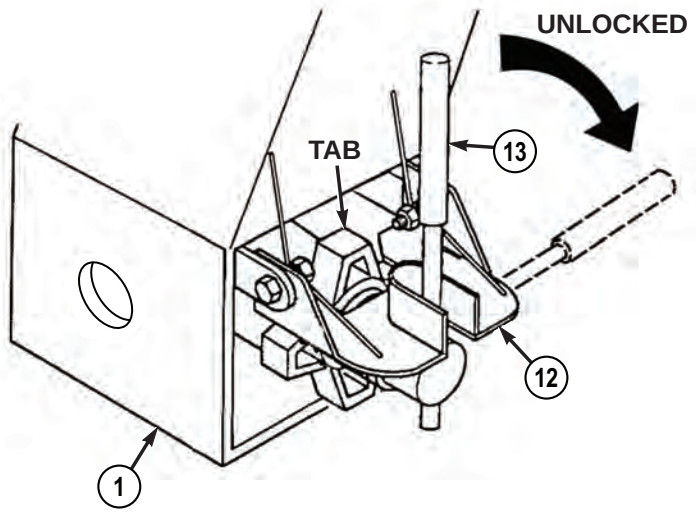


Figure 8.

17. Release handle lock plate (12) on lifting frame (1).
18. Repeat Steps (15) and (16) for left side.

CAUTION

Ensure sliders are clear of debris and surfaces are properly greased or damage to equipment may result.

NOTE

There are two rear sliders and container locks. Right side shown.

19. Rotate slider (14) so rear of slider faces down.

LOADING - Continued

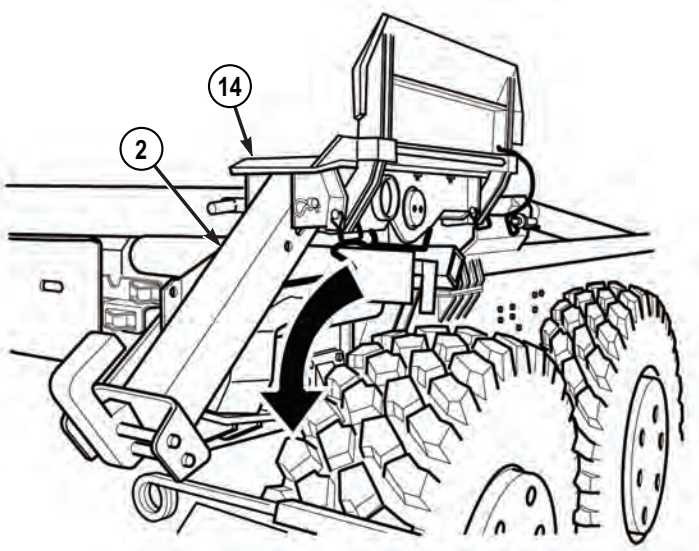


Figure 9.

20. Ensure rear container lock (2) is in ready mode or down position (WP 0043).
21. Repeat Steps (18) and (19) for left side.
22. Start engine (WP 0027).
23. Position slide arm upper front hooks (15) just above and in front of container upper corner castings (16).

LOADING - Continued

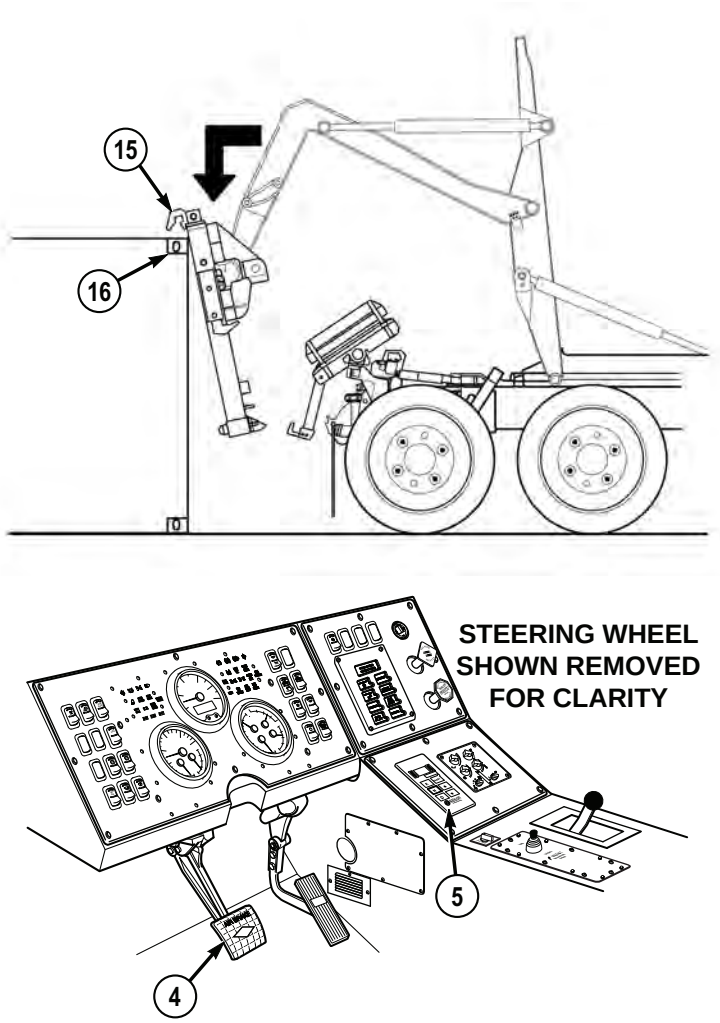


Figure 10.

24. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

LOADING - Continued

WARNING



Do not allow front lift adapter to contact the ground when half-height container front hooks are not engaged with container upper corner castings. Failure to comply may result in damage to equipment and injury or death to personnel.

25. Release service brake pedal (4) and slowly back up to approximately 12.0 in. (304.8 mm) from front of container (6).

LOADING - Continued

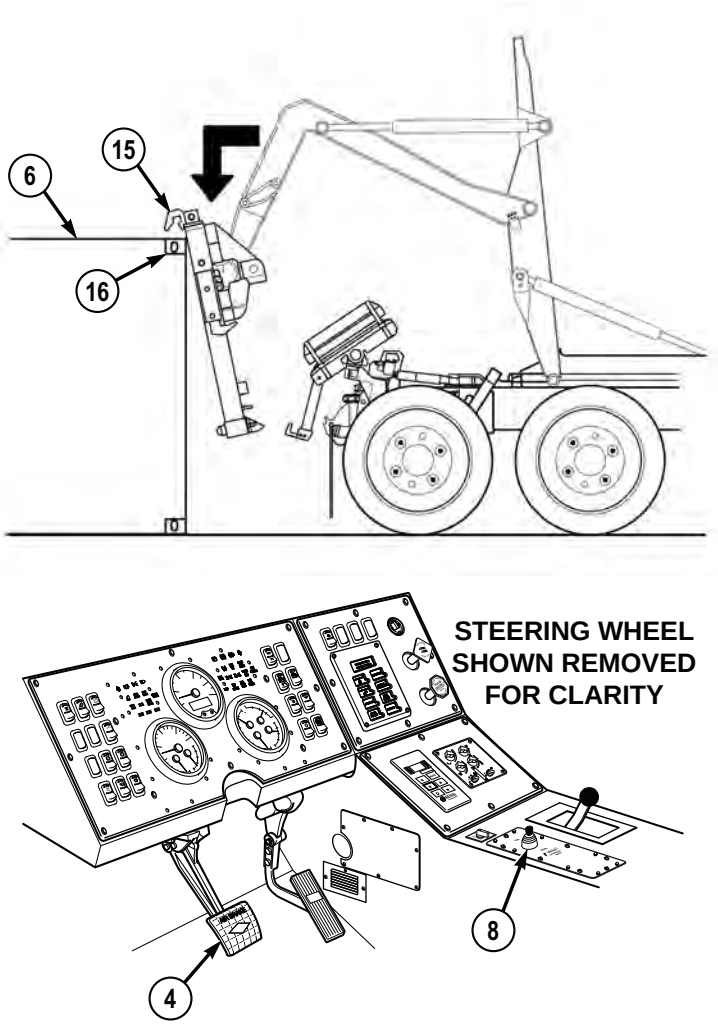


Figure 11.

26. Apply service brake pedal (4), move joystick (8) to LOAD, and raise lifting frame until front hooks (15) are above container upper front corner castings (16).

CAUTION

Ensure slide arm upper front hooks are fully engaged with container upper corner castings. Failure to comply may result in damage to equipment.

LOADING - Continued

NOTE

- To get upper hooks to properly seat it may be necessary to drive vehicle forward slightly.
- When container is on side slope, it may be difficult to get both upper hooks properly seated. Lifting frame hangs level. To get lifting frame to hang closer to same angle as container, it may be necessary to temporarily remove one rear container lock from slider and stow on downhill side of lifting frame.

27. Release service brake pedal (4), move joystick (8) to UNLOAD, and lower slide arm upper front hooks (15) into container upper front corner castings (16).

LOADING - Continued

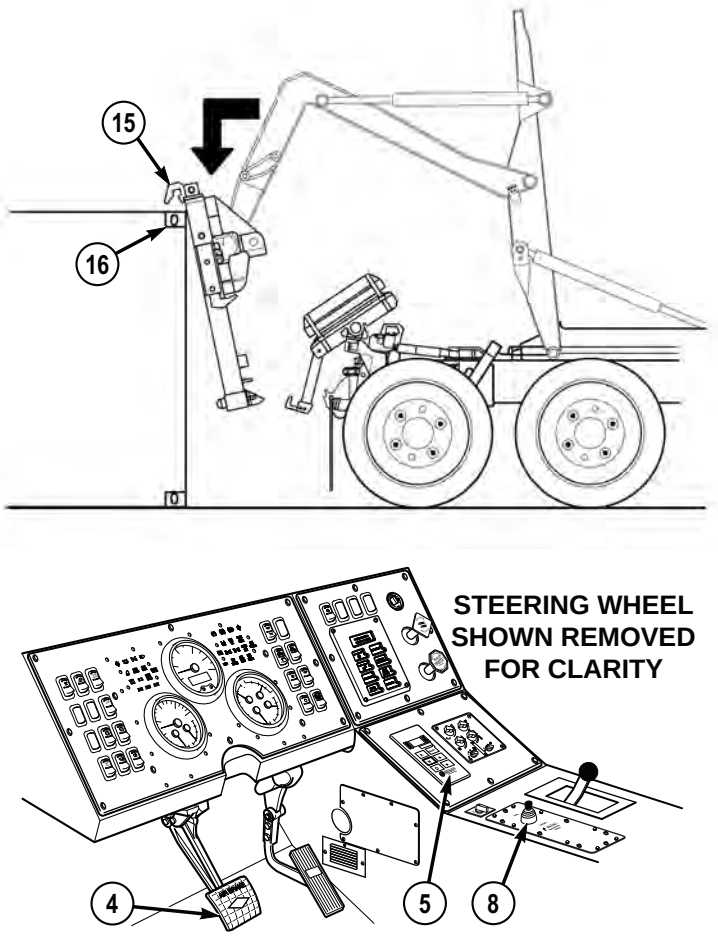


Figure 12.

28. Apply service brake pedal (4) and set transmission range selector (5) to Drive (D).
29. Release service brake pedal (4) and move vehicle forward approximately 12.0 in. (304.8 mm).

LOADING - Continued

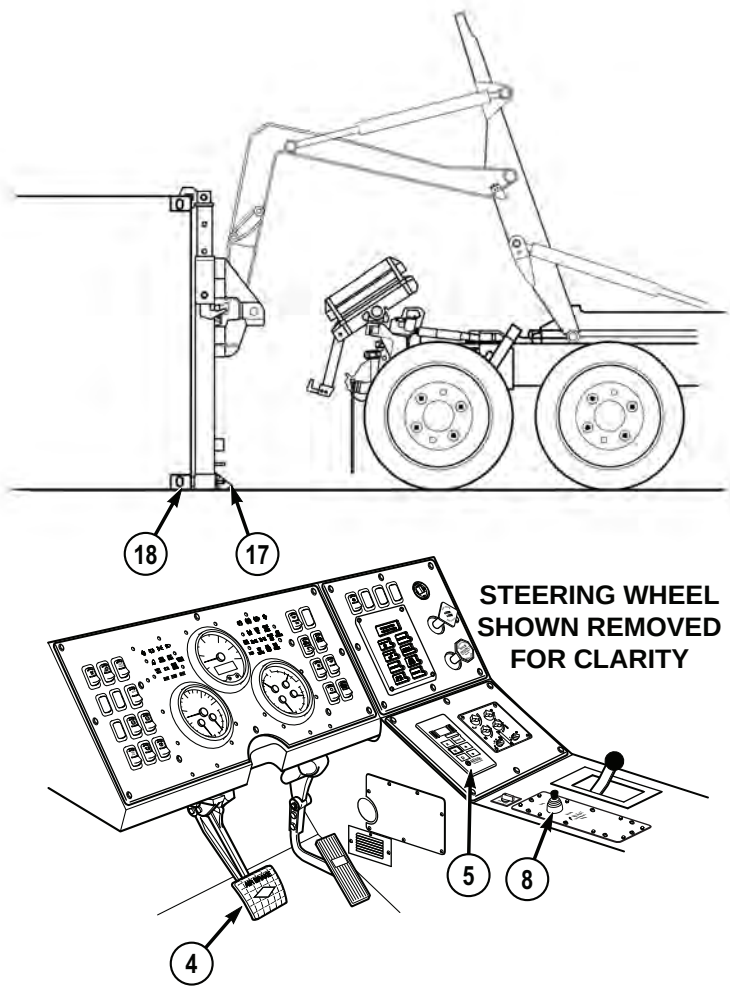


Figure 13.

30. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

31. Move joystick (8) to UNLOAD until lower container locks (17) are aligned with container lower front corner castings (18).

LOADING - Continued

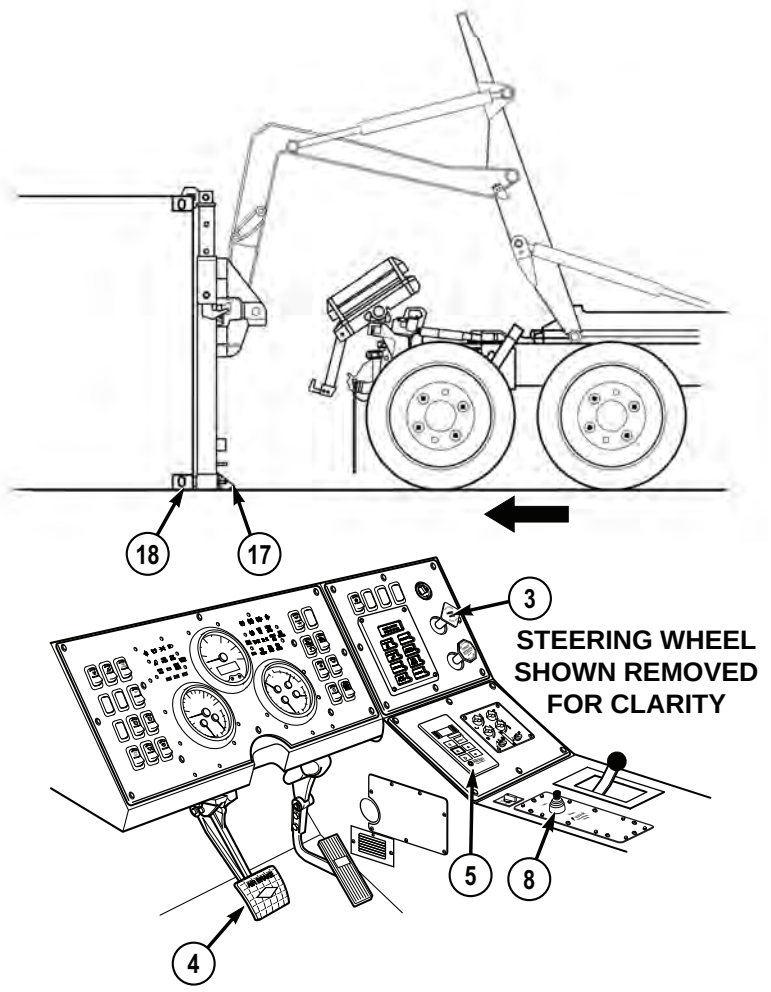


Figure 14.

32. Continue backing up vehicle until lower container locks (17) are seated in container lower front corner castings (18). Apply service brake pedal (4) and release joystick (8).

33. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

LOADING - Continued

CAUTION

Ensure lower container locks are fully engaged with container lower corner castings. Failure to comply may result in damage to equipment.

NOTE

- To get container lock handle to rotate, it may be necessary to loosen handnut.
- There are two lower container locks. Right side shown.
- After tightening handnut, it may be necessary to loosen handnut slightly to align tab with handle lock plate.
- Ensure lower container lock handle is secured in slot on handle lock plate.

34. Hold handle lock plate (12) up and rotate lower container lock handle (13) up to the locked position.

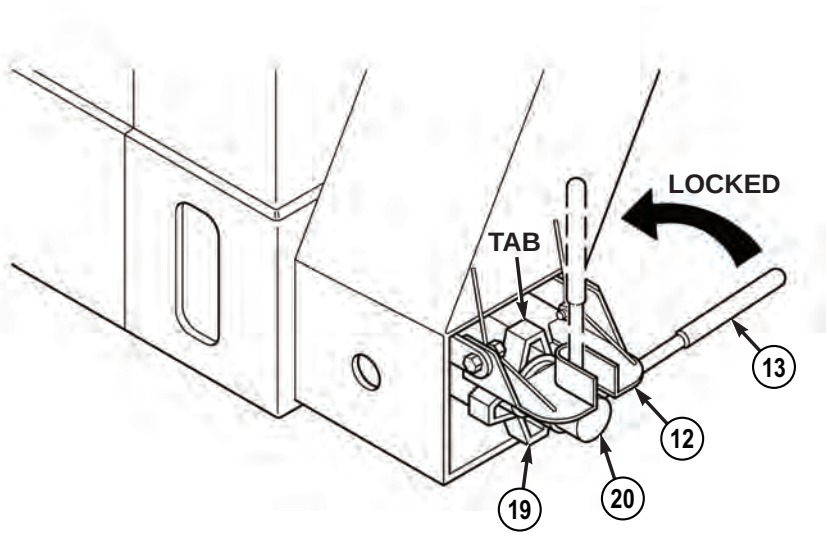


Figure 15.

35. Turn handnut (19) clockwise and tighten stem (20).

NOTE

Ensure tab on handnut faces up.

LOADING - Continued

36. Lower handle lock plate (12) over lower container lock handle (13) and handnut (19) tab.

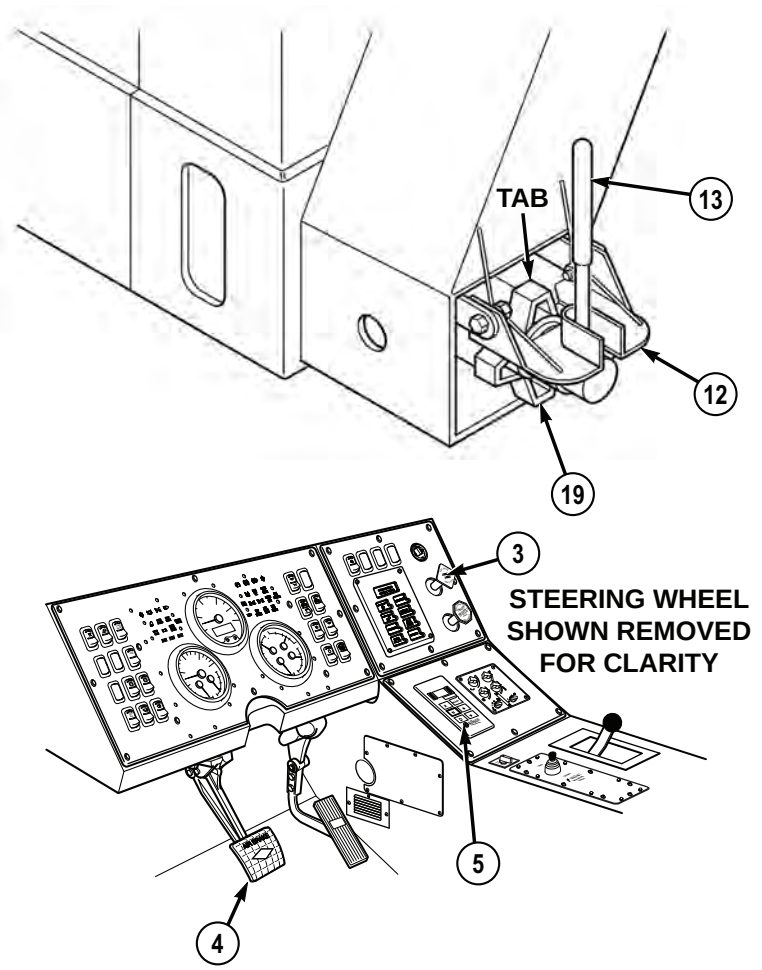


Figure 16.

37. Repeat Steps (33) through (35) for left side.

38. Set the transmission range selector (5) in Neutral (N), push in parking brake knob (3) to release parking brakes, and release service brake pedal (4).

LOADING - Continued

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

CAUTION

- If LHS overload lamp illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation, operator should notify supervisor if it appears payload is unevenly distributed in container or if container load exceeds 35,000 lbs (15,876 kg). If any of these conditions exist, payload must be redistributed or reduced or damage to equipment may result.
- Load must be evenly distributed in the container. Uneven load distribution may cause the LHS overload indicator to give false signals and cause the LHS to operate incorrectly. Damage to equipment may result.
- If LHS overload lamp illuminates and normal operation has stopped, return load to original position and notify supervisor to have payload redistributed or weight reduced. Failure to comply may result in damage to equipment.
- Ensure parking brake is not applied before starting load sequence or damage to equipment may occur.

NOTE

- The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.
- If container is extremely light or empty, it may be necessary to place transmission range selector in Reverse (R) and allow vehicle to roll under container.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (38) through (46) to reposition container.

39. Move joystick (8) to LOAD, allowing vehicle to be pulled under container (6).

LOADING - Continued

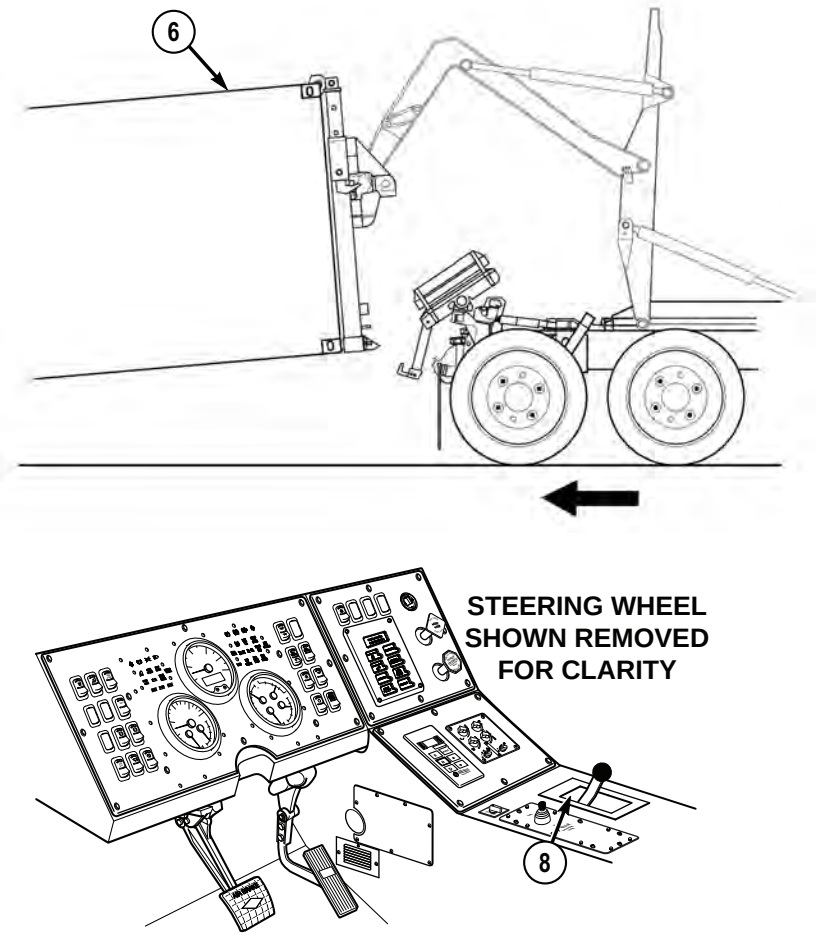


Figure 17.

WARNING



Ensure that container has contacted rear sliders correctly and is between guides. Failure to comply may result in injury or death to personnel and damage to equipment.

LOADING - Continued

CAUTION

Reduce engine speed to idle before container contacts rear sliders or damage to equipment may result.

NOTE

- LHS overload lamp may illuminate when lifting container from unusual conditions.
- As load is lifted, vehicle will be pulled under container. Some steering wheel adjustments may have to be made to ensure that container contacts rear sliders correctly and is between guides.

40. As container (6) contacts rear sliders (14), reduce engine speed to idle and apply service brake pedal (4).

LOADING - Continued

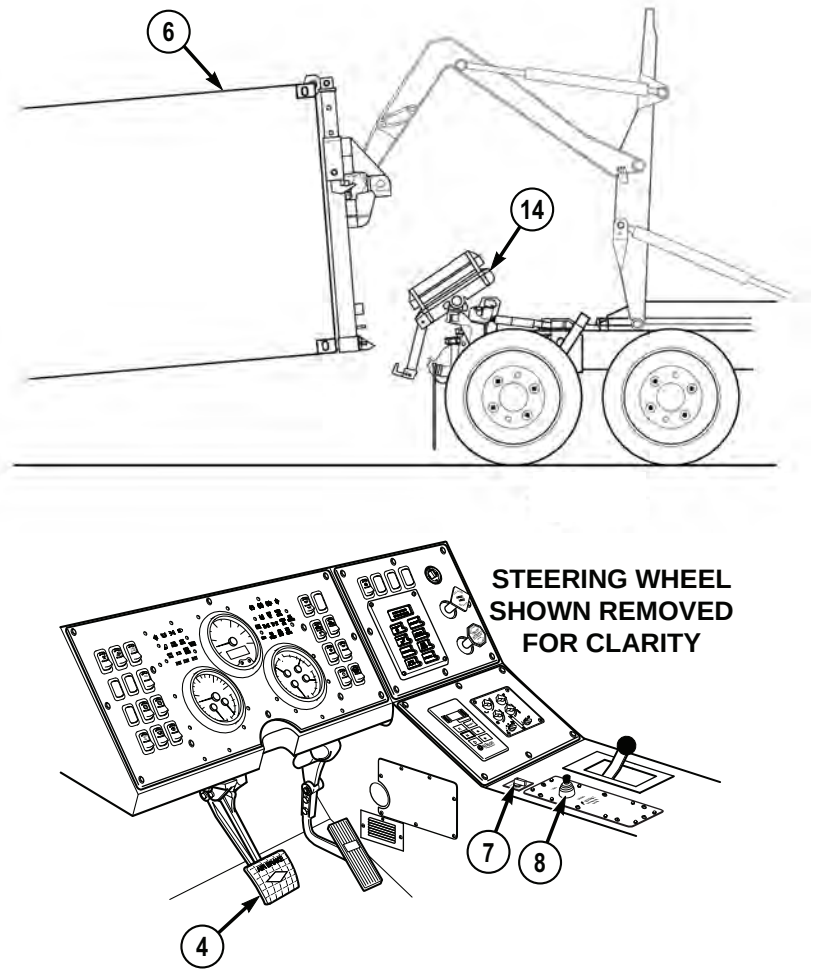


Figure 18.

NOTE

If container is being loaded in soft soil conditions, perform Steps (40) through (42).

41. Release joystick (8). Set hydraulic selector switch (7) to MAN H.A.

LOADING - Continued

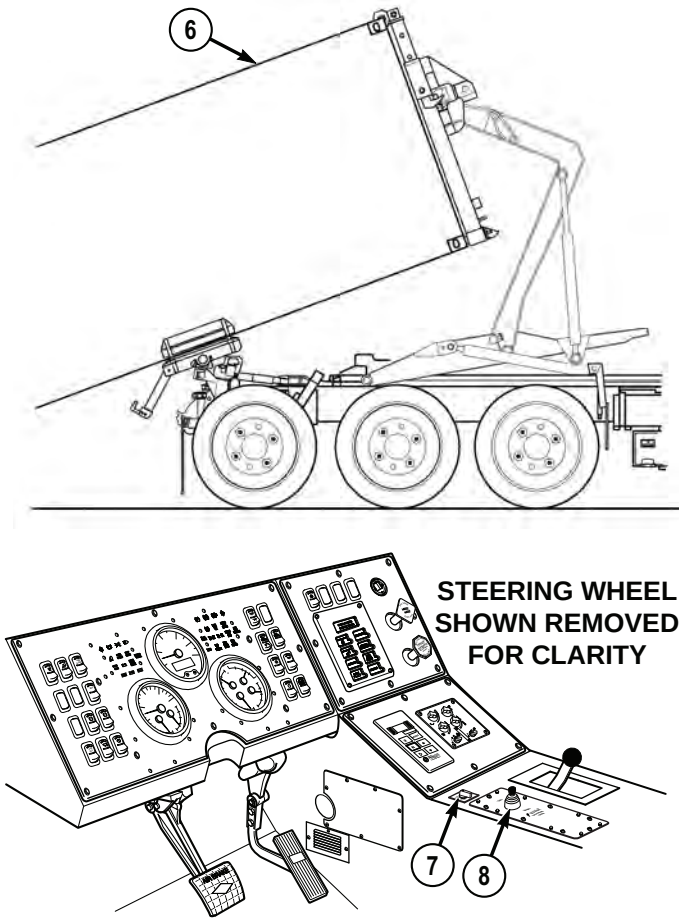


Figure 19.

42. Move joystick (8) to LOAD until container (6) is approximately 2 ft (0.61 m) off the ground. Release joystick.

43. Set hydraulic selector switch (7) to AUTO. Resume normal AUTO operations.

NOTE

Engine speed may be increased and decreased to ease loading.

44. After container (6) contacts rear sliders (14), increase engine speed to approximately 1,500 rpm until container is almost loaded. Reduce engine speed to idle.

LOADING - Continued

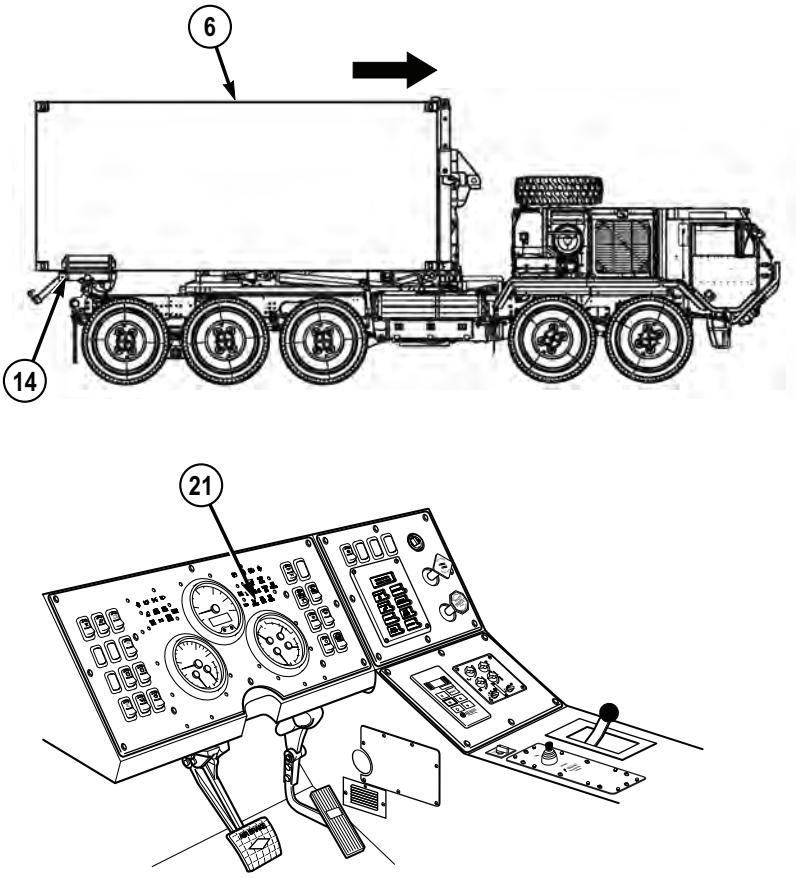


Figure 20.

CAUTION

If after loading operations using CHU kit and container, the LHS NO TRANSIT indicator goes off, operator must release the joystick from the LOAD position. Failure to release the joystick may cause LHS OVERLOAD indicator to illuminate and hydraulic cylinders to remain active, forcing a temporary bow in the LHS frame, resulting in contact between LHS and container.

45. Continue loading until container (6) is fully loaded and LHS NO TRANSIT lamp (21) goes out.

46. Release joystick (8).

LOADING - Continued

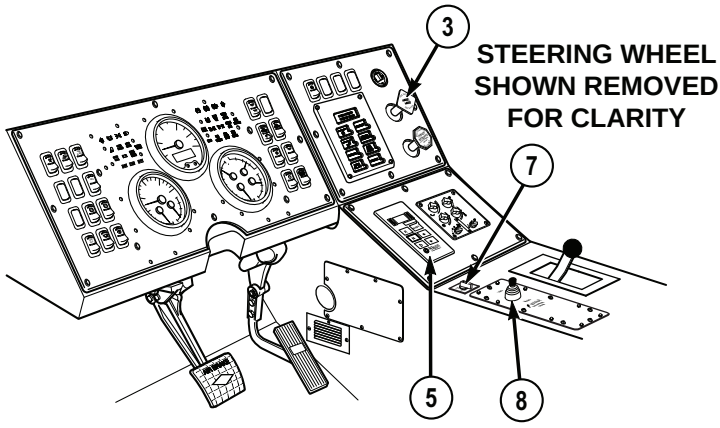


Figure 21.

47. Pull out parking brake knob (3) to apply parking brake.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

48. Turn hydraulic selector switch (7) to OFF.

49. Shut OFF engine (WP 0037).

NOTE

- There are two rear container locks. Right side shown.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (38) through (48) to reposition container.

50. Support rear container lock (2) and remove lock pin (22) and pin (23).

LOADING - Continued

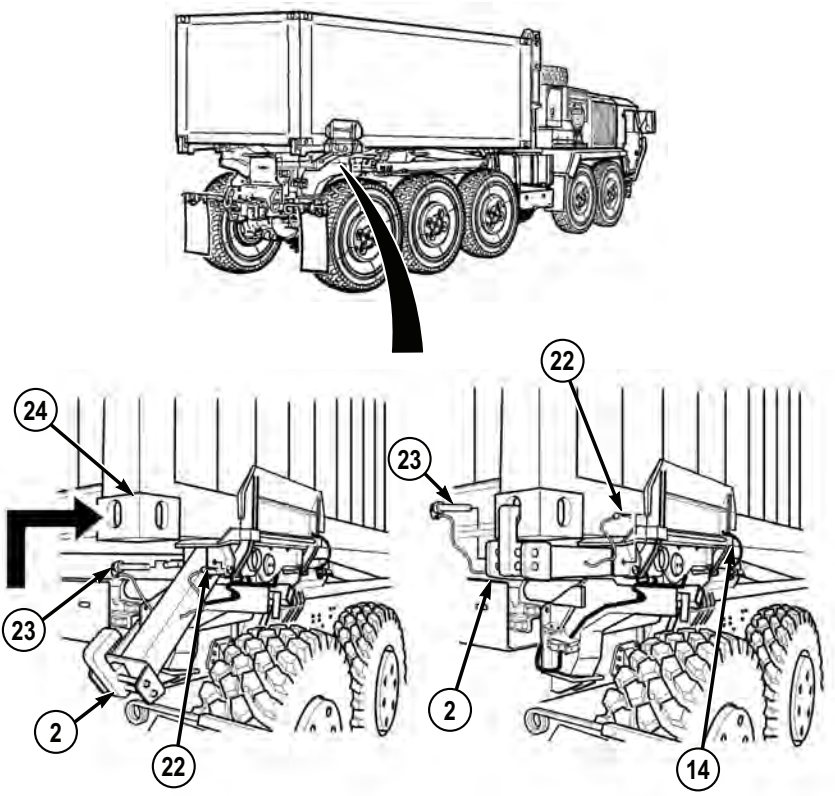


Figure 22.

51. Rotate rear container lock (2) up and position into container lower rear corner casting (24).
52. Install pin (23) and lock pin (22) in rear container lock (2) and slider (14).
53. Perform Steps (49) through (51) for left side.

END OF TASK

UNLOADING

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Injury or death could result if LHS contacts power lines.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Failure to comply may result in damage to equipment and injury or death to personnel.
- Prior to and during any load or unload cycle, all personnel should stay clear of LHS, front lift adapter, and container. Failure to comply may result in damage to equipment and injury or death to personnel.

CAUTION

- Check that ground conditions where container will be placed can support the container weight or damage to the container, lifting frame, or LHS may result.
- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading or flanges on side may be damaged and/or door hinges my make hard contact with guides.

NOTE

For detailed instructions on how to operate the LHS on the PLS vehicle, refer to Load Handling System (WP 0042).

1. Check area for operating room at front and rear of vehicle. Check overhead clearance and ground conditions.

UNLOADING - Continued

NOTE

- There are two rear container locks. Right side shown.
- It may be necessary to loosen rear container lock using hammer from BII.

2. Remove lock pin (22), pin (23), and rear container lock (2) from lower rear corner casting (24).

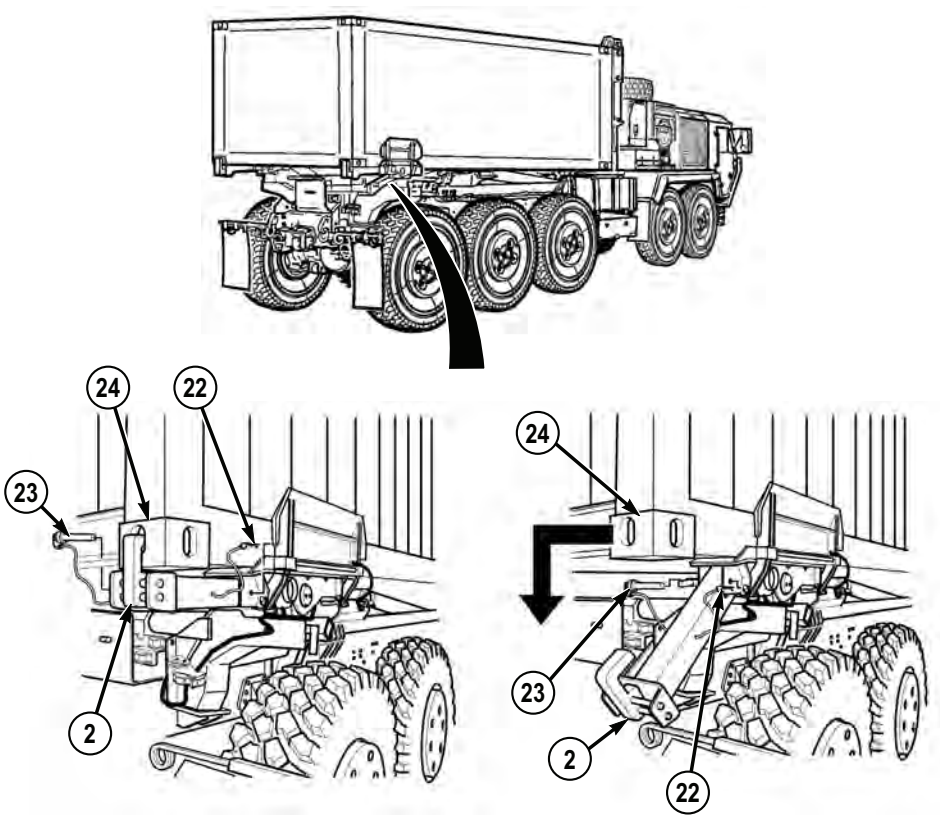


Figure 23.

3. Rotate rear container lock (2) in down position and install pin (23) and lock pin (22).
4. Perform Steps (2) and (3) for left side.
5. Start engine (WP 0027).

UNLOADING - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

6. Apply service brake pedal (4) and set transmission range selector (5) to neutral (N).

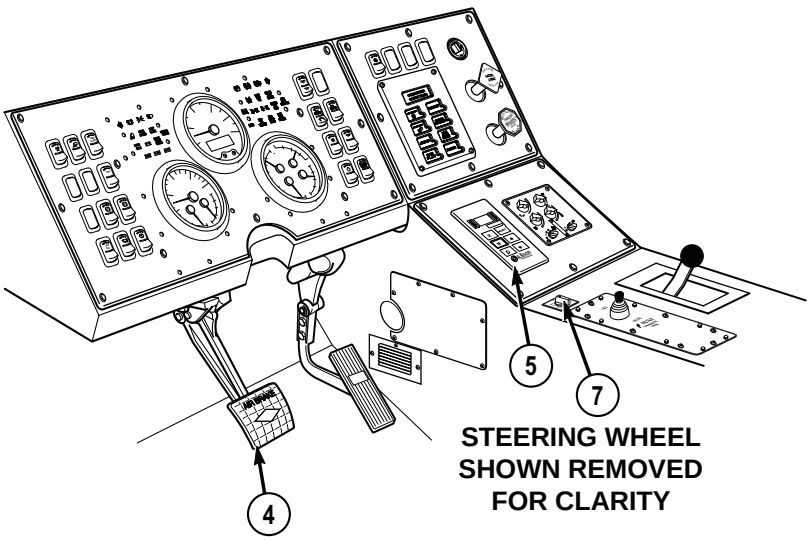


Figure 24.

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

NOTE

LHS will not operate and unload if rear container locks are engaged.

7. Turn hydraulic selector switch (7) to AUTO.

UNLOADING - Continued

8. Move joystick (8) to UNLOAD. Container (6) will start to move rearward. LHS NO TRANSIT lamp (21) will illuminate. Maintain engine speed at idle until front of container raises approximately 12.0 in. (304.8 mm).

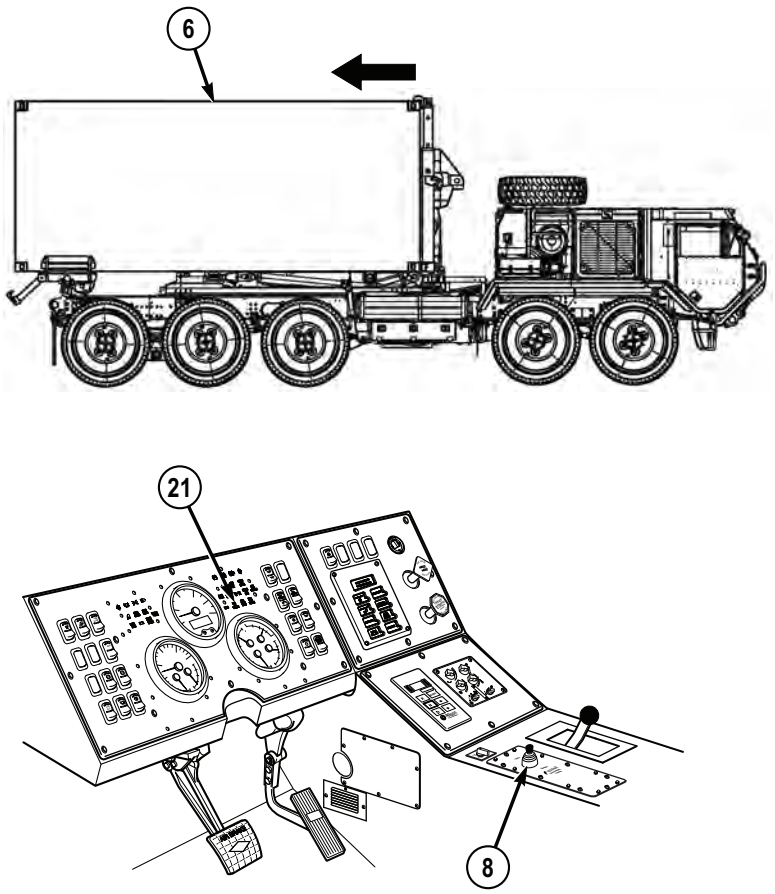


Figure 25.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

9. Continue to unload container (6) until back edge of container touches ground.

UNLOADING - Continued

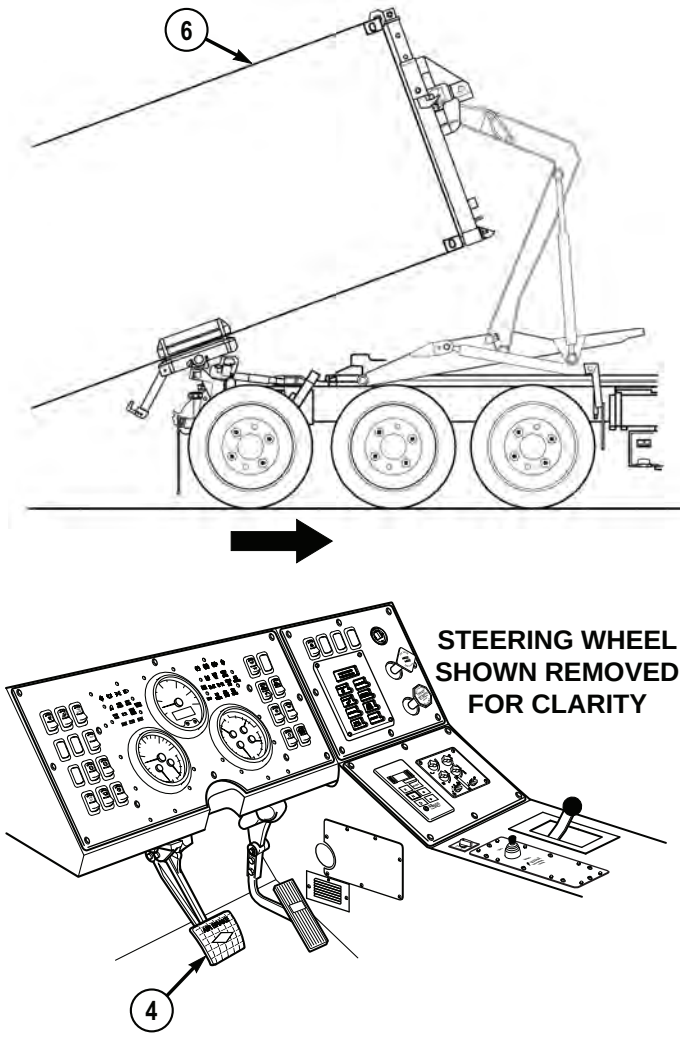


Figure 26.

10. Release service brake pedal (4) and allow container (6) to push vehicle forward from under container.

UNLOADING - Continued

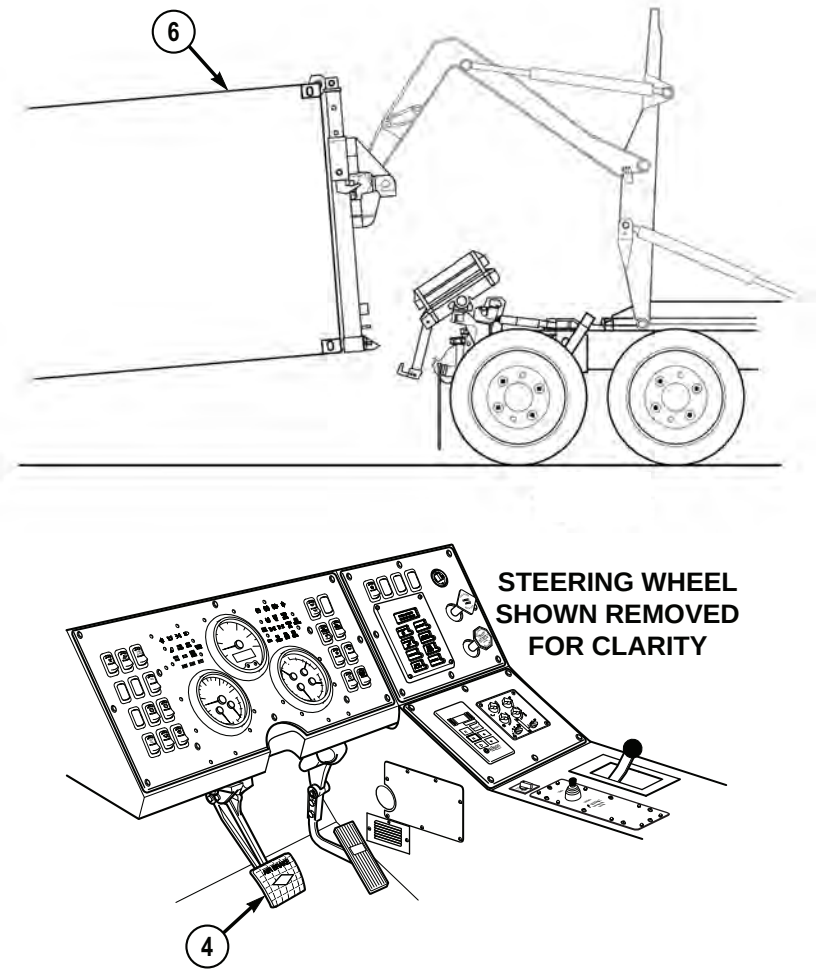


Figure 27.

11. When front of container (6) is approximately 8.0 in. (203.2 mm) above the ground, decrease engine speed to idle and apply service brake pedal (4).

CAUTION

Once vehicle's rear suspension has been relieved of container load, do not continue in UNLOAD position as possibility of jacking up the rear of vehicle with hook arm may occur and damage to equipment may result.

UNLOADING - Continued

NOTE

If container is extremely light or empty, it may be necessary to place transmission range selector in Drive (D) and allow vehicle to move out from under container.

12. Continue unloading until bottom of container (6) is on ground and rear suspension is unloaded.

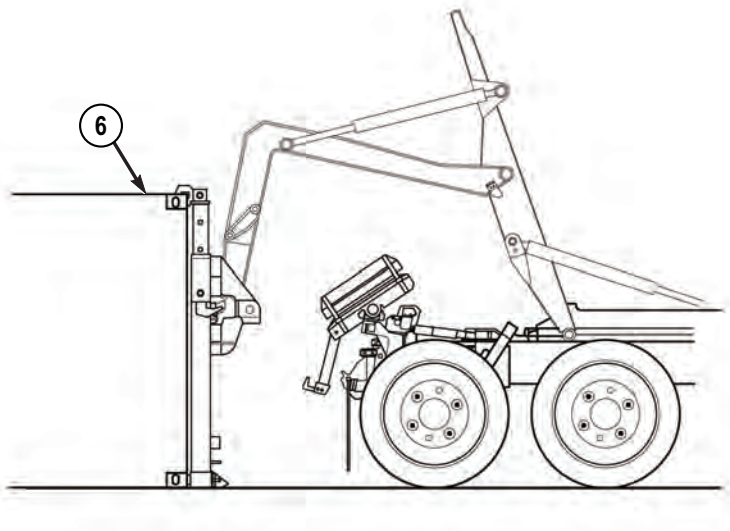


Figure 28.

13. Pull out parking brake knob (3) to apply parking brakes.

UNLOADING - Continued

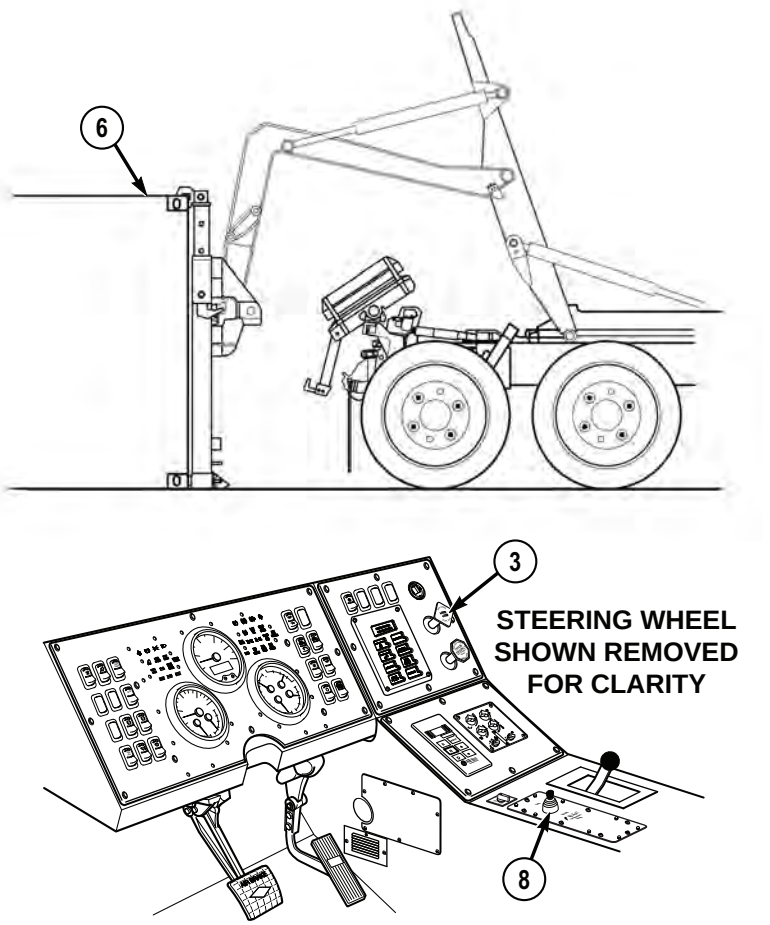


Figure 29.

14. Release joystick (8) when container (6) is resting on ground.

WARNING



Ensure that all tension has been relieved between LHS hook and front lift-adapter prior to unlocking front lift-adapter lower-container locks. Stay

UNLOADING - Continued

clear of front lift-adapter when unlocking front lift-adapter lower-container locks as front lift adapter may separate from container unexpectedly. Failure to comply may result in injury or death to personnel.

NOTE

There are two lifting frame lower container locks. Right side shown.

15. Raise handle lock plate (12) and turn handnut (19) counterclockwise and loosen stem (20).

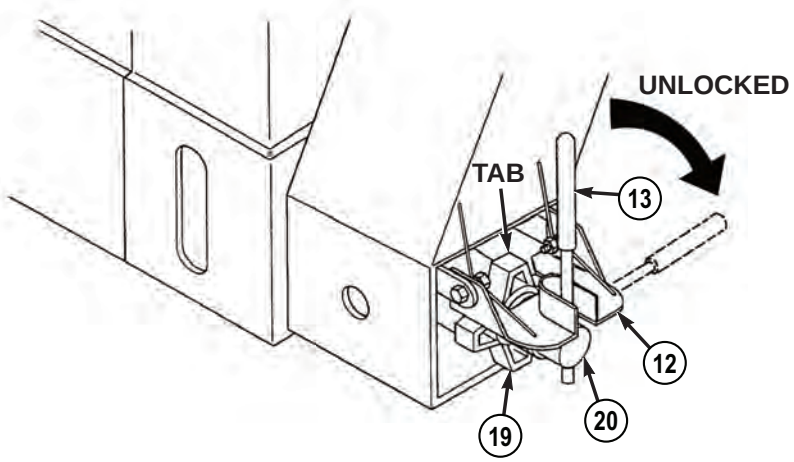


Figure 30.

NOTE

Ensure tab on handnut faces up.

16. Rotate lower container lock handle (13) towards center of vehicle to unlocked position.

CAUTION

Handnut must be tightened clockwise to tighten stem. Failure to tighten stem may cause damage to equipment during next container loading procedure.

17. Turn handnut (19) clockwise and tighten stem (20).
18. Release handle lock plate (12) over container lock handle and handnut (19) tab.
19. Repeat Steps (15) through (18) for left side.

UNLOADING - Continued

20. Push in parking brake knob (3) and release parking brakes. Set transmission range selector (5) to Drive (D).

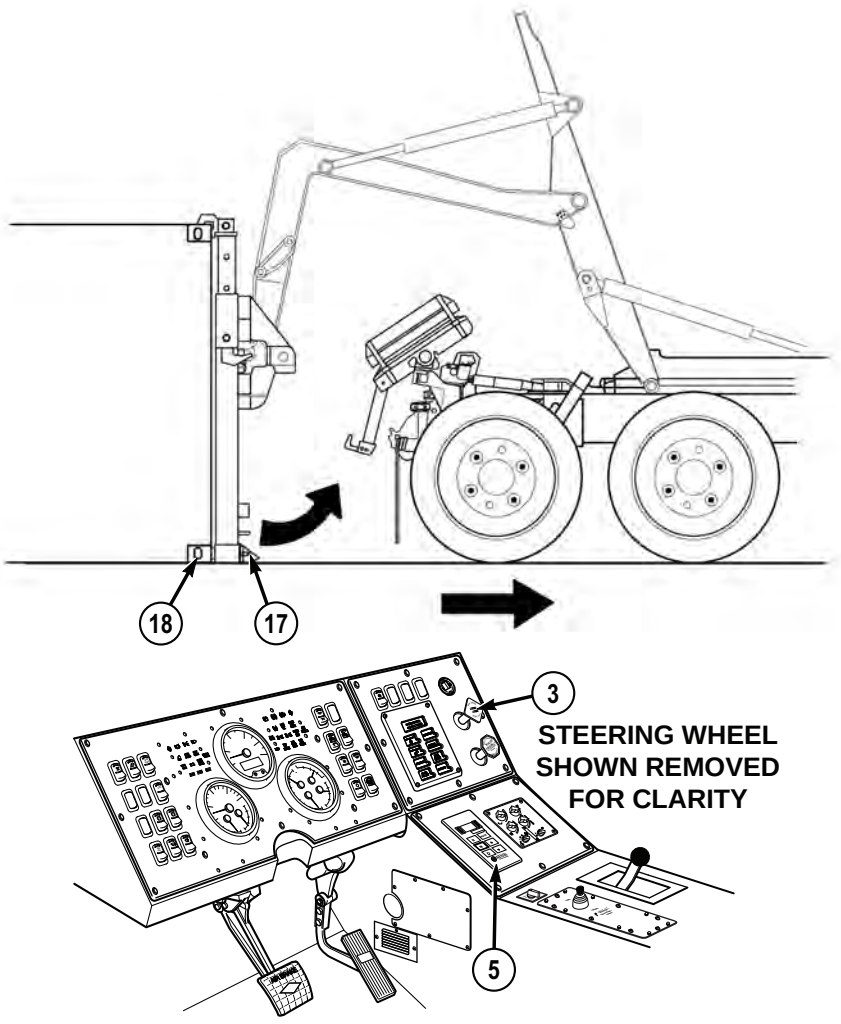


Figure 31.

21. Move vehicle forward until lower container locks (17) disengage from lower front corner castings (18) approximately 4.0 to 6.0 in. (101.6 to 152.4 mm).

UNLOADING - Continued

CAUTION

Ensure that the slide arm upper front hooks are completely disengaged and do not hang up in container upper corner castings when retracting LHS. Failure to comply may result in damage to the slide arm upper front hooks and/or container.

NOTE

It may be necessary to move the vehicle forward or backward slightly to get the slide arm upper front hooks to disengage.

22. Move joystick (8) to LOAD position until lifting frame (1) is disengaged from container (6).

UNLOADING - Continued

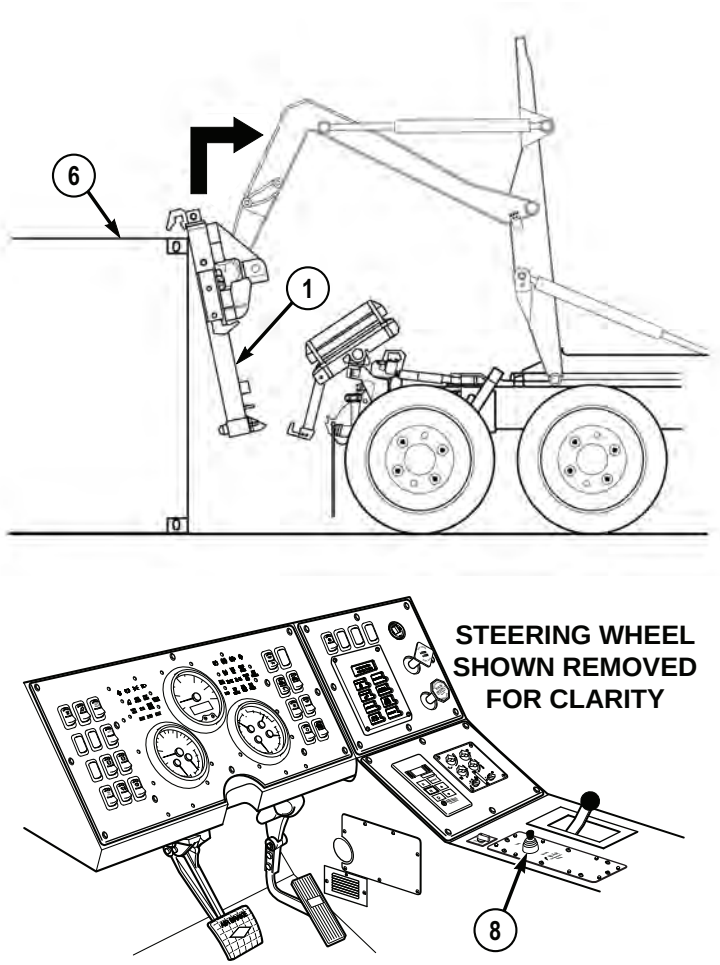


Figure 32.

23. Release joystick (8).
24. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

UNLOADING - Continued

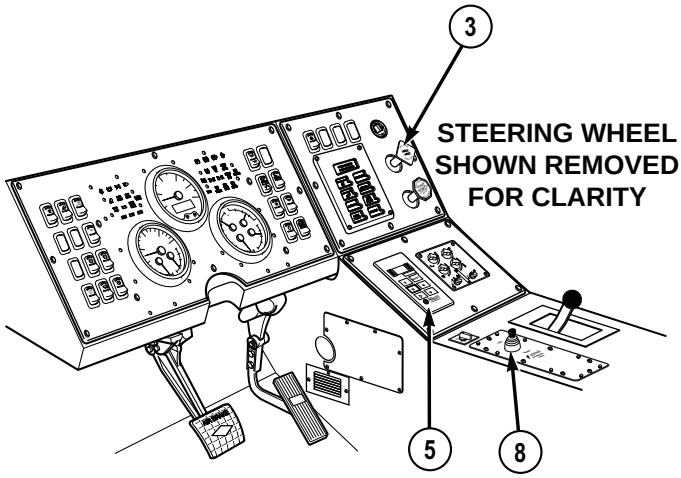


Figure 33.

CAUTION

- On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Switch hydraulic selector to MAN M.F. and retract the mainframe until the lifting frame clears the rear sliders. Return hydraulic selector to AUTO and continue (LOAD) operation. Failure to comply may result in damage to equipment.
- Never drive with LHS NO TRANSIT lamp illuminated. An illuminated lamp means that the LHS is not fully stowed. Failure to comply may result in damage to equipment.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

25. Move joystick (8) to LOAD position until LHS is fully retracted and lifting frame (1) is positioned on bumper supports (25). LHS NO TRANSIT lamp (21) will go out indicating LHS is in transport position.

UNLOADING - Continued

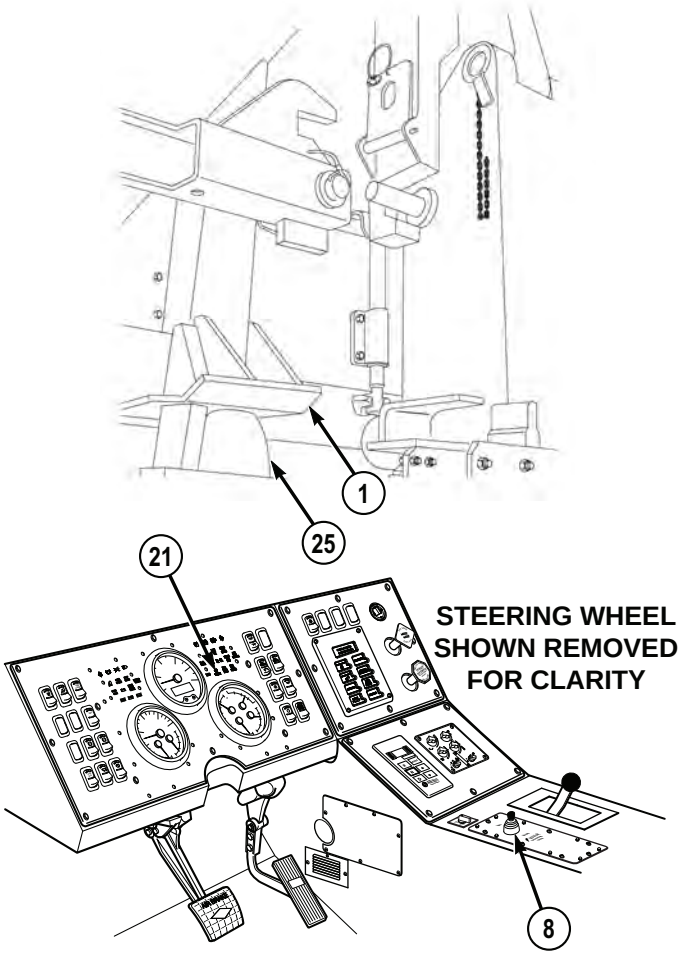


Figure 34.

26. Release joystick (8).

NOTE

If lifting frame is not sitting properly on bumper supports, perform Steps (27) through (29).

27. Operate vehicle a short distance to nearest level ground.
28. Move joystick (8) to UNLOAD position to raise lifting frame (1) approximately 3 ft (0.9 m).

UNLOADING - Continued

29. Move joystick (8) to LOAD position until LHS is fully retracted and lifting frame (1) is positioned on bumper support (25).

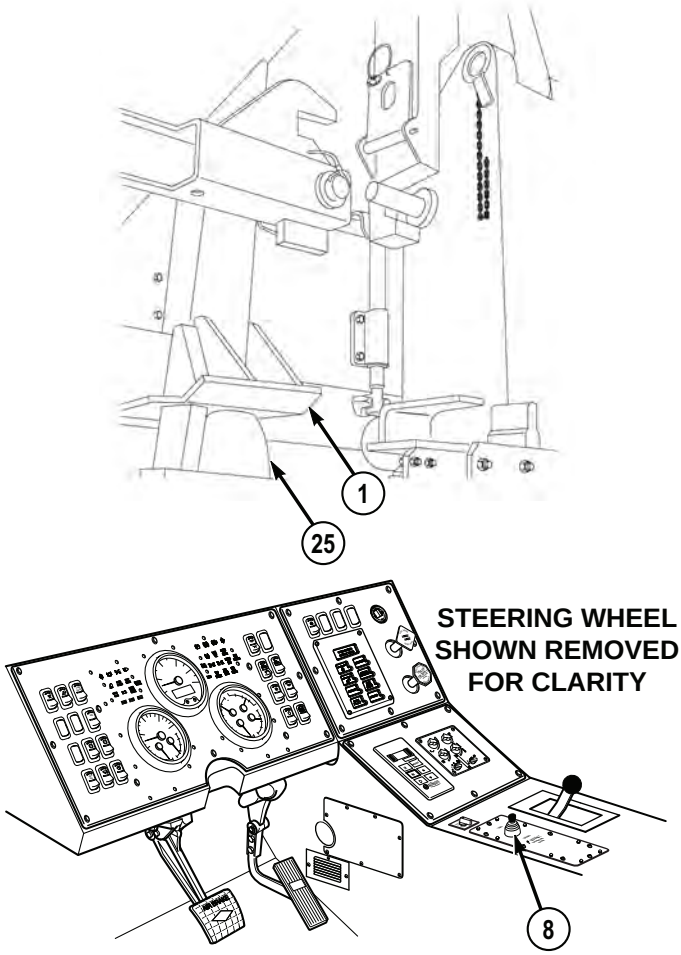


Figure 35.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

UNLOADING - Continued

30. Turn hydraulic selector switch (7) to OFF.

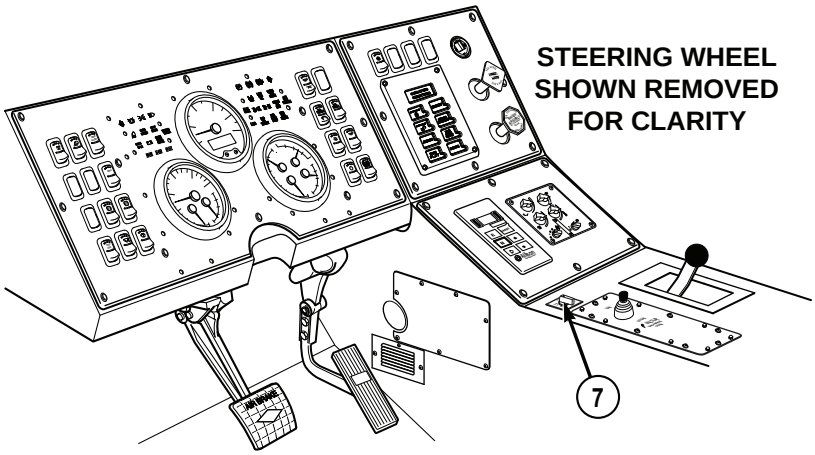


Figure 36.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOADING AND UNLOADING CONTAINER (72.0 IN. [1828.8 MM] TALL) TO PLS VEHICLE USING LIFTING FRAME (LF)

INITIAL SETUP:

Not Applicable

END OF TASK

LOADING

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure lifting frame is in the unlocked position before attempting to load a container on vehicle. Failure to comply will result in damage to equipment.

1. Ensure lifting frame (1) is in container mode (WP 0043) and unlocked. (WP 0048)

LOADING - Continued

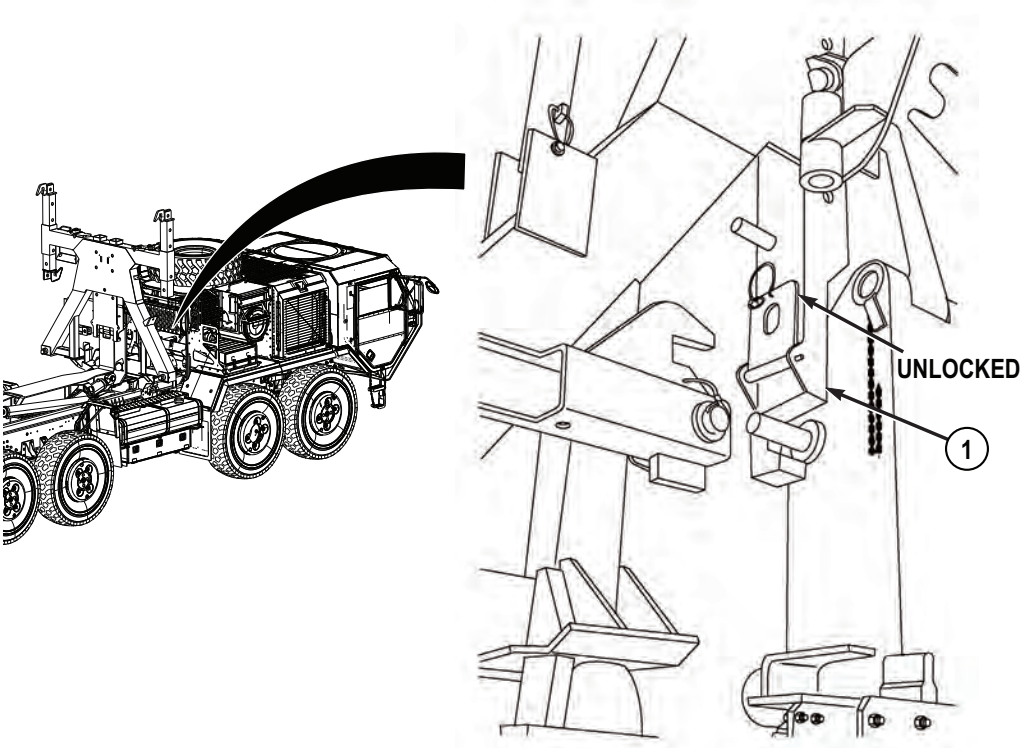


Figure 1.

CAUTION

Ensure vehicle is in container mode before attempting to load a container to vehicle. Failure to comply will result in damage to equipment.

2. Ensure vehicle is in container mode (WP 0043).
3. Ensure rear container lock (2) is in ready mode (WP 0043).

LOADING - Continued

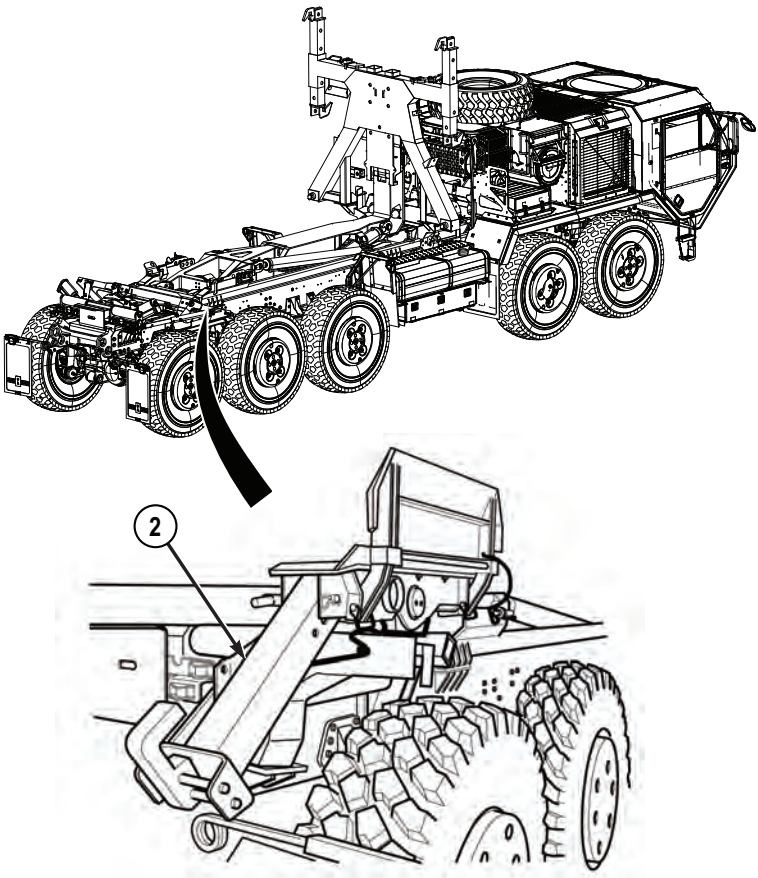


Figure 2.

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).

LOADING - Continued

- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

CAUTION

- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and/or door hinges may make hard contact with guides.
- When operating CHU with nonstandard, end-opening, 20.0 ft (6.1 m) long shipping containers, operator needs to take extra care to ensure that sliders and guides contact container properly, container slides on sliders properly, and container loads are centered on vehicle. Failure to comply can result in container getting hung up or making hard contact with sliders and guides, causing damage to CHU or container.

NOTE

- For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators, Picking-up a Flatrack in Auto Mode, and Off-loading a Flatrack in Auto Mode.
- Rear mud flaps may be pinned up to provide better visibility of lifting frame lower container locks.
- Multiple connected containers cannot be used with CHU. This includes Six CONS and Quad CONS.
- It is recommended that two personnel be used to ease operation (driver and spotter to position lifting frame).

4. Start engine (WP 0027).

LOADING - Continued

5. Push in parking brake knob (3), apply service brake pedal (4), and set transmission range selector (5) to Reverse (R).

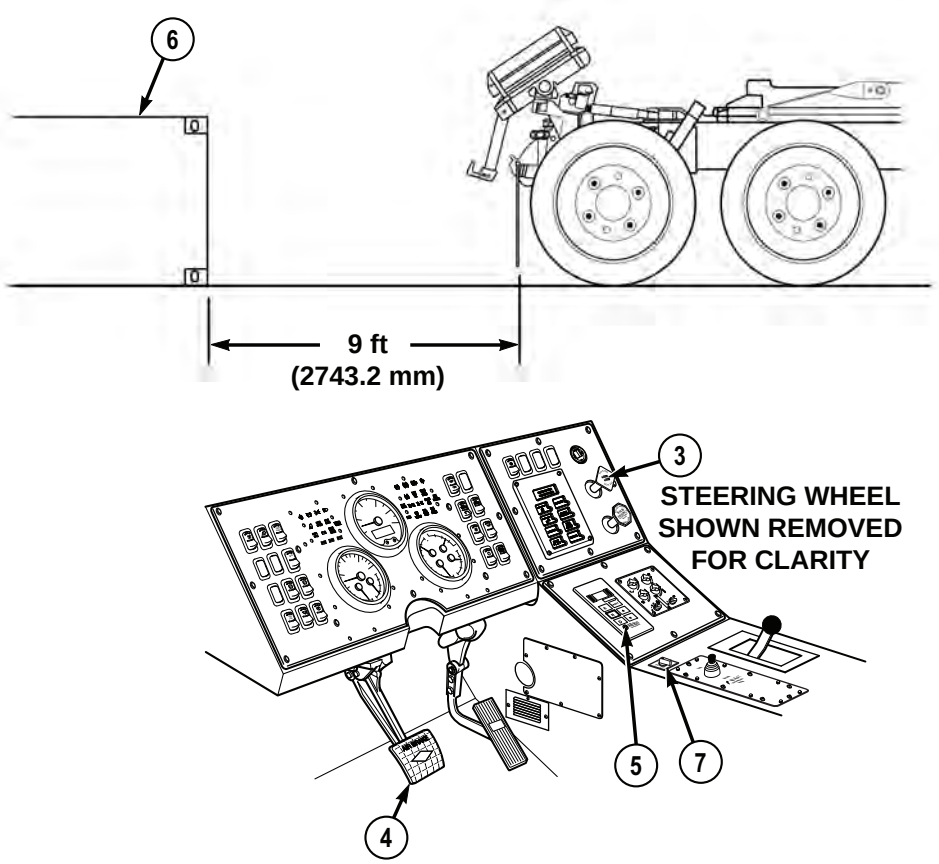


Figure 3.

6. Release service brake pedal (4) and position rear of vehicle within 9.0 ft (2743.2 mm) of front of container (6), aligning centerline of vehicle within 2.0 in. (50.8 mm) of container centerline.

LOADING - Continued

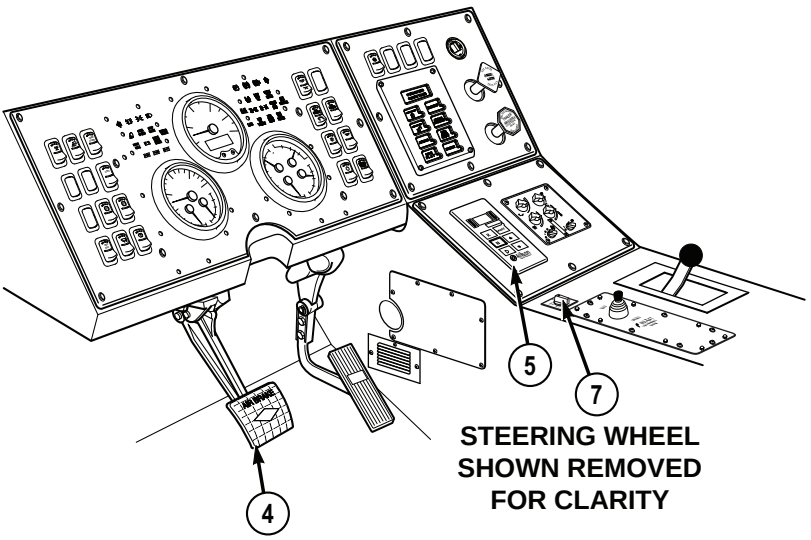


Figure 4.

7. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

8. Turn hydraulic selector switch (7) to AUTO.

CAUTION

On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Return hydraulic selector to AUTO and continue (UNLOAD) operation. Repeat as required. Failure to comply may result in damage to equipment.

9. Move joystick (8) to UNLOAD position until lifting frame (1) is in position in front of container (6).

LOADING - Continued

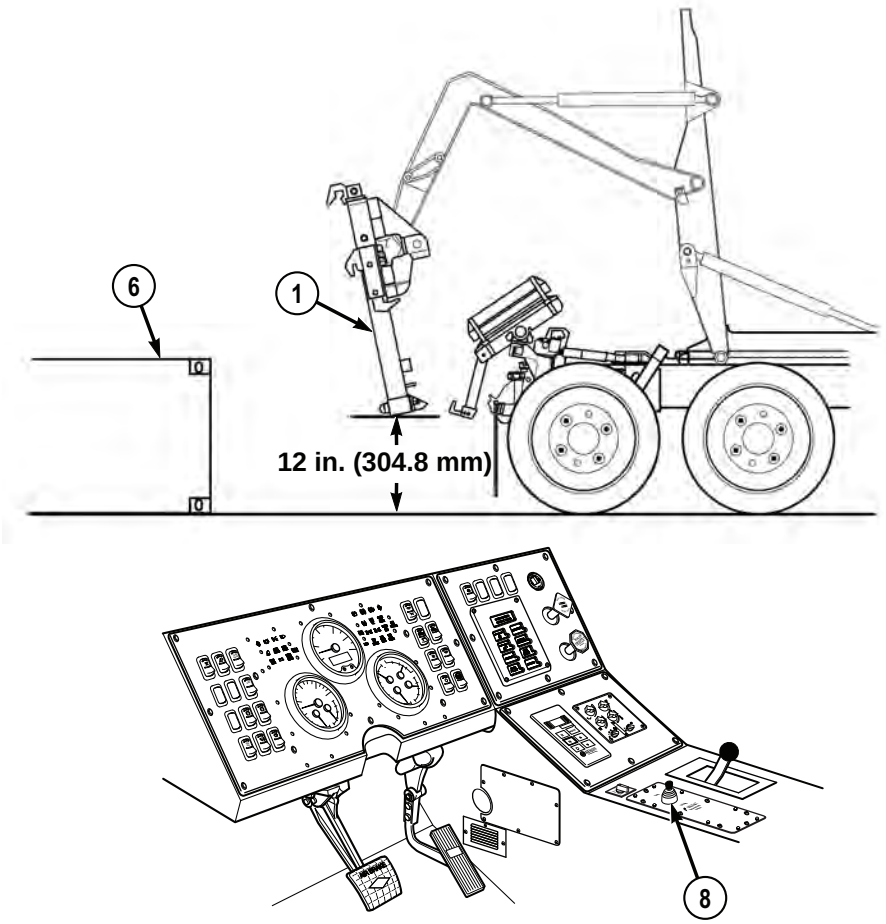


Figure 5.

10. Operate LHS in AUTO mode until lifting frame (1) is approximately 12.0 in. (304.8 mm) off of ground.

LOADING - Continued

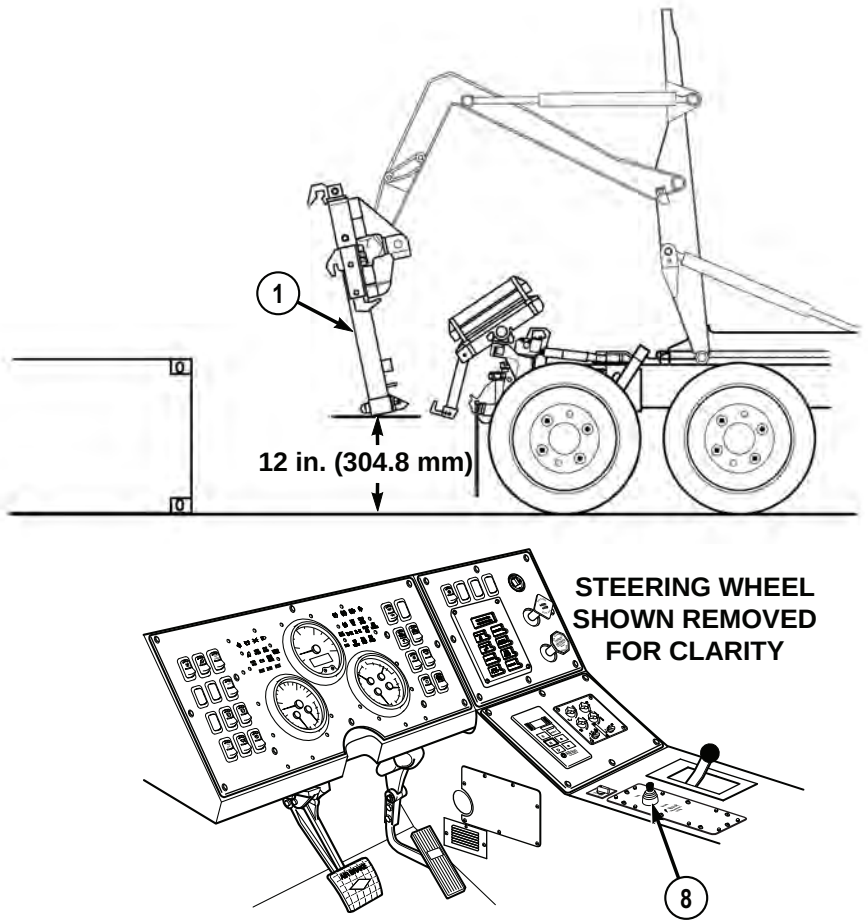


Figure 6.

11. Release joystick (8).
12. Shut OFF engine (WP 0037).

NOTE

- Refer to the lifting frame data plate for the proper configuration needed for the height of each container being loaded.
- There are two slide arms. Right side shown.

13. Remove lock pin (9), pin (10), and standard hook (11) from slide arm (12).

LOADING - Continued

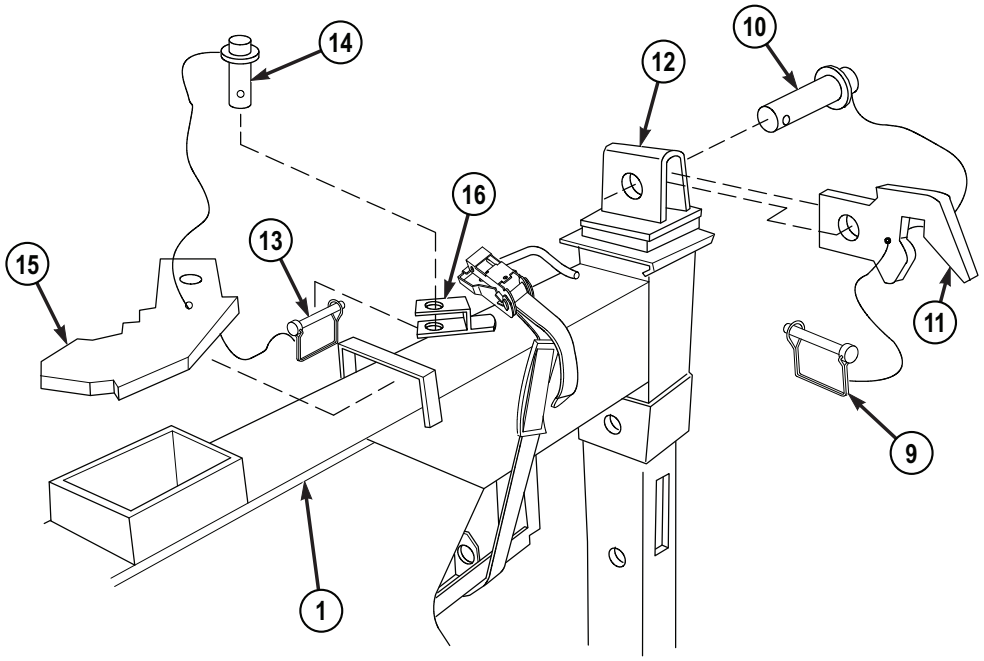


Figure 7.

NOTE

Ensure 6.0 ft hook faces down when installed.

14. Remove lock pin (13), pin (14), and 6.0 ft hook (15) from stowage bracket (16) on lifting frame (1).
15. Install 6.0 ft hook (15), pin (14), and lock pin (13) in slide arm (12).

LOADING - Continued

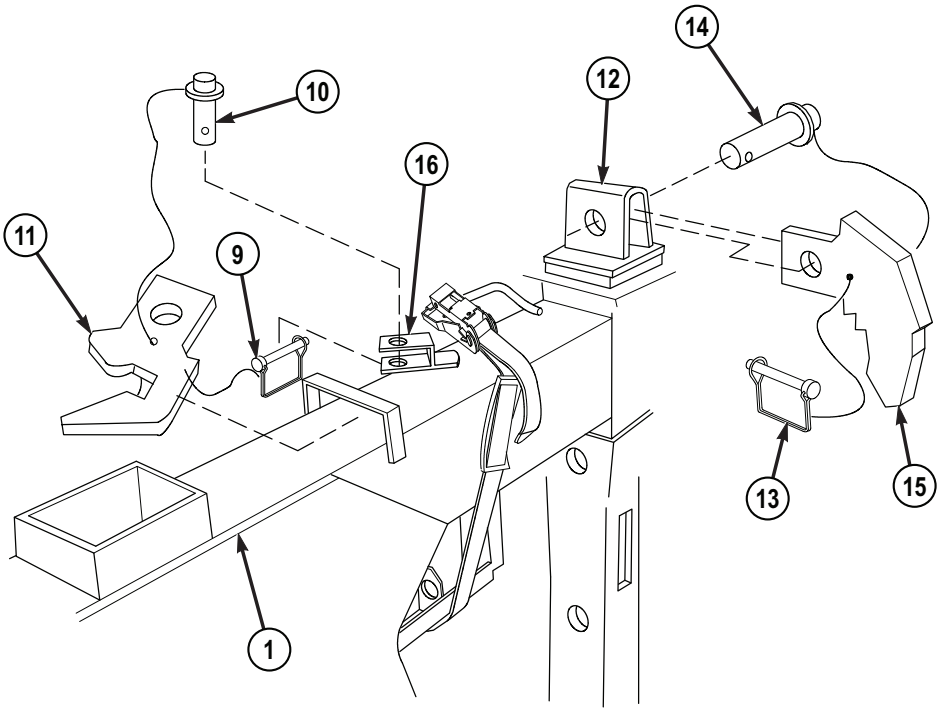


Figure 8.

16. Install standard hook (11), pin (10), and lock pin (9) in stowage bracket (16) on lifting frame (1).

NOTE

If pin is in stowed position, perform Steps (17) and (18).

17. Remove lock pin (17) and pin (18) from stowed position on lifting frame (1).

LOADING - Continued

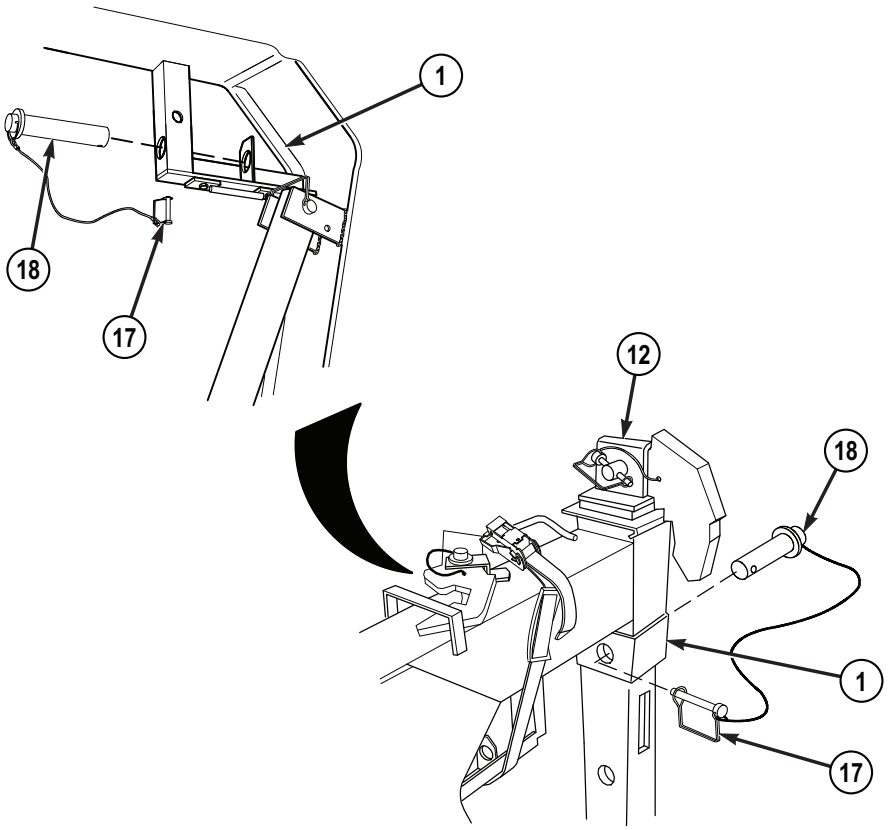


Figure 9.

18. Install pin (18) and lock pin (17) in lifting frame (1) and slide arm (12) in upper hole.
19. Repeat Steps (13) through (18) for left side.

NOTE

- There are two lifting frame lower container locks. Right side shown.
- Ensure lifting frame lower container lock handle is positioned in slot on handle lock plate.
- Ensure tab on handnut faces up.

20. Raise handle lock plate (19) and rotate lower container lock handle (20) towards center of lifting frame (1) to unlocked position.

LOADING - Continued

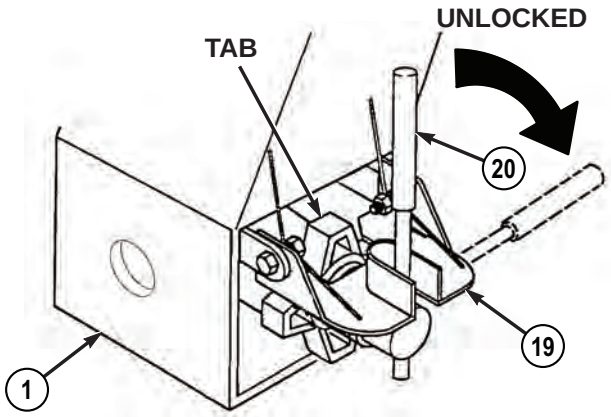


Figure 10.

21. Release handle lock plate (19) on lifting frame (1).
22. Repeat Steps (20) and (21) for left side.

CAUTION

Ensure sliders are clear of debris and surfaces are properly greased or damage to equipment may result.

NOTE

There are two rear sliders and container locks. Right side shown.

23. Rotate slider (21) so rear of slider faces down.

LOADING - Continued

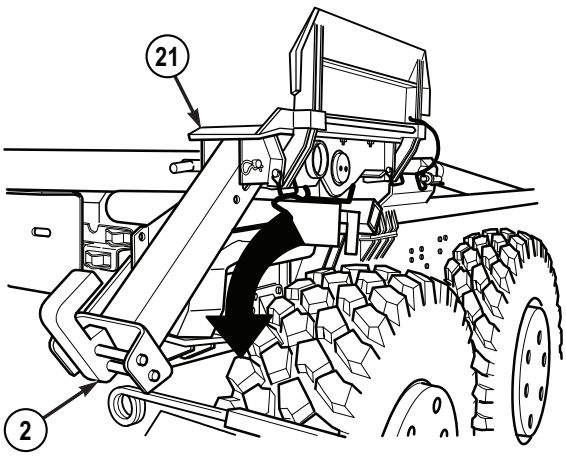


Figure 11.

24. Ensure rear container lock (2) is in ready mode or down position (WP 0043).
25. Repeat Steps (23) and (24) for left side.
26. Start engine (WP 0027).
27. Position slide arm 6 ft hooks (15) just above and in front of container upper corner castings (22).

LOADING - Continued

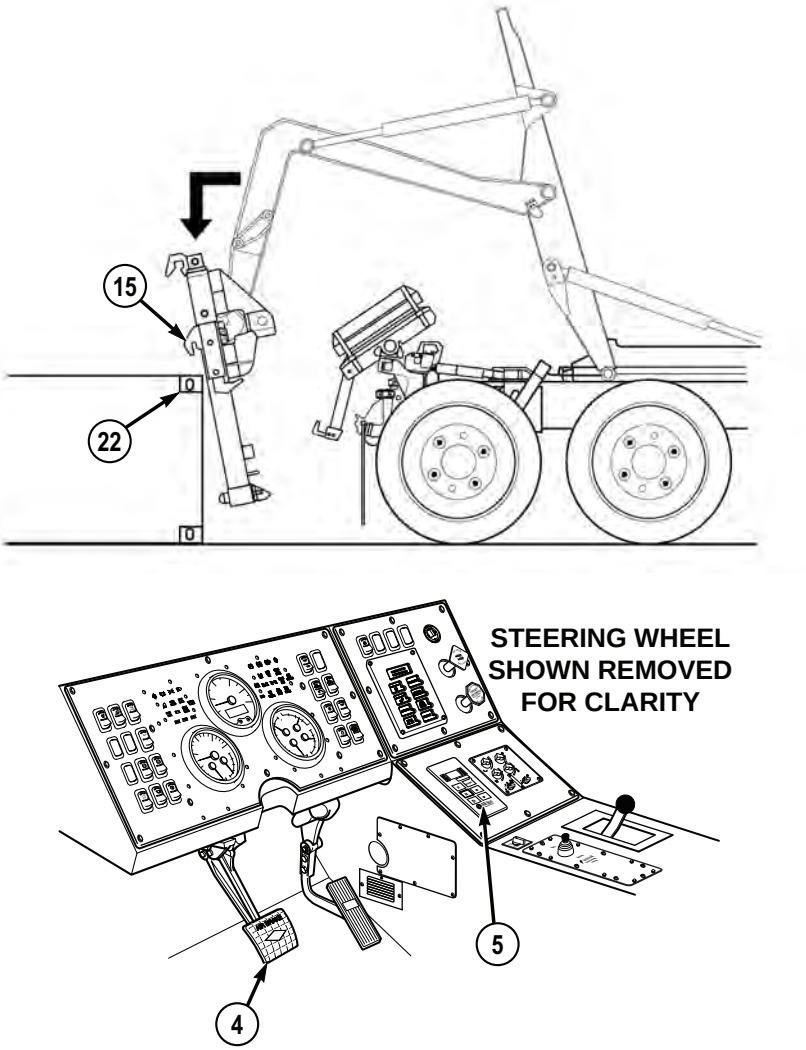


Figure 12.

28. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

LOADING - Continued

WARNING



Do not allow front lift adapter to contact the ground when slide arm hooks are not engaged with container upper corner castings. Failure to comply may result in injury or death to personnel and damage to equipment.

29. Release service brake pedal (4) and slowly back up to approximately 12.0 in. (304.8 mm) from front of container (6).

LOADING - Continued

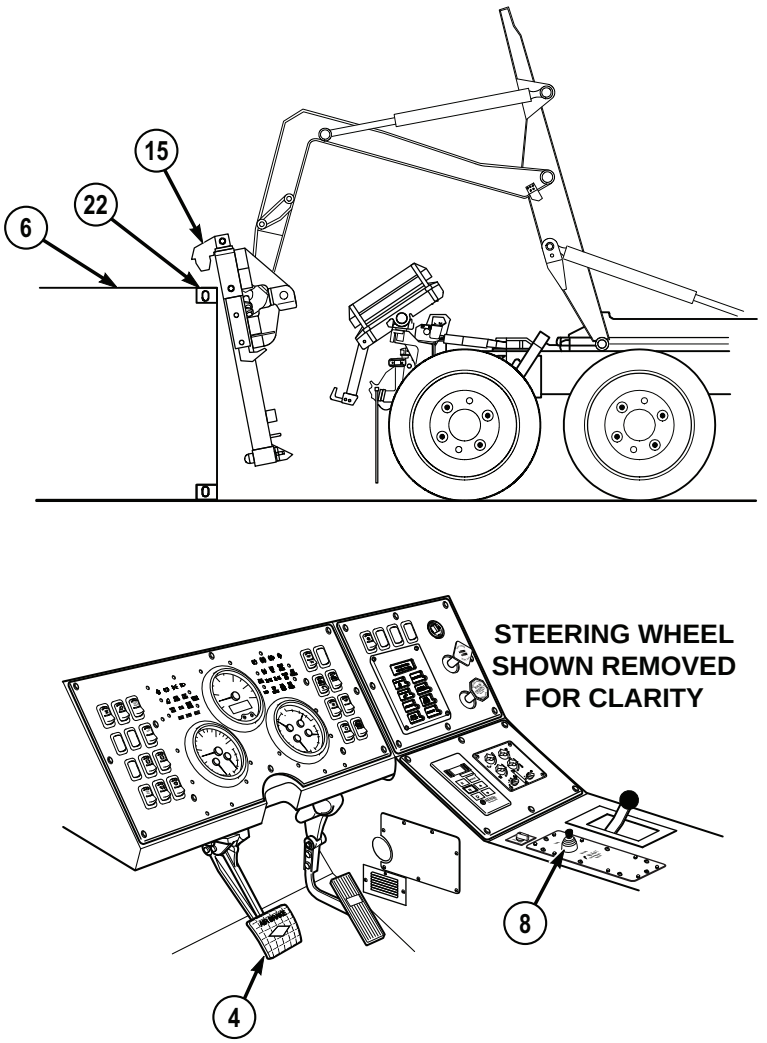


Figure 13.

30. Apply service brake pedal (4), move joystick (8) to LOAD, and raise lifting frame until slide arm 6 ft hooks (15) are above container upper front corner castings (22).

CAUTION

Ensure slide arm 6 ft hooks are fully engaged with container upper corner castings. Failure to comply may result in damage to equipment.

LOADING - Continued

NOTE

- To get slide arm 6 ft hooks to properly seat it may be necessary to drive vehicle forward slightly.
- When container is on side slope, it may be difficult to get both upper hooks properly seated. Lifting frame hangs level. To get lifting frame to hang closer to same angle as container, it may be necessary to temporarily remove one rear container lock from slider and stow on downhill side of lifting frame.

31. Release service brake pedal (4), move joystick (8) to UNLOAD, and lower slide arm 6 ft hooks (15) into container upper front corner castings (22).

LOADING - Continued

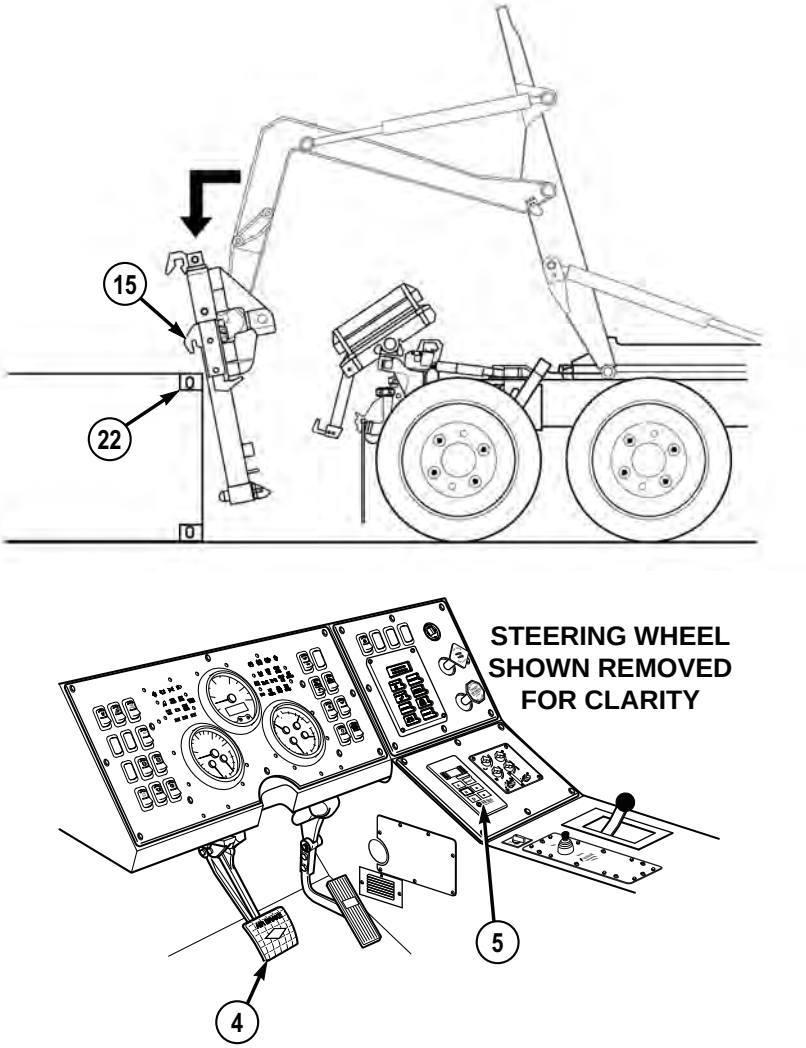


Figure 14.

32. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

LOADING - Continued

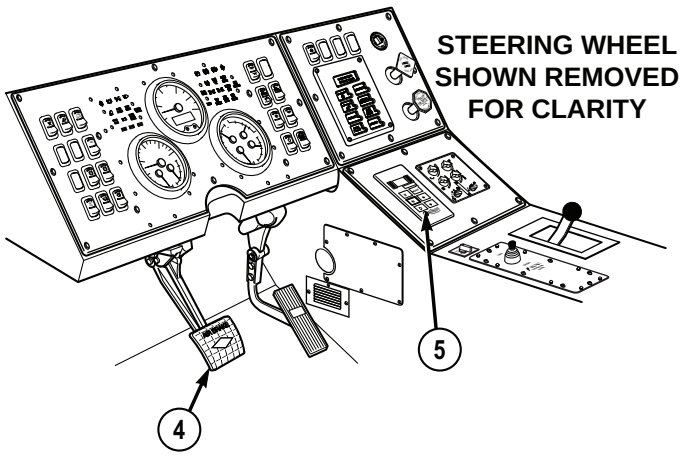


Figure 15.

33. Continue backing up until lower container locks (23) are seated in container lower front corner castings (24). Apply service brake pedal (4) and release joystick (8).

LOADING - Continued

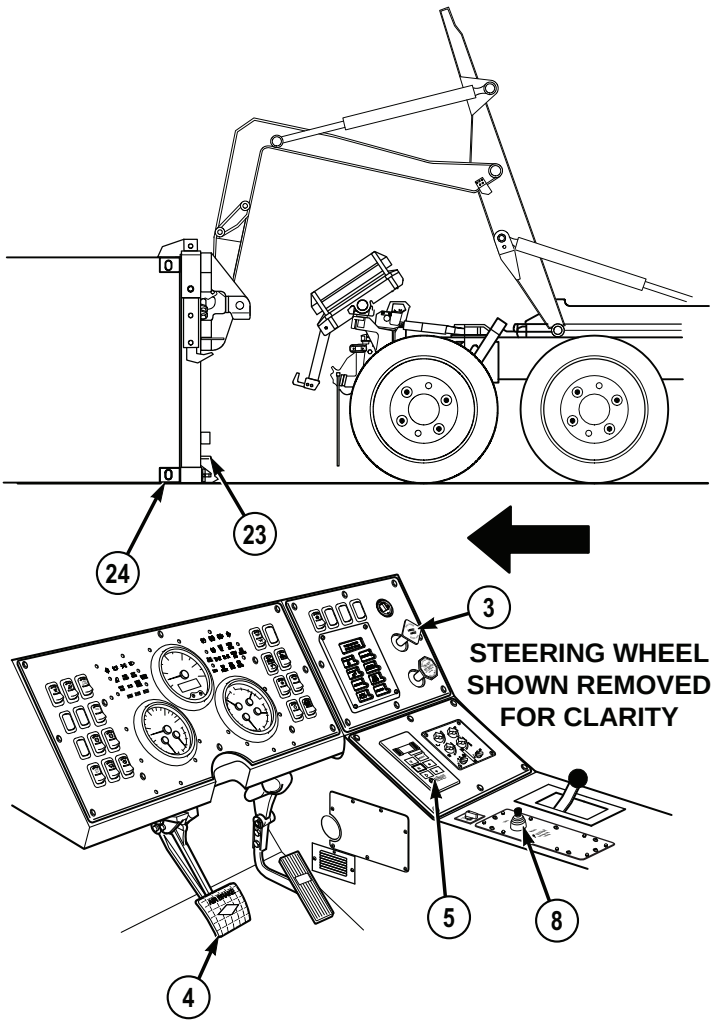


Figure 16.

34. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

CAUTION

Ensure lower container locks are fully engaged with container lower front corner castings. Failure to comply may result in damage to equipment.

LOADING - Continued

NOTE

- To get container lock handle to rotate, it may be necessary to loosen handnut.
- There are two lower container locks. Right side shown.
- After tightening handnut, it may be necessary to loosen handnut slightly to align tab with handle lock plate.
- Ensure lower container lock handle is secured in slot on handle lock plate.

35. Hold handle lock plate (19) up and rotate lower container lock handle (20) up in the locked position.

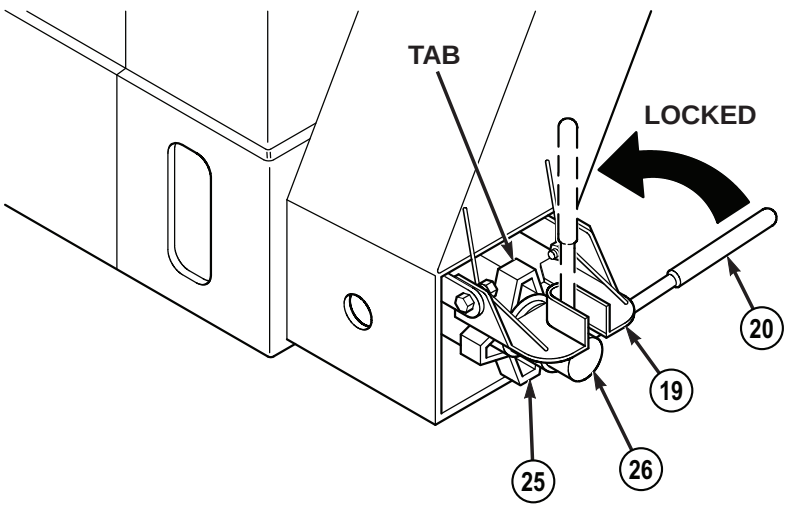


Figure 17.

36. Turn handnut (25) clockwise and tighten stem (26).

NOTE

Ensure tab on handnut faces up.

37. Lower handle lock plate (19) over lower container lock handle (20) and handnut (25) tab.

LOADING - Continued

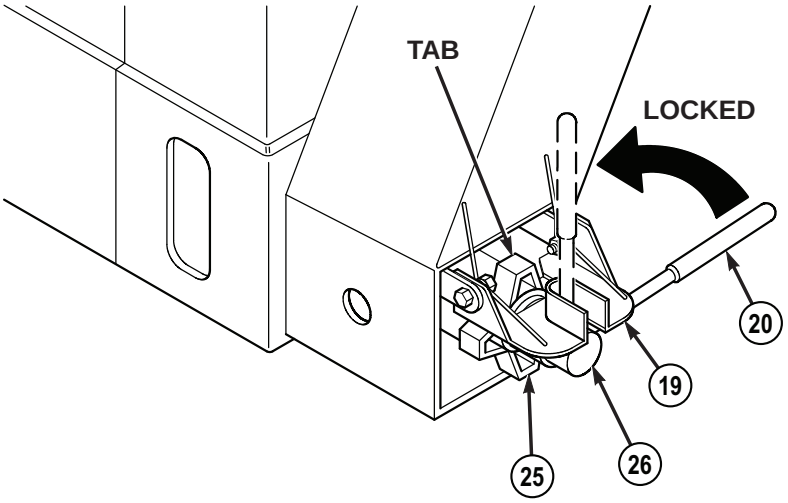


Figure 18.

38. Repeat Steps (35) through (37) for left side.

39. Set the transmission range selector (5) in Neutral (N), push in parking brake knob (3) to release parking brakes and release service brake pedal (4).

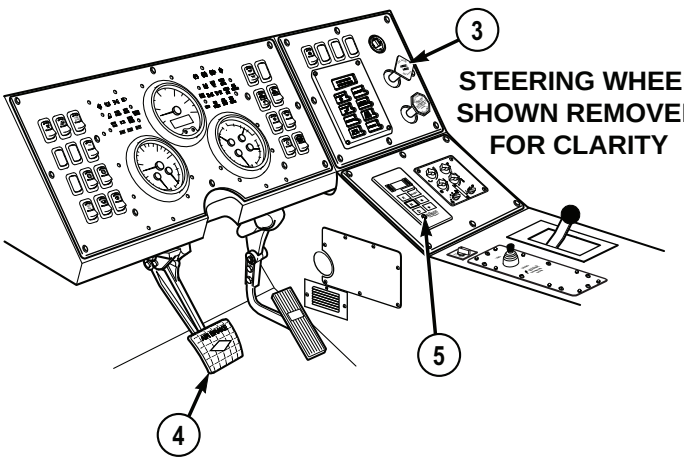


Figure 19.

LOADING - Continued

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

CAUTION

- If LHS overload lamp illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation operator should notify supervisor if it appears payload is unevenly distributed in container or if container load exceeds 35,000 lbs (15,890 kg). If any of these conditions exists, payload must be redistributed or reduced or damage to equipment may result.
- Load must be evenly distributed in the container. Uneven load distribution may cause the LHS overload indicator to give false signals and cause the LHS to operate incorrectly. Damage to equipment may result.
- If LHS overload lamp illuminates and normal operation has stopped, return load to original position and notify supervisor to have payload redistributed or weight reduced. Failure to comply may result in damage to equipment.
- Ensure parking brake is not applied before starting load sequence or damage to equipment may occur.

NOTE

- The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading and unloading times.
- If container is extremely light or empty, it may be necessary to place transmission range selector to Reverse (R) and allow vehicle to roll under container.
- If container is not centered and transit locks can not be installed and pinned, repeat Steps (40) through (48) to reposition container.

40. Move joystick (8) to LOAD, allowing vehicle to be pulled under container (6).

LOADING - Continued

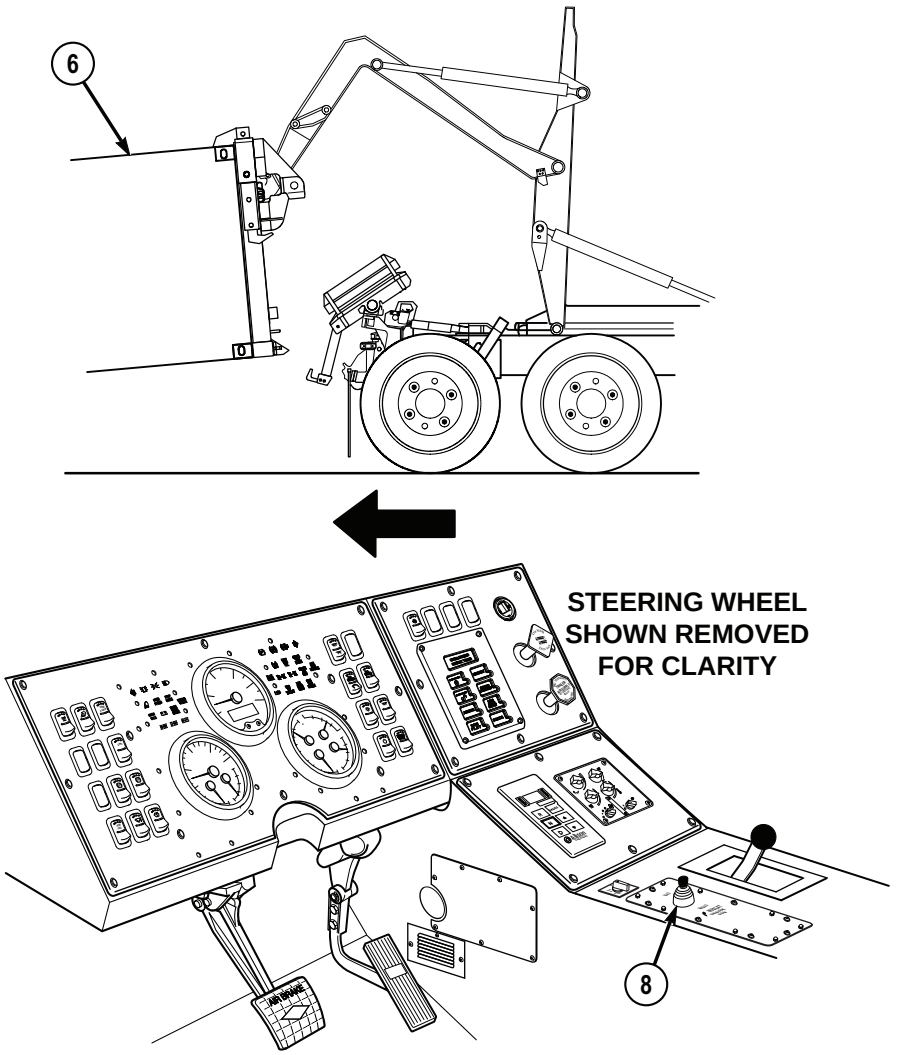


Figure 20.

LOADING - Continued

WARNING



Ensure that container has contacted rear sliders correctly and is between guides. Failure to comply may result in injury or death to personnel and damage to equipment.

CAUTION

Reduce engine speed to idle before container contacts rear sliders or damage to equipment may result.

NOTE

- LHS overload lamp may illuminate when lifting container from unusual conditions.
- As load is lifted, vehicle will be pulled under container. Some steering wheel adjustments may have to be made to ensure that container contacts rear sliders correctly and is between guides.

41. As container (6) contacts rear sliders (21), reduce engine speed to idle and apply service brake pedal (4).

LOADING - Continued

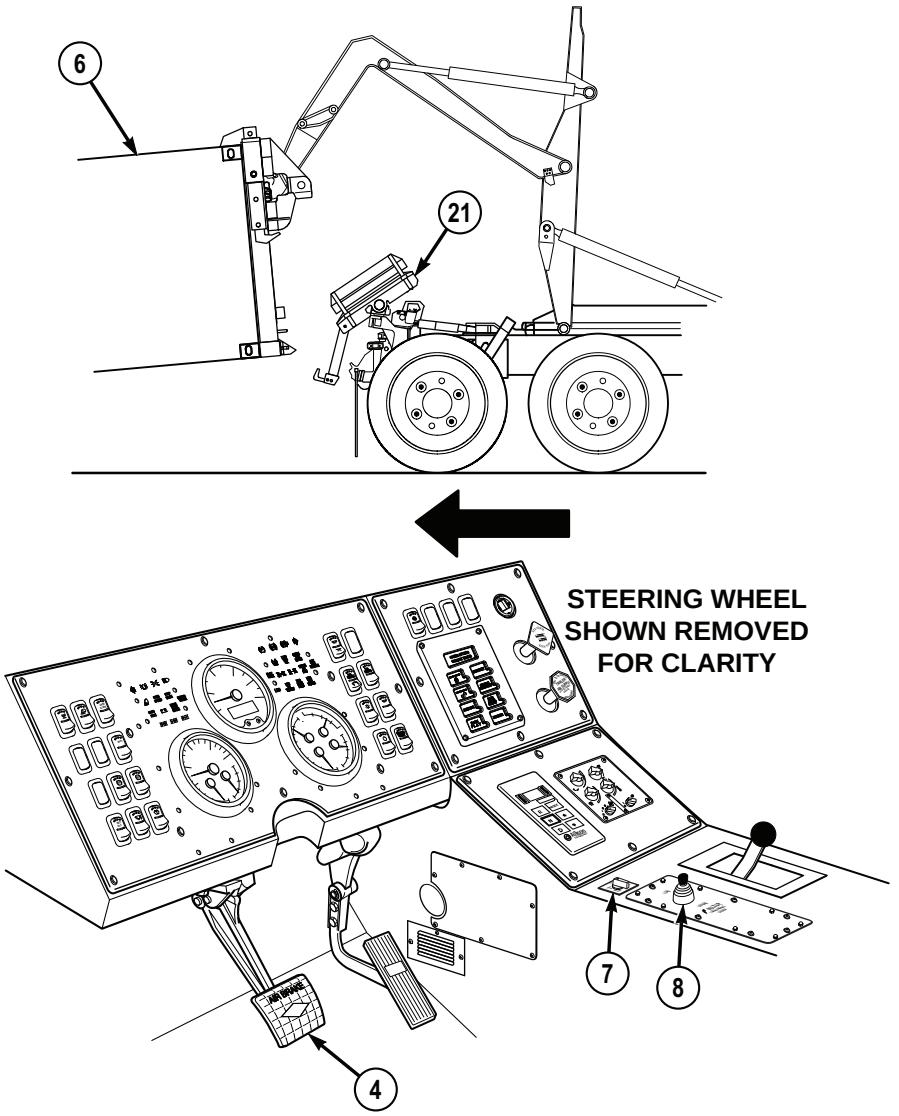


Figure 21.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

LOADING - Continued

NOTE

If container is being loaded in soft soil conditions, perform Steps (42) through (44).

42. Release joystick (8). Set hydraulic selector switch (7) to MAN H.A.

43. Move joystick (8) to LOAD until container (6) is approximately 2.0 ft (609.6 mm) off the ground. Release joystick.

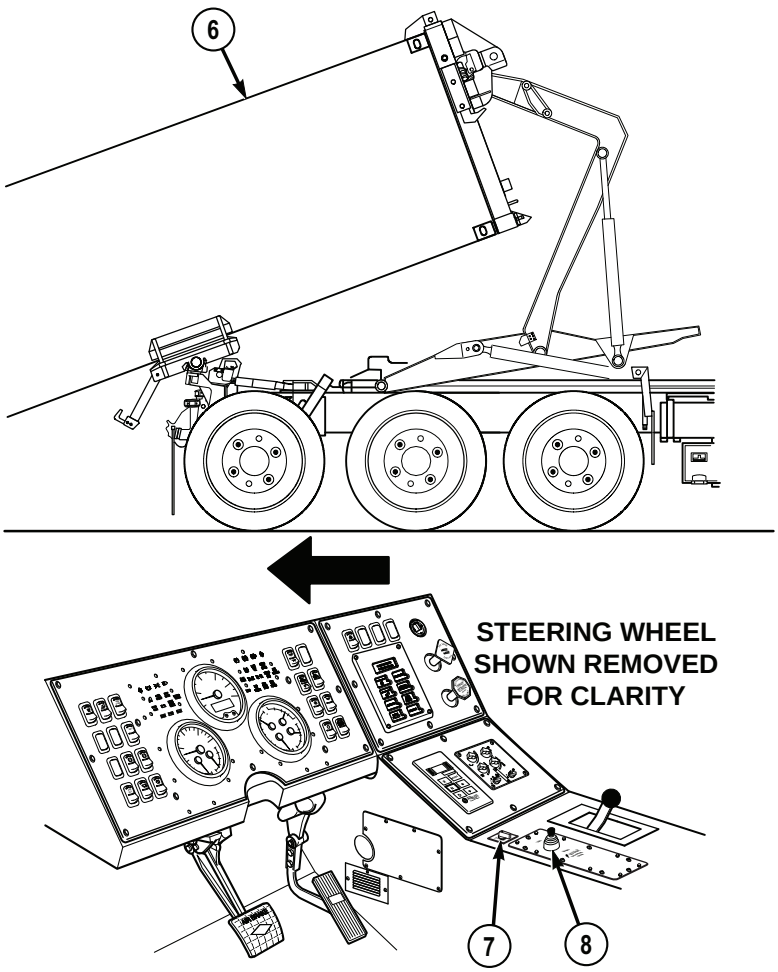


Figure 22.

44. Set hydraulic selector switch (7) to AUTO. Resume normal AUTO operations.

LOADING - Continued

NOTE

Engine speed may be increased and decreased to ease loading.

45. After container (6) contacts rear sliders (21), increase engine speed to approximately 1,500 rpm until container is almost loaded. Reduce engine speed to idle.

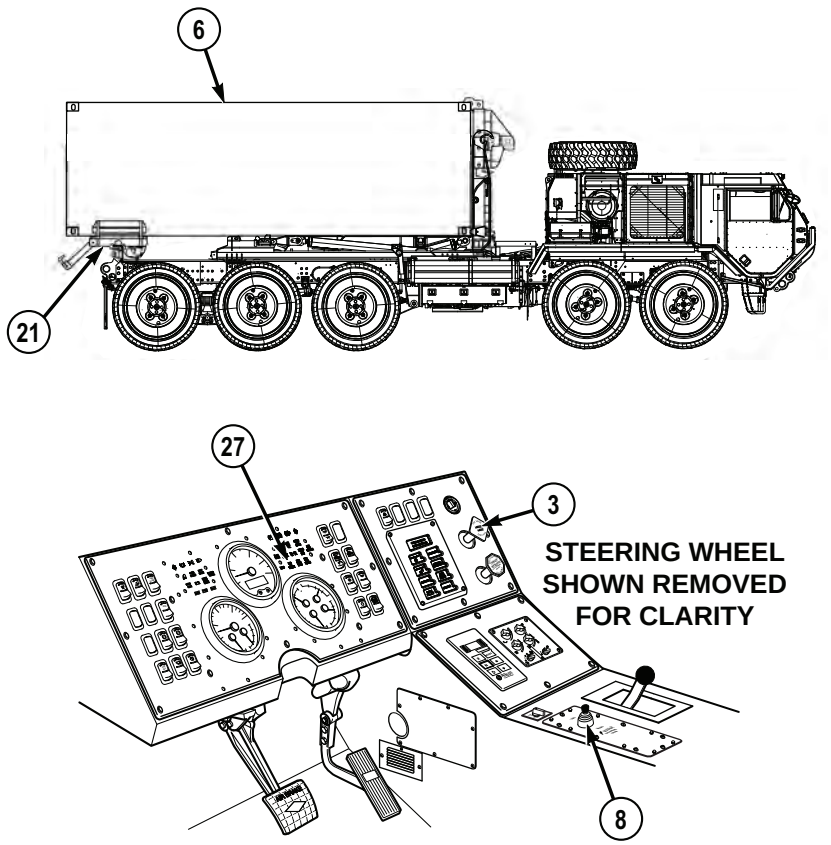


Figure 23.

CAUTION

After loading operations using CHU kit and container and the LHS NO TRANSIT indicator goes off, operator must release the joystick from the LOAD position. Failure to release the joystick may cause LHS OVER LOAD indicator to illuminate and hydraulic cylinders to remain active, forcing a temporary bow in the LHS frame, resulting in contact between LHS and container.

LOADING - Continued

46. Continue loading until container (6) is fully loaded and LHS NO TRANS lamp (27) goes out.
47. Release joystick (8).
48. Pull out parking brake knob (3) and apply parking brake.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

49. Turn hydraulic selector switch (7) to OFF.

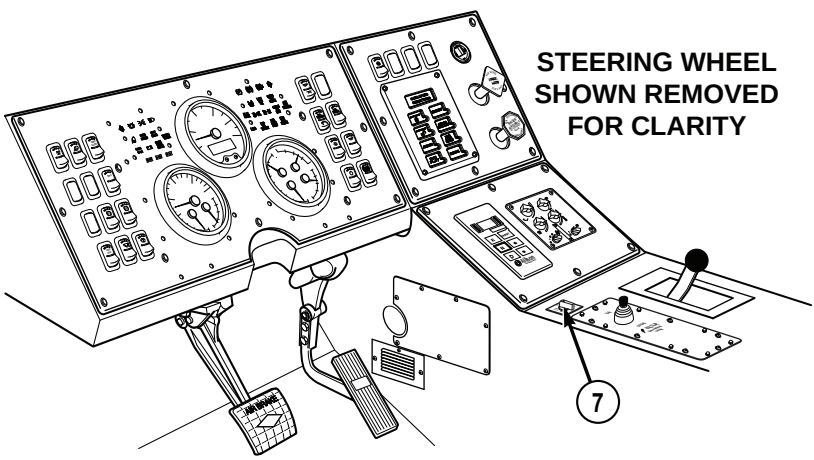


Figure 24.

50. Shut OFF engine (WP 0037).

NOTE

- There are two rear container locks. Right side shown.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (40) through (50) to reposition container.

51. Support rear container lock (2) and remove lock pin (28) and pin (29).

LOADING - Continued

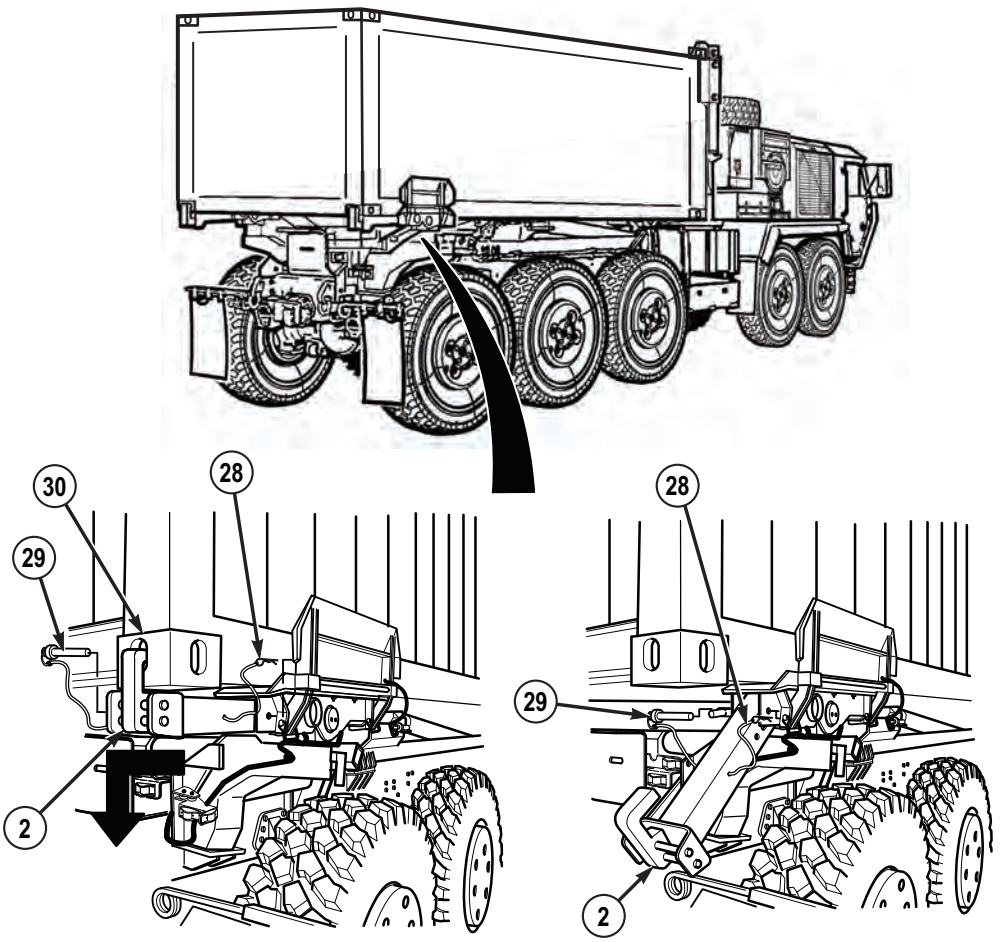


Figure 25.

52. Rotate rear container lock (2) up and position into container lower rear corner casting (30).
53. Install pin (29) and lock pin (28) in rear container lock (2) and slider (21).
54. Perform Steps (51) through (53) for left side.

END OF TASK

END OF TASK

UNLOADING

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Injury or death could result if LHS contacts power lines.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Failure to comply may result in damage to equipment and injury or death to personnel.
- Prior to and during any load or unload cycle, all personnel should stay clear of LHS, front lift adapter, and container. Failure to comply may result in damage to equipment and injury or death to personnel.

CAUTION

- Check that ground conditions, where container will be placed, can support the container weight or damage to the container, lifting frame, or LHS may result.
- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and/or door hinges may make hard contact with guides.

NOTE

For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators , Picking-up a Flatrack in Auto Mode , and Off-loading a Flatrack in Auto Mode .

1. Check area for operating room at front and rear of vehicle. Check overhead clearance and ground conditions.

UNLOADING - Continued

NOTE

There are two rear container locks. Right side shown.

2. Remove lock pin (28), pin (29), and rear container lock (2) from lower rear corner casting (30).

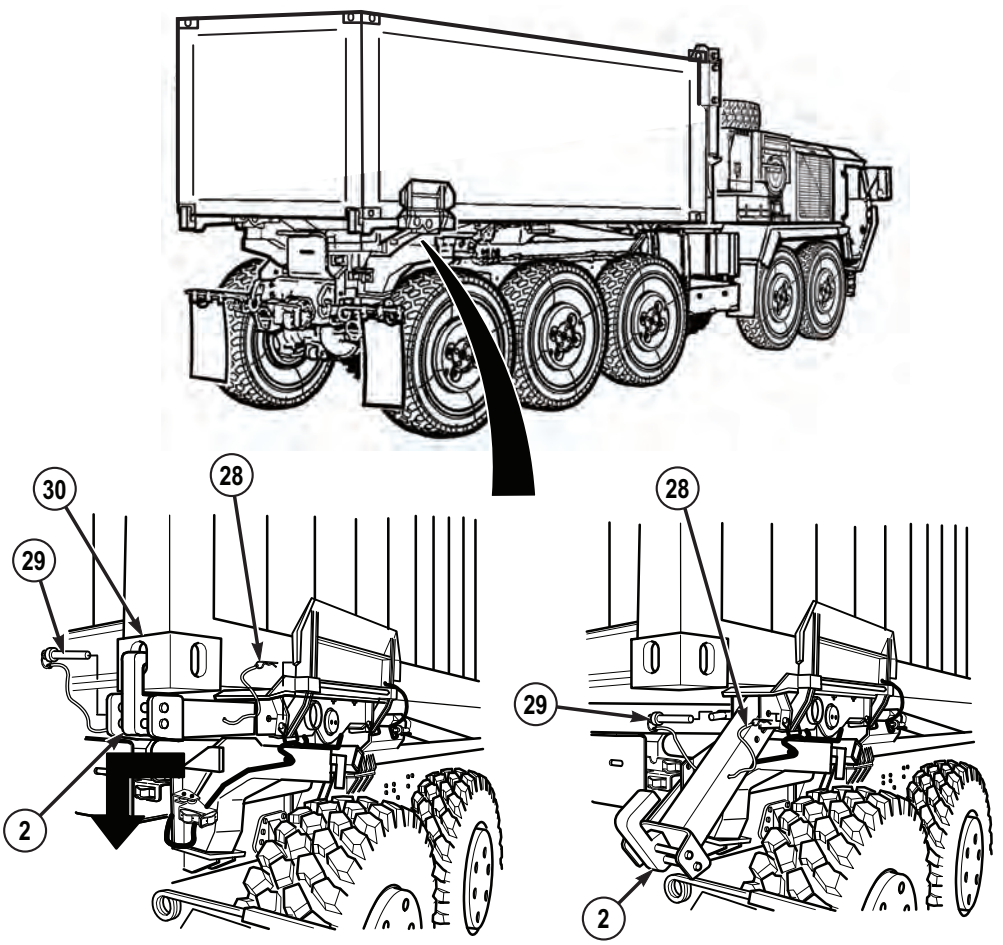


Figure 26.

3. Rotate rear container lock (2) in down position and install pin (29) and lock pin (28).
4. Perform Steps (2) and (3) for left side.
5. Start engine (WP 0027).

UNLOADING - Continued

6. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

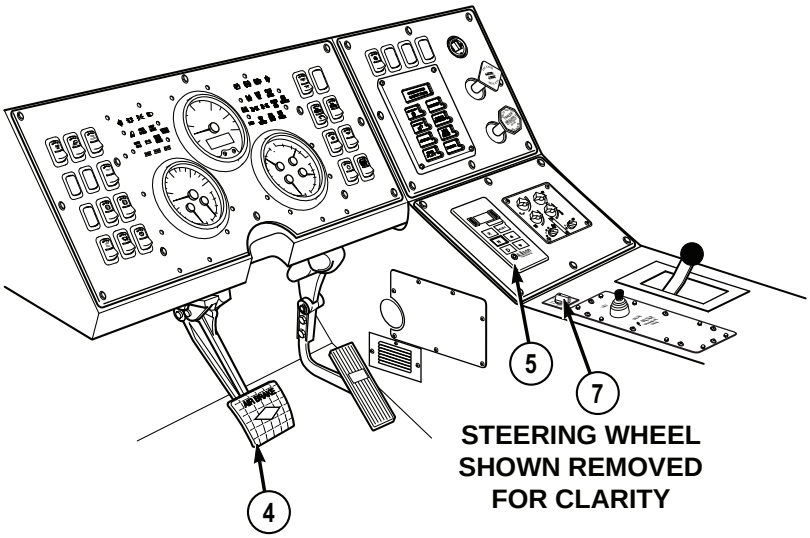


Figure 27.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Turn hydraulic selector switch (7) to AUTO.

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

NOTE

LHS will not operate and unload if rear container locks are engaged.

UNLOADING - Continued

8. Move joystick (8) to UNLOAD. Container (6) will start to move rearward. LHS NO TRANS lamp (27) will illuminate. Maintain engine speed at idle until front of container raises approximately 12.0 in. (304.8 mm).

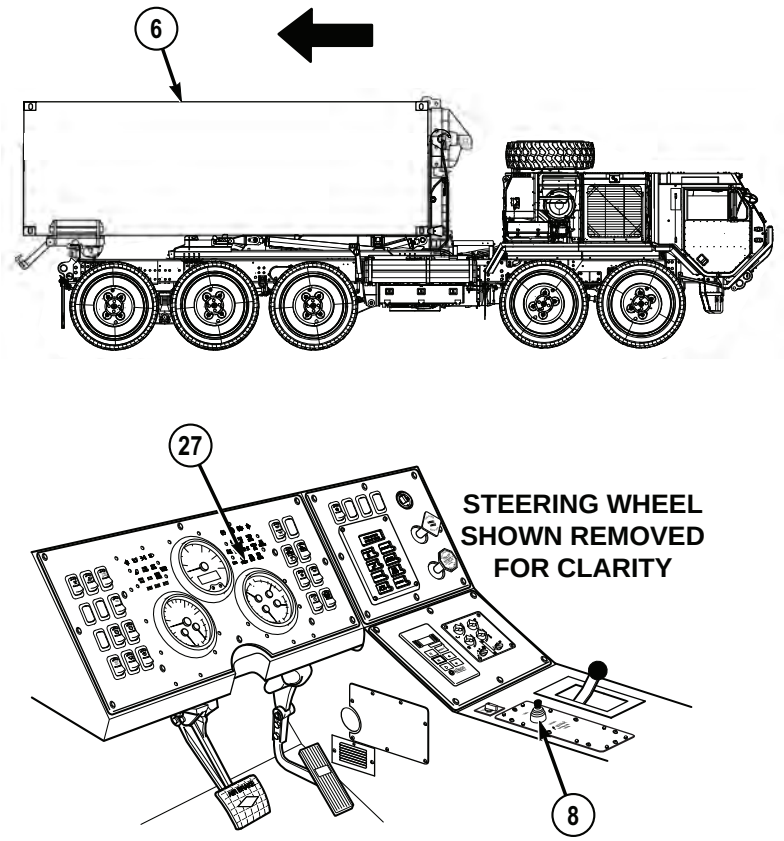


Figure 28.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

9. Continue to unload container (6) until back edge of container touches ground.

UNLOADING - Continued

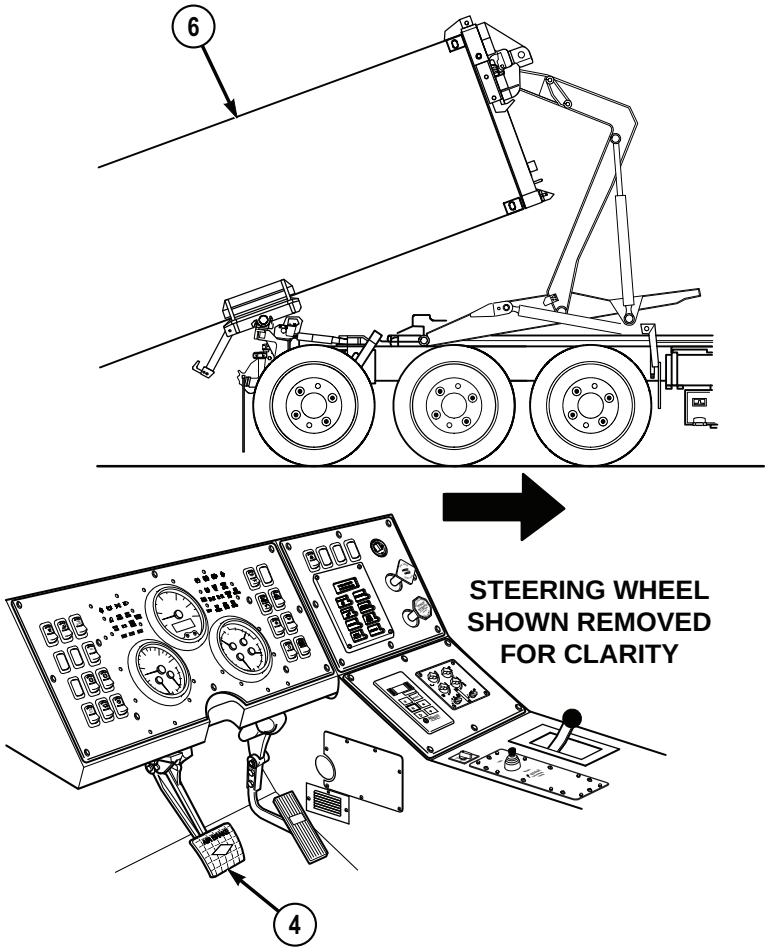


Figure 29.

10. Release service brake pedal (4) and allow container (6) to push vehicle forward from under container.

UNLOADING - Continued

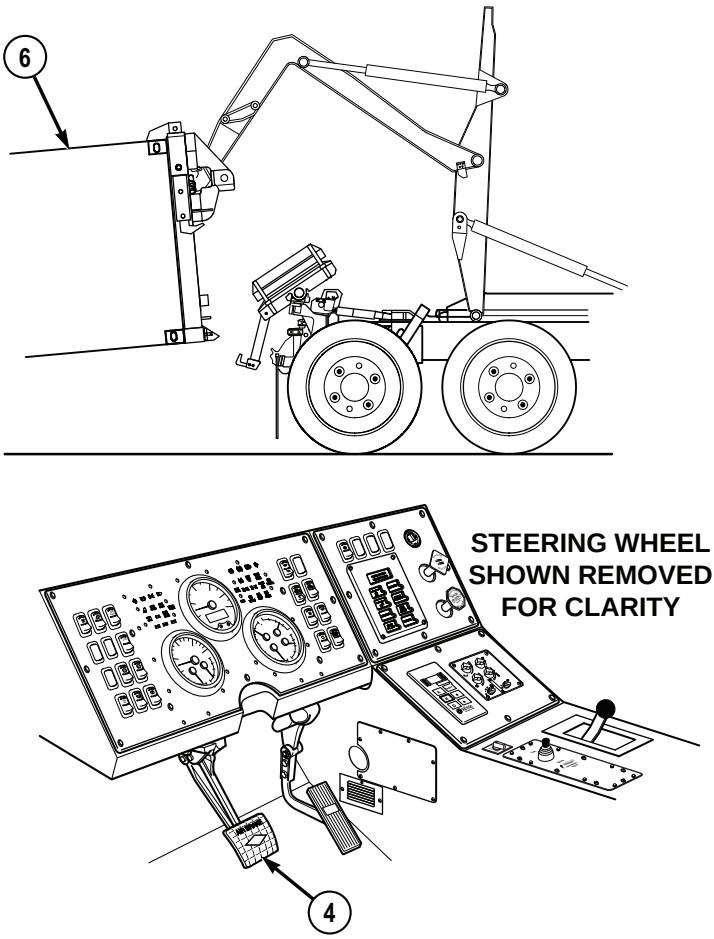


Figure 30.

11. As front of container (6) approaches within approximately 8.0 in. (203.2 mm) of ground, decrease engine speed to idle and apply service brake pedal (4).

UNLOADING - Continued

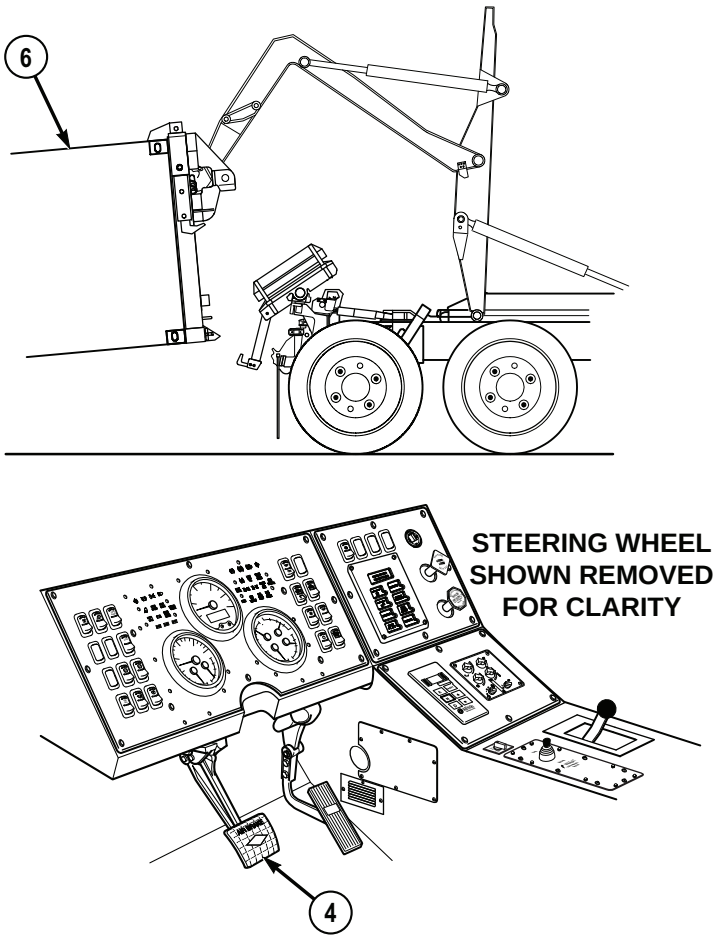


Figure 31.

CAUTION

Once vehicle's rear suspension has been relieved of container load, do not continue in UNLOAD position as possibility of jacking up the rear of vehicle with hook harm may occur and damage to equipment may result.

NOTE

If container is extremely light or empty, it may be necessary to place transmission range selector to Drive (D) and allow vehicle to move out from under container.

UNLOADING - Continued

12. Continue unloading until bottom of container (6) is on ground and rear suspension is unloaded.

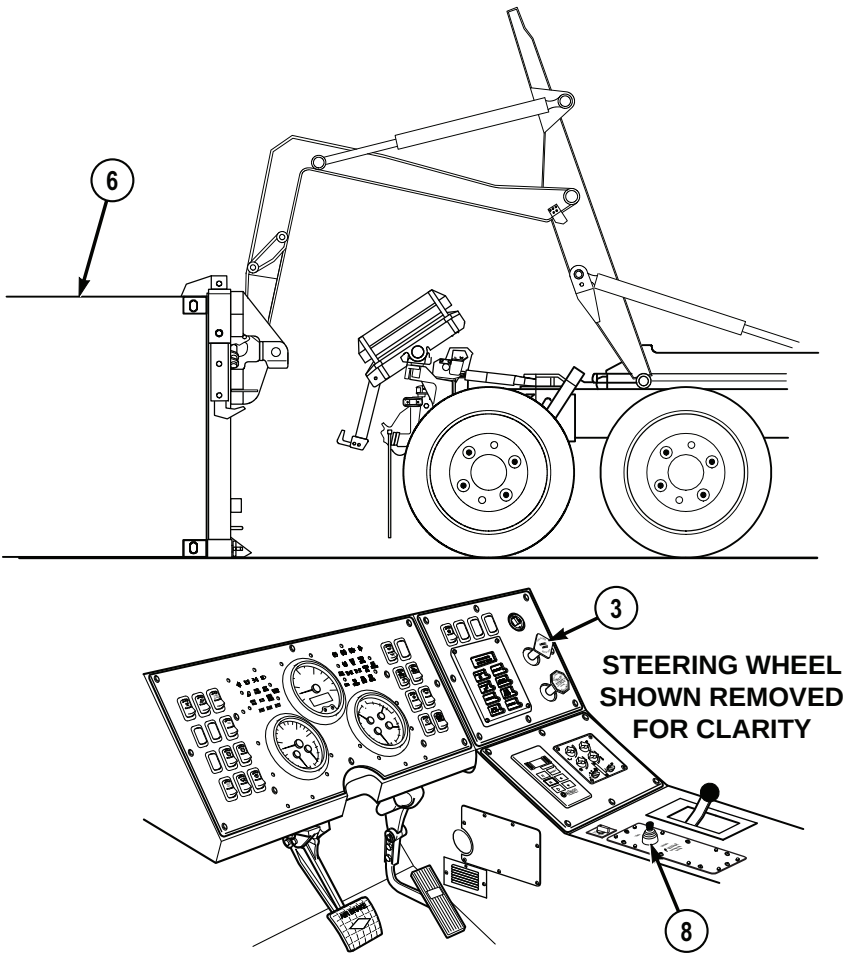


Figure 32.

13. Release joystick (8) when container (6) is resting on ground.
14. Pull out parking brake knob (3) to apply parking brakes.

UNLOADING - Continued

WARNING



Ensure that all tension has been relieved between LHS hook and front lift-adapter prior to unlocking front lift-adapter lower-container locks. Stay clear of front lift-adapter when unlocking front lift-adapter lower-container locks as front lift adapter may separate from container unexpectedly. Failure to comply may result in injury or death to personnel.

NOTE

There are two lifting frame lower container locks. Right side shown.

15. Raise handle lock plate (19) and turn handnut (25) counterclockwise and loosen stem (26).

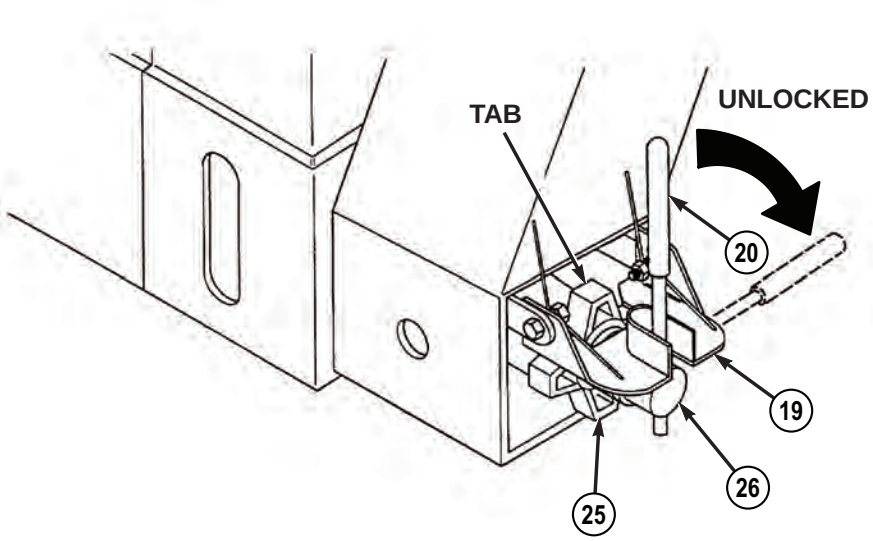


Figure 33.

NOTE

Ensure tab on handnut faces up.

16. Rotate lower container lock handle (20) towards center of vehicle to unlocked position.

UNLOADING - Continued

CAUTION

Handnut must be tightened clockwise to tighten stem. Failure to tighten stem may cause damage to equipment during next container loading procedure.

17. Turn handnut (25) clockwise and tighten stem (26).
18. Release handle lock plate (19) over container lock handle (20) and handnut (25) tab.
19. Repeat Steps (15) through (18) for left side.
20. Push in parking brake knob (3) and release parking brakes. Set transmission range selector (5) to Drive (D).

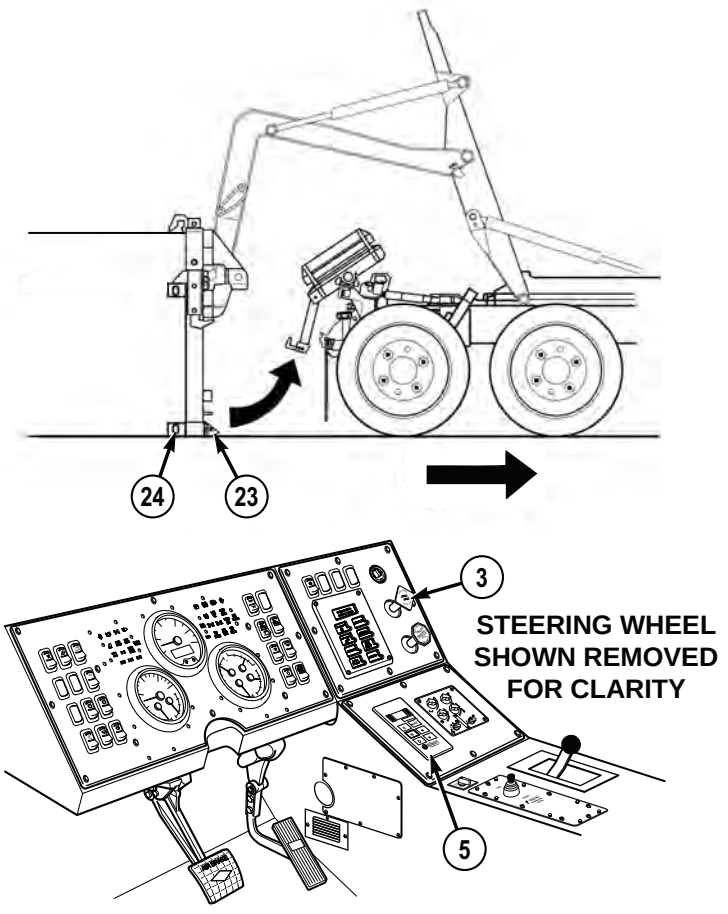


Figure 34.

UNLOADING - Continued

21. Move vehicle forward until lower container locks (23) disengage from lower front corner castings (24) approximately 4.0 to 6.0 in. (101.6 to 152.4 mm).

CAUTION

Ensure that the slide arm 6 ft hooks are completely disengaged and do not hang up in container upper corner castings when retracting LHS. Failure to comply may result in damage to the slide arm 6 ft hooks and/or container.

NOTE

It may be necessary to move the vehicle forward or backward slightly to get the slide arm 6.0 ft hooks to disengage.

22. Move joystick (8) to LOAD position until lifting frame (1) is disengaged from container (6).

UNLOADING - Continued

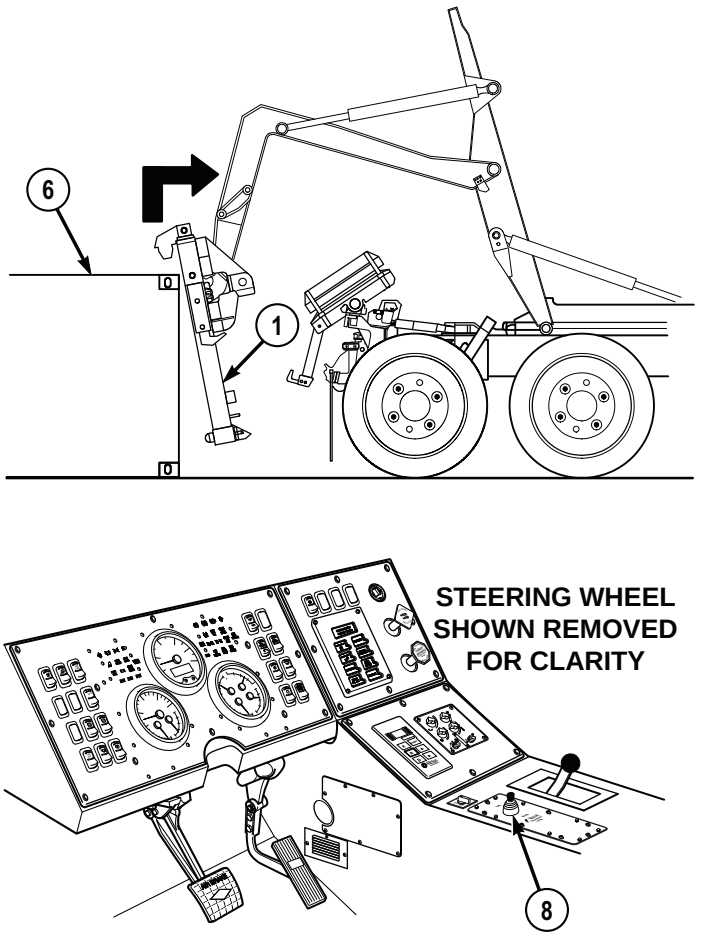


Figure 35.

23. Release joystick (8).

UNLOADING - Continued

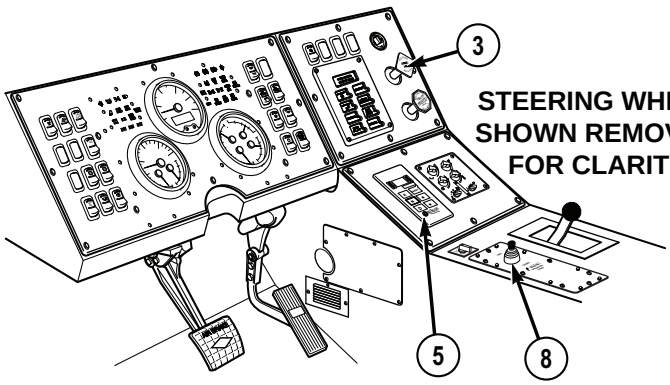


Figure 36.

24. Move vehicle forward until rear of vehicle is approximately 9.0 ft (2743.2 mm) in front of container.
25. Move joystick (8) to unload position until lifting frame is positioned approximately 12.0 in. (304.8 mm) off the ground.
26. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

CAUTION

- On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN M.A. and retract (LOAD) hook arm a few inches. Switch hydraulic selector to MAN M.F. and retract the mainframe until the lifting frame clears the rear sliders. Return hydraulic selector to AUTO and continue (LOAD) operation. Failure to comply may result in damage to equipment.
- Never drive with LHS NO TRANS light illuminated. An illuminated lamp means that the LHS is not fully stowed. Failure to comply may result in damage to equipment.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

27. Move joystick (8) to LOAD position until LHS is fully retracted and lifting frame (1) is positioned on bumper supports (31). LHS NO TRANS lamp (27) will go out indicating LHS is in transport position.

UNLOADING - Continued

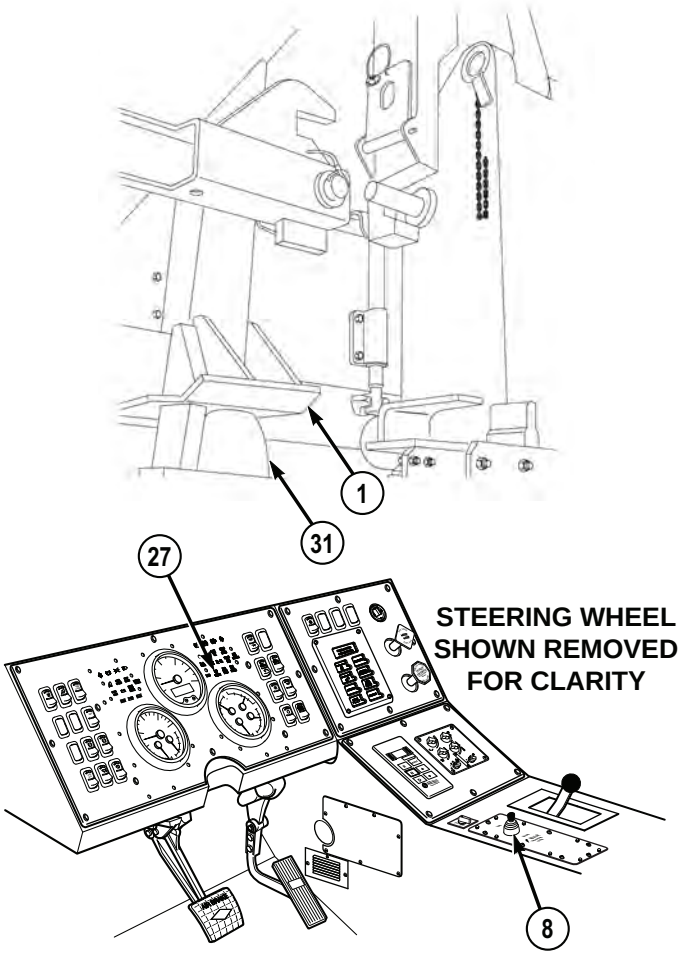


Figure 37.

28. Release joystick (8).

CAUTION

Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

29. Remove lock pin (13), pin (14), and 6.0 ft hook (15) from slide arm (12).

UNLOADING - Continued

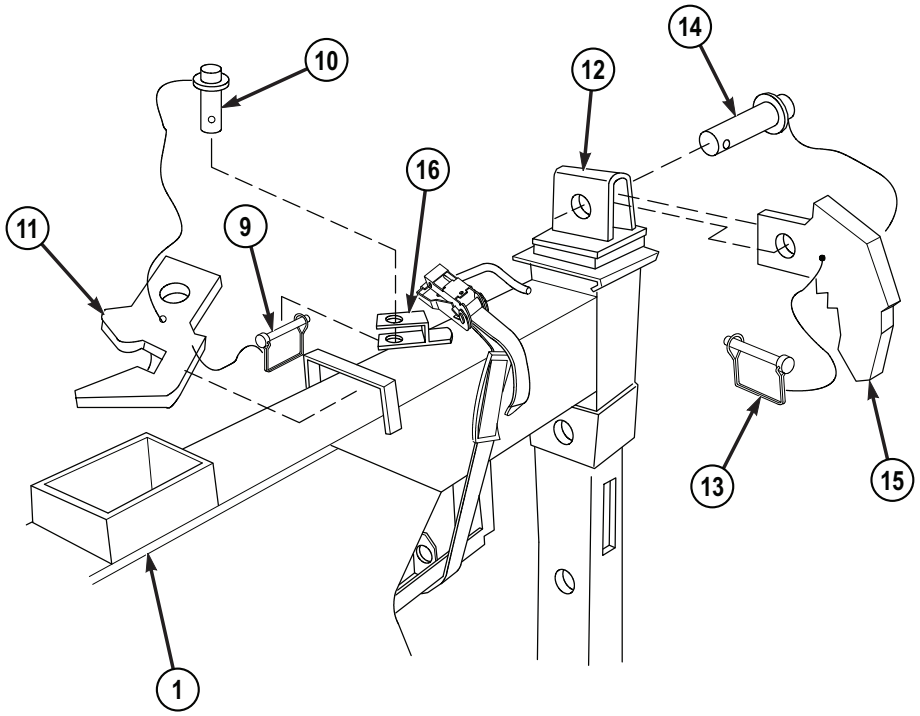


Figure 38.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

30. Turn hydraulic selector switch (7) to OFF.

UNLOADING - Continued

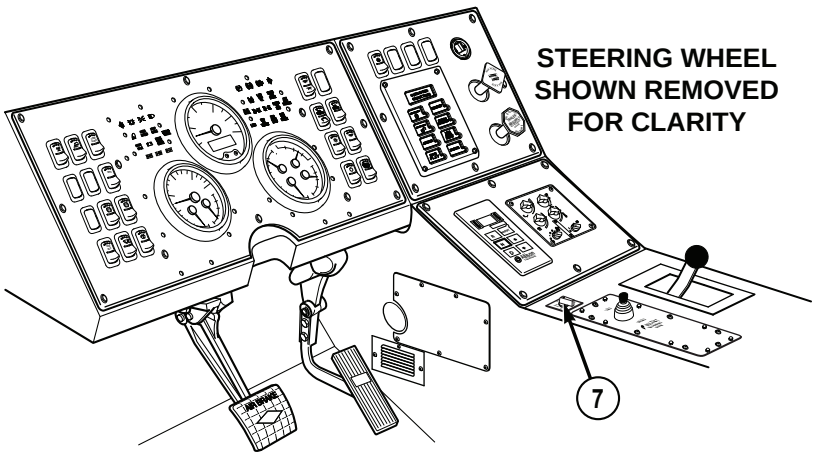


Figure 39.

NOTE

- Perform Steps (31) through (34) if remainder of CHU operation does not require use of 6.0 ft hooks.
- There are two slide arms. Right side shown.

31. Remove lock pin (9), pin (10), and standard hook (11) from stowage bracket (16) on lifting frame (1).

UNLOADING - Continued

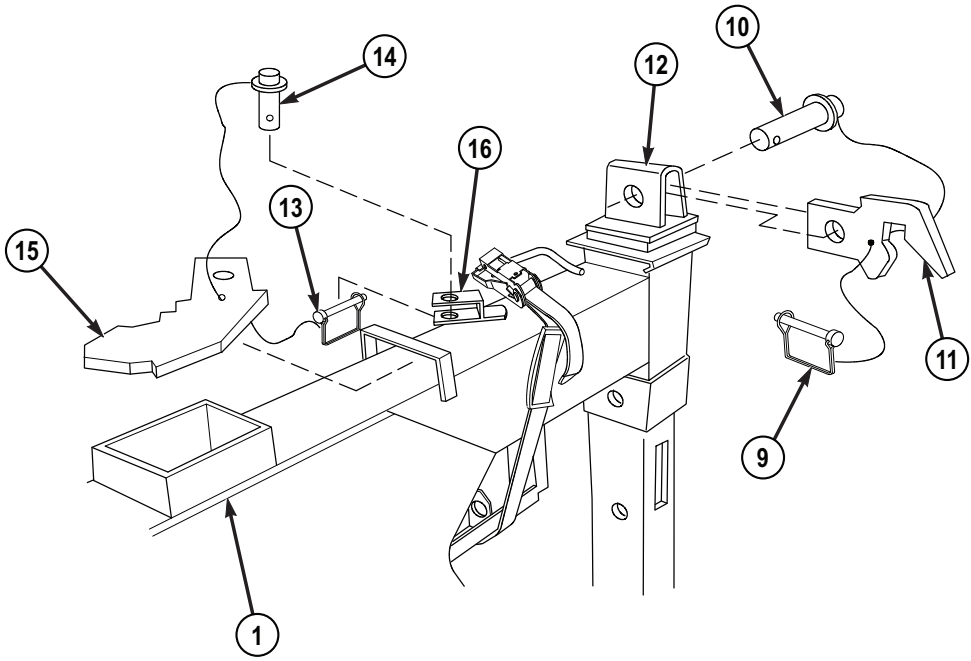


Figure 40.

NOTE

Ensure standard hooks face down when installed.

32. Install standard hook (11), pin (10), and lock pin (9) on slide arm (12).
33. Install 6.0 ft hook (15), pin (14), and lock pin (13) in stowage bracket (16) on lifting frame (1).
34. Repeat Steps (31) through (33) for left side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOADING AND UNLOADING CONTAINER (51.0 IN. [1295.4 MM] TALL) TO PLS VEHICLE USING LIFTING FRAME (LF)

INITIAL SETUP:

Not Applicable

LOADING

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure lifting frame is in the unlocked position before attempting to load a container to vehicle. Failure to comply will result in damage to equipment.

1. Ensure lifting frame (1) is in container mode (WP 0043) and unlocked (WP 0048).

LOADING - Continued

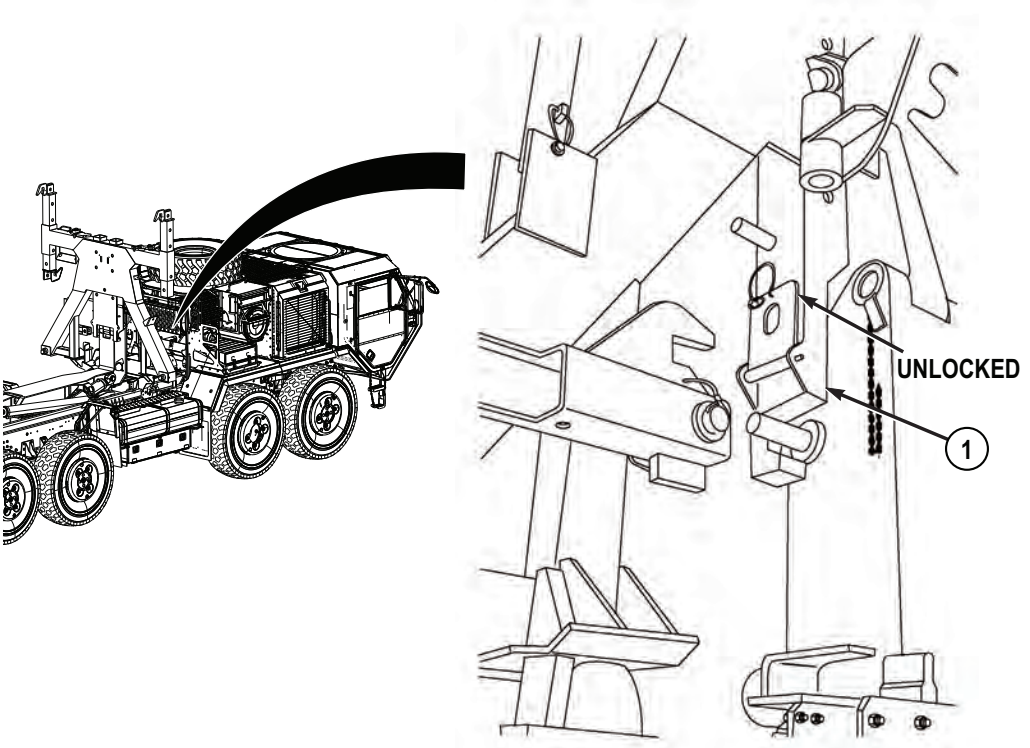


Figure 1.

CAUTION

Ensure vehicle is in container mode before attempting to load a container to vehicle. Failure to comply will result in damage to equipment.

2. Ensure vehicle is in container mode (WP 0043).
3. Ensure rear container lock (2) is in ready mode (WP 0043).

LOADING - Continued

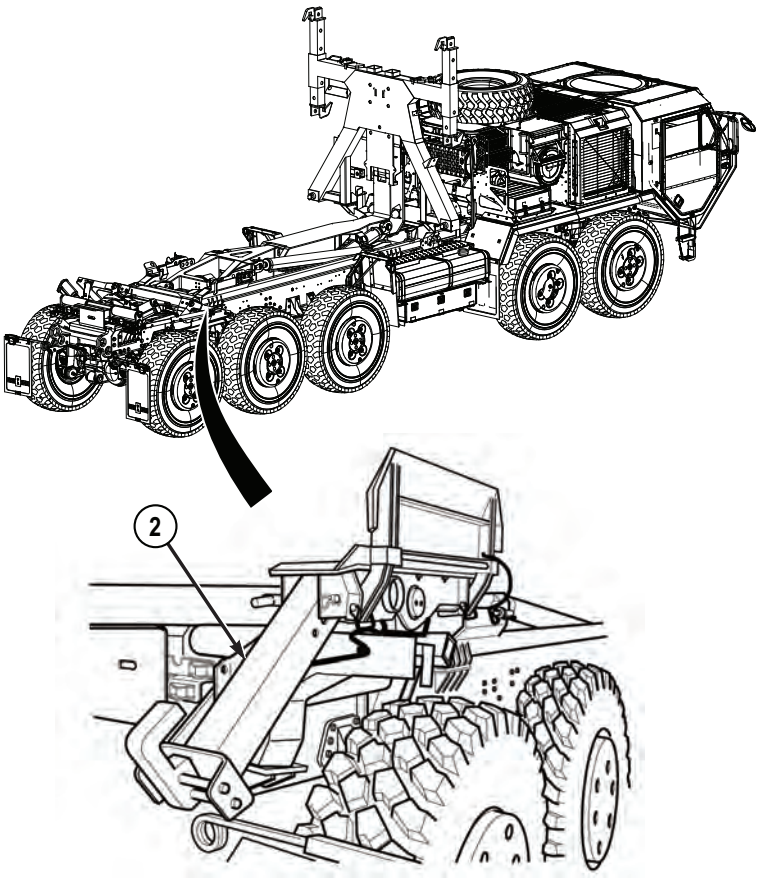


Figure 2.

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).

LOADING - Continued

- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

CAUTION

- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and/or door hinges may make hard contact with guides.
- When operating CHU with non-standard, end-opening, 20.0 ft long shipping containers, operator needs to take extra care to ensure that sliders and guides contact container properly, container slides on sliders properly, and container loads are centered on vehicle. Failure to comply may result in container getting hung up or making hard contact with sliders and guides, causing damage to CHU or container.

NOTE

- For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators, Picking-up a Flatrack in Auto Mode and Off-loading a Flatrack in Auto Mode.
- Rear mud flaps may be pinned up to provide better visibility of lifting frame lower container locks.
- Multiple connected containers can not be used with CHU. This includes Six CONS and Quad CONS.
- It is recommended that two personnel be used to ease operation (driver and spotter to position lifting frame).

4. Start engine (WP 0027).

LOADING - Continued

5. Push in parking brake knob (3), apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

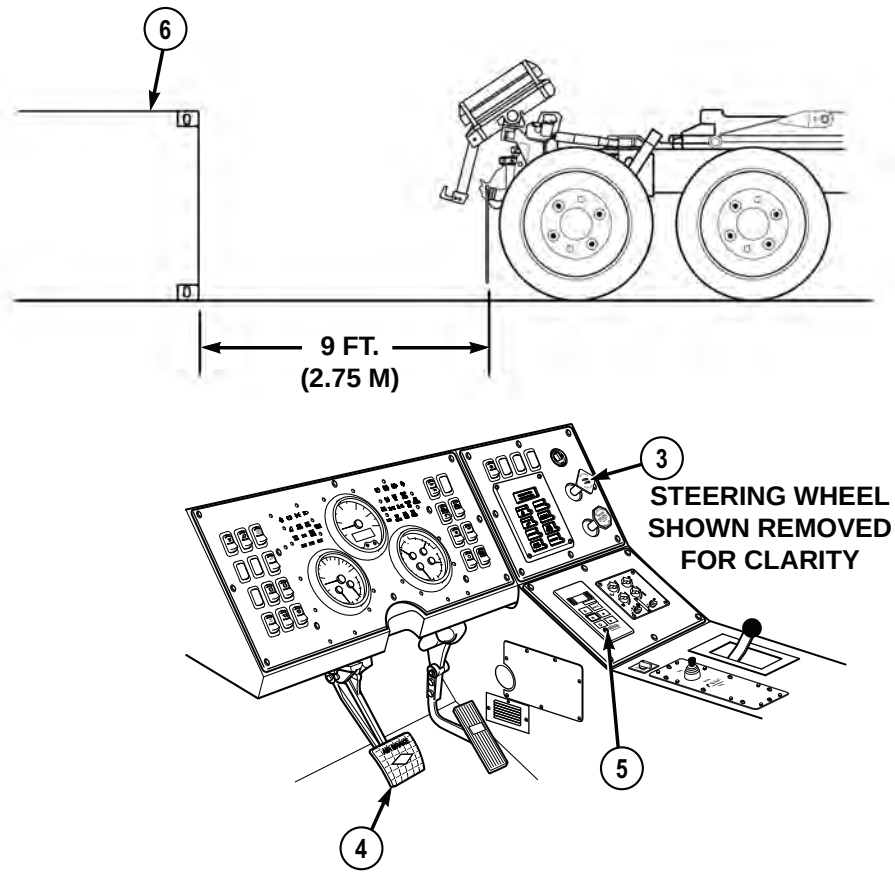


Figure 3.

6. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).
7. Release service brake pedal (4) and position rear of vehicle within 9.0 ft (2743.2 mm) of front of container (6), aligning centerline of vehicle within 2.0 in. (50.8 mm) of container centerline.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

8. Turn hydraulic selector switch (7) to AUTO.

LOADING - Continued

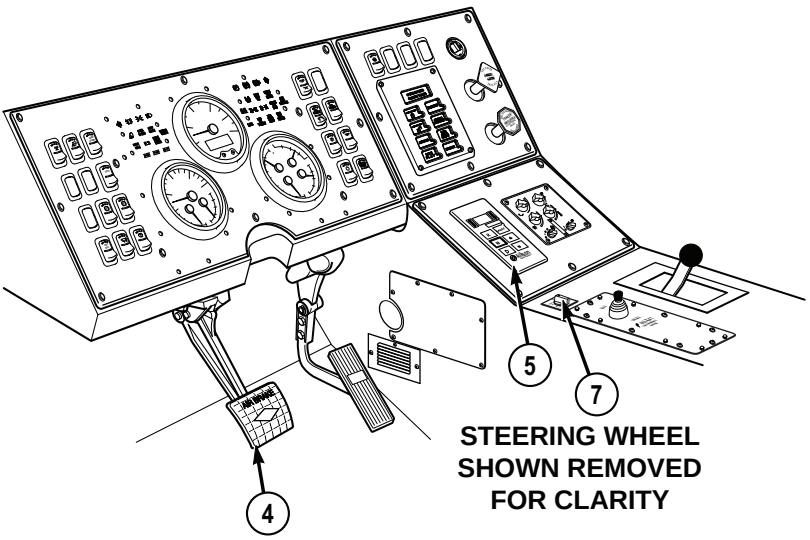


Figure 4.

CAUTION

On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Return hydraulic selector to AUTO and continue (UNLOAD) operation. Repeat as required. Failure to comply may result in damage to equipment.

9. Move joystick (8) to UNLOAD position until lifting frame (1) is positioned in front of container (6).

LOADING - Continued

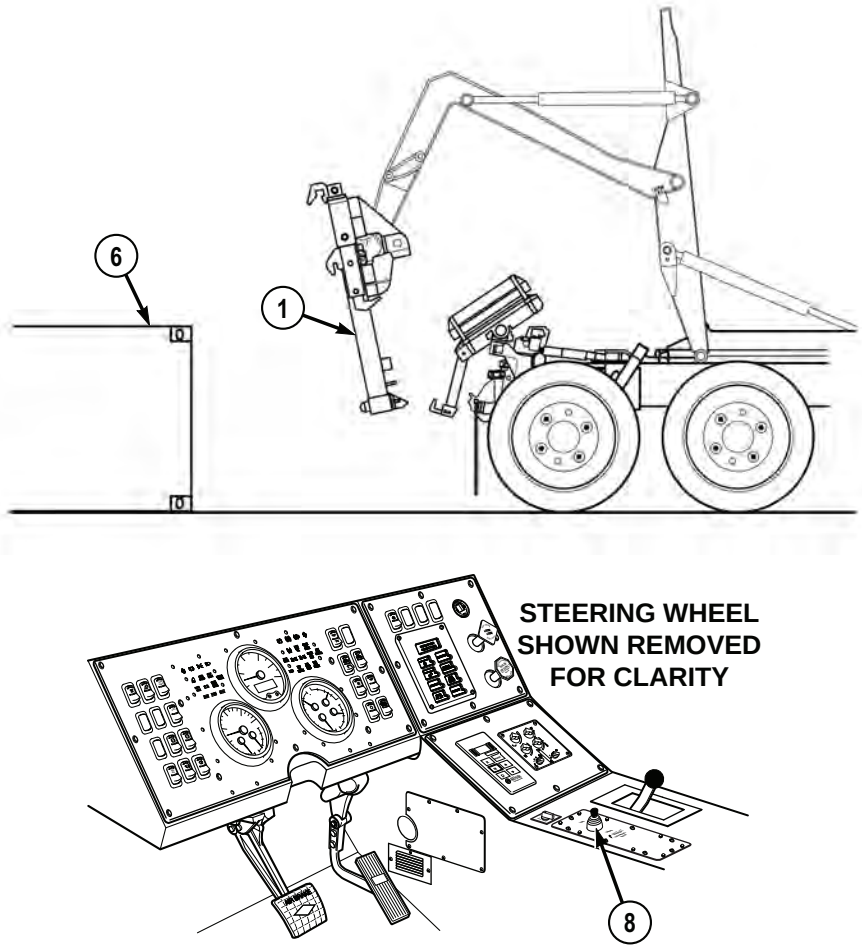


Figure 5.

10. Operate LHS in AUTO mode until lifting frame (1) is approximately 12.0 in. (304.8 mm) off of ground.

LOADING - Continued

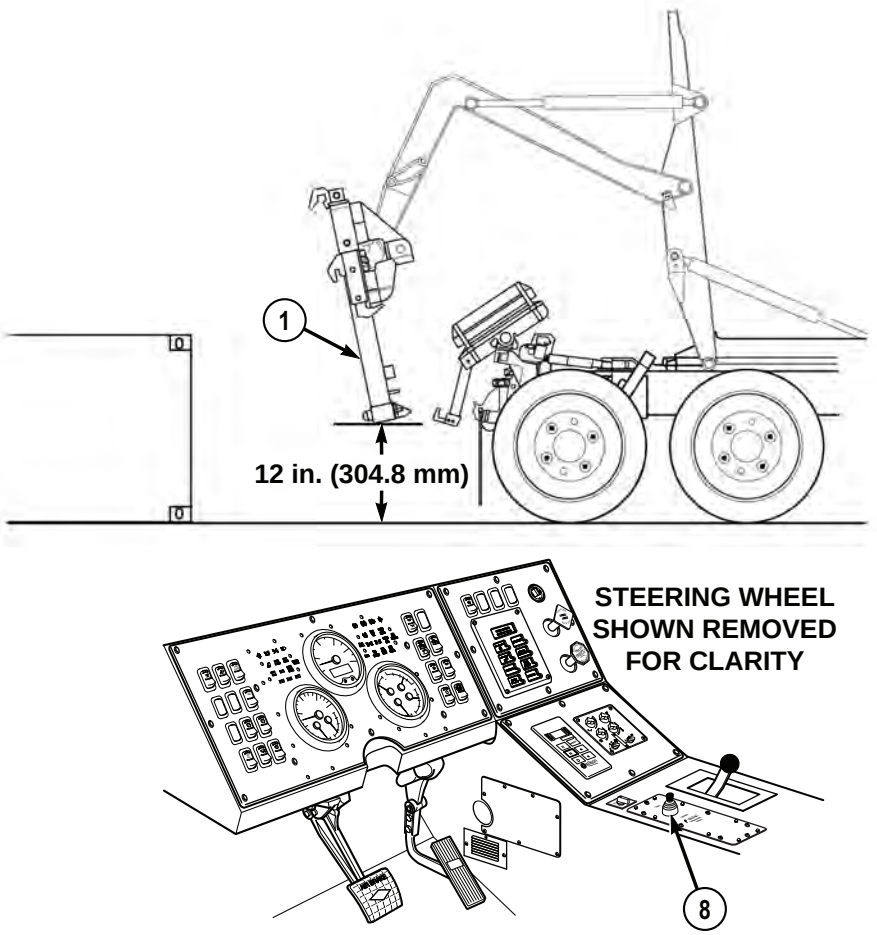


Figure 6.

11. Release joystick (8).
12. Shut OFF engine (WP 0037).
13. Remove lock pin (9), pin (10), and half-height container front hook (11) from stowage bracket (12) on lifting frame (1).

LOADING - Continued

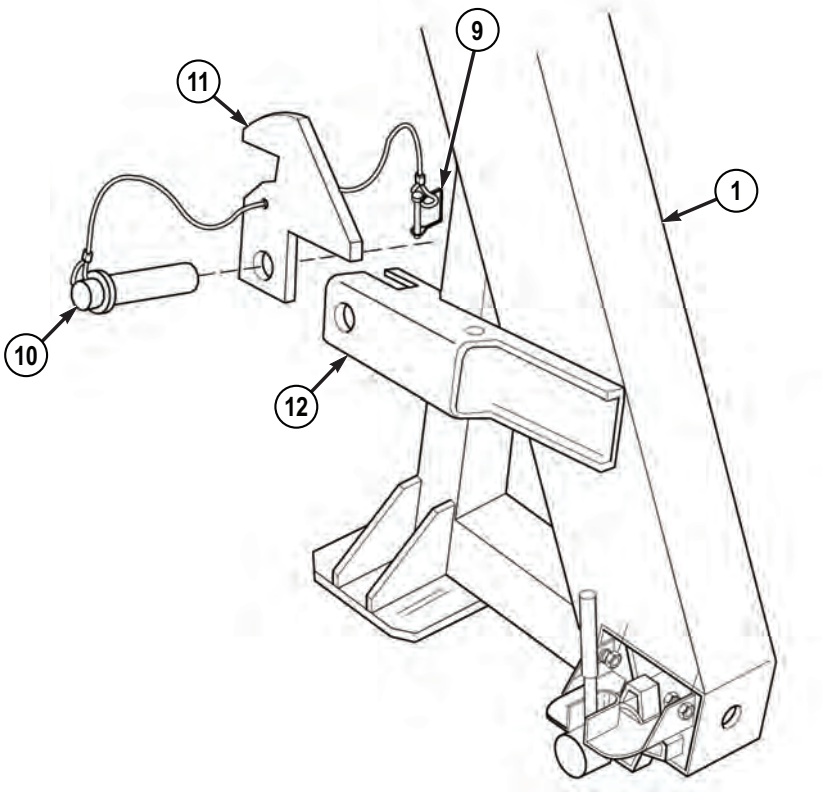


Figure 7.

NOTE

Ensure half-height container front hooks face down when installed.

14. Position half-height container front hook (11) in slot (13) on slide arm (14) and install pin (10) and lock pin (9).

LOADING - Continued

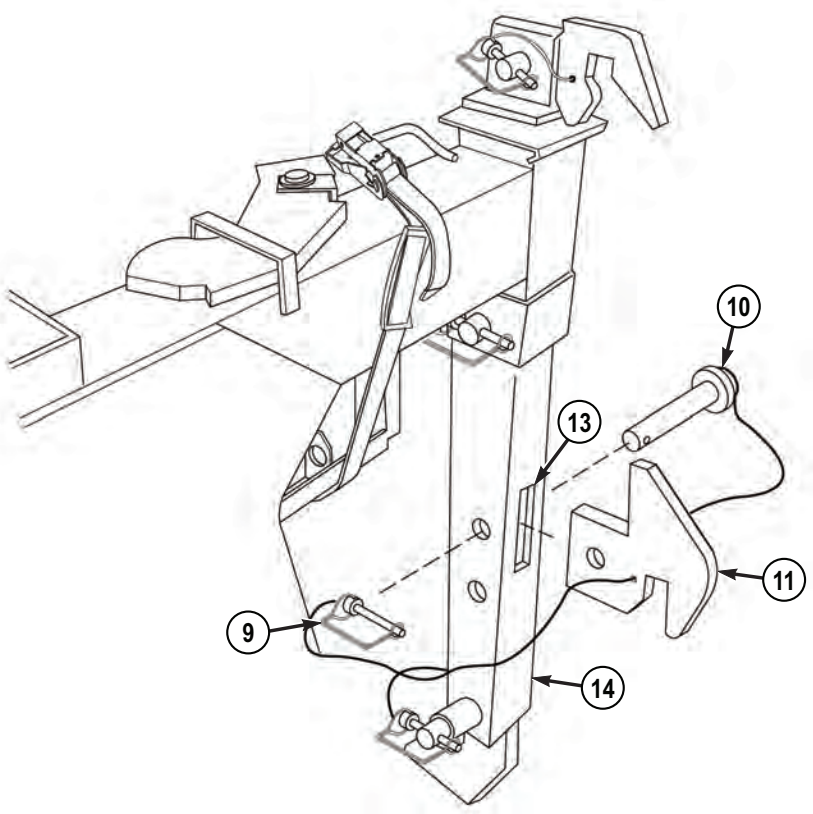


Figure 8.

NOTE

- Refer to the lifting-frame data plate for the proper configuration needed for the height of each container being loaded.
- There are two slide arms. Right side shown.

15. Remove lock pin (15) and pin (16) from lifting frame (1) and slide arm (14) upper hole.

LOADING - Continued

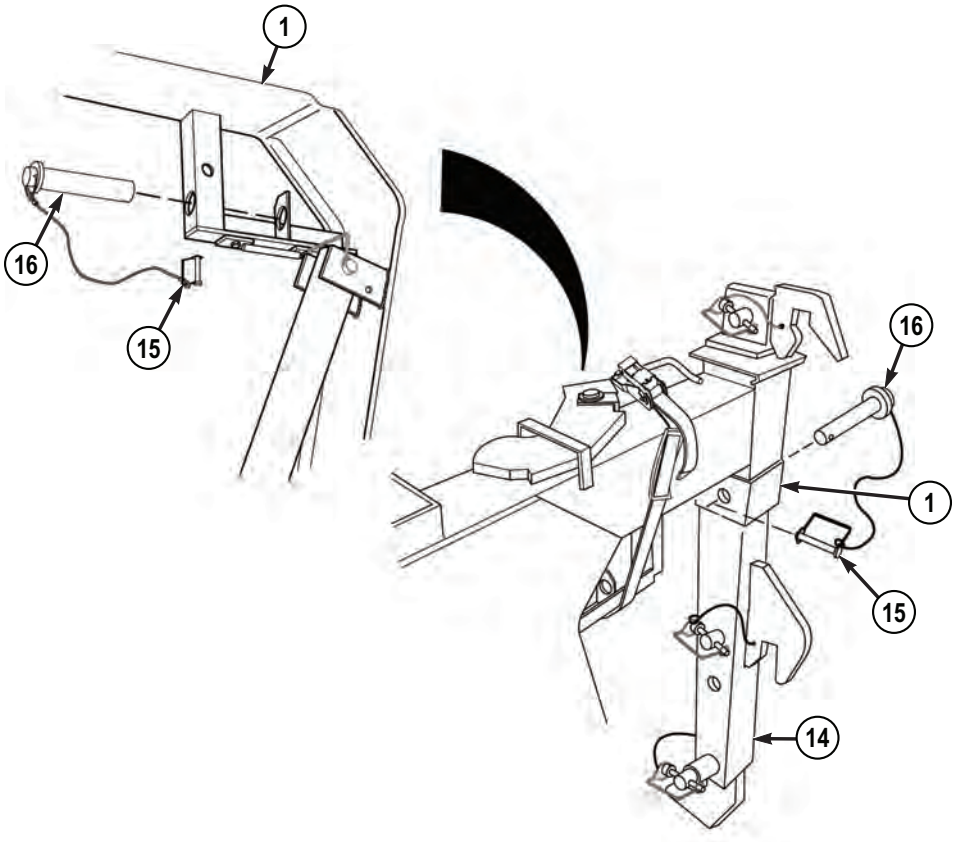


Figure 9.

16. Install pin (16) and lock pin (15) in stow position on lifting frame (1).
17. Repeat Steps (13) through (16) for left side.

NOTE

- There are two lifting-frame lower-container locks and rear sliders. Right side shown.
- Ensure lifting-frame lower-container lock handle is positioned in slot on handle-lock plate.
- Ensure tab on handnut faces up.

18. Raise handle lock plate (17) and rotate lower-container lock handle (18) towards center of lifting frame (1) to unlocked position.

LOADING - Continued

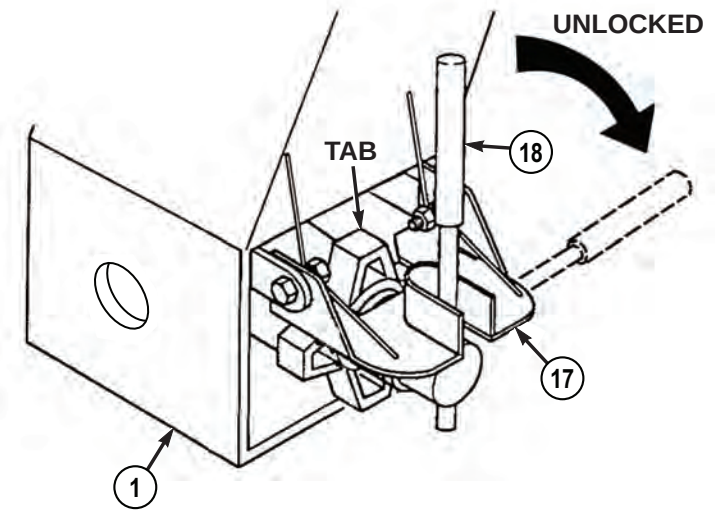


Figure 10.

19. Release handle-lock plate (17) on lifting frame (1).
20. Repeat Steps (18) and (19) for left side.

CAUTION

Ensure sliders are clear of debris and surfaces are properly greased or damage to equipment may result.

NOTE

There are two rear sliders and container locks. Right side shown.

21. Rotate slider (19) so rear of slider faces down.

LOADING - Continued

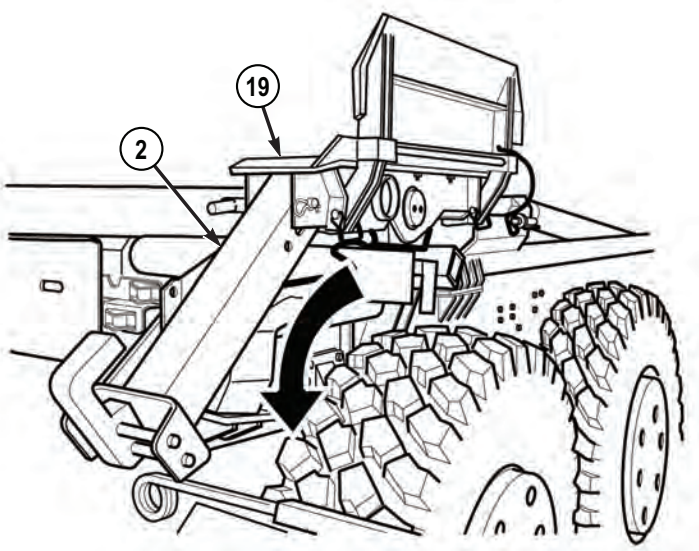


Figure 11.

22. Ensure rear container lock (2) is in ready mode or down position (WP 0043).
23. Repeat Steps (21) and (22) for left side.
24. Start engine (WP 0027).
25. Position half-height container front hooks (11) just above and in front of half-height container upper corner castings (20).

LOADING - Continued

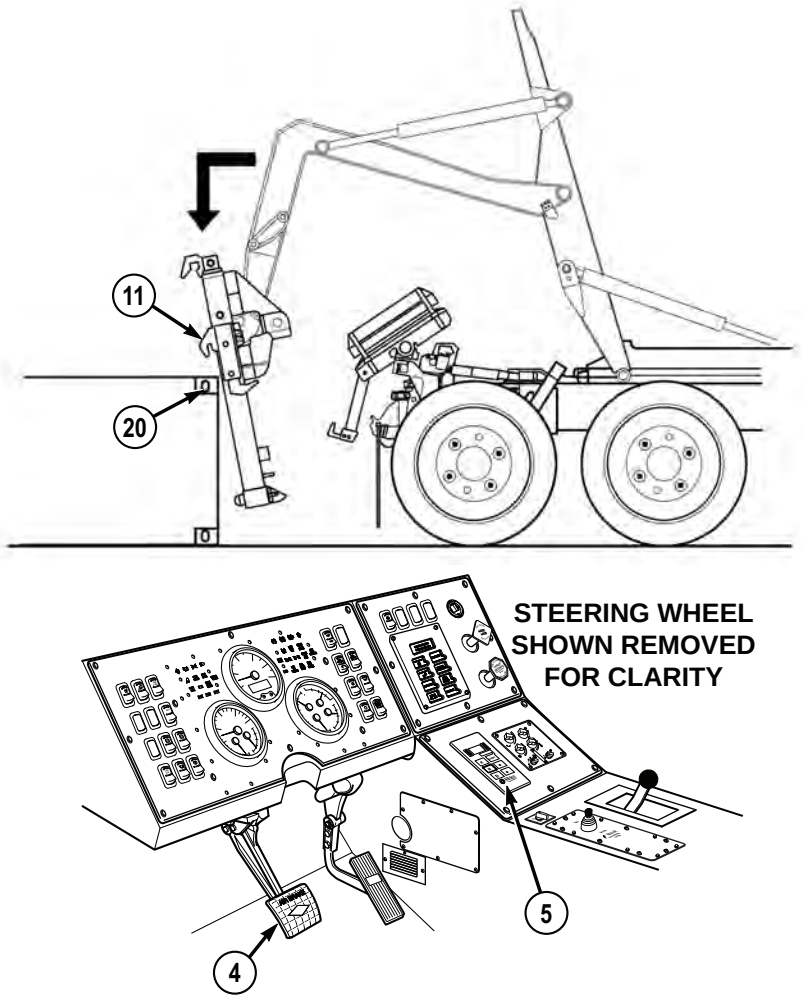


Figure 12.

26. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

LOADING - Continued

WARNING



Do not allow front lift adapter to contact the ground when half-height container front hooks are not engaged with container upper corner castings. Failure to comply may result in damage to equipment and injury or death to personnel.

27. Release service brake pedal (4) and slowly back up to approximately 12.0 in. (304.8 mm) from front of container (6).

LOADING - Continued

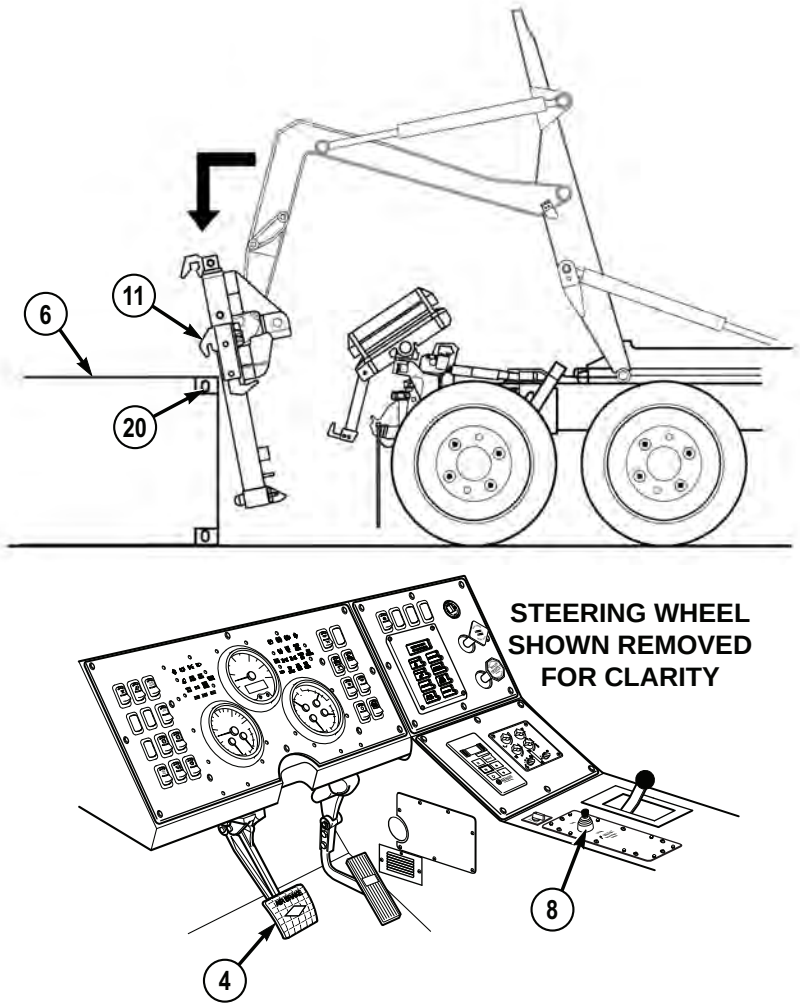


Figure 13.

28. Apply service brake pedal (4), move joystick (8) to LOAD and raise lifting frame until half height container front hooks (11) are above container upper front corner castings (20).

CAUTION

Ensure half-height container front hooks are fully engaged with container upper corner castings. Failure to comply may result in damage to equipment.

LOADING - Continued

NOTE

- To get half-height container front hooks to properly seat, it may be necessary to drive vehicle forward slightly.
- When container is on side slope, it may be difficult to get both upper hooks properly seated. Lifting frame hangs level. To get lifting frame to hang closer to same angle as container, it may be necessary to temporarily remove one rear container lock from slider and stow on downhill side of lifting frame.

29. Release service brake pedal (4) and moving joystick (8) to UNLOAD, lower half-height container front hooks (11) into container upper-front corner castings (20).

LOADING - Continued

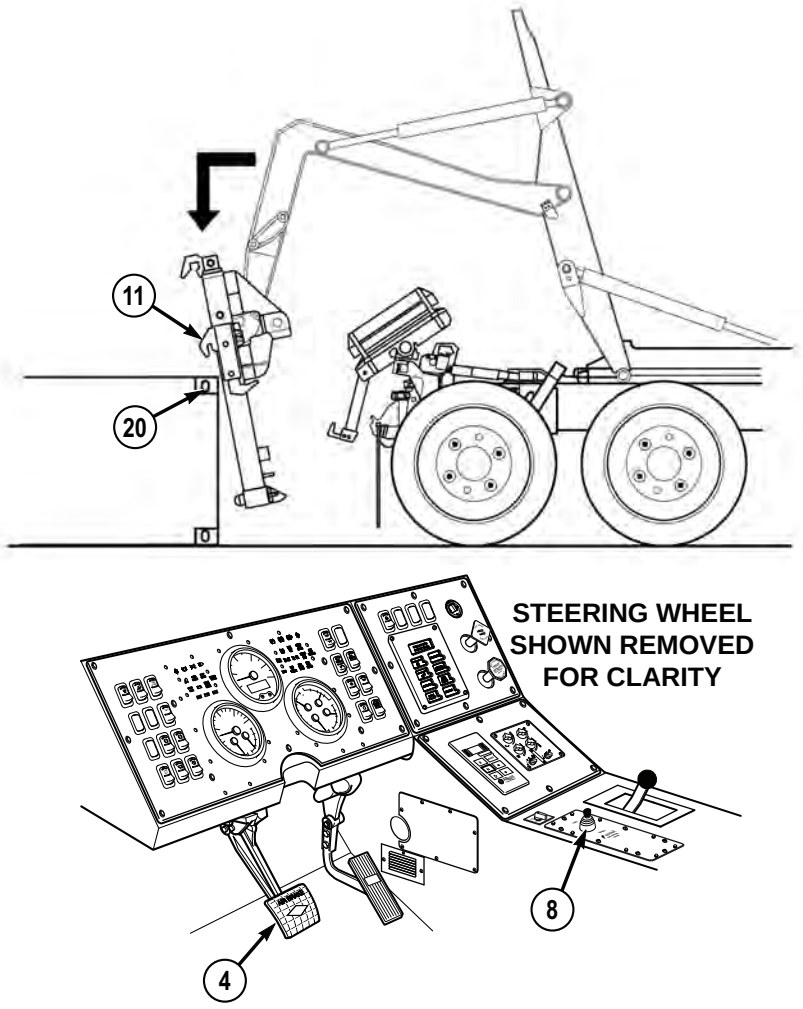


Figure 14.

30. Release service brake pedal (4) and move vehicle backward approximately 12.0 in. (304.8 mm).

31. Apply service brake pedal (4) and set transmission range selector (5) to Drive (D).

LOADING - Continued

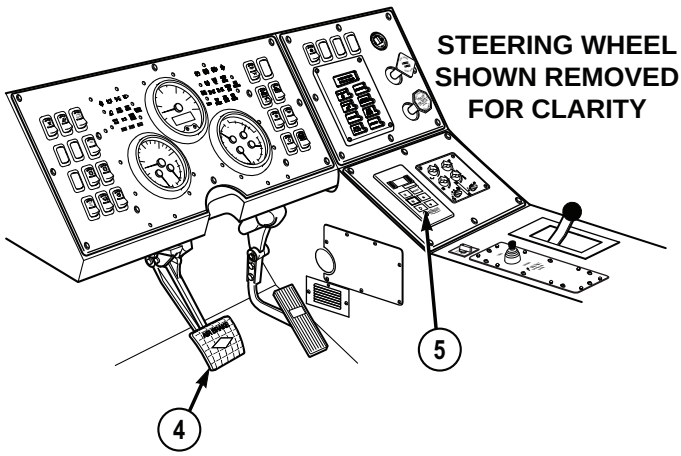


Figure 15.

32. Move joystick (8) to UNLOAD until lower container locks (21) are aligned with container lower-front corner castings (22).

LOADING - Continued

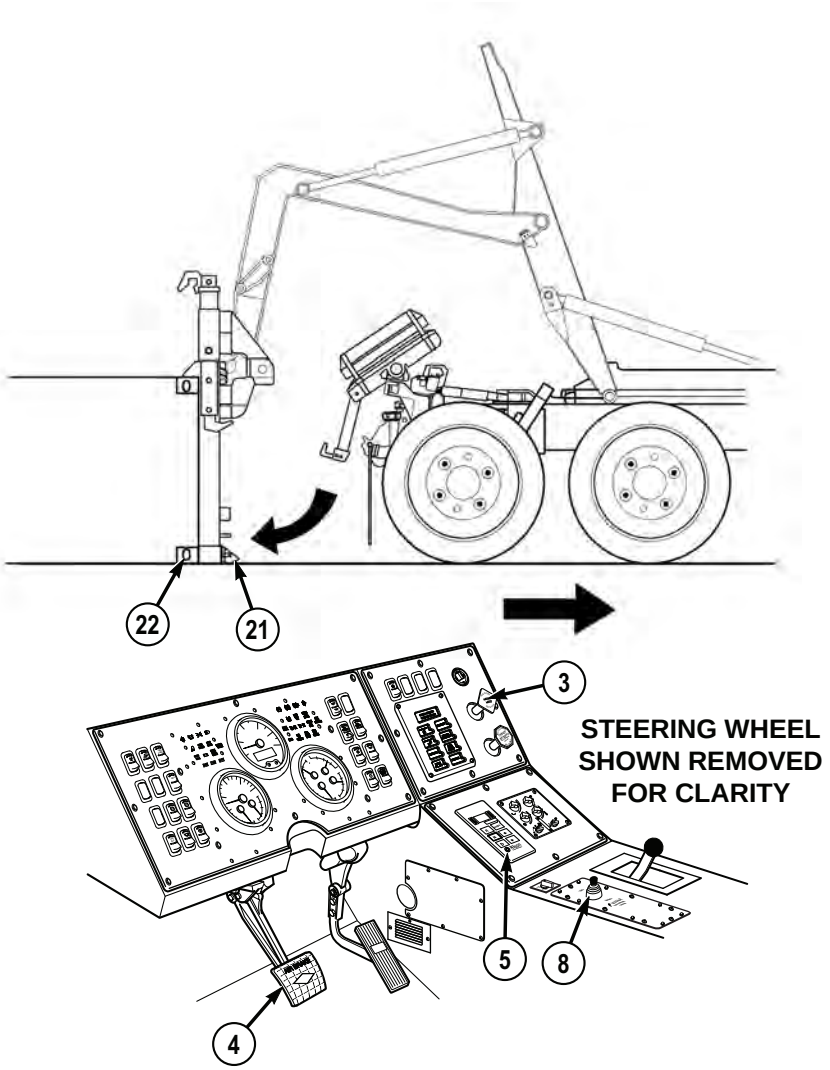


Figure 16.

33. Drive forward until lower container locks (21) are seated in container lower-front corner castings (22). Apply service brake pedal (4) and release joystick (8).

34. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

LOADING - Continued

CAUTION

Ensure lower container locks are fully engaged with container lower-front corner castings. Failure to comply may result in damage to equipment.

NOTE

- To get container lock handle to rotate, it may be necessary to loosen handnut.
- There are two lower-container locks. Right side shown.
- After tightening handnut, it may be necessary to loosen handnut slightly to align tab with handle-lock plate.
- Ensure lower container lock handle is secured in slot on handle lock plate.

35. Hold handle-lock plate (17) and rotate lower container lock handle (18) up in the locked position.

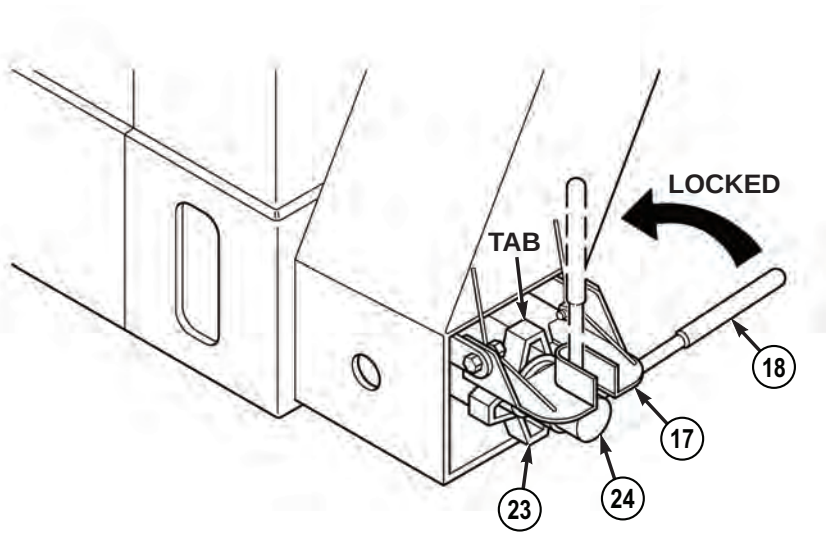


Figure 17.

36. Turn handnut (23) clockwise and tighten stem (24).

NOTE

Ensure tab on handnut faces up.

LOADING - Continued

37. Lower handle-lock plate (17) over lower-container lock handle (18) and handnut (23) tab.
38. Repeat Steps (35) through (37) for left side.
39. Set the transmission range selector (5) in Neutral (N), push in parking brake knob (3) to release parking brakes and release service brake pedal (4).

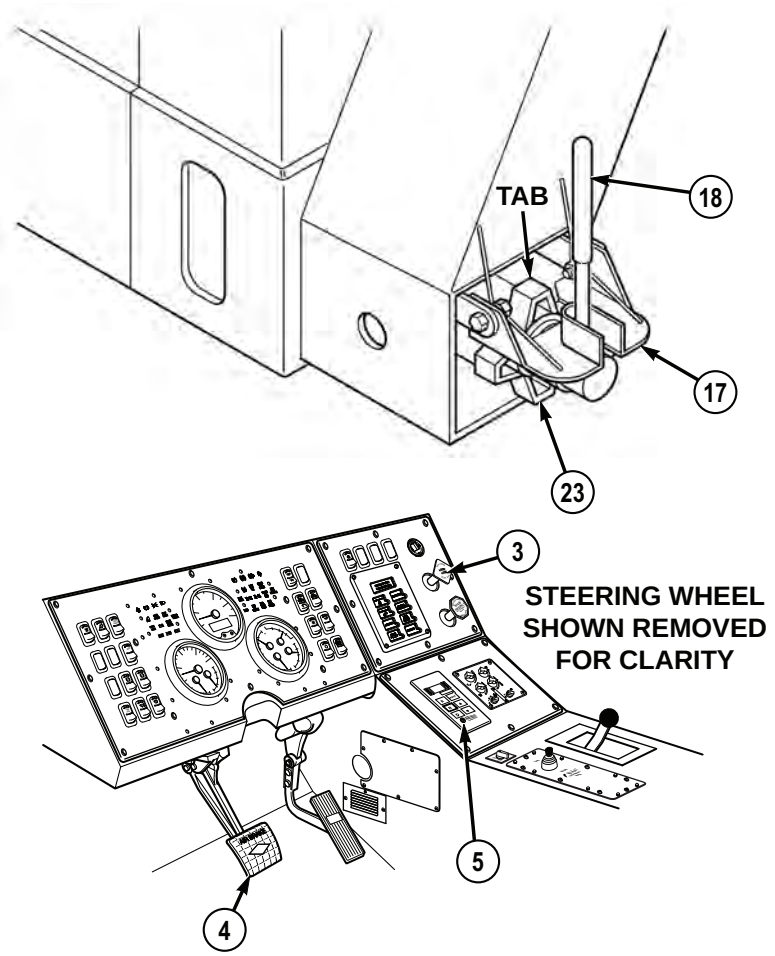


Figure 18.

LOADING - Continued

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

CAUTION

- If LHS overload lamp illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation operator should notify supervisor if it appears payload is unevenly distributed in container or if container load exceeds 35,000 lbs. (15,890 kg). If any of these conditions exists, payload must be redistributed or reduced or damage to equipment may result.
- Load must be evenly distributed in the container. Uneven load distribution may cause the LHS overload indicator to give false signals and cause the LHS to operate incorrectly. Damage to Equipment may result.
- If LHS overload lamp illuminates and normal operation has stopped, return load to original position and notify supervisor to have payload redistributed or weight reduced. Failure to comply may result in damage to equipment.
- Ensure parking brake is not applied before starting load sequence or damage to equipment may occur.

NOTE

- The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading and unloading times.
- If container is extremely light or empty, it may be necessary to place transmission range selector to Reverse (R) and allow vehicle to roll under container.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (40) through (48) to reposition container.

40. Move joystick (8) to LOAD, allowing vehicle to be pulled under container (6).

LOADING - Continued

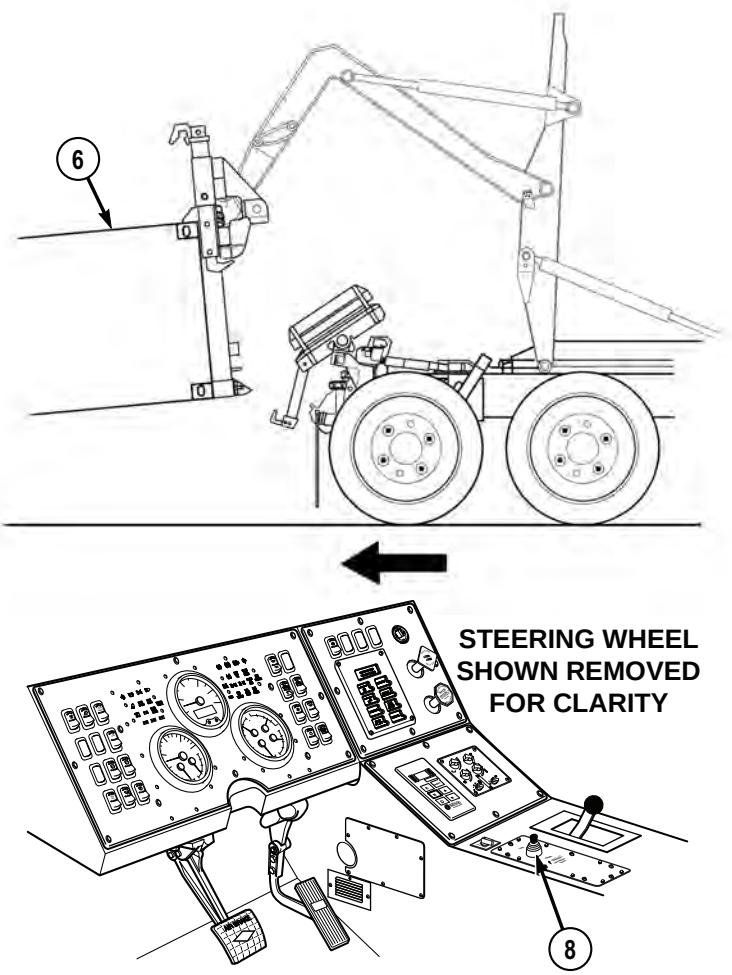


Figure 19.

LOADING - Continued

WARNING



Ensure that container has contacted rear sliders correctly and is between guides. Failure to comply may result in injury or death to personnel and damage to equipment.

CAUTION

Reduce engine speed to idle before container contacts rear sliders or damage to equipment may result.

NOTE

- LHS overload lamp may illuminate when lifting container from unusual conditions.
- As load is lifted, vehicle will be pulled under container. Some steering wheel adjustments may have to be made to ensure that container contacts rear sliders correctly and is between guides.

41. As container (6) contacts rear sliders (19), reduce engine speed to idle and apply service brake pedal (4).

LOADING - Continued

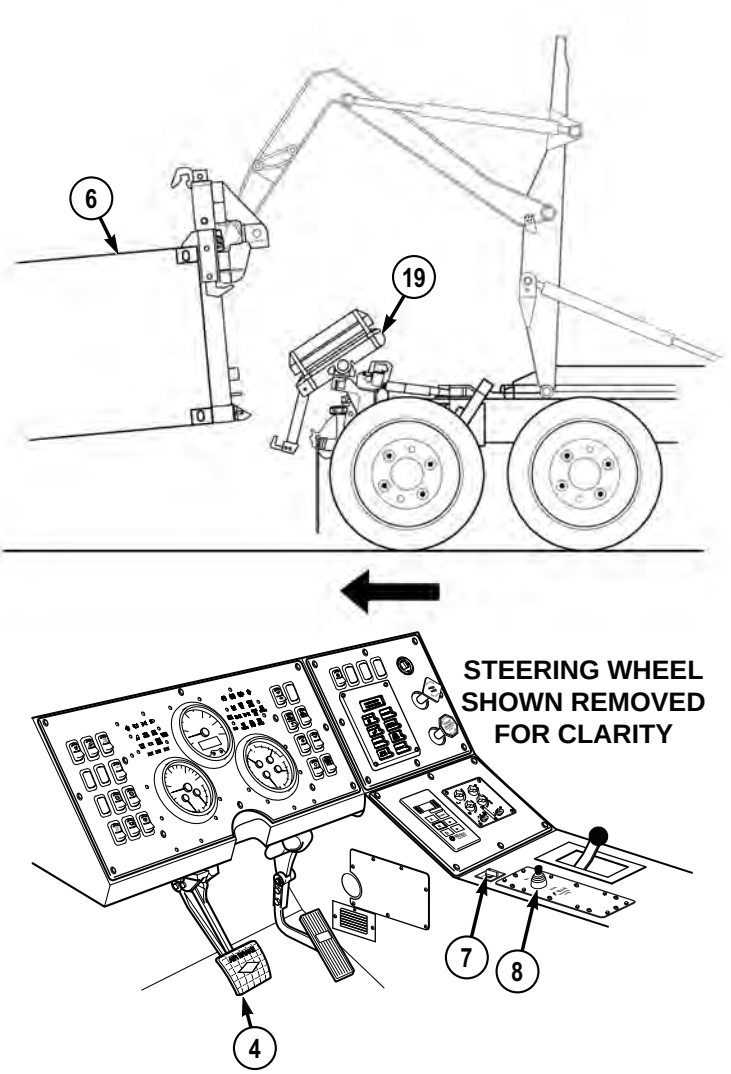


Figure 20.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

LOADING - Continued

NOTE

If container is being loaded in soft soil conditions, perform Steps (42) through (44).

42. Release joystick (8). Set hydraulic selector switch (7) to MAN H.A.

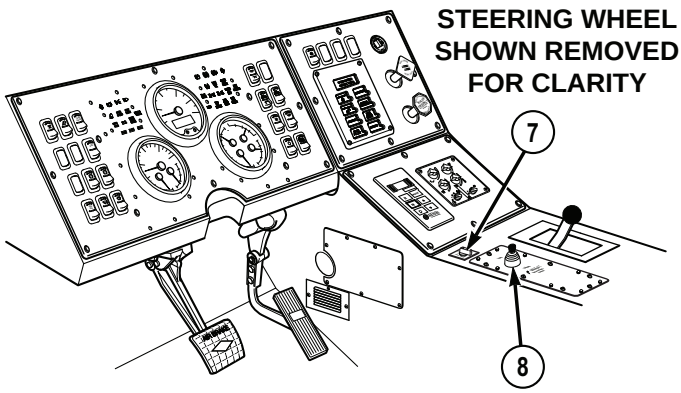


Figure 21.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

43. Move joystick (8) to LOAD until container (6) is approximately 2.0 ft (609.6 mm) off the ground. Release joystick.

LOADING - Continued

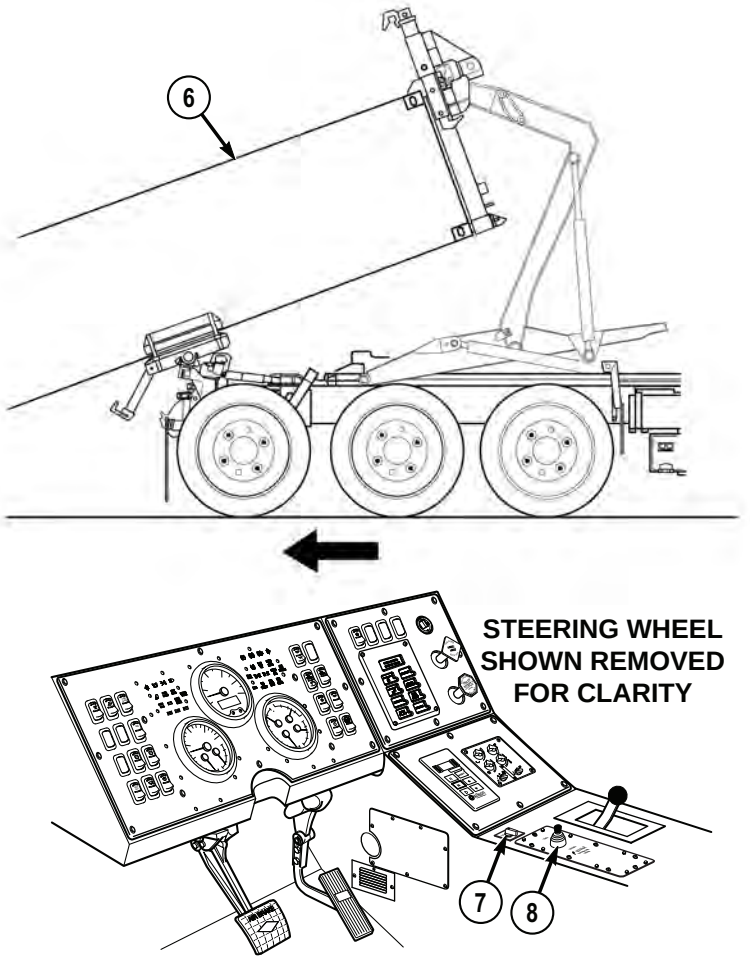


Figure 22.

44. Set hydraulic selector switch (7) to AUTO. Resume normal AUTO operations.

NOTE

Engine speed may be increased and decreased to ease loading.

45. After container (6) contacts rear sliders (19), increase engine speed to approximately 1,500 rpm until container is almost loaded. Reduce engine speed to idle.

LOADING - Continued

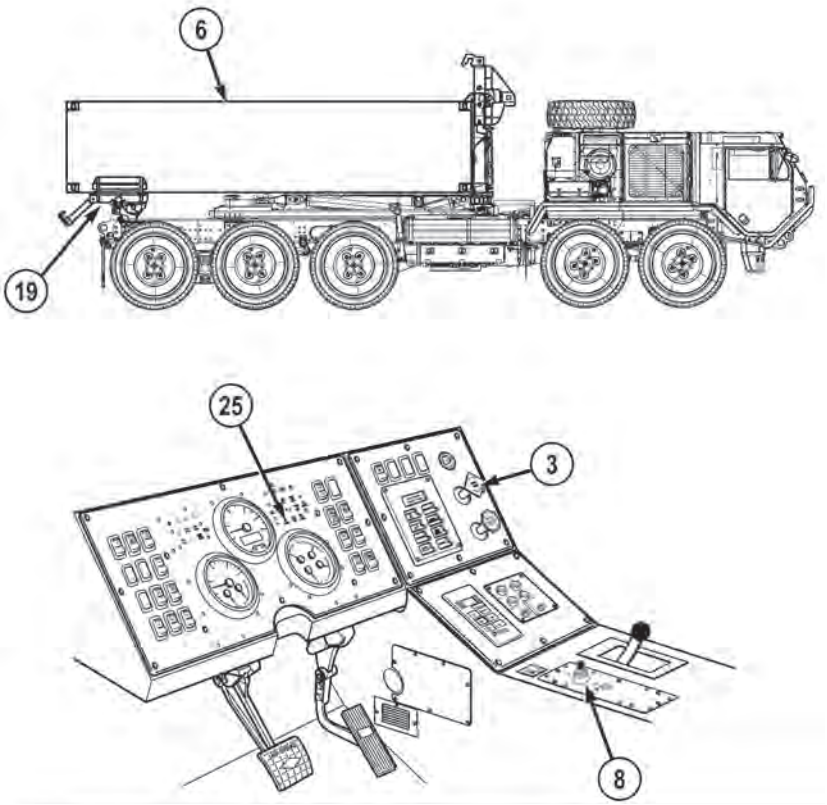


Figure 23.

CAUTION

After loading operations using CHU kit and container and the LHS NO TRANSIT indicator goes off, operator must release the joystick from the LOAD position. Failure to release the joystick may cause LHS OVERLOAD indicator to illuminate and hydraulic cylinders to remain active, forcing a temporary bow in the LHS frame, resulting in contact between LHS and container.

46. Continue loading until container (6) is fully loaded and LHS NO TRANS lamp (25) goes out.
47. Release joystick (8).
48. Pull out parking brake knob (3) and apply parking brake.

LOADING - Continued

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

49. Turn hydraulic selector switch (7) to OFF.

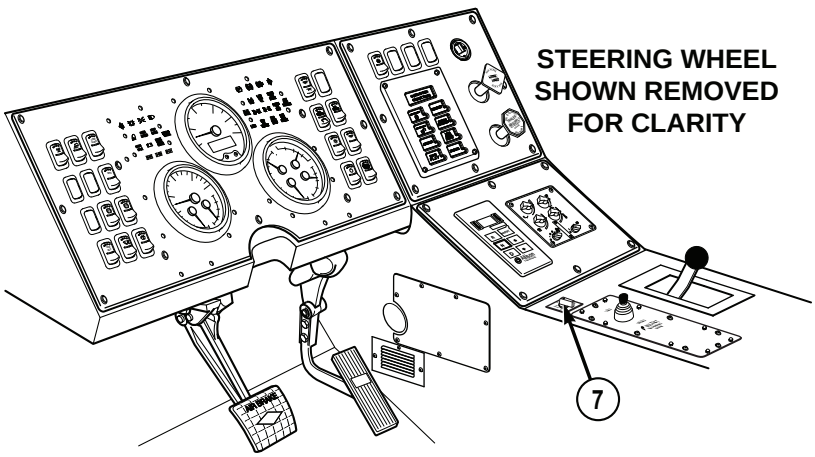


Figure 24.

50. Shut off engine (WP 0037).

NOTE

- There are two rear container locks. Right side shown.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (40) through (50) to reposition container.

51. Support rear container lock (2) and remove lock pin (26) and pin (27).

LOADING - Continued

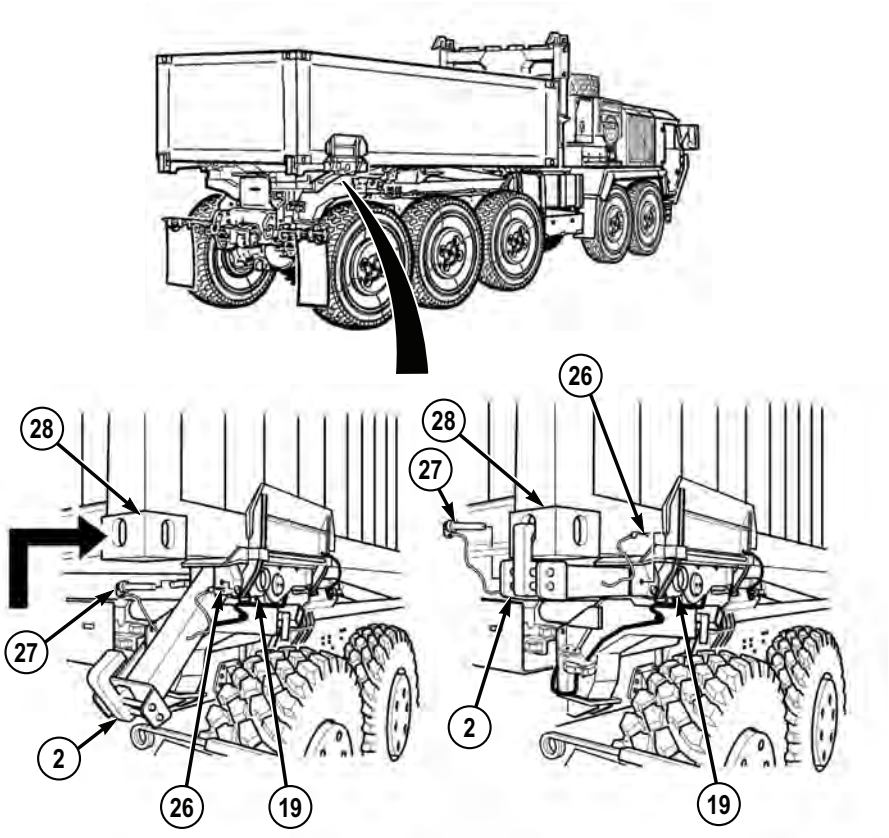


Figure 25.

52. Rotate rear container lock (2) up and position in container lower-rear corner casting (28).
53. Install pin (27) and lock pin (26) in rear container lock (2) and slider (19).
54. Perform Steps (51) through (53) for left side.

END OF TASK

UNLOADING

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Injury or death could result if LHS contacts power lines.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Failure to comply may result in damage to equipment and injury or death to personnel.
- Prior to and during any load or unload cycle, all personnel should stay clear of LHS, front lift adapter, and container. Failure to comply may result in damage to equipment and injury or death to personnel.

CAUTION

- Check that ground conditions, where container will be placed, can support the container weight or damage to the container, lifting frame, or LHS may result.
- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and or door hinges may make hard contact with guides.

NOTE

For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators , Picking-up a Flatrack in Auto Mode and Off-loading a Flatrack in Auto Mode .

1. Check area for operating room at front and rear of vehicle. Check overhead clearance and ground conditions.

UNLOADING - Continued

NOTE

There are two rear container locks. Right side shown.

2. Remove lock pin (26), pin (27), and rear container lock (2) from lower rear corner casting (28).

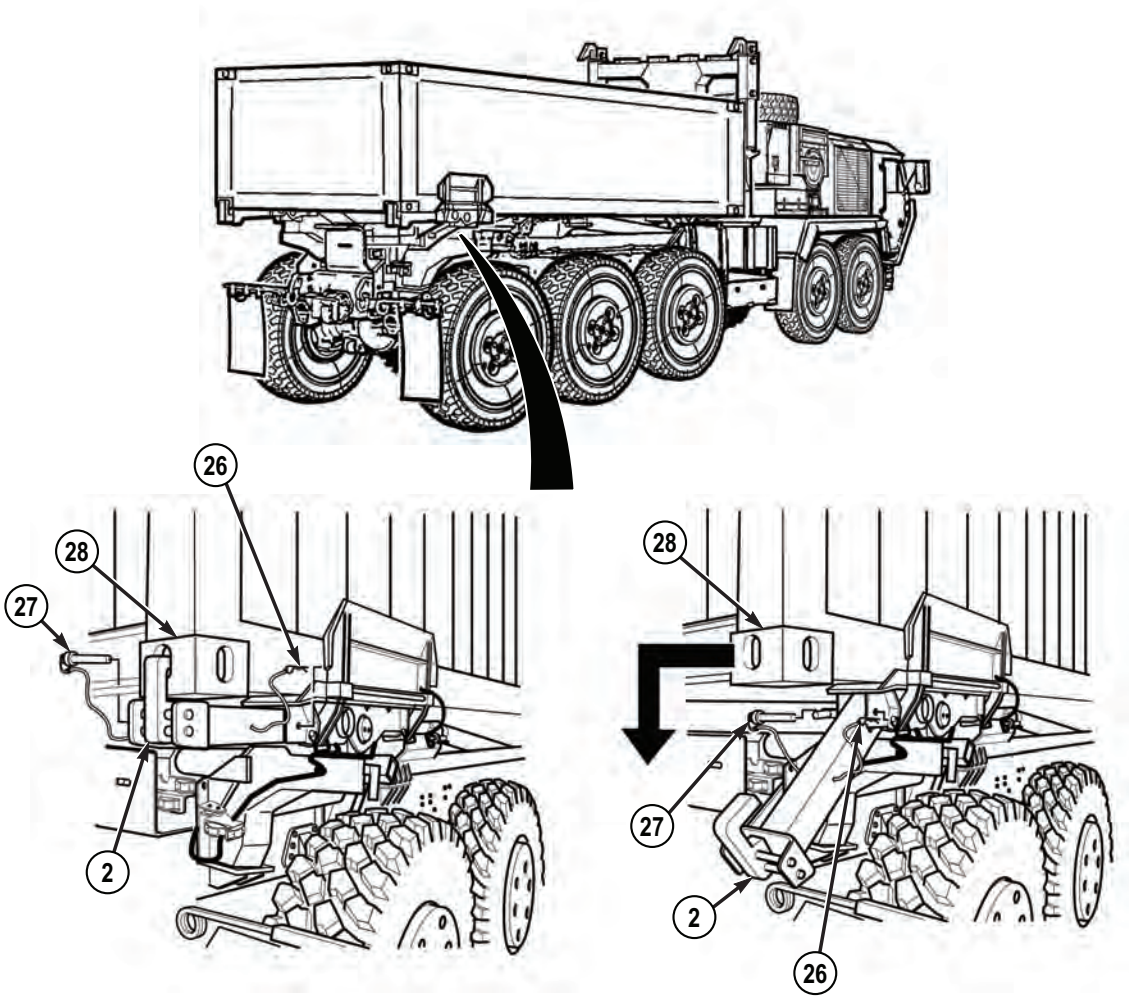


Figure 26.

3. Rotate rear container lock (2) in down position and install pin (27) and lock pin (26).
4. Perform Steps (2) and (3) for left side.

UNLOADING - Continued

5. Start engine (WP 0027).
6. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

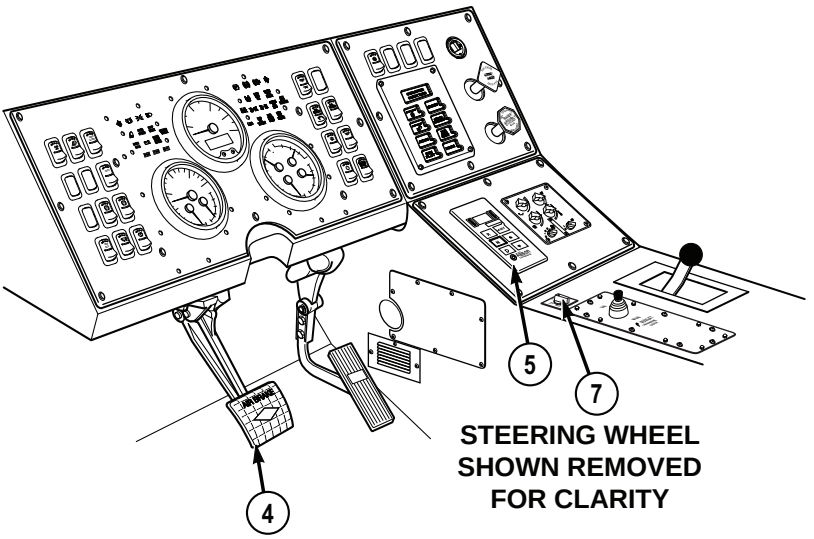


Figure 27.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Turn hydraulic selector switch (7) to AUTO.

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

NOTE

LHS will not operate and unload if rear container locks are engaged.

UNLOADING - Continued

8. Move joystick (8) to UNLOAD. Container (6) will start to move rearward. LHS NO TRANS lamp (25) will illuminate. Maintain engine speed at idle until front of container raises approximately 12.0 in. (304.8 mm).

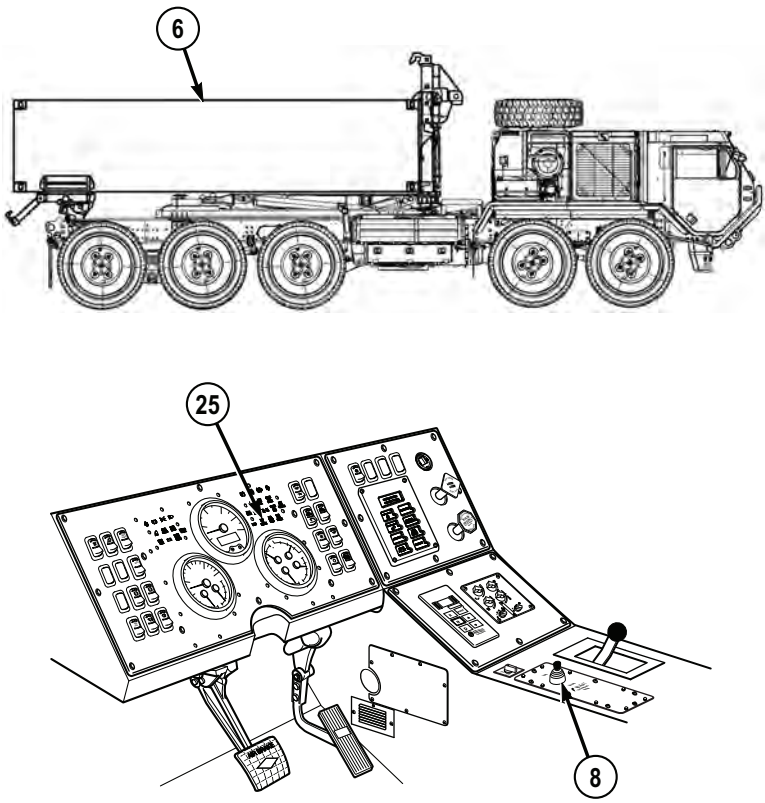


Figure 28.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading and unloading times.

9. Continue to unload container (6) until back edge of container touches ground.

UNLOADING - Continued

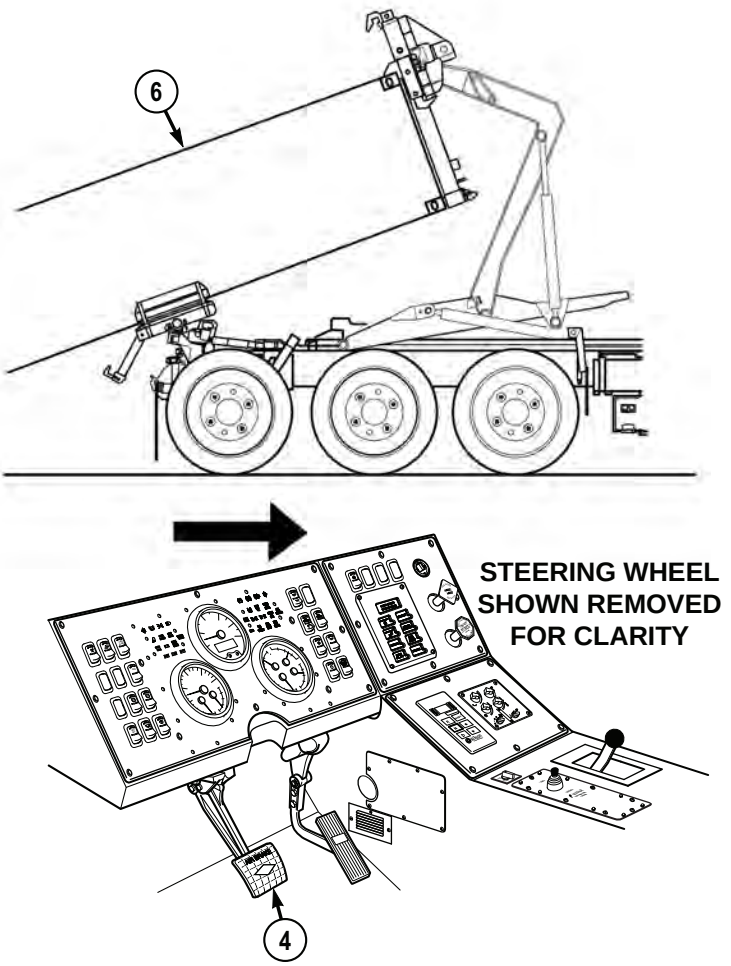


Figure 29.

10. Release service brake pedal (4) and allow container (6) to push vehicle forward from under container.
11. When front of container (6) is approximately 8.0 in. (203.2 mm) off of ground, decrease engine speed to idle and apply service brake pedal (4).

UNLOADING - Continued

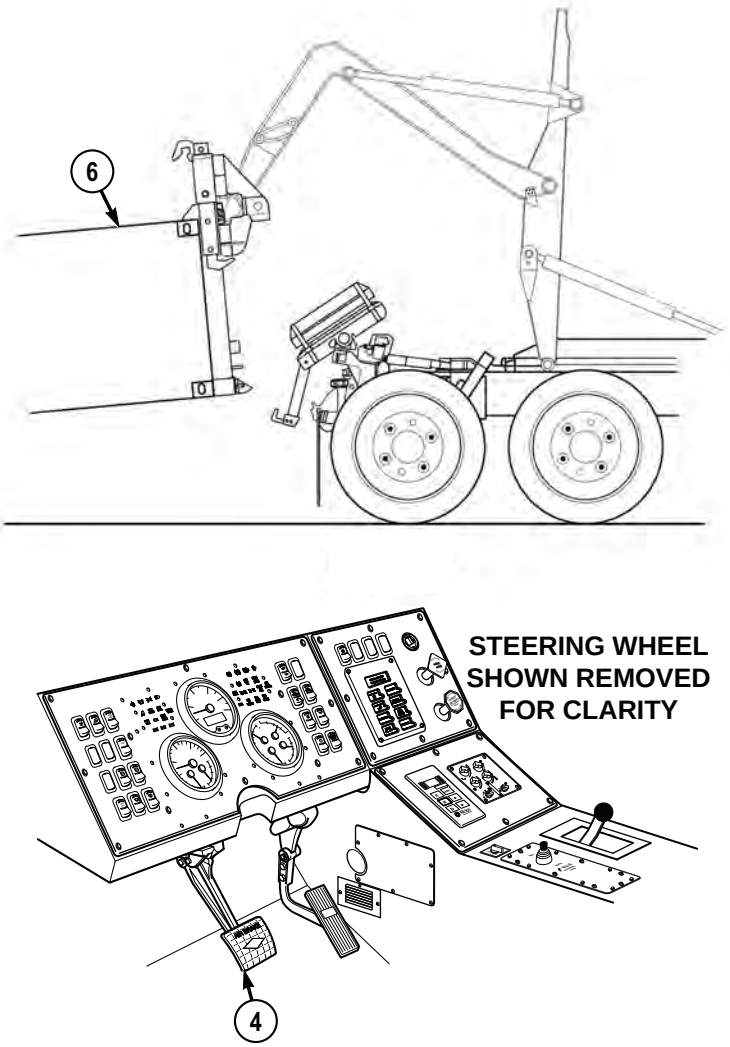


Figure 30.

CAUTION

Once vehicle's rear suspension has been relieved of container load, do not continue in UNLOAD position as possibility of jacking up the rear of vehicle with hook arm may occur and damage to equipment may result.

UNLOADING - Continued

NOTE

If container is extremely light or empty, it may be necessary to place transmission range selector to Drive (D) and allow vehicle to move out from under container.

12. Continue unloading until bottom of container (6) is on ground and rear suspension is unloaded.

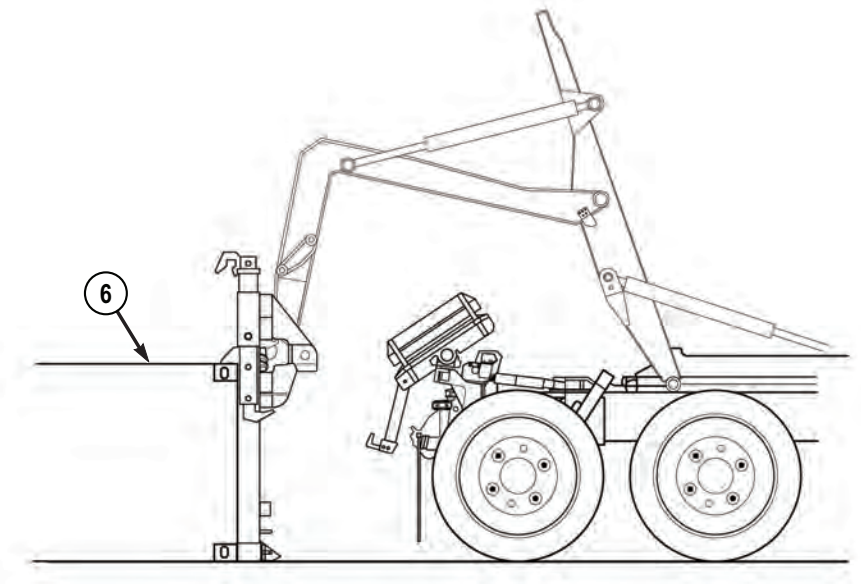


Figure 31.

13. Release joystick (8) when container (6) is resting on ground.

UNLOADING - Continued

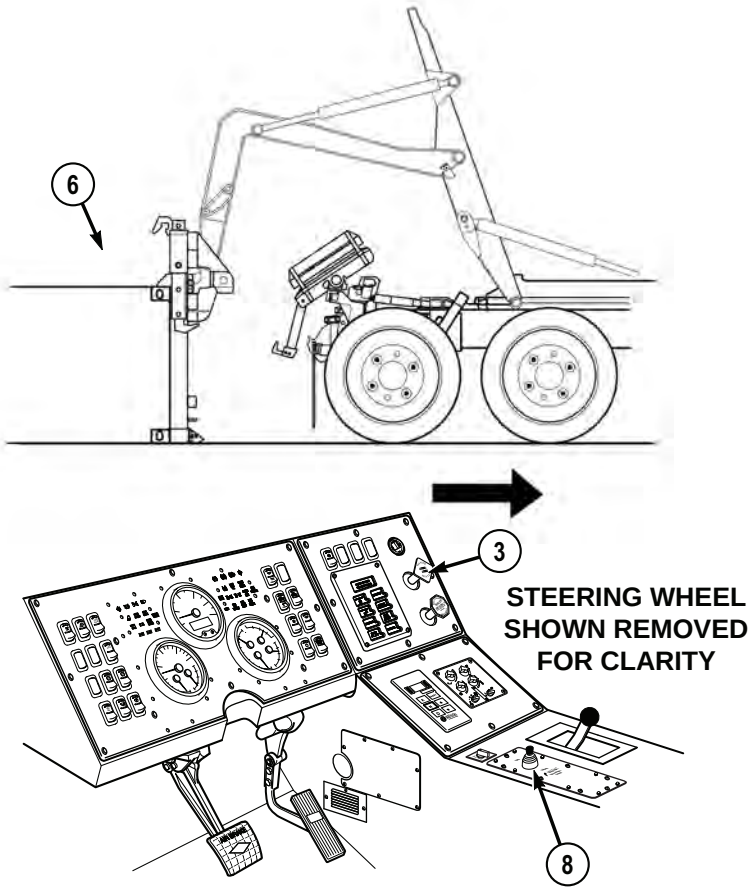


Figure 32.

14. Pull out parking brake knob (3) to apply parking brakes.

WARNING



Ensure that all tension has been relieved between LHS hook and front lift-adapter prior to unlocking front lift-adapter lower-container locks. Stay clear of front lift-adapter when unlocking front lift-adapter lower-container

UNLOADING - Continued

locks as front lift adapter may separate from container unexpectedly. Failure to comply may result in injury or death to personnel.

NOTE

There are two lifting-frame lower-container locks. Right side shown.

15. Raise handle-lock plate (17) and turn handnut (23) counterclockwise and loosen stem (24).

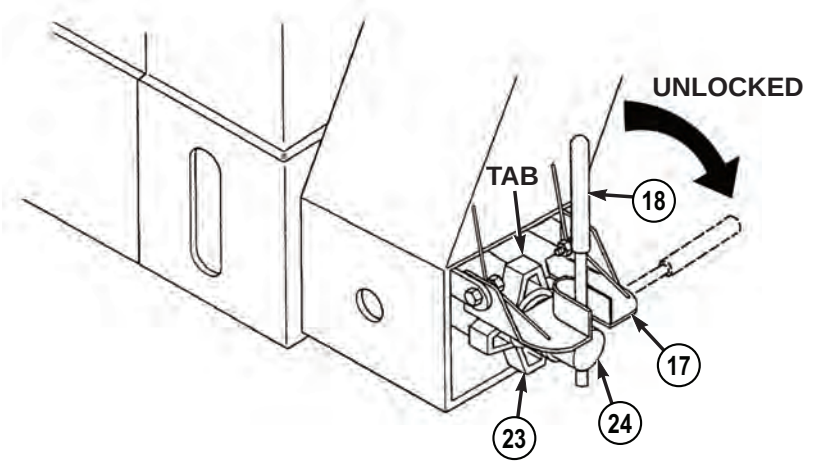


Figure 33.

NOTE

Ensure tab on handnut faces up.

16. Rotate lower-container lock handle (18) towards center of vehicle to unlocked position.

CAUTION

Handnut must be tightened clockwise to tighten stem. Failure to tighten stem may cause damage to equipment during next container loading procedure.

17. Turn handnut (23) clockwise and tighten stem (24).
18. Release handle-lock plate (17) over container-lock handle (18) and handnut (23) tab.
19. Repeat Steps (15) through (18) for left side.

UNLOADING - Continued

20. Push in parking brake knob (3) and release parking brakes. Set transmission range selector (5) to Reverse (R).

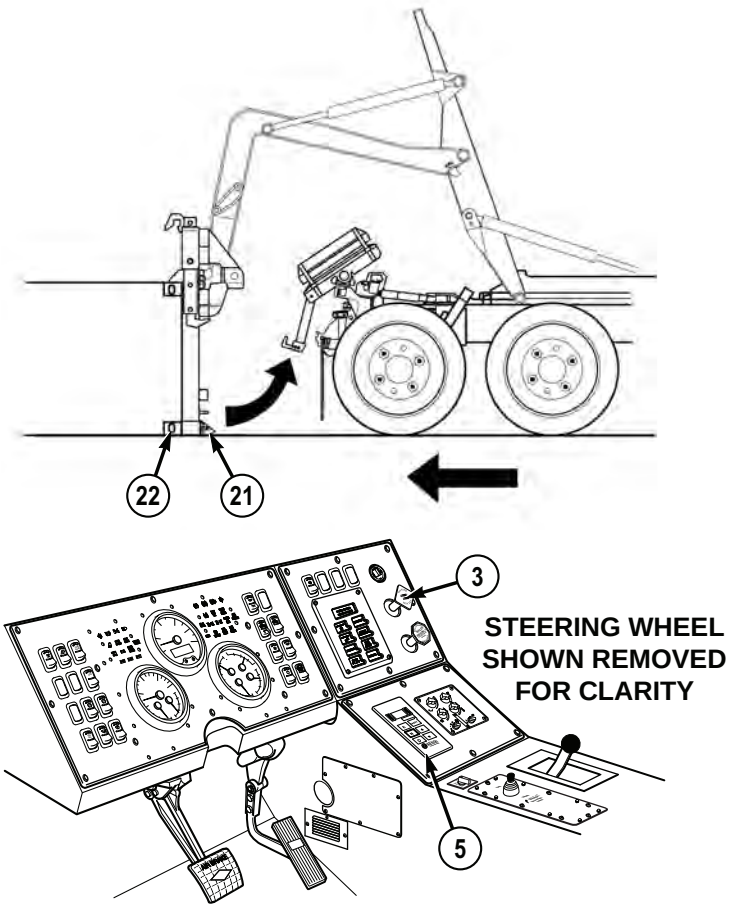


Figure 34.

21. Move vehicle backward until lower-container locks (21) disengage from lower front corner castings (22) approximately 4.0 to 6.0 in. (101.6 to 152.4 mm).

CAUTION

Ensure that the half-height container front hooks are completely disengaged and do not hang up in container upper corner castings when retracting LHS. Failure to comply may result in damage to the half-height container front hooks and/or container.

UNLOADING - Continued

NOTE

It may be necessary to move the vehicle forward or backward slightly to get the half-height container front hooks to disengage.

22. Move joystick (8) to LOAD position until lifting frame (1) is disengaged from container (6).

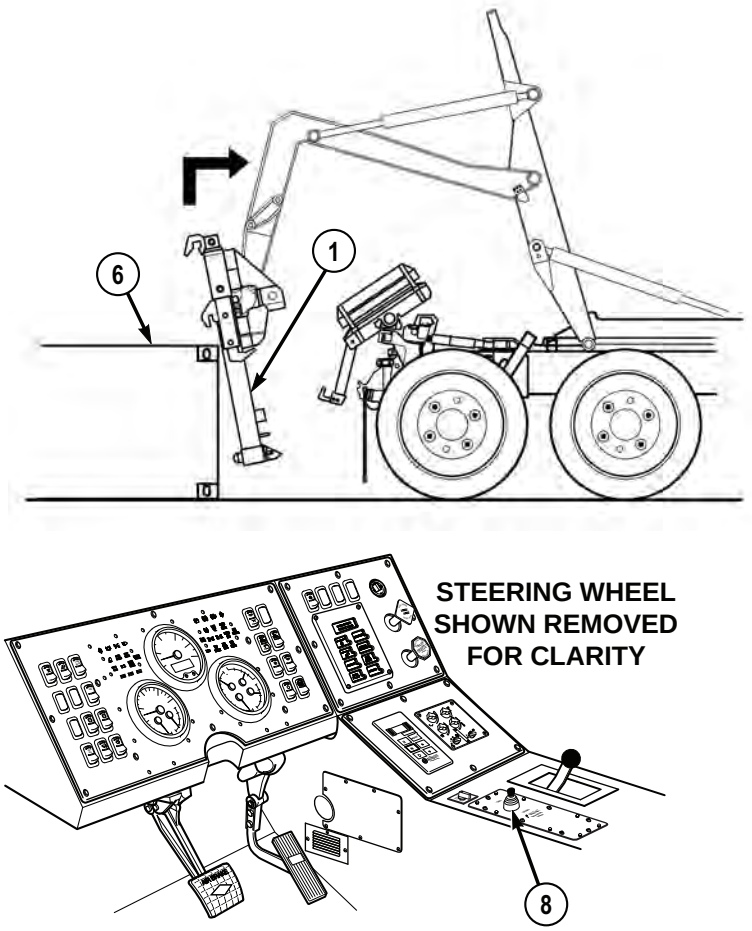


Figure 35.

23. Release joystick (8).

24. Move vehicle forward until rear of vehicle is approximately 9.0 ft (2743.2 mm) in front of container.

UNLOADING - Continued

25. Move joystick (8) to unload position until lifting frame is positioned approximately 12.0 in. (304.8 mm) off the ground.

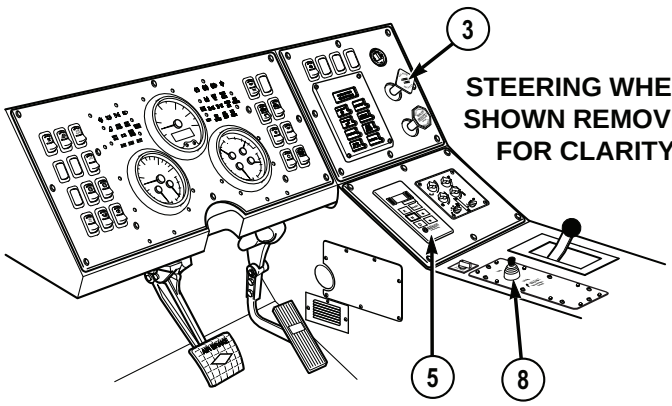


Figure 36.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

26. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

CAUTION

- On steep downgrades, contact is possible between the lifting-frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN M.A. and retract (LOAD) hook arm a few inches. Switch hydraulic selector to MAN M.F. and retract the mainframe until the lifting frame clears the rear sliders. Return hydraulic selector to AUTO and continue (LOAD) operation. Failure to comply may result in damage to equipment.
- Never drive with LHS NO TRANS light illuminated. An illuminated lamp means that the LHS is not fully stowed. Failure to comply may result in damage to equipment.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading and unloading times.

UNLOADING - Continued

27. Move joystick (8) to LOAD position until LHS is fully retracted and lifting frame (1) is positioned on bumper supports (29). LHS NO TRANS lamp (25) will go out indicating LHS is in transport position.

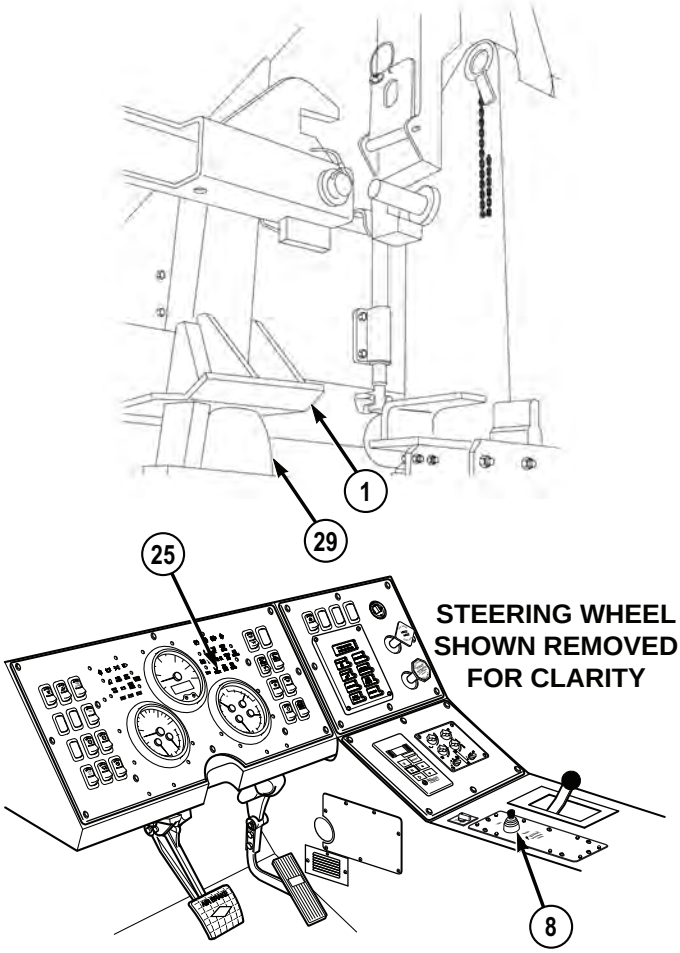


Figure 37.

28. Release joystick (8).

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

UNLOADING - Continued

- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

29. Turn hydraulic selector switch (7) to OFF.



Figure 38.

NOTE

- Perform Steps (30) through (34) if remainder of CHU operations for 51.0 in. (1295.4 mm) containers has been completed.
- There are two slide arms and half-height container front hooks. Right side shown.

30. Remove lock pin (15) and pin (16) from stow position on lifting frame (1).

UNLOADING - Continued

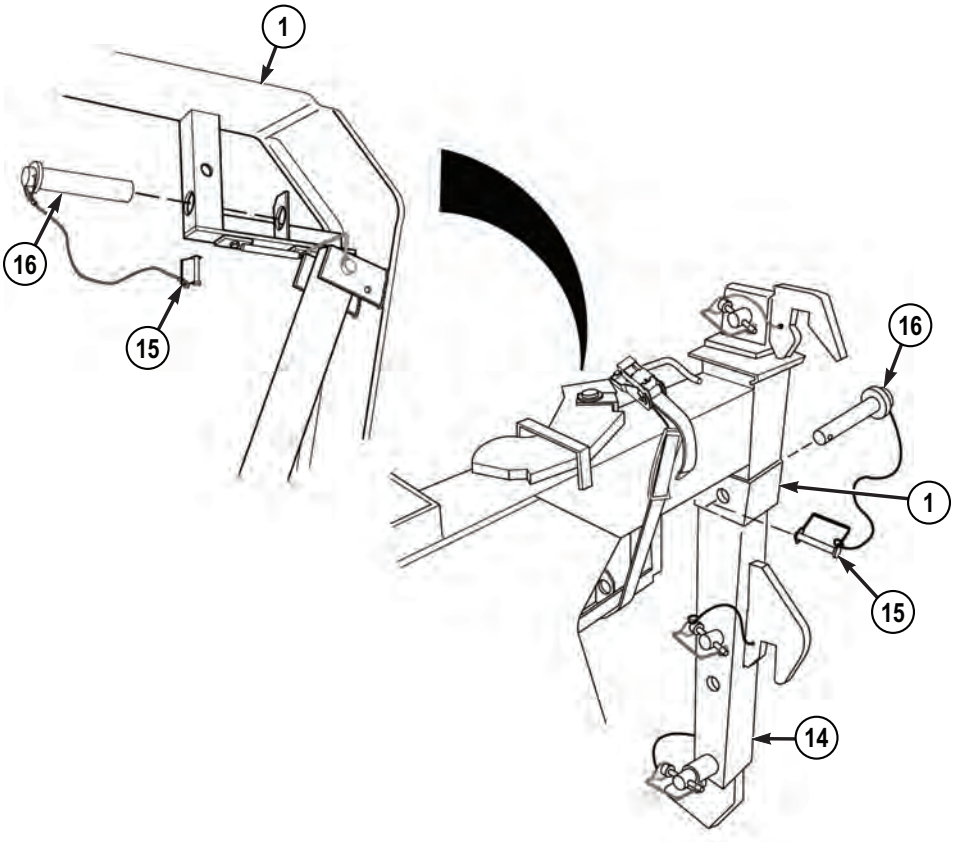


Figure 39.

31. Install pin (16) and lock pin (15) in lifting frame (1) and slide arm (14) upper hole.
32. Remove lock pin (9), pin (10), and half-height container front hook (11) from slot (13) in slide arm (14).

UNLOADING - Continued

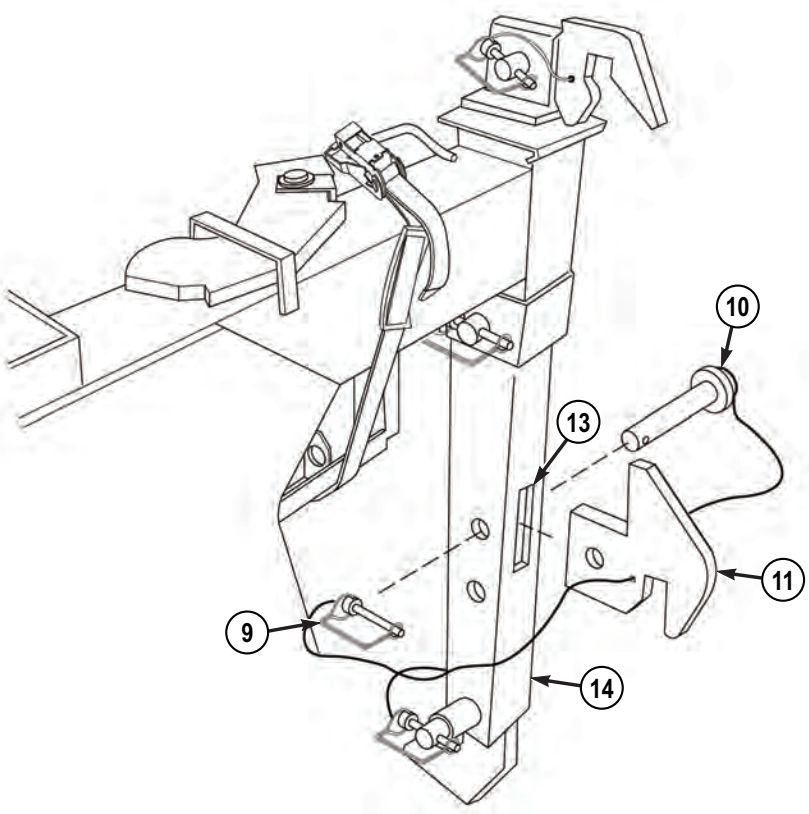


Figure 40.

33. Position half-height container front hook (11) in stowage bracket (12) on lifting frame (1) and install pin (10) and lock pin (9).

UNLOADING - Continued

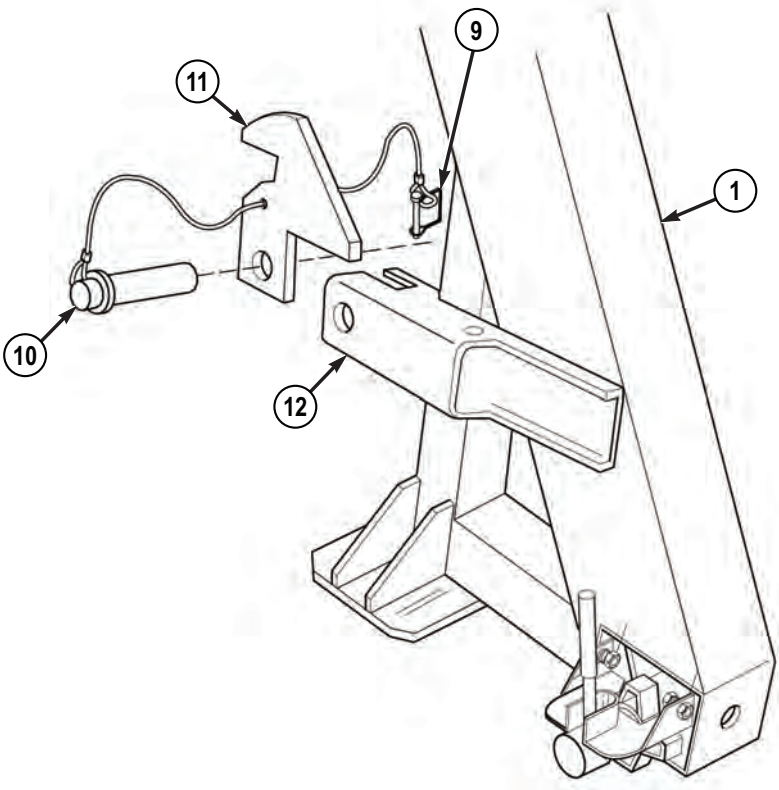


Figure 41.

34. Repeat Steps (30) through (33) for left side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOADING AND UNLOADING CONTAINER (48.0 IN. [1219.2 MM] TALL) TO PLS VEHICLE USING LIFTING FRAME (LF)

INITIAL SETUP:

Not Applicable

LOADING

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure lifting frame is in the unlocked position before attempting to load a container on vehicle. Failure to comply will result in damage to equipment.

1. Ensure lifting frame (1) is in container mode (WP 0043) and unlocked (WP 0048).

LOADING - Continued

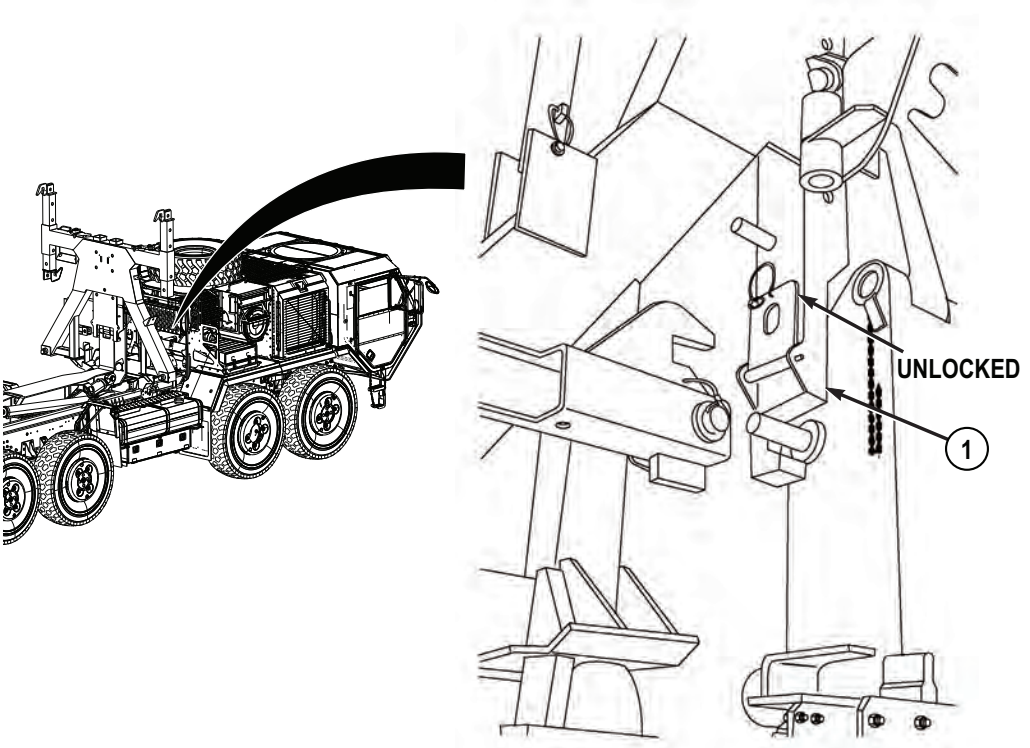


Figure 1.

CAUTION

Ensure vehicle is in container mode before attempting to load a container to vehicle. Failure to comply will result in damage to equipment.

2. Ensure vehicle is in container mode (WP 0043).
3. Ensure rear container lock (2) is in ready mode (WP 0043).

LOADING - Continued

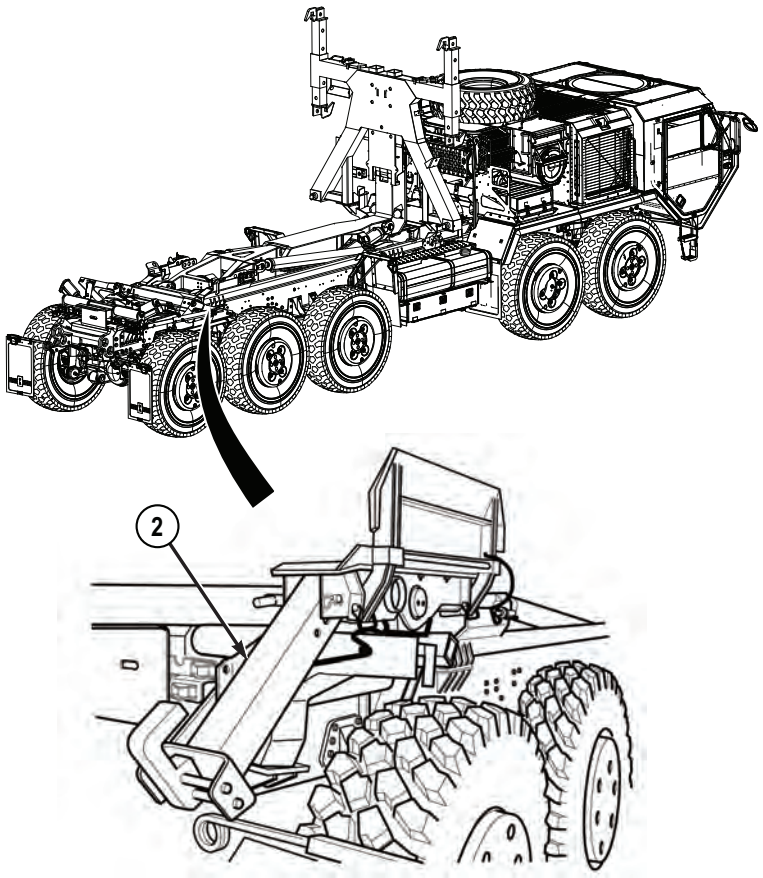


Figure 2.

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).

LOADING - Continued

- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

CAUTION

- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and/or door hinges may make hard contact with guides.
- When operating CHU with non-standard, end-opening, 20.0 ft (6096 mm) long shipping containers, operator needs to take extra care to ensure that sliders and guides contact container properly, container slides on sliders properly, and container loads are centered on vehicle. Failure to comply can result in container getting hung up or making hard contact with sliders and guides, causing damage to CHU or container.

NOTE

- For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators, Picking up a Flatrack in Auto Mode and Off-loading a Flatrack in Auto Mode.
- Rear mud flaps may be pinned up to provide better visibility of lifting frame lower container locks.
- Multiple connected containers cannot be used with CHU. This includes Six CONS and Quad CONS.
- It is recommended that two personnel be used to ease operation (driver and spotter to position lifting frame).

4. Start engine (WP 0027).

LOADING - Continued

5. Push in parking brake knob (3), apply service brake pedal (4), and set transmission range selector (5) to Reverse (R).

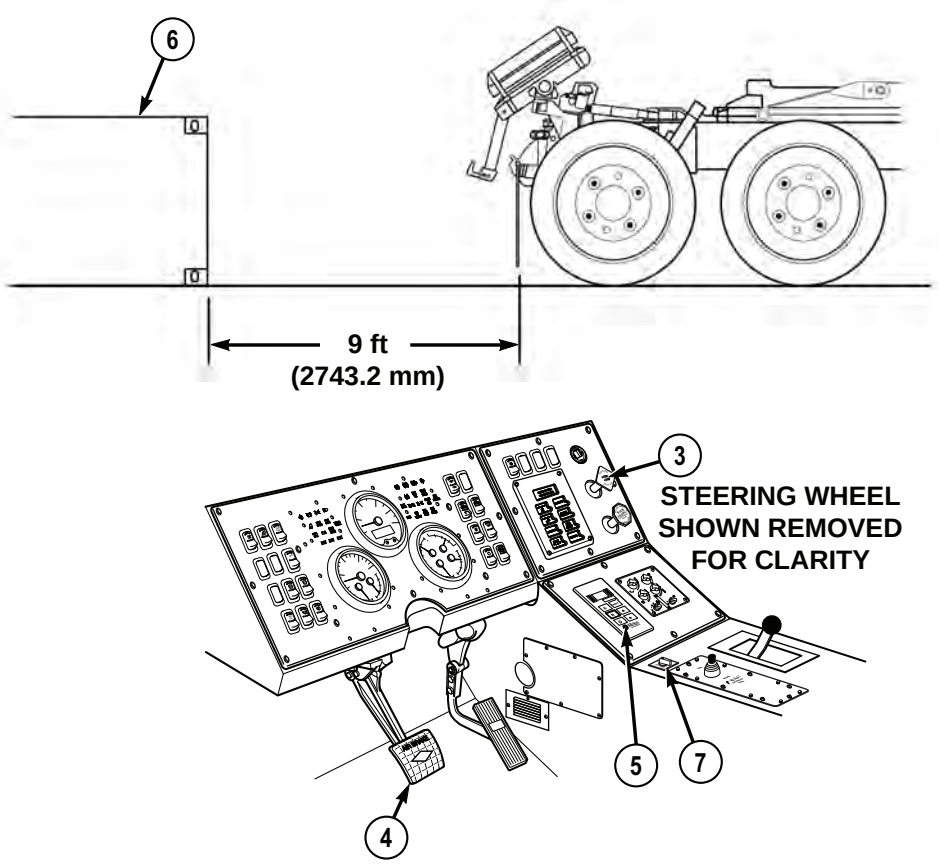


Figure 3.

6. Release service brake pedal (4) and position rear of vehicle within 9.0 ft (2743.2 mm) of front of container (6), aligning centerline of vehicle within 2.0 in. (50.8 mm) of container centerline.

7. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

8. Turn hydraulic selector switch (7) to AUTO.

LOADING - Continued

CAUTION

On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Return hydraulic selector to AUTO and continue (UNLOAD) operation. Repeat as required. Failure to comply may result in damage to equipment.

9. Move joystick (8) to UNLOAD position until lifting frame (1) is positioned in front of container (6).

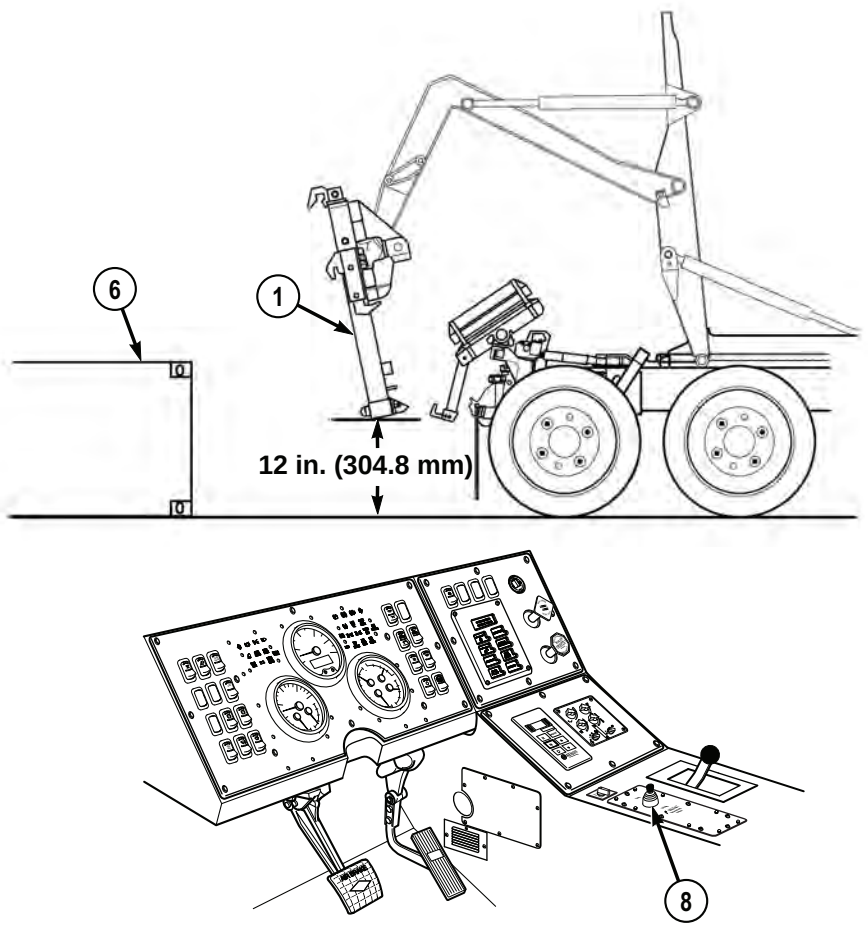


Figure 4.

LOADING - Continued

10. Operate LHS (WP 0042) in AUTO mode until lifting frame (1) is approximately 12.0 in. (304.8 mm) off of ground.
11. Release joystick (8).
12. Shut OFF engine (WP 0037).

NOTE

- Refer to the lifting frame data plate for the proper configuration needed for the height of the container being loaded.
- There are two slide arms. Right side shown.

13. Remove lock pin (9), pin (10), and half-height container front hook (11) from stowage bracket (12) on lifting frame (1).

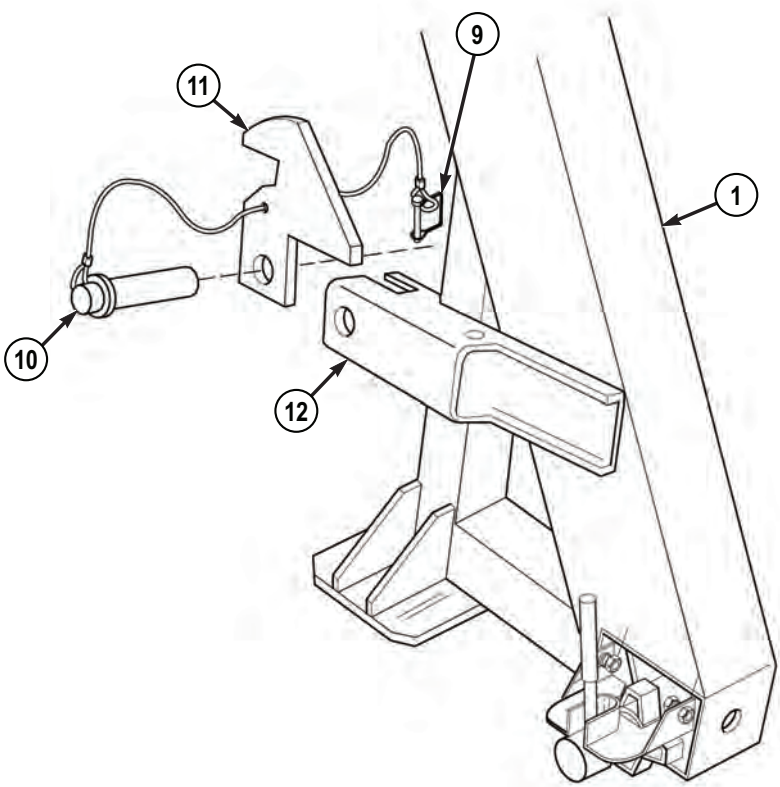


Figure 5.

LOADING - Continued

NOTE

Ensure half-height container front hooks face down when installed.

14. Position half-height container front hook (11) in slot (13) on slide arm (14) and install pin (10) and lock pin (9).

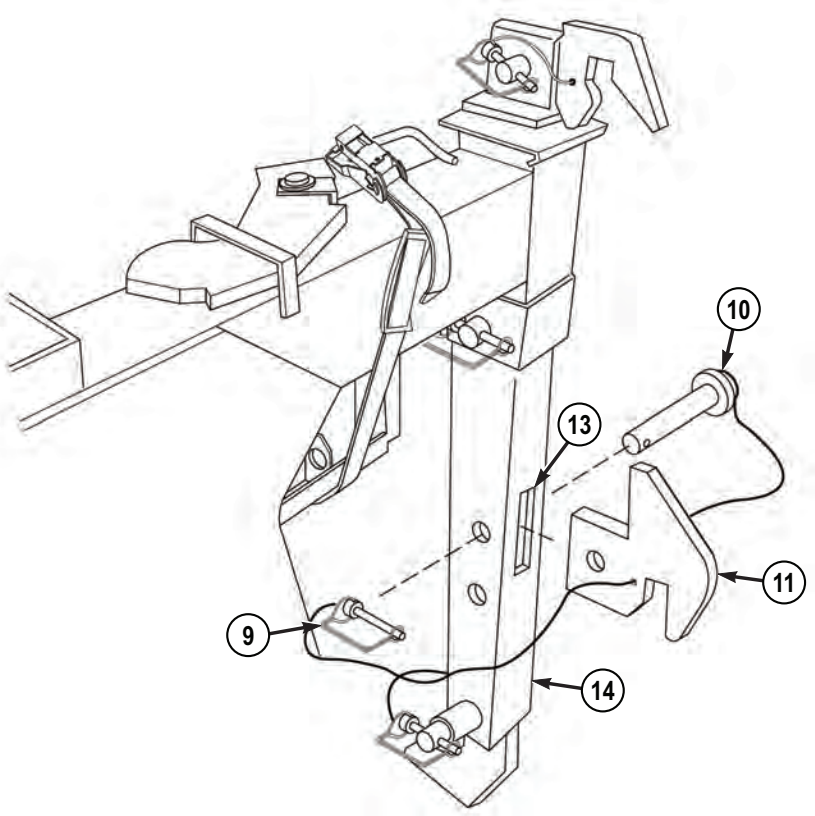


Figure 6.

NOTE

If pin is in stow position, perform Steps (15) and (16).

15. Remove lock pin (15) and pin (16) from stow position on lifting frame (1).

LOADING - Continued

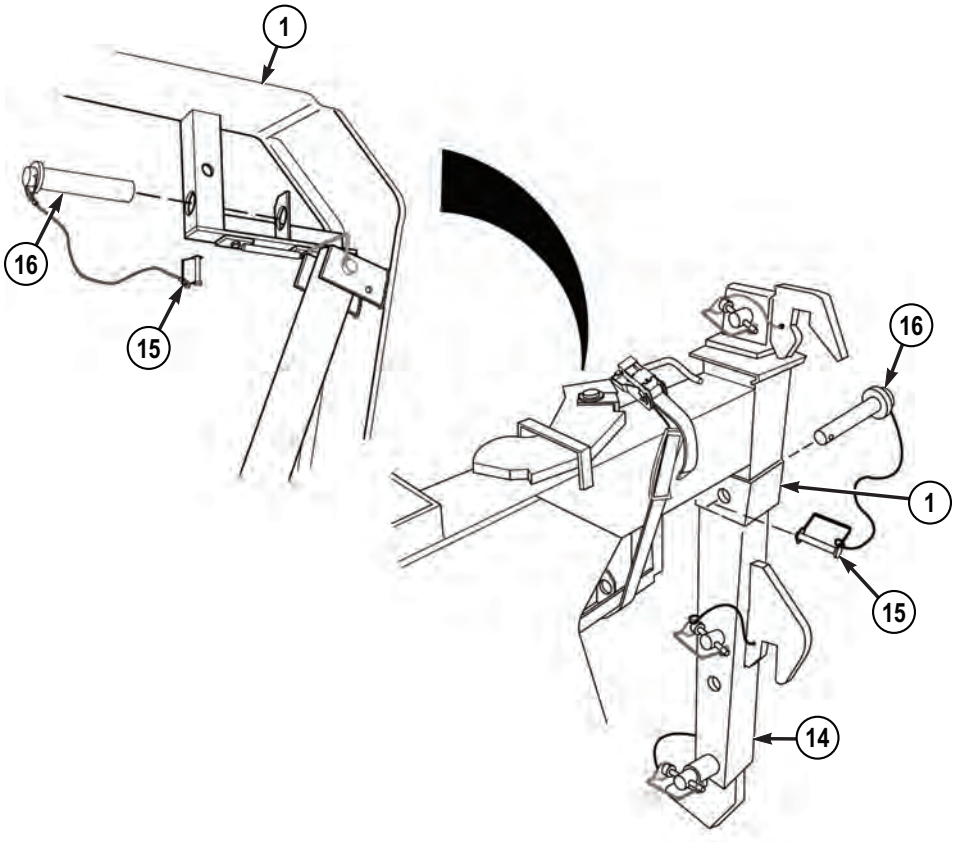


Figure 7.

16. Install pin (16) and lock pin (15) in lifting frame (1) and slide arm (14) in upper hole.
17. Repeat Steps (13) through (16) for left side.

NOTE

- There are two lifting-frame lower-container locks and rear sliders. Right side shown.
- Ensure lifting-frame lower-container lock handle is positioned in slot on handle-lock plate.
- Ensure tab on handnut faces up.

18. Raise handle-lock plate (17) and rotate lower-container lock handle (18) towards center of lifting frame (1) to unlocked position.

LOADING - Continued

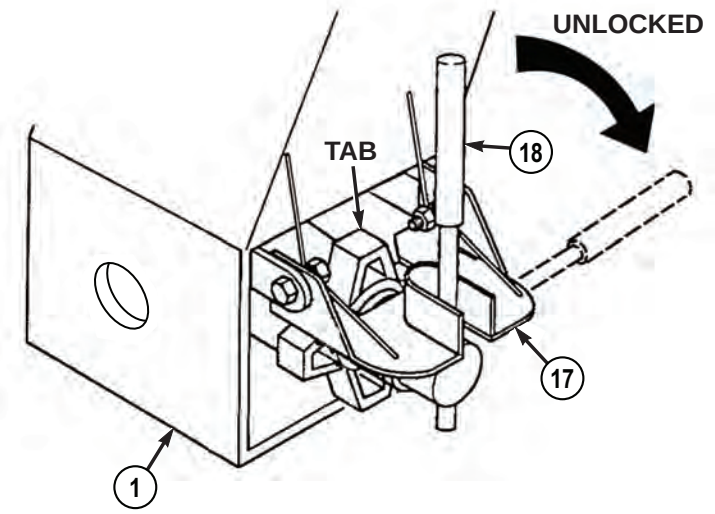


Figure 8.

19. Release handle-lock plate (17) on lifting frame (1).
20. Repeat Steps (18) and (19) for left side.

CAUTION

Ensure sliders are clear of debris and surfaces are properly greased or damage to equipment may result.

NOTE

There are two rear sliders and container locks. Right side shown.

21. Rotate slider (19) so rear of slider faces down.

LOADING - Continued

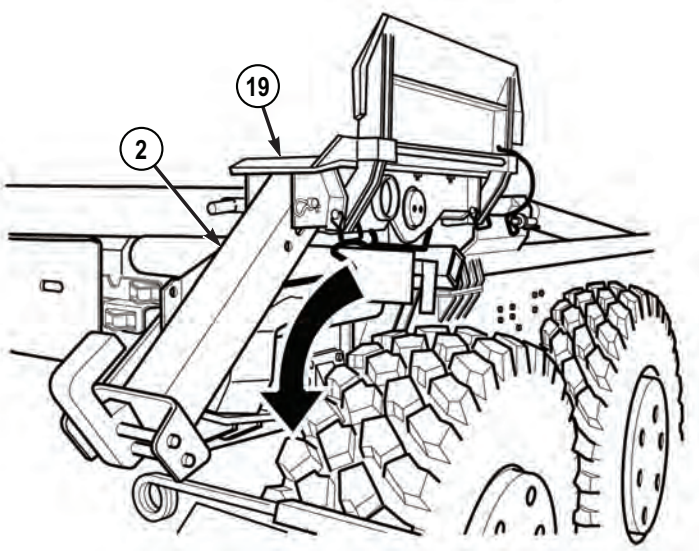


Figure 9.

22. Ensure rear container lock (2) is in ready mode or down position (WP 0043).
23. Repeat Steps (21) and (22) for left side.
24. Start engine (WP 0027).
25. Position half-height container front hooks (11) just above and in front of half-height container upper corner castings (20).

LOADING - Continued

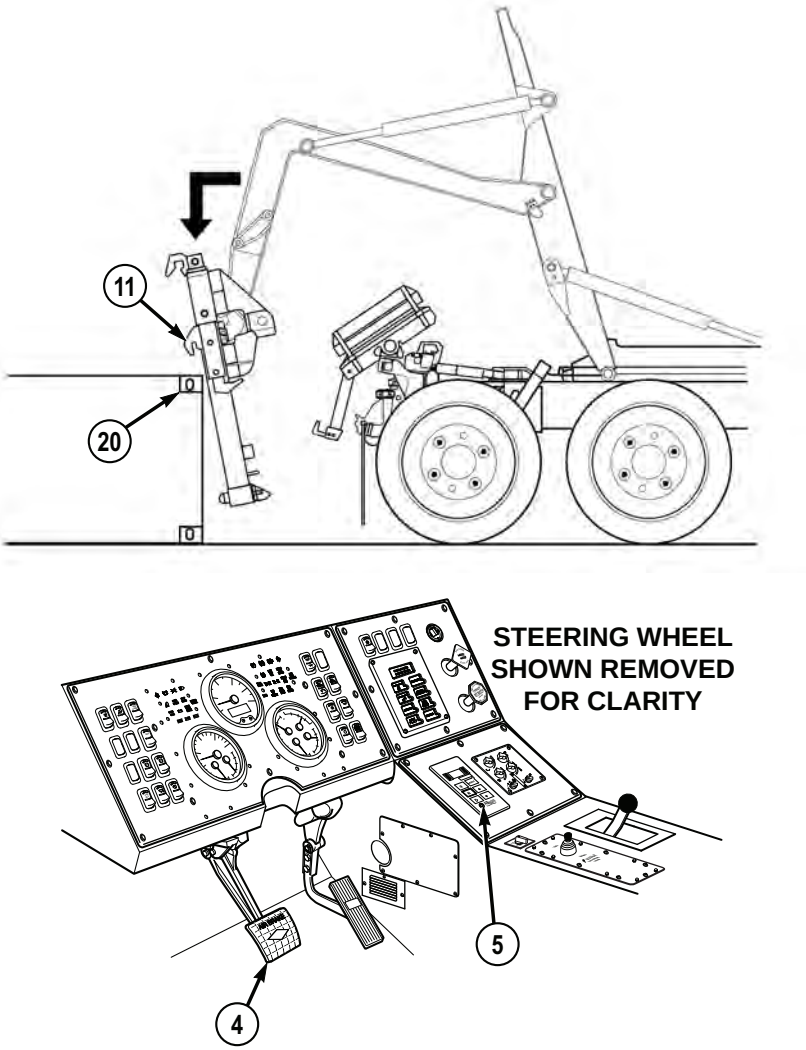


Figure 10.

26. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).

LOADING - Continued

WARNING



Do not allow front lift adapter to contact the ground when half-height container front hooks are not engaged with container upper corner castings. Failure to comply may result in damage to equipment and injury or death to personnel.

27. Release service brake pedal (4) and slowly back up to approximately 12.0 in. (304.8 mm) from front of container (6).

LOADING - Continued

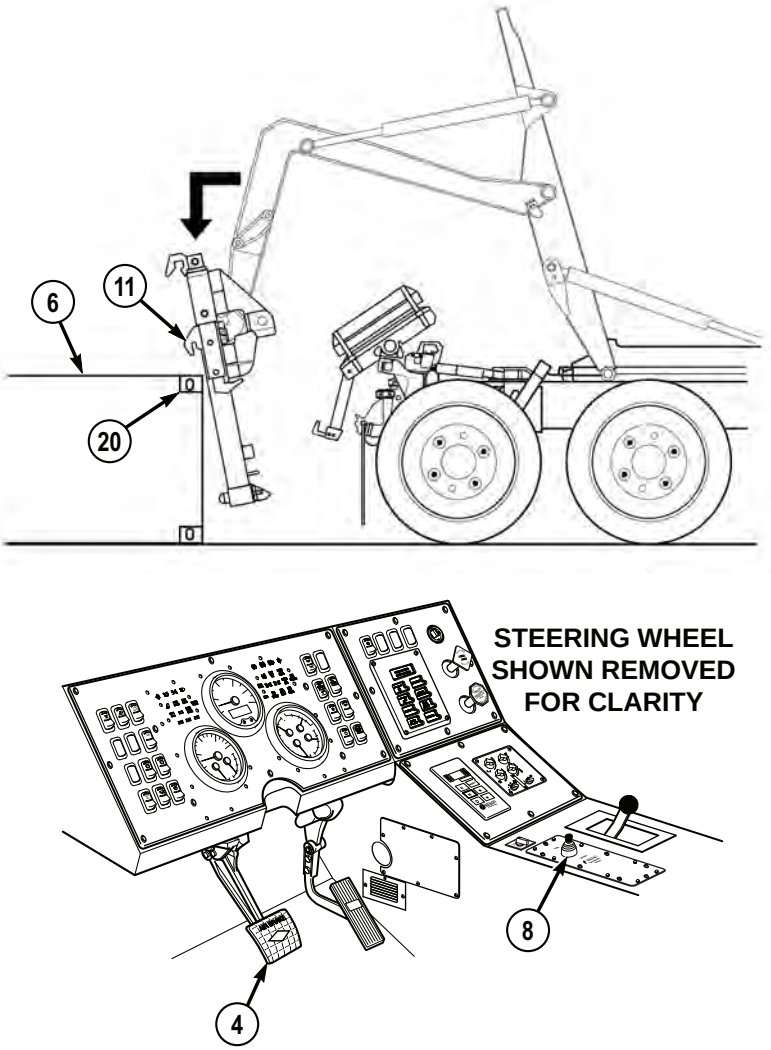


Figure 11.

28. Apply service brake pedal (4), move joystick (8) to LOAD and raise lifting frame until half-height container front hooks (11) are above container upper-front corner castings (20).

CAUTION

Ensure half-height container front hooks are fully engaged with container upper castings. Failure to comply may result in damage to equipment.

LOADING - Continued

NOTE

To get half-height container front hooks to properly seat, it may be necessary to drive vehicle forward slightly.

29. Release service brake pedal (4) and move joystick (8) to UNLOAD, lower half-height container front hooks (11) into half-height container upper-front corner castings (20).

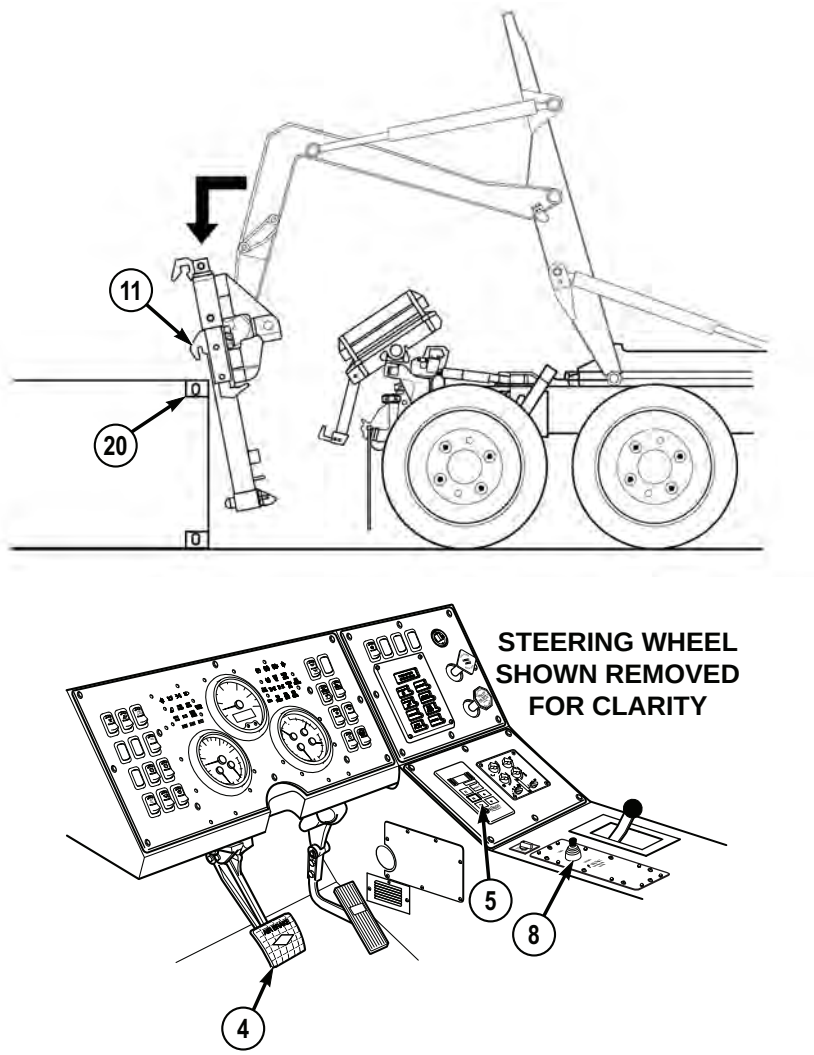


Figure 12.

LOADING - Continued

30. Apply service brake pedal (4) and set transmission range selector (5) to Reverse (R).
31. Release service brake pedal (4) and move vehicle backward approximately 12.0 in. (304.8 mm).
32. Apply service brake pedal (4) and set transmission range selector (5) to Drive (D).

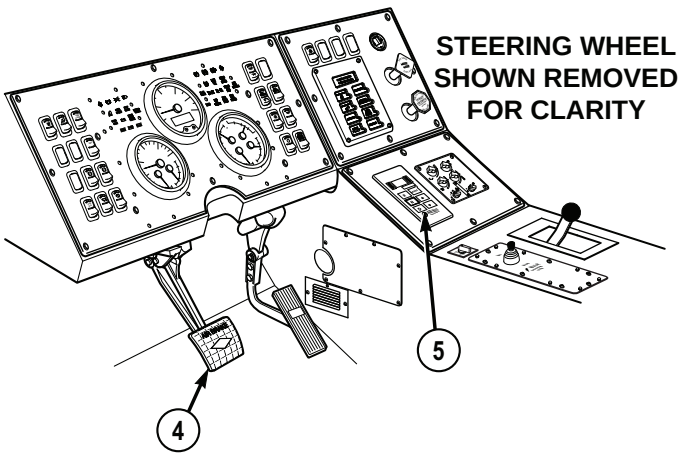


Figure 13.

33. Move joystick (8) to UNLOAD until lower container locks (21) are aligned with container lower-front corner castings (22).

LOADING - Continued

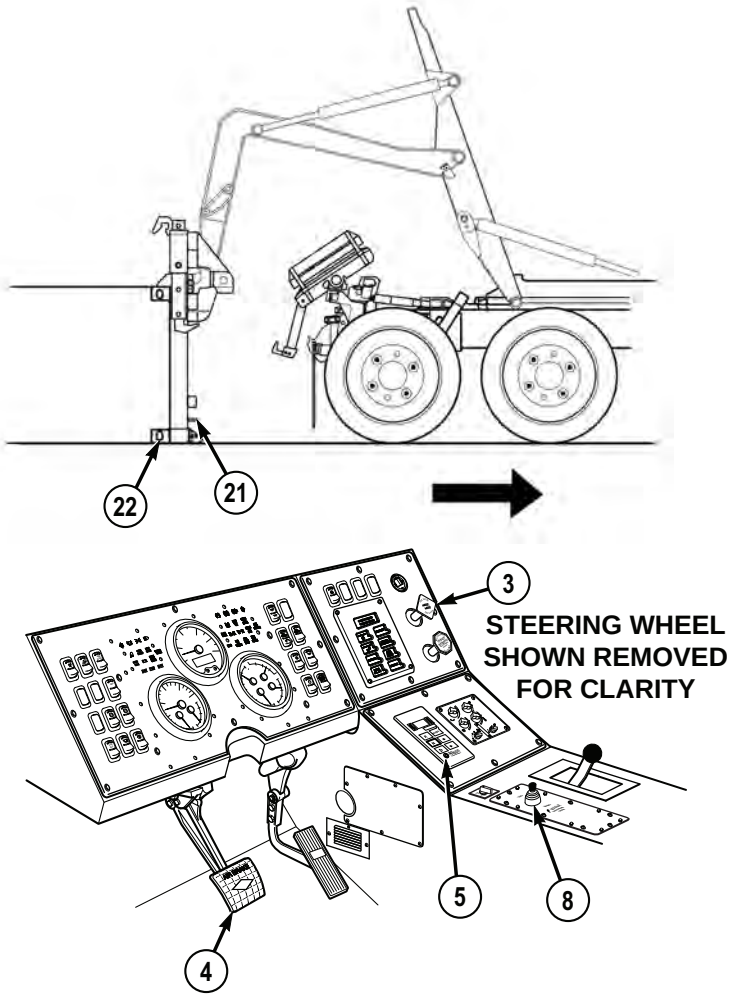


Figure 14.

34. Drive forward until lower container locks (21) are seated in container lower-front corner castings (22). Apply service brake pedal (4) and release joystick (8).

35. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

36. Hold handle-lock plate (17) and rotate lower container lock handle (18) up in the locked position.

LOADING - Continued

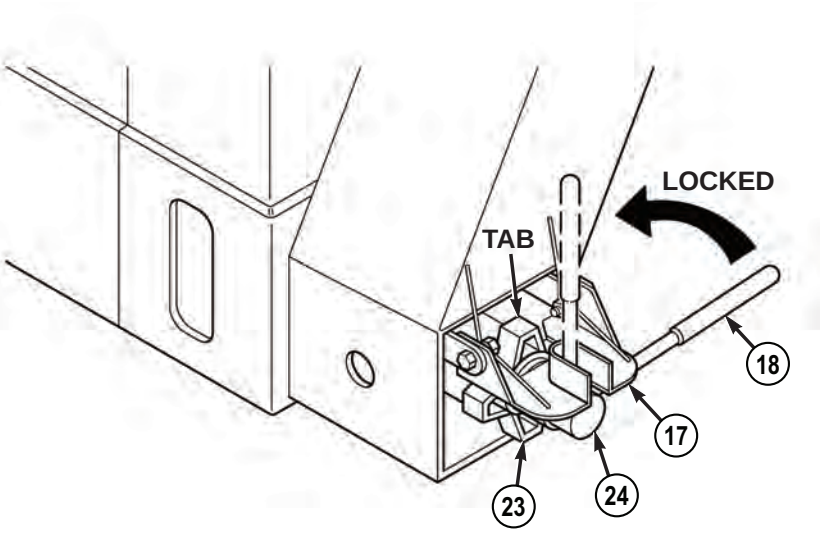


Figure 15.

CAUTION

Ensure lower container locks are fully engaged with container lower-front corner castings. Failure to comply may result in damage to equipment.

NOTE

- To get container lock handle to rotate, it may be necessary to loosen handnut.
- There are two lower-container locks. Right side shown.
- After tightening handnut, it may be necessary to loosen handnut slightly to align tab with handle lock plate.
- Ensure lower-container lock handle is secured in slot on handle lock plate.

37. Turn handnut (23) clockwise and tighten stem (24).

NOTE

Ensure tab on handnut faces up.

38. Lower handle-lock plate (17) over lower-container lock handle (18) and handnut (23) tab.

LOADING - Continued

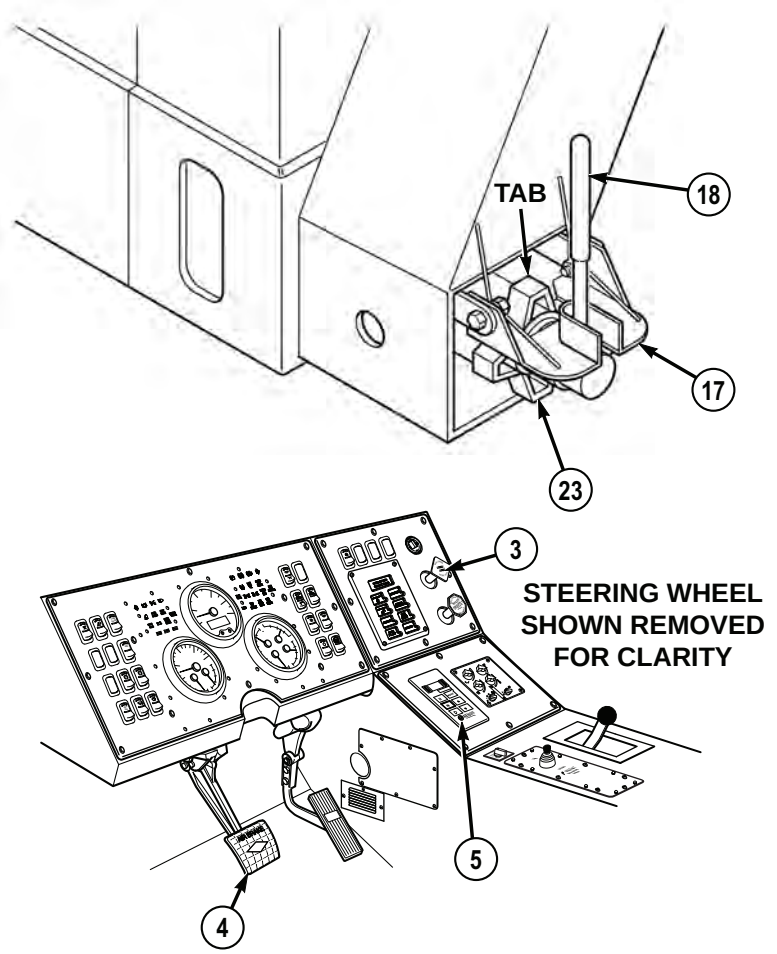


Figure 16.

39. Repeat Steps (35) through (37) for left side.

40. Set transmission range selector (5) in Neutral (N), push in parking brake knob (3) to release parking brakes and release service brake pedal (4).

LOADING - Continued

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

CAUTION

- If LHS overload lamp illuminates but loading operation continues, operator is cautioned that LHS is nearing maximum capacity. In this situation operator should notify supervisor if it appears payload is unevenly distributed in container or if container load exceeds 35,000 lbs (15,876 kg). If any of these conditions exist, payload must be redistributed or reduced or damage to equipment may result.
- Load must be evenly distributed in the container. Uneven load distribution may cause the LHS overload indicator to give false signals and cause the LHS to operate incorrectly. Damage to equipment may result.
- If LHS overload lamp illuminates and normal operation has stopped, return load to original position and notify supervisor to have payload redistributed or weight reduced. Failure to comply may result in damage to equipment.
- Ensure parking brake is not applied before starting load sequence or damage to equipment may occur.

NOTE

- The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.
- If container is extremely light or empty, it may be necessary to place transmission range selector in Reverse (R) and allow vehicle to roll under container.
- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (40) through (48) to reposition container.

41. Move joystick (8) to LOAD, allowing vehicle to be pulled under container (6).

LOADING - Continued

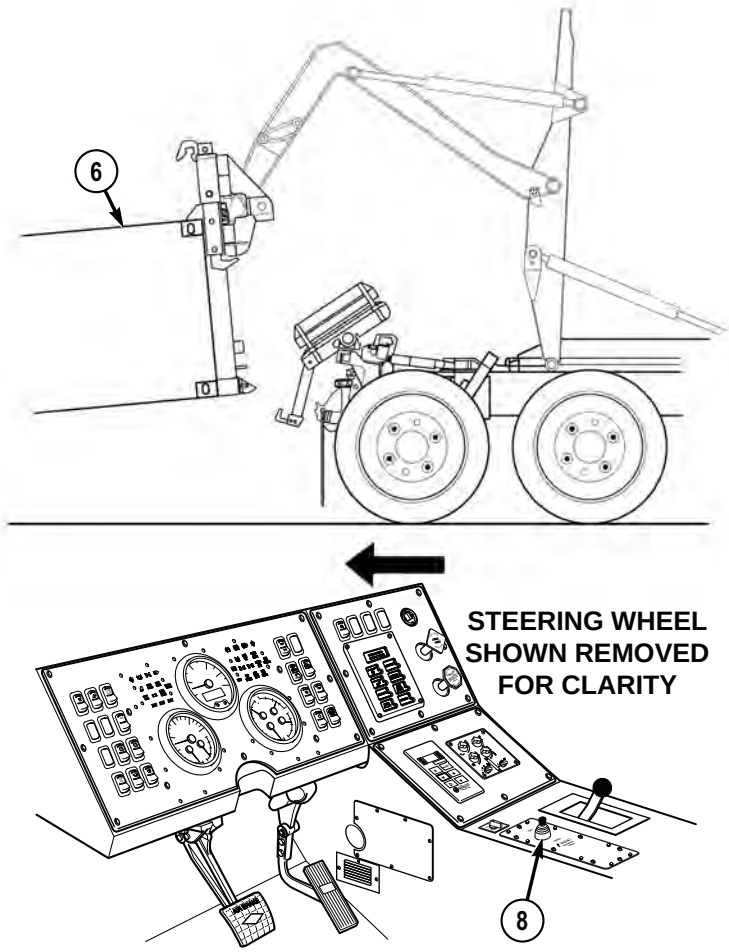


Figure 17.

LOADING - Continued

WARNING



Ensure that container has contacted rear sliders correctly and is between guides. Failure to comply may result in injury or death to personnel and damage to equipment.

CAUTION

Reduce engine speed to idle before container contacts rear sliders or damage to equipment may result.

NOTE

- LHS overload lamp may illuminate when lifting container from unusual conditions.
- As load is lifted, vehicle will be pulled under container. Some steering wheel adjustments may have to be made to ensure that container contacts rear sliders correctly and is between guides.

42. As container (6) contacts rear sliders (19), reduce engine speed to idle and apply service brake pedal (4).

LOADING - Continued

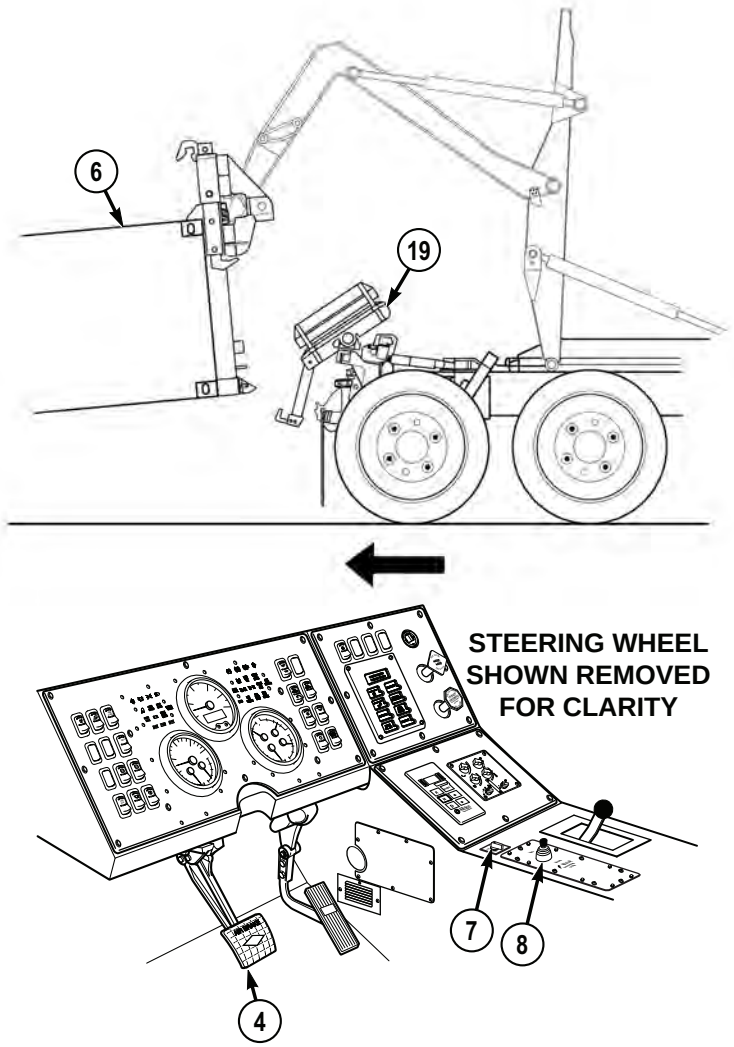


Figure 18.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

LOADING - Continued

NOTE

If container is being loaded in soft soil conditions, perform Steps (42) through (44).

43. Release joystick (8). Set hydraulic selector switch (7) to MAN H.A.

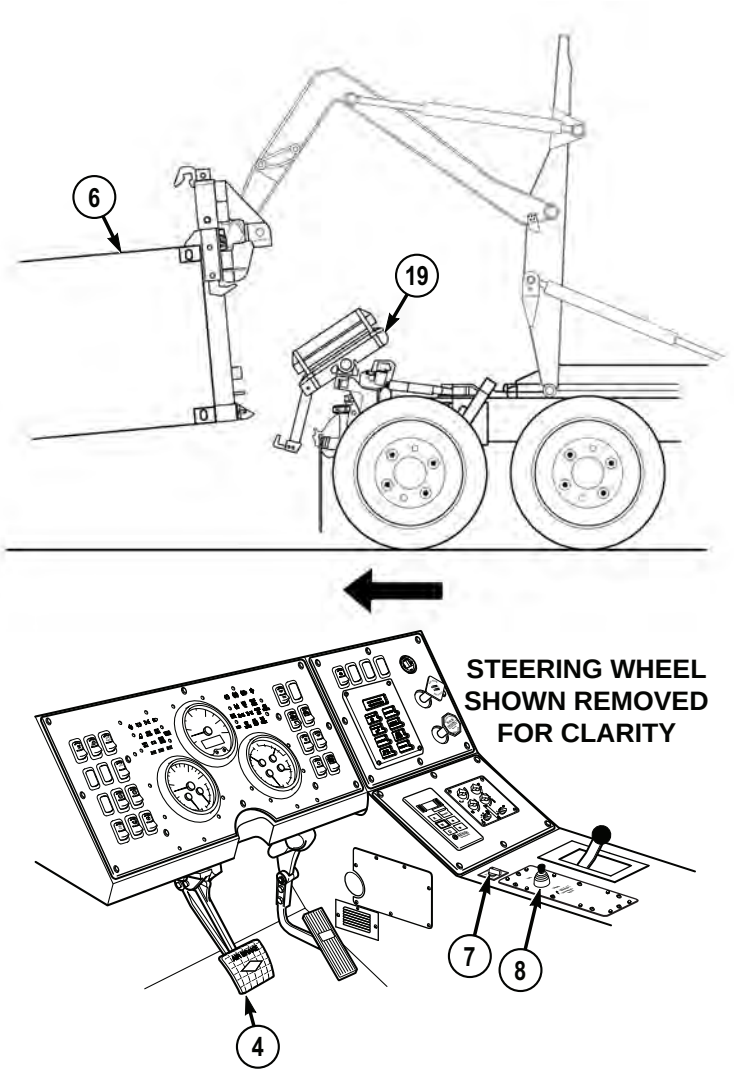


Figure 19.

LOADING - Continued

44. Move joystick (8) to LOAD until container (6) is approximately 2.0 ft (0.61 m) off the ground. Release joystick.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

45. Set hydraulic selector switch (7) to AUTO. Resume normal AUTO operations.

NOTE

Engine speed may be increased and decreased to ease loading.

46. After container (6) contacts rear sliders (19), increase engine speed to approximately 1,500 rpm until container is almost loaded. Reduce engine speed to idle.

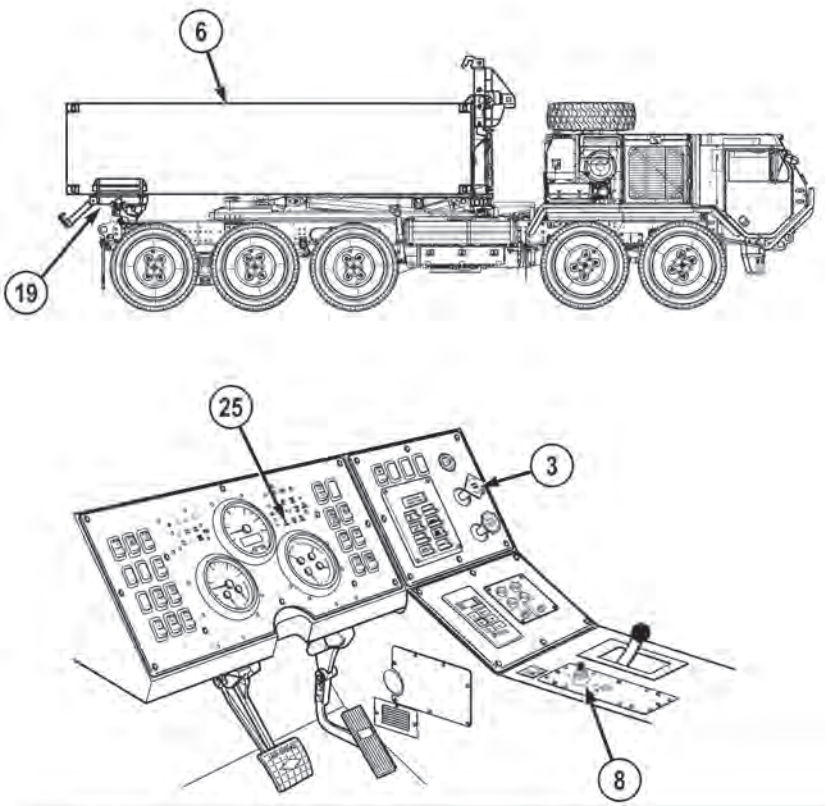


Figure 20.

LOADING - Continued

CAUTION

After loading operations using CHU kit and container and the LHS NO TRANSIT indicator goes off, operator must release the joystick from the LOAD position. Failure to release the joystick may cause LHS OVERLOAD indicator to illuminate and hydraulic cylinders to remain active, forcing a temporary bow in the LHS frame, resulting in contact between LHS and container.

47. Continue loading until container (6) is fully loaded and LHS NO TRANS lamp (25) goes out.
48. Release joystick (8).
49. Pull out parking brake knob (3) to apply parking brake.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in OFF position before driving vehicle or hydraulic system could overheat.

50. Turn hydraulic selector switch (7) to OFF.

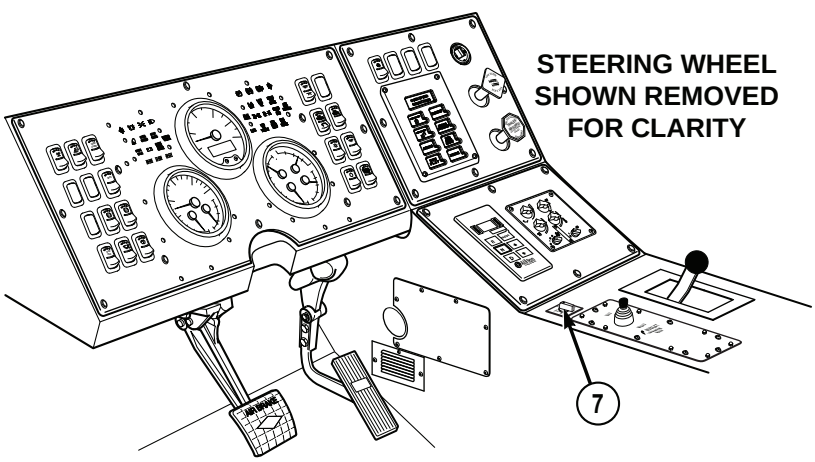


Figure 21.

51. Shut OFF engine (WP 0037).

NOTE

- There are two rear container locks. Right side shown

LOADING - Continued

- If container is not centered and transit locks cannot be installed and pinned, repeat Steps (40) through (50) to reposition container.

52. Support rear container lock (2) and remove lock pin (26) and pin (27).

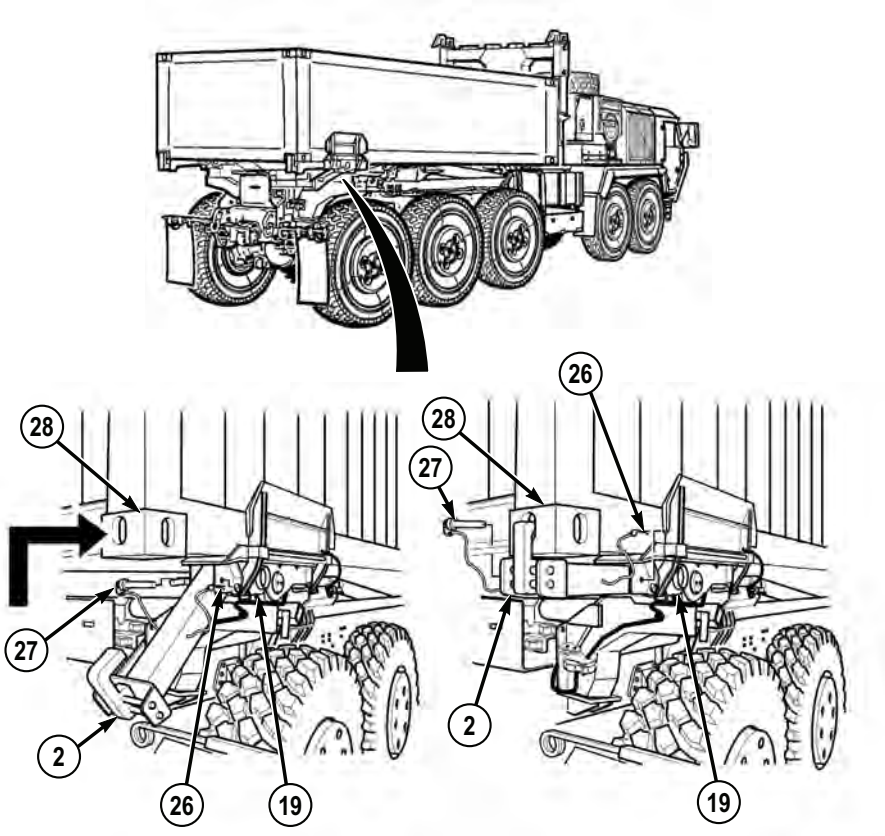


Figure 22.

53. Rotate rear container lock (2) up and position into container lower-rear corner casting (28).

54. Install pin (27) and lock pin (26) in rear container lock (2) and slider (19).

55. Perform Steps (51) through (53) for left side.

END OF TASK

UNLOADING

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Injury or death could result if LHS contacts power lines.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Failure to comply may result in damage to equipment and injury or death to personnel.
- Prior to and during any load or unload cycle, all personnel should stay clear of LHS, front lift adapter, and container. Failure to comply may result in damage to equipment and injury or death to personnel.

CAUTION

- Check that ground conditions, where container will be placed, can support the container weight or damage to the container, lifting frame, or LHS may result.
- Use extreme caution when loading/unloading container with side doors. Container must remain centered during loading/unloading, or flanges on side may be damaged and/or door hinges may make hard contact with guides.

NOTE

For detailed instructions on how to operate the LHS on the vehicle, refer to LHS Controls and Indicators (WP 0042), Picking-up a Flatrack in Auto Mode and Off-loading a Flatrack in Auto Mode .

1. Check area for operating room at front and rear of vehicle. Check overhead clearance and ground conditions.

UNLOADING - Continued

NOTE

There are two rear container locks. Right side shown.

2. Remove lock pin (26), pin (27), and rear container lock (2) from lower rear corner casting (28).

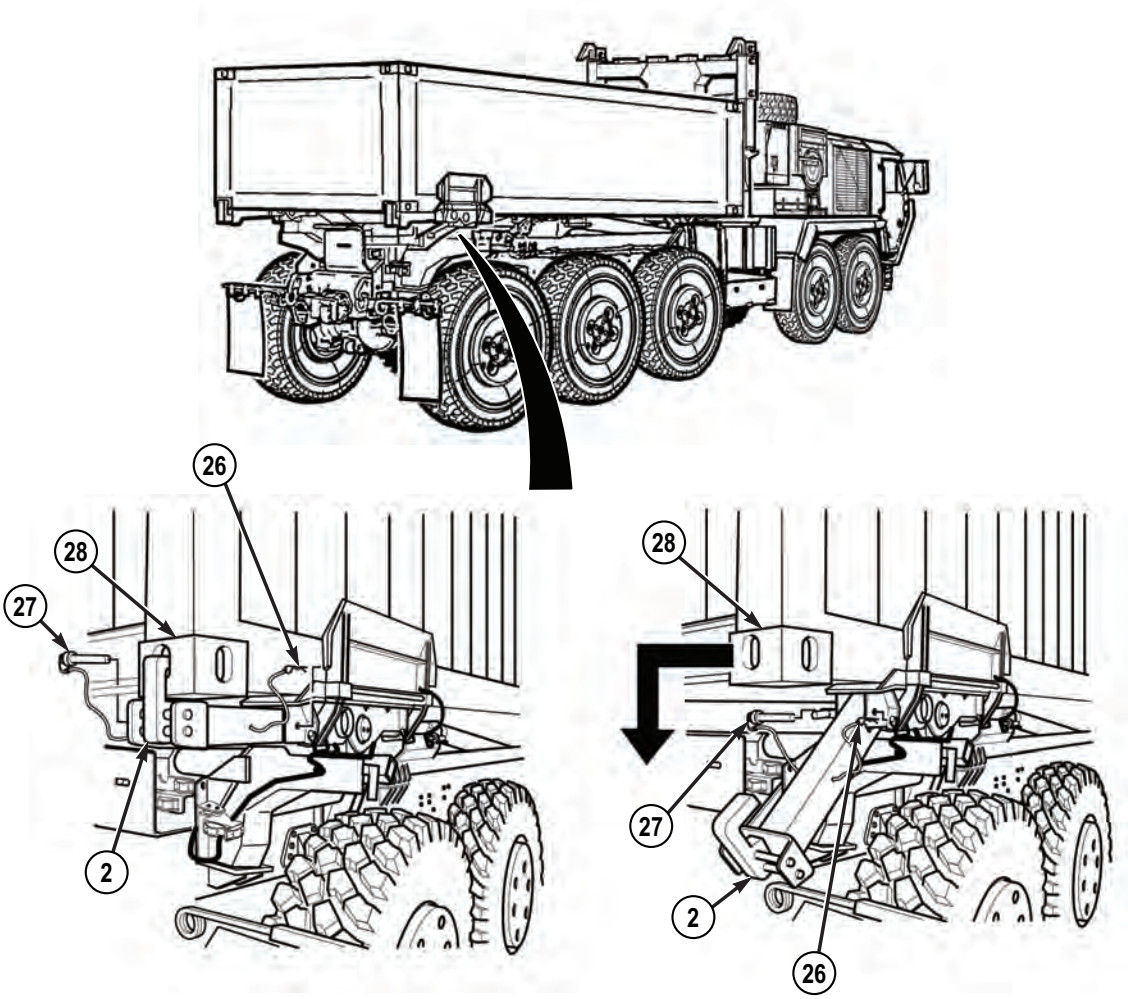


Figure 23.

3. Rotate rear container lock (2) in down position and install pin (27) and lock pin (26).
4. Perform Steps (2) and (3) for left side.

UNLOADING - Continued

5. Start engine (WP 0027).
6. Apply service brake pedal (4) and set transmission range selector (5) to Neutral (N).

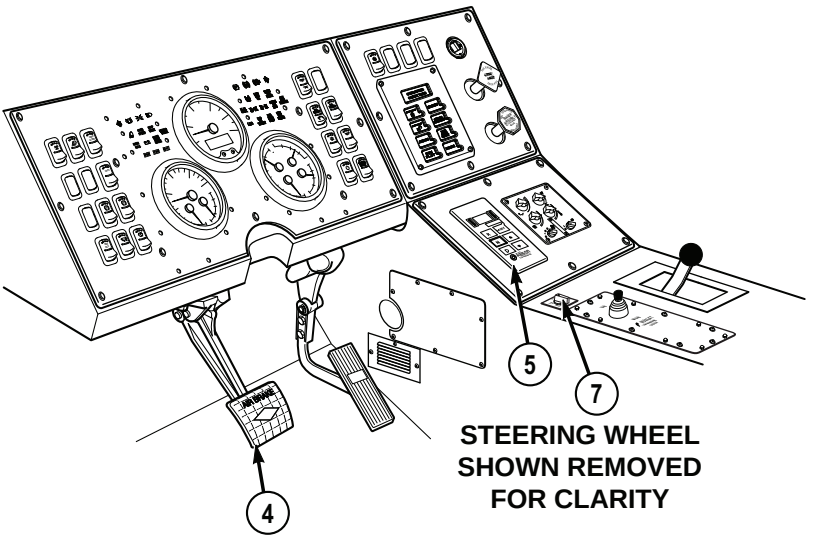


Figure 24.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Turn hydraulic selector switch (7) to AUTO.

WARNING



When loading or unloading containers on uneven ground (side slope or downgrades up to 5 degrees), it may be necessary to apply vehicle service brakes to prevent vehicle rollaway. Failure to comply may result in injury or death to personnel.

NOTE

LHS will not operate and unload if rear container locks are engaged.

UNLOADING - Continued

8. Move joystick (8) to UNLOAD. Container (6) will start to move rearward. LHS NO TRANS lamp (25) will illuminate. Maintain engine speed at idle until front of container raises approximately 12.0 in. (304.8 mm).

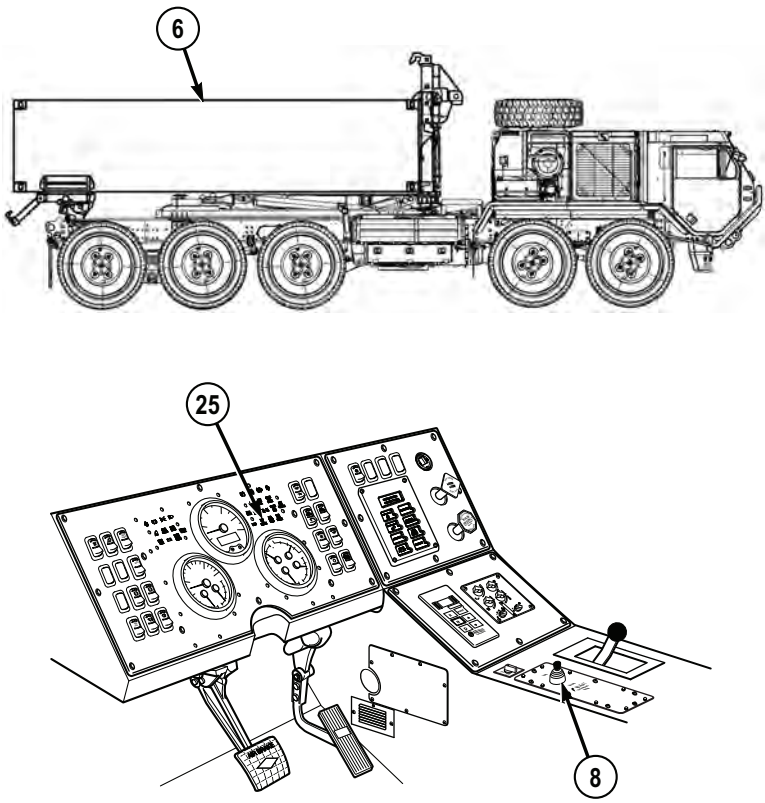


Figure 25.

NOTE

The amount of time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1,500 rpm to reduce loading and unloading times.

9. Continue to unload container (6) until back edge of container touches ground.

UNLOADING - Continued

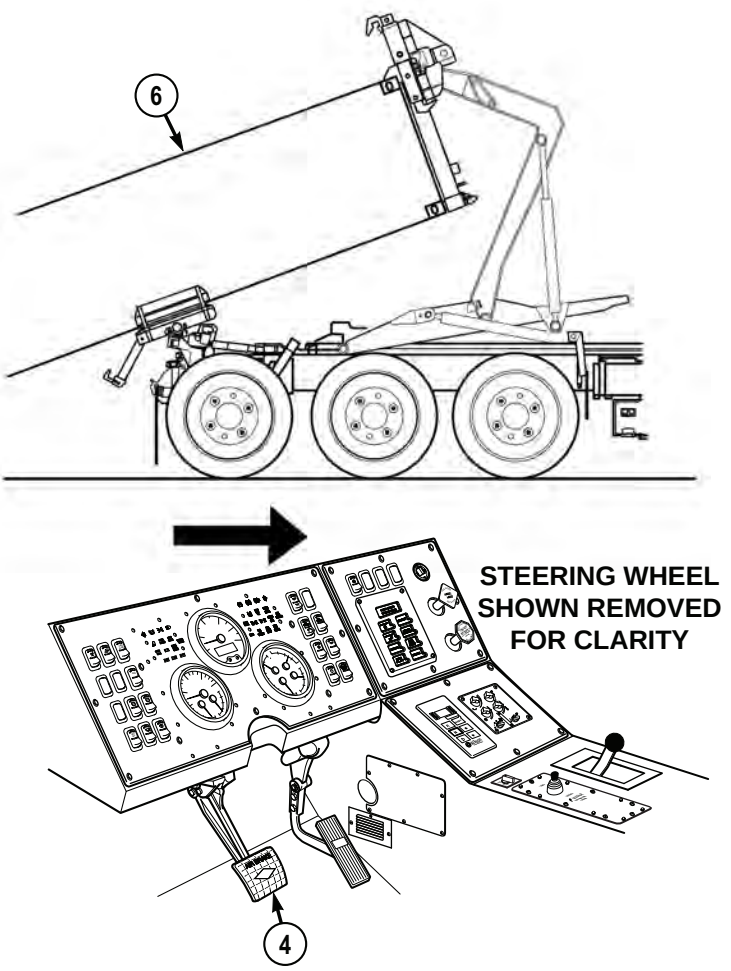


Figure 26.

10. Release service brake pedal (4) and allow container (6) to push vehicle forward from under container.
11. When front of container (6) is approximately 8.0 in. (203.2 mm) above the ground, decrease engine speed to idle and apply service brake pedal (4).

UNLOADING - Continued

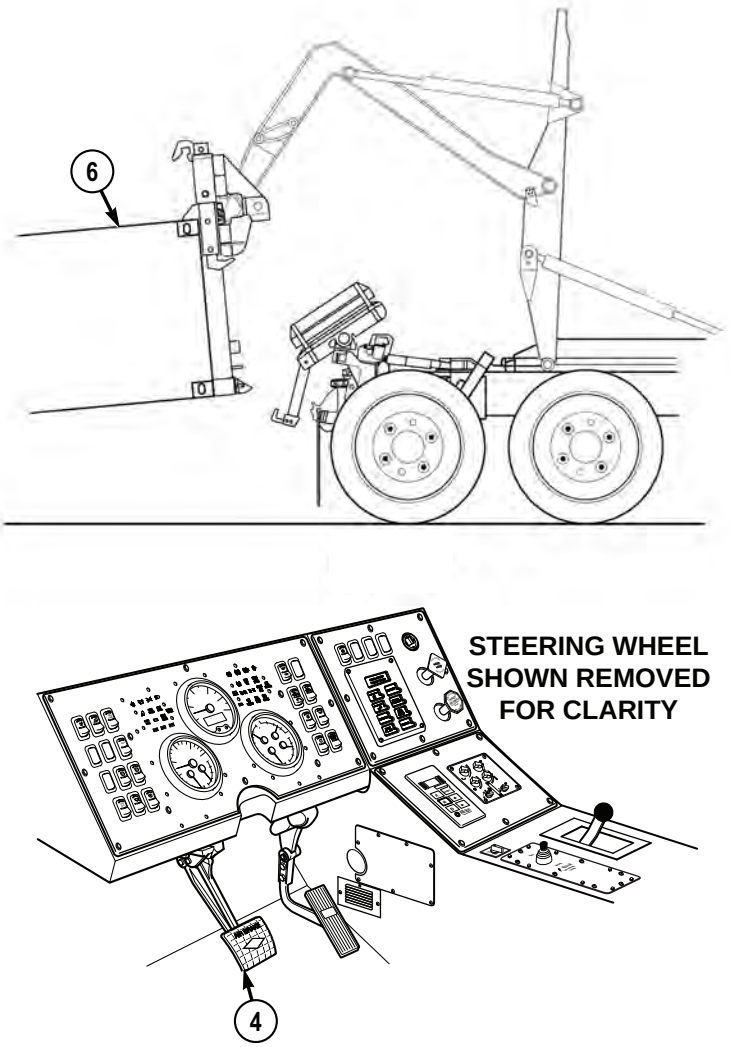


Figure 27.

CAUTION

Once vehicle's rear suspension has been relieved of container load, do not continue in UNLOAD position as possibility of jacking up the rear of vehicle with hook arm may occur and damage to equipment may result.

UNLOADING - Continued

NOTE

If container is extremely light or empty, it may be necessary to place transmission range selector in Drive (D) and allow vehicle to move out from under container.

12. Continue unloading until bottom of container (6) is on ground and rear suspension is unloaded.

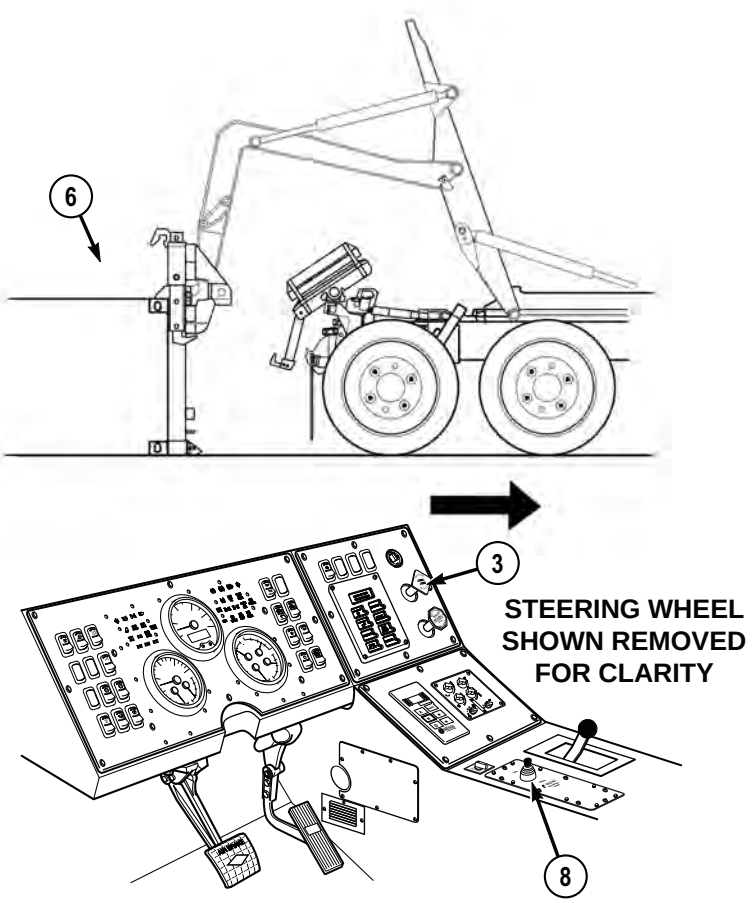


Figure 28.

13. Release joystick (8) when container (6) is resting on ground.
14. Pull out parking brake knob (3) to apply parking brakes.

UNLOADING - Continued

WARNING



Ensure that all tension has been relieved between LHS hook and front lift-adapter prior to unlocking front lift-adapter lower-container locks. Stay clear of front lift-adapter when unlocking front lift-adapter lower-container locks as front lift adapter may separate from container unexpectedly. Failure to comply may result in injury or death to personnel.

NOTE

There are two lifting-frame lower-container locks. Right side shown.

15. Raise handle-lock plate (17) and turn handnut (23) counterclockwise and loosen stem (24).

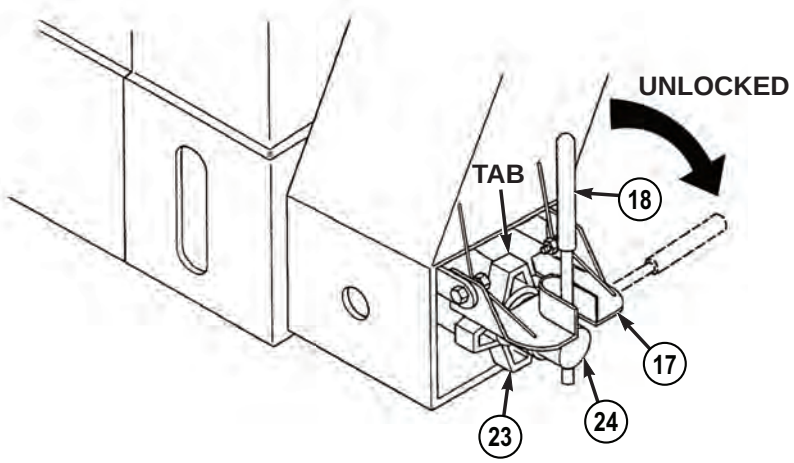


Figure 29.

16. Rotate lower-container lock handle (18) towards center of vehicle to unlocked position.

CAUTION

Handnut must be tightened clockwise to tighten stem. Failure to tighten stem may cause damage to equipment during next container loading procedure.

UNLOADING - Continued

17. Turn handnut (23) clockwise and tighten stem (24).
18. Release handle-lock plate (17) over container-lock handle and handnut (23) tab.
19. Repeat Steps (15) through (18) for left side.
20. Push in parking brake knob (3) and release parking brakes. Set transmission range selector (5) to Reverse (R).

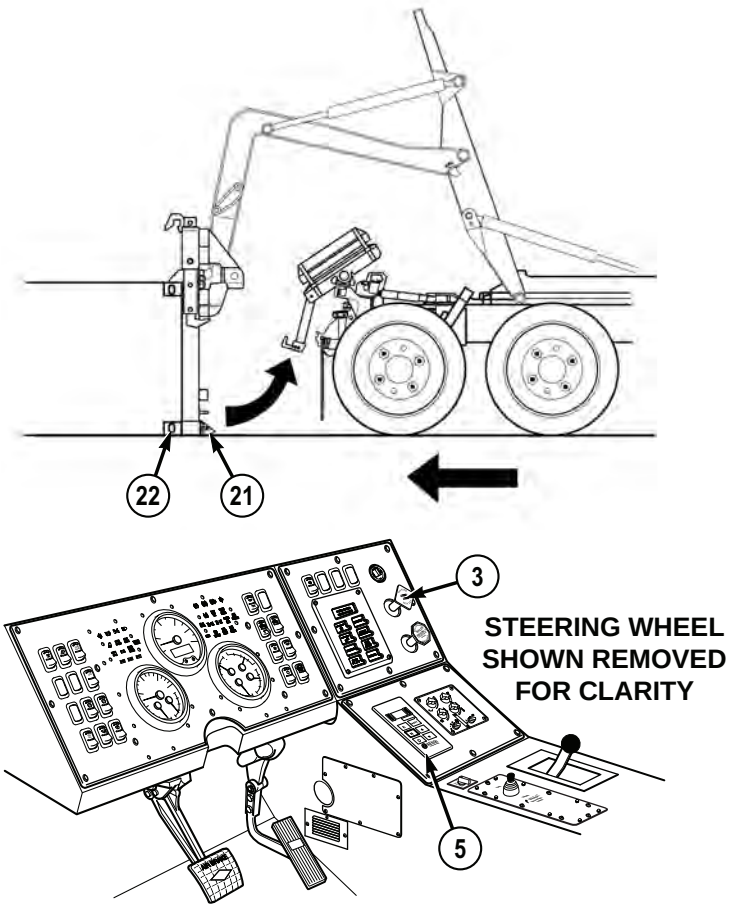


Figure 30.

21. Move vehicle backward until lower-container locks (21) disengage from lower front corner castings (22) approximately 4.0 to 6.0 in. (101.6 to 152.4 mm).

UNLOADING - Continued

CAUTION

Ensure that the half-height container front hooks are completely disengaged and do not hang up in container upper corner castings when retracting LHS. Failure to comply may result in damage to the half-height container front hooks and/or container.

NOTE

It may be necessary to move the vehicle forward or backward slightly to get the half-height container front hooks to disengage.

22. Move joystick (8) to LOAD position until lifting frame (1) is disengaged from container (6).

UNLOADING - Continued

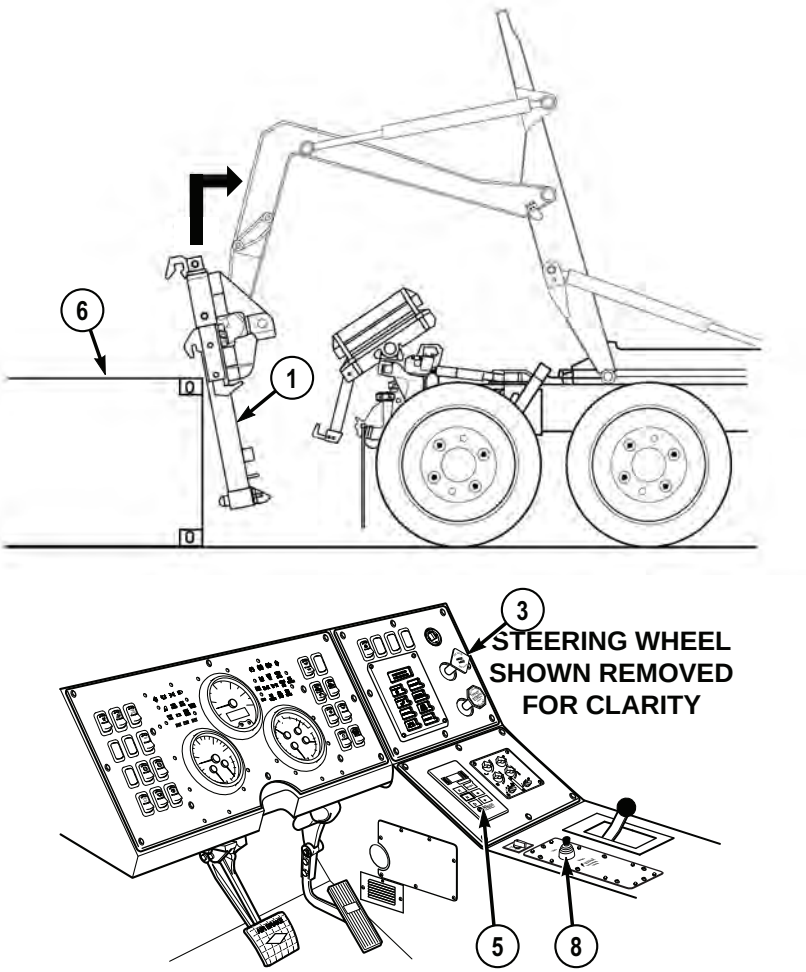


Figure 31.

23. Release joystick (8).
24. Set transmission range selector (5) to Neutral (N) and pull out parking brake knob (3) to apply parking brakes.

UNLOADING - Continued

CAUTION

- On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector to MAN H.A. and retract (LOAD) hook arm a few inches. Switch hydraulic selector to MAN M.F. and retract the mainframe until the lifting frame clears the rear sliders. Return hydraulic selector to AUTO and continue (LOAD) operation. Failure to comply may result in damage to equipment.
- Never drive with LHS NO TRANS lamp illuminated. An illuminated lamp means the LHS is not fully stowed. Failure to comply may result in damage to equipment.

25. Move joystick (8) to LOAD position until LHS is fully retracted and lifting frame (1) is positioned on bumper supports (29). LHS NO TRANS lamp (25) will go out indicating LHS is in transport position.

UNLOADING - Continued

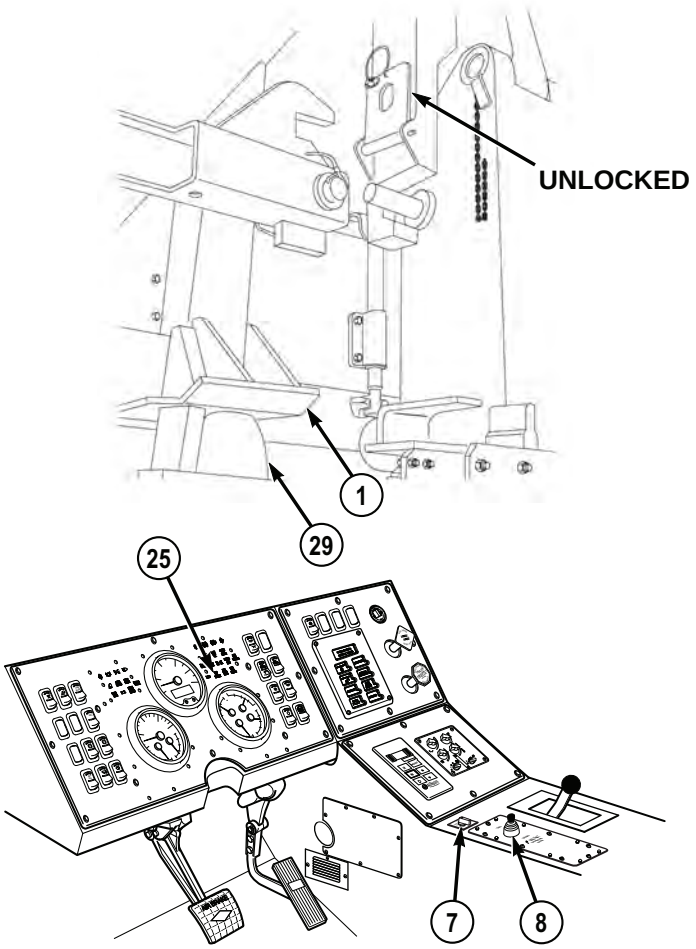


Figure 32.

26. Release joystick (8).

CAUTION

- Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.
- Hydraulic selector switch must be in the OFF position before driving vehicle or hydraulic system could overheat.

27. Turn hydraulic selector switch (7) to OFF.

UNLOADING - Continued

NOTE

- Perform Steps (28) through (30) if CHU operation for 48.0 in. (1219.2 mm) containers has been completed.
- There are two slide arms and half-height container front hooks. Right side shown.

28. Remove pin lock (9), pin (10), and half-height container front hook (11) from slide arm (14).

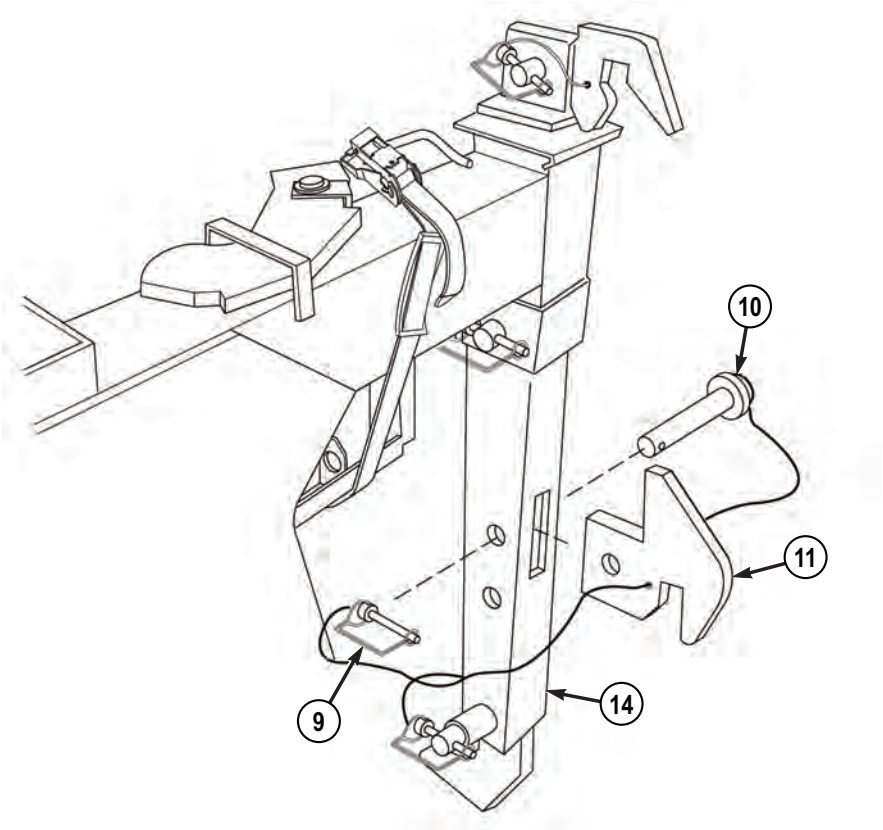


Figure 33.

29. Install half-height container front hook (11), pin (10), and lock pin (9) in stowage bracket (12) on lifting frame (1).

UNLOADING - Continued

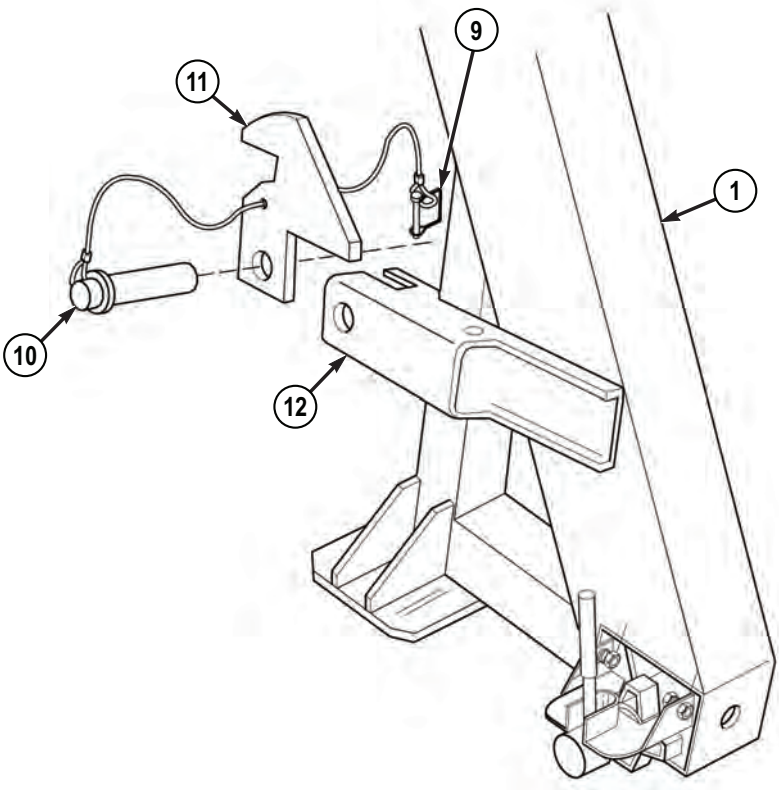


Figure 34.

30. Repeat Steps (28) and (29) for left side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TRANSPORTING LIFTING FRAME WITH PLS LHS WITHOUT CONTAINER

INITIAL SETUP:

Not Applicable

LIFTING FRAME IN LOCKED POSITION (TRANSPORT WITHOUT CONTAINER)

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

NOTE

There are two locking plates on lifting frame. Both locking plates are locked and unlocked the same way. Left side is shown.

1. Remove quick release pin (1) from locking plate (2) and bracket (3).

LIFTING FRAME IN LOCKED POSITION (TRANSPORT WITHOUT CONTAINER) - Continued

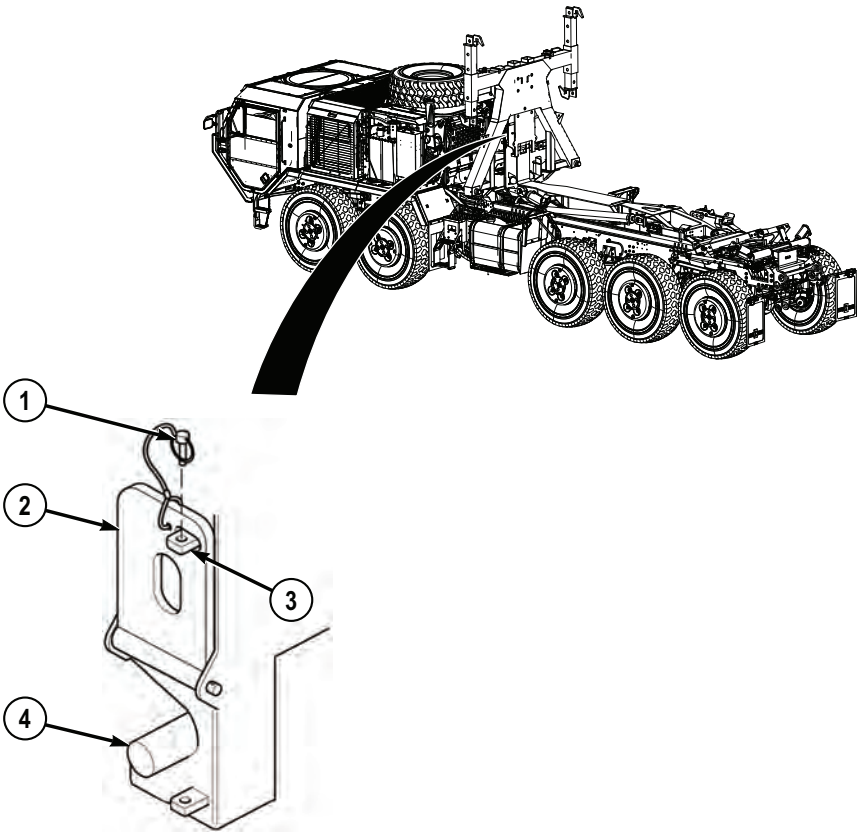


Figure 1.

2. Rotate locking plate (2) down to engage LHS hook arm pivot pin (4).

NOTE

- If locking plate does not engage LHS hook arm pivot pin, raising front lift adapter approximately 2.0 in. (50.8 mm) will allow clearance for locking plate to engage hook arm pivot pin.
- Perform Steps (3) through (7) if front lift adapter needs to be raised.

3. Start engine (WP 0027).
4. Apply service brake pedal (5) and set transmission range selector (6) to N (Neutral).

LIFTING FRAME IN LOCKED POSITION (TRANSPORT WITHOUT CONTAINER) - Continued

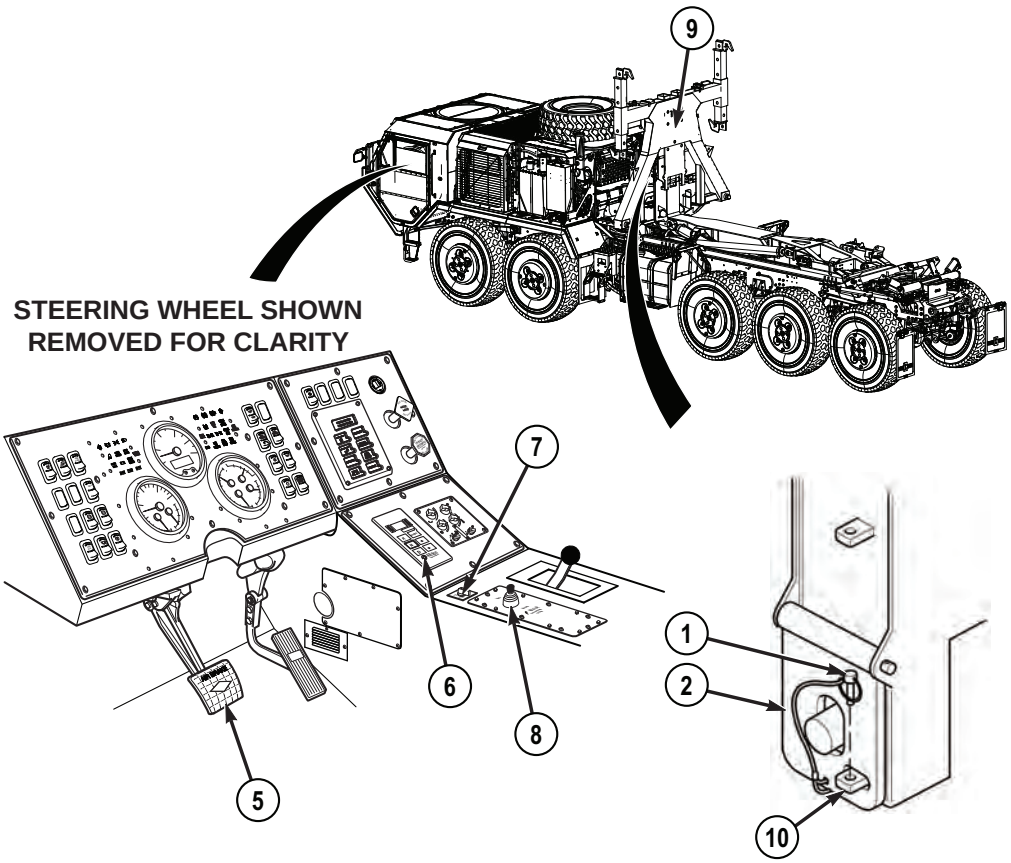


Figure 2.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

5. Turn hydraulic selector switch (7) to AUTO.
6. Move joystick (8) to UNLOAD position, and raise front lift adapter (9) approximately 2.0 in. (50.8 mm).
7. Shut OFF engine. (WP 0037)
8. Install quick release pin (1) in locking plate (2) and bracket (10).

LIFTING FRAME IN LOCKED POSITION (TRANSPORT WITHOUT CONTAINER) - Continued

9. Repeat Steps (1) through (8) for right side.

END OF TASK

LIFTING FRAME IN UNLOCKED POSITION (LOAD AND UNLOAD CONTAINER, INSTALL OR REMOVE LIFTING FRAME FROM LHS)

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

NOTE

- There are two locking plates on lifting frame. Both locking plates are locked and unlocked the same way. Left side is shown.
- If locking plate does not disengage LHS hook arm pivot pin, raising front lift adapter approximately 2.0 in. (50.8 mm) will allow clearance for locking plate to clear LHS hook arm pivot pin.
- Perform Steps (2) through (6) if front lift adapter needs to be raised.

1. Remove quick release pin (1) from locking plate (2) and bracket (10).

LIFTING FRAME IN UNLOCKED POSITION (LOAD AND UNLOAD CONTAINER, INSTALL OR REMOVE LIFTING FRAME FROM LHS) - Continued

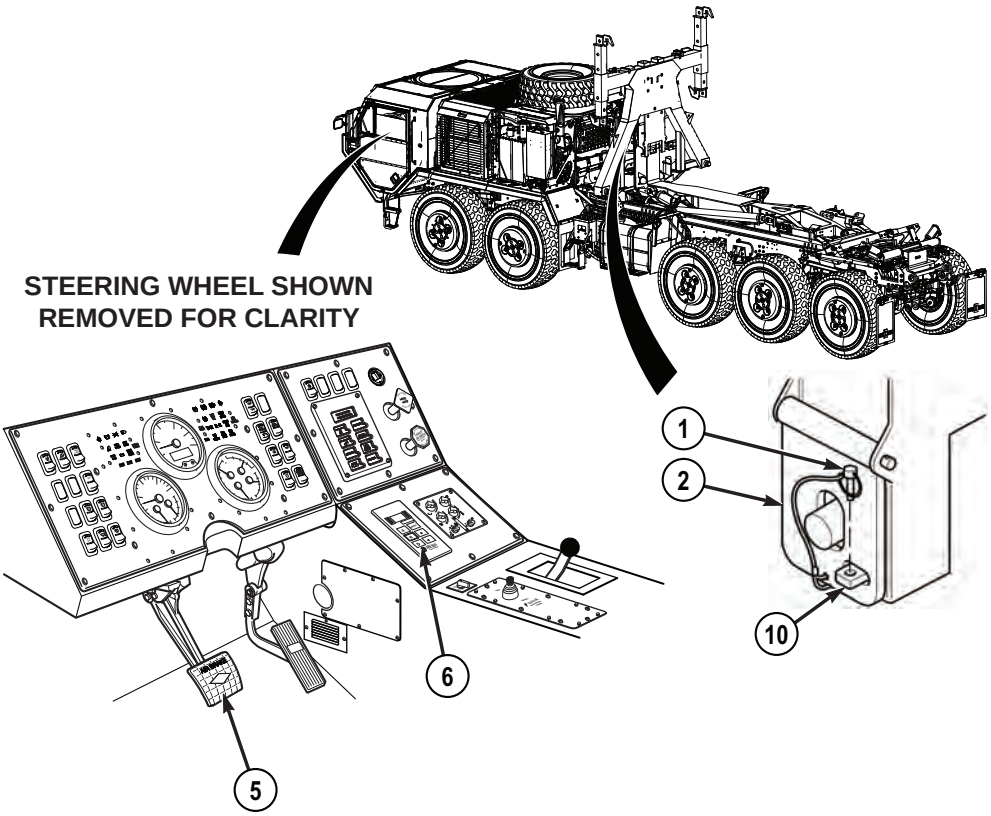


Figure 3.

2. Start engine (WP 0027).
3. Apply service brake pedal (5) and set transmission range selector (6) to (N) Neutral.
4. Turn hydraulic selector switch (7) to AUTO.

LIFTING FRAME IN UNLOCKED POSITION (LOAD AND UNLOAD CONTAINER, INSTALL OR REMOVE LIFTING FRAME FROM LHS) - Continued

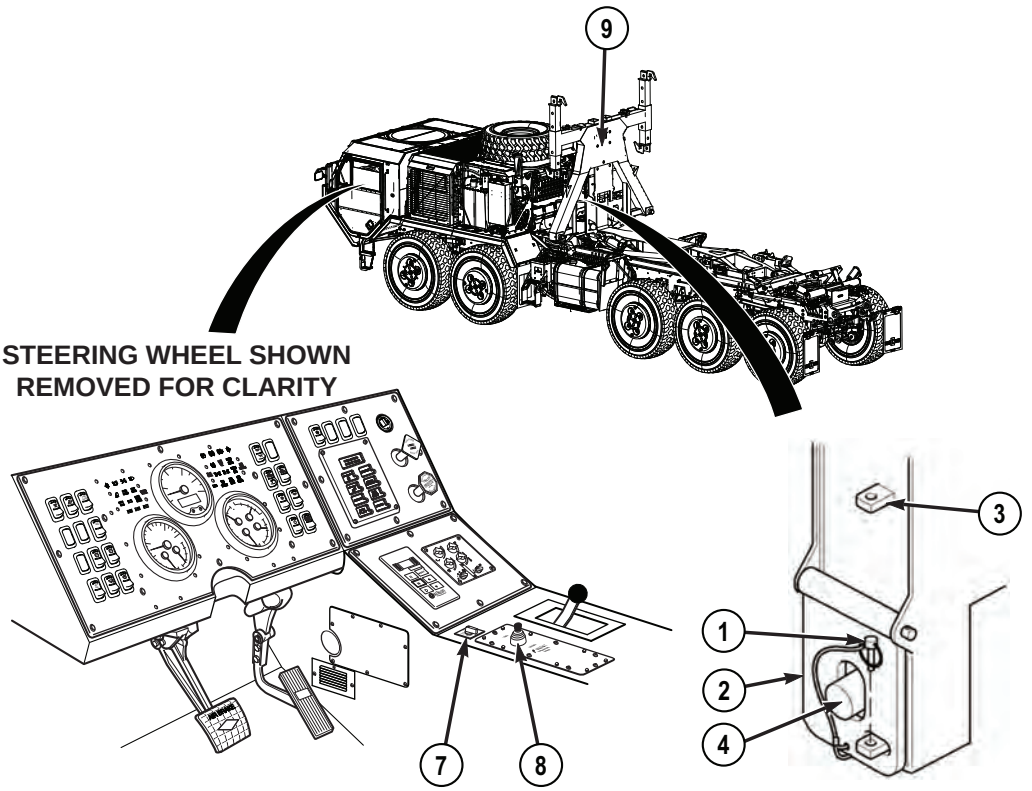


Figure 4.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

5. Move joystick (8) to UNLOAD position, and raise front lift adapter (9) approximately 2.0 in. (50.8 mm).
6. Shut OFF engine. (WP 0037)
7. Rotate locking plate (2) up to disengage LHS hook arm pivot pin (4).
8. Install quick release pin (1) in locking plate (2) and bracket (3).

LIFTING FRAME IN UNLOCKED POSITION (LOAD AND UNLOAD CONTAINER, INSTALL OR REMOVE LIFTING FRAME FROM LHS) - Continued

9. Repeat Steps (1) through (8) for right side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RETURNING PLS VEHICLE TO FLATRACK MODE

INITIAL SETUP:

Not Applicable

PREPARATION FOR FLATRACK MODE

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

WARNING



- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter contacting rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in damage to equipment and injury or death to personnel.
- Front lift adapter must be unloaded on a flat, level surface. Failure to comply may result in injury or death to personnel.

NOTE

Perform Step (1) if lifting frame is in locked position.

1. Position lifting frame (1) in unlocked position (WP 0048).

PREPARATION FOR FLATRACK MODE - Continued

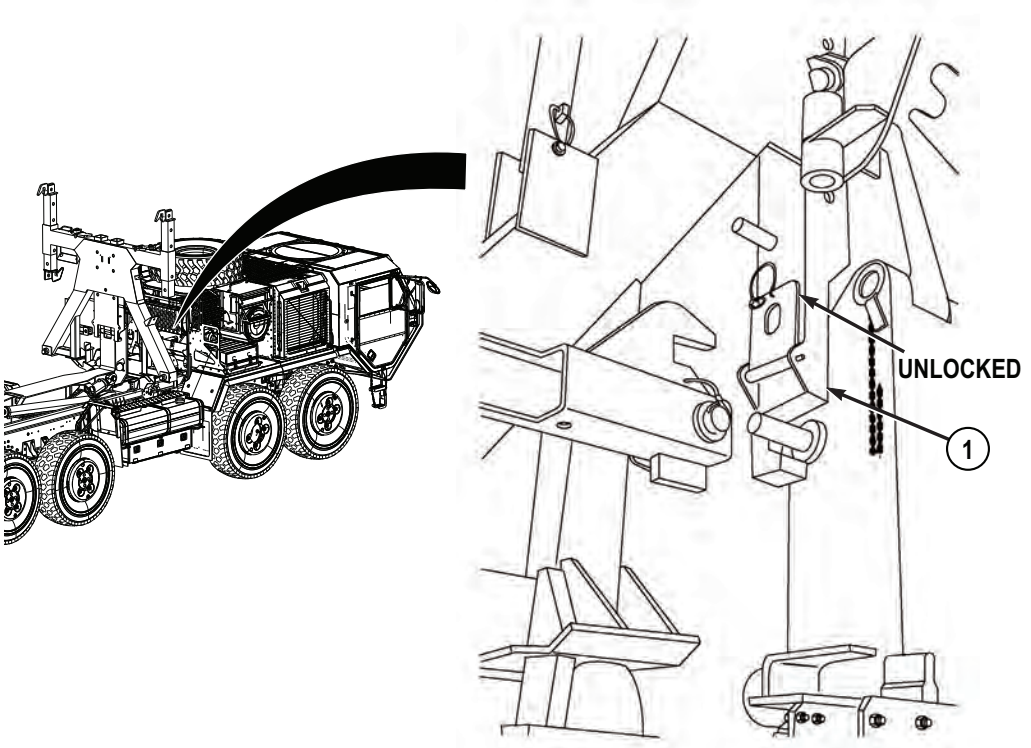


Figure 1.

2. Start engine (WP 0027).
3. Turn hydraulic selector switch (2) to AUTO.

PREPARATION FOR FLATRACK MODE - Continued

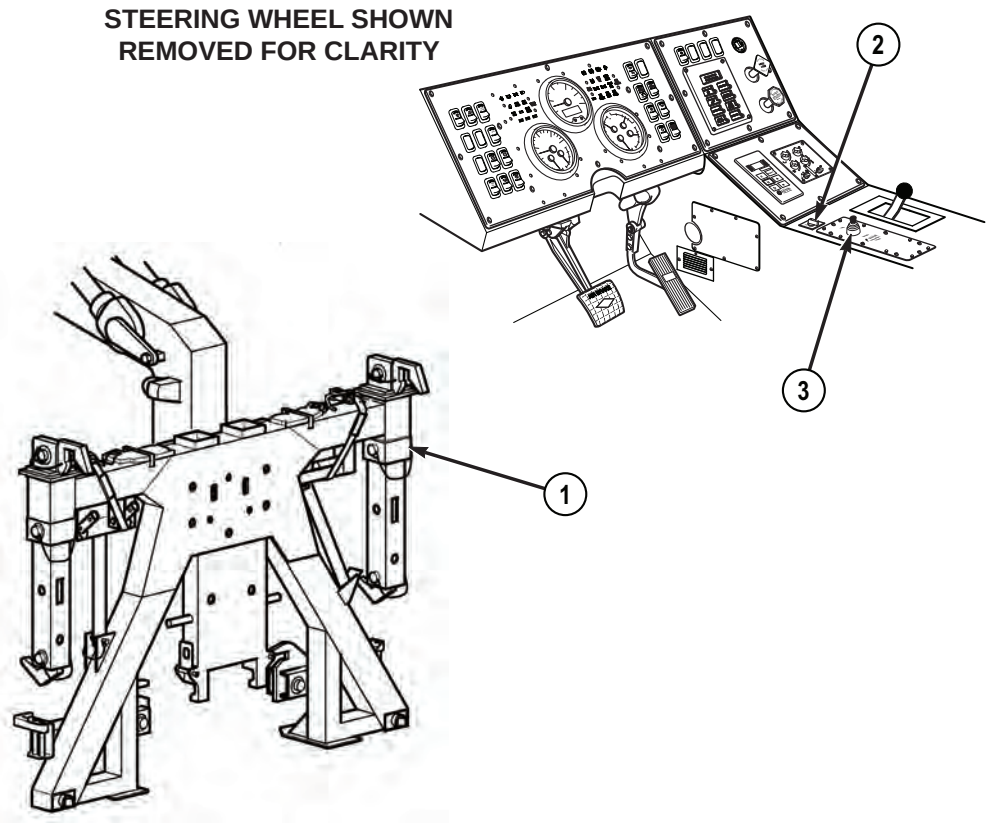


Figure 2.

4. Move joystick (3) to UNLOAD until lifting frame (1) is approximately 12.0 in. (304.8 mm) off of ground.
5. Shut OFF engine (WP 0037).

NOTE

There are two guides and bumper supports on lifting frame. Left side is shown.

6. Remove two lock pins (4), pins (5), and container guide (6) from slider (7).

PREPARATION FOR FLATRACK MODE - Continued

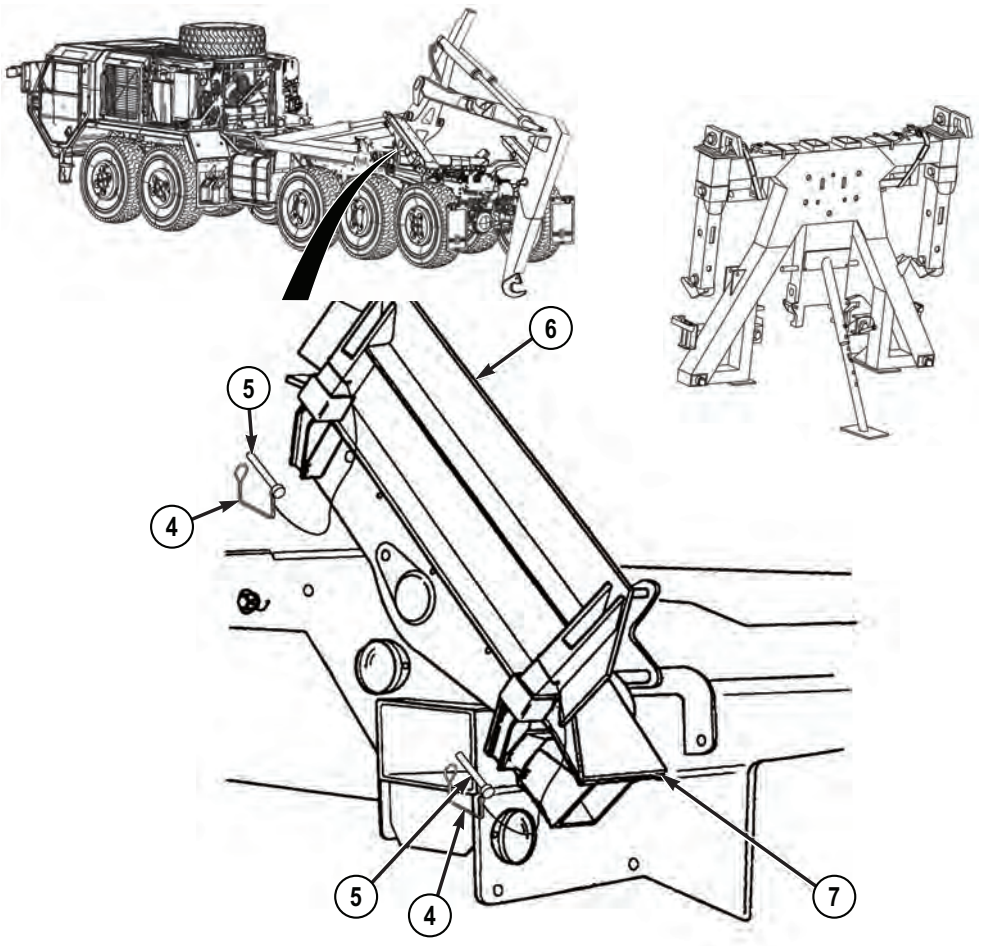


Figure 3.

7. Install two pins (5) and lock pins (4) in container guide (6).
8. Remove lock pin (8) and pin (9) from stowage bracket (10).

PREPARATION FOR FLATRACK MODE - Continued

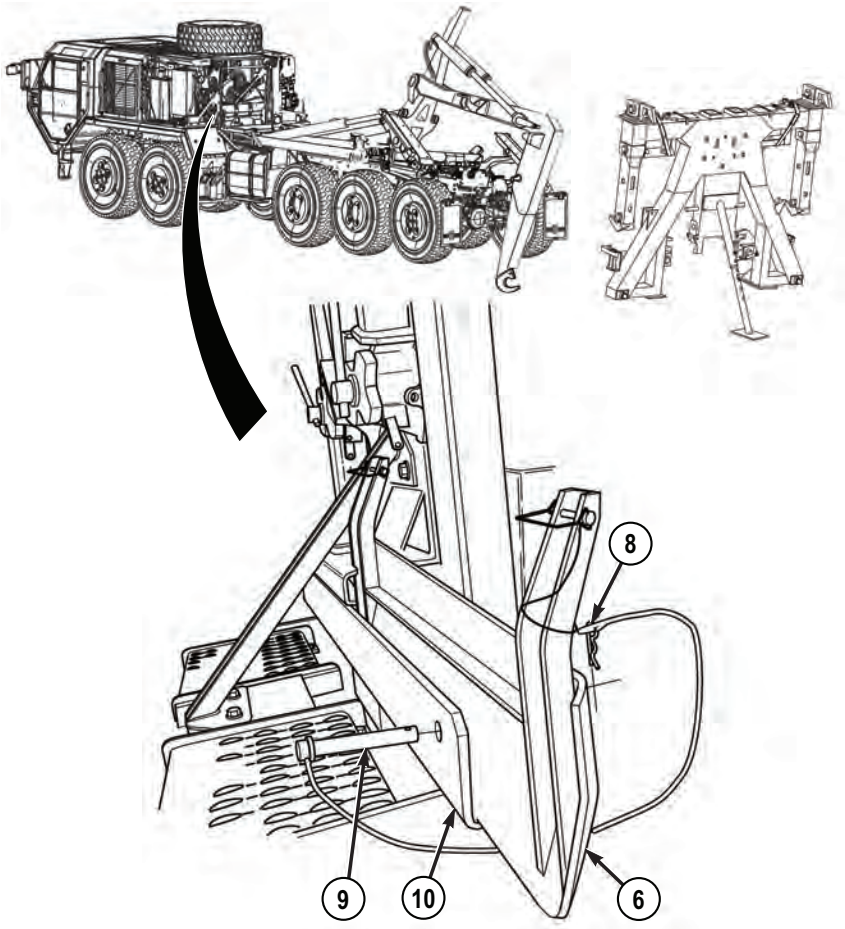


Figure 4.

9. Position container guide (6) in stowage bracket (10) with pin (9) and lock pin (8).

NOTE

Bumper support is in flatrack mode when bumper support is positioned completely over bracket, towards front of vehicle.

10. Remove lock pin (11) from bumper support (12).

PREPARATION FOR FLATRACK MODE - Continued

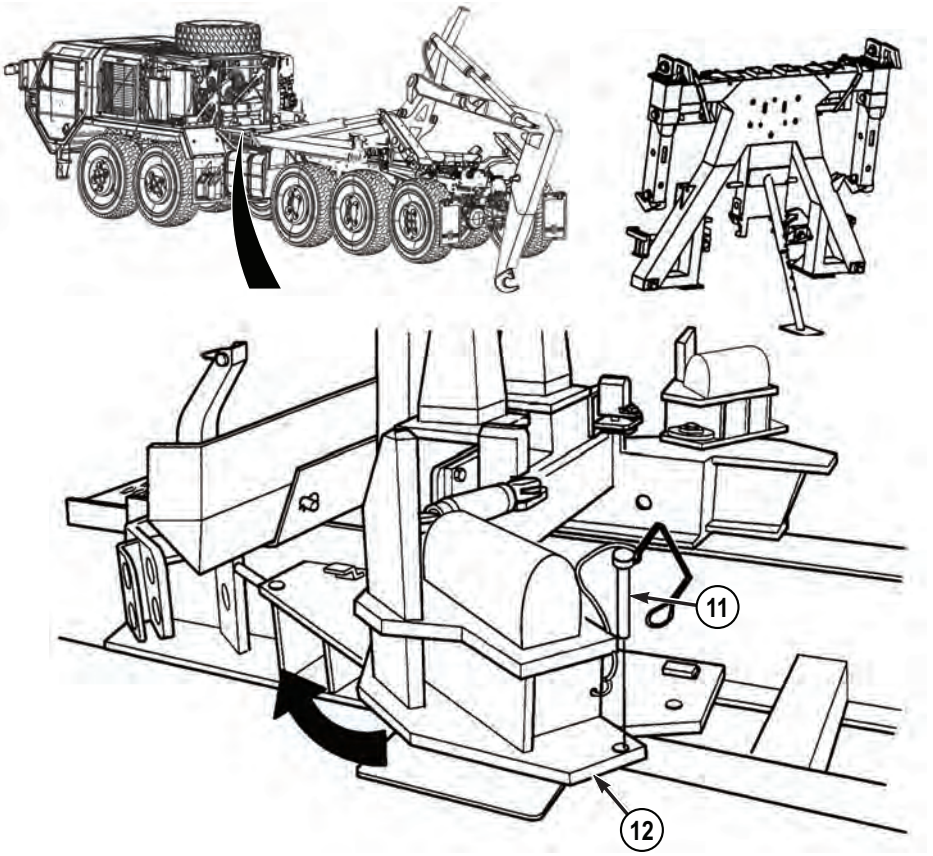


Figure 5.

11. Rotate bumper support (12) approximately 180 degrees towards front of vehicle.
12. Install lock pin (11) in bumper support (12).
13. Repeat Steps (6) through (12) for right side.
14. Remove two lock pins (13) from pins (14) through two lower holes on lifting frame (1).

PREPARATION FOR FLATRACK MODE - Continued

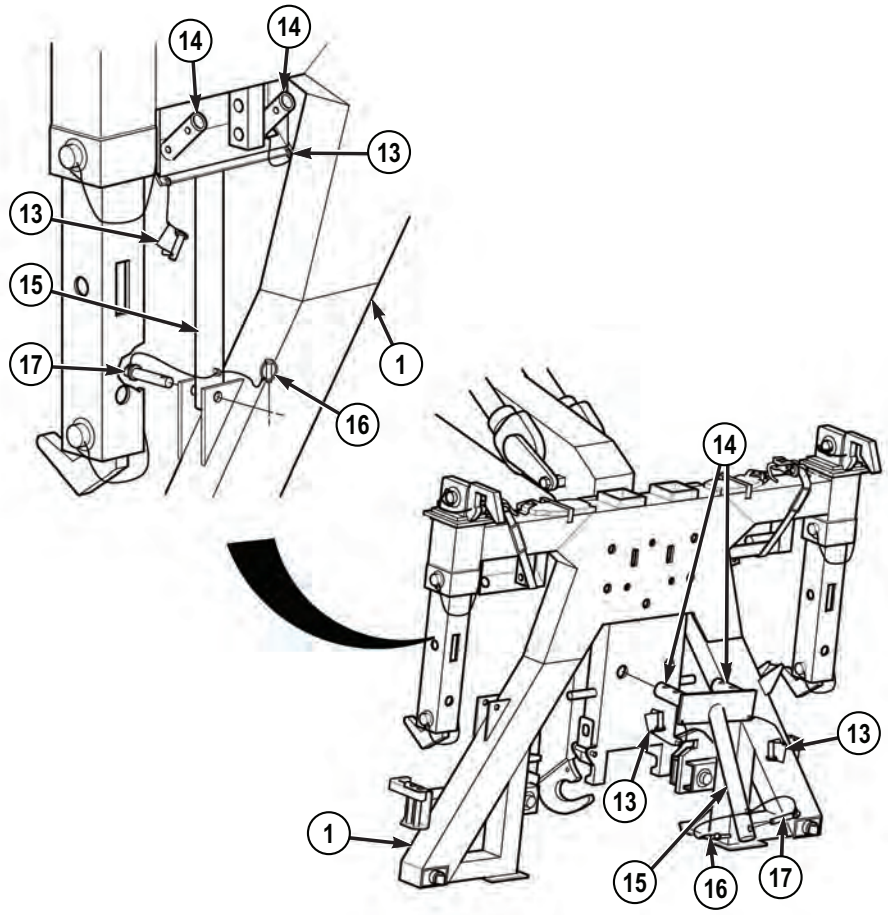


Figure 6.

15. Remove lock pin (16), pin (17), and upper support leg (15) from stowage bracket on lifting frame (1).
16. Position two pins (14) on upper support leg (15) through two lower holes on lifting frame (1).
17. Install two lock pins (13) in pins (14) on upper support leg (15) and front side of lifting frame (1).
18. Remove lock pin (18) and lower support leg (19) from stowage bracket on lifting frame (1).

PREPARATION FOR FLATRACK MODE - Continued

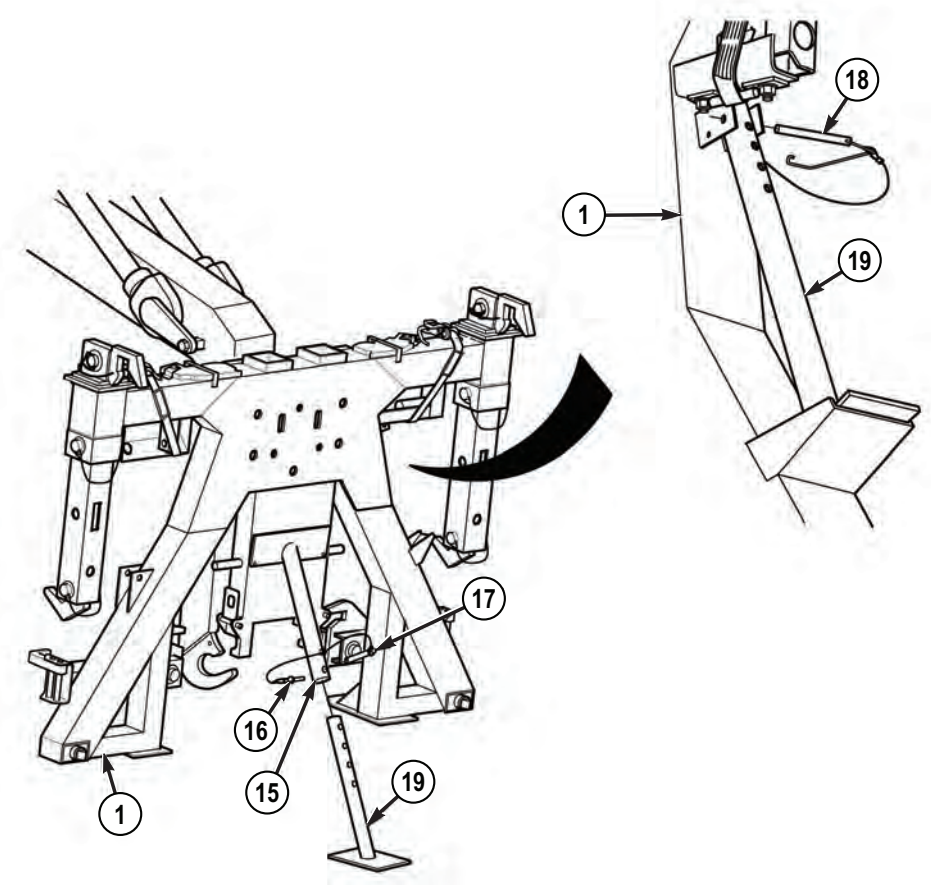


Figure 7.

19. Insert lower support leg (19) into upper support leg (15).

NOTE

Other support leg pin hole positions may be used if ground is uneven.

20. Align hole in upper support leg (15) with second hole from bottom on lower support leg (19) and install pin (17) and lock pin (16).

21. Install lock pin (18) in stowage bracket on lifting frame (1).

PREPARATION FOR FLATRACK MODE - Continued

NOTE

There are two pins and lock pins on slide arm on lifting frame. Right side is shown.

22. Remove lock pin (20) and pin (21) from stow position on lifting frame (1).

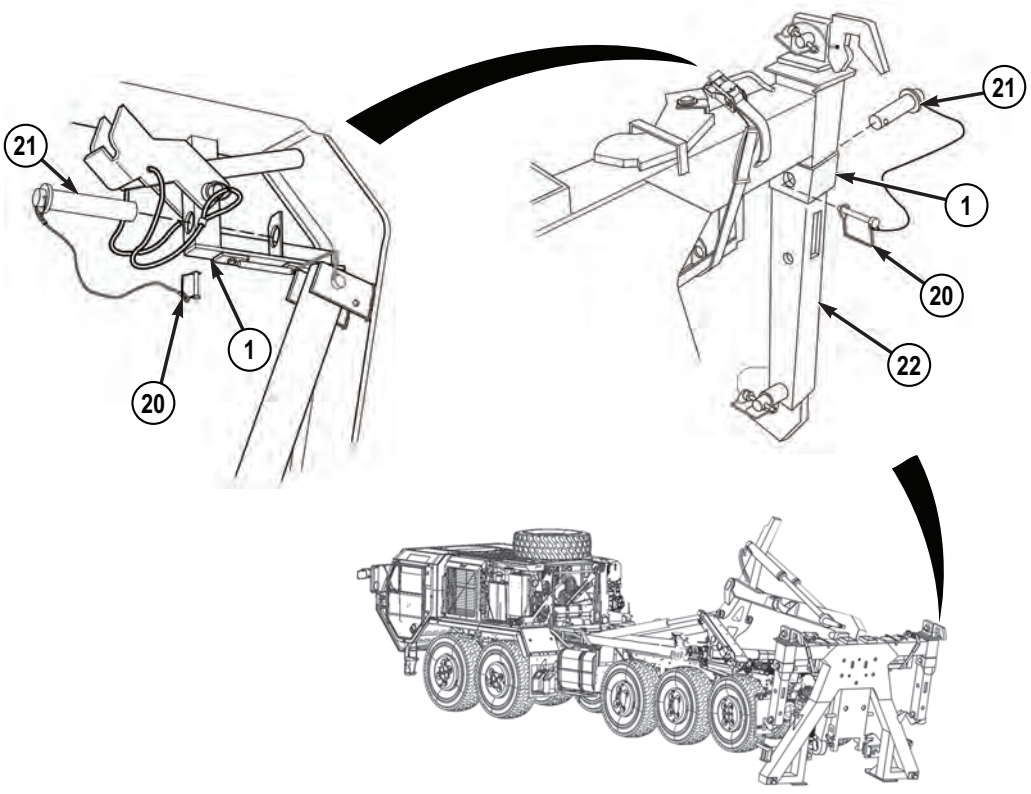


Figure 8.

23. Install pin (21) and lock pin (20) in lifting frame (1) and slide arm (22) in upper hole.
24. Repeat Steps (22) and (23) for left side.
25. Remove lock pin (23), pin (24), and bail bar lock (25) from hook (26).

PREPARATION FOR FLATRACK MODE - Continued

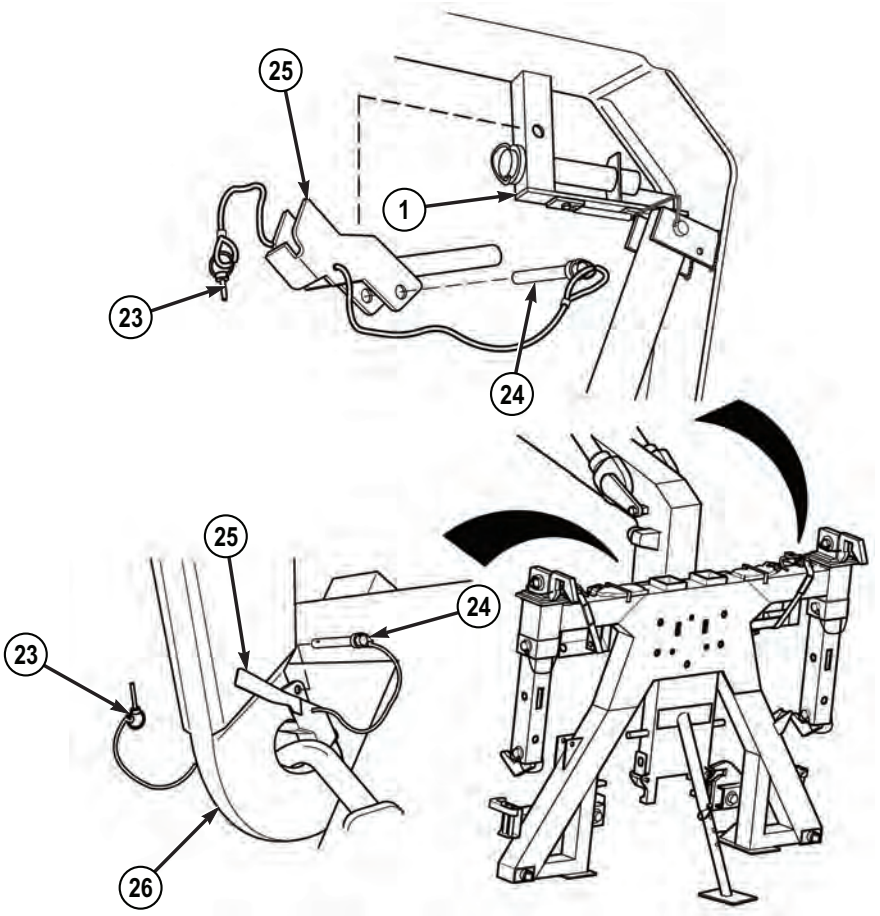


Figure 9.

26. Install bail bar lock (25), pin (24), and lock pin (23) in stowage bracket on lifting frame (1).

NOTE

- To disengage LHS hook from lifting frame hook it may be necessary to cycle LHS to unload after driving ahead slightly.
- If ground is soft, jacking plate from vehicle BII or similar item may be positioned under support leg pad to prevent lifting frame from sinking into ground.

27. Start engine (WP 0027).

PREPARATION FOR FLATRACK MODE - Continued

28. Move joystick (3) to UNLOAD until LHS stops and hook (26) is below lifting frame hook bar (27).

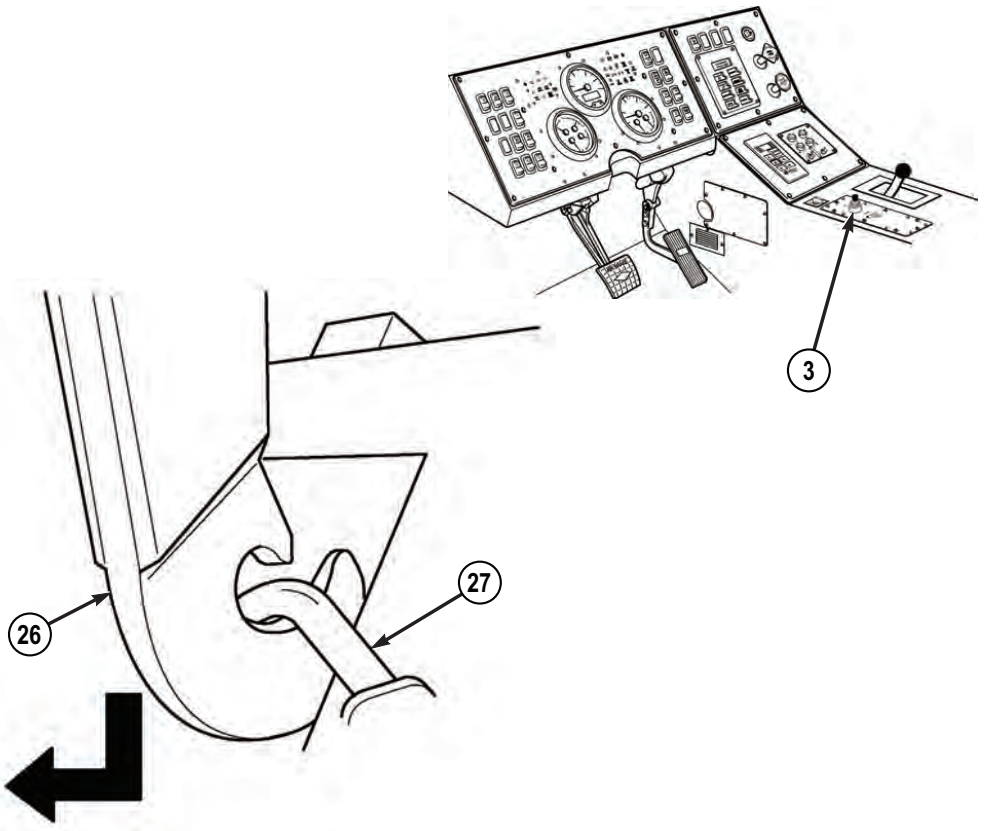


Figure 10.

29. Drive vehicle ahead approximately 12.0 in. (304.8 mm).
30. Shut OFF engine (WP 0037).

NOTE

There are two rear container locks on lifting frame. Left side is shown.

31. Remove lock pin (28) and pin (29) from slider (7) and rear container lock (30).

PREPARATION FOR FLATRACK MODE - Continued

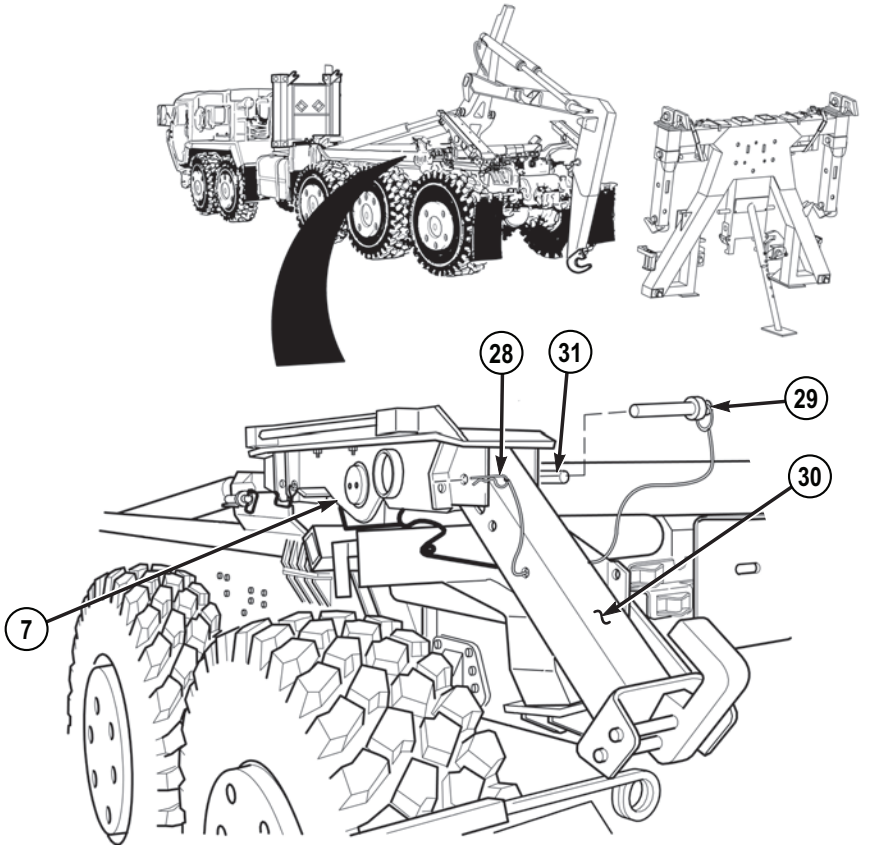


Figure 11.

32. Support rear container lock (30) and turn handle (31) on slider (7) forward to unlocked position.
33. Remove rear container lock (30) from slider (7).
34. Install rear container lock (30), pin (29), and lock pin (28) in stowage bracket on lifting frame (1).

PREPARATION FOR FLATRACK MODE - Continued

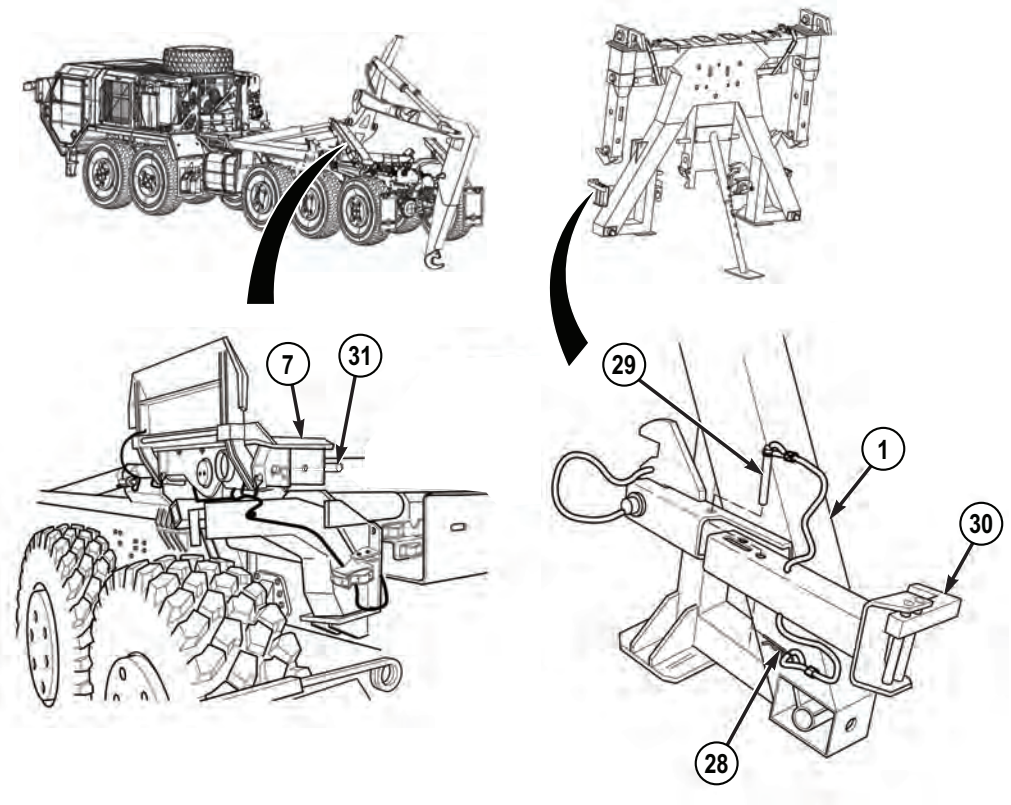


Figure 12.

35. Turn handle (31) on slider (7) back to locked position.
36. Repeat Steps (31) through (35) for right side.

NOTE

There are two strut and slider assemblies on PLS vehicle. Left side is shown.

37. Remove lock pin (32) and pin (33) from short strut (34) and long strut (35).

PREPARATION FOR FLATRACK MODE - Continued

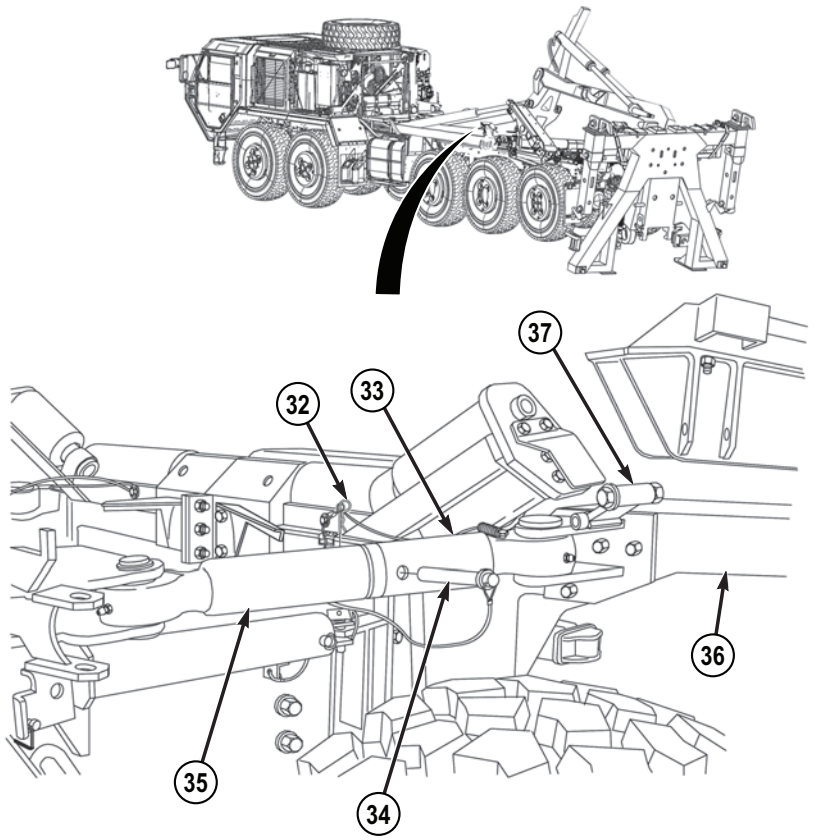


Figure 13.

38. Rotate slider arm (36) with handle outward to separate short strut (34) and long strut (35).
39. Position flip lock (37) up to hold slider arm (36) out.
40. Release slider arm (36).
41. Position long strut (35) on stowage bracket (38) and install pin (33) and lock pin (32).

PREPARATION FOR FLATRACK MODE - Continued

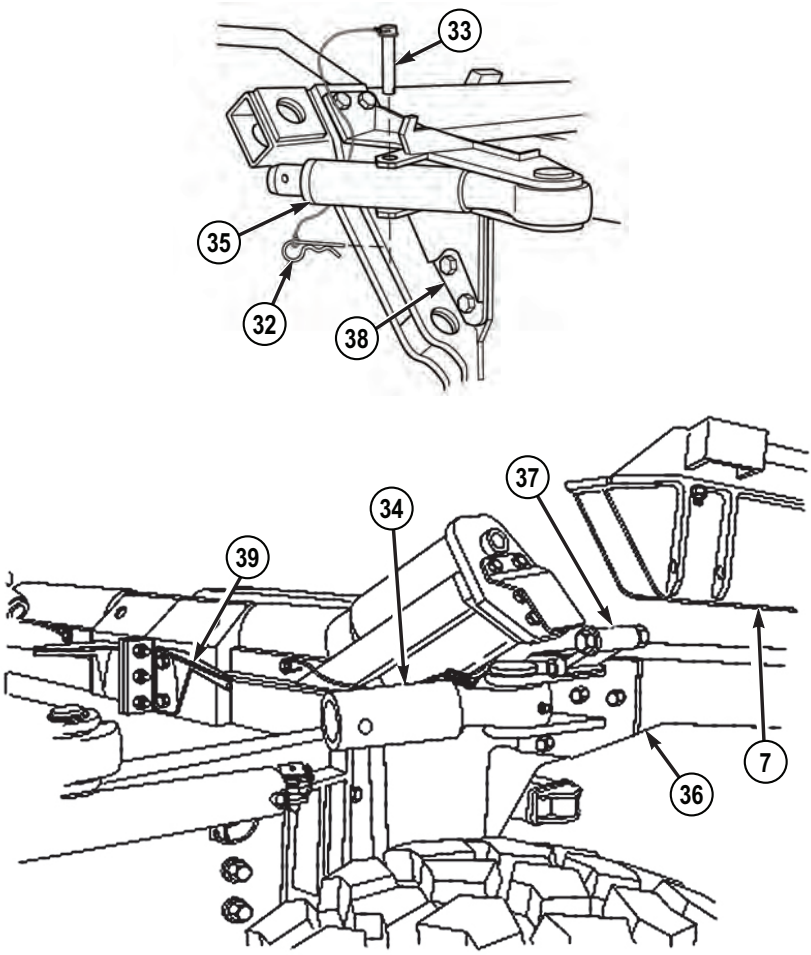


Figure 14.

42. Rotate slider arm (36) with handle outward and disengage flip lock (37) by rotating it down.

43. Rotate slider arm (36) forward and front of slider (7) down and position short strut (34) on stow plate (39).

44. Pull down pivot lock pin handle (40), lift rear of slider (7) and rotate front of slider over retaining plate (41) until pivot lock pins lock.

PREPARATION FOR FLATRACK MODE - Continued

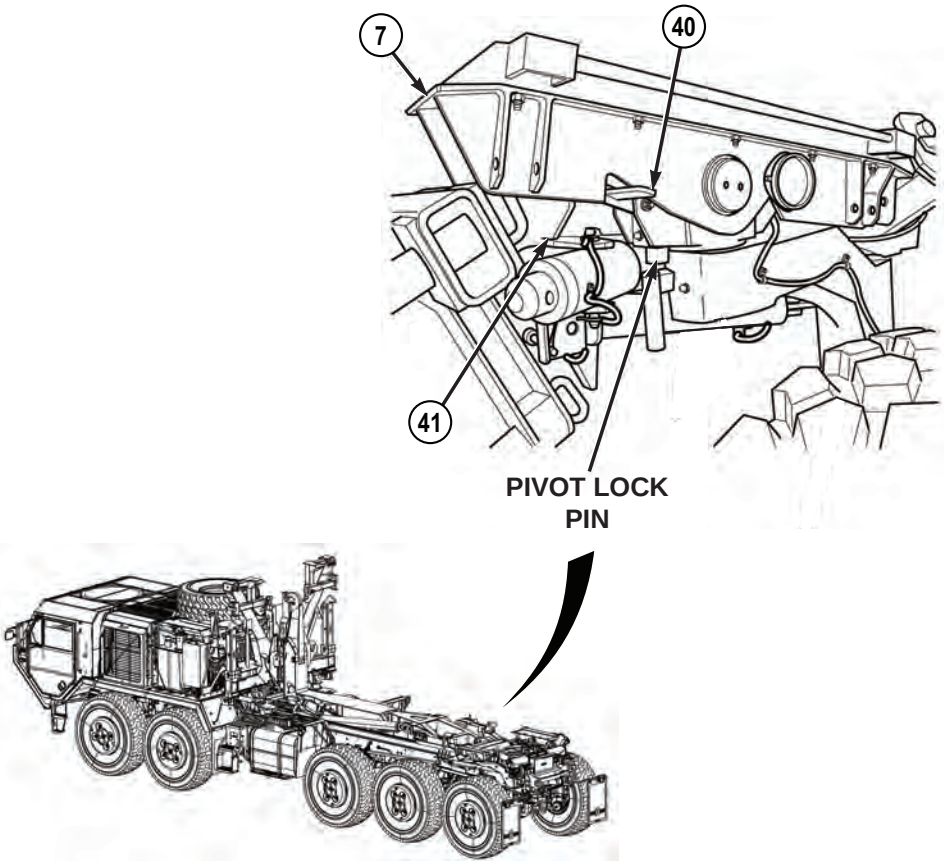


Figure 15.

WARNING



Do not to hold on to front of slider when stowing. Hands and fingers may be pinched between front of slider and hard lift bracket. Failure to comply may result in injury or death to personnel.

PREPARATION FOR FLATRACK MODE - Continued

NOTE

- Rear of slider may have to be pulled out slightly to position front of slider on retaining bracket.
- Pivot lock pins may not lock if lock pin receptacle is full of debris. If this occurs, remove debris and lubricate lock pin and lock pin fitting.

45. Release pivot lock pin handle (40).
46. Repeat Steps (37) through (45) for right side.

NOTE

There are two flipper bracket lock plates on lifting frame. Left side is shown.

47. Lift pin handle (42) and release pin (43).

PREPARATION FOR FLATRACK MODE - Continued

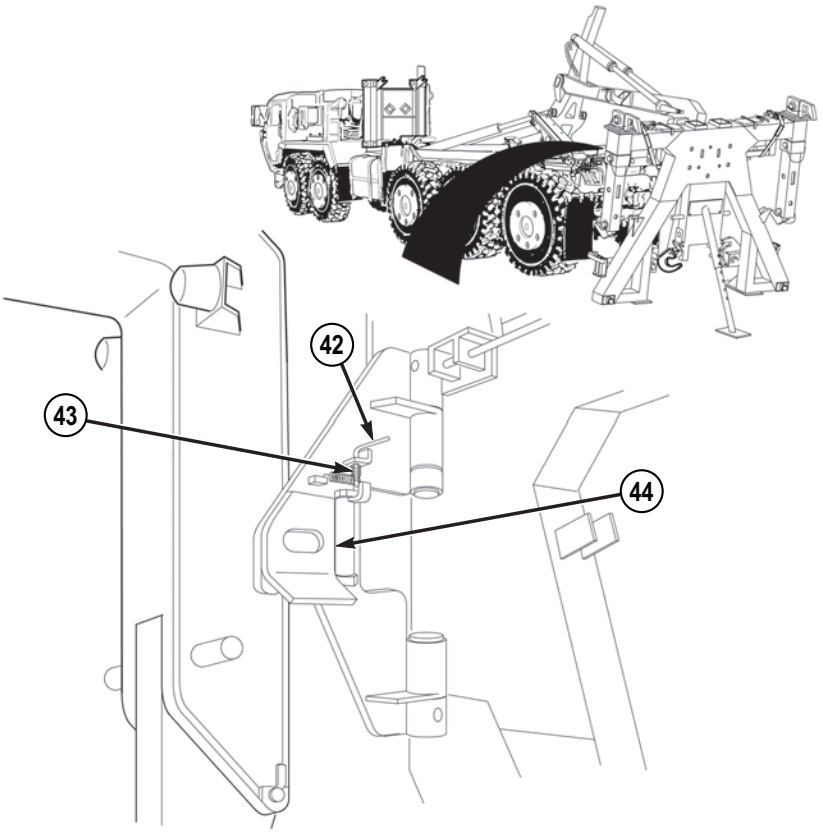


Figure 16.

48. Rotate pin handle (42) towards lifting frame to unlocked position and secure pin handle in detent.
49. Ensure flipper bracket lock plate (44) moves freely.
50. Repeat Steps (47) through (49) for right side.

PREPARATION FOR FLATRACK MODE - Continued

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

WARNING



Ensure front lift adapter is free of snow, ice, and mud when installing on LHS. Front lift adapter may be unbalanced. Failure to comply may result in injury or death to personnel.

NOTE

For detailed instructions on how to operate the LHS on the vehicle, refer to Load Handling System (LHS) (WP 0042).

51. Start engine (WP 0027).
52. Move joystick (3) to UNLOAD until LHS stops and pivot pin (45) is below flipper bracket (46) and flipper bracket lock plate (44) on lifting frame (1).

PREPARATION FOR FLATRACK MODE - Continued

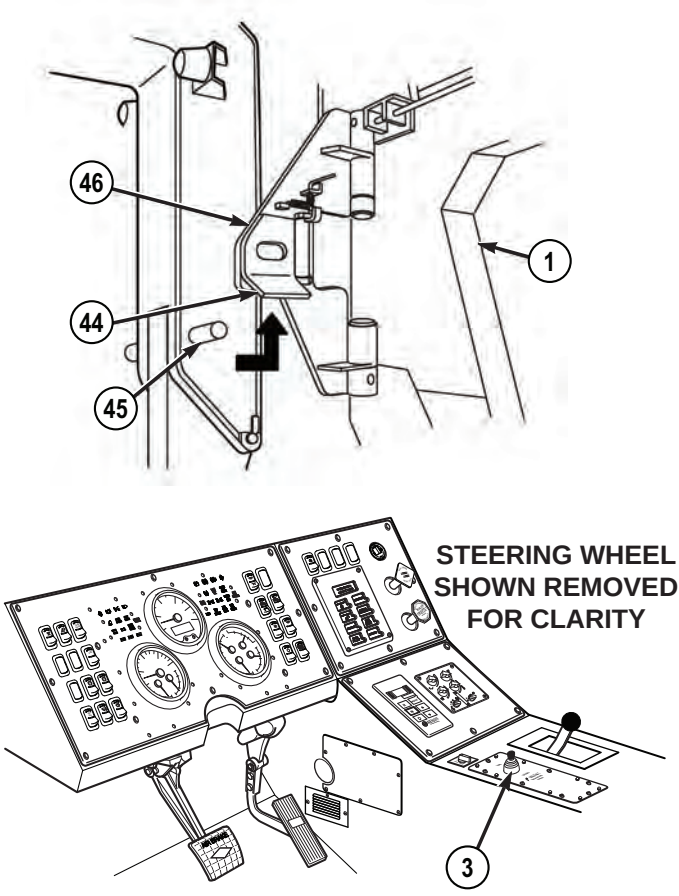


Figure 17.

53. Back up vehicle until HA contacts lifting frame (1), and pivot pin (45) is directly below flipper bracket (46) and flipper bracket lock plate (44).

PREPARATION FOR FLATRACK MODE - Continued

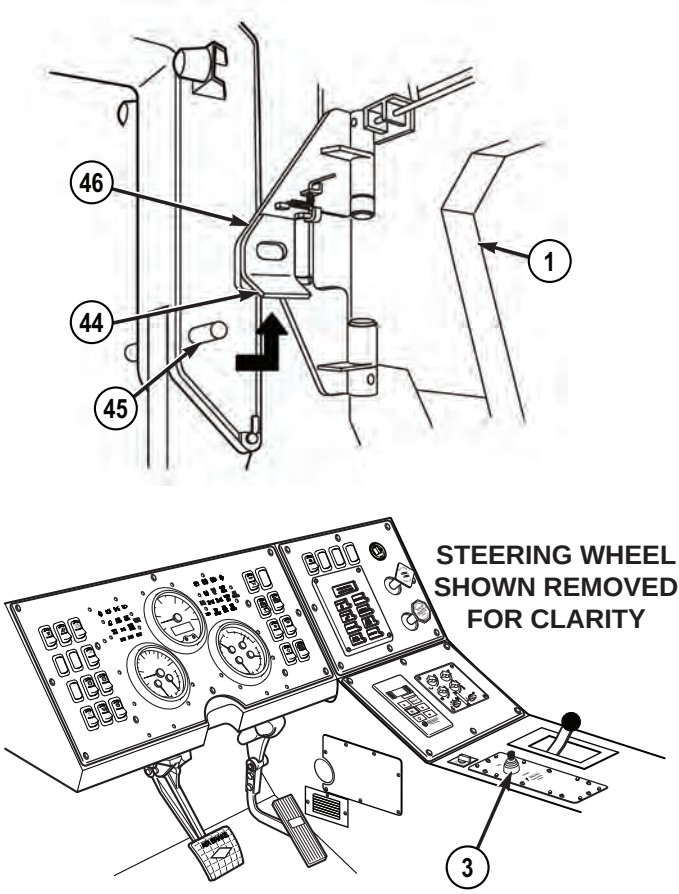


Figure 18.

54. Move joystick (3) to LOAD and raise pivot pin (45) in flipper bracket (46) and flipper bracket lock plate (44) on lifting frame (1).
55. Raise lifting frame (1) approximately 12.0 in. (304.8 mm) off of ground.
56. Shut OFF engine (WP 0037).

PREPARATION FOR FLATRACK MODE - Continued

WARNING



Front lift adapter must be properly secured to HA pivot pin.

57. Verify lifting frame is secure and flipper bracket lock plate (44) is locked onto pivot pin (45). If necessary, repeat Steps (52) through (56).

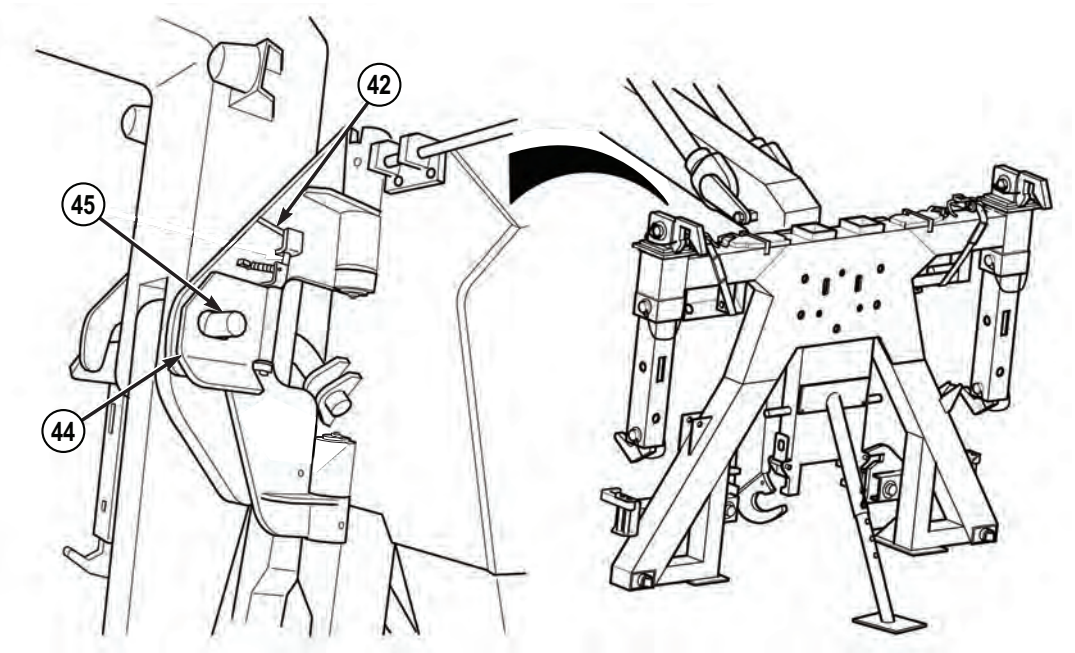


Figure 19.

NOTE

There are two flipper bracket lock plates. Left side shown.

58. Lift pin handle (42).

59. Rotate pin handle (42) into locked position and release pin handle.

60. Ensure flipper bracket lock plate (44) is positioned over pivot pin (45) and pin handle (42) is locked.

PREPARATION FOR FLATRACK MODE - Continued

61. Repeat Steps (58) through (60) for right side.
62. Remove lock pin (18) from stowage bracket on lifting frame (1).

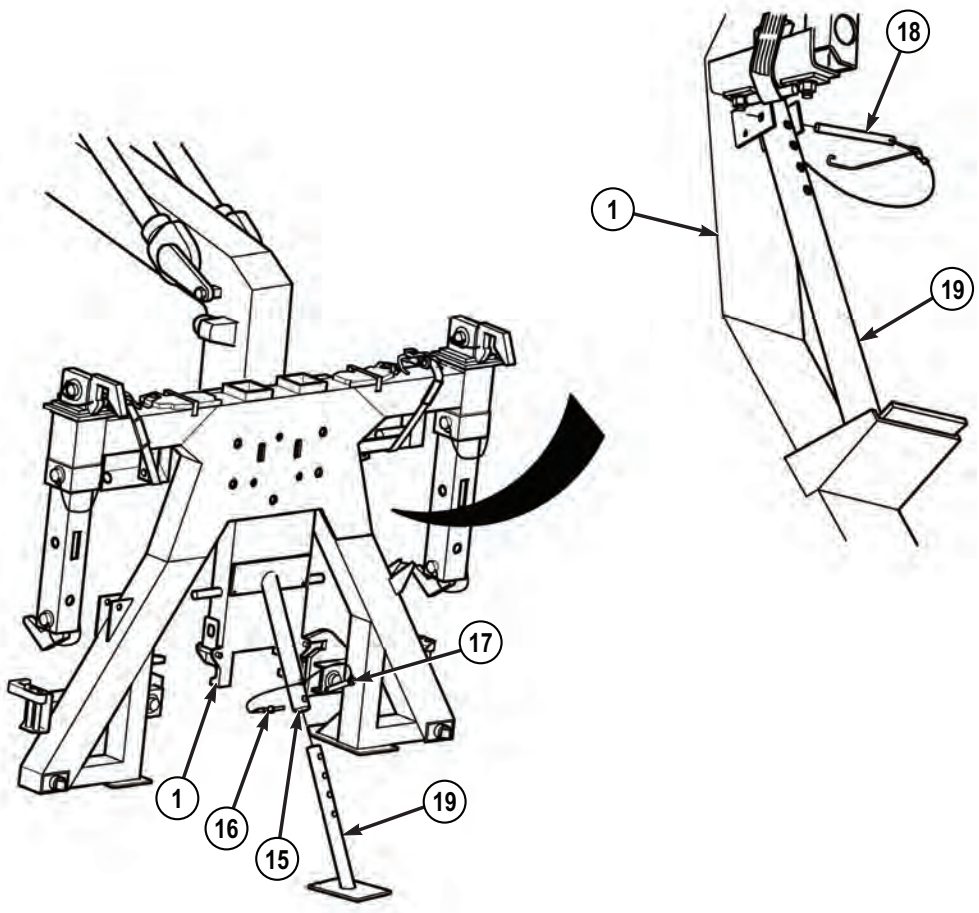


Figure 20.

63. Support lower support leg (19) and remove lock pin (16) and pin (17).
64. Remove lower support leg (19) from upper support leg (15).
65. Position lower support leg (19) in stowage bracket on lifting frame (1) and install lock pin (18).
66. Support upper support leg (15) and remove two lock pins (13) from pins (14).

PREPARATION FOR FLATRACK MODE - Continued

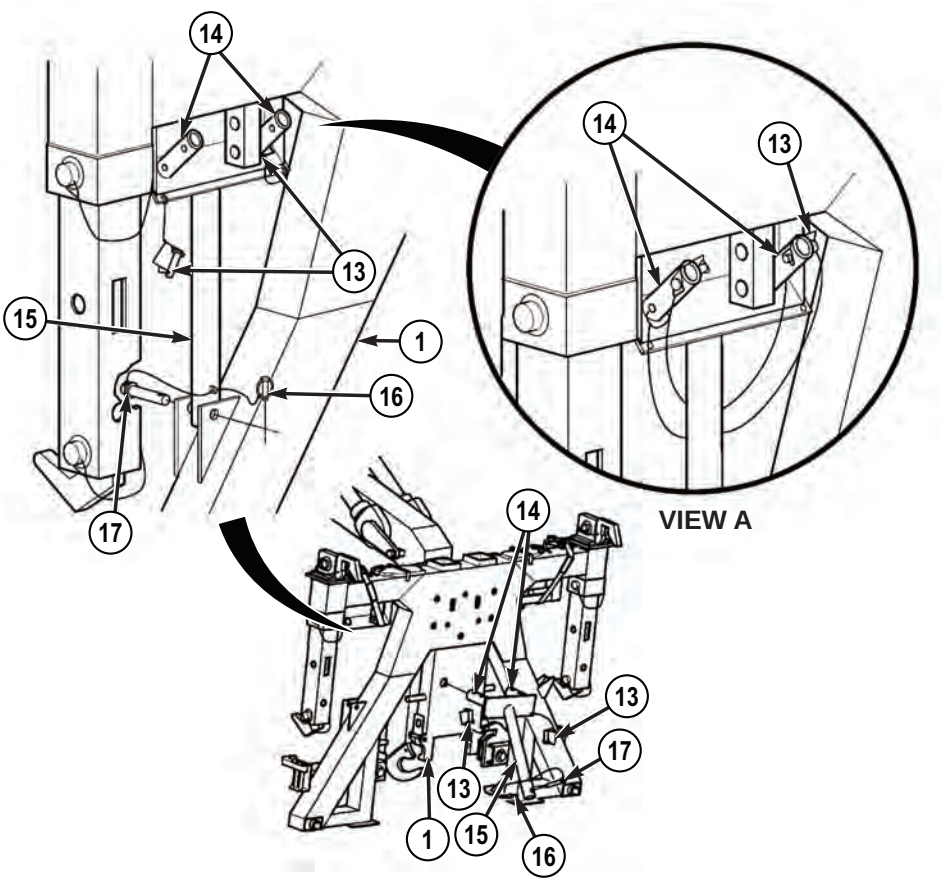


Figure 21.

67. Remove upper support leg (15) from lifting frame (1).

68. Position upper support leg (15) in stowage bracket on lifting frame (1) and install two lock pins (13) on pins (14). Criss-cross tethers by routing lower right lock pin to upper left hole in upper strut and lower left lock pin to upper right hole in upper strut, as shown in View A.

CAUTION

Ensure tethers of two lock pins installed in Step (68) route behind upper support leg and are installed on opposite pins. Failure to comply may allow tethers to catch on lift hook, causing damage to equipment.

PREPARATION FOR FLATRACK MODE - Continued

69. Install pin (17) and lock pin (16) on upper support leg (15) and stowage bracket on lifting frame (1).

WARNING



- Flipper bracket and flipper lock plate must be properly locked to pivot pin before operating LHS to stow front lift adapter. Failure to comply could cause front lift adapter to become unhooked. Failure to comply may result in injury or death to personnel.
- Before stowing front lift adapter on vehicle, ensure paddles are rotated to engage position, bumper support rotated forward, slide arms stowed and rear container locks are stowed on front lift adapter. Failure to comply may result in injury or death to personnel.

NOTE

- Paddles are properly positioned when air cylinders are fully extended and paddles face towards front of vehicle.
- Ensure paddles are properly positioned to engage lifting frame.

70. Operate air controls (47) to rotate paddles (48) to engaged position.

PREPARATION FOR FLATRACK MODE - Continued

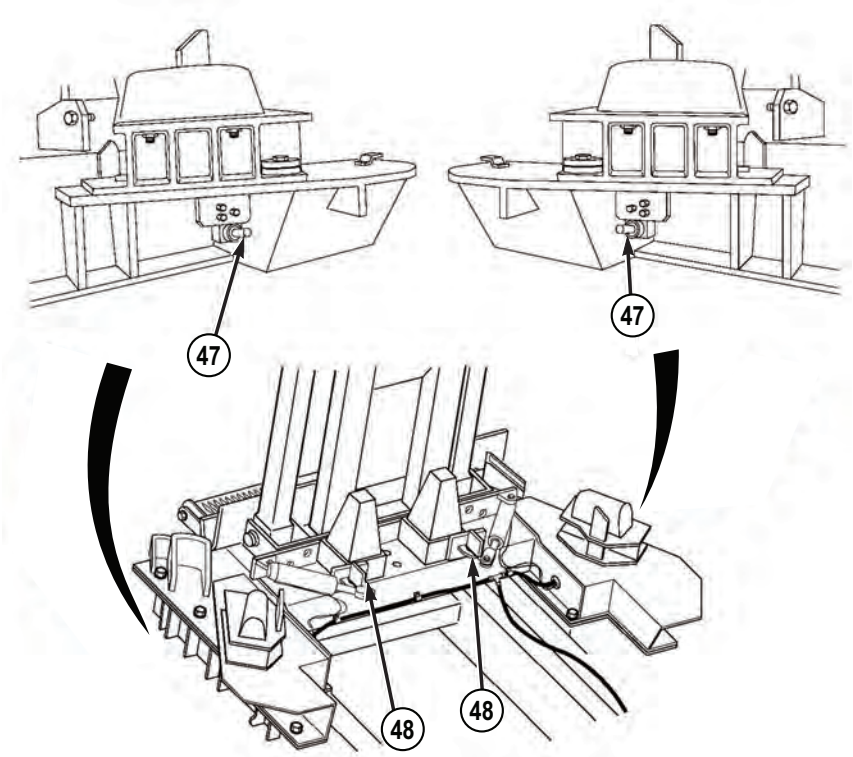


Figure 22.

71. Start engine (WP 0027).
72. Move joystick (3) to LOAD and stow lifting frame (1) on cone weldments (49).

PREPARATION FOR FLATRACK MODE - Continued

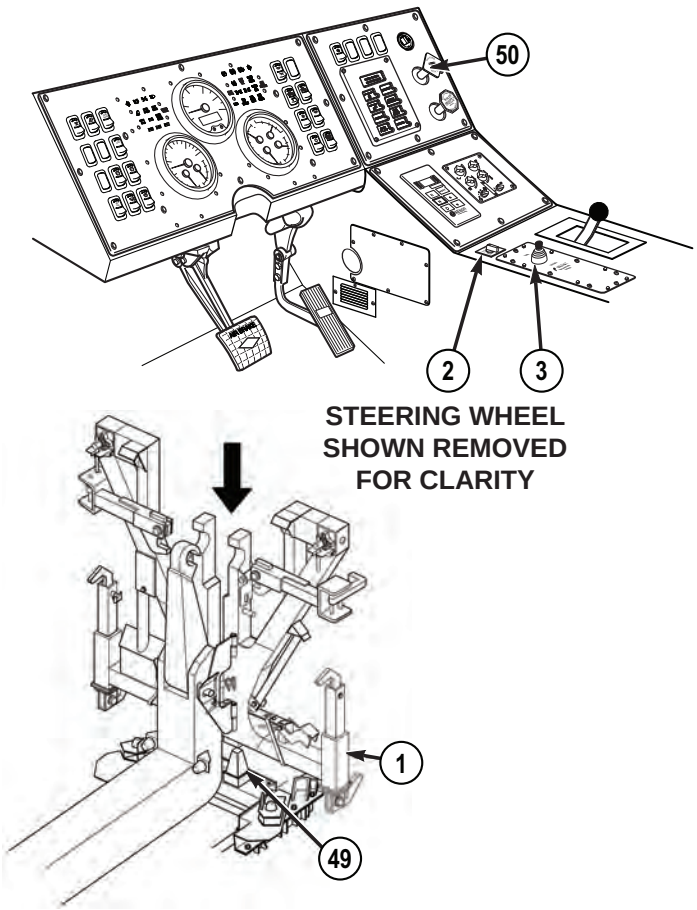


Figure 23.

73. Turn hydraulic selector switch (2) to OFF.
74. Shut OFF engine (WP 0037).
75. Pull out parking brake knob (50) to apply parking brakes.

NOTE

There are two flipper lock assemblies and straps on lifting frame. Left side is shown.

76. Pull flipper lock handle (51) out and push air valve lever (47) down to rotate flipper bracket (46) and flipper bracket lock plate (44) off of pivot pin (45).

PREPARATION FOR FLATRACK MODE - Continued

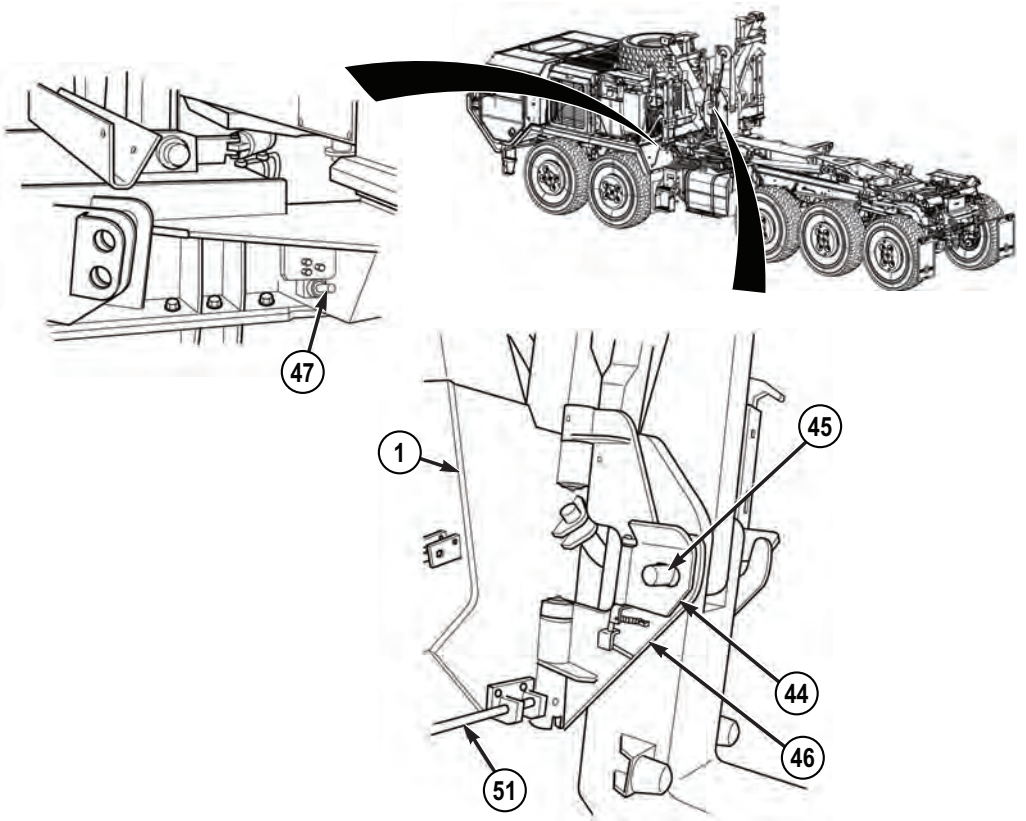


Figure 24.

77. Release flipper lock handle (51).
78. Ensure flipper bracket (46) is positioned against lifting frame (1) away from pivot pin (45).
79. Ensure flipper lock pin is engaged in flipper bracket (46).
80. Position hook of strap (52) on rod of front support assembly (53) and tighten strap.

PREPARATION FOR FLATRACK MODE - Continued

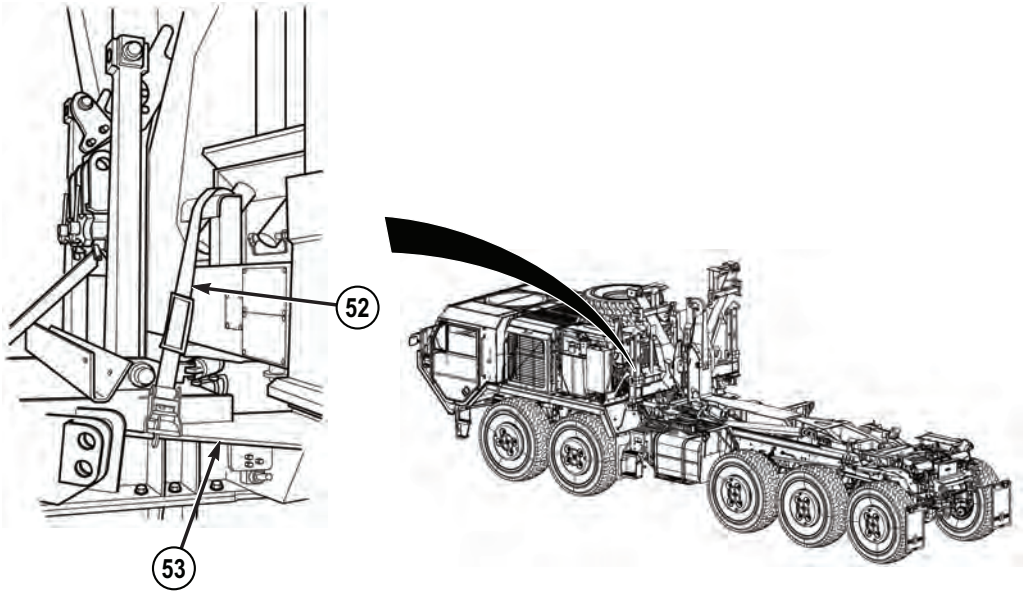


Figure 25.

81. Repeat Steps (76) through (80) for right side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RAIL TRANSPORT

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

RAIL TRANSPORT STRUT INSTALLATION

NOTE

- Ensure ISO lower corner castings are free of dirt and debris.
- Driver and passenger side ISO corner locks are installed the same way. Passenger side shown.
- Ensure container is fully loaded on vehicle and rear container locks are opened, refer to;
- 48 in. (1219.2 mm) tall container (WP 0047).
- 51 in. (1295.4 mm) tall container (WP 0046).
- 72 in. (1828.8 mm) tall container (WP 0045).
- 82 in. (2082.8 mm) or taller container (WP 0044).

1. Remove lock pin (1) from bracket (2) and lift tab (3) to unlock handle (4).

RAIL TRANSPORT STRUT INSTALLATION - Continued

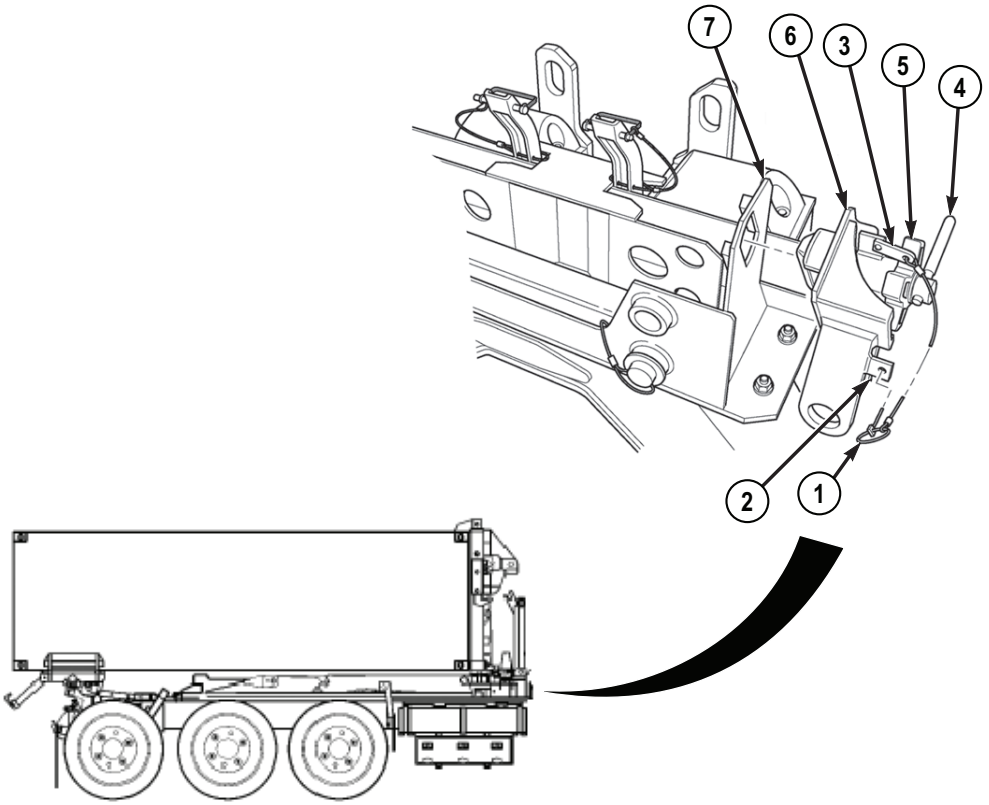


Figure 1.

2. Loosen handnut (5), rotate lock handle (4) 90 degrees, and remove ISO corner lock (6) from stowage bracket (7).
3. Position ISO corner lock (6) in front bottom corner casting (8) of ISO container (9).

RAIL TRANSPORT STRUT INSTALLATION - Continued

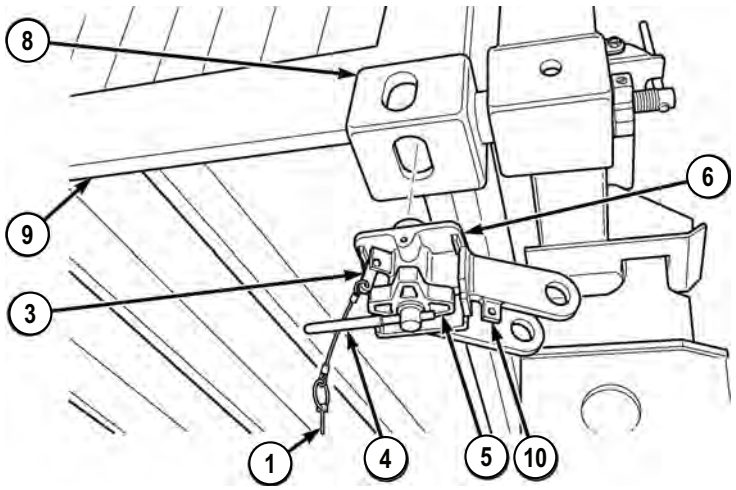


Figure 2.

NOTE

ISO corner lock handle will point toward front or rear of vehicle when in locked.

4. Rotate lock handle (4) 90 degrees to locked and tighten handnut (5).
5. Rotate tab (3) down to lock handnut (5) and install lock pin (1) in bracket (10).

WARNING



Rail transport struts each weigh 60 lbs (27 kg). Do not attempt to lift or move rail transport struts without the aid of an assistant. Failure to comply may result in injury or death to personnel.

6. With the aid of an assistant, remove two lock pins (11), pins (12), and rail transport strut (13) from stowage bracket (7).

RAIL TRANSPORT STRUT INSTALLATION - Continued

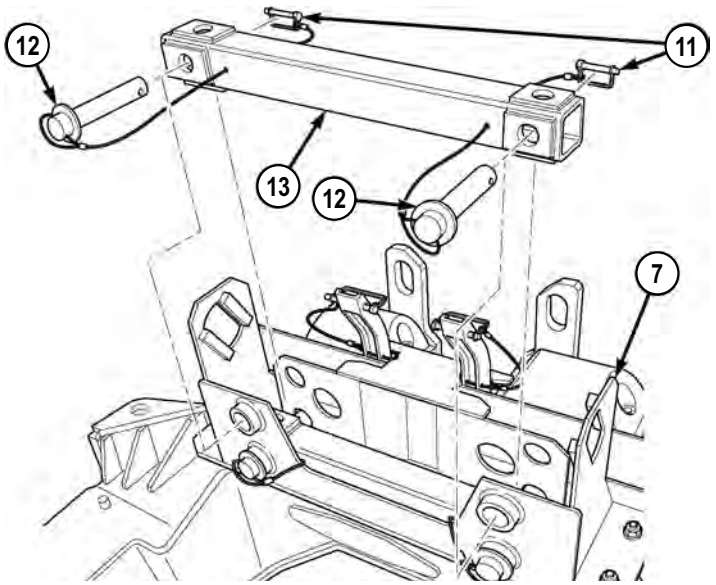


Figure 3.

NOTE

- There are two different rail transport strut lengths: one stenciled "L" for longer hole placement, and another stenciled "S" for shorter hole placement.
- Depending on which length is required, align with correct hole on front container support.
- ISO corner lock may have to be loosened and reed to install pins.

7. Align rail transport strut (13) between front container support (14) and ISO corner lock (6).

RAIL TRANSPORT STRUT INSTALLATION - Continued

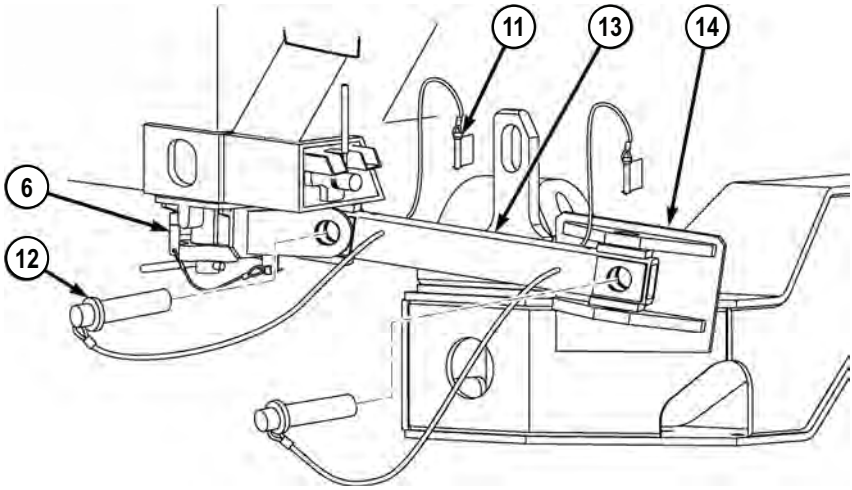


Figure 4.

8. Install rail transport strut (13) to ISO corner lock (6) with pin (12) and lock pin (11).

NOTE

It may be necessary to rotate rail transport strut 90 degrees to align holes.

9. Align rail transport strut (13) with either hole on front container support (14).

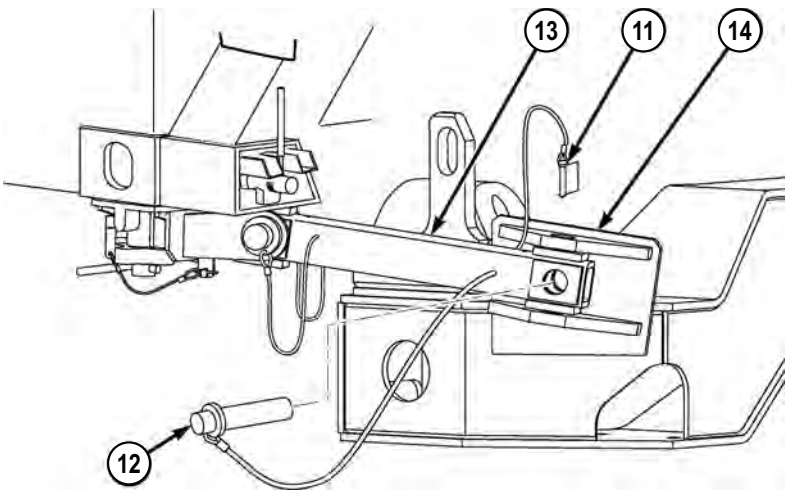


Figure 5.

RAIL TRANSPORT STRUT INSTALLATION - Continued

10. Install pin (12) and lock pin (11) in rail transport strut (13) and front container support (14).
11. Repeat Steps (1) through (10) for driver side.

END OF TASK

RAIL TRANSPORT STRUT REMOVAL

NOTE

Driver and passenger side ISO corner locks are removed the same way. Passenger side shown.

1. Support rail transport strut (1) and remove lock pin (2) and pin (3).

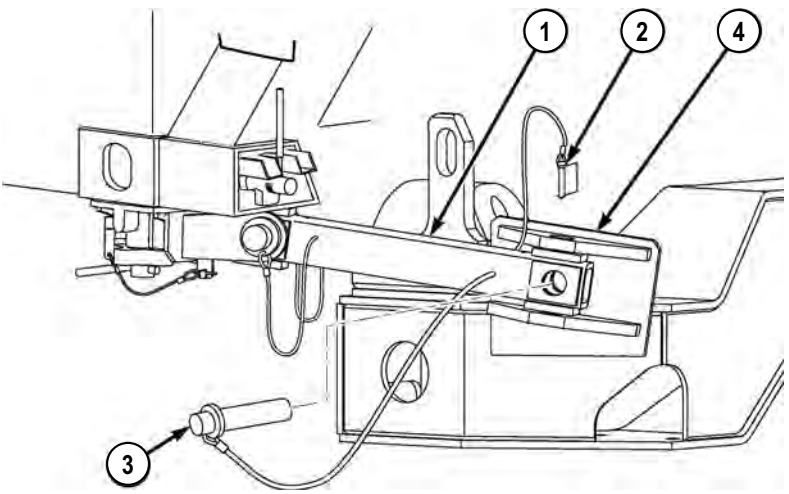


Figure 6.

WARNING



Rail transport struts each weigh 60 lbs (27 kg). Do not attempt to lift or move rail transport struts without the aid of an assistant. Failure to comply may result in injury or death to personnel.

RAIL TRANSPORT STRUT REMOVAL - Continued

2. With the aid of an assistant, remove lock pin (2), pin (3), and rail transport strut (1) from ISO corner lock (5).

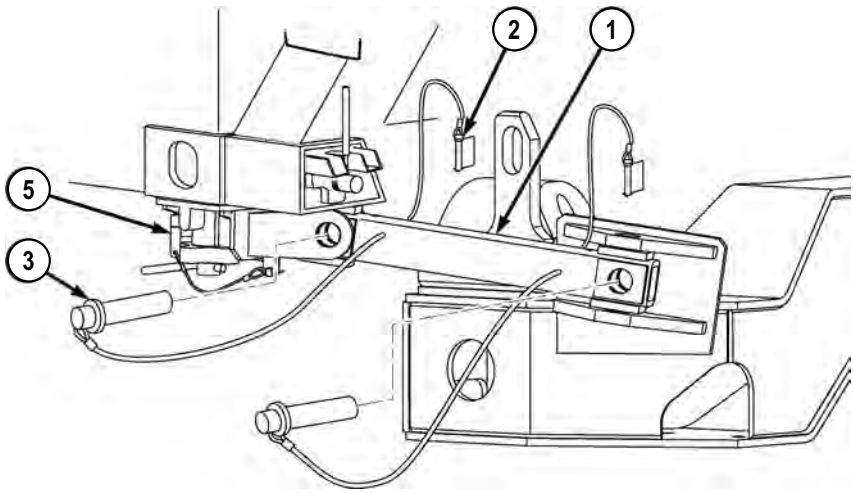


Figure 7.

NOTE

Rail transport struts are positioned on stowage tray in "S" (shorter) hole placement, with "S" facing outward.

3. Position rail transport strut (1) on stowage bracket (6). Install two pins (3) and lock pins (2).

RAIL TRANSPORT STRUT REMOVAL - Continued

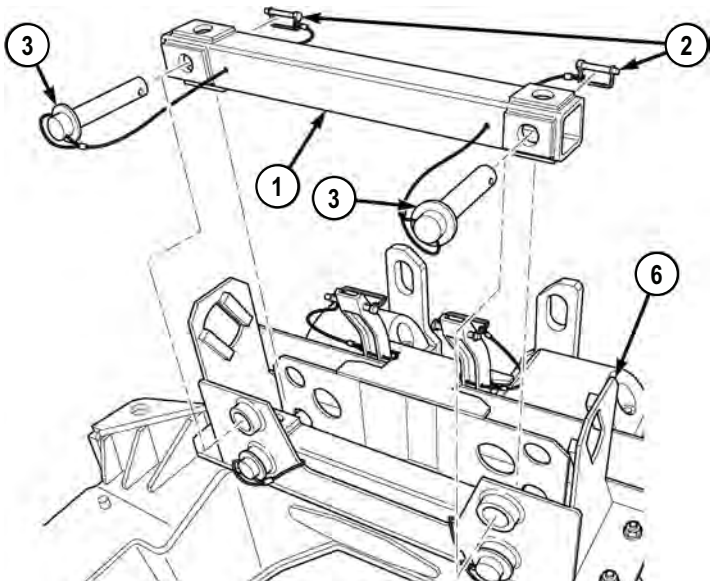


Figure 8.

4. Remove lock pin (7) from bracket (8) and rotate tab (9) up.

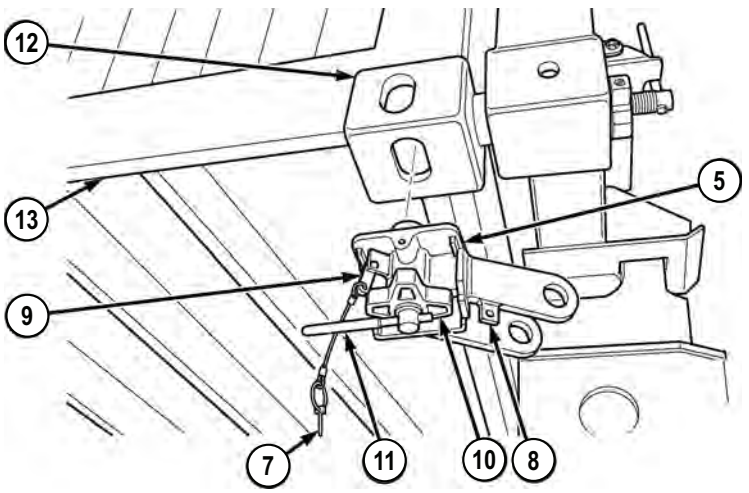


Figure 9.

RAIL TRANSPORT STRUT REMOVAL - Continued

NOTE

ISO corner lock will become loose from front bottom corner casting of ISO container when performing Step (5).

5. Loosen handnut (10), rotate lock handle (11) 90 degrees, and remove ISO corner lock (5) from front bottom corner casting (12) of ISO container (13).

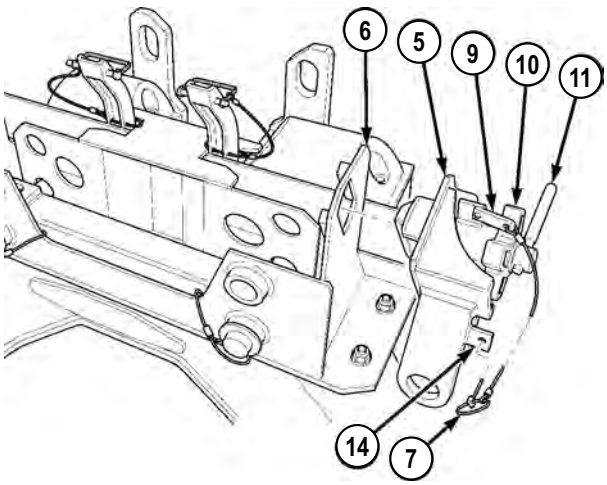


Figure 10.

6. Install ISO corner lock (5) on stowage bracket (6) and rotate lock handle (11) 90 degrees.
7. Tighten handnut (10), rotate tab (9) to lock handnut (10), and install lock pin (7) in bracket (14).
8. Repeat Steps (1) through (7) for driver side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PREPARING PLS VEHICLE WITH LIFTING FRAME FOR AIR TRANSPORT

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

PREPARATION FOR TRANSPORT

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

1. Ensure two slide-arm lower, front hooks (1) are in stowed location on lifting frame (2).

PREPARATION FOR TRANSPORT - Continued

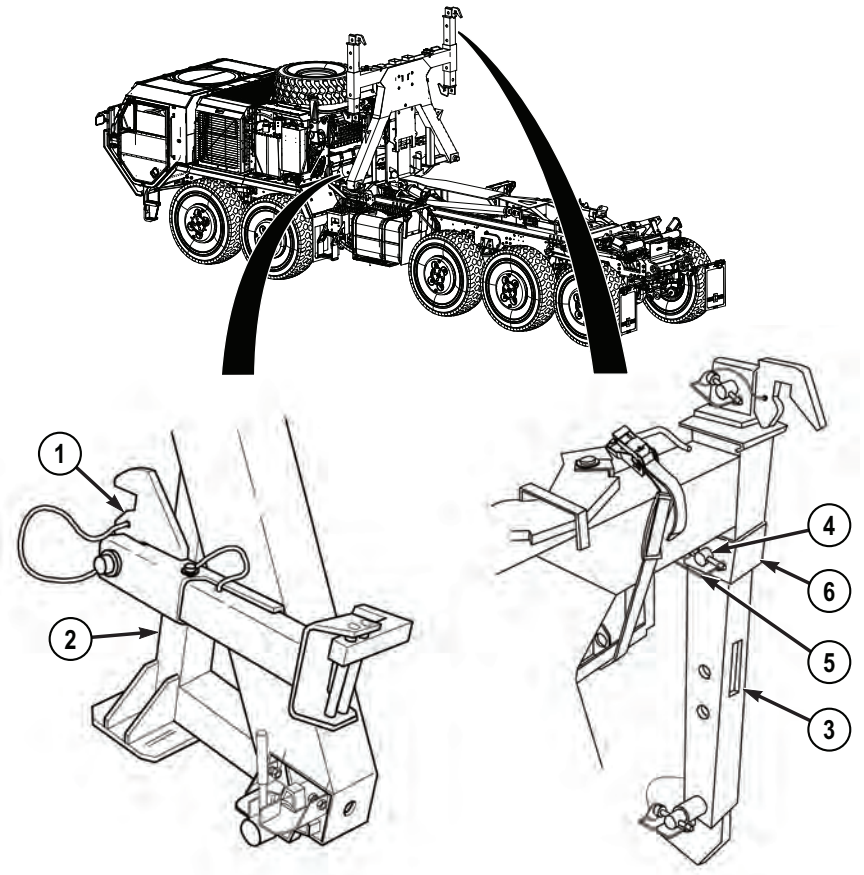


Figure 1.

2. Ensure two slide arms (3) have pins (4) and lock pins (5) installed in lifting-frame upper arms (6).

NOTE

There are two slide arms. Right side shown.

3. Remove lock pin (7), pin (8), and slide-arm upper, front hook (9) from slide arm (3).

PREPARATION FOR TRANSPORT - Continued

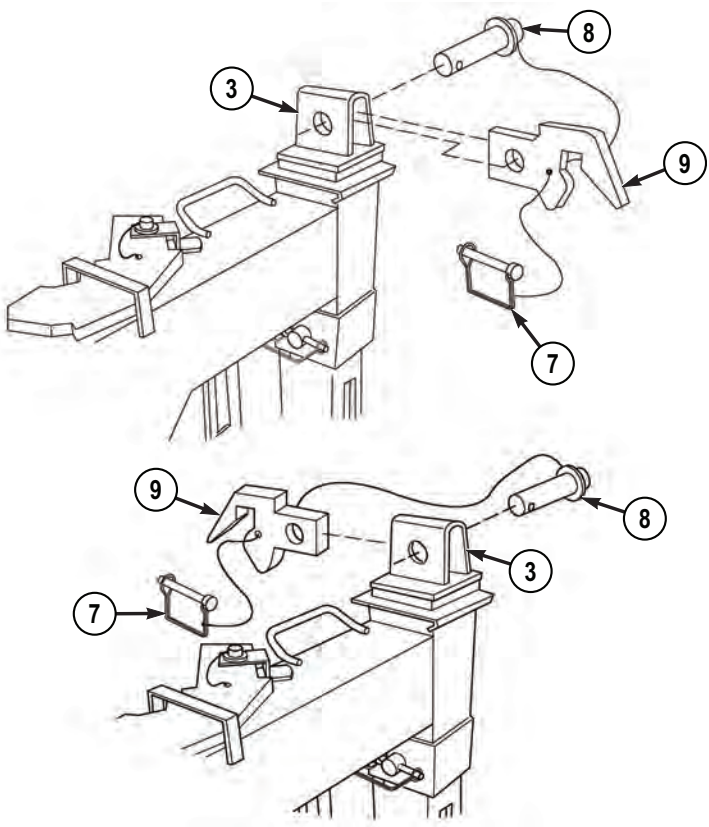


Figure 2.

NOTE

Slide-arm upper, front hooks should face away from tires when in transport mode.

4. Rotate slide-arm upper, front hook (9) 180 degrees and install in slide arm (3) with pin (8) and lock pin (7).
5. Repeat steps (3) and (4) for left side.
6. Ensure lifting frame (10) is installed on PLS vehicle in container mode (WP 0052).

PREPARATION FOR TRANSPORT - Continued

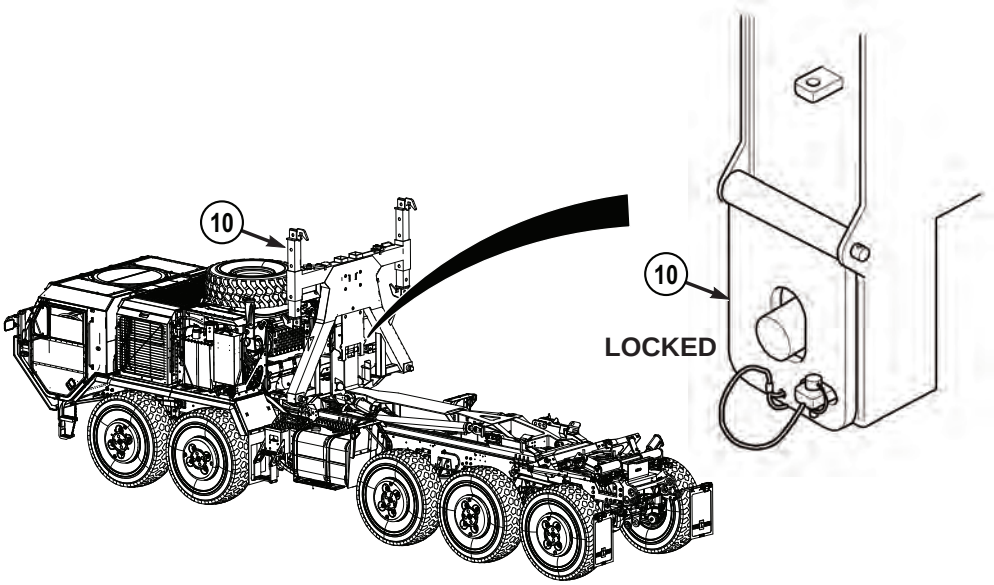


Figure 3.

7. Ensure lifting frame (10) is in locked position (WP 0048).
8. Ensure sliders (11) and struts (12) are stowed in flatrack mode (WP 0049) positions.

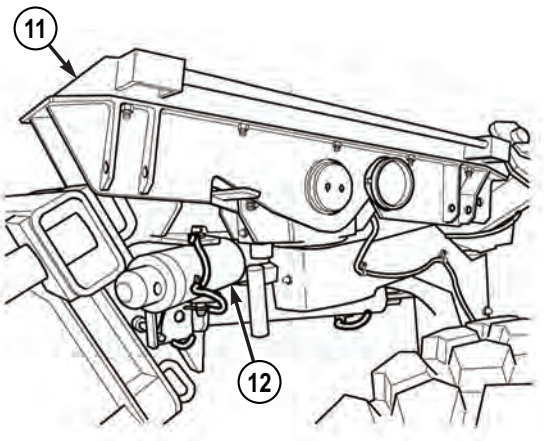


Figure 4.

PREPARATION FOR TRANSPORT - Continued

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).
- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

NOTE

For detailed instructions on how to operate the LHS on the vehicle, refer to the Load Handling System (LHS) (WP 0042).

9. Start engine (WP 0027).

WARNING



- Do not allow front lift adapter to contact the ground or front lift adapter may disengage LHS hook arm. Failure to comply may result in injury or death to personnel and damage to equipment.

PREPARATION FOR TRANSPORT - Continued

- Front lift adapter and hook weigh 1,750 lbs (795 kg). Do not attempt to lift or move front lift adapter and hook without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

10. Attach lifting device to lifting frame (10).

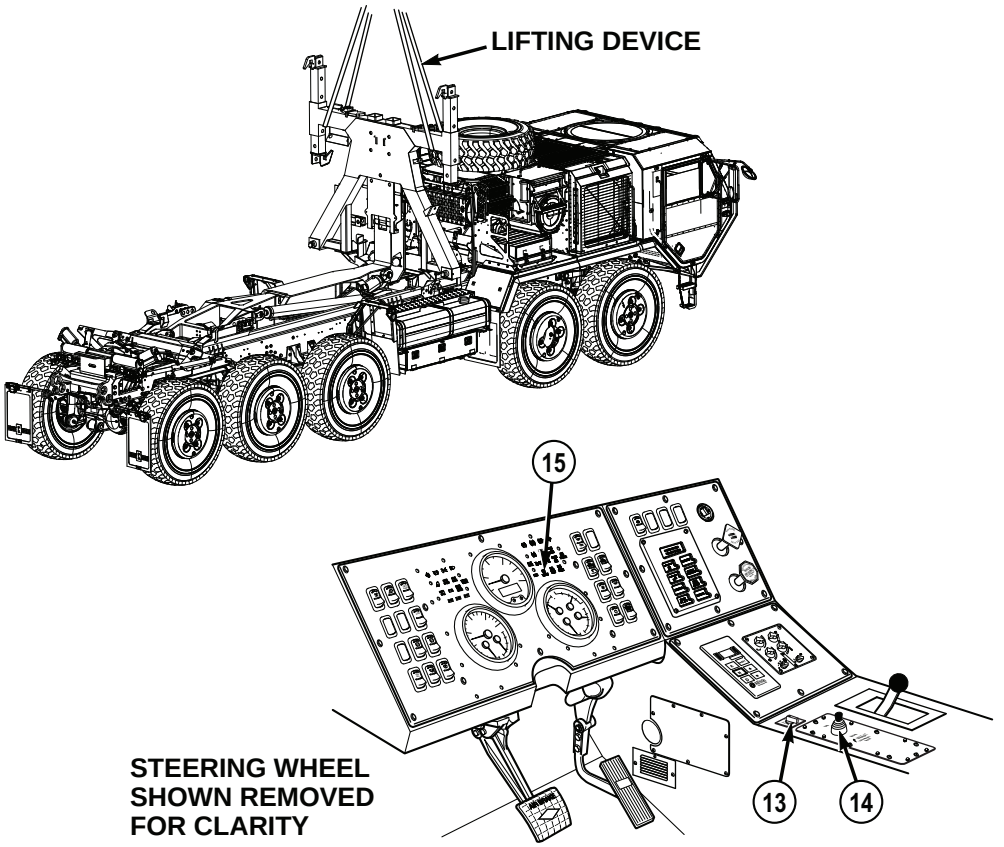


Figure 5.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

11. Turn hydraulic selector switch (13) to AUTO.

PREPARATION FOR TRANSPORT - Continued

12. Move joystick (14) to UNLOAD. Hook arm will raise and begin to move rearward. LHS NO TRANS lamp (15) will illuminate to indicate hook arm is up and load lock has been cleared.

NOTE

The position LHS and lifting frame need to be in to access the hook-arm retaining pin will vary depending on the height of the operator.

13. Continue to hold joystick (14) in UNLOAD position until LHS hook-arm retaining pin (16) can be removed.

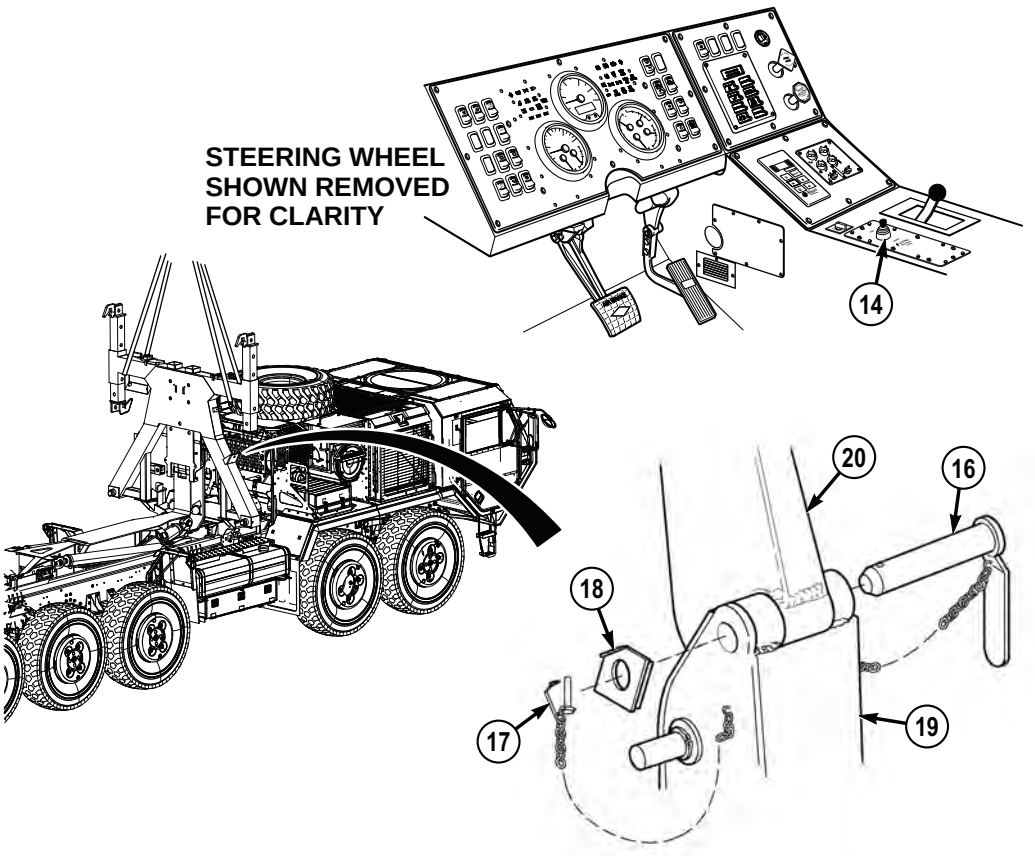


Figure 6.

14. Release joystick (14).

PREPARATION FOR TRANSPORT - Continued

15. Remove lock pin (17), retaining bracket (18), and LHS hook-arm retaining pin (16) from LHS hook arm (19) and hook (20).
16. Move joystick (14) to LOAD, until LHS is fully stowed and LHS NO TRANS lamp (15) extinguishes.

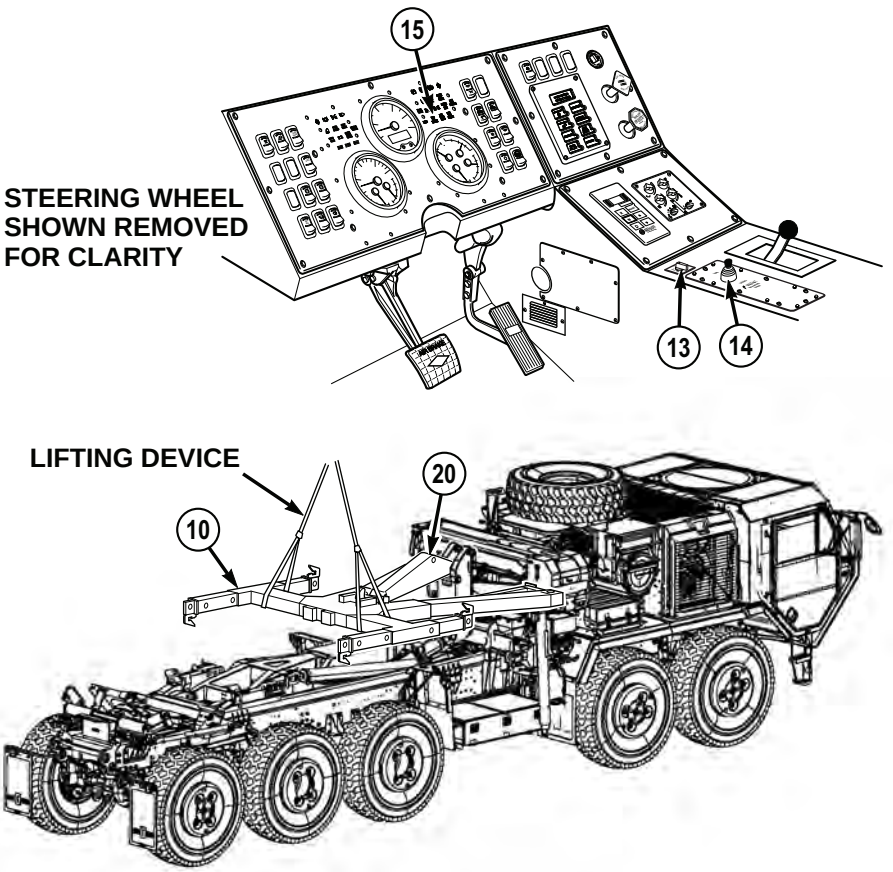


Figure 7.

17. Release joystick (14).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

PREPARATION FOR TRANSPORT - Continued

18. Turn hydraulic selector switch (13) to OFF.
19. With the aid of an assistant and lifting device, lower lifting frame (10) and hook (20) onto vehicle.
20. Install LHS hook-arm retaining pin (16), retaining bracket (18), and lock pin (17) in LHS hook arm (19).

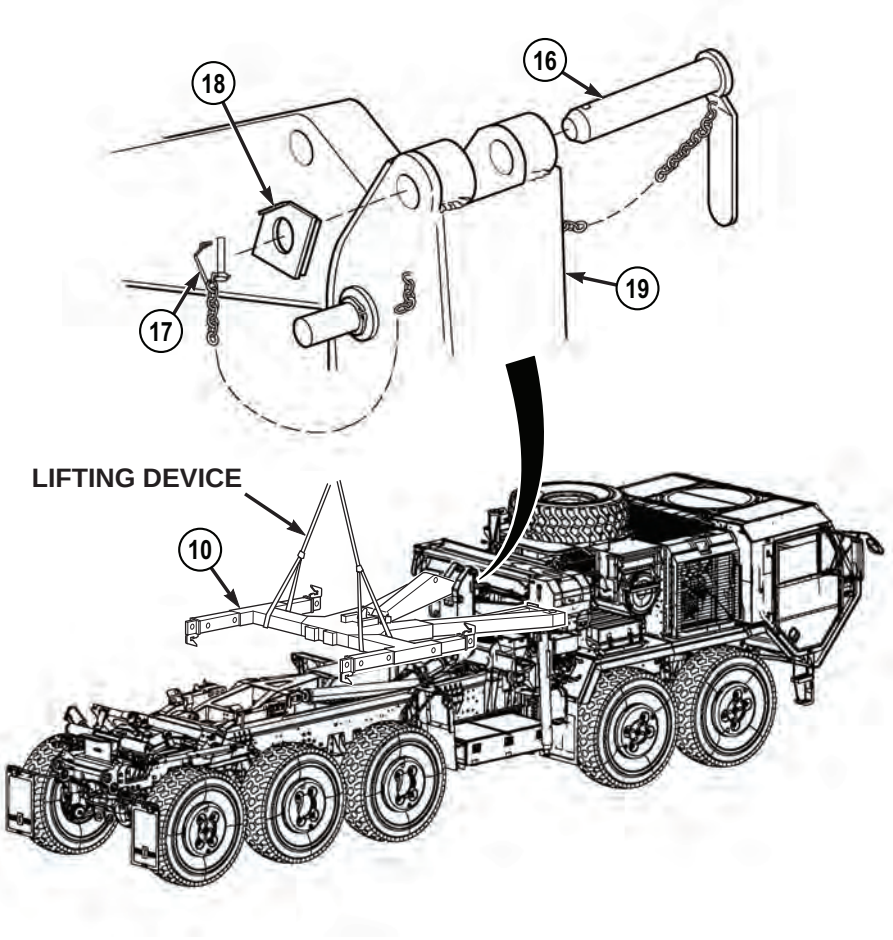


Figure 8.

21. Remove lifting device from lifting frame (10).

END OF TASK

PREPARATION AFTER TRANSPORT

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).
- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

WARNING



Front lift adapter and hook weigh 1,750 lbs (795 kg). Do not attempt to lift or move front lift adapter and hook without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

1. Attach lifting device to lifting frame (10).

PREPARATION AFTER TRANSPORT - Continued

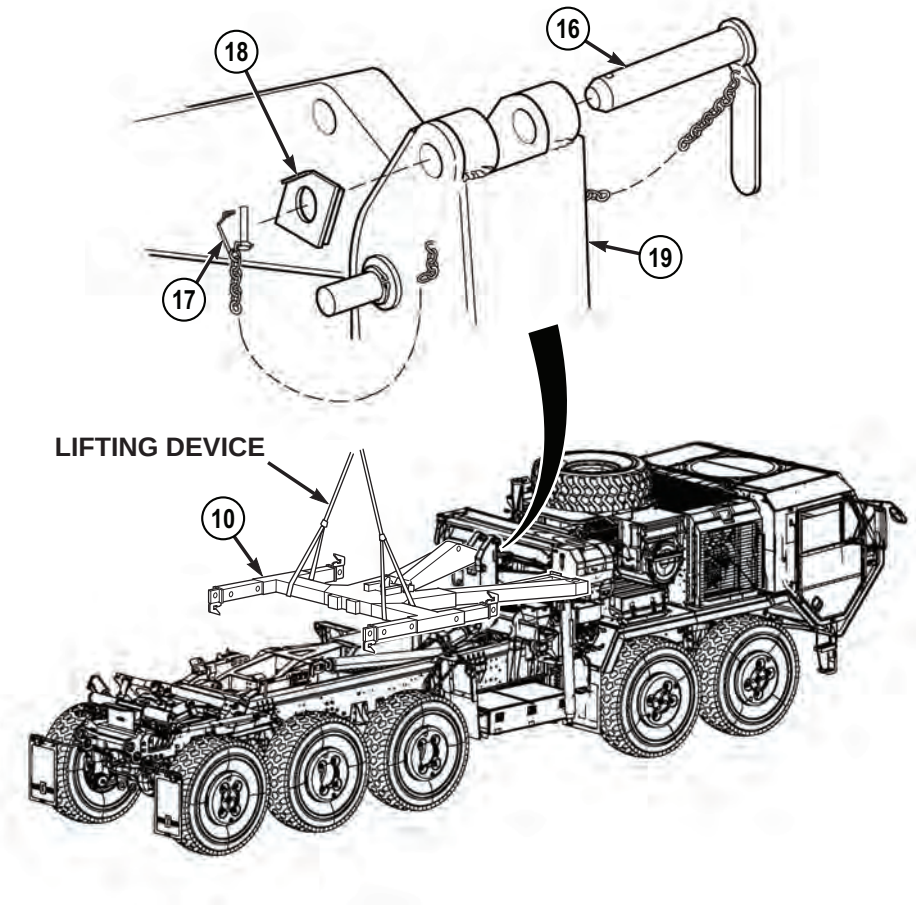


Figure 9.

2. Remove lock pin (17), retaining bracket (18), and LHS hook-arm retaining pin (16) from LHS hook arm (19).
3. With the aid of an assistant and suitable lifting device, lift lifting frame (10) and hook (20) off of vehicle.

PREPARATION AFTER TRANSPORT - Continued

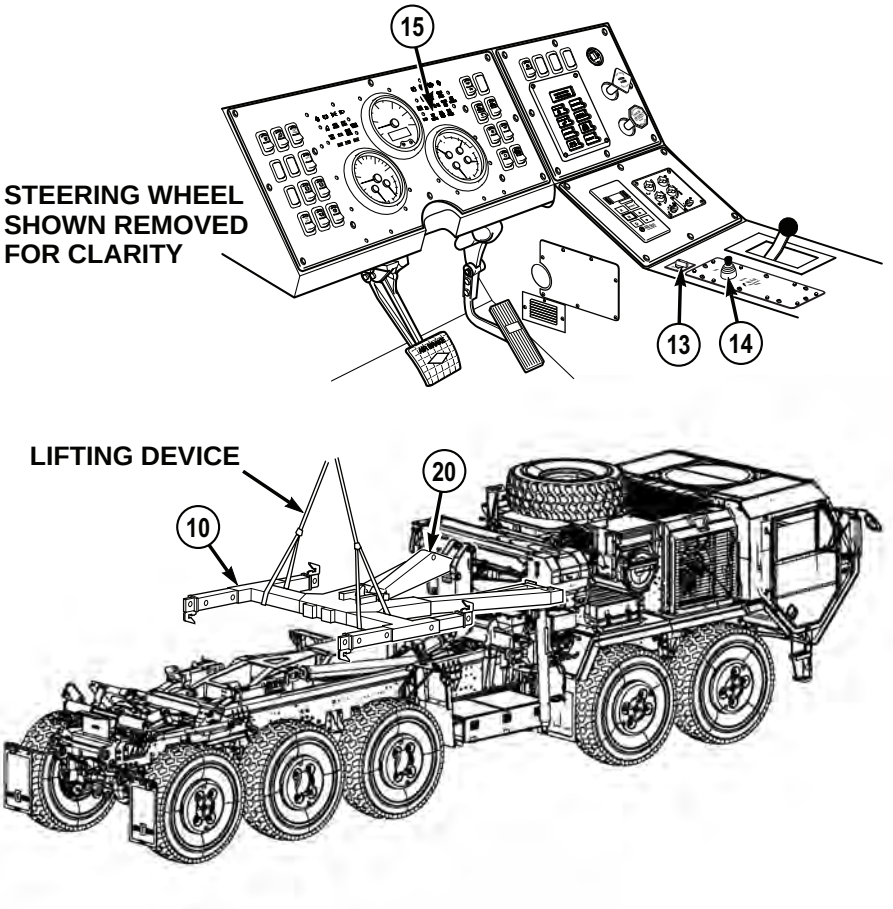


Figure 10.

4. Start engine (WP 0027).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

5. Turn hydraulic selector switch (13) to AUTO.
6. Move joystick (14) to UNLOAD. Hook arm will raise and begin to move rearward. LHS NO TRANS lamp (15) will illuminate to indicate hook arm is up and load lock has been cleared.

PREPARATION AFTER TRANSPORT - Continued

NOTE

The position LHS and lifting frame need to be in to access the hook-arm retaining pin will vary depending on the height of the operator.

7. Continue to hold joystick (14) in UNLOAD position until LHS hook-arm retaining pin (16) can be installed.

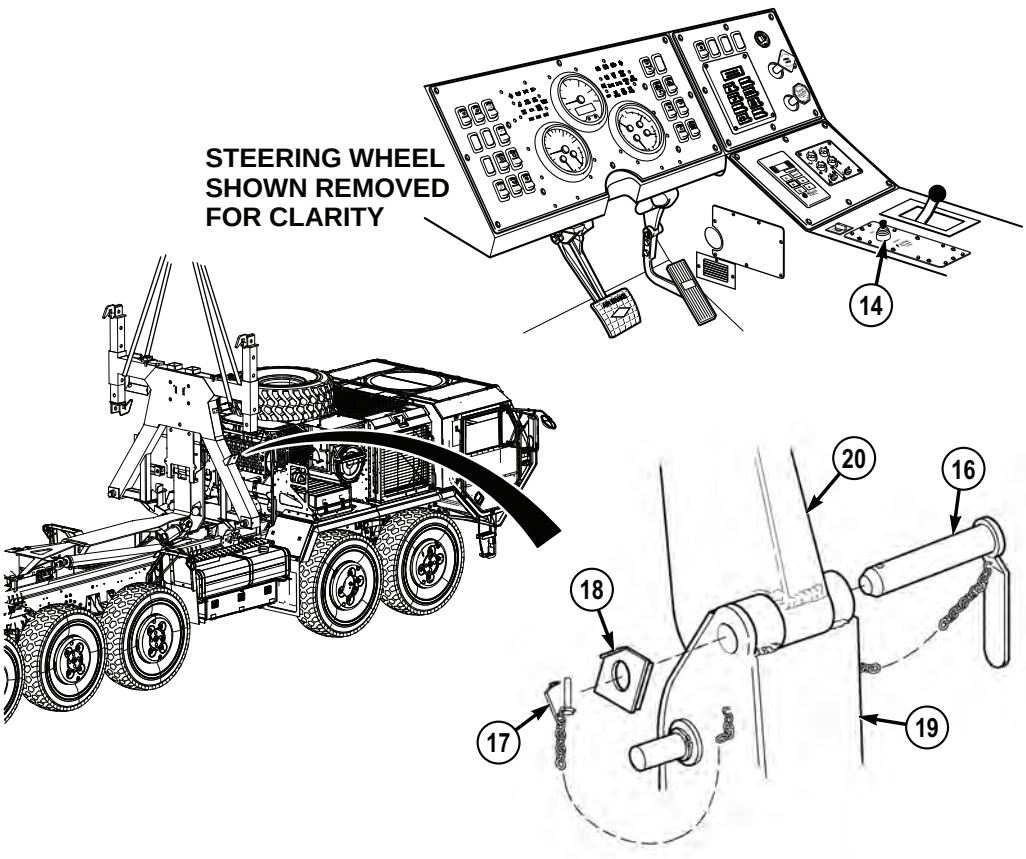


Figure 11.

8. Release joystick (14).
9. Install LHS hook-arm retaining pin (16), retaining bracket (18) and lock pin (17) in LHS hook arm (19) and hook (20).
10. Move joystick (14) to LOAD until LHS is fully stowed and LHS NO TRANS lamp (15) extinguishes.

PREPARATION AFTER TRANSPORT - Continued

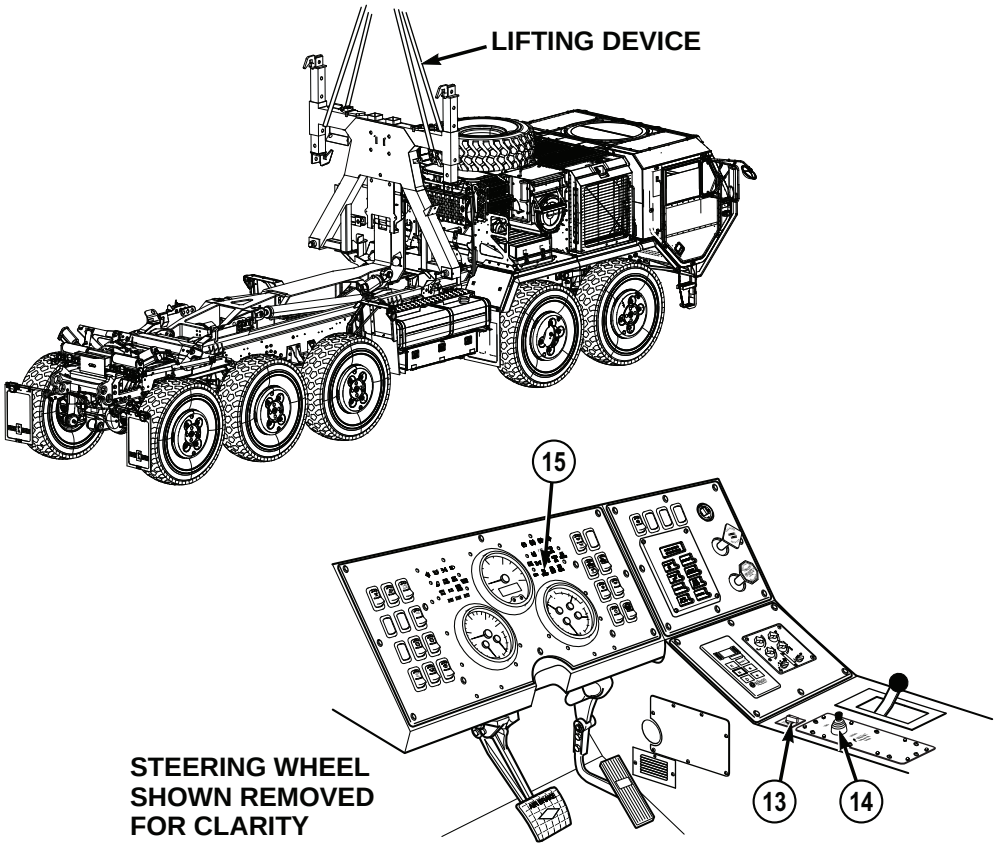


Figure 12.

11. Release joystick (14).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

12. Turn hydraulic selector switch (13) to OFF.
13. Remove lifting device from lifting frame (10).

NOTE

There are two slide arms. Right side shown.

14. Remove lock pin (7), pin (8), and slide arm upper front hook (9) from slide arm (3).

PREPARATION AFTER TRANSPORT - Continued

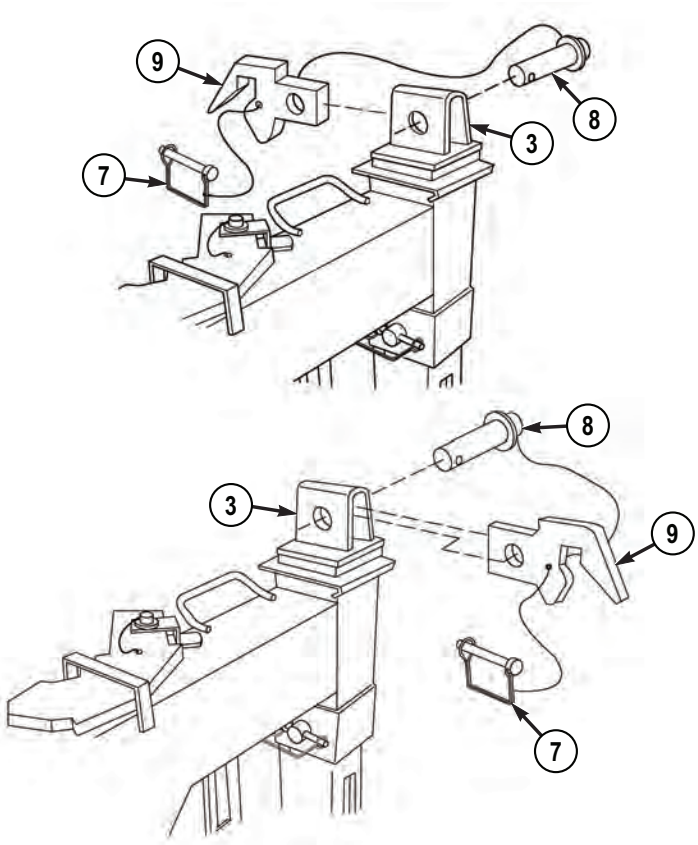


Figure 13.

NOTE

Slide arm upper front hooks should face towards rear of vehicle.

15. Rotate slide arm upper front hook (9) 180 degrees and install in slide arm (3) with pin (8) and lock pin (7).
16. Repeat steps (14) and (15) for left side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
REMOVING AND INSTALLING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE

INITIAL SETUP:

Not Applicable

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE

WARNING



- Lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.
- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter may contact rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in injury or death to personnel.
- Front lift adapter must be unloaded on a flat, level surface. Failure to comply may result in injury or death to personnel.

NOTE

- Prepare an area to set lifting frame. Ensure the area is accessible for the vehicle.
- Perform Step (1) if lifting frame is in locked position.

1. Position lifting frame (1) in unlocked position (WP 0048).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

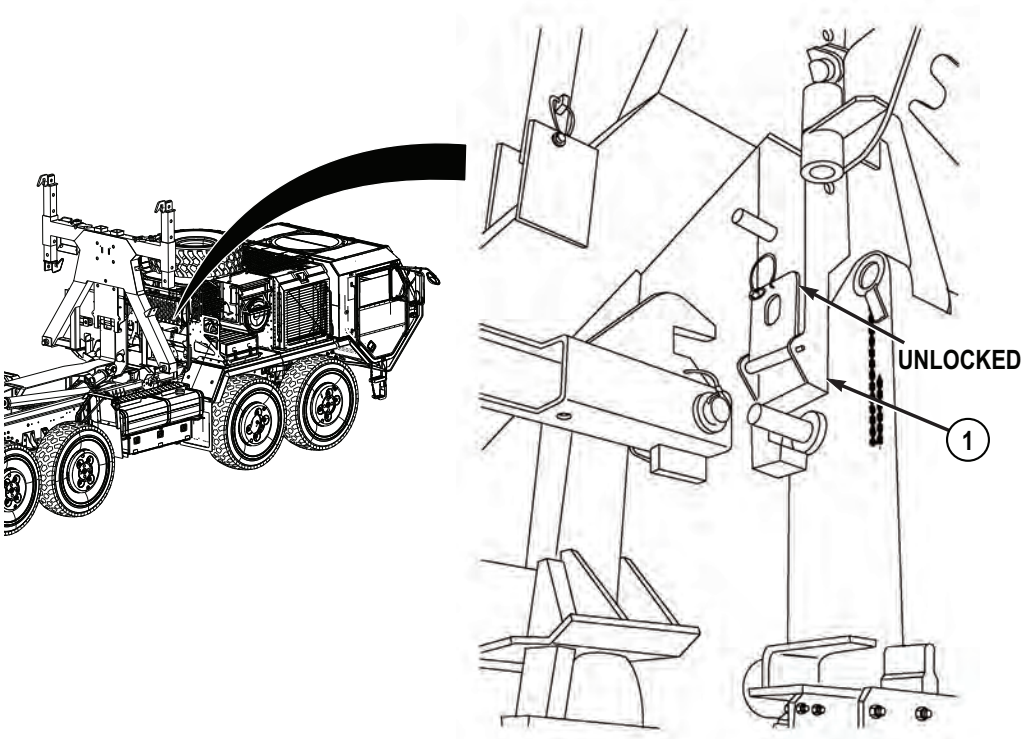


Figure 1.

2. Start engine (WP 0027).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

3. Turn hydraulic selector switch (2) to AUTO.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

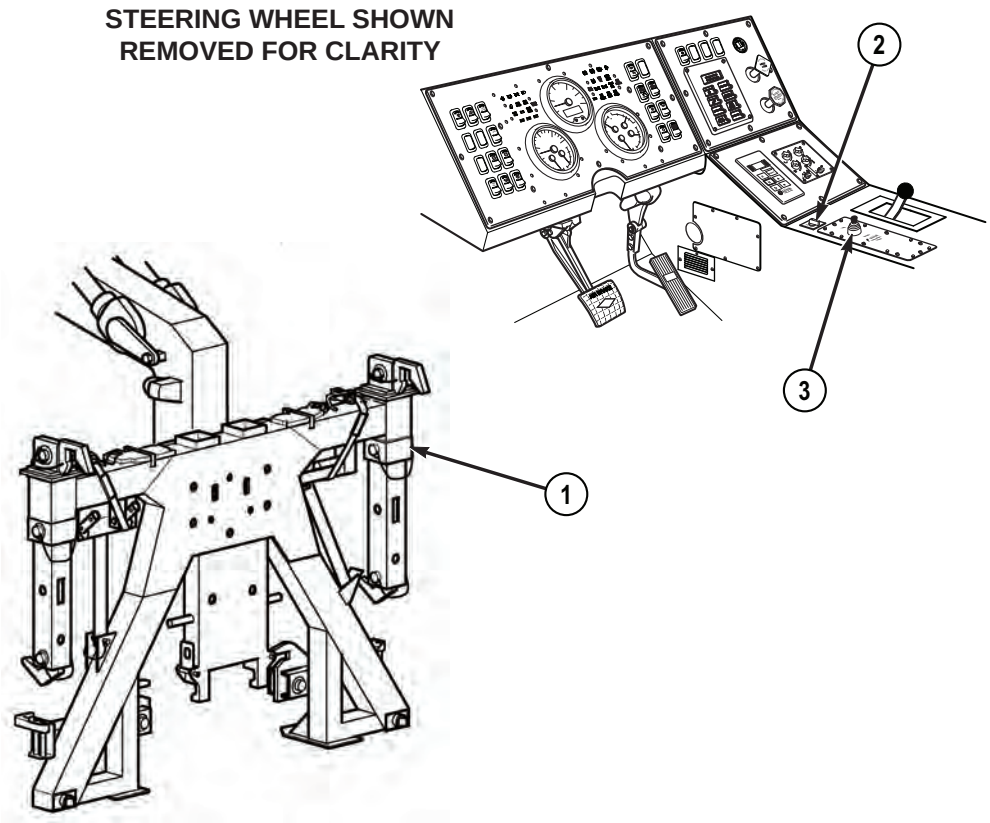


Figure 2.

4. Move joystick (3) to UNLOAD until lifting frame (1) stops.
5. Turn hydraulic selector switch (2) to MAN H.A. mode and lower lifting frame (1) until lifting frame is approximately 12.0 in. (304.8 mm) from the ground.
6. Shut OFF engine (WP 0037).
7. Remove two lock pins (4) from pins (5) and upper support legs (6).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

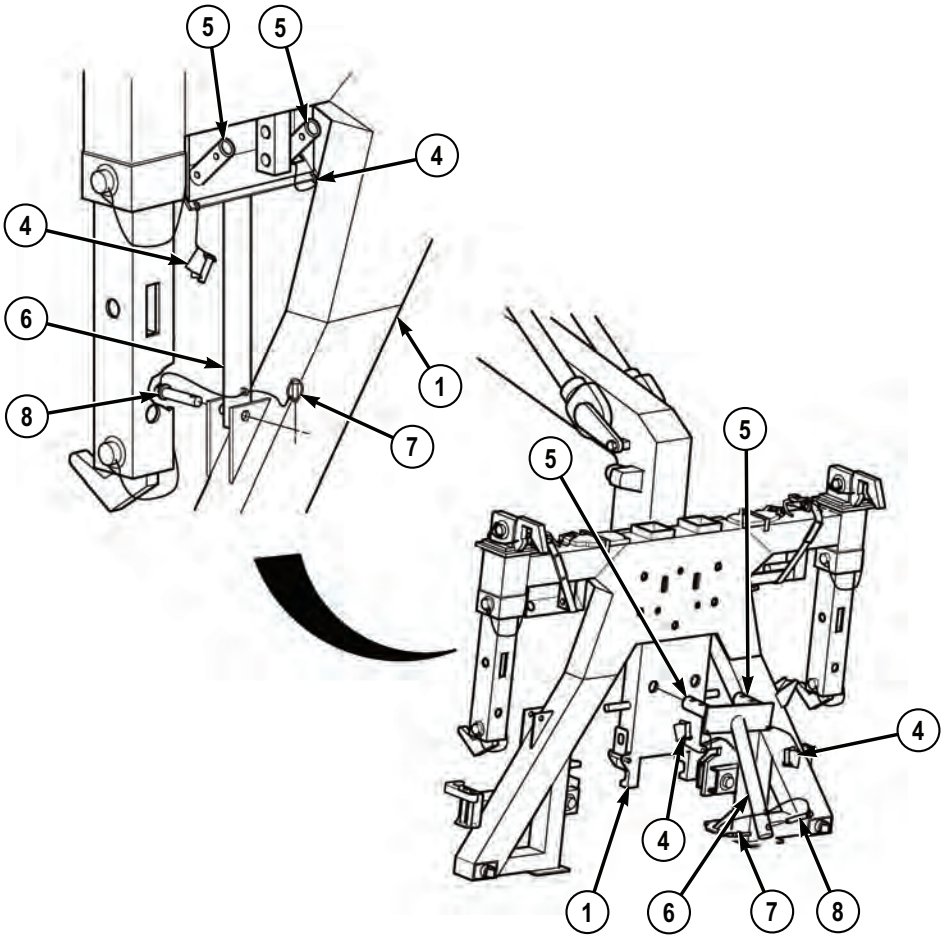


Figure 3.

8. Remove lock pin (7), pin (8), and upper support leg (6) from stowage bracket on lifting frame (1).
9. Position two pins (5) on upper support leg (6) through two lower holes on lifting frame (1).
10. Install two lock pins (4) in pins (5) on upper support leg (6) and front side of lifting frame (1).
11. Remove lock pin (9) and lower support leg (10) from stowage bracket on lifting frame (1).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

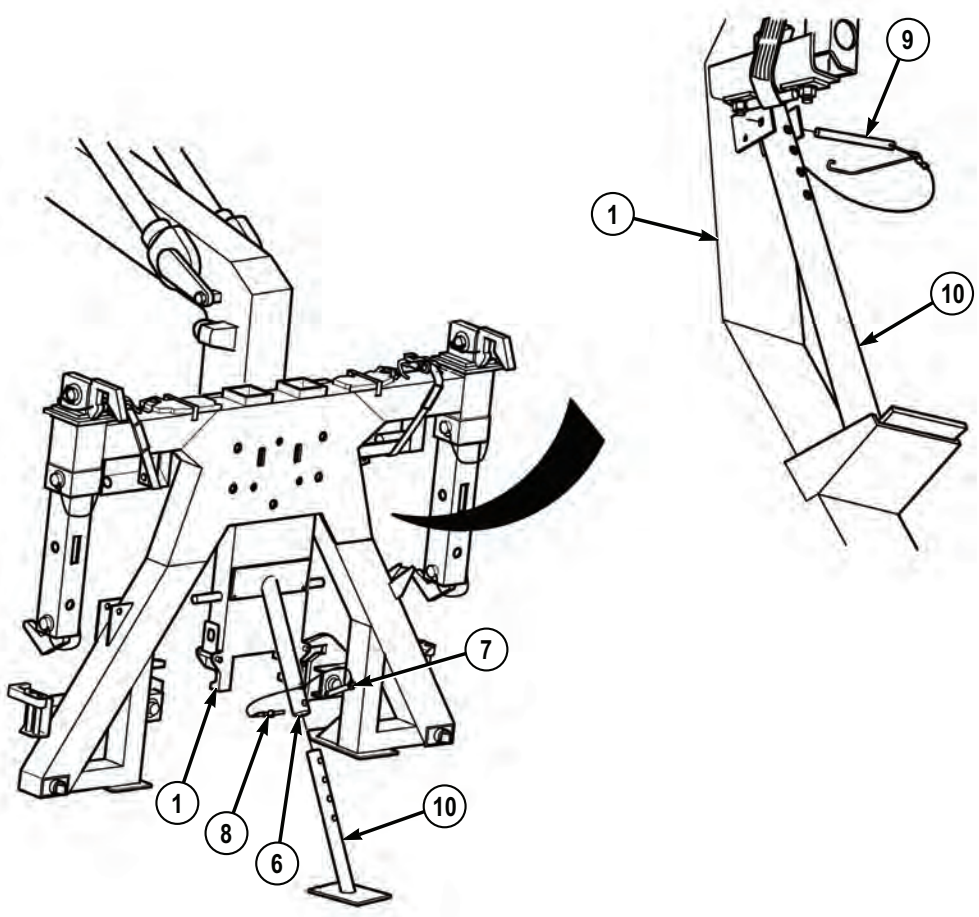


Figure 4.

12. Position lower support leg (10) in upper support leg (6).

NOTE

Other support leg pin hole positions may be used if ground is uneven.

13. Align hole in upper support leg (6) with second hole from bottom on lower support leg (10) and install pin (8) and lock pin (7).
14. Install lock pin (9) in stowage bracket on lifting frame (1).
15. Remove lock pin (11), pin (12), and bail bar lock (13) from hook (14).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

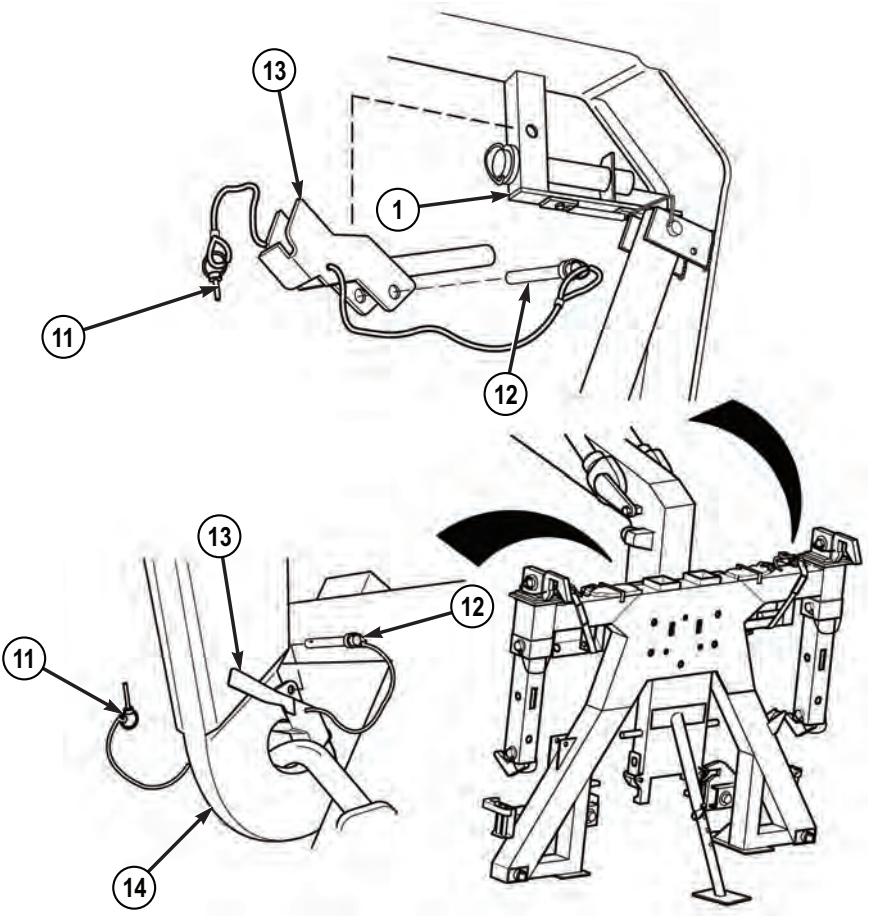


Figure 5.

16. Install bail bar lock (13), pin (12), and lock pin (11) in stowage bracket on lifting frame (1).
17. Start engine (WP 0027).

NOTE

- To disengage LHS hook arm from lifting frame hook, it may be necessary to cycle LHS to unload after driving ahead slightly.
- If ground is soft, jacking plate from vehicle BII or similar item may be positioned under support leg pad to prevent lifting frame from sinking in ground.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN CONTAINER MODE - Continued

18. Move joystick (3) to UNLOAD until LHS stops and hook (14) is below lifting frame hook bar (15).

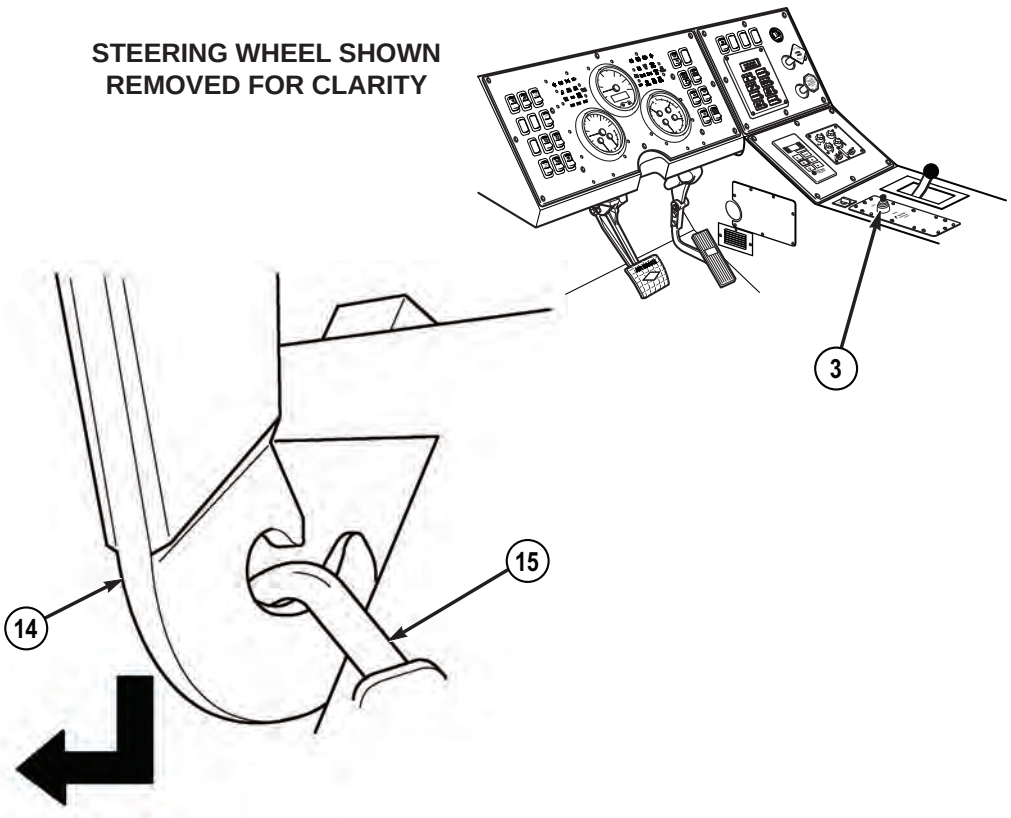


Figure 6.

19. Drive vehicle ahead approximately 12.0 in. (304.8 mm).
20. Shut OFF engine (WP 0037).

END OF TASK

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE

WARNING



- Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.
- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter may contact rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in injury or death to personnel.
- Ensure lift adapter is free of snow, ice, and mud when installing on LHS. Lift adapter may be unbalanced and may cause injury or death to personnel.

NOTE

For detailed instructions on how to operate the LHS on the vehicle refer to Load Handling System (LHS) (WP 0042).

1. Start engine (WP 0027).
2. Move joystick (3) to LOAD until hook (14) is below lifting frame hook bar (15).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE - Continued

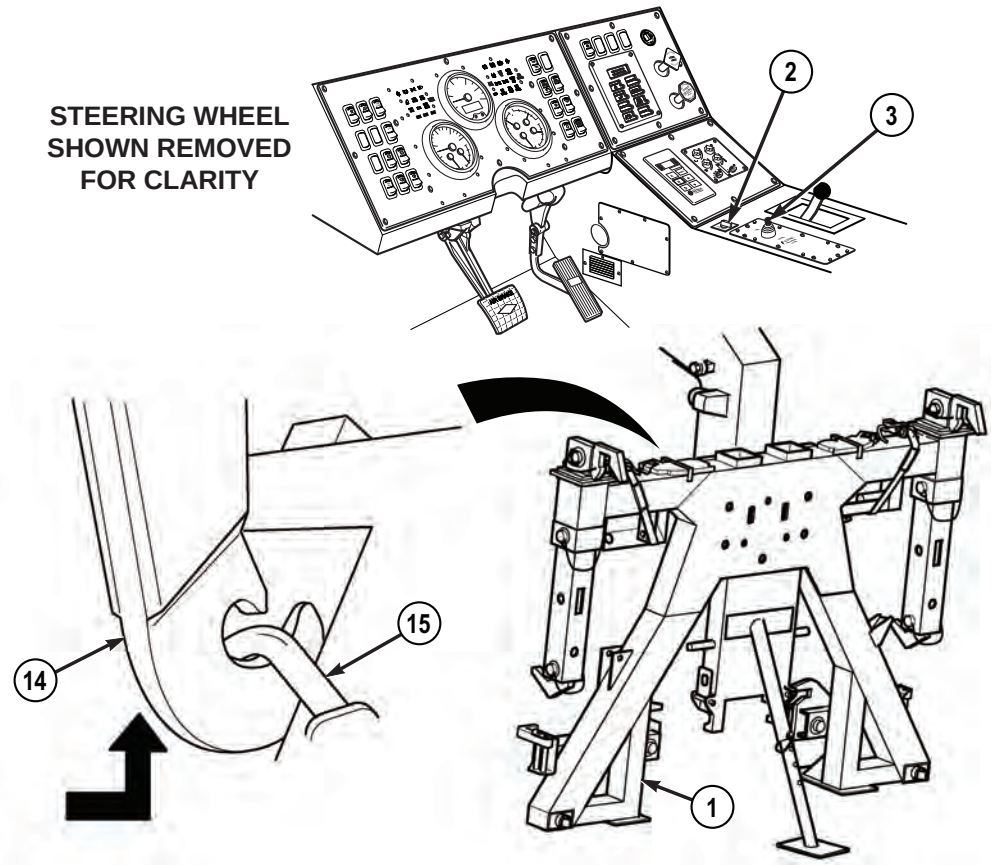


Figure 7.

3. Back up vehicle and engage hook bar (15) with hook (14).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

4. Turn hydraulic selector switch (2) to AUTO mode.
5. Move joystick (3) to LOAD and raise lifting frame (1) approximately 12.0 in. (304.8 mm) off of ground.
6. Shut OFF engine (WP 0037).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE - Continued

7. Remove lock pin (11), pin (12), and bail bar lock (13) from stowage bracket on lifting frame (1).

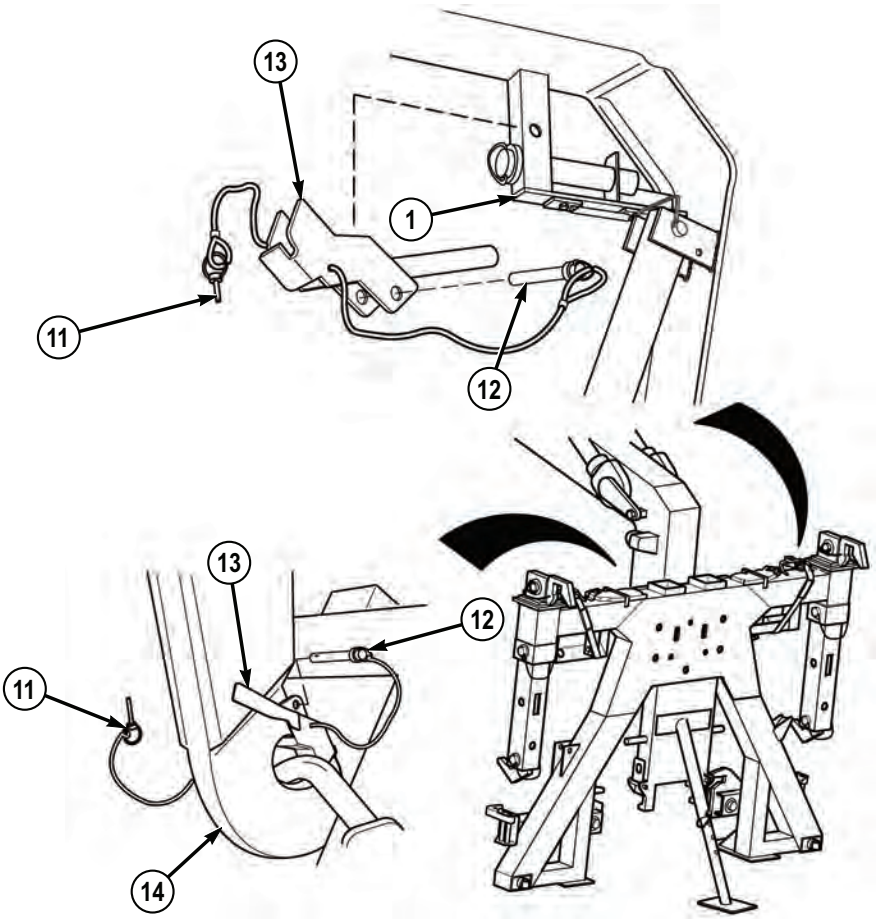


Figure 8.

8. Install bail bar lock (13) on hook (14) with pin (12) and lock pin (11).
9. Support lower support leg (10) and remove lock pin (7) and pin (8).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE - Continued

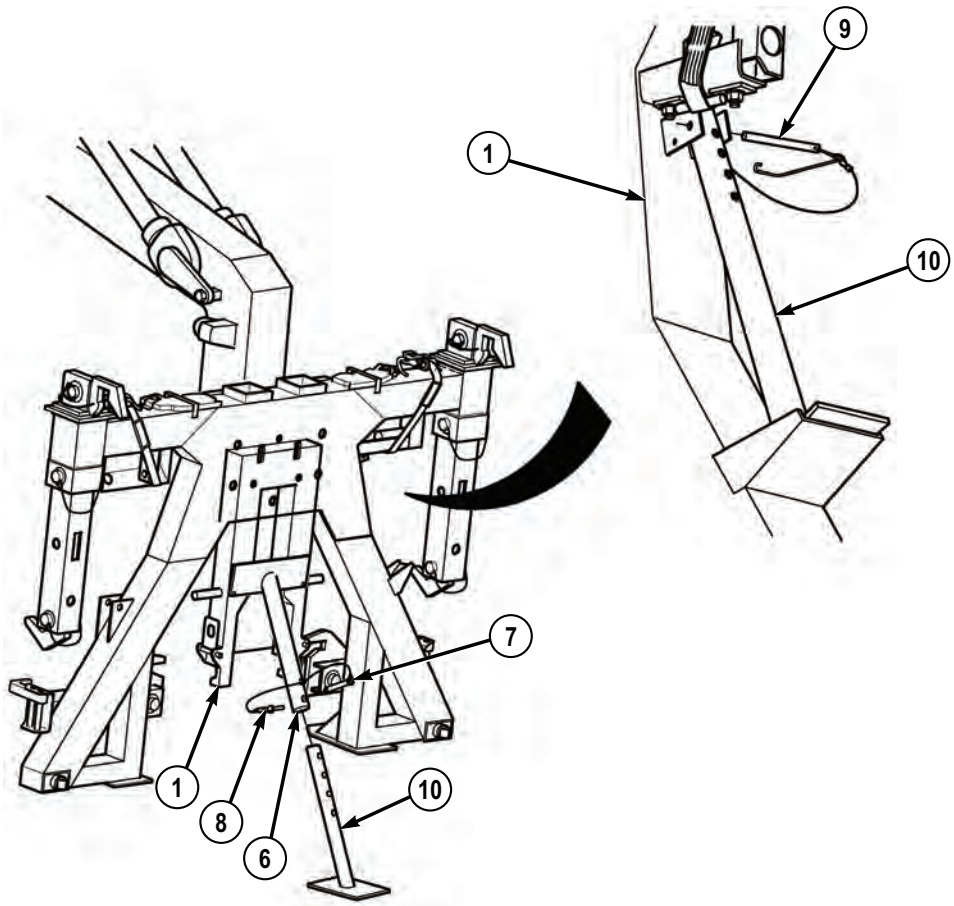


Figure 9.

10. Remove lower support leg (10) from upper support leg (6).
11. Remove lock pin (9) from stowage bracket on lifting frame (1).
12. Position lower support leg (10) in stowage bracket on lifting frame (1) and install lock pin (9).
13. Support upper support leg (6) and remove two lock pins (4) from pins (5).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE - Continued

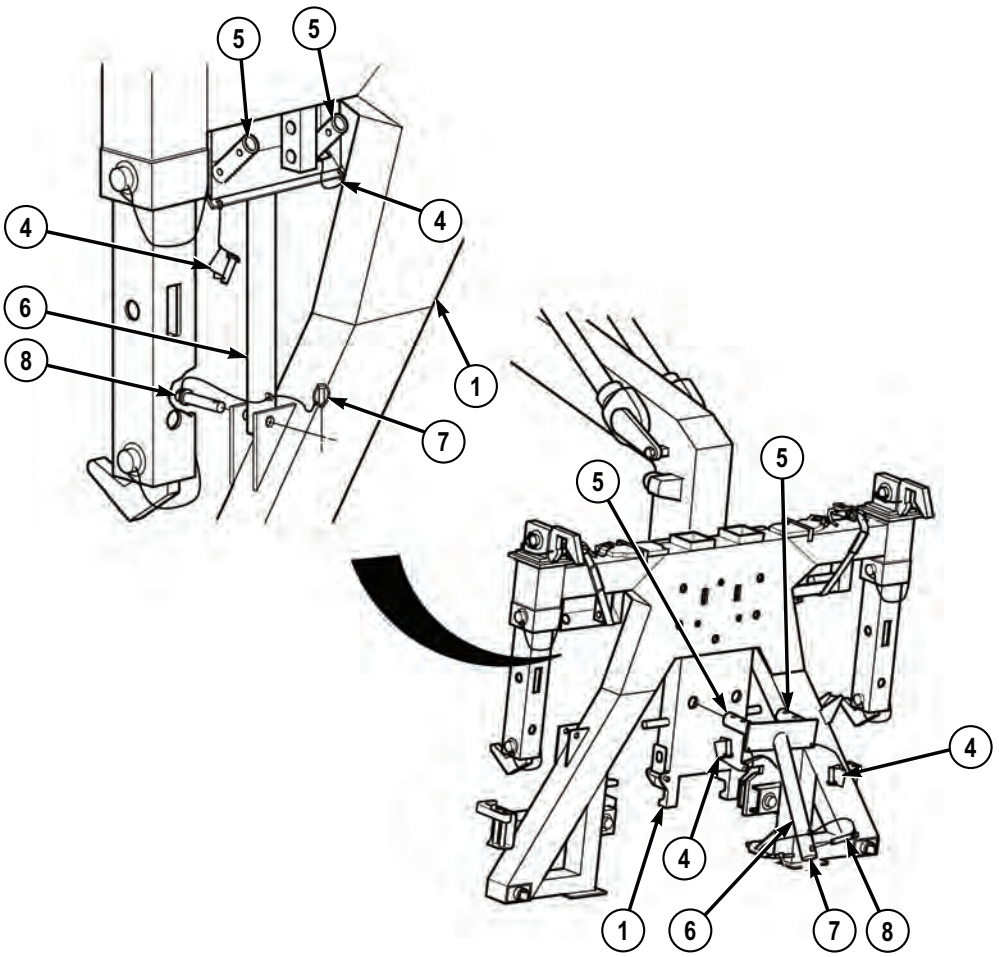


Figure 10.

14. Remove upper support leg (6) from lifting frame (1).
15. Position upper support leg (6) in stowage bracket on lifting frame (1) and install two lock pins (4) on pins (5).
16. Install pin (8), lock pin (7), and upper support leg (6) to stowage bracket on lifting frame (1).
17. Start engine (WP 0027).
18. Move joystick (3) to LOAD position until LHS NO TRANSIT light (16) goes out and lifting frame (1) is positioned on bumper supports (17).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN CONTAINER MODE - Continued

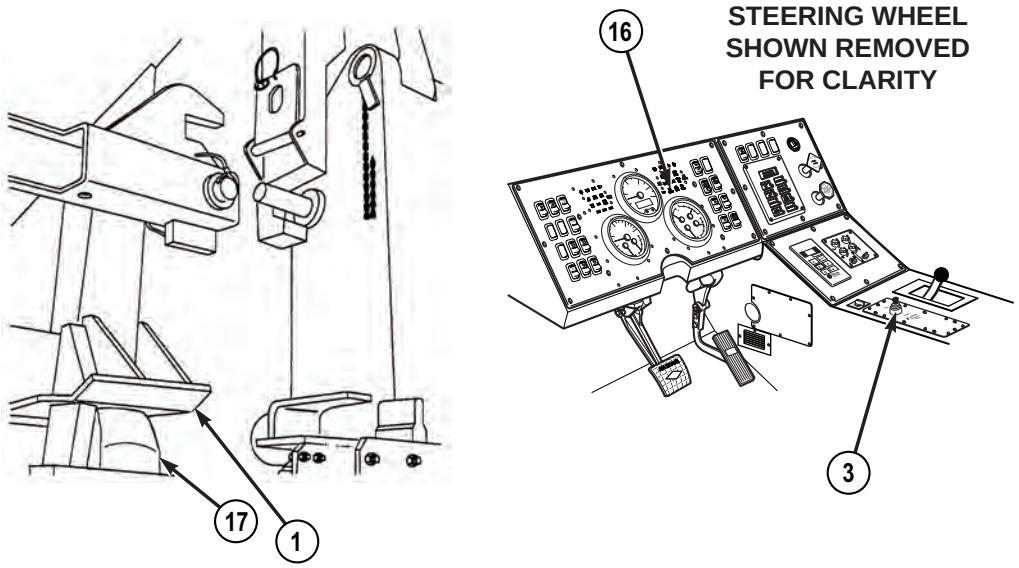


Figure 11.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
REMOVING AND INSTALLING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE

INITIAL SETUP:

Not Applicable

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE

WARNING



- Check for overhead power lines or other obstructions before attempting CHU operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Ensure engine is OFF and vehicle parking brake is ON before preparing PLS vehicle for container mode. Failure to comply may result in injury or death to personnel.

NOTE

There are two straps and flipper lock assemblies on lifting frame. Left side is shown.

1. Remove strap (1) from rod on front support assembly (2).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

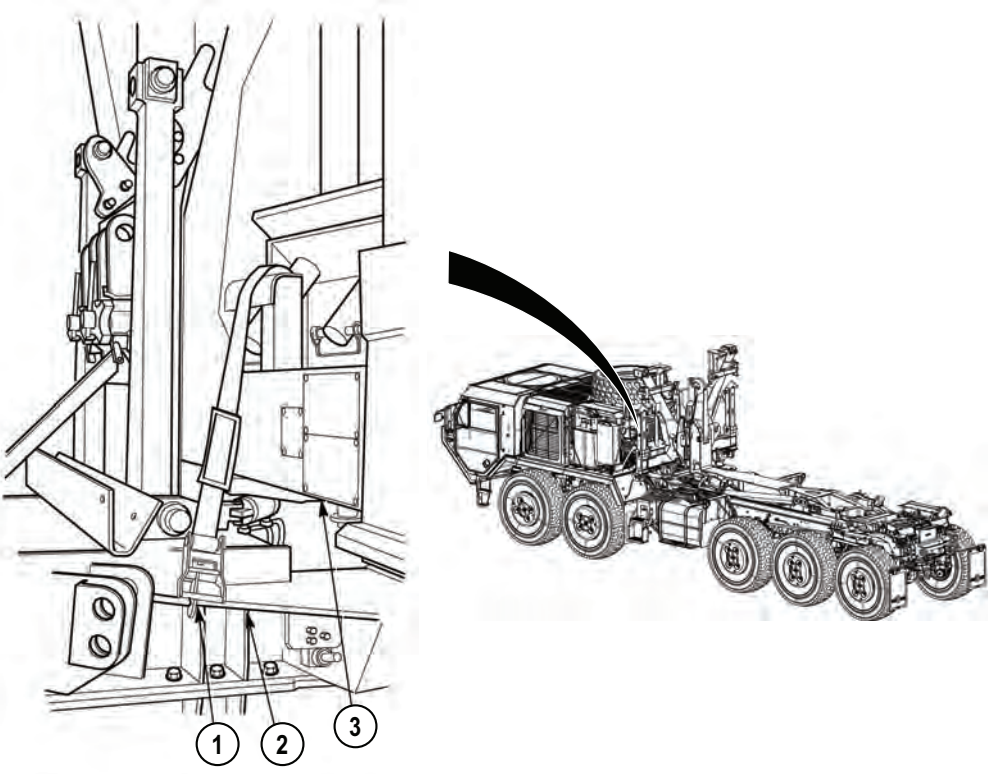


Figure 1.

2. Stow strap (1) on lifting frame (3) stowbar.
3. Pull flipper lock pin handle (4) out and lift air valve lever (5) up to rotate flipper bracket (6) and flipper bracket lock plate (7) on pivot pin (8).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

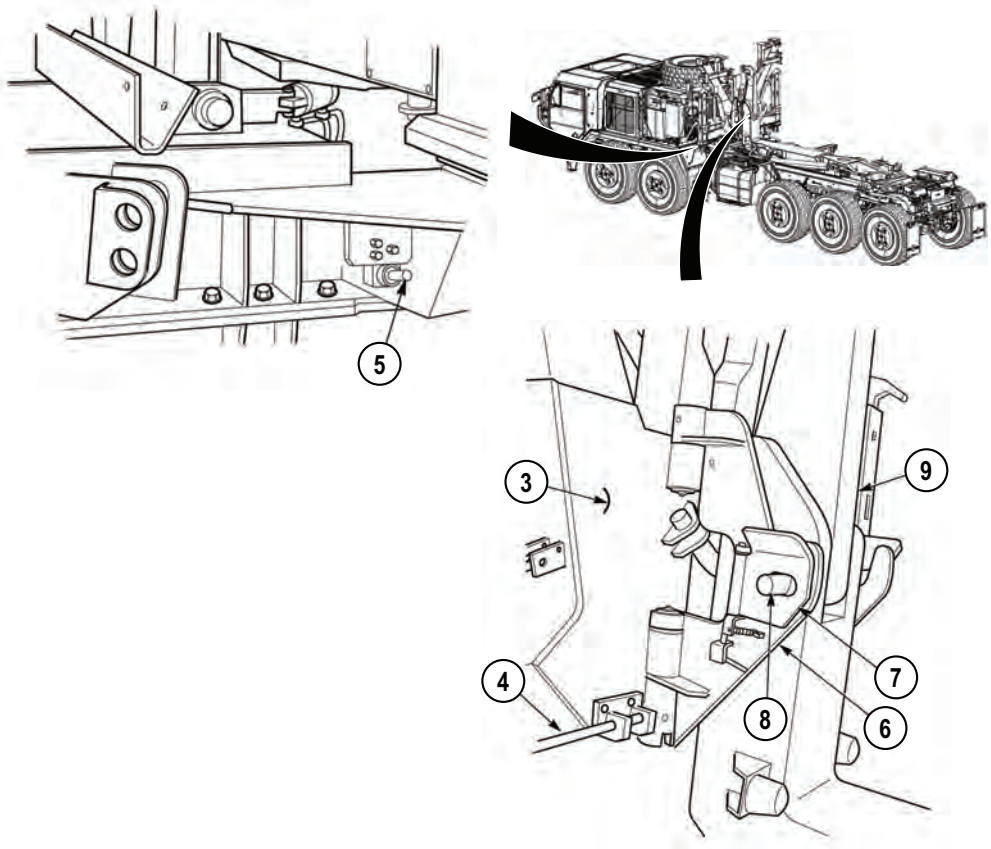


Figure 2.

4. Release flipper lock pin handle (4).
5. Ensure flipper bracket (6) is positioned over pivot pin (8) on hook arm (9).
6. Ensure flipper lock pin handle (4) is engaged in flipper bracket (6).
7. Repeat Steps (3) and (5) if necessary.
8. Repeat Steps (1) through (7) for right side flipper lock.

NOTE

There are two strut and slider assemblies. Left side is shown.

9. Pull down pivot lock pin handle (10) and rotate by pulling rear end of slider (11) over tire (12) until pivot lock pin locks.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

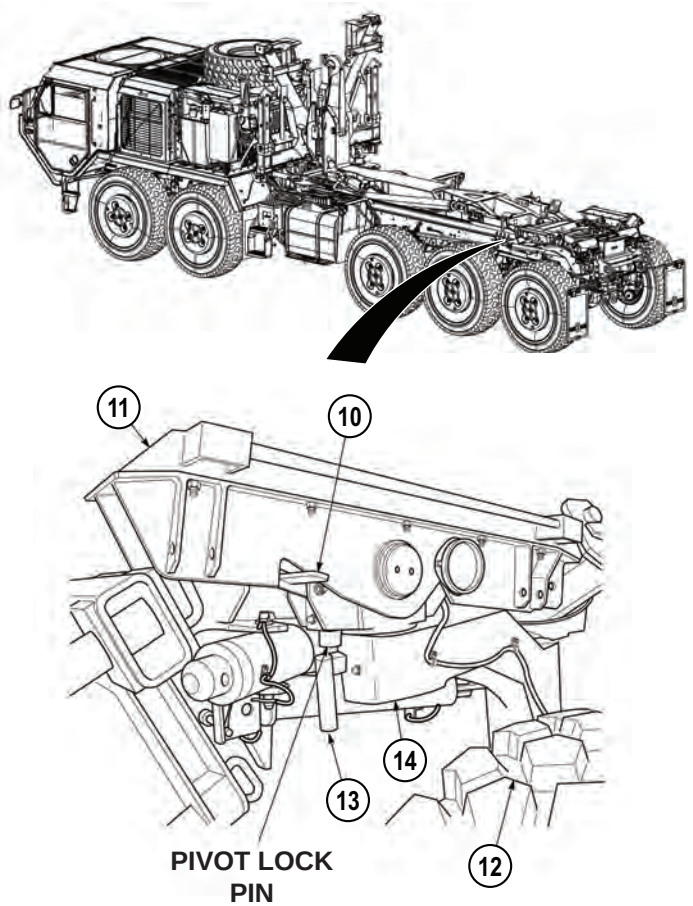


Figure 3.

10. Lift rear of slider (11) and, using handle (13), rotate slider arm (14) outward.

WARNING



Ensure fingers and hands are not between strut front and rear halves. Fingers and hands could become pinched during assembly. Failure to comply may result in injury or death to personnel.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

11. Rotate flip lock (15) up to hold slider arm (14). Release slider arm.

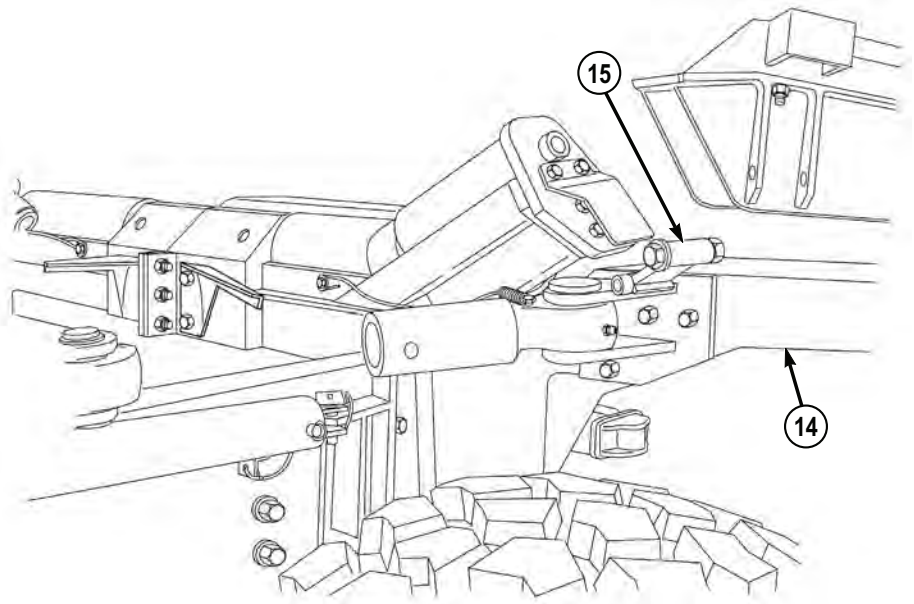


Figure 4.

12. Remove lock pin (16) and pin (17) from long strut (18) and stowage bracket (19).

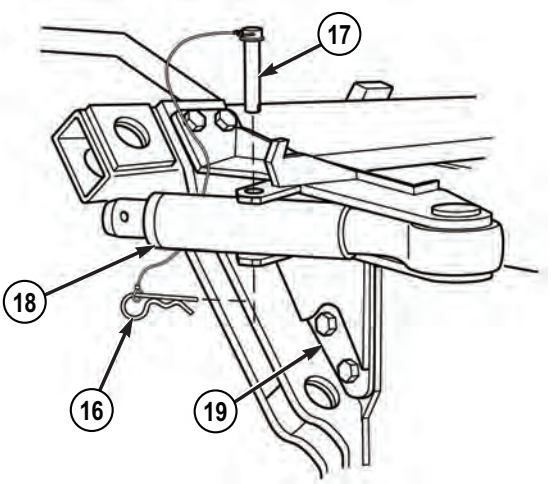


Figure 5.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

13. Align long strut (18) with short strut (20).

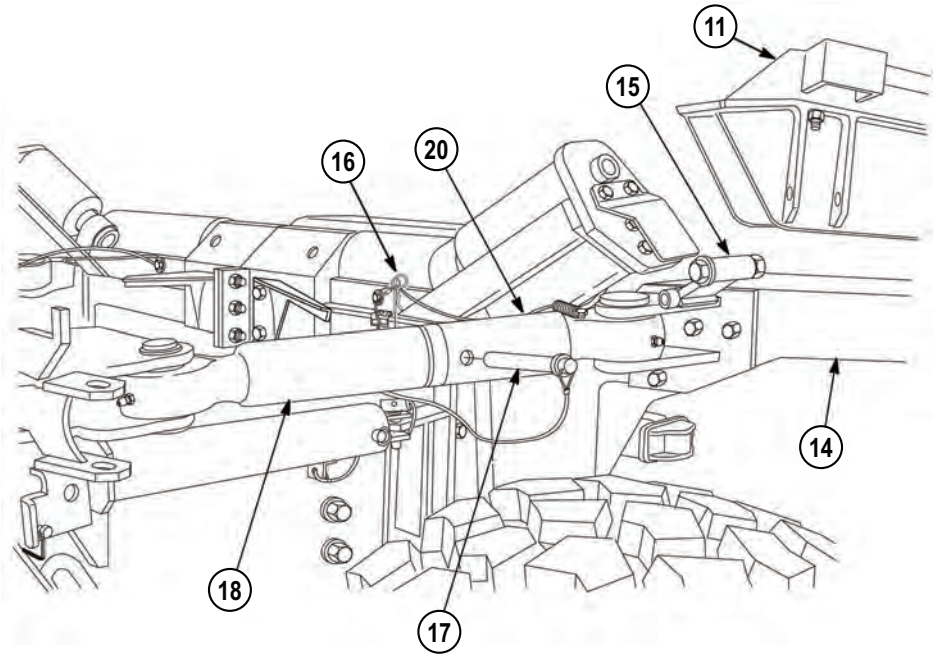


Figure 6.

14. Rotate slider arm (14) out with handle and disengage flip lock (15) by rotating it down.
15. Position long strut (18) in short strut (20) and install pin (17) and lock pin (16). Ensure slider (11) is in straight ahead position.
16. Repeat Steps (9) through (15) for right side.
17. Start engine (WP 0027).

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

WARNING



- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter contacting rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in damage to equipment and injury or death to personnel.
- Front lift adapter must be unloaded on a flat, level surface. Failure to comply may result in injury or death to personnel.

18. Position vehicle for removal of lifting frame (3).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

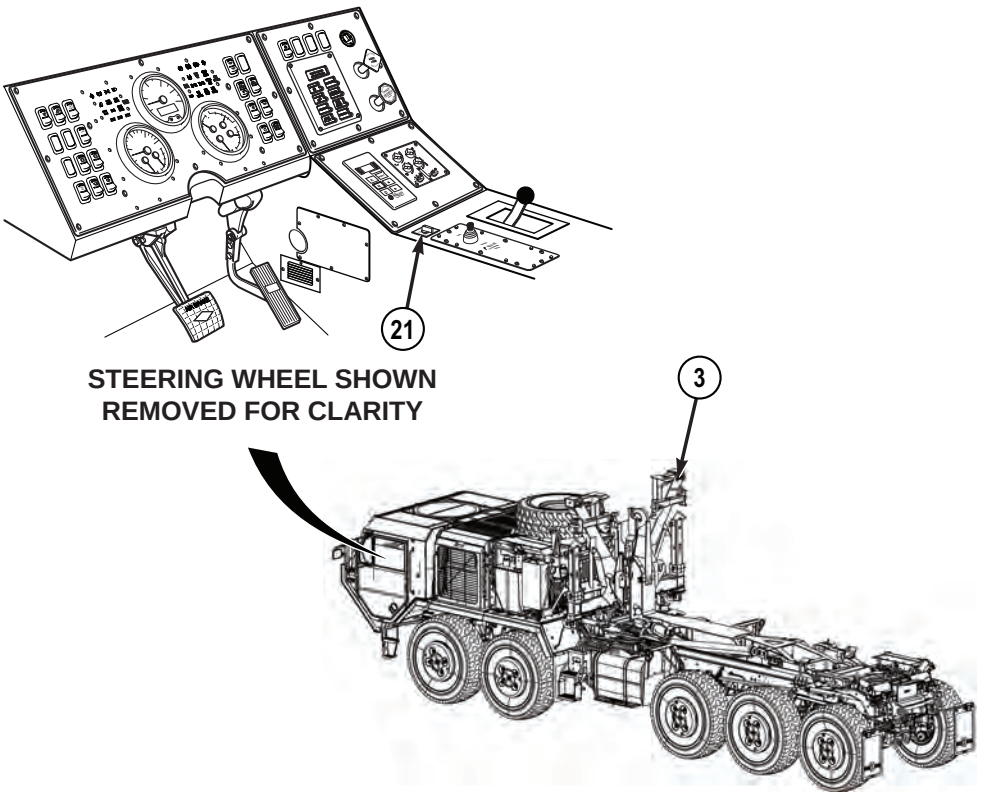


Figure 7.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

19. Turn hydraulic selector switch (21) to AUTO.
20. Operate LHS in AUTO mode until lifting frame (3) stops.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

21. Turn hydraulic selector switch (21) to MAN H.A. mode and lower until lifting frame (3) is approximately 12.0 in. (304.8 mm) from the ground.

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

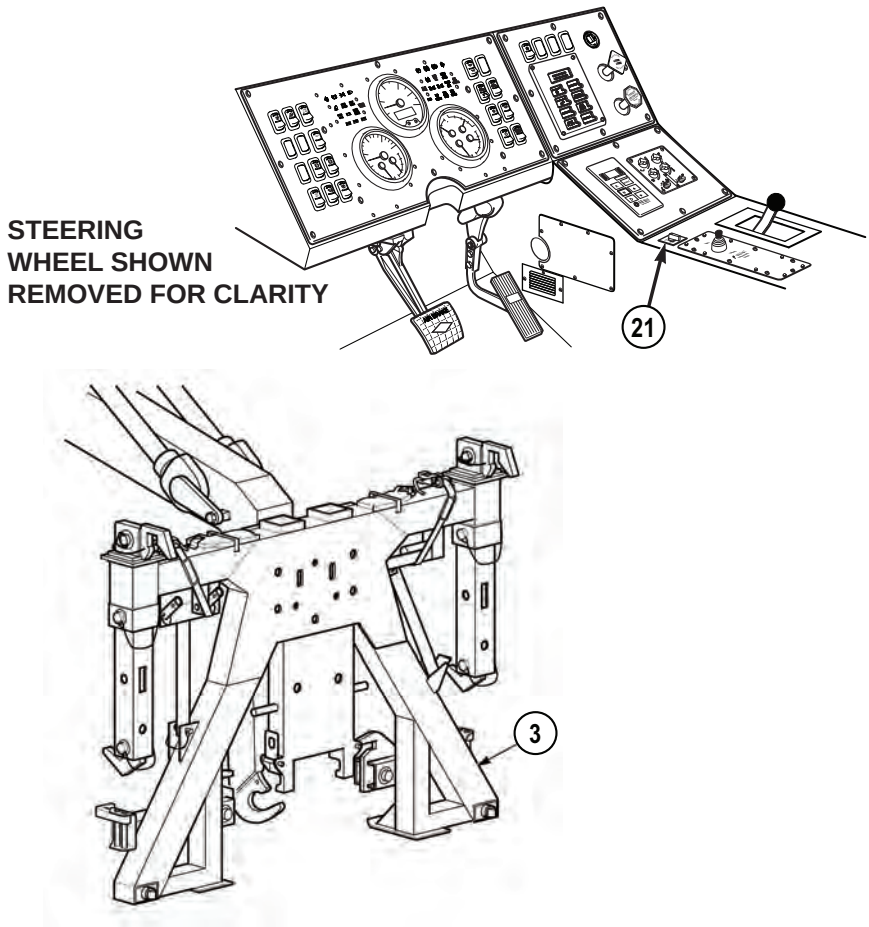


Figure 8.

22. Shut OFF engine (WP 0037).
23. Remove two lock pins (22) and pins (23) from upper support leg (24).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

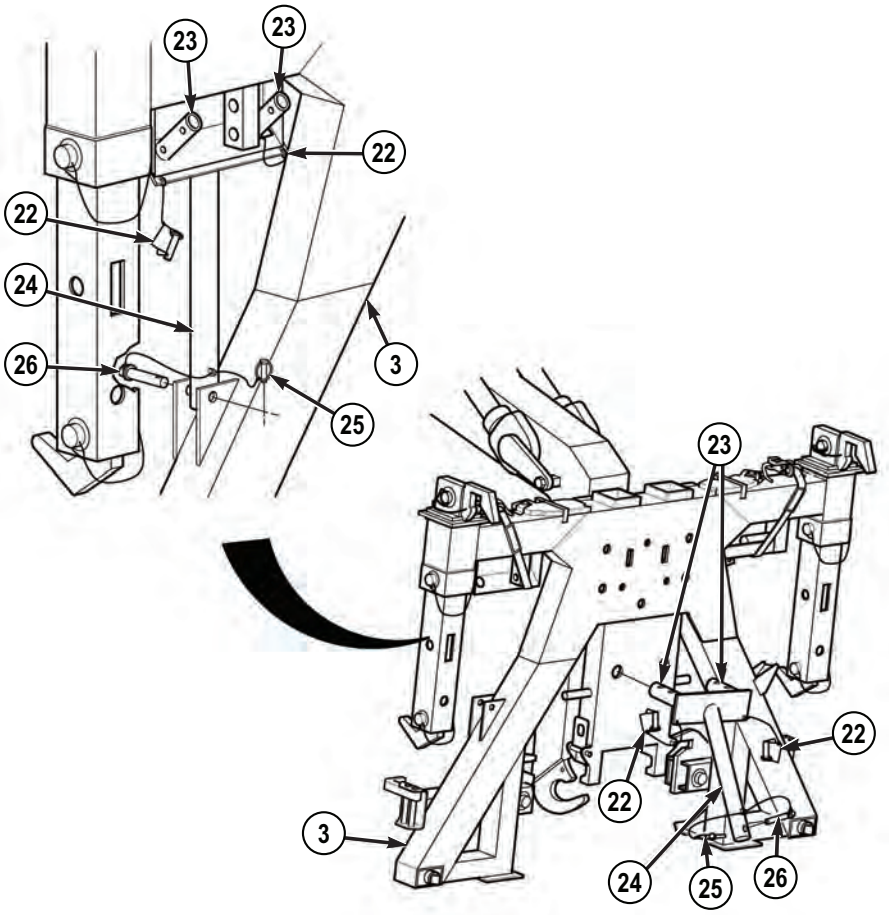


Figure 9.

24. Remove lock pin (25), pin (26), and upper support leg (24) from stowage bracket on lifting frame (3).
25. Position two pins (23) on upper support leg (24) through two lower holes on lifting frame (3).
26. Install two lock pins (22) in pins (23) on front side of lifting frame (3).
27. Remove lock pin (27) and lower support leg (28) from stowage bracket on lifting frame (3).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

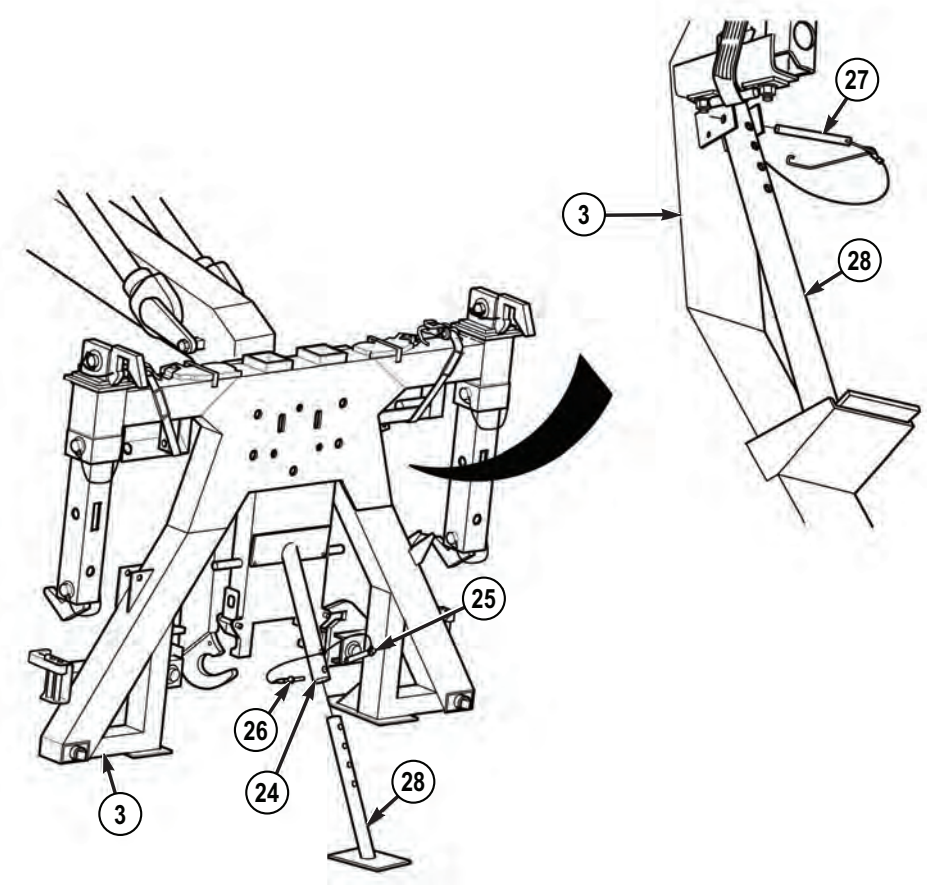


Figure 10.

28. Position lower support leg (28) in upper support leg (24).

NOTE

Other support leg pin hole positions may be used if ground is uneven.

29. Align hole in upper support leg (24) with second hole from bottom on lower support leg (28) and install pin (26) and lock pin (25).
30. Install lock pin (27) in stowage bracket on lifting frame (3).
31. Lift pin handle (29) and release pin (30).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

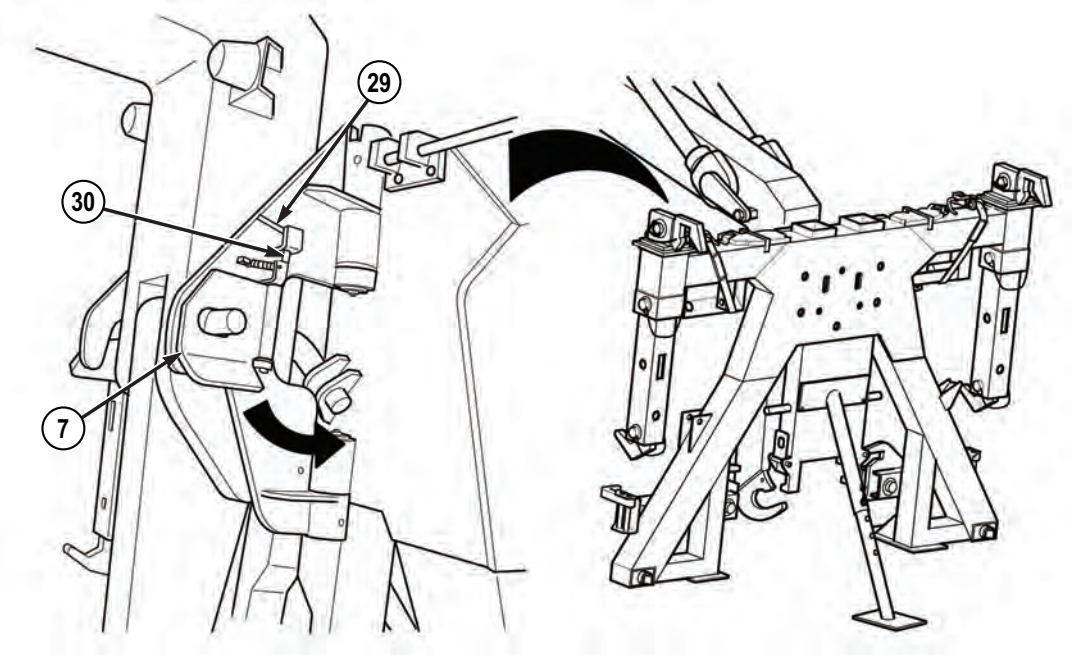


Figure 11.

NOTE

- If ground is soft, jacking plate from vehicle BII or similar item may be positioned under support leg pad to prevent lifting frame from sinking in ground.
- There are two flipper bracket lock plates on lifting frame. Left side is shown.

32. Rotate flipper bracket lock plate (7) out to unlocked position and release pin handle (29).
33. Ensure pin (30) is locked in flipper bracket lock plate (7).
34. Repeat Steps (31) through (33) for right side.
35. Start engine (WP 0027).
36. Move joystick (31) to UNLOAD until LHS stops and pivot pin (8) is below flipper bracket (6).

REMOVING LIFTING FRAME FROM PLS VEHICLE IN FLATRACK MODE - Continued

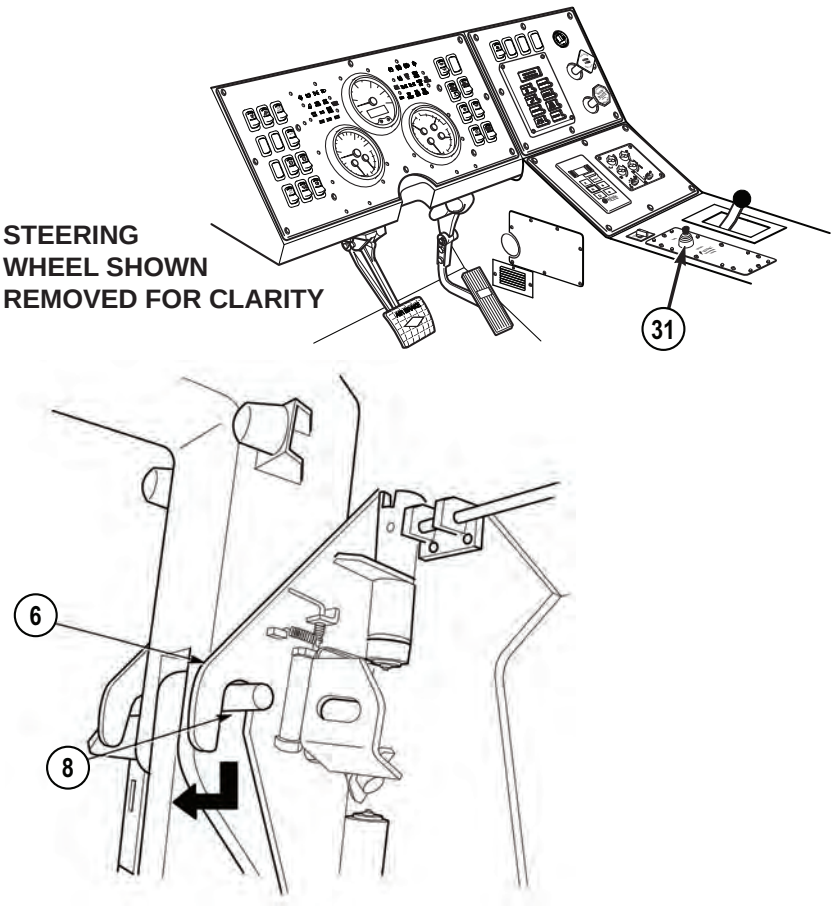


Figure 12.

37. Drive vehicle ahead approximately 12.0 in. (304.8 mm).

END OF TASK

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE

WARNING



Front lift adapter weighs 1,600 lbs (726 kg). Personnel must stay clear when installing or removing front lift adapter to LHS hook arm hook. Failure to comply may result in injury or death to personnel.

WARNING



- Sliders must be deployed before operating LHS in container mode for proper LHS cycle. Failure to comply will result in hook arm extending too far and lift adapter contacting rear of vehicle. Front lift adapter could become unhooked. Failure to comply may result in damage to equipment and injury or death to personnel.
- Front lift adapter must be unloaded on a flat, level surface. Failure to comply may result in injury or death to personnel.

NOTE

- For detailed instructions on how to operate the LHS on the vehicle refer to Load Handling System (LHS).
- Ensure vehicle is in container mode.

1. Start engine (WP 0027).
2. Move joystick (31) to UNLOAD until LHS stops and pivot pin (8) is below flipper bracket (6) and flipper bracket lock plate (7) on lifting frame (3).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

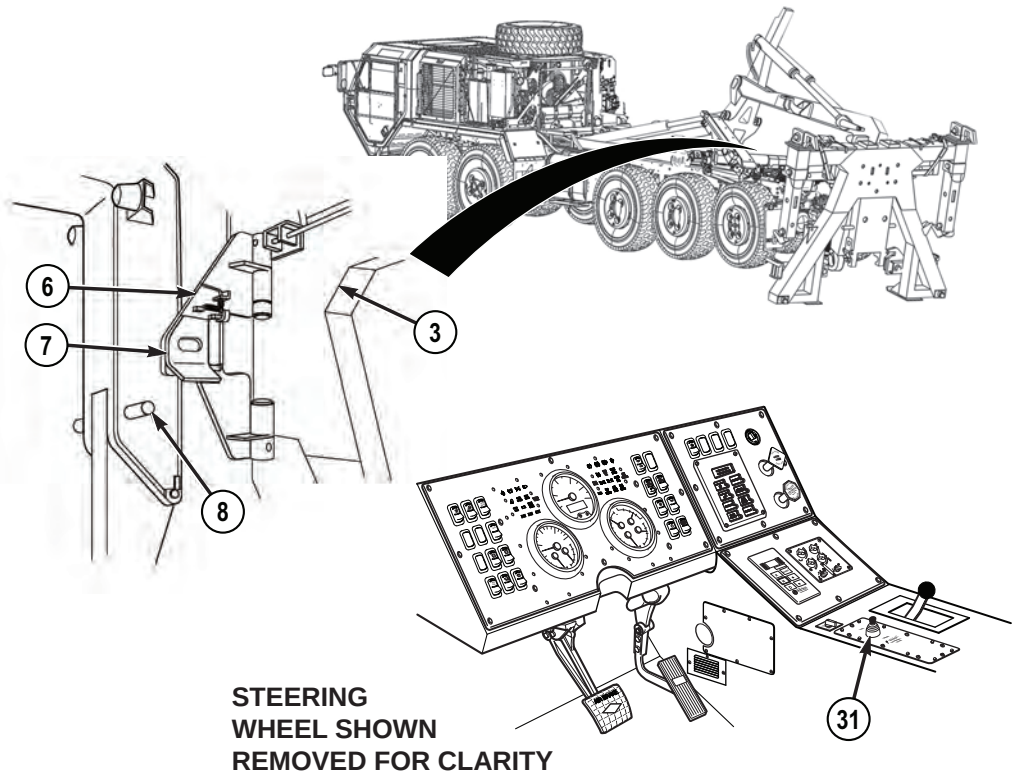


Figure 13.

3. Shut OFF engine (WP 0037).

NOTE

There are two strut and slider assemblies on PLS vehicle. Left side is shown.

4. Remove lock pin (16) and pin (17) from short strut (20) and long strut (18).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

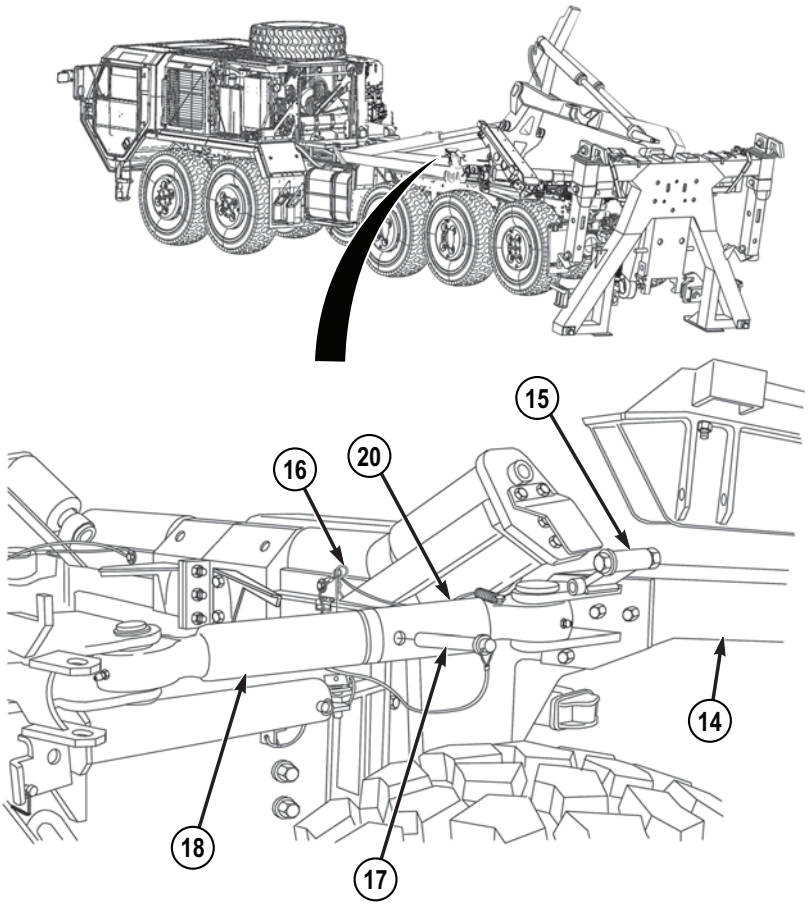


Figure 14.

5. Rotate slider arm (14), with handle out, to separate short strut (20) and long strut (18).
6. Position flip lock (15) up to hold slider arm (14) out.
7. Release slider arm (14).
8. Position long strut (18) on stowage bracket (19) and install pin (17) and lock pin (16).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

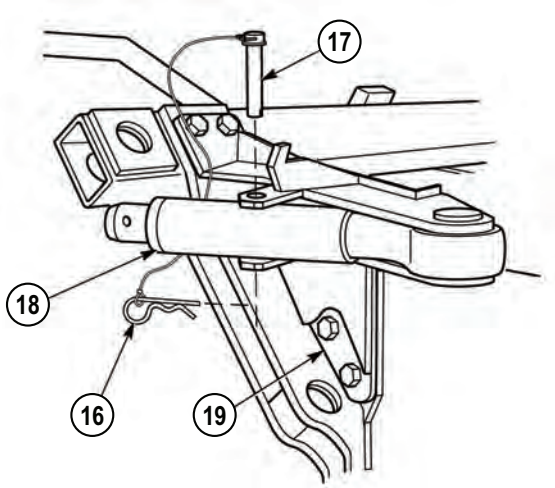


Figure 15.

9. Rotate slider arm (14) out with handle and disengage flip lock (15) by rotating it down.

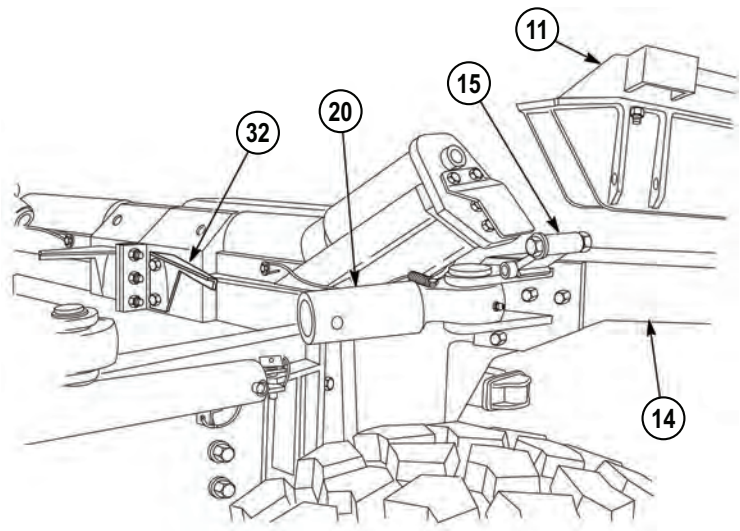


Figure 16.

10. Rotate slider arm (14) forward and front of slider (11) down and position short strut (20) on stowage pin (32).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

WARNING



Do not to hold on to front of slider when stowing. Hands and fingers may be pinched between front of slider and hard lift bracket. Failure to comply may result in injury or death to personnel.

NOTE

Rear of slider may have to be pulled out slightly to position front of slider on retaining bracket.

11. Pull down pivot lock pin handle (10), lift rear of slider (11) and rotate front of slider over retaining plate (33) until pivot lock pin locks.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

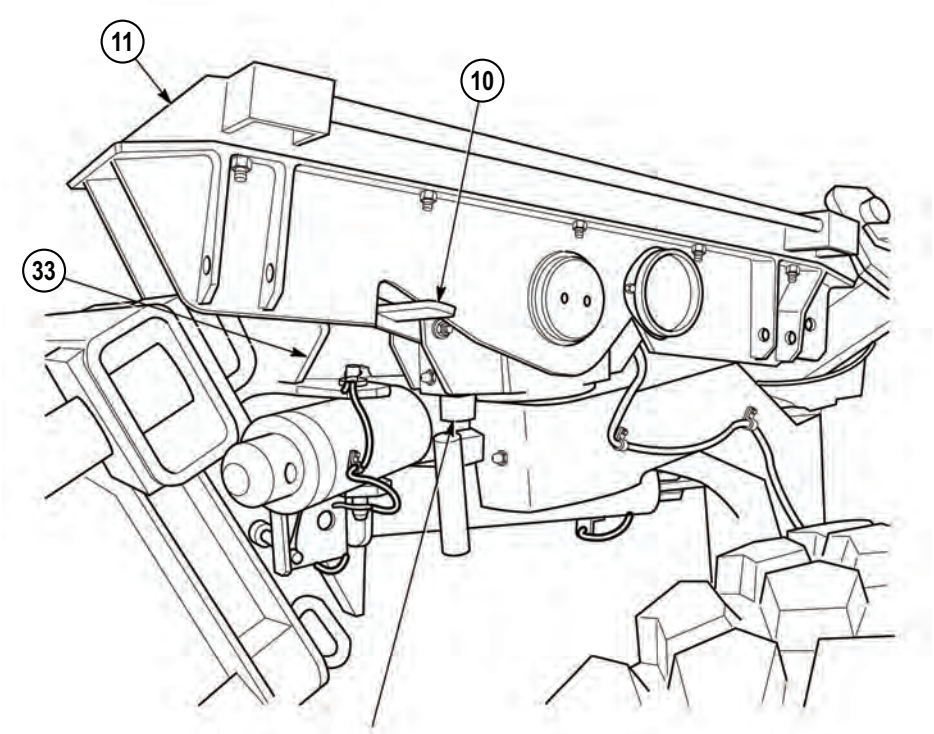


Figure 17.

12. Release pivot lock pin handle (10).
13. Repeat Steps (4) through (12) for right side.

NOTE

There are two flipper bracket lock plates on lifting frame. Left side shown.

14. Lift pin handle (29) and release pin (30).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

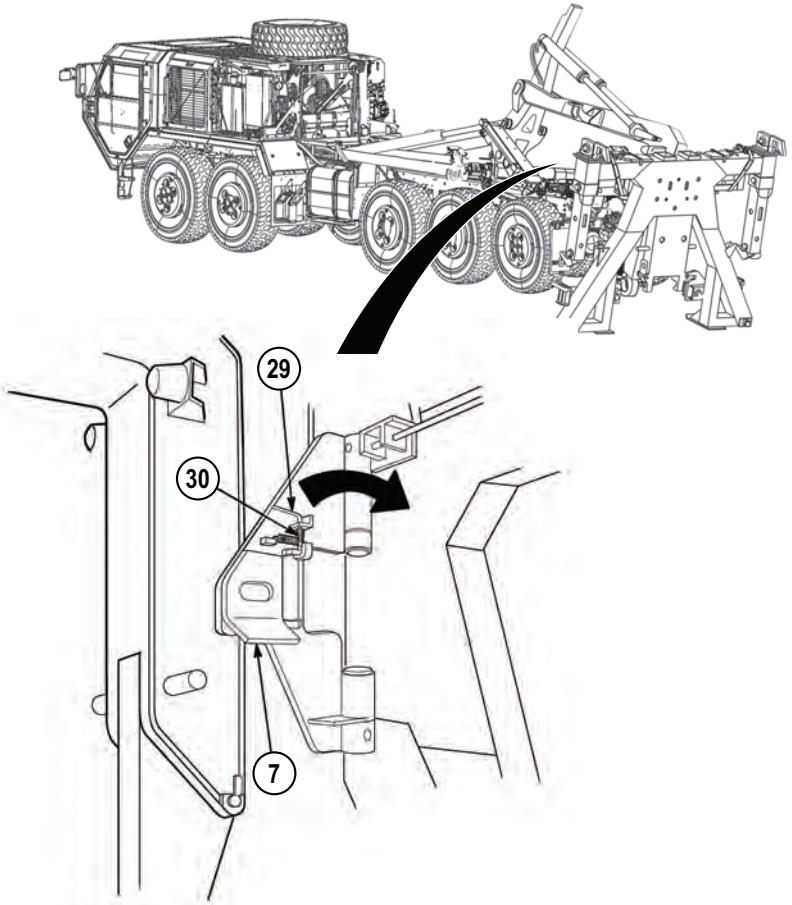


Figure 18.

15. Rotate pin handle (29) to unlocked position and release pin handle.
16. Ensure flipper bracket lock plate (7) moves freely.
17. Repeat Steps (14) through (16) for right side.

NOTE

There are two flipper bracket lock plates on lifting frame. Left side shown.

18. Remove lock pin (35) and pin (34) from stow position on lifting frame (3).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

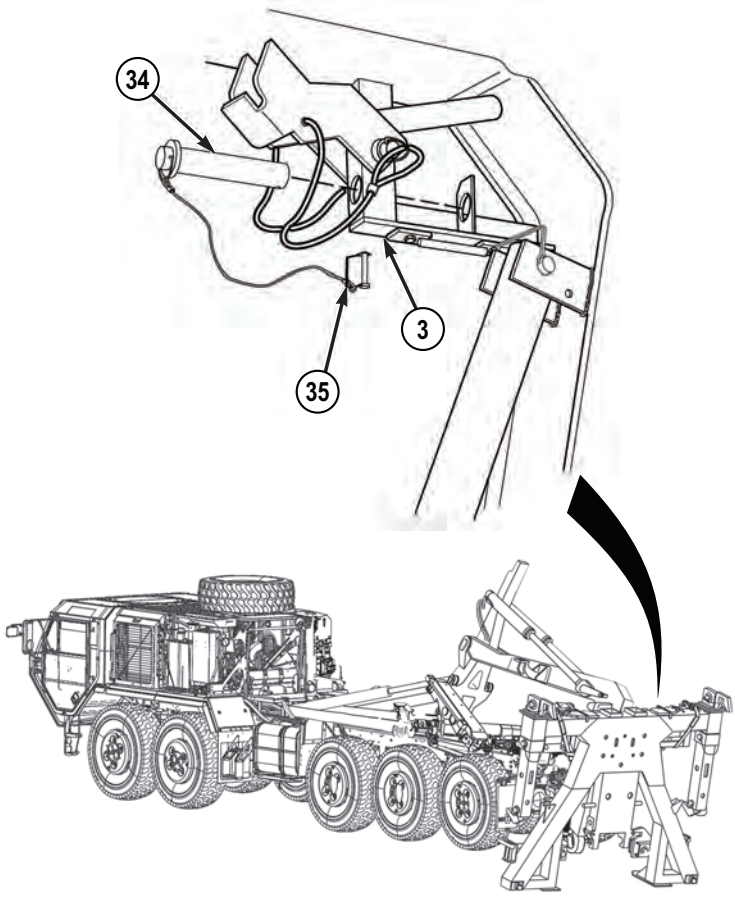


Figure 19.

19. Install pin (34) and lock pin (35) in lifting frame (3) and slide arm (36) in upper hole.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

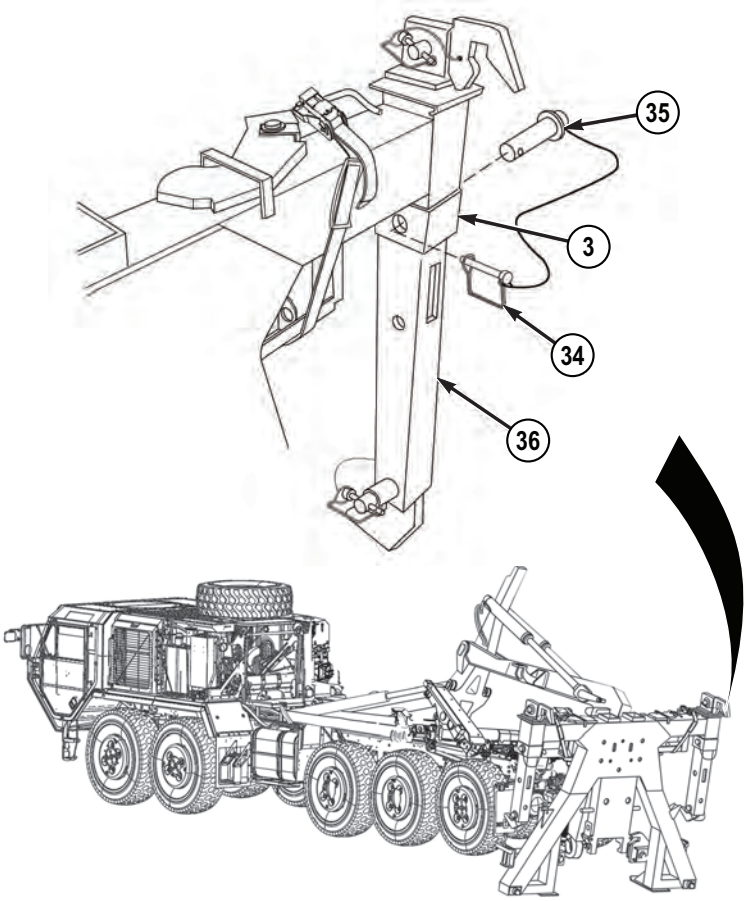


Figure 20.

20. Repeat Steps (18) and (19) for right side.
21. Start engine (WP 0027).
22. Back up vehicle until LHS contacts lifting frame (3), and pivot pin (8) is directly below flipper bracket (6) and flipper bracket lock plate (7).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

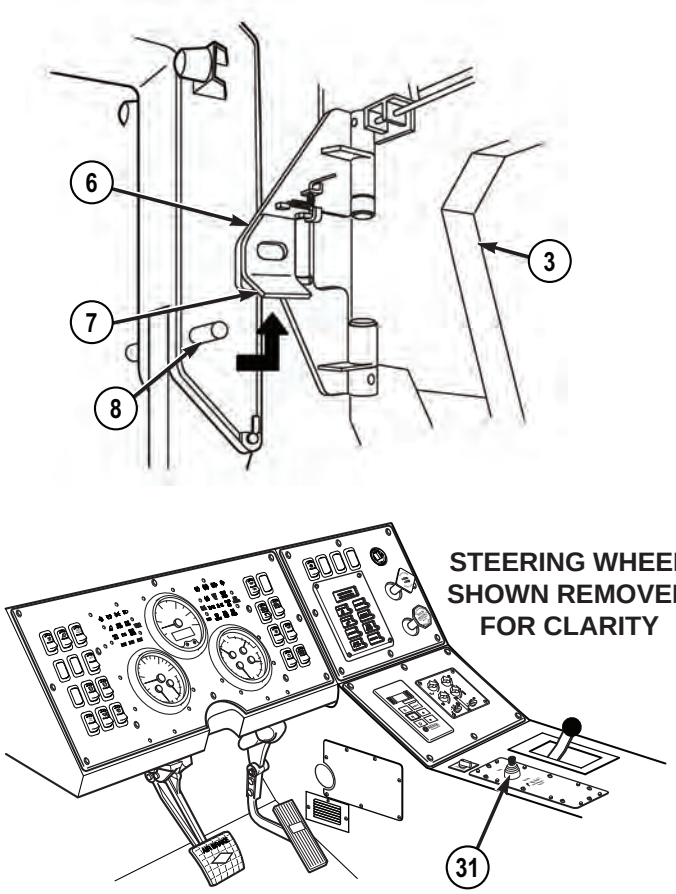


Figure 21.

WARNING



Flipper bracket and flipper bracket lock plate must be properly locked to pivot pin before operating the LHS to stow lift adapter. Failure to comply could cause lift adapter to become unhooked. Failure to comply may result in injury or death to personnel.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

23. Move joystick (31) to LOAD and raise pivot pin (8) into flipper bracket (6) and flipper bracket lock plate (7).
24. Move joystick (31) to LOAD and raise lifting frame (3) approximately 12.0 in. (304.8 mm) above the ground.

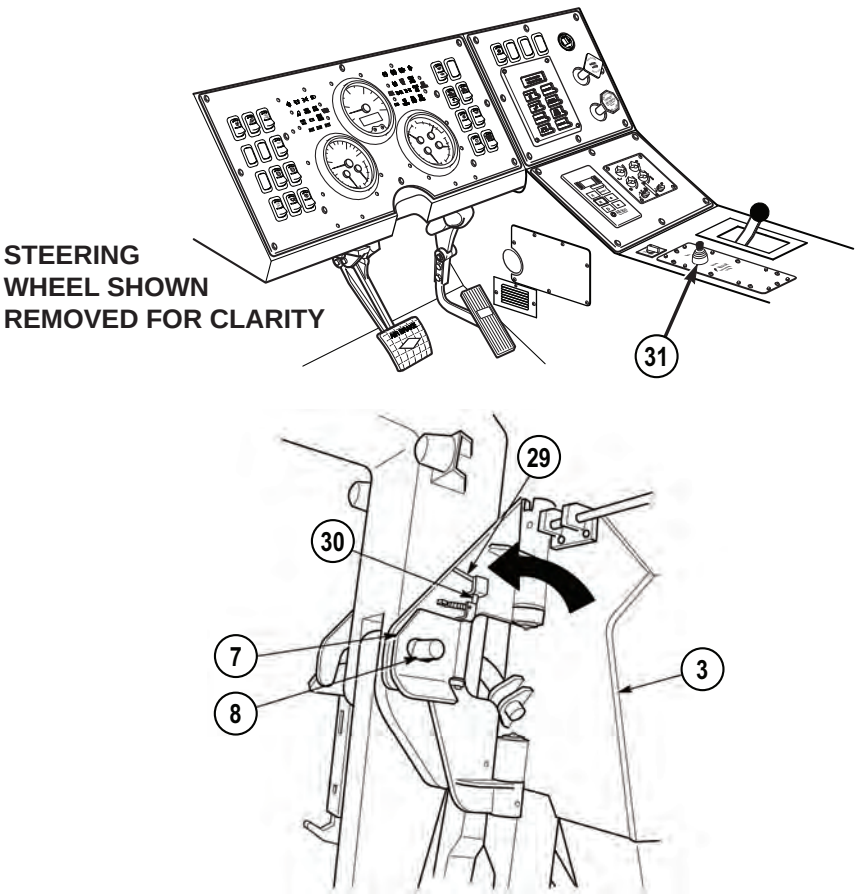


Figure 22.

25. Shut OFF engine (WP 0037).
26. Lift pin handle (29) and release pin (30).
27. Rotate pin handle (29) into locked position and release pin handle.
28. Ensure flipper bracket lock plate (7) is positioned over pivot pin (8) and pin handle (29) is locked.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

29. Repeat Steps (26) through (28) for right side.
30. Remove lock pin (27) from stowage bracket on lifting frame (3).

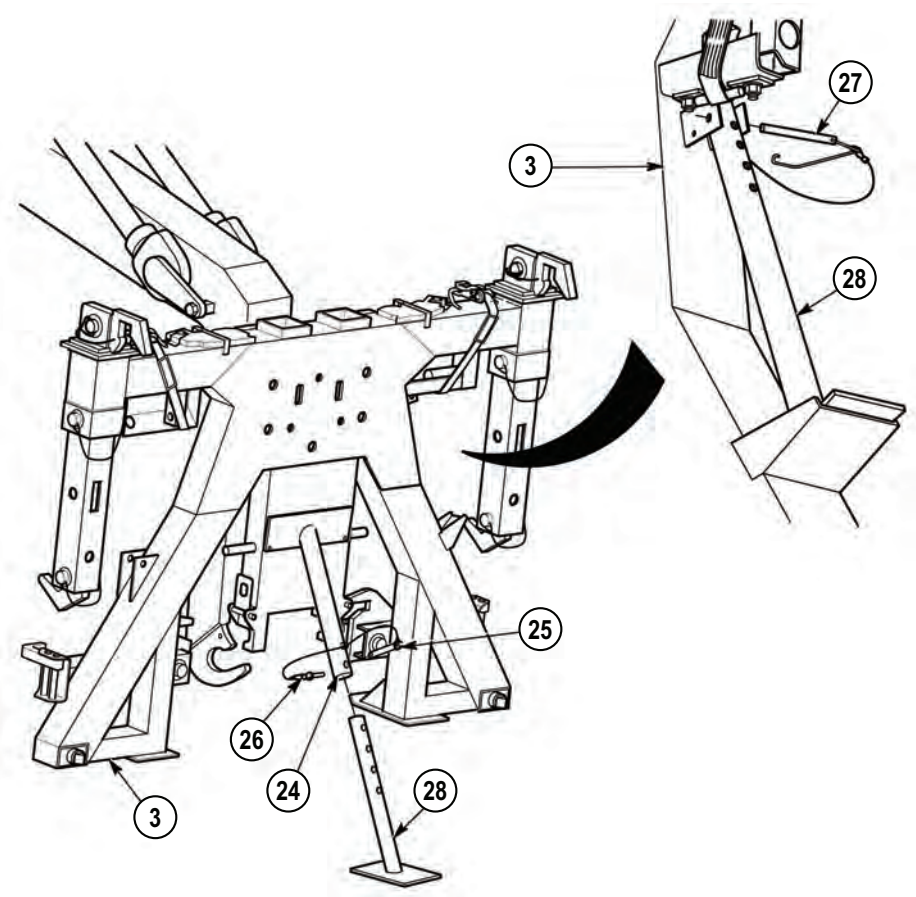


Figure 23.

31. Support lower support leg (28) and remove lock pin (25) and pin (26).
32. Remove lower support leg (28) from upper support leg (24).
33. Position lower support leg (28) on stowage bracket of lifting frame (3) and install lock pin (27).
34. Support upper support leg (24) and remove two lock pins (22) from pins (23).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

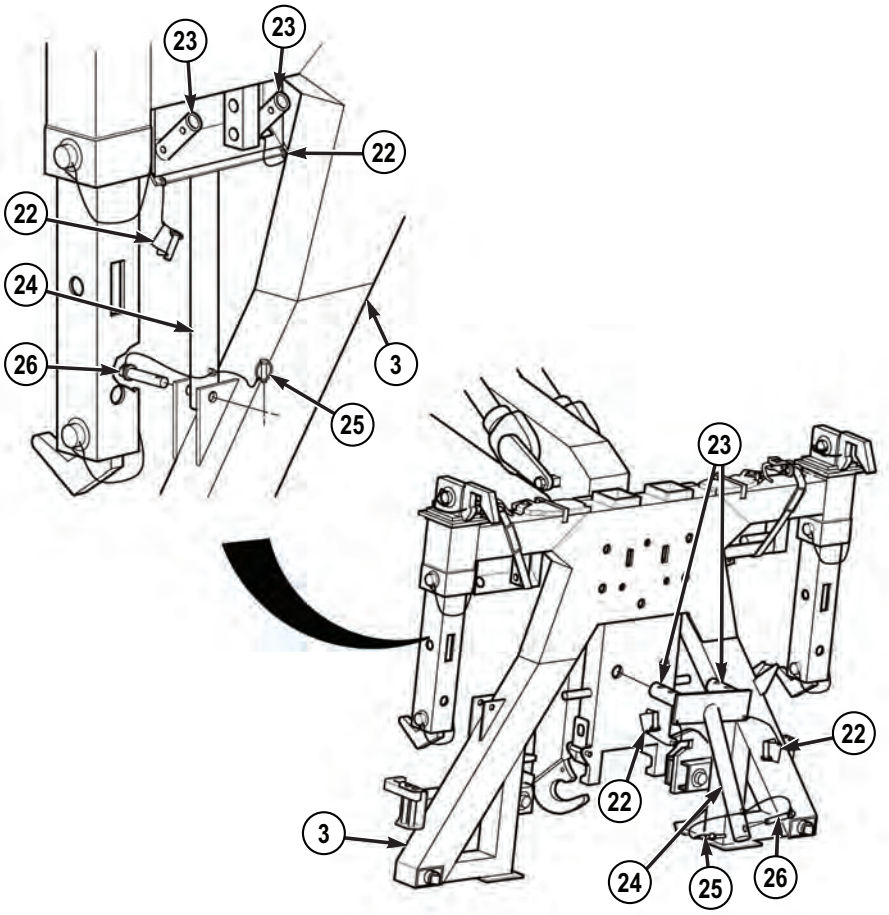


Figure 24.

35. Remove upper support leg (24) from lifting frame (3).
36. Position upper support leg (24) in stowage bracket of lifting frame (3) and install two lock pins (22) on pins (23).
37. Install pin (26) and lock pin (25) on upper support leg (24) and stowage bracket of lifting frame (3).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

WARNING



- Flipper bracket and flipper lock plate must be properly locked to pivot pin before operating LHS to stow front lift adapter. Failure to comply could cause front lift adapter to become unhooked. Failure to comply may result in injury or death to personnel.
- Before stowing front lift adapter on vehicle, ensure paddles are rotated to engage position, bumper support rotated forward, slide arms stowed and rear container locks are stowed on front lift adapter. Failure to comply may result in injury or death to personnel.

NOTE

- Paddles are properly positioned when air cylinders are fully extended and paddles face towards front of vehicle.
- Ensure paddles are properly positioned to engage lifting frame.

38. Operate air valve levers (5) to rotate paddles (37) to engage position.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

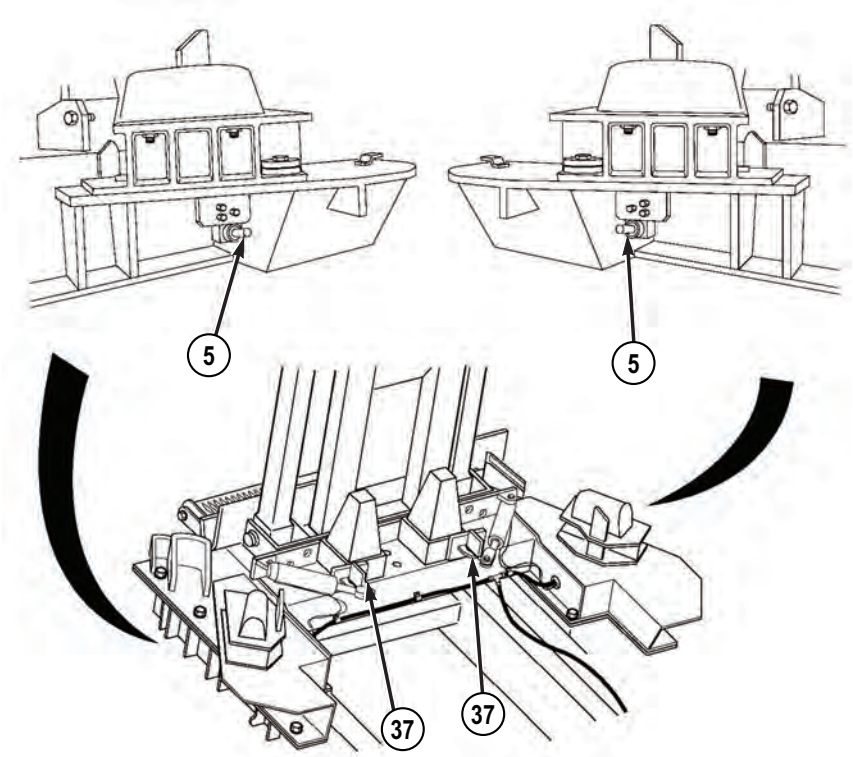


Figure 25.

39. Start engine (WP 0027).
40. Move joystick (31) to LOAD and stow lifting frame (3) on cone weldments (38).

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

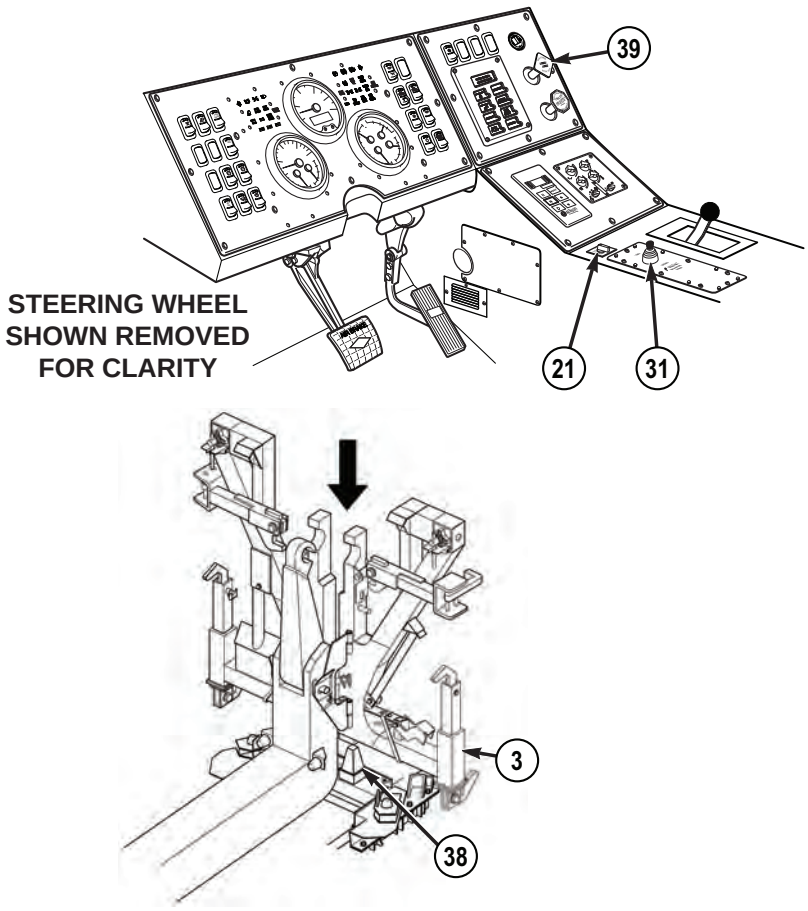


Figure 26.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

41. Turn hydraulic selector switch (21) to OFF.
42. Shut OFF engine (WP 0037).
43. Pull out parking brake knob (39) to apply parking brakes.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

NOTE

There are two flipper lock assemblies and straps on lifting frame. Left side is shown.

44. Pull flipper lock pin handle (4) out and push air valve lever (5) down to rotate flipper bracket (6) and flipper bracket lock plate (7) off of pivot pin (8).

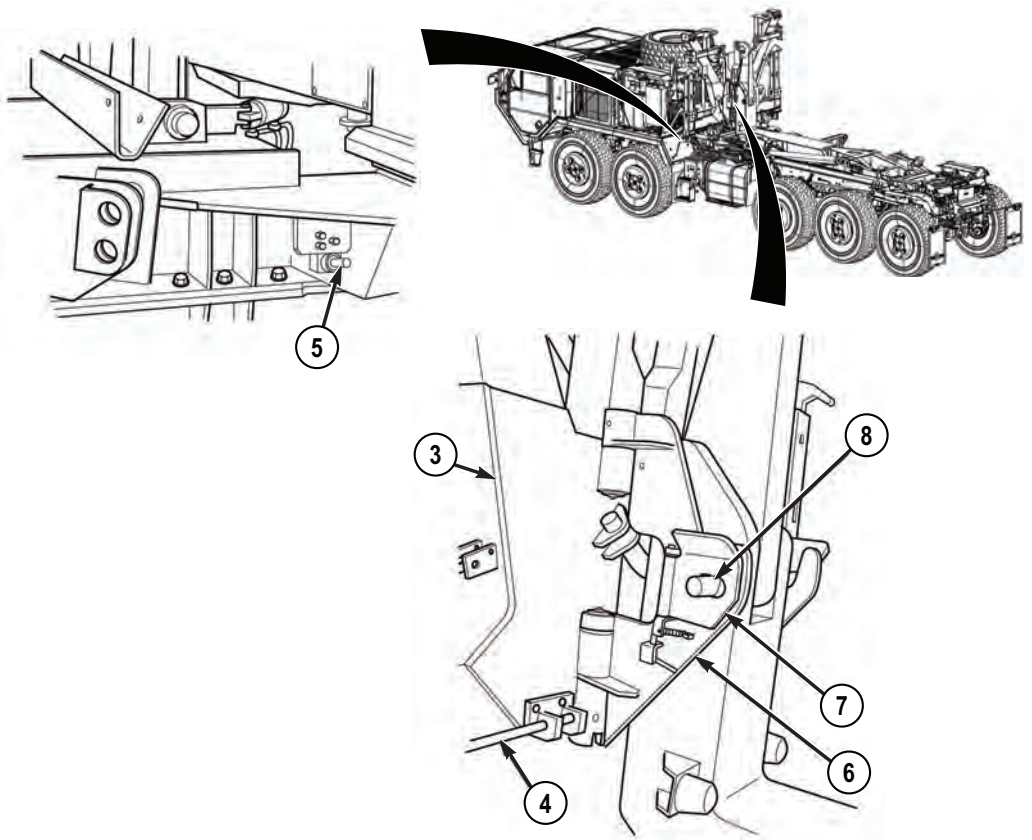


Figure 27.

45. Release flipper lock pin handle (4).
46. Ensure flipper bracket (6) is positioned against lifting frame (3) away from pivot pin (8).
47. Ensure flipper lock pin handle (4) is engaged in flipper bracket (6).
48. Position hook of strap (1) to rod on front support assembly (2) and tighten strap.

INSTALLING LIFTING FRAME ONTO PLS VEHICLE IN FLATRACK MODE - Continued

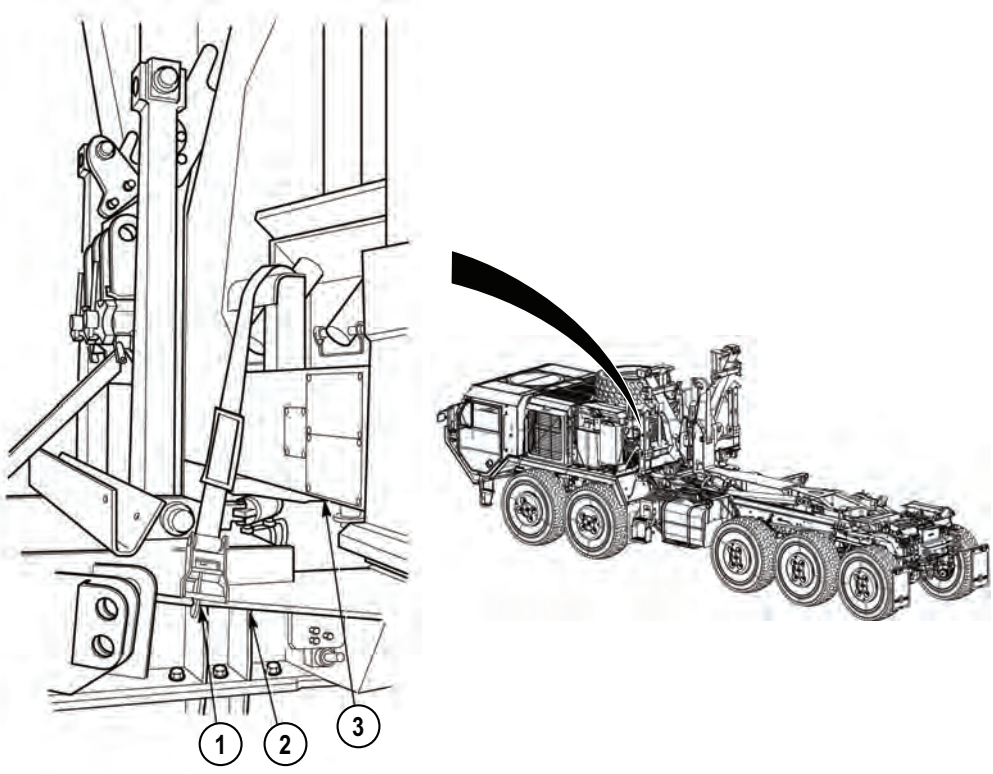


Figure 28.

49. Repeat Steps (44) through (48) for right side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
MATERIAL HANDLING CRANE (MHC) OPERATION (MANUAL CONTROLS)

INITIAL SETUP:

Not Applicable

PREPARE CRANE FOR USE

1. Start engine. (WP 0027)

NOTE

- If the ground is not level, outrigger jacks can be used to level the vehicle on up to a seven percent side slope.
- If outrigger pads do not stay in firm contact with ground, crane functions will not operate.

2. Position vehicle on level ground so all loading and unloading can be done from one position.
3. Put transmission range selector (1) in Neutral (N) position and pull PARKING BRAKE control knob (2) out.

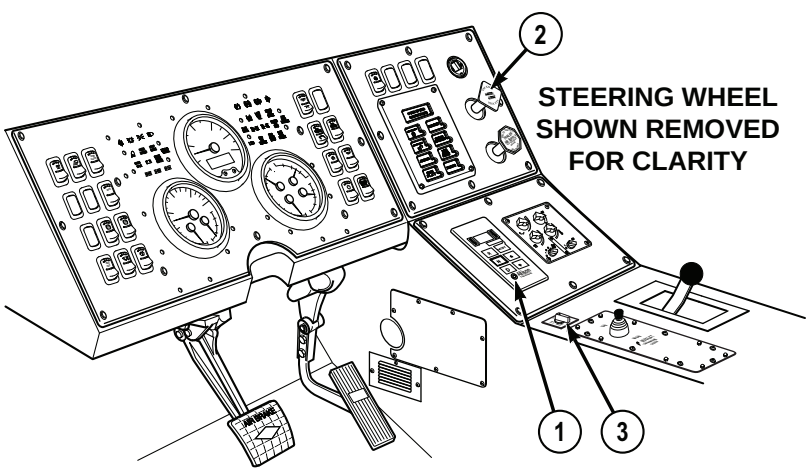


Figure 1.

PREPARE CRANE FOR USE - Continued

CAUTION

Hydraulic selector switch must be in OFF position before moving selector switch. Failure to comply may result in damage to equipment.

4. Ensure hydraulic selector switch (3) is in OFF position.

WARNING



When operating vehicle at speeds in excess of 55 mph (89 km/hr), or when operating crane, hearing protection must be worn. Failure to comply may result in injury or death to personnel.

5. Press High Idle switch (4) to the on position for crane operation.

PREPARE CRANE FOR USE - Continued

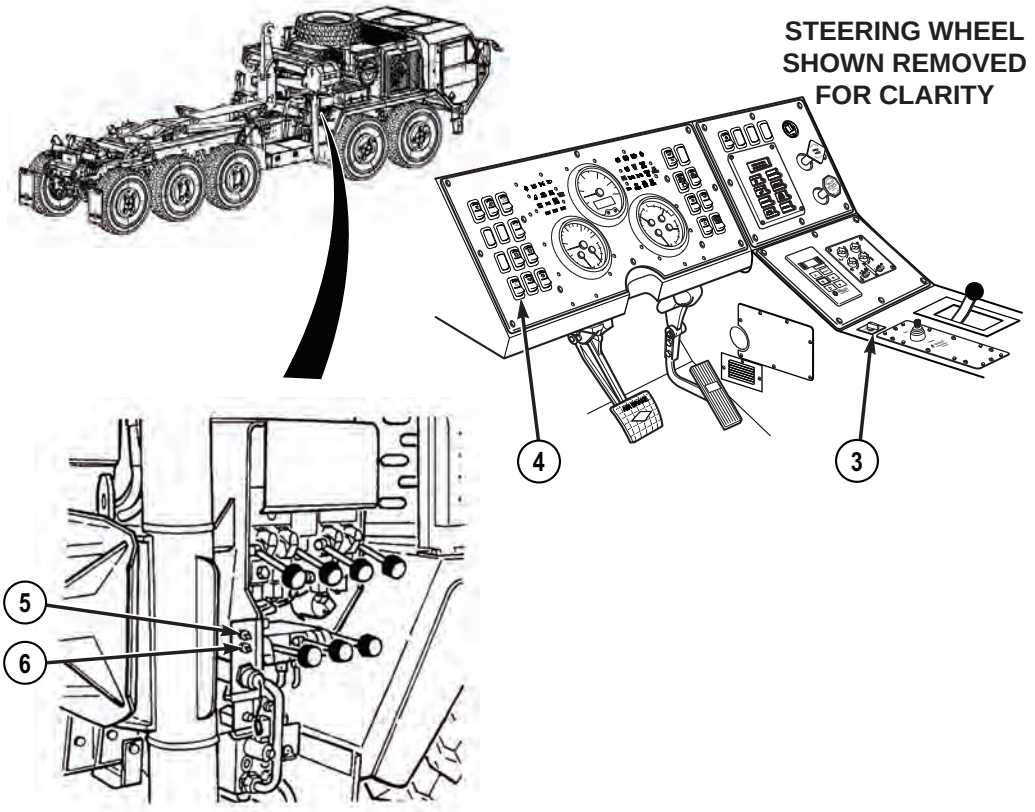


Figure 2.

CAUTION

Engine speed must be at idle before using hydraulic selector switch. Failure to comply may result in damage to equipment.

6. Set hydraulic selector switch (3) to CRANE/SRW position.
7. Set CRANE MAIN POWER switch (5) to ON position.
8. Push ENGINE HIGH IDLE LATCH switch (6) to LATCH and release.

END OF TASK

OUTRIGGER JACKS SETUP

WARNING



Use caution when handling outrigger pads. Sharp edges can injure hands. Failure to comply may result in injury or death to personnel.

NOTE

Both outrigger pads are the same. Left side is shown.

1. Remove two safety pins (7) and remove outrigger pad (8) from crane subframe (9).

OUTRIGGER JACKS SETUP - Continued

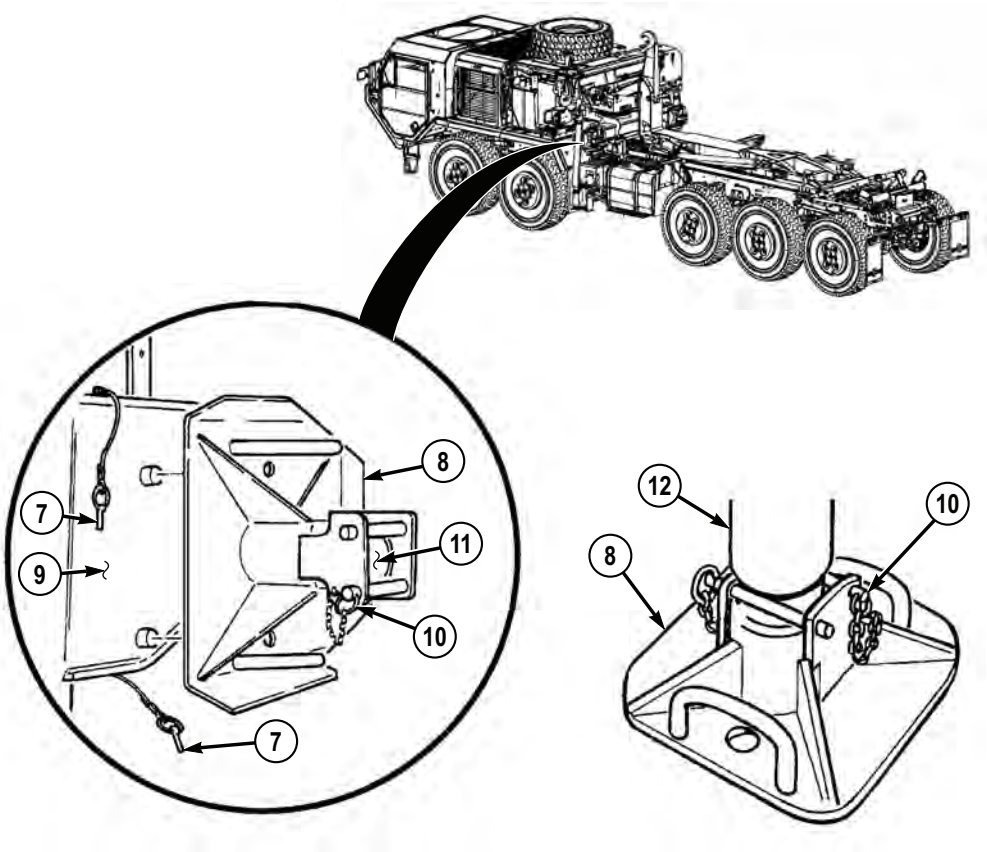


Figure 3.

2. Remove two retaining pins (10) from outrigger pad (8).
3. Clean all of the foreign material from socket (11) in outrigger pad (8) and from rod end of outrigger jack cylinder (12).
4. Position outrigger pad (8) directly below outrigger jack cylinder (12).
5. Repeat Steps (1) through (4) to set up outrigger pad (8) on other side.

OUTRIGGER JACKS SETUP - Continued

WARNING



- Always use outrigger jack control valve on the same side of the vehicle as the outrigger jack is being extended. Failure to comply may result in injury or death to personnel.
- Keep hands and feet away from outrigger jack cylinders and outrigger pads while operating outrigger jack levers. Failure to comply may result in injury or death to personnel.

NOTE

- Adjust outrigger pad position as required so ball end will lower into pad socket.
- Outrigger jacks will come down slower with light pressure on lever. Pushing lever to full travel will cause faster movement.

6. Move left outrigger jack (LH O/R JACK) control lever (13) (on left side of vehicle) to DOWN position and lower outrigger jack cylinder (12) until ball end is seated in outrigger pad (8).

OUTRIGGER JACKS SETUP - Continued

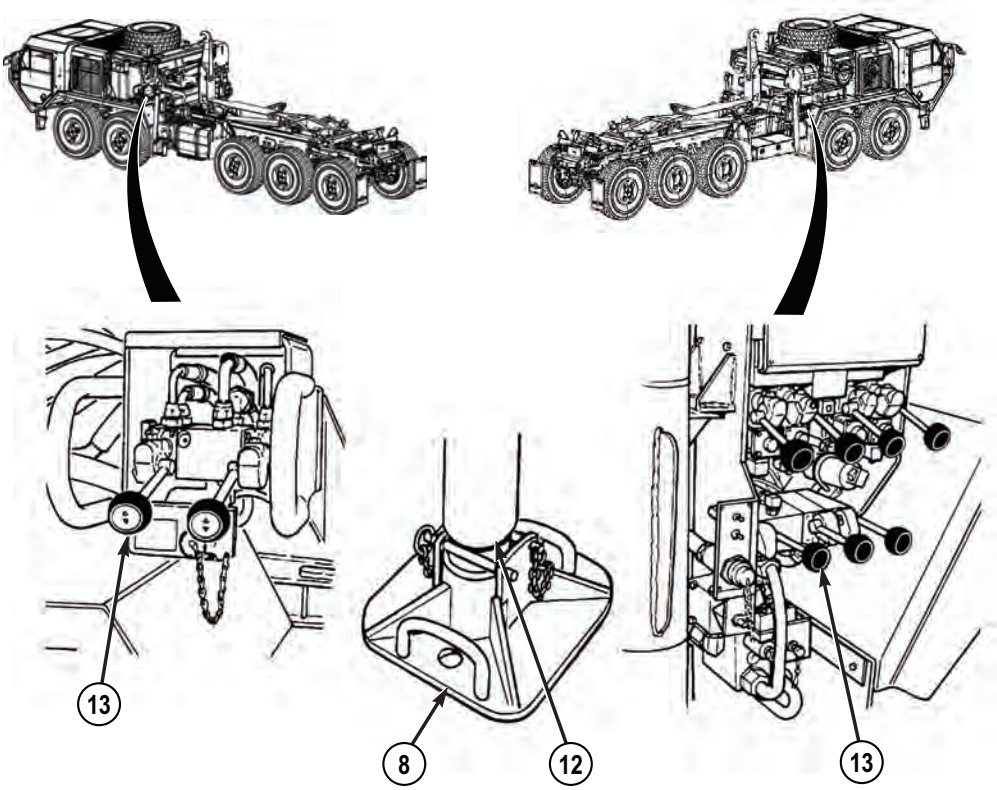


Figure 4.

7. Install retaining pins (10) in outrigger pad (8).

OUTRIGGER JACKS SETUP - Continued

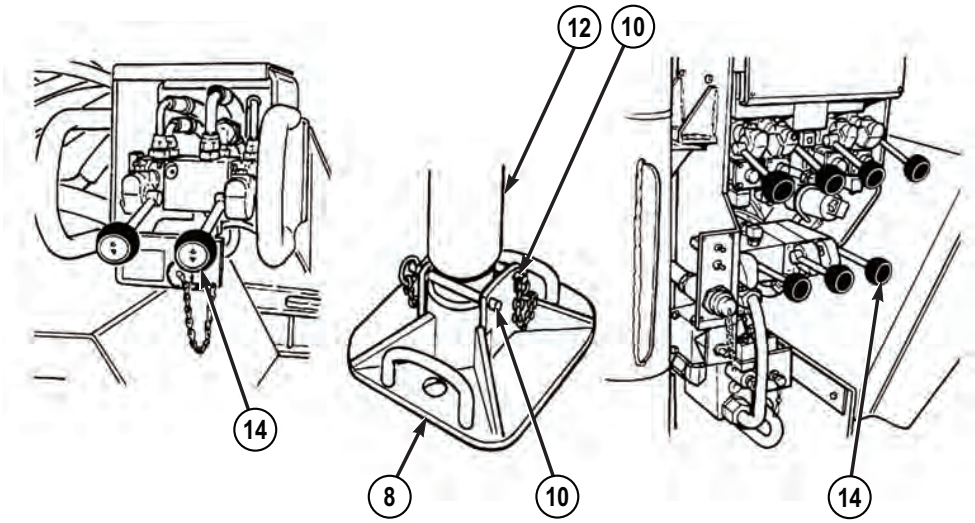


Figure 5.

8. Move right outrigger jack (RH O/R JACK) control lever (14) (on right side of vehicle) to DOWN position and lower outrigger jack cylinder (12) until ball end is seated in outrigger pad (8).
9. Install retaining pins (10) in outrigger pad (8).

WARNING



Outrigger jack cylinders must be extended to remove enough weight from the suspension so that the tires do not bulge or vehicle could roll over. Failure to comply may result in injury or death to personnel.

NOTE

- Operate left and right outrigger jack (LH O/R JACK and RH O/R JACK) control levers at same time.
- Crane movement from one lever may be slower than the other when operating two levers together.
- Vehicle weight should be off suspension at least until tires do not bulge from weight of vehicle.

OUTRIGGER JACKS SETUP - Continued

- Outrigger jacks must properly support vehicle or crane functions will not operate.
- If outrigger jacks depress into ground beyond outrigger pad retaining pins, reposition vehicle.

10. Move left outrigger jack (LH O/R JACK) and right outrigger jack (RH O/R JACK) control levers (13) and (14) to DOWN position. Lower left and right outrigger jack cylinders (12) until vehicle weight is off suspension. Extend jacks individually as necessary to level the vehicle side-to-side.

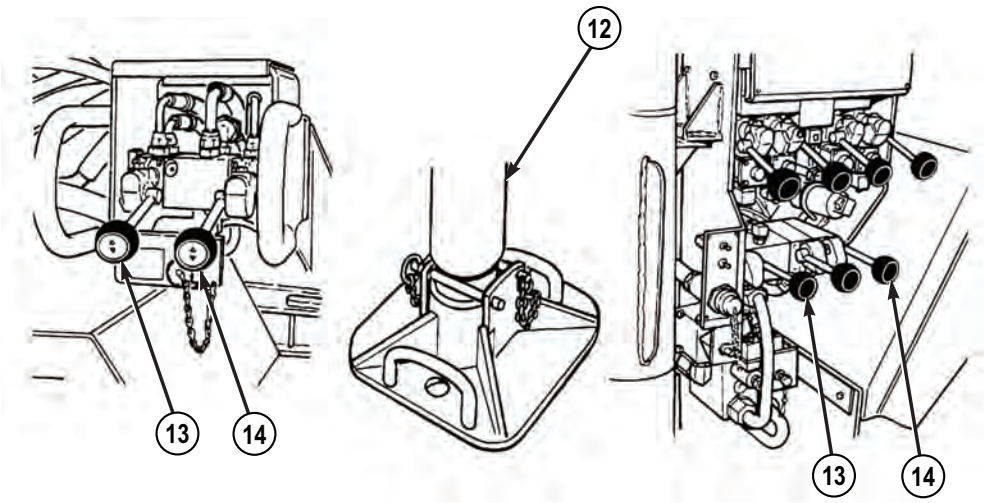


Figure 6.

END OF TASK

RAISE AND OPERATE CRANE

WARNING



Do not operate crane unless outriggers are firmly in place or vehicle could turn over. Failure to comply may result in injury or death to personnel.

RAISE AND OPERATE CRANE - Continued

WARNING



Operator should be stationed to be able to see load at all times during crane operation. Operate crane from RH or LH remote control station, if load is not visible from main crane control panel. Failure to comply may result in injury or death to personnel.

CAUTION

Do not let cable unwind and become slack or cable may get tangled on hoist drum. Failure to comply may result in damage to equipment.

NOTE

Crane will not operate unless outrigger jacks are firmly in place.

1. Move HOIST control lever (15) to DOWN position and lower hoist cable (16) approximately 4.0 in. (101.6 mm).

RAISE AND OPERATE CRANE - Continued

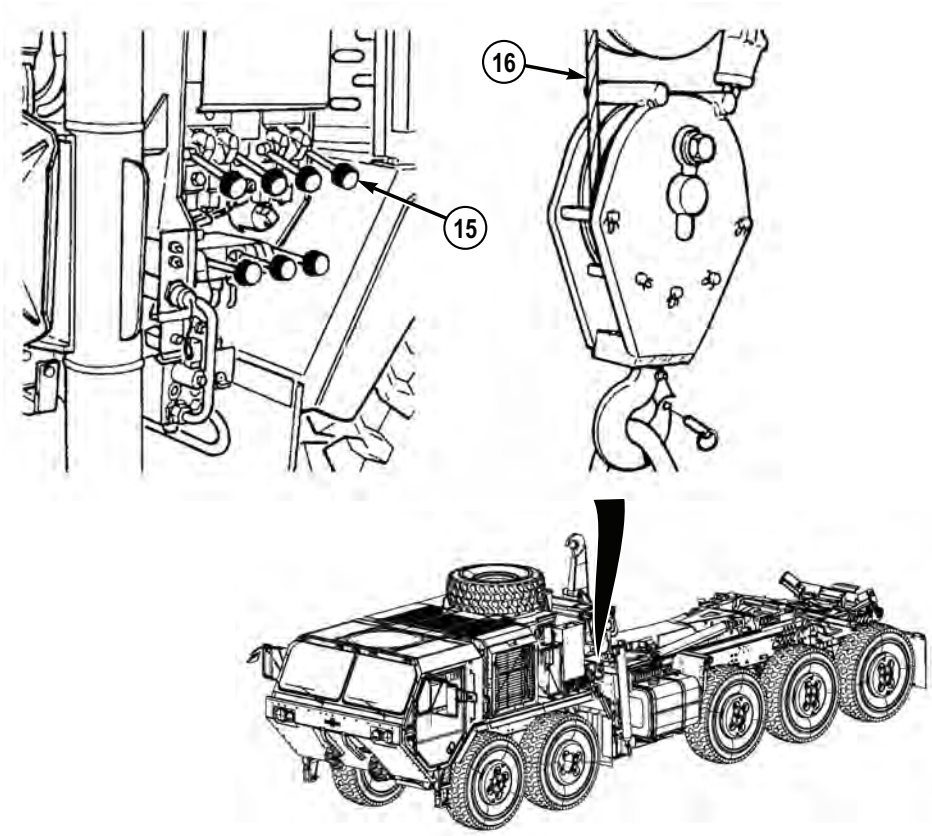


Figure 7.

WARNING



When using crane on any vehicle, park vehicle clear of all overhead electrical lines. Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel.

2. Pull lock pin (17) from lower hole and install in upper hole.

RAISE AND OPERATE CRANE - Continued

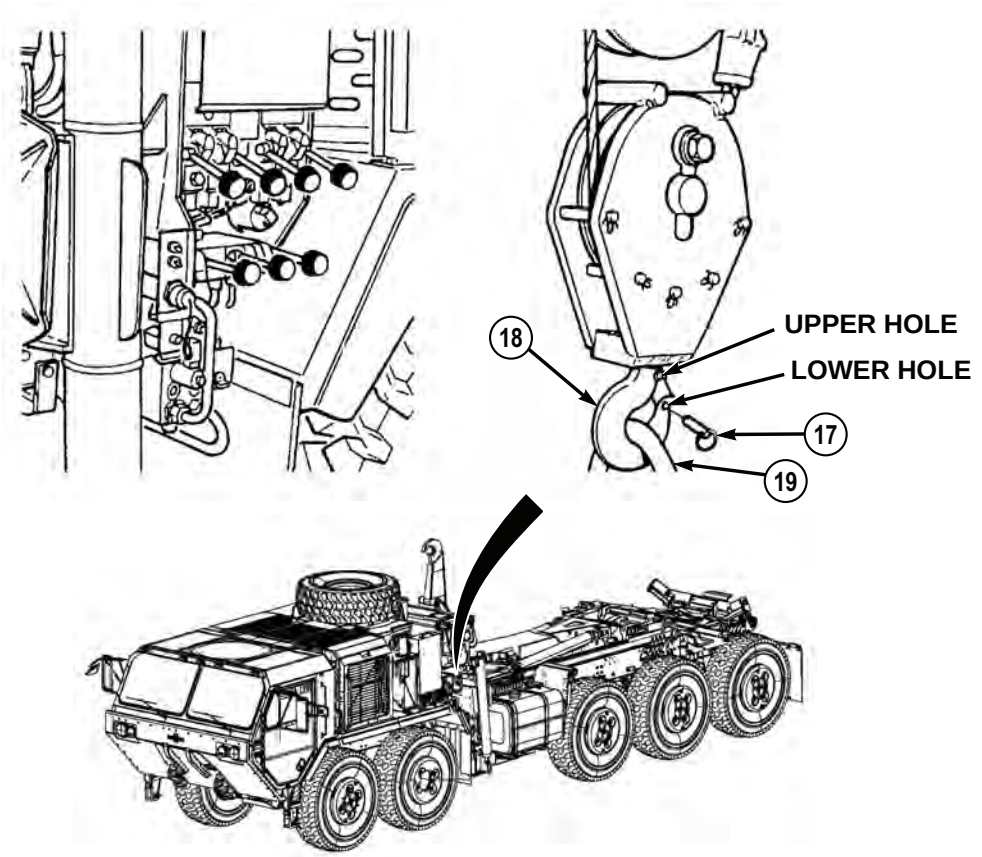


Figure 8.

3. Disconnect load hook (18) from hook block tiedown (19).

WARNING



Do not operate crane unless outriggers are firmly in place or vehicle could turn over. Failure to comply may result in injury or death to personnel.

RAISE AND OPERATE CRANE - Continued

WARNING



Operator should be stationed to be able to see load at all times during crane operation. Operate crane from RH or LH remote control station, if load is not visible from main crane control panel. Failure to comply may result in injury or death to personnel.

CAUTION

Do not operate mast control lever until boom is raised approximately 45 degrees. Otherwise, boom nose can be driven down into crane structure and damage to equipment will result.

NOTE

Mast will not erect if boom angle is significantly greater than 45 degrees.

4. Observe boom angle indicator (20) and operate BOOM control lever (21) in UP position until boom (22) is approximately 45 degrees above horizontal.

RAISE AND OPERATE CRANE - Continued

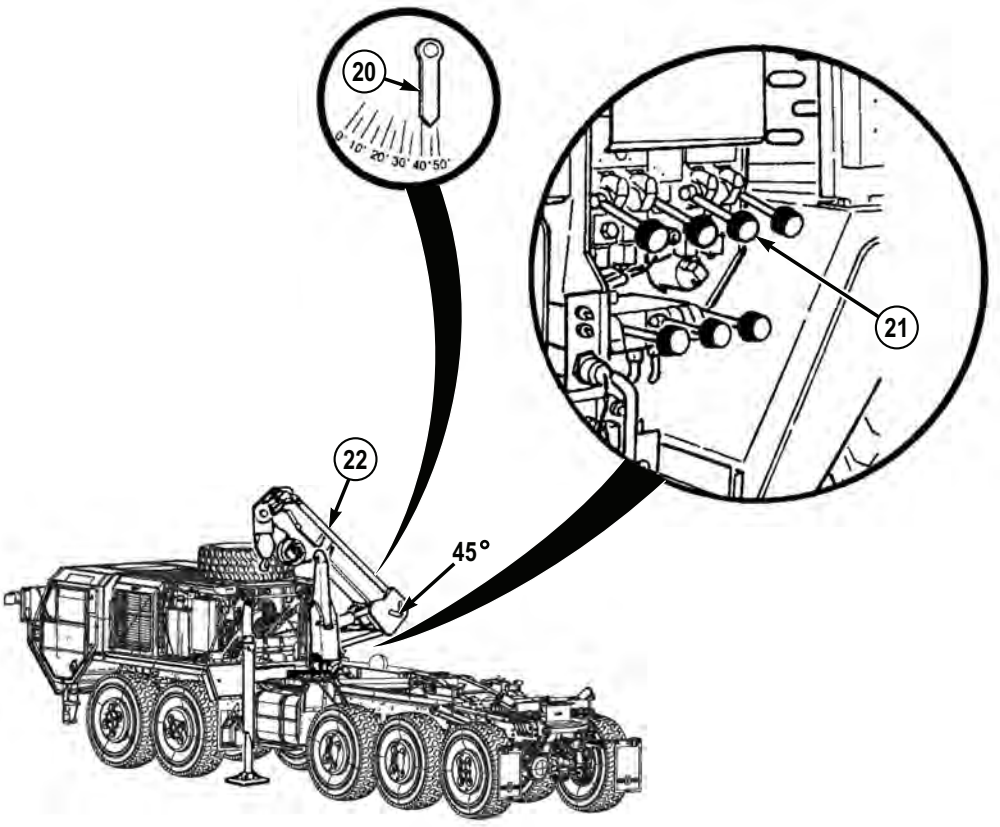


Figure 9.

CAUTION

Failure to extend mast fully before load is lifted may result in mast cylinder seal damage.

5. Operate MAST control lever (23) in UP position until mast (24) is fully extended and boom (22) is approximately in a horizontal position.

RAISE AND OPERATE CRANE - Continued

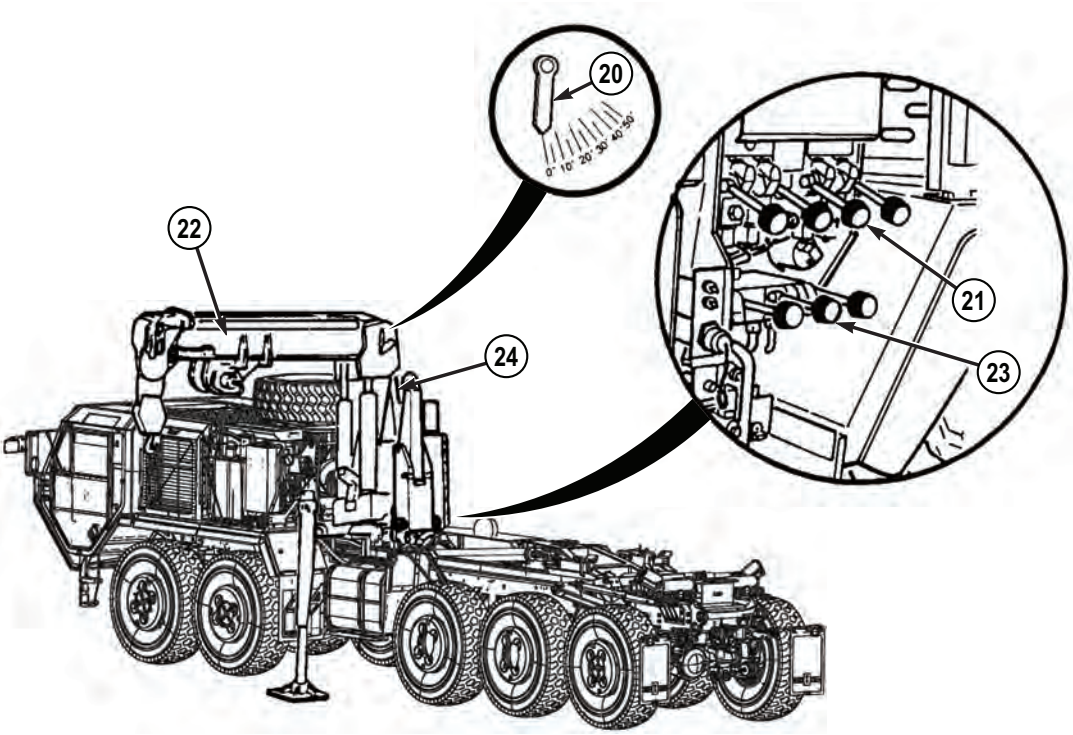


Figure 10.

6. Move BOOM lever (21) until indicator (20) reads 0 degrees.

WARNING



When using crane on any vehicle, park vehicle clear of all overhead electrical lines. Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel.

RAISE AND OPERATE CRANE - Continued

WARNING



Ensure that area is clear of personnel before moving SWING control lever. Boom should be swung slowly enough so crane operator has complete control. If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

WARNING



Operator must keep control of load at all times. If necessary, attach cargo tiedowns to load for control. Failure to comply may result in injury or death to personnel.

CAUTION

Boom must be above hook arm, flatrack, and vehicle load for clearance. Hitting obstacles with boom may cause damage to boom or vehicle.

NOTE

Operate control levers with light, even pressure. Moving lever slightly will cause slow movement of crane. Moving lever to full travel will cause faster movement of crane.

7. Move SWING control lever (25) to CCW position to move boom (22) counterclockwise.

RAISE AND OPERATE CRANE - Continued

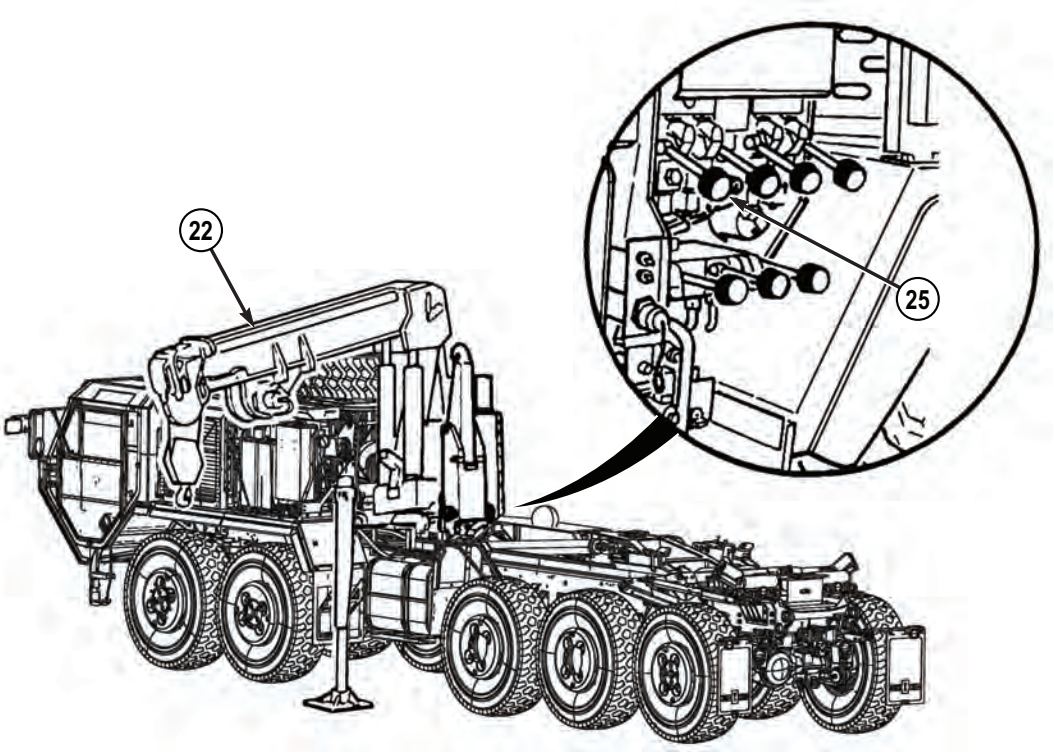


Figure 11.

WARNING

When operating two control levers at the same time, if one function is held wide open and dead-headed (i.e. cylinder is fully extended) and another function is operated, the second function can operate at a greater than normal speed, which could cause loss of control. Failure to comply may result in injury or death to personnel.

CAUTION

- Keep hook block at least 2.0 ft (609.6 mm) from end of boom. If hook block hits end of boom, it may damage cable or hook block and crane will lose control functions. Lower hook block and wait 6 seconds for power to return, then check crane for damage.
- Do not jerk TELESCOPE control lever or load may bounce causing possible damage to crane or load and causing overload shutdown system to activate.

RAISE AND OPERATE CRANE - Continued

- Do not let cable unwind and become slack or cable may get tangled on drum and cause damage to drum.

NOTE

TELESCOPE and HOIST control levers should be operated at same time.

8. Move SWING control lever (25) to CW position to move boom (22) clockwise.
9. Move TELESCOPE control lever (26) to OUT position to extend boom (22) while moving HOIST control lever (15) to DOWN position to pay out hoist cable (16). This prevents hook block from contacting boom nose (27).

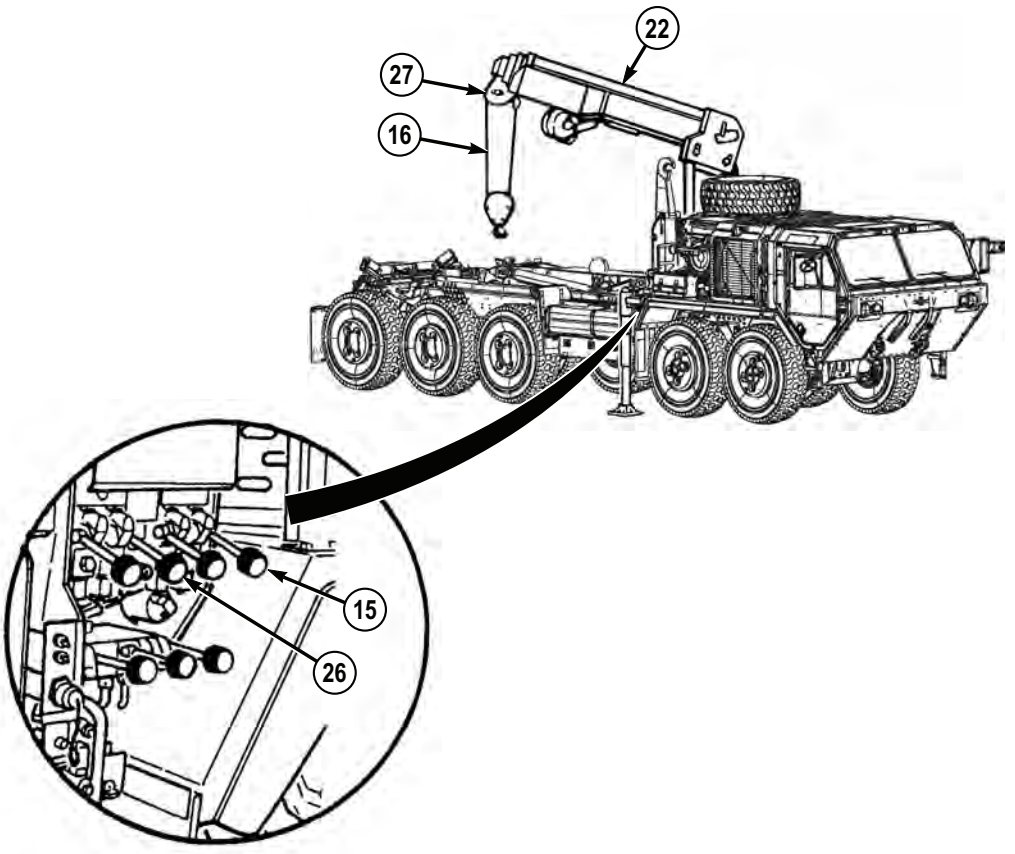


Figure 12.

RAISE AND OPERATE CRANE - Continued

CAUTION

Do not attempt to lift more than maximum load rating as shown in RANGE DIAGRAM. Exceeding load ratings will cause damage to equipment.

NOTE

- Boom length is indicated on side of boom as it is extended.
- Load radius is measured from MHC pivot point to load hook. (Measurement must be taken parallel to vehicle, point A to point B.)
- Numbers along top and bottom of diagram refer to load radius. Numbers along side of diagram refer to working height. For example: Boom length is at 20.0 ft (6096 mm) as indicated on side of boom. Load radius is 12.0 ft (3658 mm) as measured from point A to point B. Chart on right indicates a maximum lift of 5,400 lbs. (2449 kg).

10. Refer to RANGE DIAGRAM data plate above RH Crane Control Panel to move boom to correct load radius before connecting to load.

RAISE AND OPERATE CRANE - Continued

RANGE DIAGRAM PLS

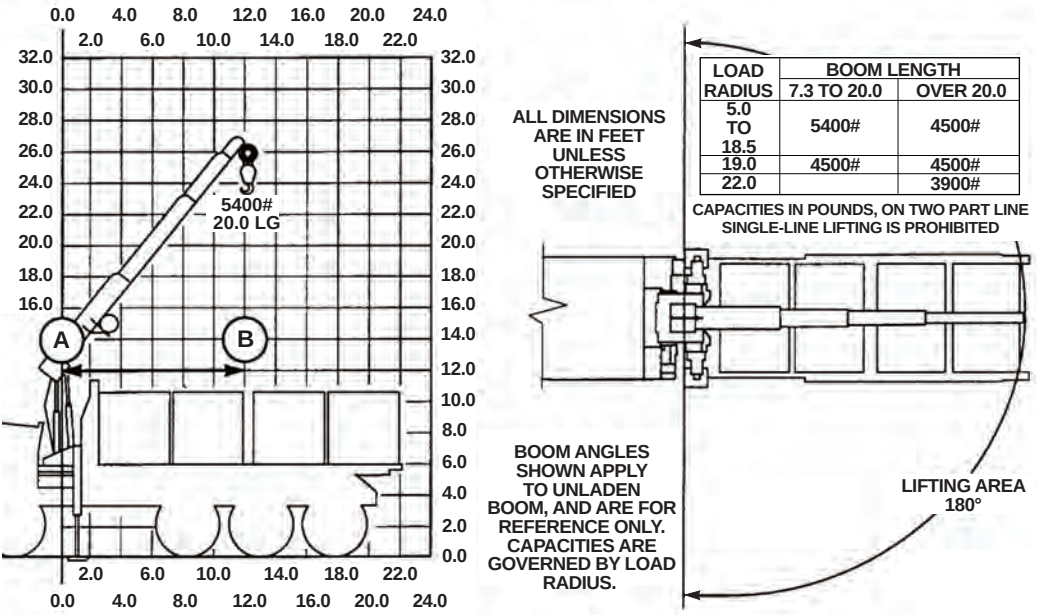


Figure 13.

END OF TASK

RAISE AND LOWER LOAD

WARNING



Ensure that area is clear of personnel before moving SWING control lever. Boom should be swung slowly enough so crane operator has complete control. If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

RAISE AND LOWER LOAD - Continued

WARNING



Load hook must not extend beyond attaching point of load. When lifting load, boom will deflect slightly and load radius will increase depending on length of boom and weight of load. Boom deflection may cause load to swing out. Failure to comply may result in injury or death to personnel.

CAUTION

- Do not let cable become slack or cable may get tangled on drum. Failure to comply may result in damage to equipment.
- Do not drag load on ground or damage to crane may result.

1. Operate SWING control lever (25) and center end of boom (22) directly over load.

RAISE AND LOWER LOAD - Continued

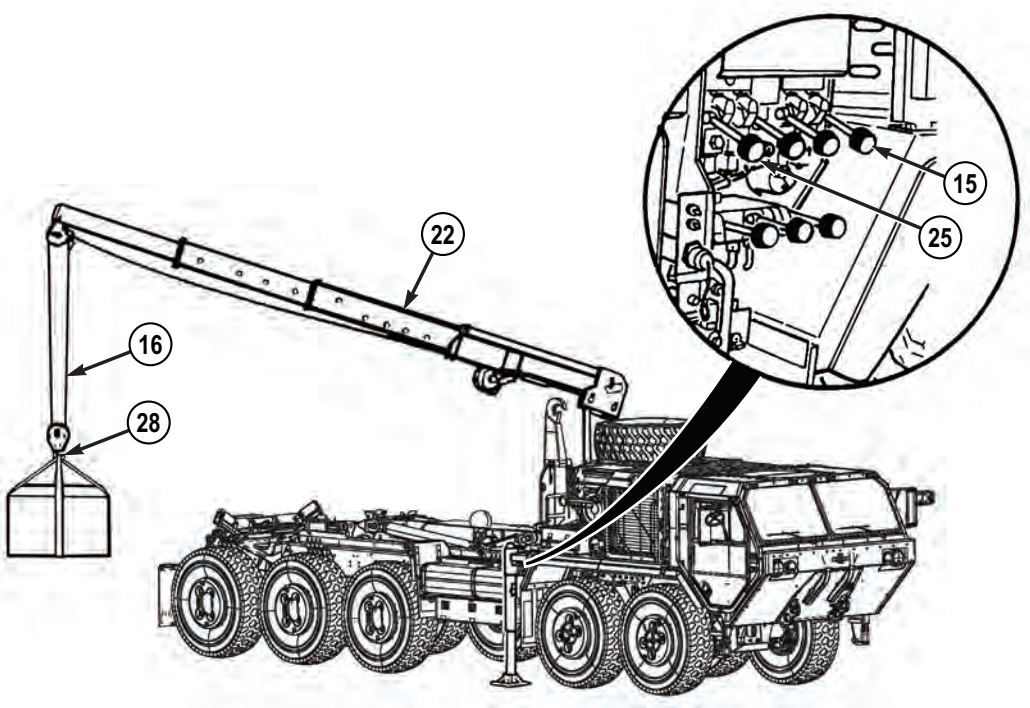


Figure 14.

2. Operate HOIST control lever (15) to raise or lower hoist cable (16) and connect load hook (28) to load.

WARNING



Ensure there are at least two wraps of cable on hoist drum at all times. Serious injury or death could result if cable comes off hoist drum while lifting load.

CAUTION

- Do not jerk HOIST control lever or load will bounce causing possible damage to crane or load and causing overload shutdown to operate.

RAISE AND LOWER LOAD - Continued

- Use the PLS range diagram and know the weight of the load before hoisting the load or equipment damage may result.

NOTE

- When crane is overloaded, the overload shutdown system will automatically shut off power to Telescope Boom Out, Boom Up, Boom Down, and Hoist Up functions. Overload condition can be corrected by using Hoist Down, function to lower load to ground or other supporting surface. All crane functions will be restored in about six seconds after overload condition is eliminated.
- It is normal for fluctuation of the engine rpm to occur whenever a change in load on the engine occurs.

3. Move HOIST control lever (15) to UP position to lift load. Move BOOM control lever (21) to UP position to raise load and bring load closer to crane. Use SWING control lever (25) to rotate crane to desired location to deposit load.

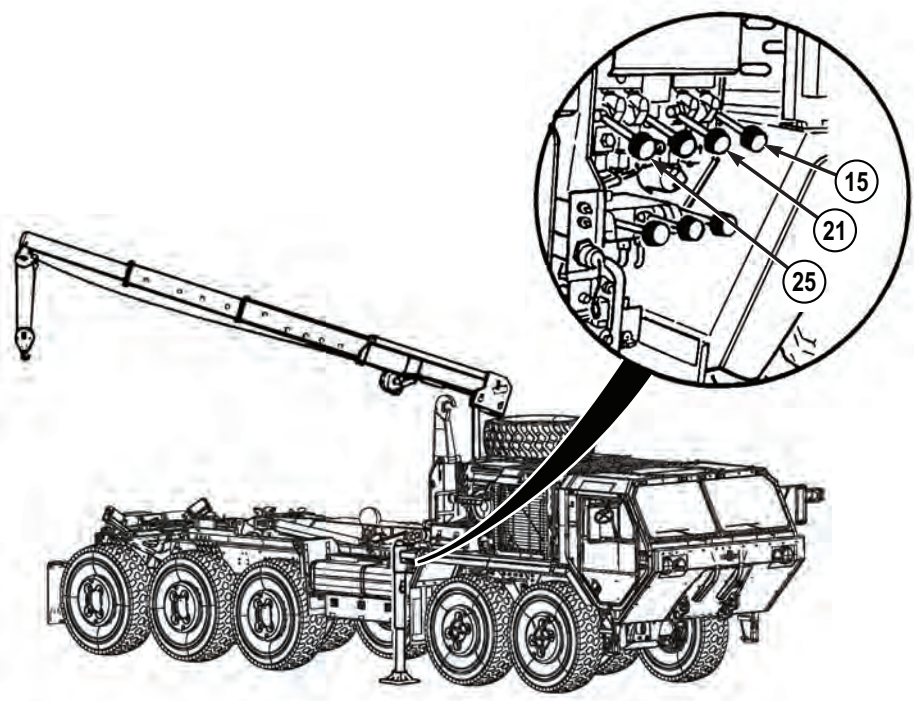


Figure 15.

RAISE AND LOWER LOAD - Continued

4. Move HOIST control lever (15) to DOWN position to lower load. Move BOOM control lever (21) to DOWN position (telescope function can also be used to adjust the load position for setting down) to lower load and move load away from crane.
5. Shut down crane.

END OF TASK

SHUT DOWN CRANE

CAUTION

- If the crane main power switch has been temporarily turned OFF following crane operations, repower the crane and reset engine high idle according to PREPARE CRANE FOR USE in this procedure. Otherwise, proceed as follows:
- Leave approximately 2.0 ft (609.6 mm) of cable between boom sheave and hook block when reeling in cable or damage to equipment could result.
- Do not let cable unwind and become slack or cable may get tangled on drum and cause damage to drum.

NOTE

TELESCOPE and HOIST control levers should be operated at same time.

1. Move TELESCOPE control lever (26) to IN position to pull boom extensions (22) in and move HOIST control lever (15) to UP position to reel in hoist cable (16) until boom extensions are fully retracted and load hook (18) hangs approximately 8.0 in. (203.2 mm) below boom nose.

SHUT DOWN CRANE - Continued

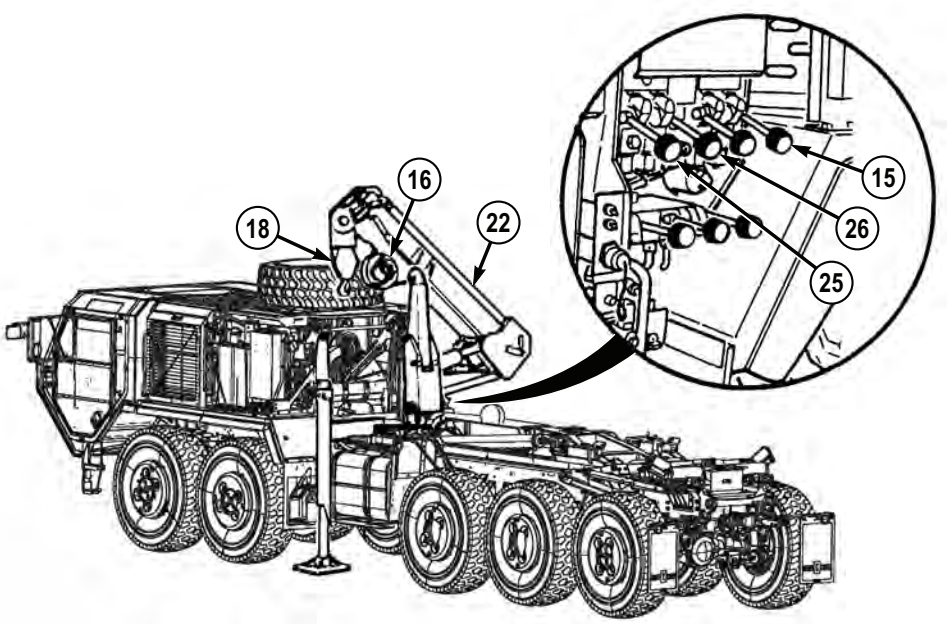


Figure 16.

CAUTION

- Boom must rest on rest pad when transporting vehicle. If not, damage to vehicle can result.
- When lowering mast, boom must align with hook and hook block tiedown or mast may contact muffler and boom may contact LHS hook arm, flatrack, or vehicle. Damage to vehicle may result.
- Do not lower mast and boom at the same time. Mast must be completely folded down before lowering boom, otherwise boom nose will be driven down into the crane structure and damage to equipment will result.

2. Operate SWING control lever (25) to align hook block with hook block tiedown.
3. Move MAST control lever (23) to DOWN position to lower mast (24) until mast is completely folded down.

SHUT DOWN CRANE - Continued

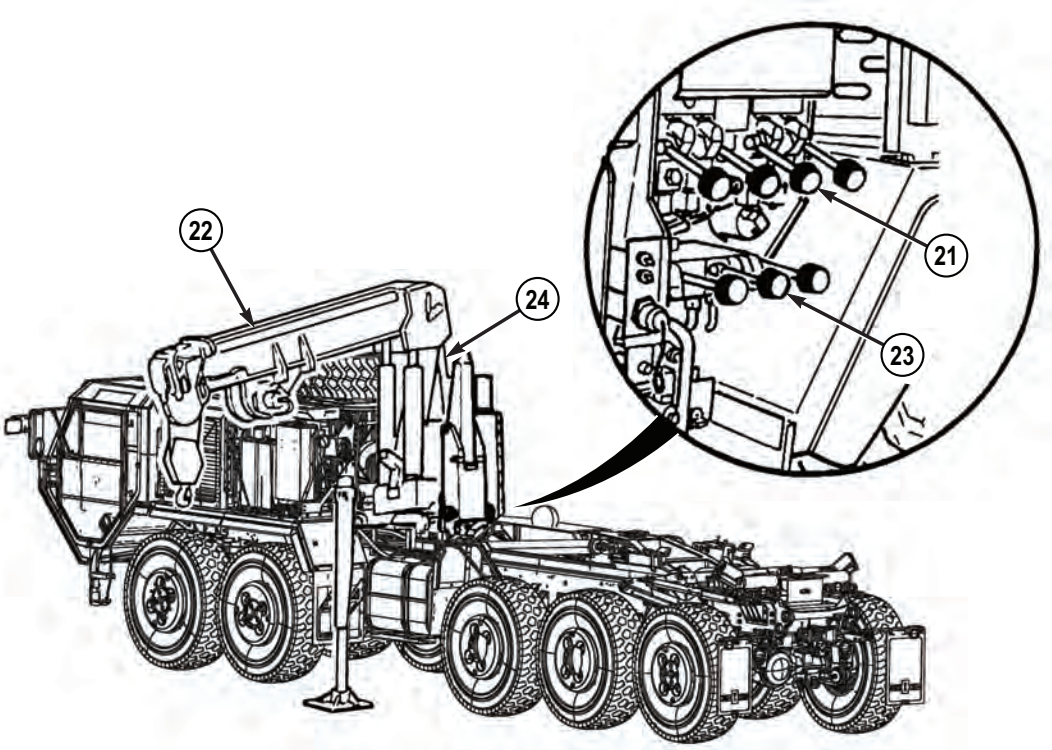


Figure 17.

CAUTION

Ensure that hoist cable is not too tight when crane is stowed. Boom nose may contact hook block during driving operations. Failure to comply may result in damage to equipment.

4. Move BOOM control lever (21) to DOWN position until boom (22) comes to rest on mast rest pad.

5. Connect load hook (18) to hook block tiedown (19). Remove pin (17) from upper hole and install in lower hole. Move HOIST control lever (15) to UP position to remove slack from hoist cable (16).

SHUT DOWN CRANE - Continued

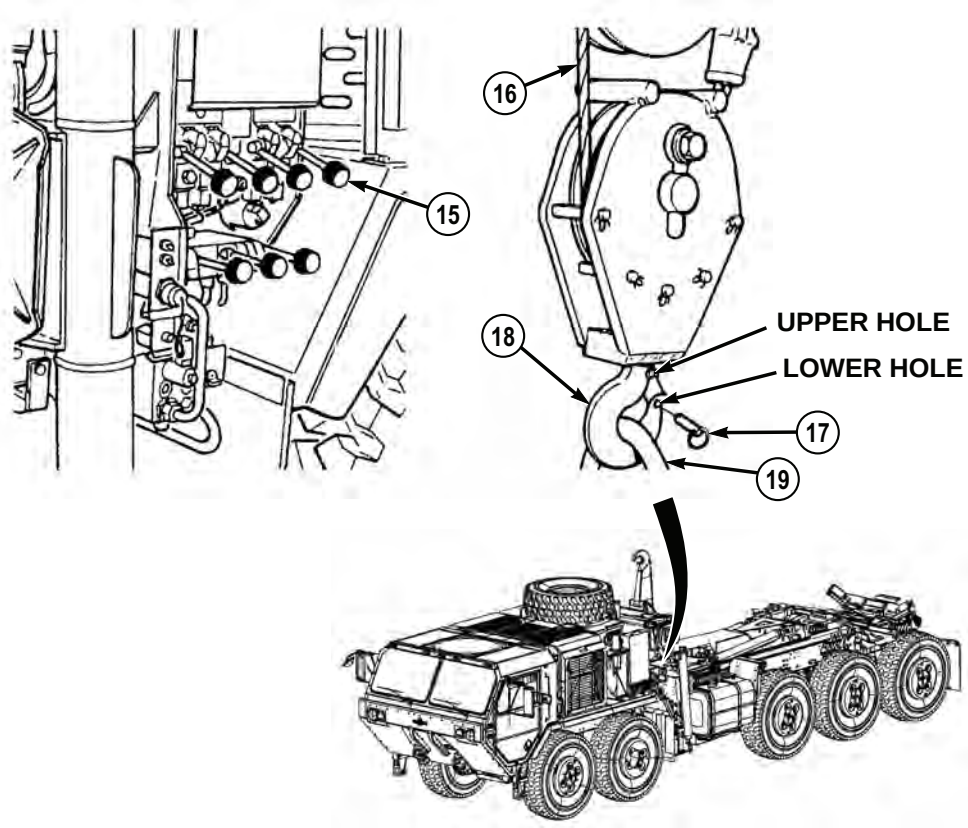


Figure 18.

END OF TASK

STOW OUTRIGGER JACKS

1. Remove two retaining pins (10) from each outrigger pad (8).

STOW OUTRIGGER JACKS - Continued

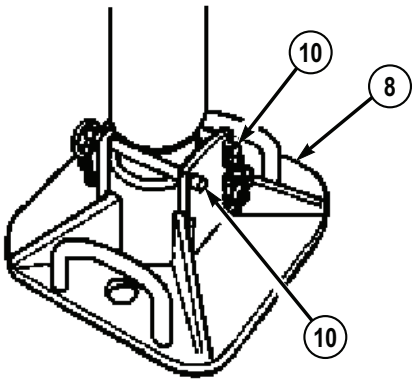


Figure 19.

WARNING



Keep hands and feet clear of outrigger jack cylinders. Failure to comply may result in injury or death to personnel.

NOTE

Operate left and right outrigger jack (LH O/R JACK and RH O/R JACK) levers at the same time until both outrigger jack cylinders are out of pads.

2. Move left outrigger jack (LH O/R JACK) and right outrigger jack (RH O/R JACK) control levers (13) and (14) to UP position to retract outrigger jack cylinders (12) completely.

STOW OUTRIGGER JACKS - Continued

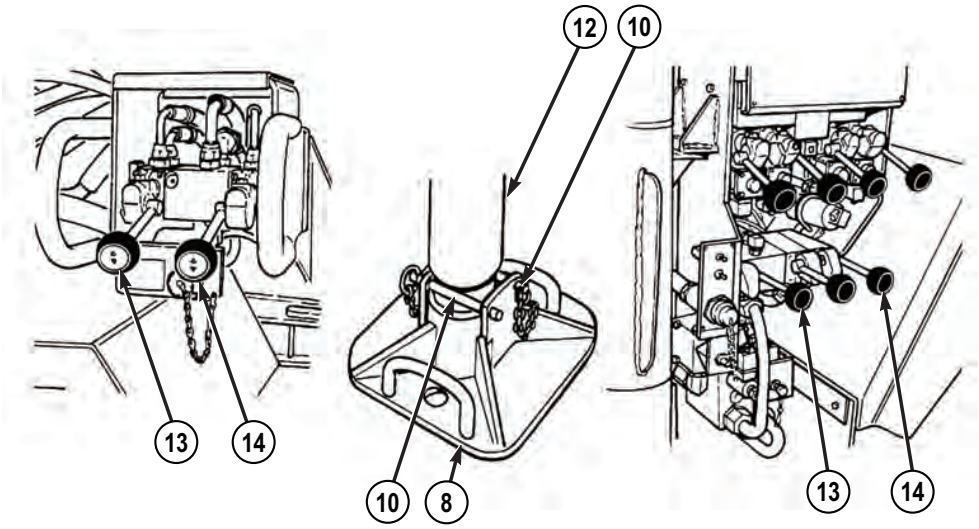


Figure 20.

3. Install two retaining pins (10) in outrigger jack pads (8).

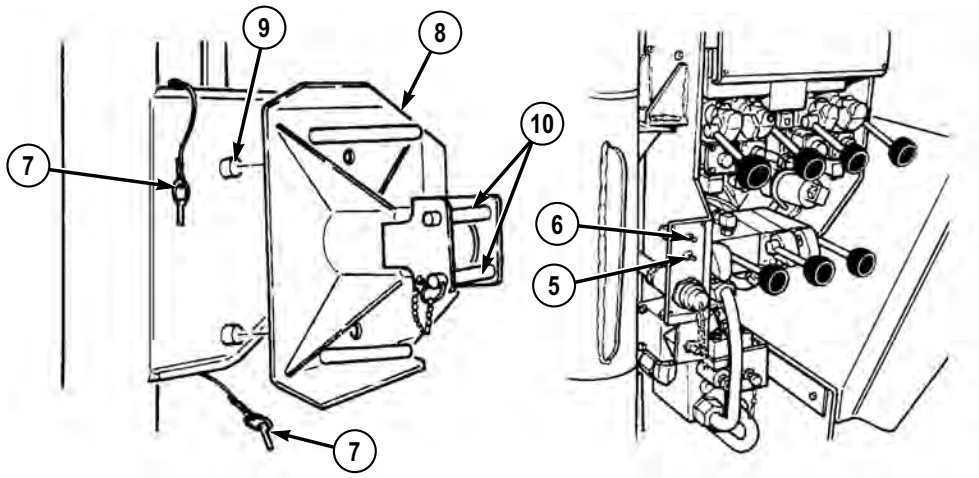


Figure 21.

4. Stow outrigger jack pads (8) on crane subframe (9).
5. Install safety pins (7) through crane subframe (9).
6. Push ENGINE HIGH IDLE latch switch (6) to UNLATCH position and release.

STOW OUTRIGGER JACKS - Continued

7. Turn crane main power switch (5) to OFF position.

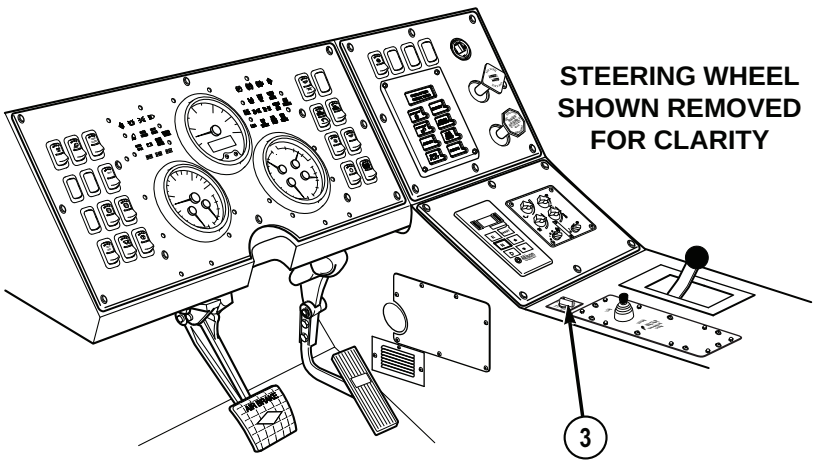


Figure 22.

CAUTION

Engine speed must be at idle before using hydraulic selector switch or damage to equipment may result.

8. Set hydraulic selector switch (3) to OFF position.
9. Shut off engine (WP 0037).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
MATERIAL HANDLING CRANE (MHC) OPERATION (REMOTE CONTROL)

INITIAL SETUP:

Not Applicable

SET UP REMOTE CONTROL UNIT

WARNING



Operator should be stationed to be able to see load at all times during crane operation. Operate crane from RH or LH remote control station, if load is not visible from main crane control panel. Failure to comply may result in injury or death to personnel.

WARNING



When operating crane, hearing protection must be worn or hearing loss may result. Failure to comply may result in injury or death to personnel.

1. Prepare crane for use (WP 0054).
2. Set up outrigger jacks (WP 0054).
3. Raise crane to operating position (WP 0054).
4. Remove REMOTE CONTROL UNIT (1) from stowage box (2).

SET UP REMOTE CONTROL UNIT - Continued

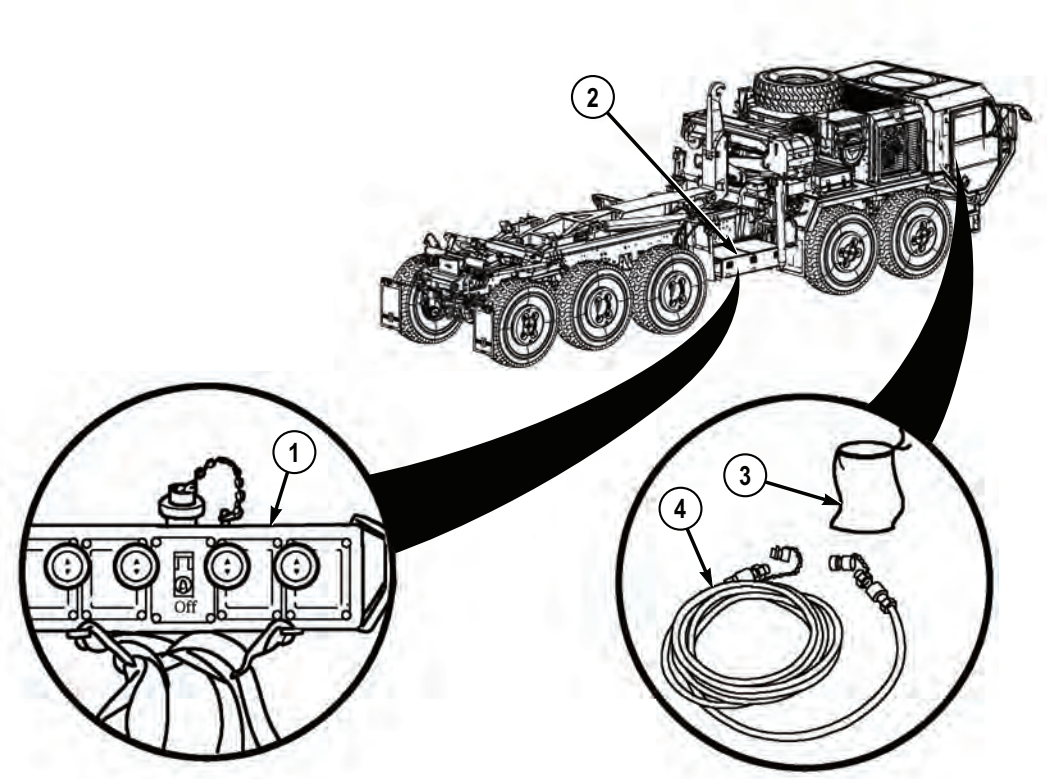


Figure 1.

5. Remove remote control cable bag (3) from behind passenger seat.
6. Remove remote control cable (4) from bag (3).

CAUTION

Covers should be removed from cable and remote just before they are hooked together to avoid contamination. Failure to comply may result in damage to equipment.

7. Remove cover (5) from cable connector (6) and cover (7) from REMOTE CONTROL UNIT receptacle (8).

SET UP REMOTE CONTROL UNIT - Continued

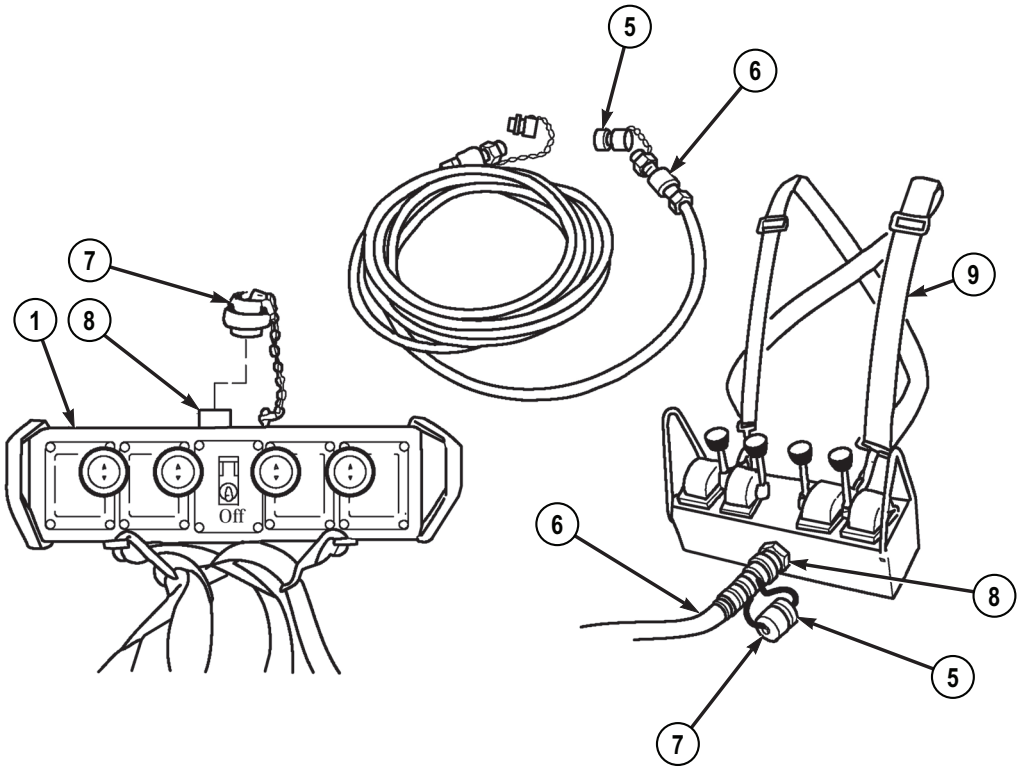


Figure 2.

WARNING



Shut off and remove REMOTE CONTROL UNIT from around neck and shoulders prior to climbing on vehicle or flatrack. Failure to comply may result in injury or death to personnel.

NOTE

REMOTE CONTROL UNIT straps may be crisscrossed in either front or rear for operator comfort.

SET UP REMOTE CONTROL UNIT - Continued

8. Position REMOTE CONTROL UNIT strap (9) around neck and over shoulders to wear REMOTE CONTROL UNIT (1).
9. Connect cable connector (6) to REMOTE CONTROL UNIT receptacle (8).
10. Connect cover (7) of REMOTE CONTROL UNIT receptacle (8) to cover (5) of cable connector (6).

END OF TASK

CONNECT REMOTE CONTROL UNIT TO RIGHT-HAND OUTLET

1. Remove cover (10) from RH REMOTE CONTROL CONNECTOR outlet (11) and remove cover (5) from other end of cable connector (12).

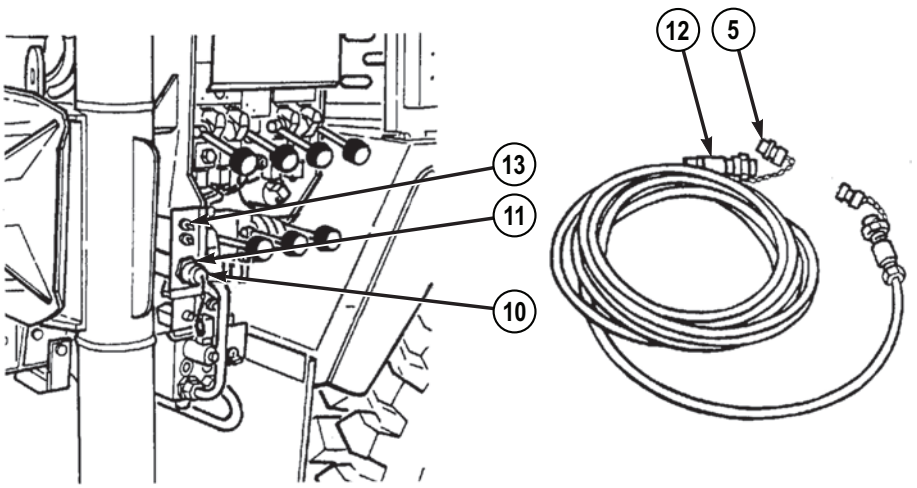


Figure 3.

WARNING



If electrical power fails during crane operation, move switch on remote control unit to OFF position. Failure to comply may result in injury or death to personnel.

CONNECT REMOTE CONTROL UNIT TO RIGHT-HAND OUTLET - Continued

WARNING



Ensure REMOTE CONTROL EMERGENCY STOP/ON/OFF POWER switch is in OFF position and switch guard is closed before connecting REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

NOTE

Idle speed will decrease when REMOTE CONTROL UNIT is plugged in.

2. Connect cable connector (12) to RH REMOTE CONTROL CONNECTOR outlet (11).
3. Connect cover (10) of RH REMOTE CONTROL CONNECTOR outlet (11) to cover (5) from cable connector (12).
4. Ensure crane power switch (13) is ON.

NOTE

- Closing the switch guard of the EMERGENCY STOP ON/OFF switch will activate the emergency stop.
- Turning switch to ON will automatically engage high idle.

5. Set the REMOTE CONTROL EMERGENCY STOP ON/OFF power switch (14) to ON position.

CONNECT REMOTE CONTROL UNIT TO RIGHT-HAND OUTLET - Continued

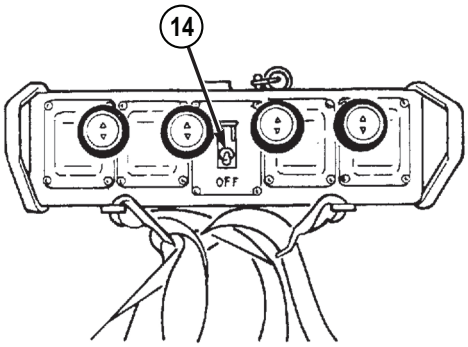


Figure 4.

END OF TASK

CONNECT REMOTE CONTROL UNIT TO LEFT-HAND OUTLET

CAUTION

Covers should be removed from cable and REMOTE CONTROL UNIT just before they are connected to avoid contamination. Failure to comply may result in damage to equipment.

1. Remove cover (15) from LH REMOTE CONTROL outlet (16) and remove cover (5) from other end of cable connector (12).

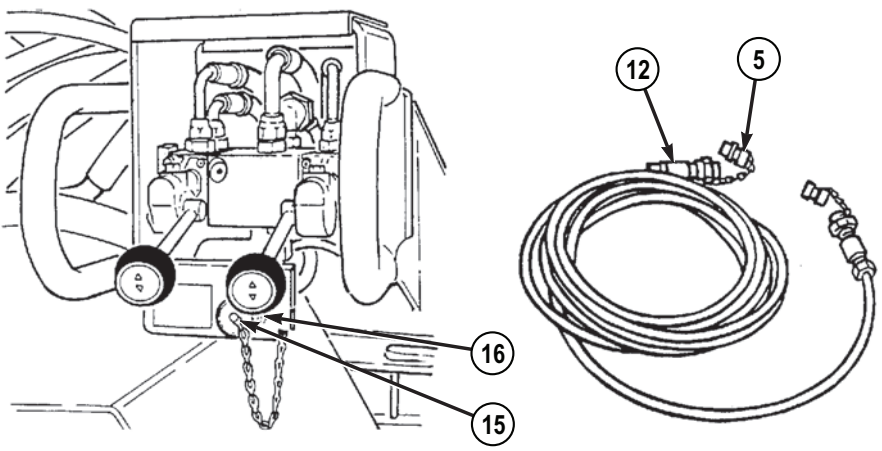


Figure 5.

CONNECT REMOTE CONTROL UNIT TO LEFT-HAND OUTLET - Continued

2. Refer to CONNECT REMOTE CONTROL UNIT TO RIGHT-HAND OUTLET, Steps (2) through (4), in this procedure, to prepare REMOTE CONTROL UNIT for operation.

END OF TASK

ROTATE AND TELESCOPE BOOM

WARNING



Operator should be stationed to be able to see load at all times during crane operation. Operate crane from RH or LH remote control station, if load is not visible from main crane control panel. Failure to comply may result in injury or death to personnel.

WARNING



Ensure that area is clear of personnel before moving SWING control lever. Boom should be swung slowly enough so crane operator has complete control. If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

WARNING



Operator must keep control of load at all times. If necessary, attach cargo tiedowns to load for control. Failure to comply may result in injury or death to personnel.

ROTATE AND TELESCOPE BOOM - Continued

WARNING



When using crane on any vehicle, park vehicle clear of all overhead electrical lines. Keep boom clear of all electrical lines and other obstacles while operating crane. Failure to comply may result in injury or death to personnel.

WARNING



Boom must be above vehicle hook arm, flatrack, and vehicle load for clearance. Hitting obstacles with boom may cause damage equipment and/or injury or death to personnel.

NOTE

Operate control levers with light, even pressure. Moving lever slightly will cause slow movement of crane. Moving lever to full travel will cause faster movement of crane.

1. Move SWING control lever (17) to CCW position to move boom (18) counterclockwise.

ROTATE AND TELESCOPE BOOM - Continued

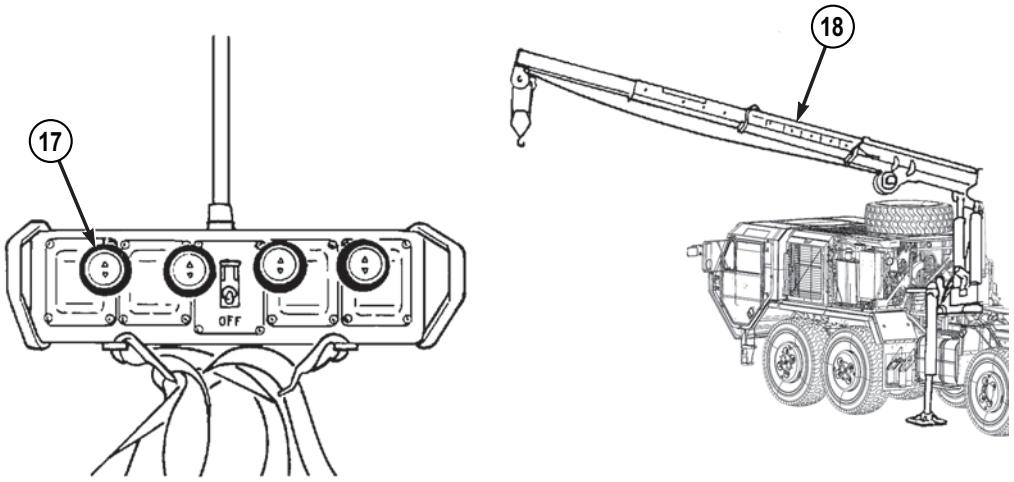


Figure 6.

2. Move SWING control lever (17) to CW position to move boom (18) clockwise.

WARNING



When operating two control levers at the same time, if one function is held wide open and "dead-headed" (i.e., cylinder is fully extended) and another function is operated, the second function can operate at greater than normal speed, which could cause loss of control. Failure to comply may result in injury or death to personnel.

CAUTION

Keep hook block at least 2 ft (609.6 mm) from end of boom. If hook block hits end of boom it may damage cable or hook block and crane will lose control functions. Lower hook block and wait 6 seconds for power to return. Check crane for damage. Failure to comply may result in damage to equipment.

ROTATE AND TELESCOPE BOOM - Continued

NOTE

- When crane is overloaded, the overload shutdown system will automatically shut off power to Telescope Boom Out, Boom Up, Boom Down, and Hoist Up functions.
- TELESCOPE and HOIST control levers should be operated at same time.
- Crane movement from one lever may be slower than the other when operating two levers together.

3. Move TELESCOPE control lever (19) to OUT position to extend boom (18) while moving HOIST control lever (20) to DOWN position to pay out cable (21). This prevents hook block (22) from contacting boom nose.

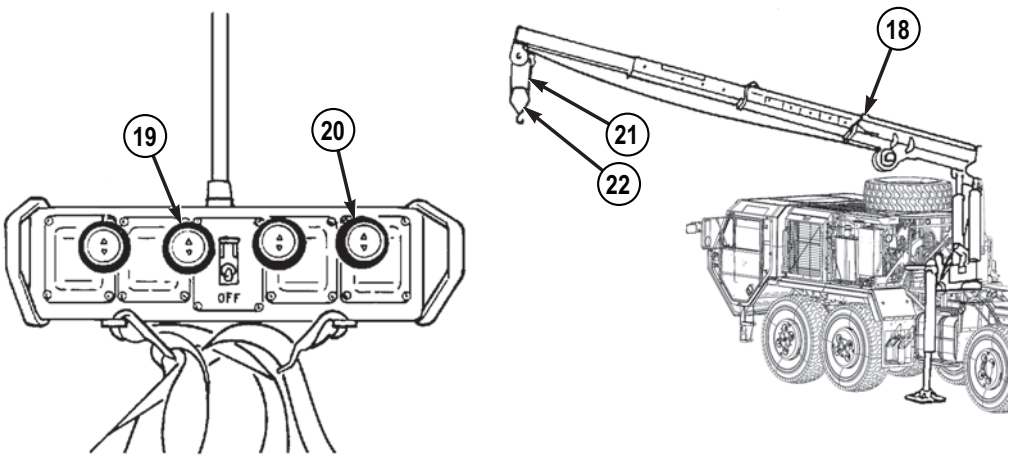


Figure 7.

WARNING



Operator must keep control of load at all times. If necessary, attach cargo tiedowns to load for control. Failure to comply may result in injury or death to personnel.

ROTATE AND TELESCOPE BOOM - Continued

CAUTION

Do not attempt to lift more than maximum load rating as shown on RANGE DIAGRAM. Exceeding load ratings could cause damage to equipment.

NOTE

Refer to the RANGE DIAGRAM data plate above RH Crane Control Panel on rear of left front fender.

4. Move boom (18) to correct radius as shown on data plate (23) before connecting to load (24).

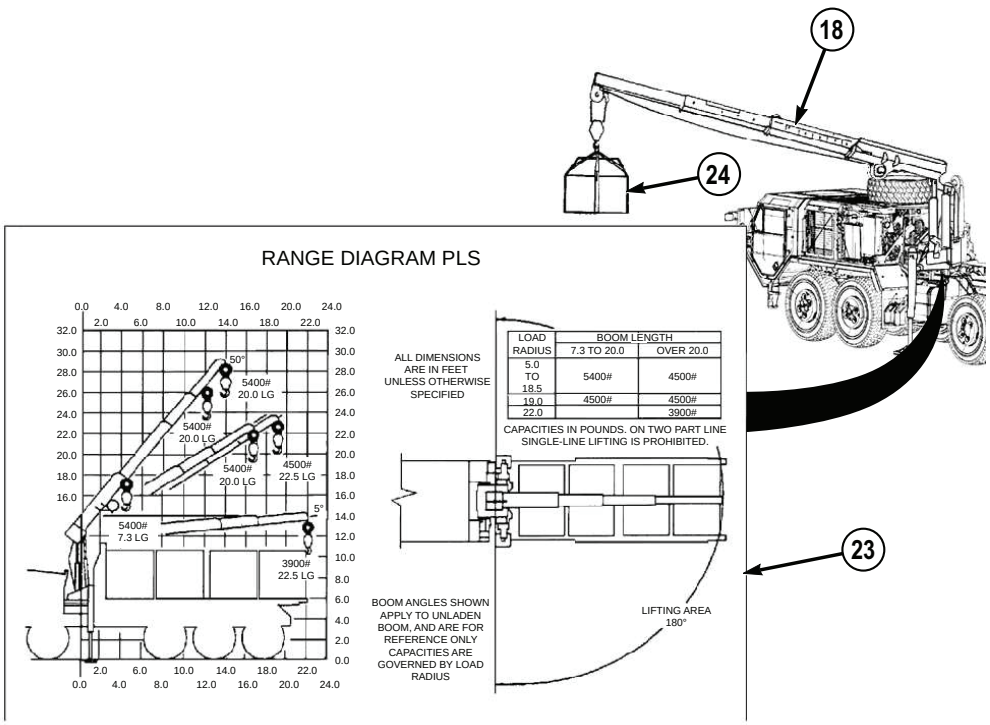


Figure 8.

END OF TASK

RAISE AND LOWER LOAD

WARNING



Load hook must not extend beyond attaching point of load. When lifting load, boom will deflect slightly and load radius will increase depending on length of boom and weight of load. Boom deflection may cause load to swing out. Failure to comply may result in injury or death to personnel.

WARNING



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

WARNING



Operator should use REMOTE CONTROL UNIT if the load or boom will pass overhead. Failure to comply may result in injury or death to personnel.

CAUTION

- Do not let cable become slack. Cable may get tangled on drum and damage cable. Failure to comply may result in damage to equipment.
- Do not drag load sideways on ground. Dragging load could cause damage to crane.

1. Operate SWING control lever (17) and center end of boom (18) directly over load (24).

RAISE AND LOWER LOAD - Continued

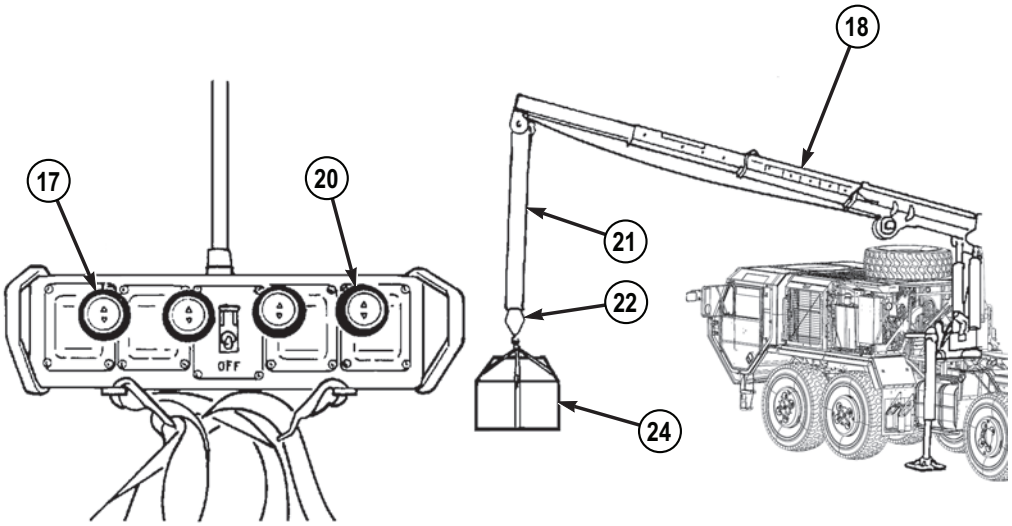


Figure 9.

2. Operate HOIST control lever (20) to raise or lower cable (21) and connect hook (22) to load (24).

WARNING



Ensure there are at least two wraps of cable on hoist drum at all times. Serious injury or death could result if cable comes off hoist drum while lifting load.

CAUTION

- Do not jerk HOIST control lever or load will bounce, causing possible damage to crane or load and causing overload shutdown to operate.
- Do not attempt to lift more than maximum load rating as shown on RANGE DIAGRAM. Exceeding load ratings could cause damage to equipment.

3. Move HOIST control lever (20) to UP position to lift load. Move BOOM control lever (25) to UP position to raise load higher and bring load closer to crane.

RAISE AND LOWER LOAD - Continued

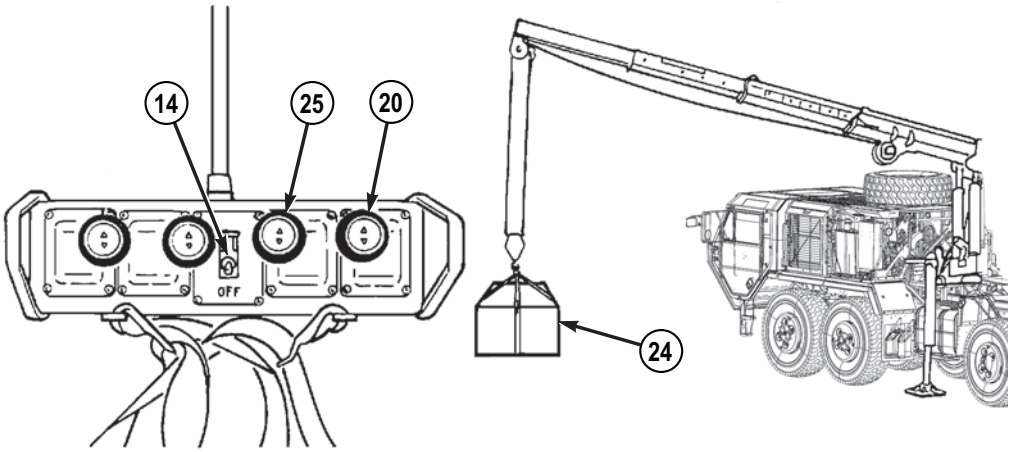


Figure 10.

4. Move HOIST control lever (20) to DOWN position to lower the load. Move BOOM control lever (25) to DOWN position to lower load further and move load away from crane as necessary.
5. Lower load (24) until properly positioned.

WARNING



Shut off and remove REMOTE CONTROL UNIT from around neck and shoulders prior to climbing on vehicle or flatrack. Failure to comply may result in injury or death to personnel.

6. Turn REMOTE CONTROL EMERGENCY STOP ON/OFF power switch (14) to OFF and disconnect load (24).

END OF TASK

DISCONNECT REMOTE CONTROL FROM RH OUTLET

1. Put REMOTE CONTROL EMERGENCY STOP ON/OFF power switch (14) on REMOTE CONTROL UNIT (1) in OFF position.

DISCONNECT REMOTE CONTROL FROM RH OUTLET - Continued

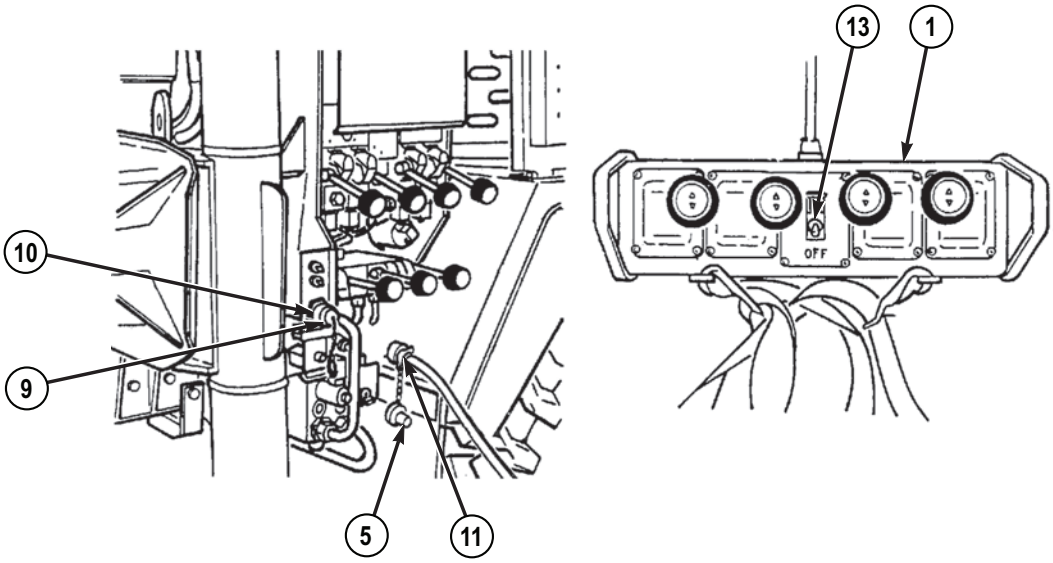


Figure 11.

2. Disconnect cover (10) from cover (5).
3. Disconnect cable connector (12) from RH REMOTE CONTROL CONNECTOR outlet (11) and install cover (10) on outlet. Install cover (5) on cable connector (12).

DISCONNECT REMOTE CONTROL FROM RH OUTLET - Continued

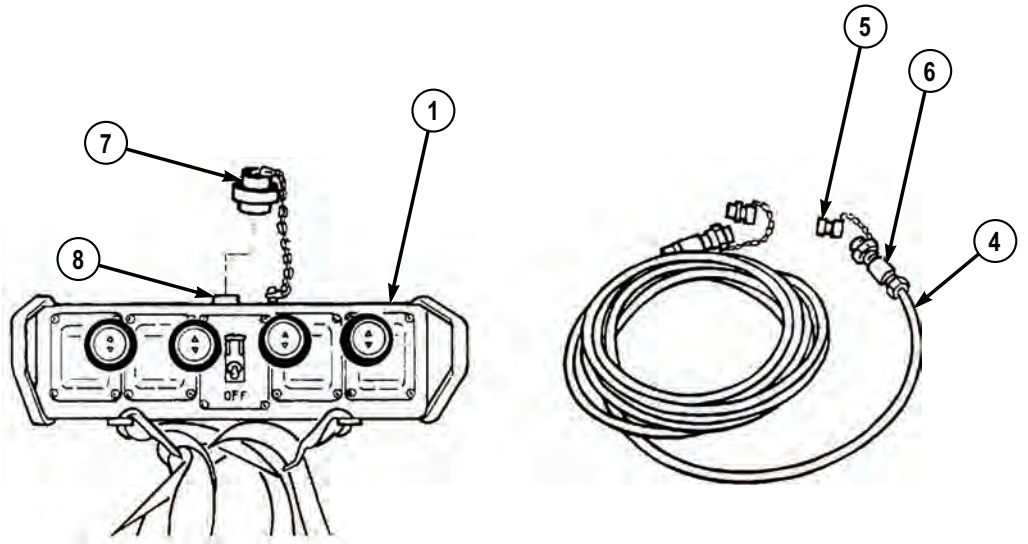


Figure 12.

4. Disconnect cover (7) from cover (5).
5. Disconnect cable connector (6) from REMOTE CONTROL UNIT receptacle (8) and install cover (7) on receptacle.
6. Replace covers (5) on cable connector (6).
7. Place REMOTE CONTROL UNIT (1) and coiled cable (4) in stowage box.
8. Shut down the crane (WP 0054).

END OF TASK

DISCONNECT REMOTE CONTROL UNIT FROM LH OUTLET

1. Set REMOTE CONTROL EMERGENCY STOP ON/OFF power switch (14) on REMOTE CONTROL UNIT (1) to OFF position.

DISCONNECT REMOTE CONTROL UNIT FROM LH OUTLET - Continued

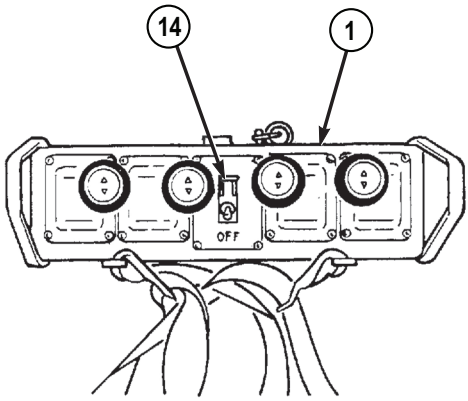


Figure 13.

2. Disconnect cover (15) from cover (5).

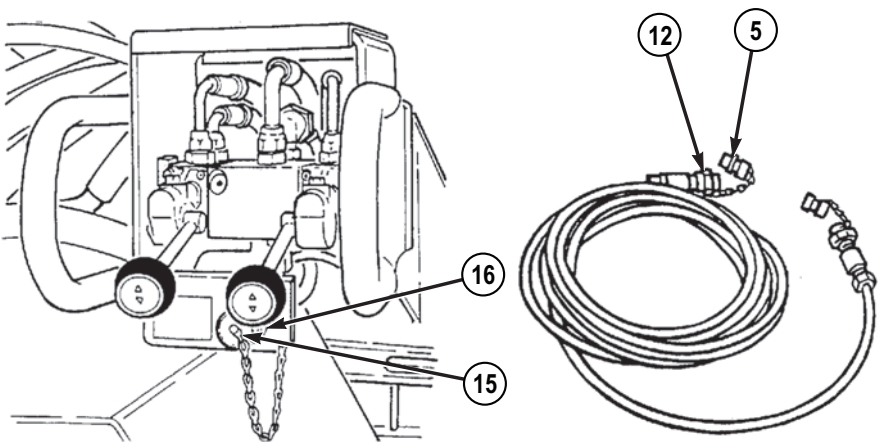


Figure 14.

3. Disconnect cable connector plug (12) from LH REMOTE CONTROL CONNECTOR outlet (16) and install cover (15) on outlet. Install cover (5) on cable connector plug (12).

4. Disconnect cover (7) from cover (5).

DISCONNECT REMOTE CONTROL UNIT FROM LH OUTLET - Continued

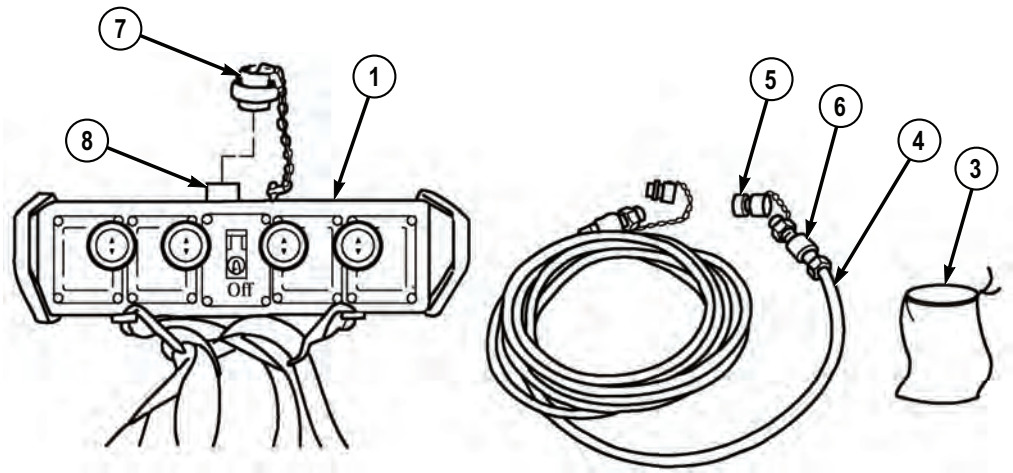


Figure 15.

5. Disconnect cable connector (6) from REMOTE CONTROL UNIT receptacle (8) and install cover (7) on receptacle.
6. Install cover (5) on cable connector (6).
7. Place REMOTE CONTROL UNIT (1) in stowage box.
8. Place remote control cable (4) in bag (3).
9. Place remote control cable bag (3) behind passenger seat.
10. Shut down the crane (WP 0054).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE CAB TEMPERATURE CONTROLS

INITIAL SETUP:

Not Applicable

OPERATE PERSONNEL HEATER

NOTE

- If heater does not blow hot air, ensure heater valves are open. (Volume 2, WP 0135)
- Air temperature is controlled by position of temperature control switch.
- Turn temperature control switch CW to increase temperature.
- Turn temperature control switch CCW to decrease temperature.

1. Position temperature control switch (1) to desired setting.

OPERATE PERSONNEL HEATER - Continued

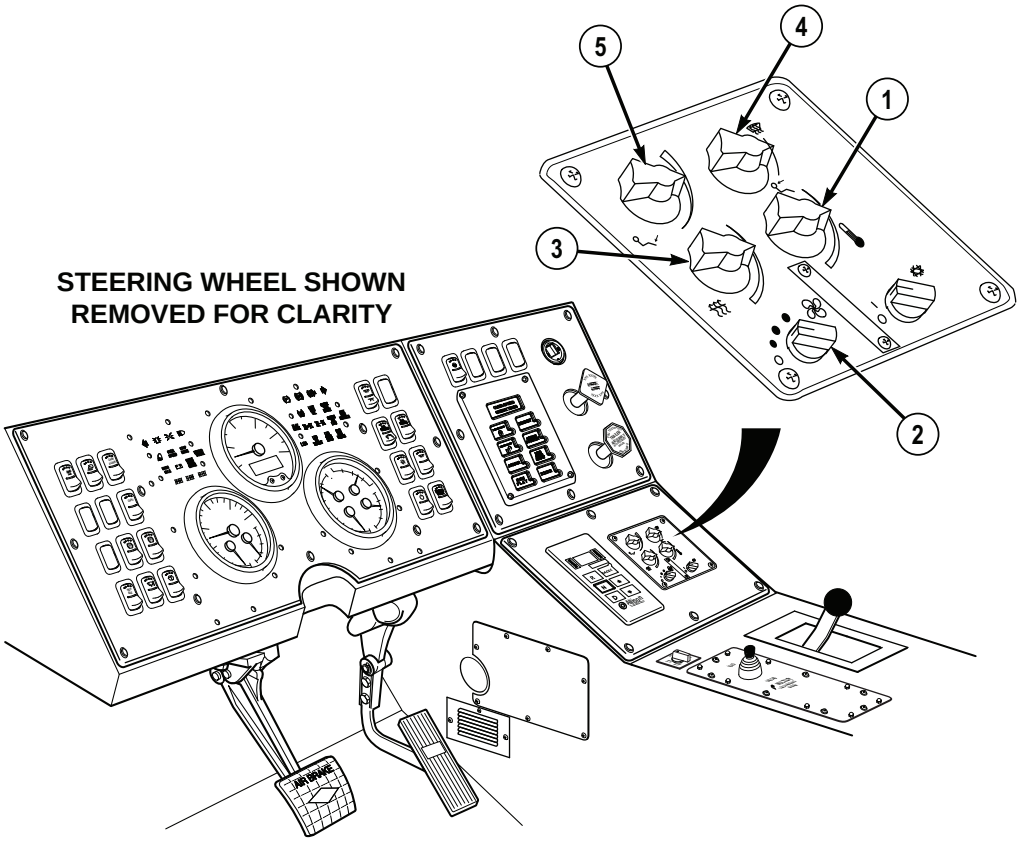


Figure 1.

2. Set fan switch (2) to desired position:
   Off - full CCW.
   Low - one position CW from off.
   Medium - two positions CW from off.
   High - full CW.

3. Position vent control switch (3) as desired to control outside airflow for cab ventilation. Full CCW shuts outside air ventilation off.

4. Position mid-level/defrost vent control switch (4) as desired to control airflow direction:

   a. Turning the mid-level/defrost vent control switch (4) full counterclockwise position turns maximum airflow to defrost vent, and shuts off all airflow to mid-level vents.

OPERATE PERSONNEL HEATER - Continued

b. Turning the mid-level/defrost vent control switch (4) clockwise causes a relative distribution of airflow between defrost and mid-level vents.

c. Turning the mid-level/defrost vent control switch (4) full clockwise turns maximum airflow to mid-level vents and shuts off all airflow to defrost vents.

5. Position floor vent control switch (5) as desired to control airflow to the floor vents:

   a. Turning the floor vent control switch (5) full counterclockwise directs maximum airflow to floor vents.

   b. Turning the floor vent control switch (5) counterclockwise causes a relative decrease in airflow.

   c. Turning the floor vent control switch (5) full clockwise shuts airflow to foot vents off.

6. When personnel heater is no longer required:

   a. Position temperature control switch (1) to desired setting.

   b. Set FAN switch (2) to off (full counterclockwise).

   c. Adjust vent switches (3), (4), and (5) as desired.

END OF TASK

OPERATE WINDSHIELD DEFROST

NOTE

If windshield defrost does not blow hot air, ensure heater valves are open. (Volume 2, WP 0135)

1. Turn mid-level/defrost vent control switch (4) to full counterclockwise position.

OPERATE WINDSHIELD DEFROST - Continued

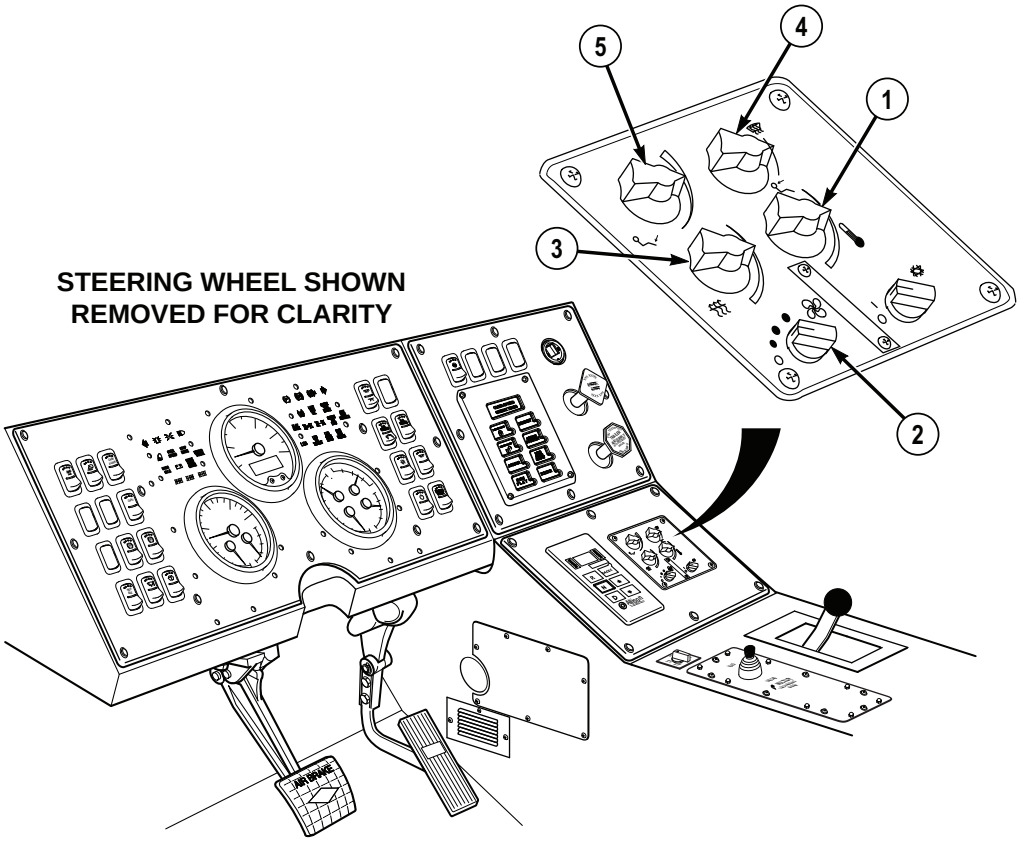


Figure 2.

2. Position temperature control switch (1) to desired setting.
3. Set fan switch (2) to desired setting:
   a. Off - full counterclockwise.
   b. Low - one position clockwise from off.
   c. Medium - two positions clockwise from off.
   d. High - full clockwise.
4. When windshield defrost is no longer required:
   a. Position mid-level/defrost vent control switch (4) to desired setting.
   b. Position temperature control switch (1) to desired setting.

OPERATE WINDSHIELD DEFROST - Continued

c. Set FAN switch (2) to off.

END OF TASK

OPERATE AIR CONDITIONER

NOTE

- Close heater valves (Volume 2, WP 0135) to improve the efficiency of cabin air conditioning.
- Closing the heater valves disables cabin heat.

1. Set air conditioning control switch (6) to on (full CW).

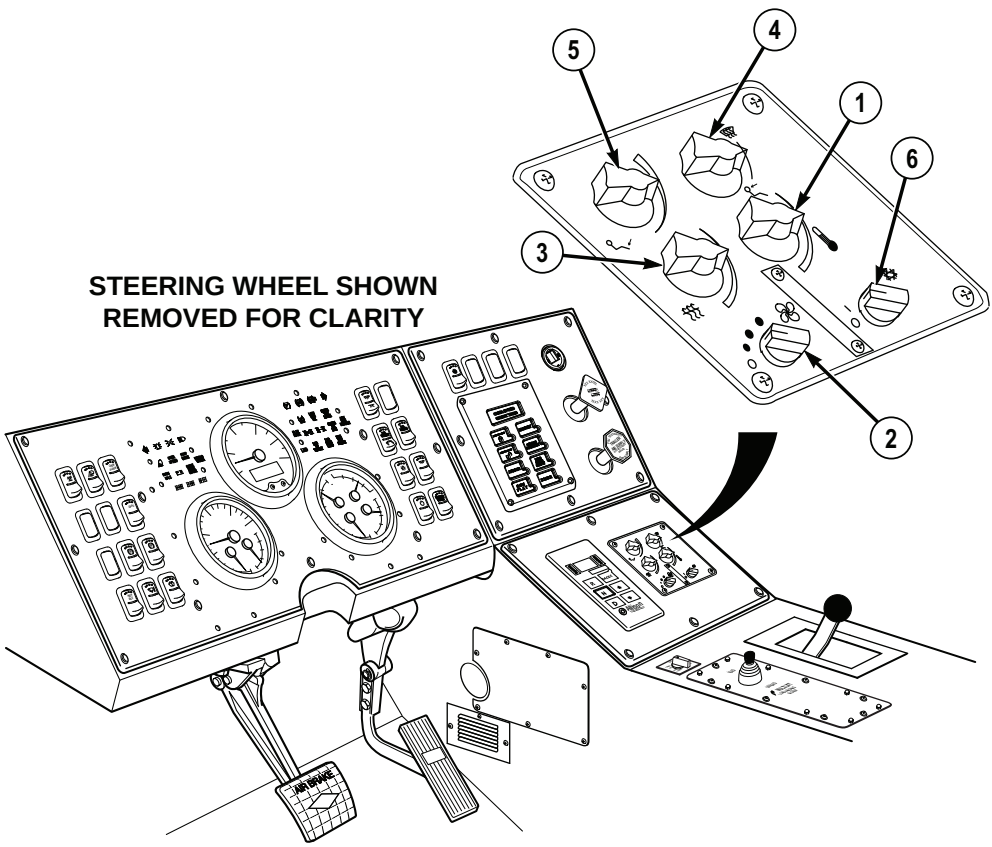


Figure 3.

OPERATE AIR CONDITIONER - Continued

2. Set fan switch (2) to desired setting:
   a. Off - full counterclockwise.
   b. Low - one position clockwise from off.
   c. Medium - two positions clockwise from off.
   d. High - full clockwise.
3. Position vent control switch (3) as desired to control outside airflow for cab ventilation. Full counterclockwise shuts outside air ventilation off.
4. Position mid-level/defrost vent control switch (4) as desired to control airflow direction:
   a. Turning the mid-level/defrost vent control switch (4) full counterclockwise position turns maximum airflow to defrost vent, and shuts off all airflow to mid-level vents.
   b. Turning the mid-level/defrost vent control switch (4) CW causes a relative distribution of airflow between defrost and mid-level vents.
   c. Turning the mid-level/defrost vent control switch (4) full CW turns maximum airflow to mid-level vents and shuts off all airflow to defrost vents.
5. Position floor vent control switch (5) as desired to control airflow to the floor vents:
   a. Turning the floor vent control switch (5) full counterclockwise directs maximum airflow to floor vents.
   b. Turning the floor vent control switch (5) clockwise causes a relative decrease in airflow.
   c. Turning the floor vent control switch (5) full clockwise shuts airflow to foot vents off.
6. When air conditioner is no longer required:
   a. Set air conditioning control switch (6) to off (full counterclockwise).
   b. Position temperature control switch (1) to desired setting.
   c. Set FAN switch (2) to off (full counterclockwise).
   d. Adjust vent switches (3), (4), and (5) as desired.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
VEHICLE PREPARATION FOR TRANSPORT

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

VEHICLE PREPARATION FOR LIFT

NOTE

Ensure Container Handling Unit (CHU) is in stowed position (WP 0053) if equipped.

1. Remove lift bracket tie-down straps (1), two screws (2), screws (3), four lockwashers (4), and plates (5) from brackets (6).

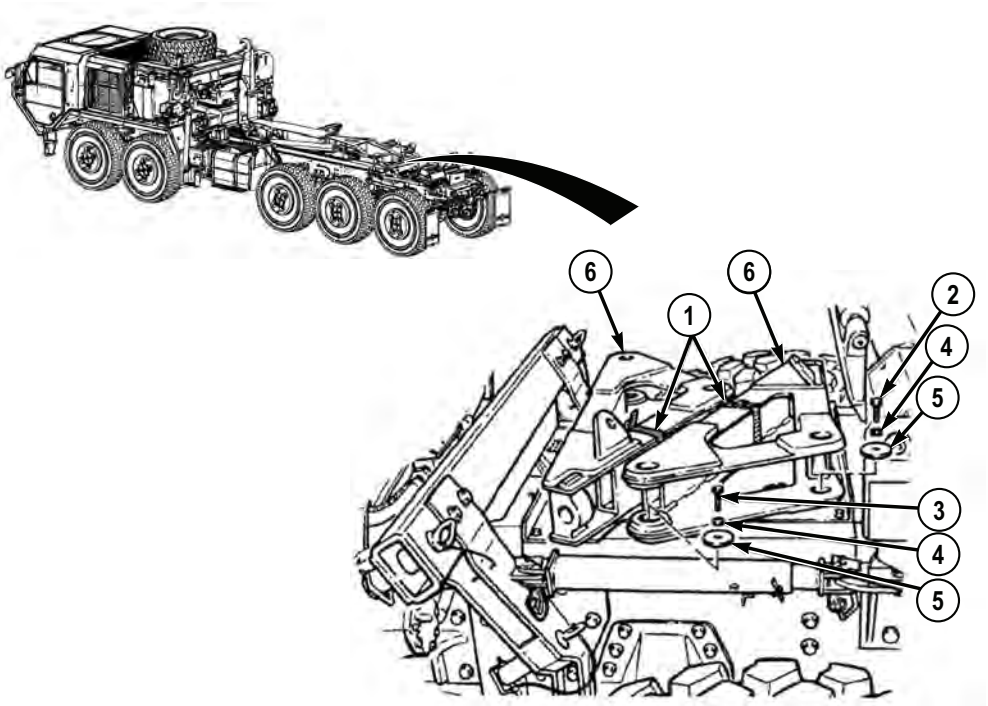


Figure 1.

VEHICLE PREPARATION FOR LIFT - Continued

NOTE

- Secure mounting hardware to bracket storage grill for storage.
- Both brackets are installed the same way. Left bracket is shown.

2. Remove two safety pins (7) and two lift assembly pins (8) from lift assembly (9).

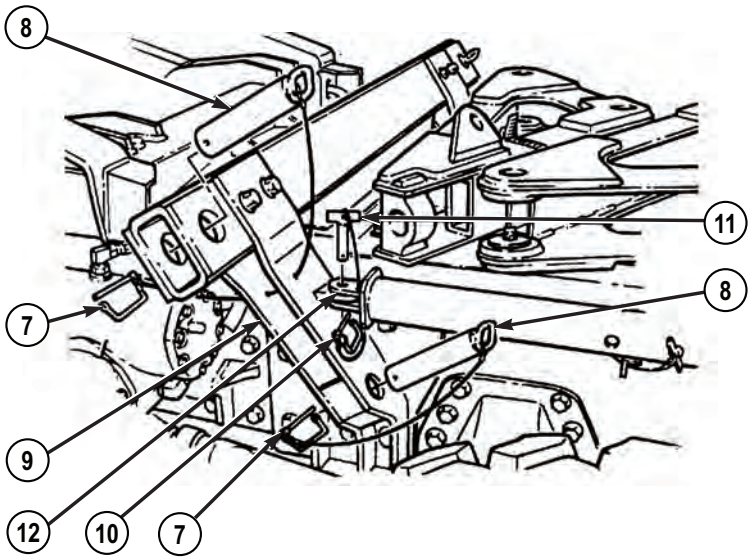


Figure 2.

3. Remove front safety pin (10) and pin (11) from stabilizer arm (12).

WARNING



Brackets weigh 80 lb (36 kg). Do not attempt to lift or move without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

4. Swing stabilizer arm (12) out to rest on tire (13).

VEHICLE PREPARATION FOR LIFT - Continued

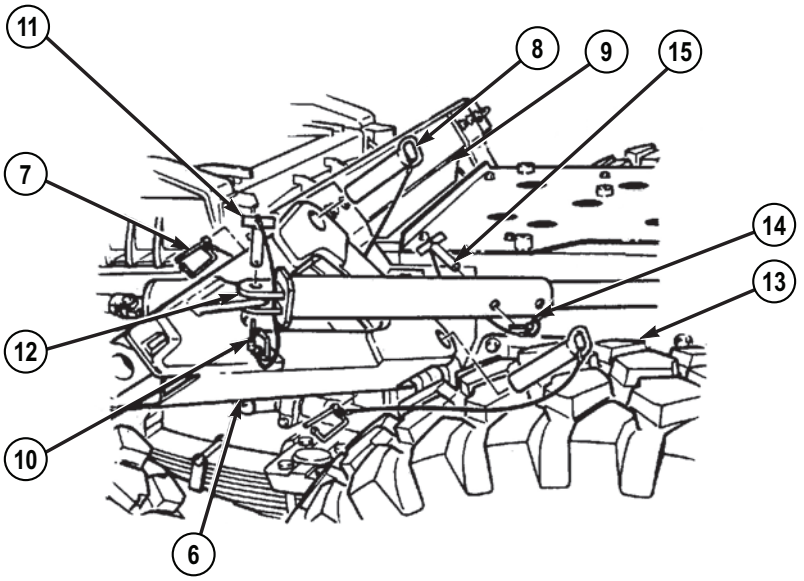


Figure 3.

5. With the aid of an assistant, install bracket (6) on lift assembly (9) using lift assembly pins (8).
6. Lock lift assembly pin (8) with safety pin (7).
7. Remove safety pin (14) and pin (15) from stabilizer arm (12).
8. Extend stabilizer arm (12).
9. Install pin (15) in stabilizer arm (12) and lock with safety pin (14).

NOTE

- Perform Step (10) if vehicle is not equipped with Container Handling Unit (CHU).
- Perform Steps (11) and (12) if vehicle is equipped with Container Handling Unit (CHU).

10. Attach stabilizer arm (12) to bracket (6) using pin (11) and lock with safety pin (10).
11. Attach stabilizer arm (12) to bracket (6) using pin (11) and bracket (16), and lock with safety pin (10).

VEHICLE PREPARATION FOR LIFT - Continued

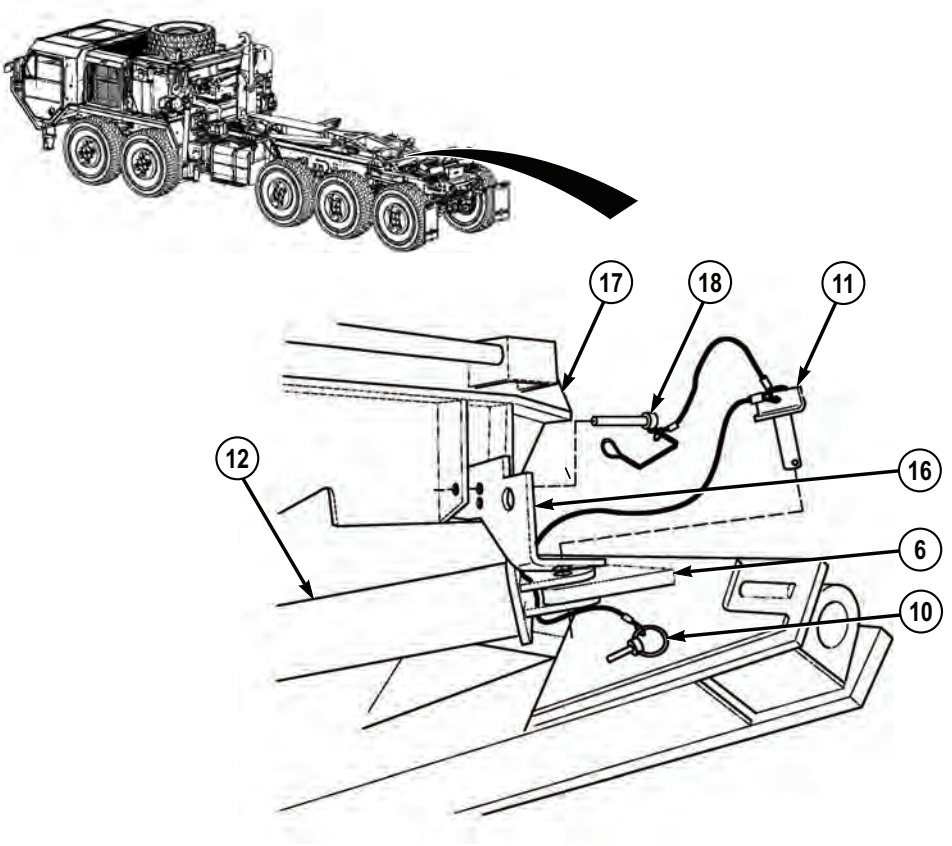


Figure 4.

12. Secure slider (17) to bracket (16) using pin (18).
13. Attach hard lift shackle (19) to bracket (6) using screw (20), nut (21), and cotter pin (22).

VEHICLE PREPARATION FOR LIFT - Continued

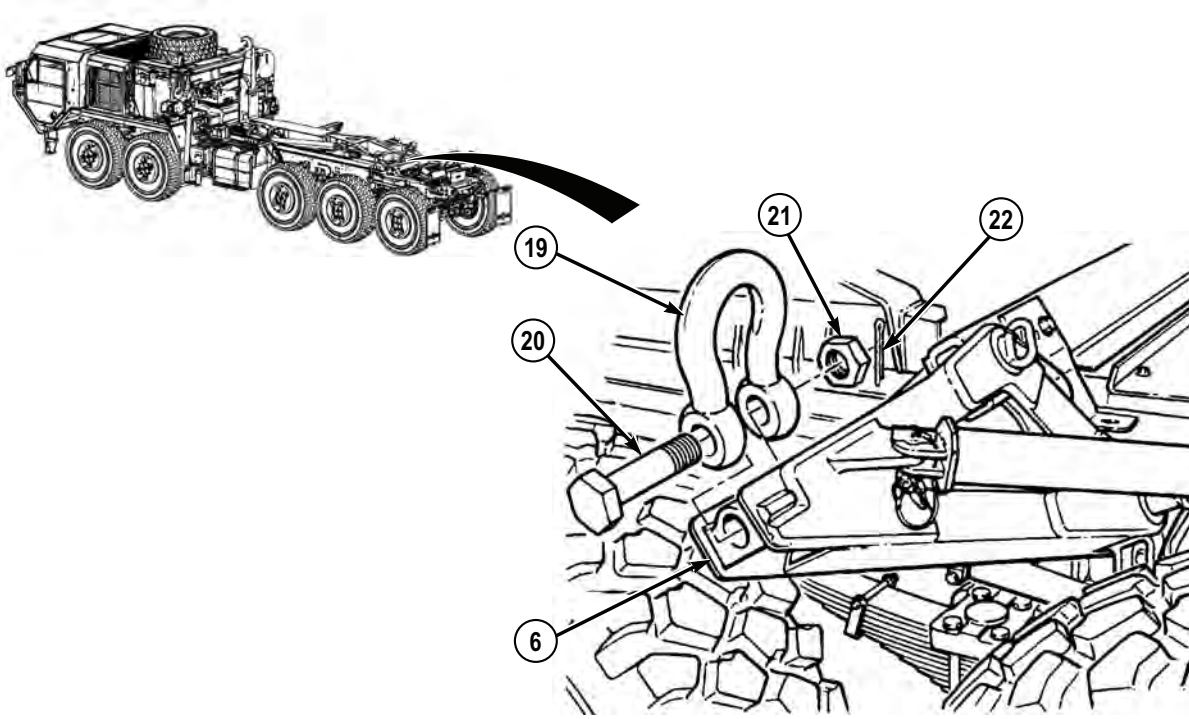


Figure 5.

14. Repeat Steps (2) through (13) to install right bracket.

NOTE

Both shackles are removed the same way. Left shackle is shown.

15. Remove cotter pin (23) from clevis pin (24).

VEHICLE PREPARATION FOR LIFT - Continued

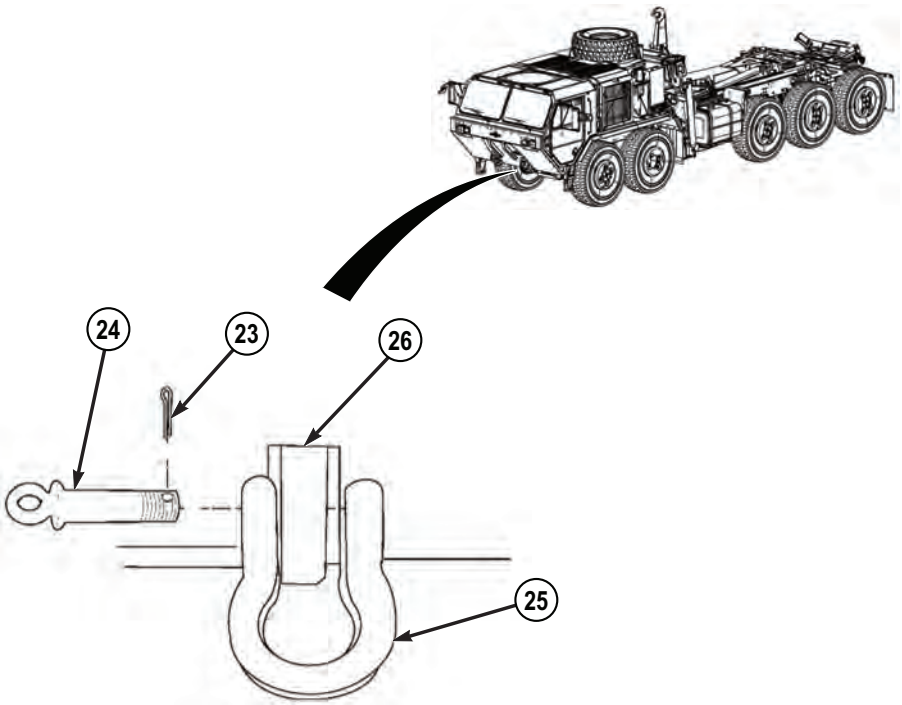


Figure 6.

16. Remove clevis pin (24) and towing shackle (25) from toweye (26).

NOTE

Both shackles are installed the same way. Left shackle is shown.

17. Attach towing shackle (25) to bracket (27) using clevis pin (24) and cotter pin (23).

VEHICLE PREPARATION FOR LIFT - Continued

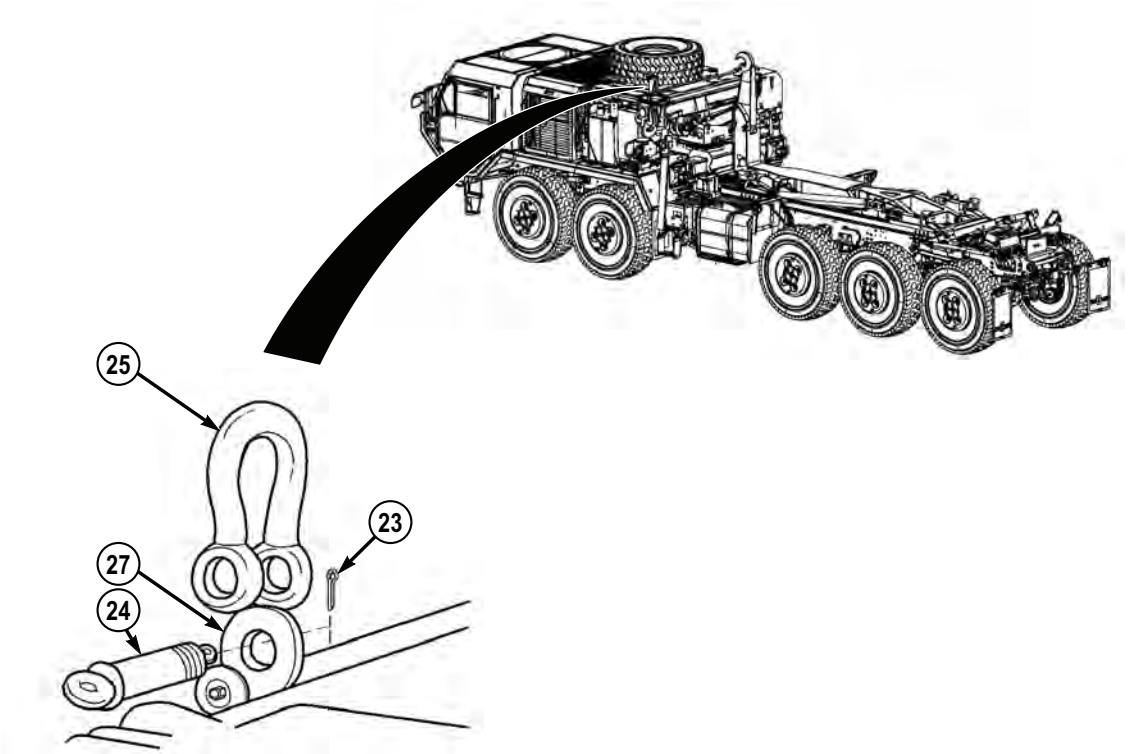


Figure 7.

18. Repeat Steps (15) through (17) to install right shackle.

END OF TASK

PREPARATION AFTER LIFT

NOTE

Both shackles are removed the same way. Left shackle is shown.

1. Remove cotter pin (23), clevis pin (24), and towing shackle (25) from bracket (27).

PREPARATION AFTER LIFT - Continued

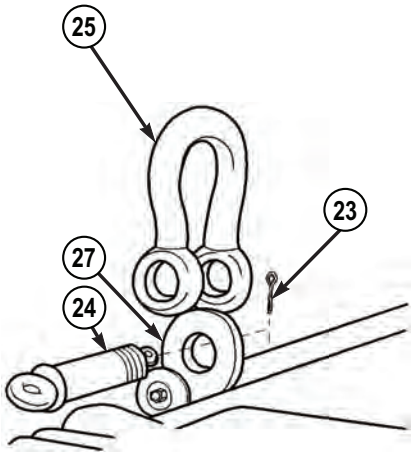


Figure 8.

2. Repeat Step (1) to remove right shackle.
3. Install towing shackle (25) on toweye (26) with clevis pin (24).

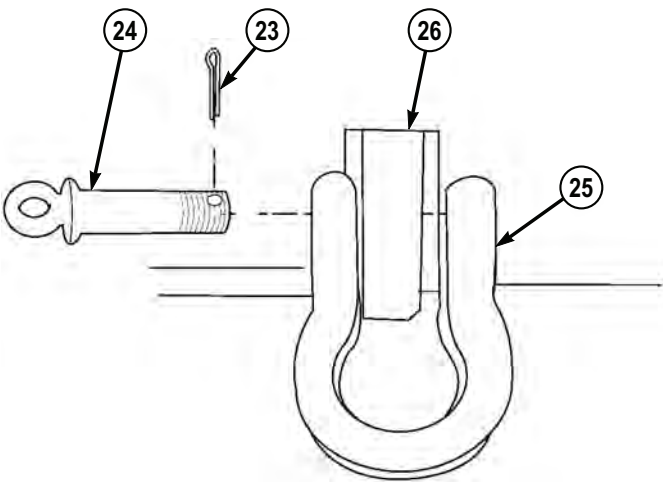


Figure 9.

4. Install cotter pin (23) in clevis pin (24).
5. Repeat Steps (3) and (4) for right shackle.

PREPARATION AFTER LIFT - Continued

NOTE

Both brackets are removed the same way. Left bracket is shown.

6. Remove cotter pin (22), nut (21), screw (20), and hard lift shackle (19) from bracket (6). Stow shackle in stowage box.

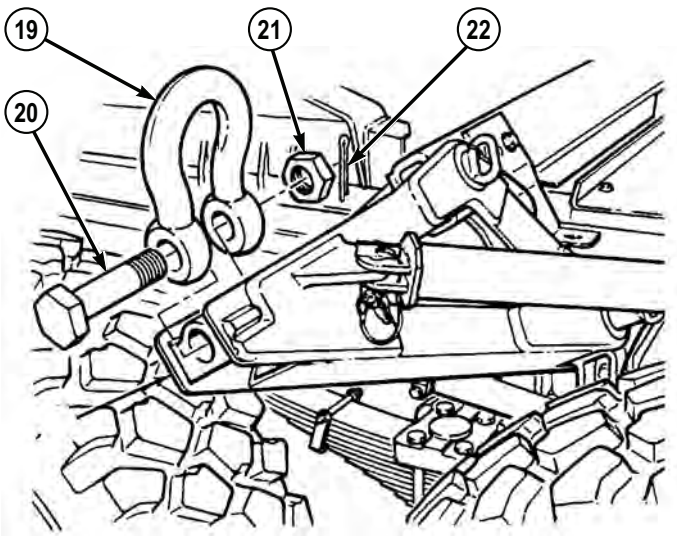


Figure 10.

NOTE

- Perform Steps (7) and (8) if vehicle is equipped with Container Handling Unit (CHU).
- Perform Step (9) if vehicle is not equipped with Container Handling Unit (CHU).

7. Remove pins (18) from bracket (16) and slider (17).

PREPARATION AFTER LIFT - Continued

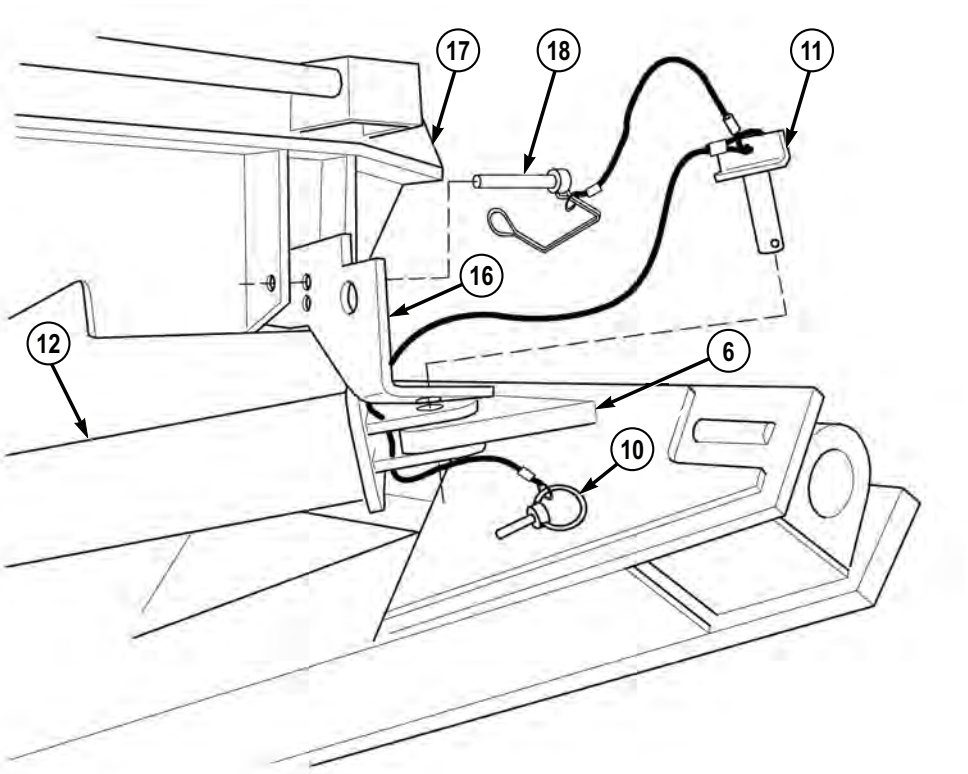


Figure 11.

8. Remove safety pin (10), pin (11), and bracket (16) from bracket (6) and stabilizer arm (12).
9. Remove safety pin (10) and pin (11) from bracket (6).
10. Swing stabilizer arm (12) out to rest on tire (13).

PREPARATION AFTER LIFT - Continued

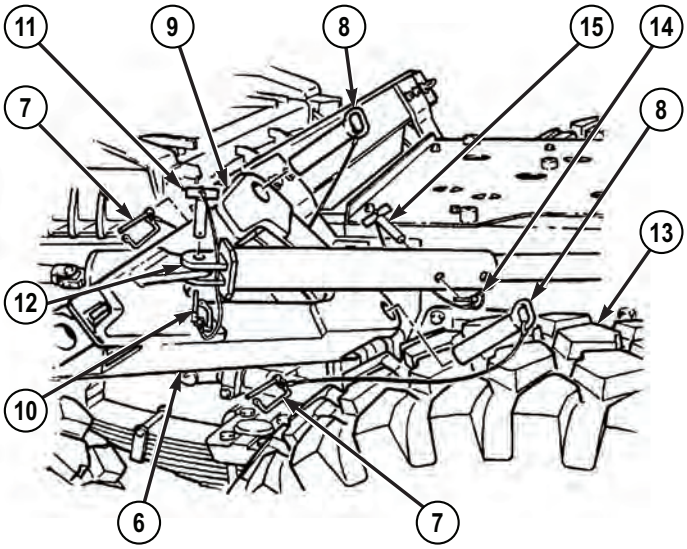


Figure 12.

11. Remove safety pin (14) and pin (15) from stabilizer arm (12).
12. Retract stabilizer arm (12).
13. Install pin (15) and safety pin (14) in stabilizer arm (12).
14. Remove two safety pins (7) and lift assembly pins (8) from bracket (6).
15. Remove bracket (6) from lift assembly (9).
16. Install stabilizer arm (12) to lift assembly (9) with pin (11) and lock with safety pin (10).

PREPARATION AFTER LIFT - Continued

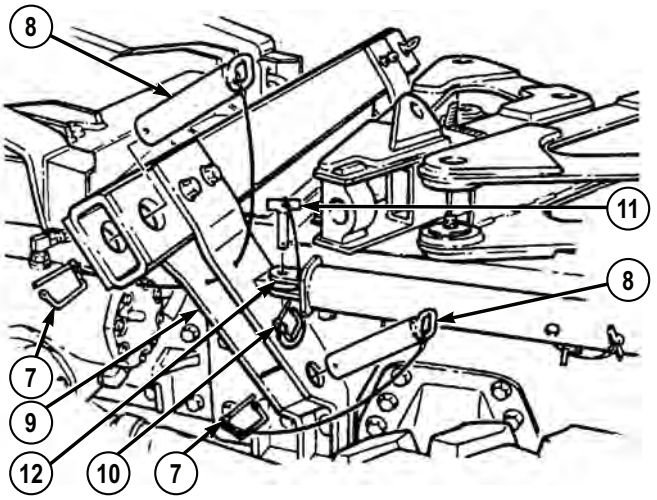


Figure 13.

17. Install two lift assembly pins (8) in lift assembly (9) and lock with two safety pins (7).
18. Install lift brackets (6) in stowage position with four plates (5), four lockwashers (4), two screws (3), two screws (2), and two lift bracket tie-down straps (1).

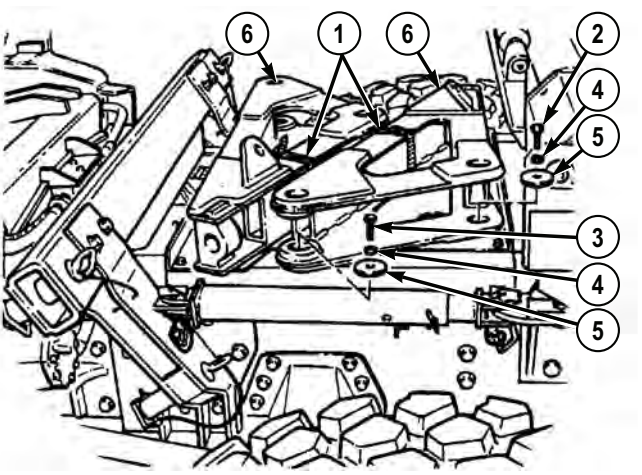


Figure 14.

END OF TASK

VEHICLE PREPARATION FOR AIR TRANSPORT

WARNING



Tire assembly weighs 500 lb (227 kg). Do not try to lift or catch tire assembly. Failure to comply may result in injury or death to personnel.

1. Remove spare tire (1) (Volume 2, WP 0134). Roll tire to back of vehicle and lay it down flat with valve stem facing up, centered behind LHS hook.

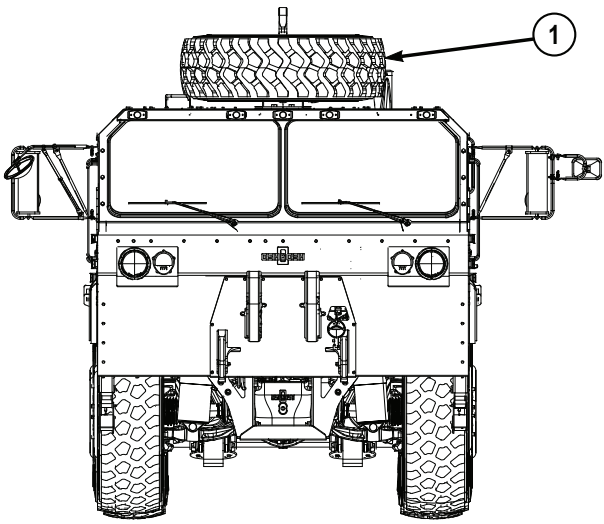


Figure 15.

2. Stow tire davit. (Volume 2, WP 0134)
3. Chock wheels (WP 0033).
4. Start engine (WP 0027) and apply parking brakes (2).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

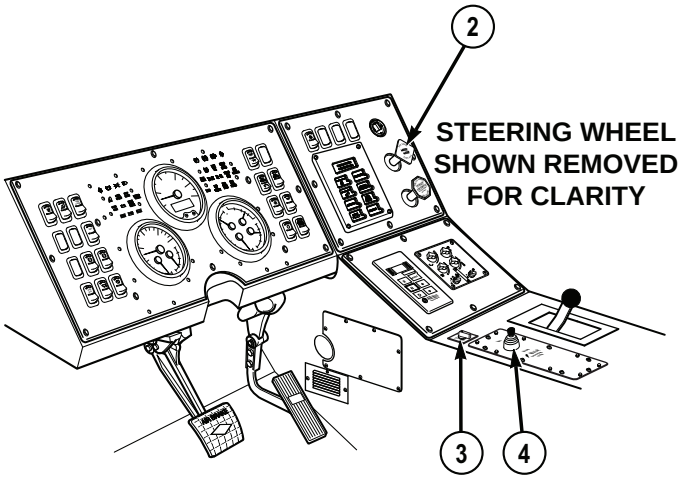


Figure 16.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

5. Move hydraulic selector switch (3) to AUTO.
6. Move joystick (4) to UNLOAD until hook (5) is 1.0 or 2.0 ft (305 to 610 mm) above spare tire (1).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

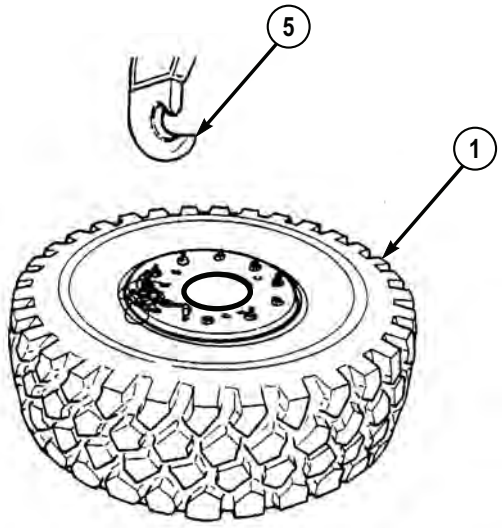


Figure 17.

7. Release joystick (4).
8. Shut OFF engine (WP 0037).
9. Keeping LHS in this position, close ball valve (6) located on crossmember (7) in front of Axle No. 3.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

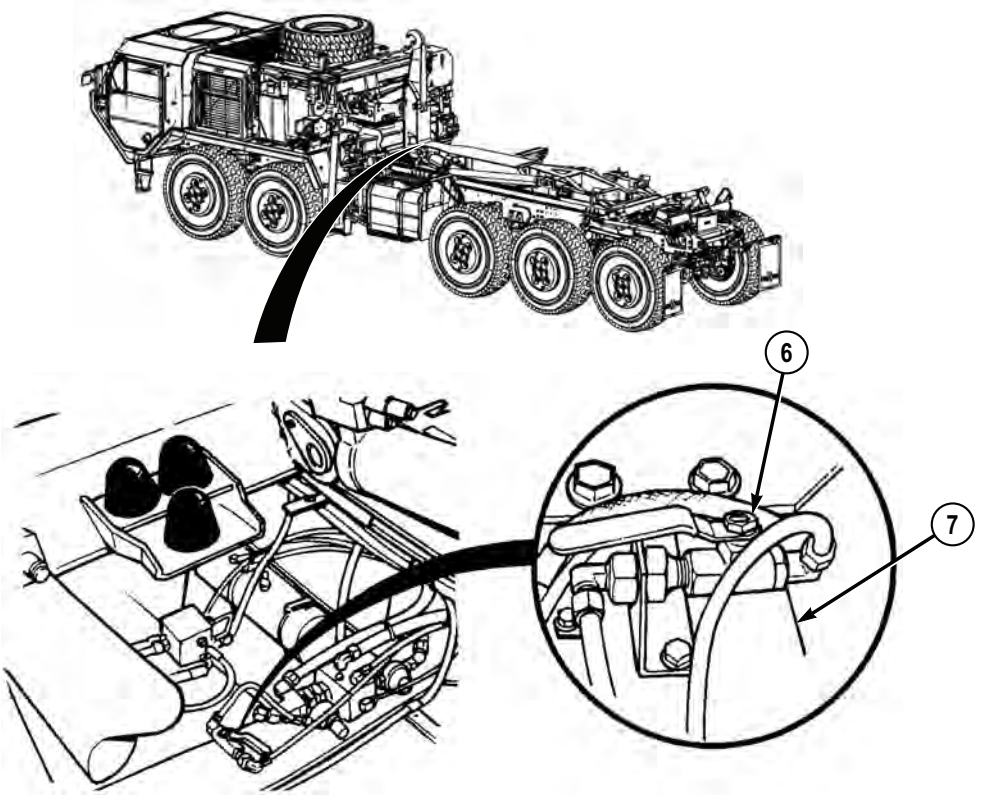


Figure 18.

NOTE

Step (11) drains air from Axle No. 3 air bags.

10. Open drain valves (8) (under fuel tank). Leave drain valves open.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

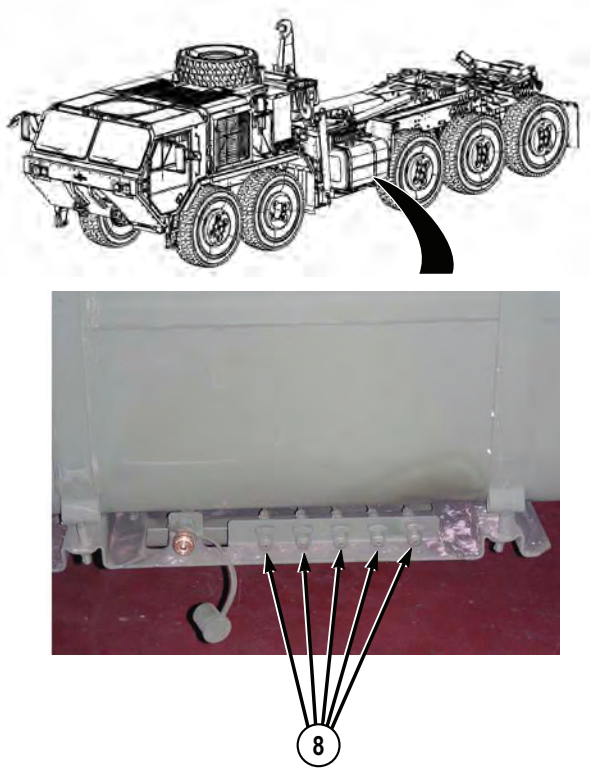


Figure 19.

WARNING



Lift-hook weighs 150 lb (68 kg). Attach suitable lifting device prior to removal or installation. Failure to comply may result in injury or death to personnel.

NOTE

- Perform Steps (14) and (15) if vehicle is not equipped with Container Handling Unit (CHU).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

- Perform Preparing PLS Vehicle With Lifting Frame For Air Transport (WP 0051) if vehicle is equipped with Container Handling Unit (CHU).

11. Remove safety pin (9), washer (10), and LHS hook arm pin (11) from hook (5).

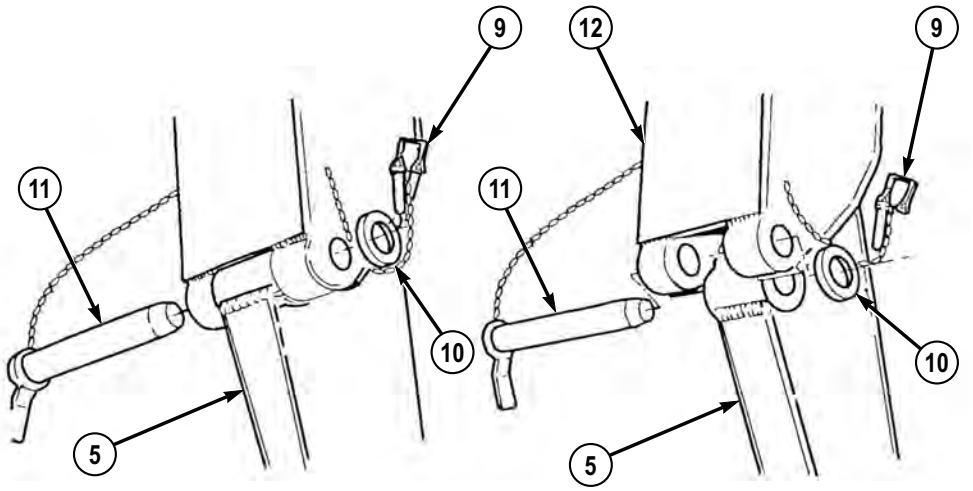


Figure 20.

12. Position hook (5) towards vehicle and reinsert hook arm pin (11), washer (10), and safety pin (9) through main beam (12) only.

13. Remove chain (13), two clevises (14), and ratchet strap (15) from stowage box (16).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

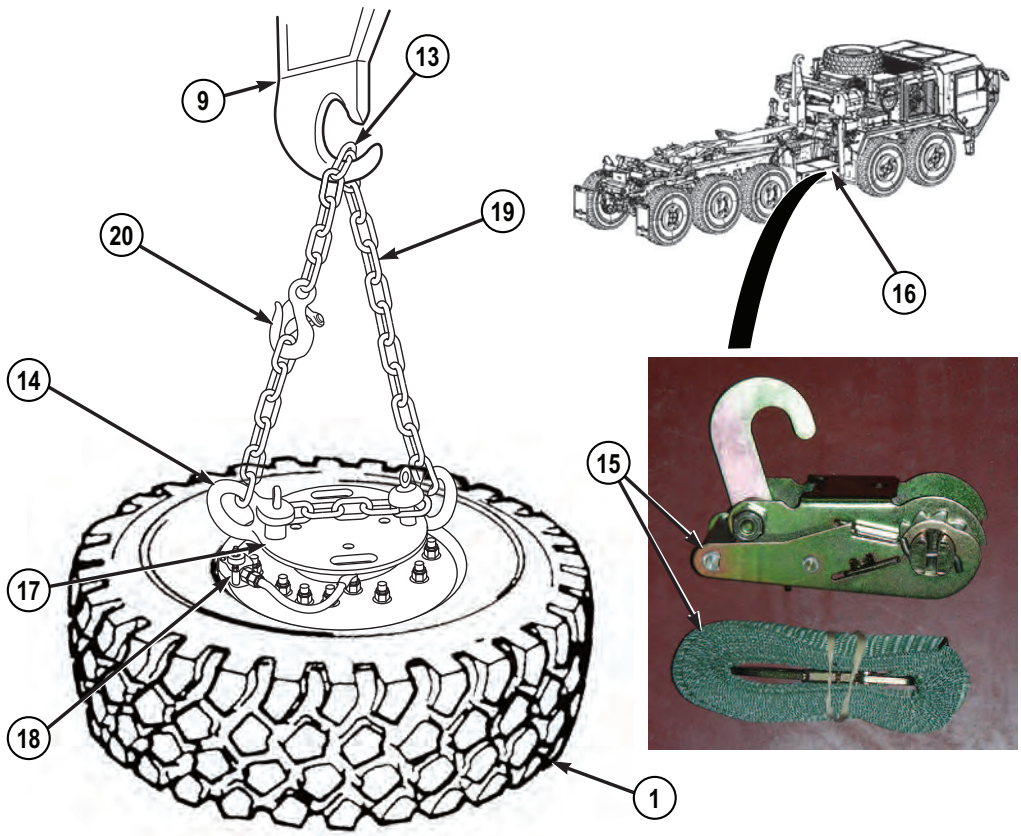


Figure 21.

CAUTION

Ensure clevises are installed with curved ends facing outward and chain is threaded away from CTIS valve. Failure to comply may result in damage to equipment.

14. Attach two clevises (14) to spare tire bracket (17).
15. Thread chain (13) through clevises (14) away from CTIS valve (18).
16. Count out 50 links (19) and make a loop with chain (13) by draping it over LHS hook (5) and placing chain hook (20) around chain link.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Injury or death could result if LHS contacts power lines.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Check ground conditions for firmness and extreme sideways inclination prior to picking up or off-loading a flatrack or container. Failure to comply may result in damage to equipment and injury or death to personnel.
- Prior to and during any load or unload cycle, all personnel should stay clear of LHS, front lift adapter, and container. Failure to comply may result in damage to equipment and injury or death to personnel.

CAUTION

- Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.
- Do not allow spare tire to swing back and forth while raising tire. Raise tire slowly during lifting operation and do not allow tire to strike LHS with force. Failure to comply could cause serious damage to equipment.

17. Start engine (WP 0027).
18. Set hydraulic selector switch (3) to MAN H.A.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

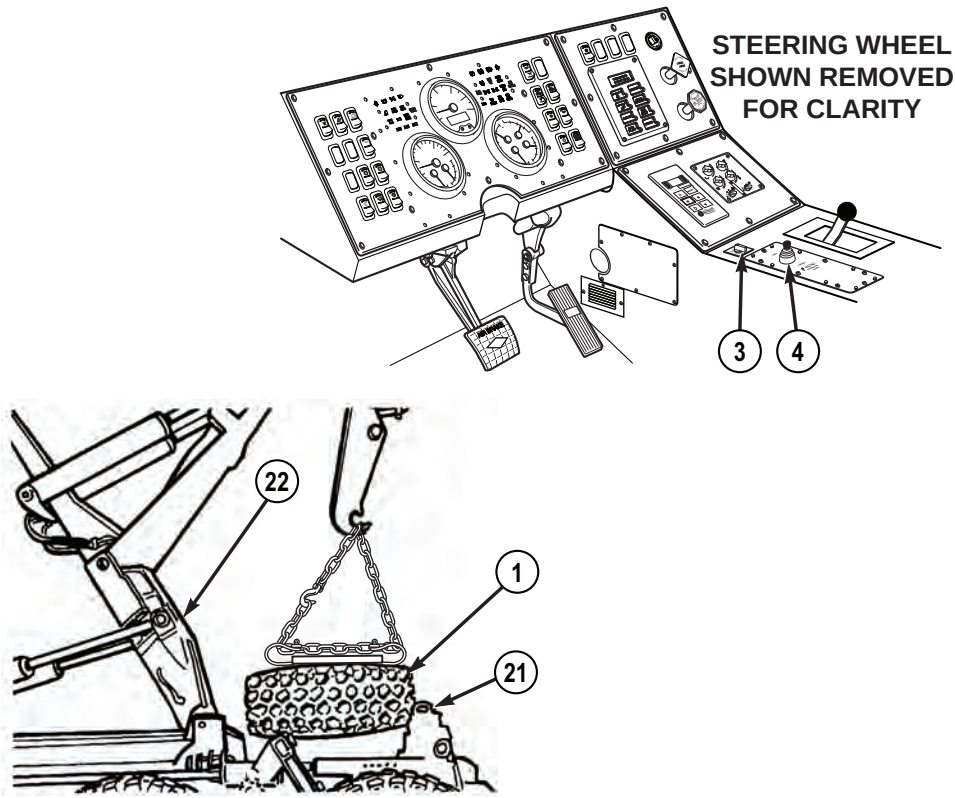


Figure 22.

19. Move joystick (4) to LOAD until spare tire (1) is lifted above rear rollers (21).
20. Release joystick (4).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

21. Set hydraulic selector switch (3) to MAN M.F.
22. Move joystick (8) to LOAD until spare tire (1) contacts LHS (22).
23. Release joystick (4).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

24. Set hydraulic selector switch (3) to MAN H.A.

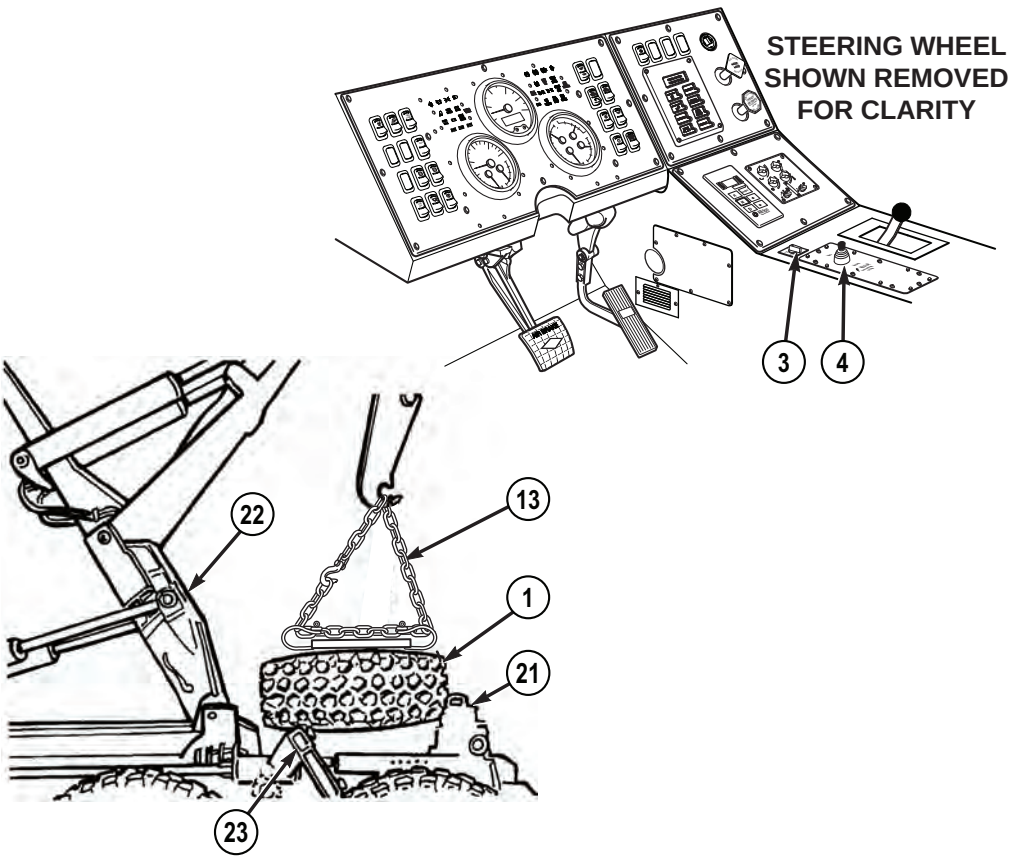


Figure 23.

25. Move joystick (4) to UNLOAD until spare tire (1) has moved approximately 1.0 ft (305 mm) away from LHS (22).

26. Release joystick (4).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

27. Set hydraulic selector switch (3) to MAN M.F.

28. Move joystick (4) to LOAD until spare tire (1) contacts LHS (22).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

29. Release joystick (4).

NOTE

The tire should not rest on top of the rear roller bracket.

30. Repeat Steps (25) through (30) until spare tire (1) rests on top of hard lift brackets (23) and just touches forward side of rear roller (19).

31. Remove chain (13) and two clevises (14) and return to stowage box.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

32. Set hydraulic selector switch (3) to AUTO.

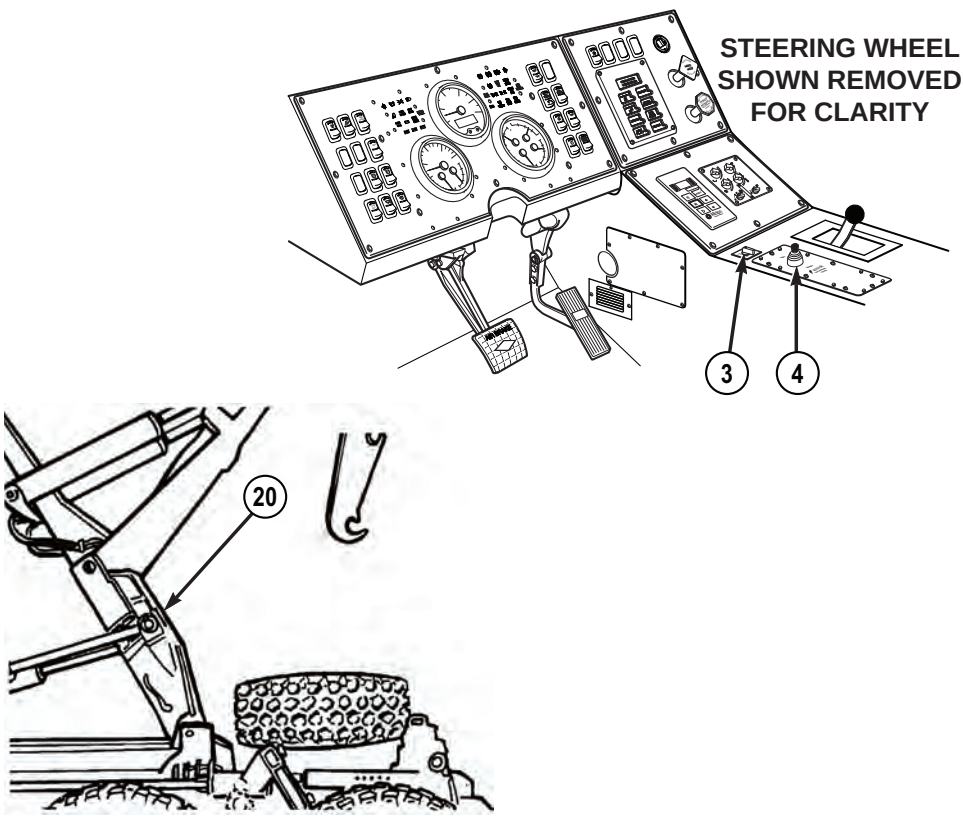


Figure 24.

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

33. Move joystick (4) to LOAD until LHS (22) is fully retracted into its transport position.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

34. Set hydraulic selector switch (3) to OFF.

NOTE

Ensure that the strap does not overlap wheel valve.

35. Thread ratchet strap (15) over top of spare tire (1).

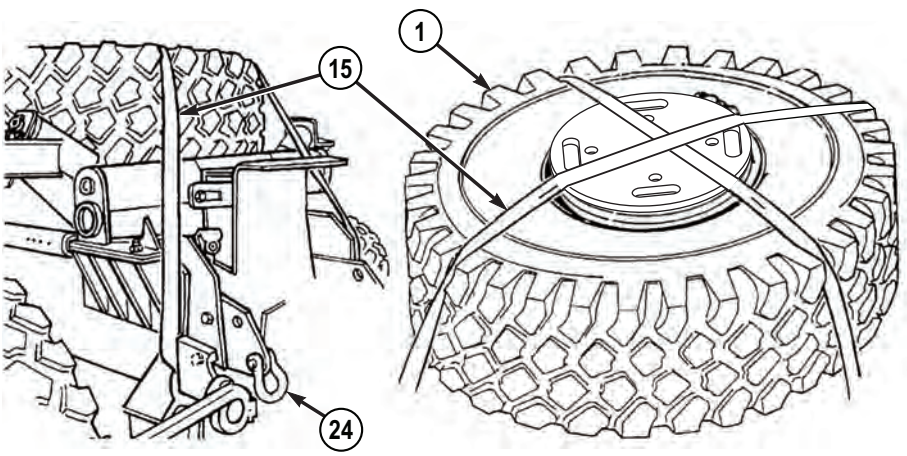


Figure 25.

36. Hook one end of ratchet strap (15) on lifting shackle (24).

37. Hook the ratchet strap (15) ends diagonally to lifting eyes (25) on rear of LHS frame (26).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

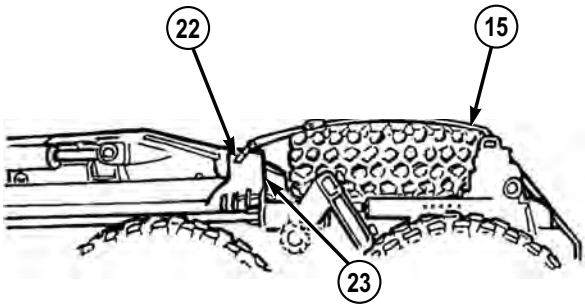


Figure 26.

38. Tighten ratchet strap (15) securely.
39. Pull up on clamp lever (27) and remove muffler stack (28).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued



Figure 27.

40. Fold in mirrors (29).

VEHICLE PREPARATION FOR AIR TRANSPORT - Continued

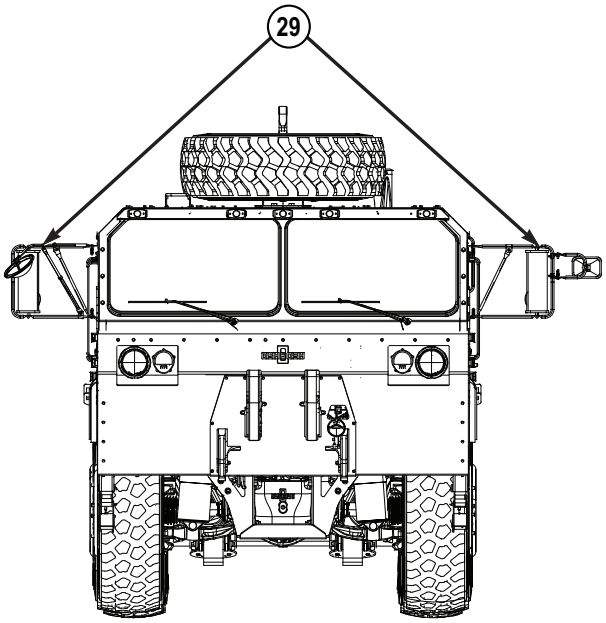


Figure 28.

END OF TASK

VEHICLE PREPARATION AFTER AIR TRANSPORT

1. Chock wheels (WP 0033).
2. Unstow tire davit and tools. (Volume 2, WP 0134)
3. Fold out mirrors (29).

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

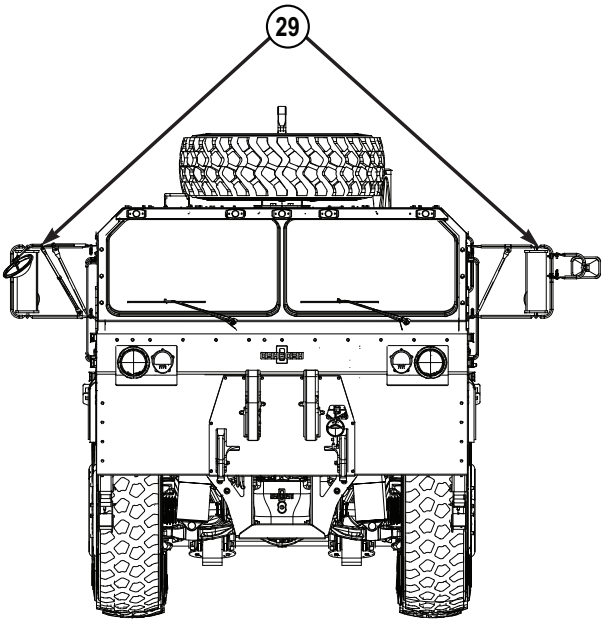


Figure 29.

4. Install muffler stack (28) with clamp (27).

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued



Figure 30.

5. Remove ratchet straps (15) from lifting shackles (24) and tire (1).

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

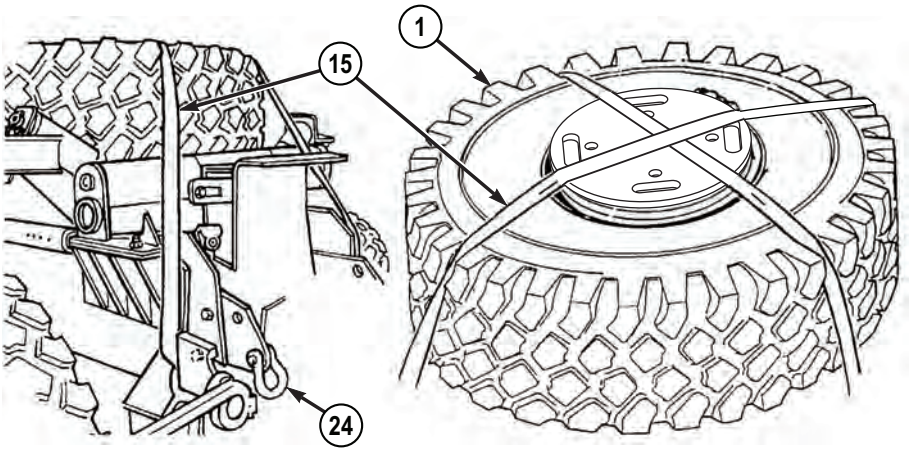


Figure 31.

6. Remove ratchet straps (15) from lifting eyes (25) on rear of LHS frame (26).

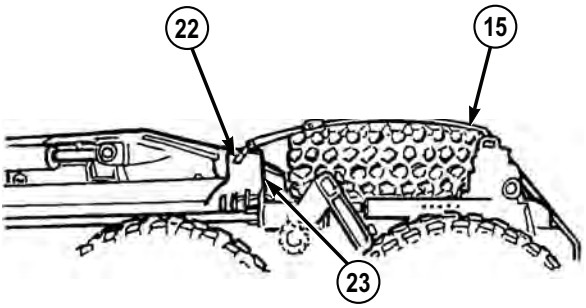


Figure 32.

7. Start vehicle (WP 0027) and apply parking brake.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

8. Set hydraulic selector switch (3) to MAN H.A.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

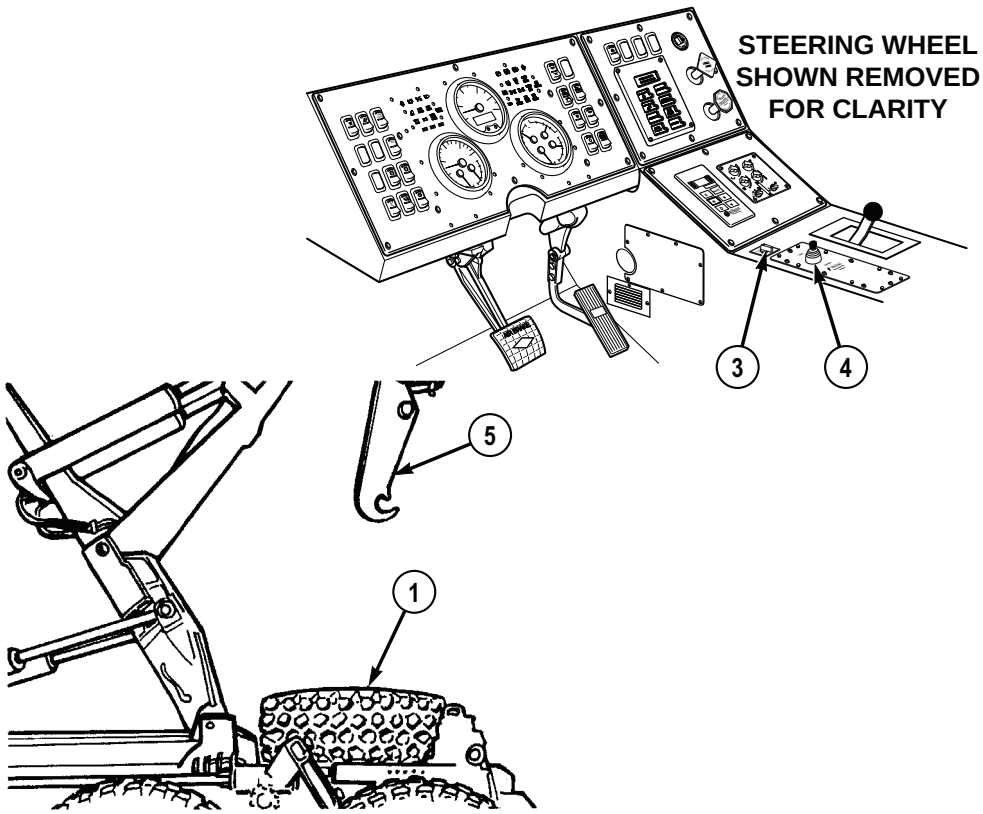


Figure 33.

WARNING



Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 17 ft 2 in. (5.23 m) with ISO container. Failure to comply may result in injury or death to personnel.

9. Move joystick (4) to UNLOAD until hook arm (5) is above spare tire (1).
10. Release joystick (4).
11. Remove chain (13) and clevises (14) from stowage.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

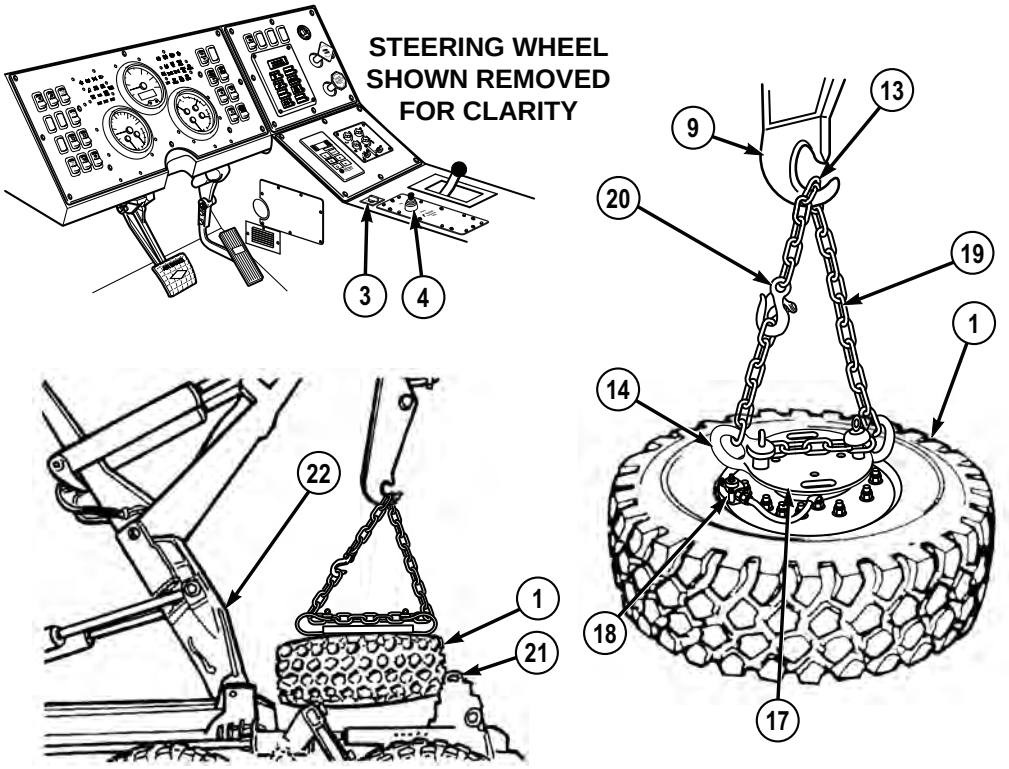


Figure 34.

CAUTION

Ensure clevises are installed with curved ends facing outward and chain is threaded away from CTIS valve Failure to comply may result in damage to equipment.

12. Attach two clevises (14) to spare tire bracket (17).
13. Thread chain (13) through clevises (14) away from CTIS valve (18).
14. Count out 50 links (19) and make a loop with chain (13) by draping it over LHS hook (5) and placing chain hook (20) around chain link.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

15. Set hydraulic selector switch (3) to MAN H.A.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

16. Move joystick (4) to LOAD and lift spare tire (1) until tire clears rollers (21) and contacts LHS (22).
17. Release joystick (4).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

18. Set hydraulic selector switch (3) to MAN M.F.
19. Move joystick (4) to UNLOAD until spare tire (1) contacts the vehicle or rear rollers (21).

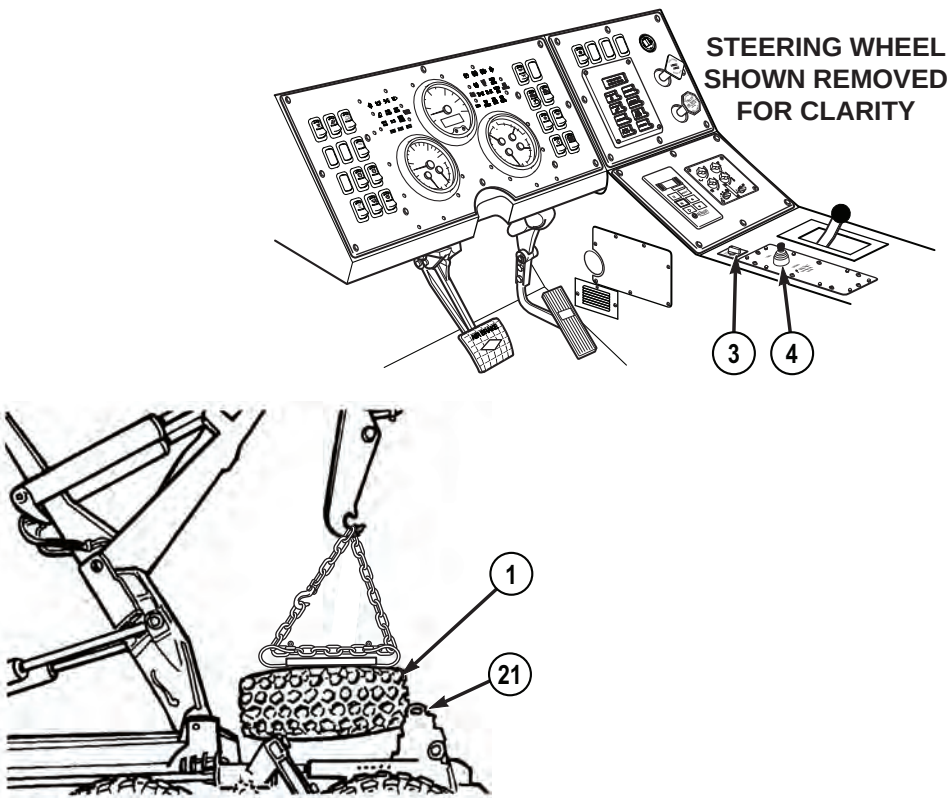


Figure 35.

20. Release joystick (4).
21. Repeat Steps (18) through (23) until tire (1) clears rear of vehicle.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

22. Set hydraulic selector switch (3) to MAN H.A.
23. Move joystick (4) to UNLOAD until spare tire (1) rests on ground.
24. Release joystick (4).
25. Remove chain hook (20) from link (19).

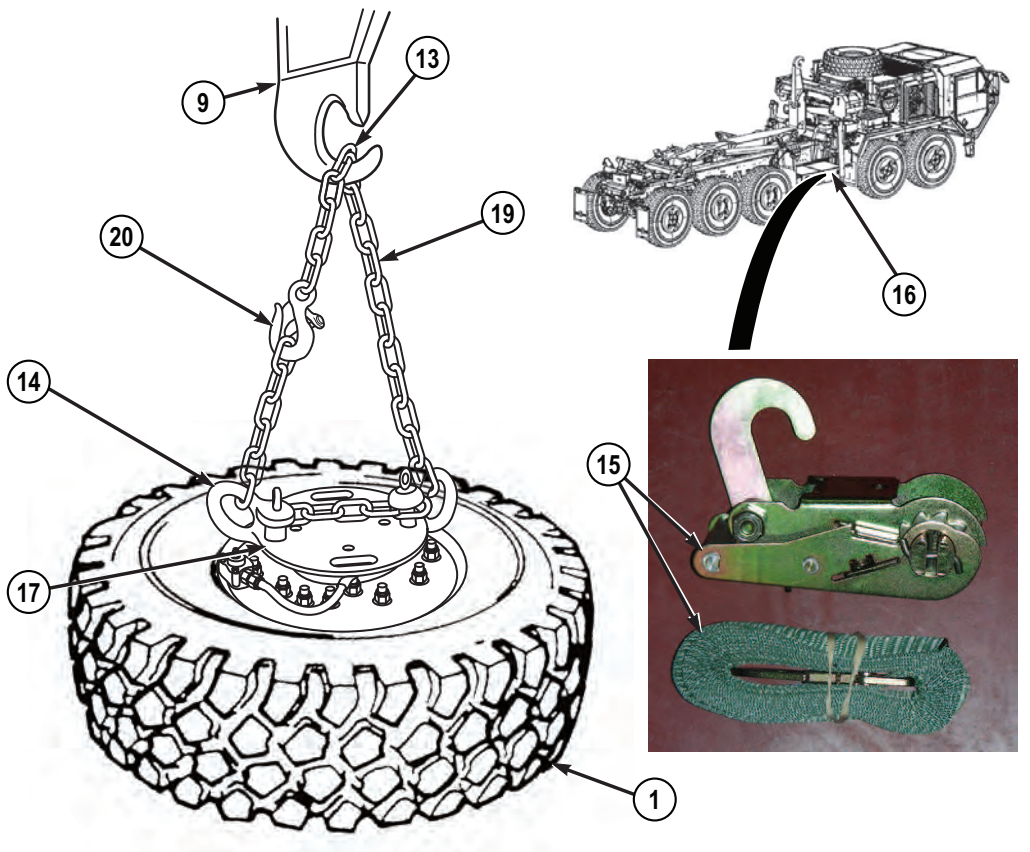


Figure 36.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

26. Remove chain (13) from hook (9), and two clevises (14).
27. Remove two clevises (14) from spare tire bracket (17).
28. Return chain (13), two clevises (14), and ratchet straps (15) to stowage box (16).

WARNING



Lift-hook weighs 150 lb (68 kg). Attach suitable lifting device prior to removal or installation. Failure to comply may result in injury or death to personnel.

NOTE

- Perform Steps (27) and (28) if vehicle is not equipped with Container Handling Unit (CHU).
- Perform Preparing PLS Vehicle With Lifting Frame for Air Transport if vehicle is equipped with Container Handling Unit (CHU).

29. Remove safety pin (9), washer (10), and pin (11) from main beam (12).

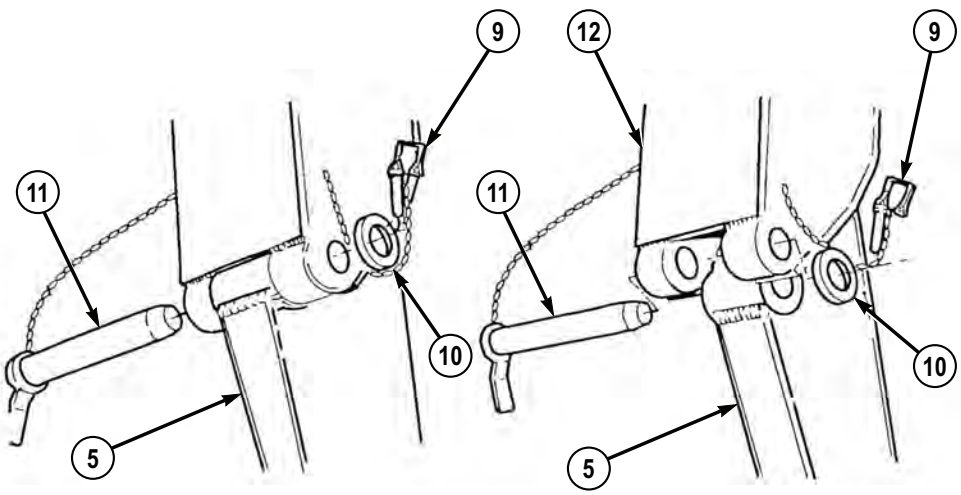


Figure 37.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

30. Position hook to rear and install pin (11) through hook arm (5). Install washer (10) and safety pin (9).
31. Shut OFF engine (WP 0037).
32. Close drain valves (8).

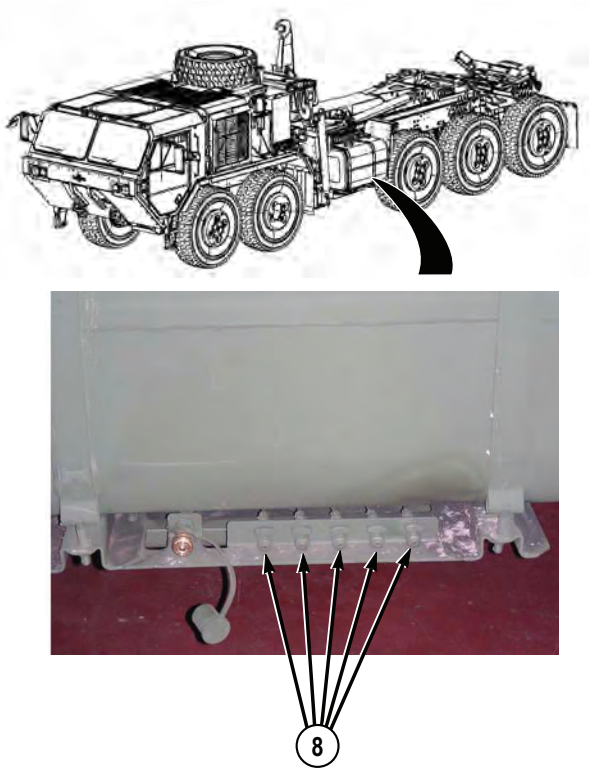


Figure 38.

33. Open ball valve (6) on crossmember (7).

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

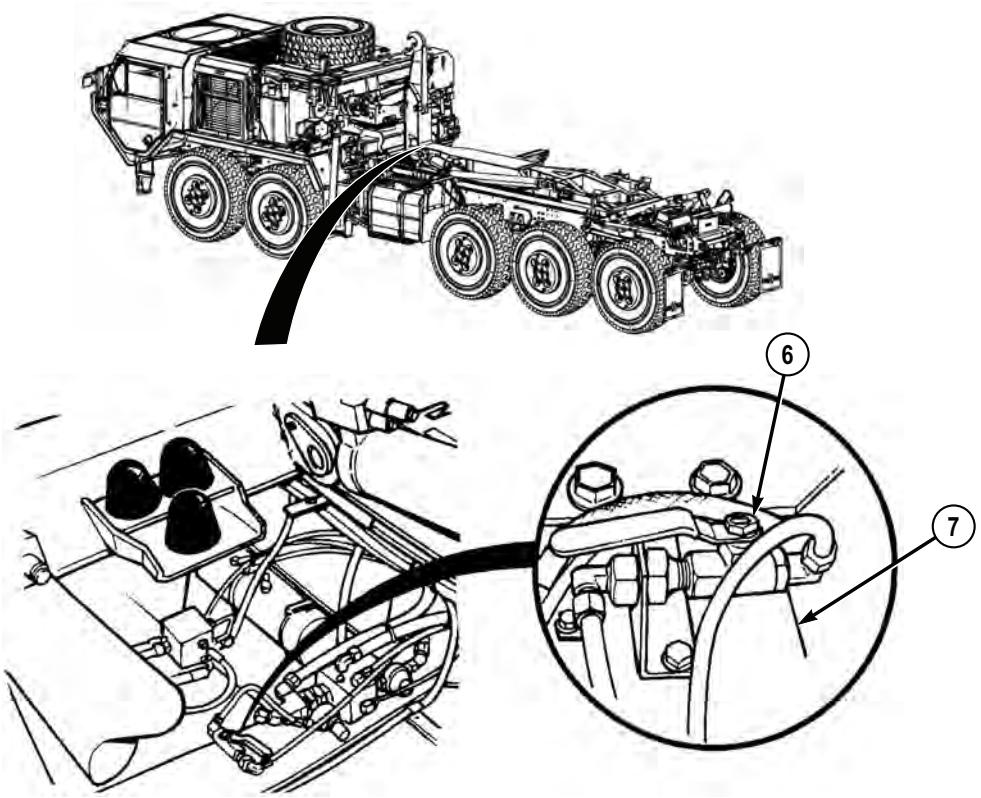


Figure 39.

34. Start engine (WP 0027).

CAUTION

Engine speed must be idle before using hydraulic selector switch, or damage to equipment may result.

35. Set hydraulic selector switch (3) to AUTO.

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

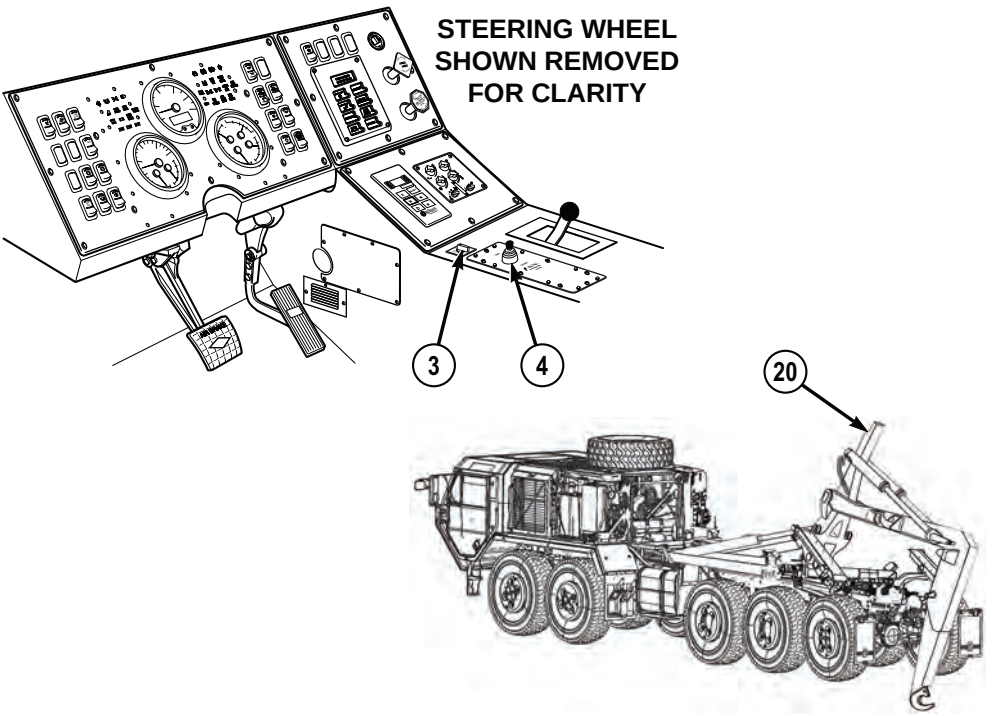


Figure 40.

36. Move joystick (4) to LOAD position until LHS (20) is fully stowed.

CAUTION

Engine speed must be idle before using hydraulic selector switch, or damage to equipment may result.

37. Set hydraulic selector switch (3) to OFF.
38. Release joystick (4).
39. Shut OFF engine (WP 0037).
40. Return spare tire (1) to stowage (Volume 2, WP 0134).

VEHICLE PREPARATION AFTER AIR TRANSPORT - Continued

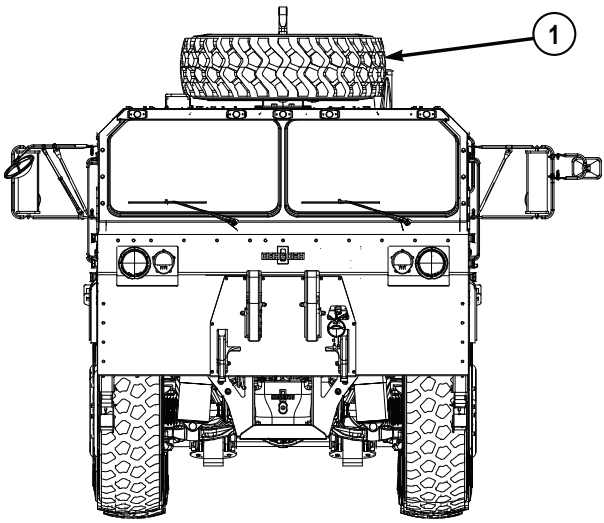


Figure 41.

END OF TASK

VEHICLE PREPARATION FOR RAIL TRANSPORT

NOTE

Both front shackles are installed the same way. Right side is shown.

1. Remove four shackles from stowage box and install shackle (1) in upper toweye (2) with clevis pin (3).

VEHICLE PREPARATION FOR RAIL TRANSPORT - Continued

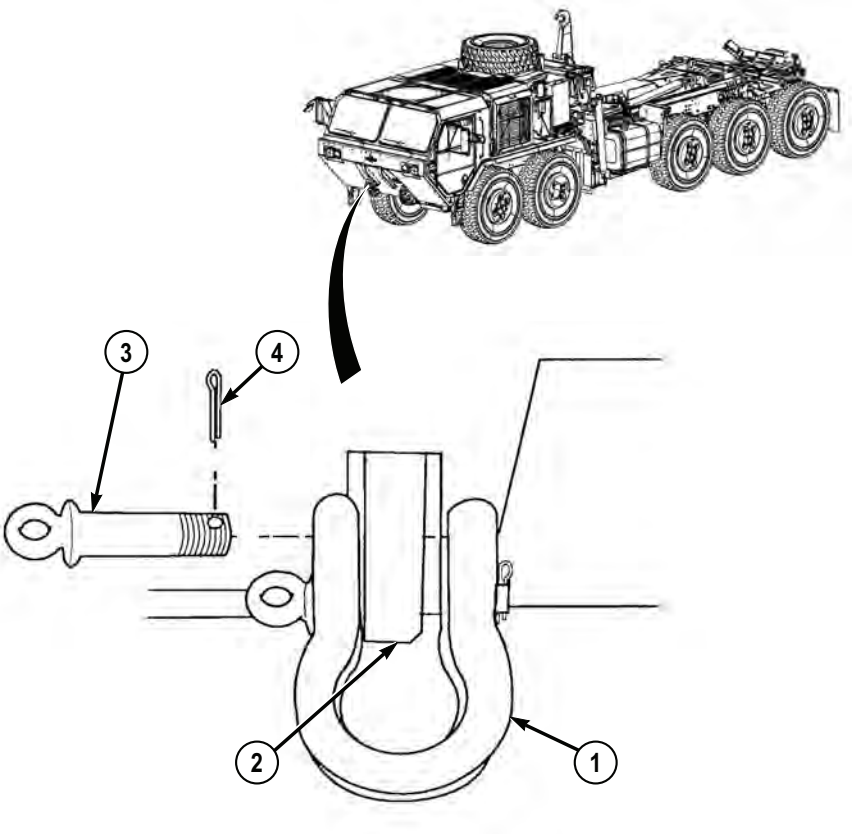


Figure 42.

2. Install cotter pin (4) in clevis pin (3) and bend cotter pin.
3. Repeat Steps (1) and (2) for left side.

NOTE

Both rear shackles are installed the same way. Right side is shown.

4. Install shackle (5) in upper toweye (6) with clevis pin (7).

VEHICLE PREPARATION FOR RAIL TRANSPORT - Continued

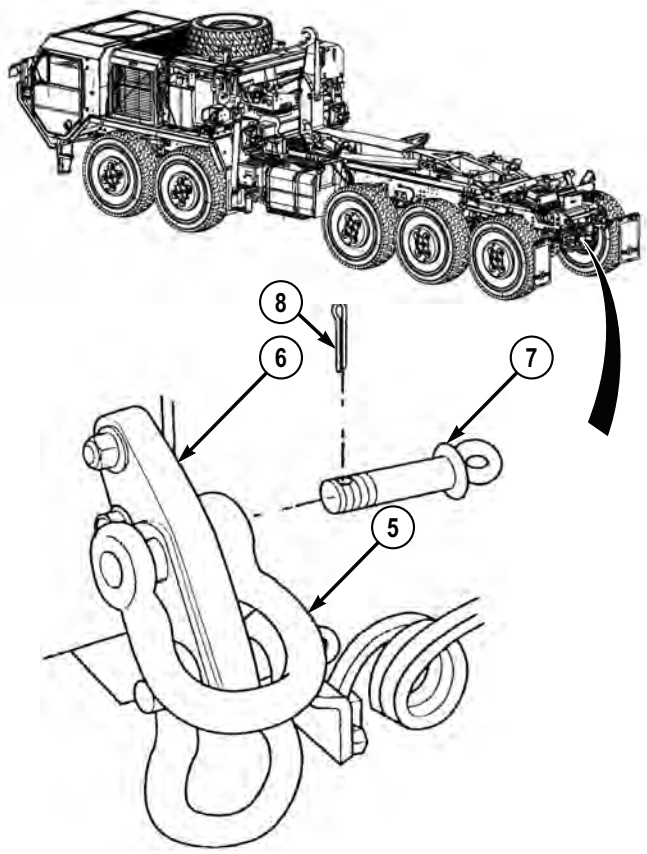


Figure 43.

5. Install cotter pin (8) in clevis pin (7) and bend cotter pin.
6. Repeat Steps (4) and (5) for left side.

NOTE

- Both hitch pins are installed the same way. Right side is shown.
- Perform Steps (7) through (12) for vehicle with flatrack.

7. Remove safety pin (9) from lock pin (10).

VEHICLE PREPARATION FOR RAIL TRANSPORT - Continued

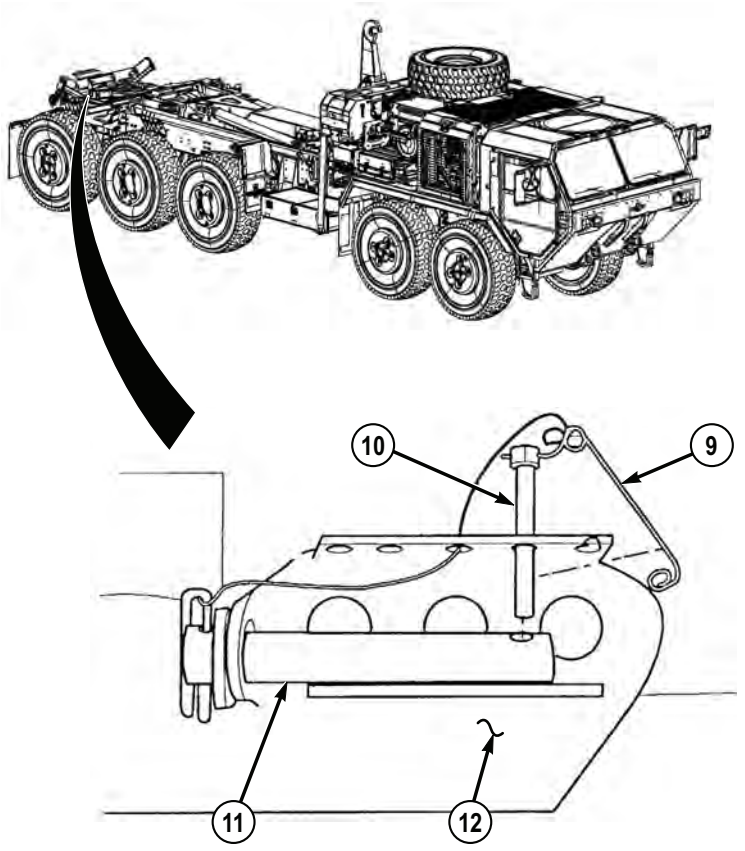


Figure 44.

8. Remove lock pin (10) from hitch pin (11).
9. Remove hitch pin (11) from bracket (12).
10. Install hitch pin (11) through bracket (12) and flatrack main rail (13).

VEHICLE PREPARATION FOR RAIL TRANSPORT - Continued

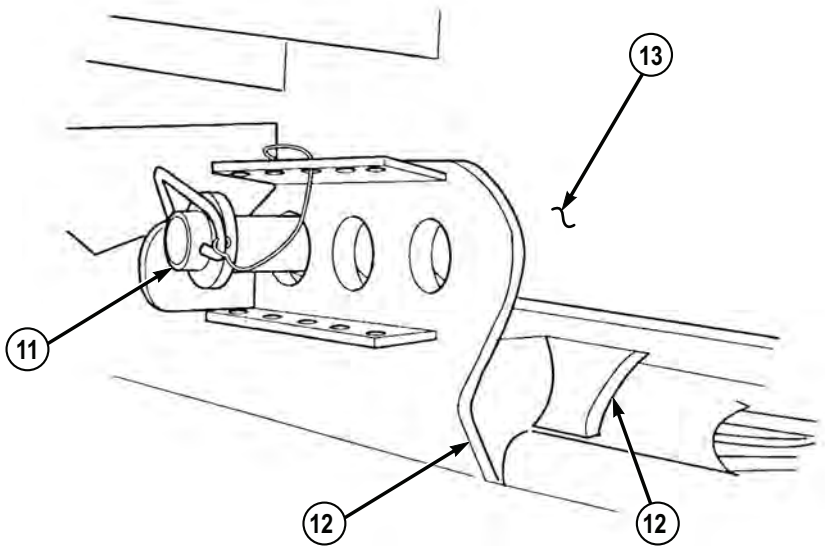


Figure 45.

11. Install lock pin (10) in hitch pin (11).

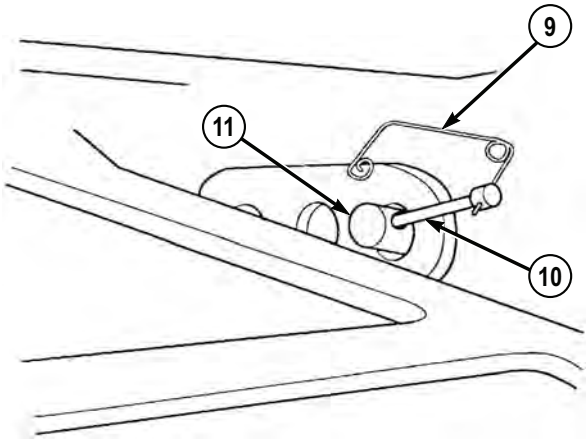


Figure 46.

12. Install safety pin (9) in lock pin (10).

VEHICLE PREPARATION FOR RAIL TRANSPORT - Continued

13. Repeat Steps (7) through (12) for left side.

END OF TASK

VEHICLE PREPARATION AFTER RAIL TRANSPORT

NOTE

Both front shackles are removed the same way. Right side is shown.

1. Straighten cotter pin (4) and remove from clevis pin (3).

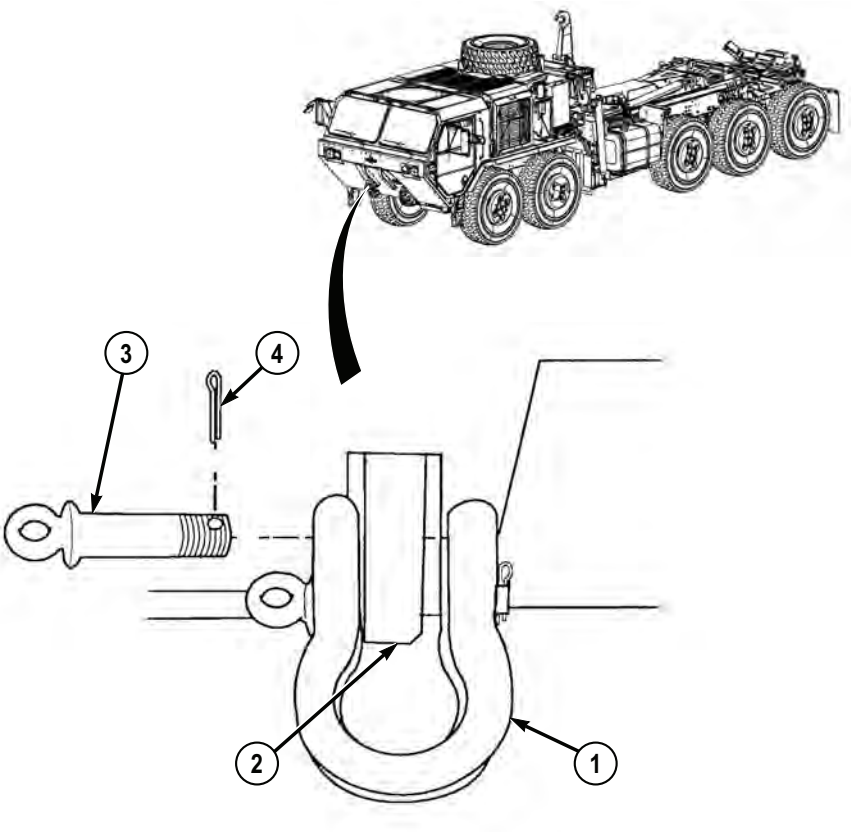


Figure 47.

2. Remove clevis pin (3) and shackle (1) from upper toweye (2). Stow shackle (1) in stowage box.

VEHICLE PREPARATION AFTER RAIL TRANSPORT - Continued

3. Repeat Steps (1) and (2) for left side.

NOTE

Both rear shackles are removed the same way. Left side is shown.

4. Straighten cotter pin (8) and remove from clevis pin (7).

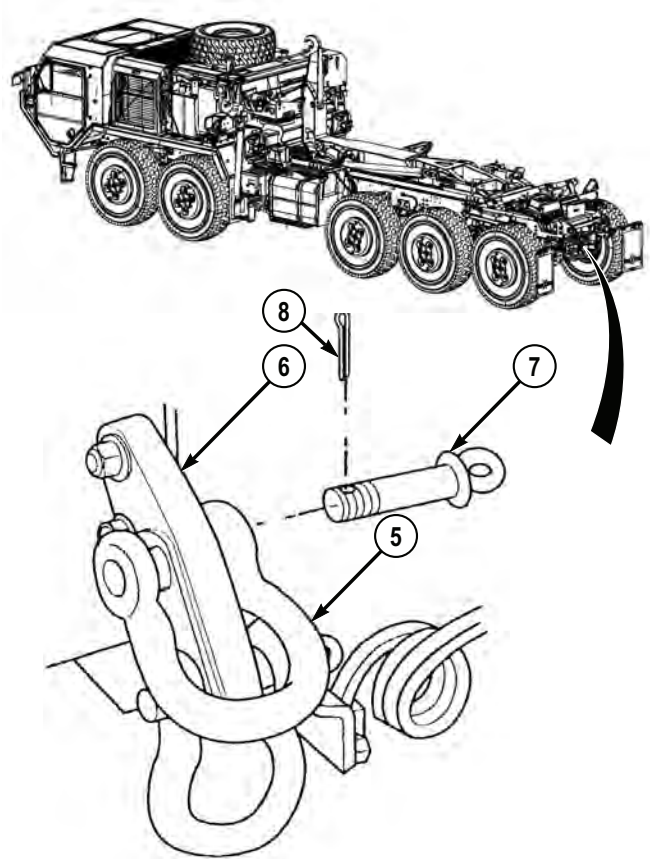


Figure 48.

5. Remove clevis pin (7) and shackle (5) from upper toweye (6). Stow shackle in stowage box.

6. Repeat Steps (4) and (5) for right side.

VEHICLE PREPARATION AFTER RAIL TRANSPORT - Continued

NOTE

- Both hitch pins are removed the same way. Right side is shown.
- Perform Steps (7) through (12) for vehicle with flatrack.

7. Remove safety pin (9) from lock pin (10).

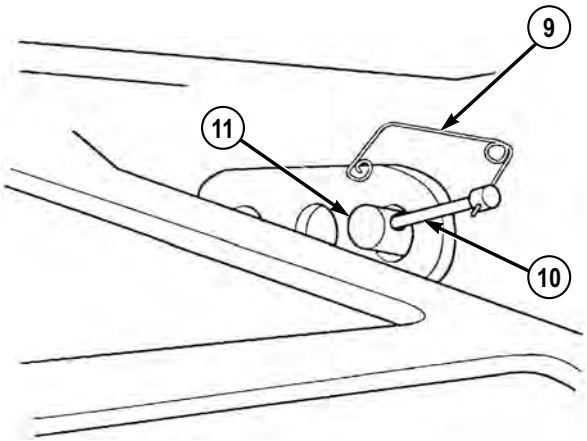


Figure 49.

8. Remove lock pin (10) from hitch pin (11).
9. Remove hitch pin (11) from bracket (12) and flatrack main rail (13).

VEHICLE PREPARATION AFTER RAIL TRANSPORT - Continued

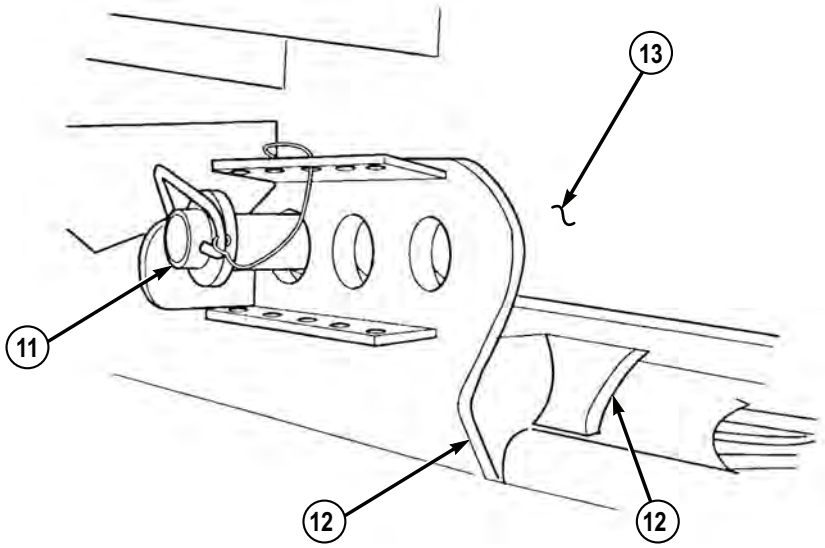


Figure 50.

10. Install hitch pin (11) on bracket (12).
11. Install lock pin (10) in hitch pin (11).

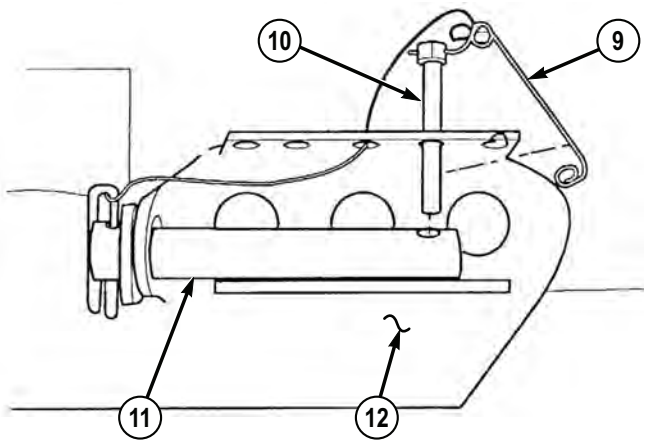


Figure 51.

12. Install safety pin (9) in lock pin (10).

VEHICLE PREPARATION AFTER RAIL TRANSPORT - Continued

13. Repeat Steps (7) through (12) for left side.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
STACKING/LOADING M3 CROP ON PLS TRAILER

INITIAL SETUP:

Not Applicable

STACKING/LOADING AND UNSTACKING/UNLOADING

NOTE

- Procedures for stacking and unstacking CROPs on PLS vehicle or trailer are the same.
- Refer to procedures to load and unload CROP to vehicle or trailer using Load Handling System (LHS).
- Once CROPs are stacked on PLS vehicle, they are off-loaded onto PLS trailer using the following procedures.
- Perform Steps (2) and (3) to secure right side part of CROP loading ramps to right rear corner of trailer frame bed.

1. Remove left and right Container Roll-In/Out Platform (CROP) loading ramp from their storage location on PLST.

CAUTION

- There are both left side and right side CROP loading ramps. For proper operation, they must be engaged on proper side.
- To ensure proper engagement and operation of CROP loading ramps, the following installation instructions must be followed. Failure to comply may result in damage to equipment.

2. Position CROP loading ramps with sloped portion (1) facing forward on trailer frame bed, toward trailer tongue.

STACKING/LOADING AND UNSTACKING/UNLOADING - Continued

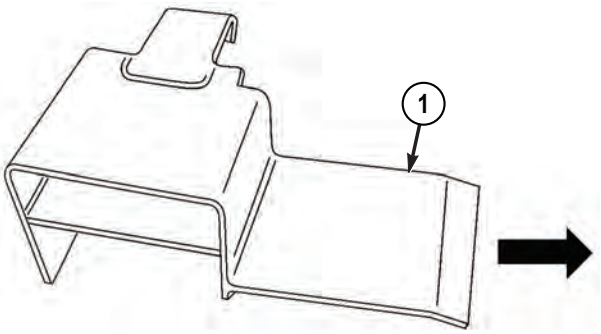


Figure 1.

3. With squared back portion of CROP loading ramp (2) flush against and contacting trailer stops, engage hook portion (3) over inboard trailer guide rail.

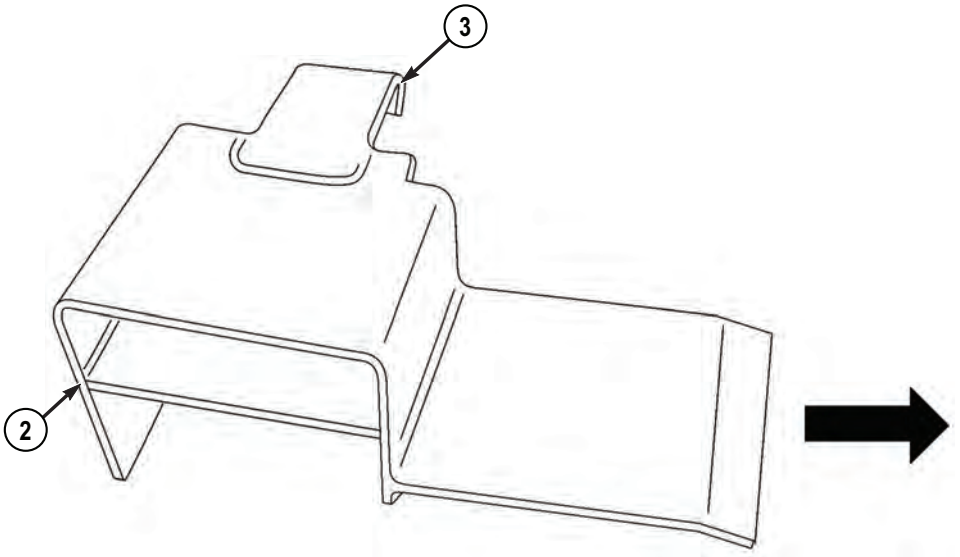


Figure 2.

4. Repeat Steps (2) and (3) for left side CROP loading ramp.
5. Make sure both right side and left side CROP loading ramps are correctly positioned.

STACKING/LOADING AND UNSTACKING/UNLOADING - Continued

6. Refer to procedures for off-loading CROPs (WP 0044) from PLS vehicle.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
HOOK ARM EXTENSION UNSTOW/STOW

INITIAL SETUP:

Not Applicable

UNSTOW

NOTE

Non-Container Handling Unit (CHU) equipped vehicle is shown for clarity. Procedures for CHU and Non-CHU vehicles are identical, except on CHU vehicle, hook arm extension fits against outside of CHU bracketry.

1. Release ratchet (1) to remove tension on strap (2).

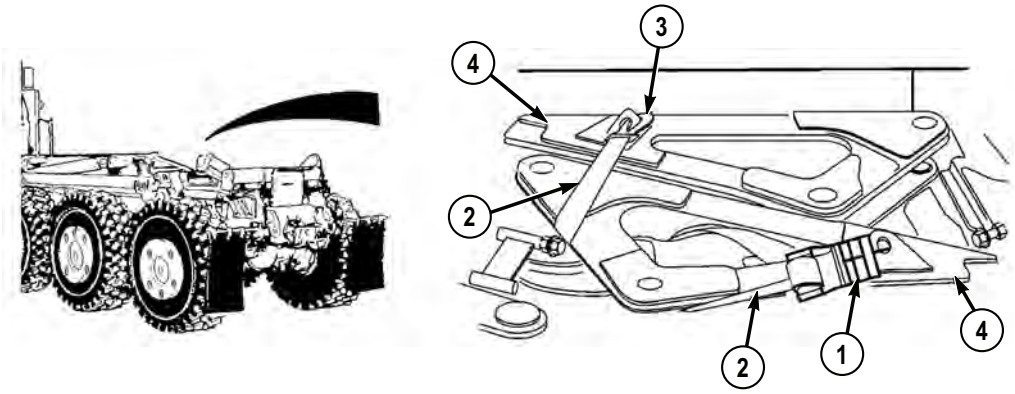


Figure 1.

NOTE

Prior to removing strap, note how strap is routed around hook arm extension.

2. Disconnect ratchet (1) and quick release fitting (3) from vehicle (4) and remove strap (2).
3. Remove two screws (5), lockwashers (6), and washers (7) from rear of vehicle (4).

UNSTOW - Continued

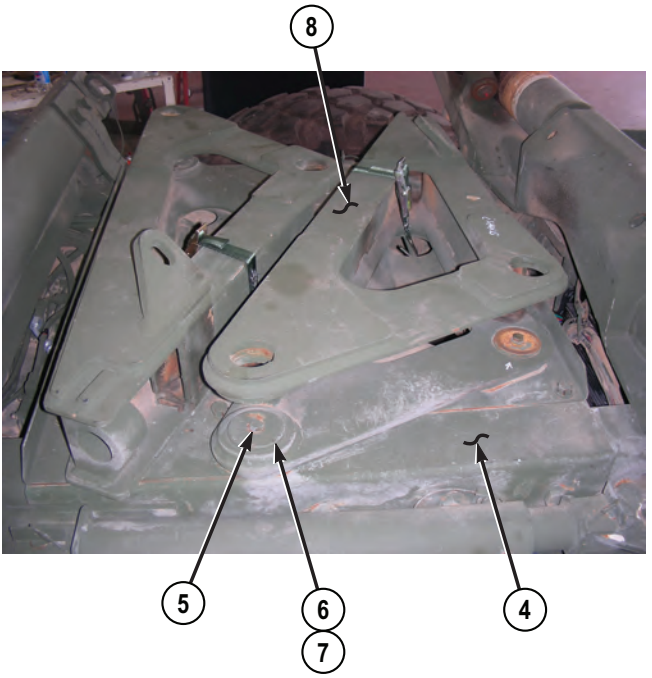


Figure 2.

4. Slide hook arm extension (8) away from vehicle (4).

END OF TASK

STOW

1. Position hook arm extension (8) on rear of vehicle (4) and slide into stowed position.

STOW - Continued

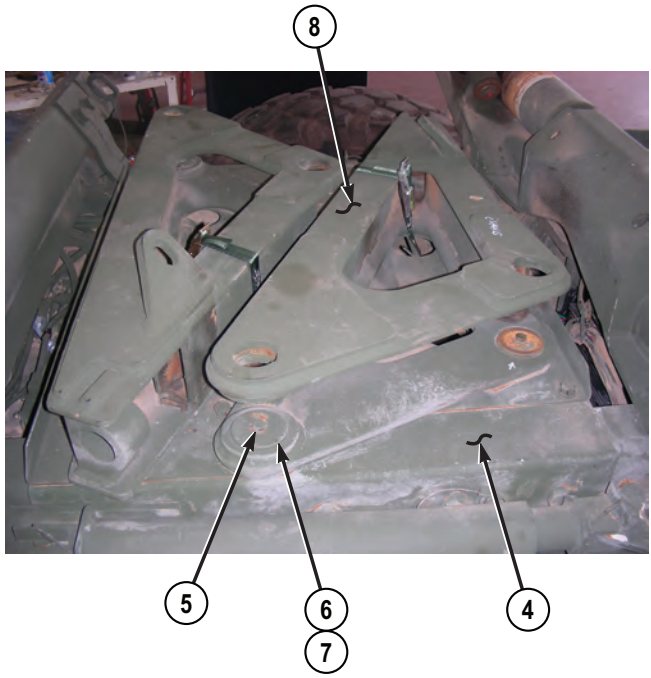


Figure 3.

NOTE

Position strap in position as noted during unstow.

2. Route strap (2) under and around hook arm extension (8) and position ratchet (1) and quick release fitting (3) at attaching points.

STOW - Continued

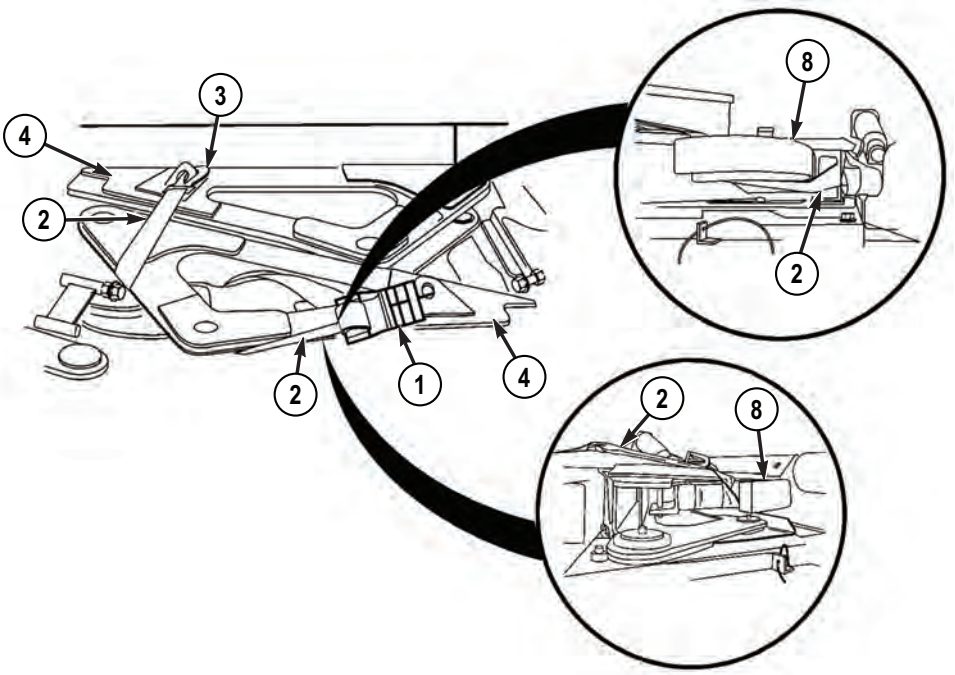


Figure 4.

3. Connect quick release fitting (3) and ratchet (1) to vehicle (4).
4. Tighten strap (2) with ratchet (1) until hook arm extension is secured to vehicle (4).
5. Install two washers (7), lockwashers (6), and screws (5) to rear of vehicle (4).

STOW - Continued

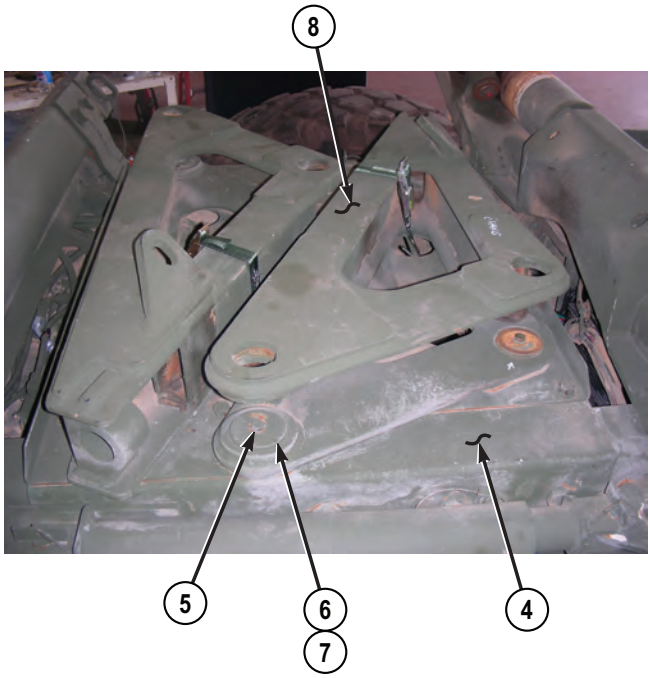


Figure 5.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOADING/UNLOADING ISO CONTAINER WITH M3 CROP

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

LOADING

WARNING



CROP weighs 3,800 lbs (1,724 kg). Six CROPs weigh 22,800 lbs (10,342 kg). Ensure all personnel stand clear of CROP when CROP is being moved. Failure to comply may result in injury or death to personnel.

WARNING



Always lift stack of CROPs by connecting lift device to bottom CROP. Failure to comply may result in injury or death to personnel.

CAUTION

- Attemping to load stack of CROPs or loaded CROP in ISO container requires extreme care to prevent damage to equipment. Clearance between ceiling of ISO container and top of load and inside walls of ISO and each side of CROP is designed to be close, requiring at least one ground guide to assist during insertion procedure.
- Ensure web straps securing stack of CROPs are removed prior to insertion into ISO container. Failure to comply may result in damage to web straps during insertion procedure.

LOADING - Continued

NOTE

- Stack of six CROPs is maximum that can be loaded into ISO container.
- The use of ramps during loading/unloading process is optional.
- If required, use suitable material as a ramp to ease loading/unloading of CROP into/from container.

1. Unstow hook arm extension (WP 0059) from PLS vehicle.
2. Prepare ISO container by opening ISO container doors (1) and securing them in open position.

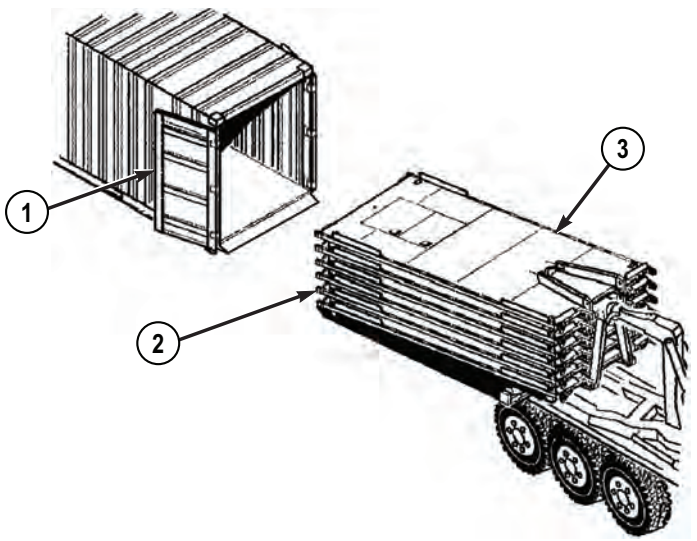


Figure 1.

3. Ensure web straps securing stack of Container Roll-In/Out Platforms (CROPs) are removed prior to insertion into ISO container.
4. Position rear of PLS vehicle approximately 15.0 ft (4.6 m) from ISO container door opening.
5. Offload CROP (WP 0058) (3) until bottom CROP rollers (2) are approximately 12.0 in. (304.8 mm) from ground.

LOADING - Continued

WARNING



Do not stand between CROP and ISO container. Ensure all personnel stand clear of CROP when CROP is being moved. Failure to comply may result in injury or death to personnel.

CAUTION

M3 CROP is designed to fit into door opening of 91.0 in. (2311.4 mm). If container is more than 10 years old, door opening may not be wide enough. DO NOT attempt to force CROP into containers with door openings less than 91.0 in. (2311.4 mm). Failure to comply may result in damage to equipment.

NOTE

If CROP load is too tall to insert load into ISO container according to Steps (6) and (7), perform Steps (9) through (10), then proceed to Step (11).

6. Using ground guide to assist, drive PLS backward and carefully insert rear of CROP (3) into door opening of ISO container approximately 24.0 in. (609.6 mm). Several attempts to insert CROP (3) may be required because ISO container door opening (4) is only slightly wider than CROP.

LOADING - Continued

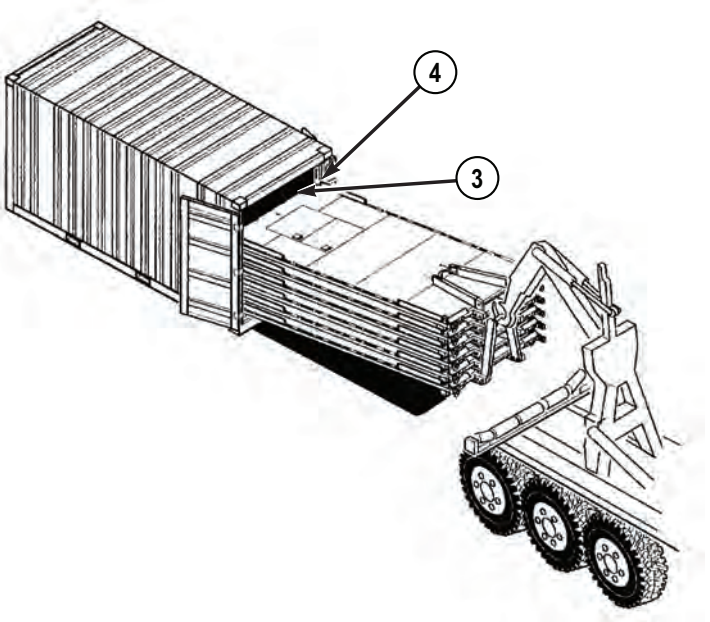


Figure 2.

7. Using extreme caution to ensure rollers remain inside ISO container (5). Continue offloading stack of CROPs (3), allowing PLS vehicle to be pushed forward or by alternately driving forward several feet, stopping, and offloading more of the CROP into ISO container. Repeat procedure until front of CROP (3) is approximately 12.0 in. (304.8 mm) from ground. Proceed to Step (11).

LOADING - Continued

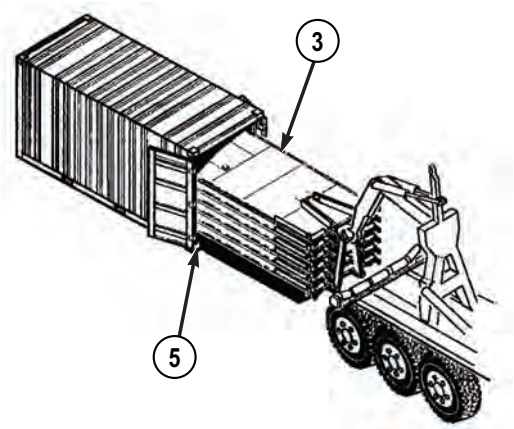


Figure 3.

NOTE

If CROP load is too tall to insert load into ISO container according to Steps (6) and (7) above, perform Steps (9) through (10) below; otherwise proceed to Step (11).

8. Position ISO container loading platforms (6) on ground, in front of and against ISO container door opening, so CROP rollers (2) can roll up platforms (6) into ISO container.

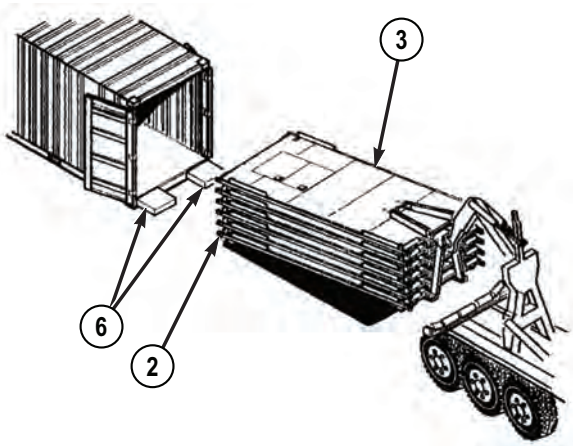


Figure 4.

LOADING - Continued

9. Offload CROP (3) until CROP rollers (2) are grounded in front of ISO container loading platforms (6) and front of CROP (3) is approximately 12.0 to 18.0 in. (304.8 to 457.2 mm) from ground.
10. With the aid of an assistant as ground guide, use PLS vehicle to push CROP (3) up loading platforms (6) and into ISO container.

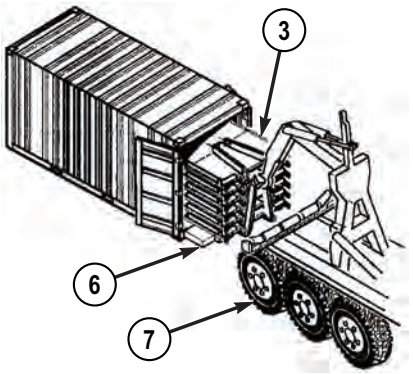


Figure 5.

WARNING



Closely observe stack of CROPs during this part of off loading to ensure CROPs do not come in contact with top of ISO container door opening or inside walls of ISO container. Failure to exercise extreme caution during insertion may result in damage to ISO container or CROP. Failure to comply may result in injury or death to personnel.

11. With ground guide watching closely, drive PLS vehicle backward very slowly and push CROP (3) into ISO container.
    a. If CROP appears to be out of alignment inside ISO container, stop backward movement, pull CROP forward several feet, and drive PLS vehicle backward to realign CROP.
    b. After CROP has been properly realigned inside ISO container, again drive PLS vehicle backward very slowly. Push CROP into ISO container until CROP front twist lock housings are inside ISO container, but before PLS vehicle rear wheels (7) contact loading platforms (6).

LOADING - Continued

12. Lower PLS hook arm until CROP is resting on ISO container floor. Disconnect hook arm from CROP and pull PLS vehicle forward approximately 3.0 ft (914.4 mm).
13. Remove both loading platforms (6).
14. Attach hook arm extension (8) to PLS lift hook (9).

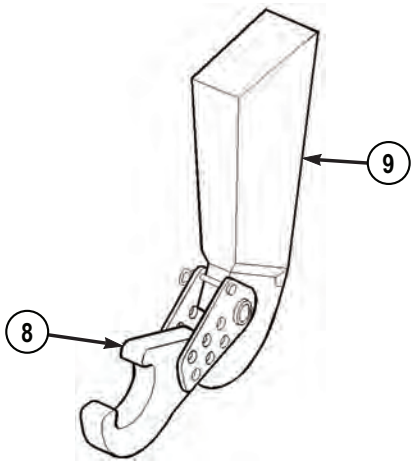


Figure 6.

15. Connect hook arm extension to CROP. Lift and push CROP into ISO container until CROP rear bumpers (10) firmly contact front of ISO container and bracing mechanism cams (11) can be positioned into shoring slots (12) on both sides of ISO container door.

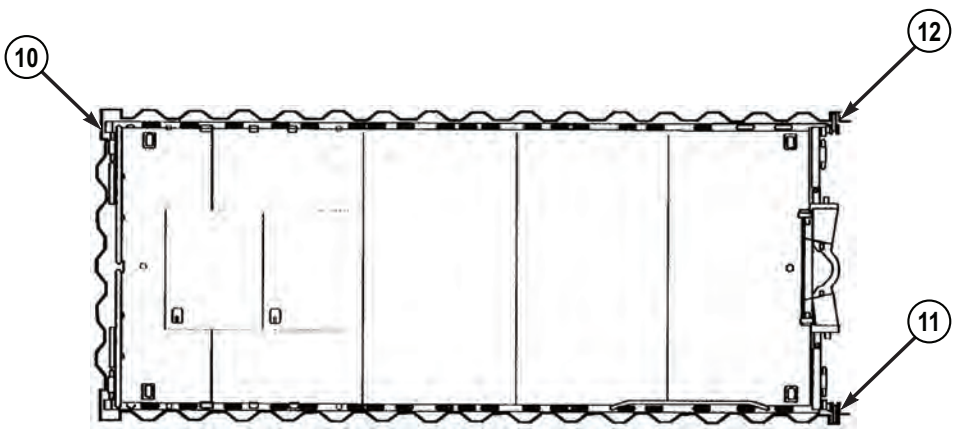


Figure 7.

LOADING - Continued

16. Disconnect hook arm extension from CROP and drive PLS vehicle forward so ISO container doors can be closed.
17. Remove and stow hook arm extension (8) from PLS lift hook (9).

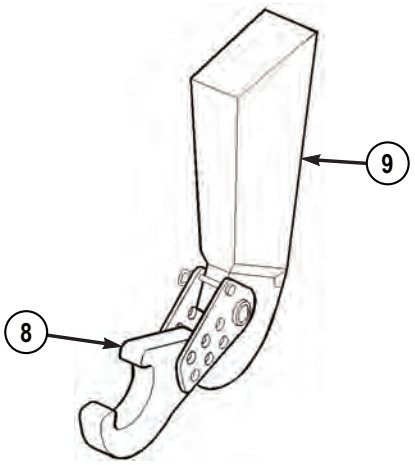


Figure 8.

NOTE

Each of two bracing mechanisms consists of free-to-rotate cam positioned between two collars welded to threaded rod. Front adjustment collar is equipped with holes, into which pin can be inserted. This provides leverage to turn adjustment collar and to adjust cam position fore and aft, enabling it to engage shoring slot. Same pin is used to secure cam after it has been engaged in shoring slot.

18. Rotate cams (11) in left and right bracing mechanisms until shoring slots (12) on both sides of ISO container are engaged.

LOADING - Continued

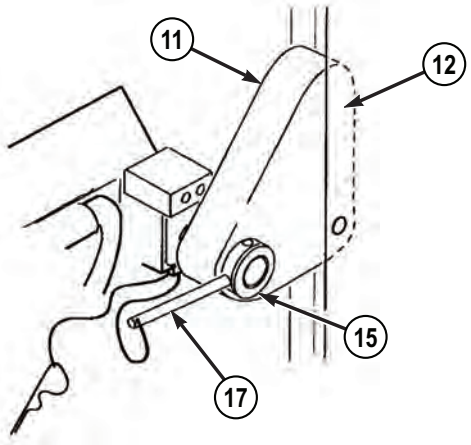


Figure 9.

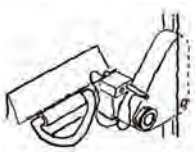
NOTE

Depending upon CROP distance from shoring slots, cams will engage in one of two positions depicted below as Nominal position and Minimum position. If required, use forklift to position CROP so either Nominal or Minimum position can be achieved.

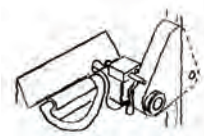
19. If cam (11) will not engage shoring slot (12), insert pin (17) into adjustment collar (15) and turn adjusting cam (11) forward or aft until cam (11) will engage shoring slot (12).



NON-USE STOWED



NOMINAL USE



MINIMAL USE



UNACCEPTABLE POSITION FOR EITHER SIDE

Figure 10.

LOADING - Continued

NOTE

Outside hole is preferred in Step (20). Pin ensures that cam cannot be dislodged during transit.

20. Using pin (17), turn adjustment collar (15) until cam (11) is positioned tight against front of shoring slot (12).

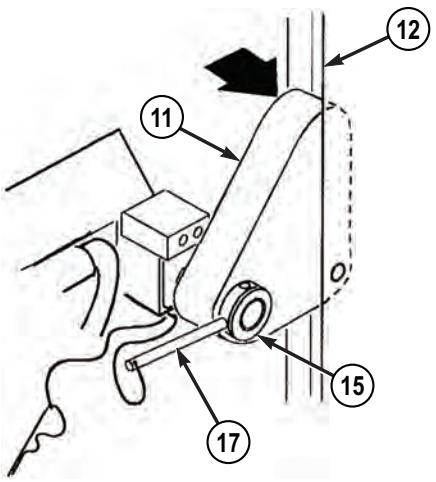


Figure 11.

21. Insert pin (17) into one of the two holes in cam securing block (18).

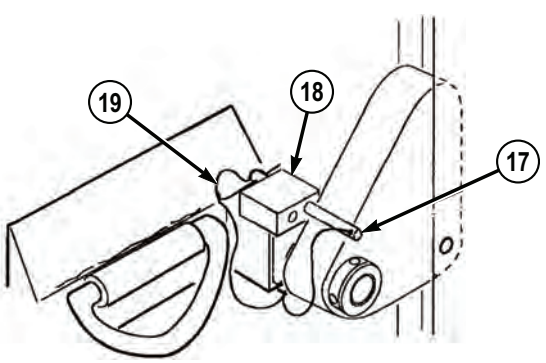


Figure 12.

22. Insert hitch pin clip (19) into pin (17).

LOADING - Continued

23. If stack of CROPs is the load, repeat Steps (18) through (22) on the bottom CROP and at least every other CROP in stack.
24. Close and secure ISO container doors.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LIFTING CONTAINER OUT OF MUD

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD

1. Ensure lifting frame is in 82.0 in. (2082.8 mm) or taller container mode (WP 0043).

WARNING



- Check for overhead power lines or other obstructions before attempting LHS operations. LHS reaches a height of 18 ft (5.5 m). Failure to comply may result in injury or death to personnel.
- Maximum permissible gross container weight is 35,000 lbs (15,876 kg).
- Use caution when working around front lift adapter. Front lift adapter may swing unexpectedly when not attached to container. Failure to comply may result in injury or death to personnel.
- Do not attempt loading or unloading operations on a side slope greater than 5 degrees and/or fore/aft slope greater than 20%. Prior to performing loading or unloading operations on slopes, determine if ground surface conditions permit safe loading or unloading operations. Slopes that contain snow, ice, loose gravel, or sand may not permit safe loading or unloading. Failure to comply may result in injury or death to personnel.
- Do not stand between front lift adapter and container. Vehicle could roll, crushing personnel between them. Failure to comply may result in injury or death to personnel.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

NOTE

- For detailed instructions on how to operate the LHS on the vehicle, refer to the Load Handling System (LHS).
- Rear mud flaps may be pinned up to provide better visibility of lifting frame lower container locks.
- Ensure soft soil conditions around stuck container are able to support vehicle during recovery operation.

2. Start engine (WP 0027).
3. Push in parking brake knob (1), press service brake pedal (2), and set transmission range selector (3) to Reverse (R).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

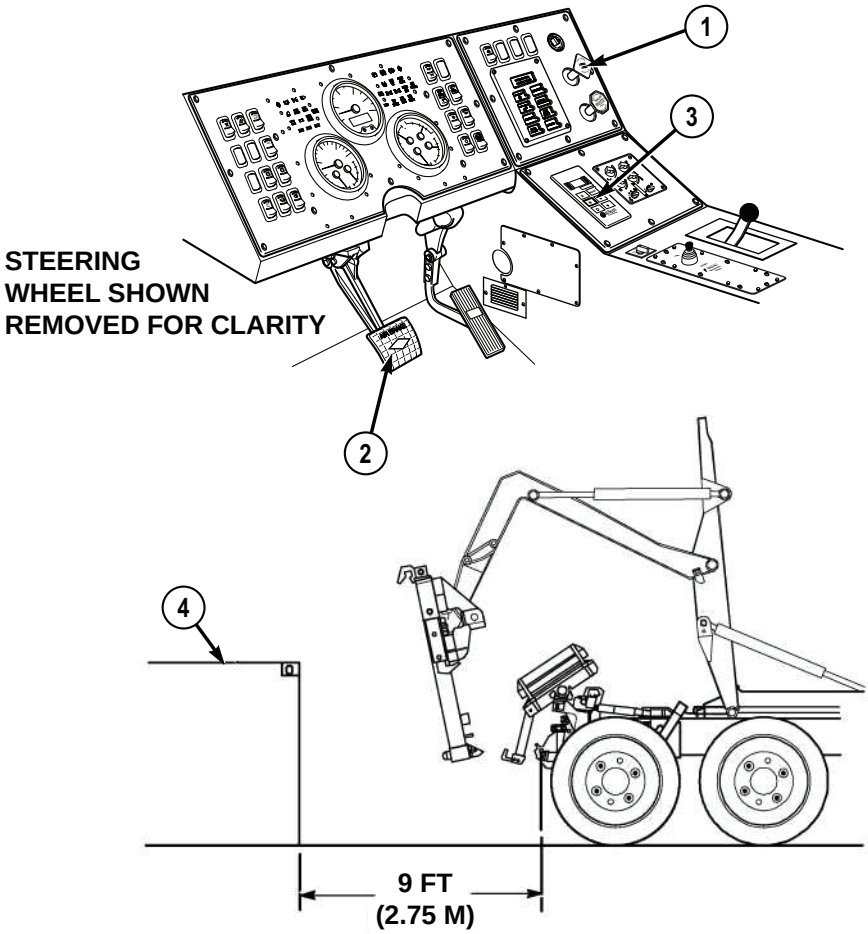


Figure 1.

4. Release service brake pedal (2) and position rear of vehicle within 9.0 ft (2.75 m) of front of container (4), aligning centerline of vehicle within 2.0 in. (50.8 mm) of container centerline.

5. Press service brake pedal (2) and set transmission range selector (3) to Neutral (N).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

6. Turn hydraulic selector switch (5) to AUTO.

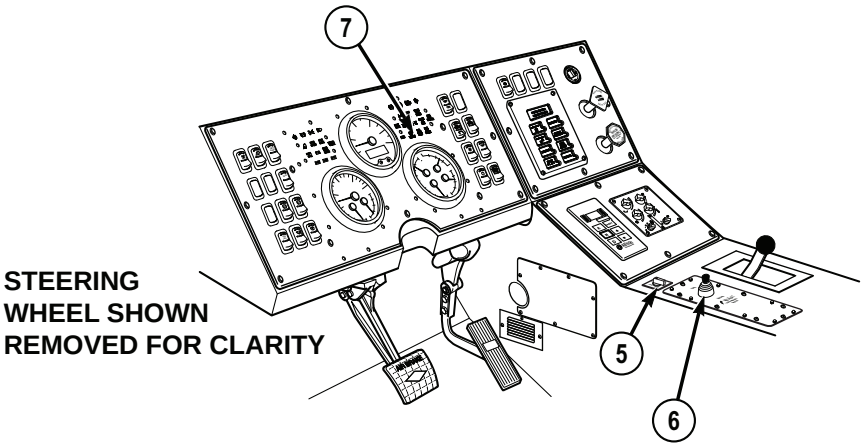


Figure 2.

CAUTION

On steep downgrades, contact is possible between the lifting frame lower legs and the rear sliders during empty LHS cycles. If contact appears likely, switch hydraulic selector switch to MAN H.A. and retract (LOAD) hook arm a few inches. Return hydraulic selector to AUTO and continue (UNLOAD) operation. Repeat as required. Failure to comply may result in damage to equipment.

7. Move joystick (6) to UNLOAD. Hook arm will raise and begin to move rearward. LHS NO TRANS lamp (7) will illuminate to indicate hook arm is up and load lock has been cleared.

8. Continue to hold joystick (6) to UNLOAD position until lifting frame (8) is positioned in front of container (4).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

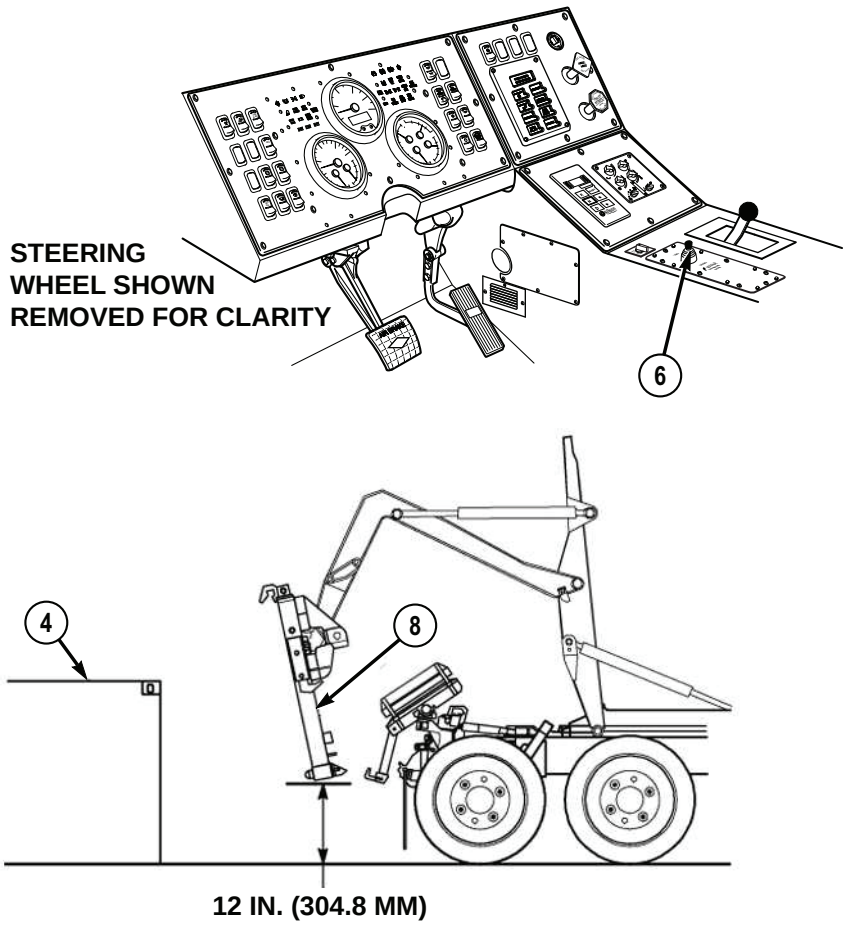


Figure 3.

9. Operate LHS in AUTO mode until lifting frame (8) is approximately 12.0 in. (304.8 mm) off of ground.
10. Shut OFF engine (WP 0037).

NOTE

There are two lift hooks. Both are installed the same way. Right side shown.

11. Remove lock pin (9), collar (10), pin (11), and lift hook (12) from slide arm (13).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

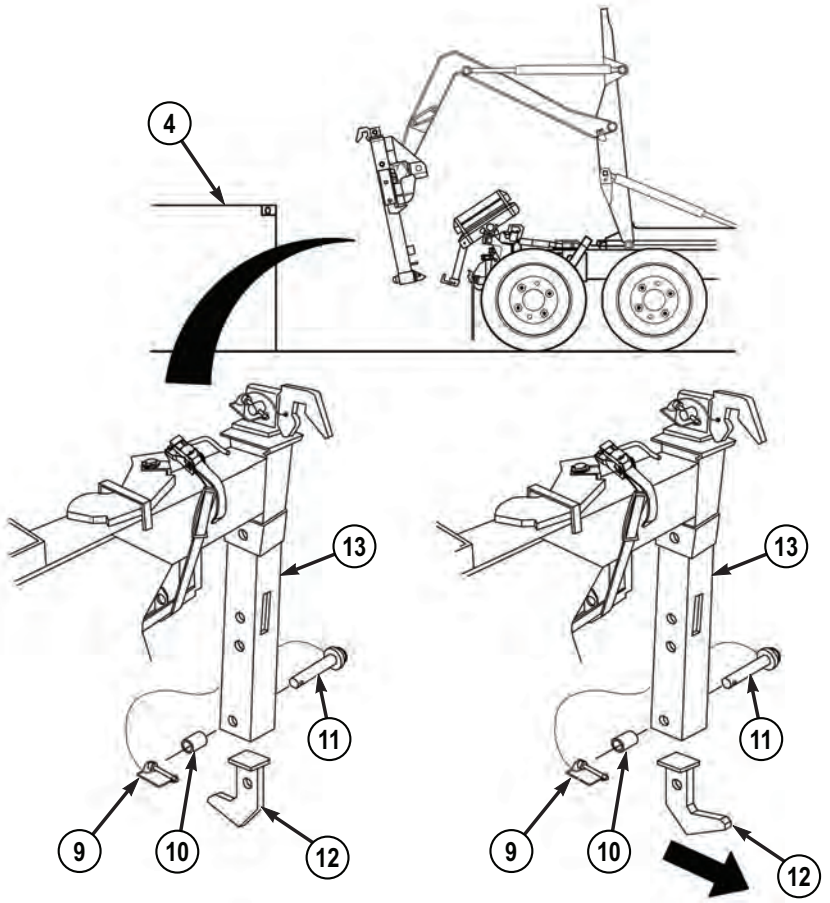


Figure 4.

12. Rotate lift hook (12) towards container (4).
13. Install lift hook (12), pin (11), collar (10), and lock pin (9) in slide arm (13).
14. Remove lock pin (14) and pin (15) from stow position on lifting frame (8).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

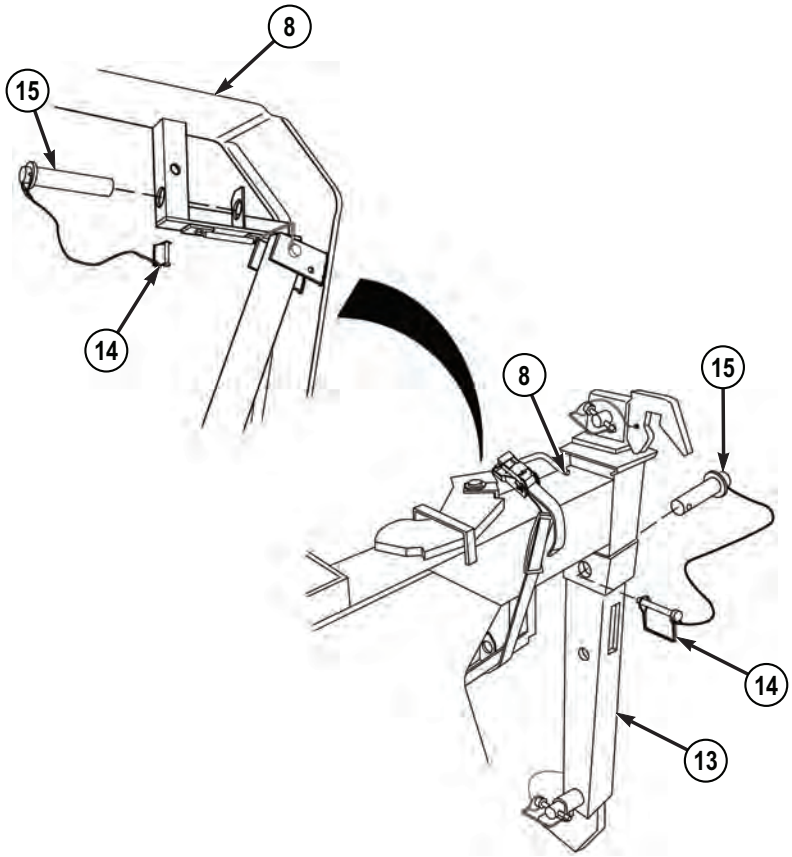
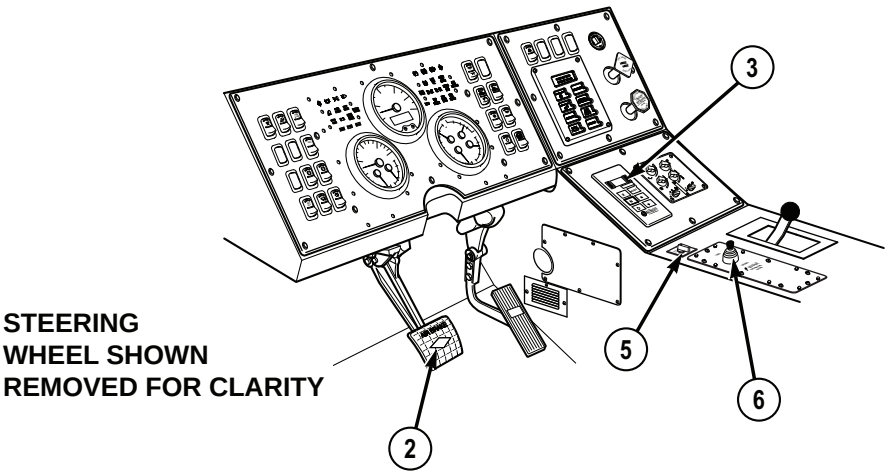


Figure 5.

15. Install pin (15) and lock pin (14) in lifting frame (8) and slide arm (13) in upper hole.
16. Repeat Steps (11) through (15) for left side.
17. Start engine (WP 0027).
18. Press service brake pedal (2) and set transmission range selector (3) to Reverse (R).

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued



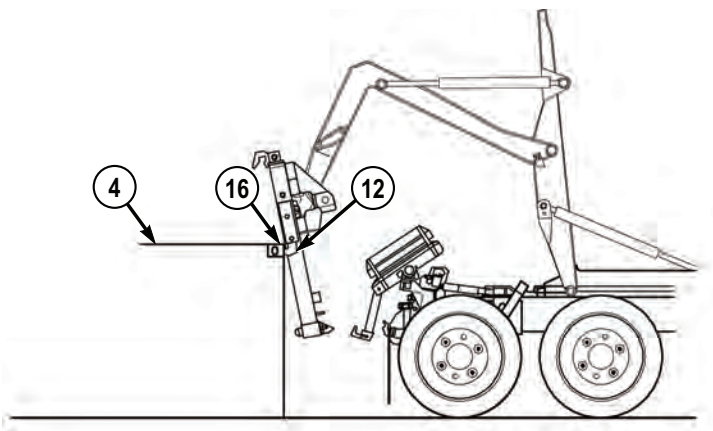


Figure 6.

CAUTION

Ensure slide arm lift hooks are fully engaged with container upper corner castings. Failure to comply may result in damage to equipment.

19. Release service brake pedal (2). Move joystick (6) to LOAD and position lift hooks (12) in container top ISO corners (16) on container (4).
20. Press service brake pedal (2).
21. Turn hydraulic selector switch (5) to MAN H.A.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

WARNING



Ensure lower container locks do not contact container. If lower container locks contact container, lift hooks will disengage container causing container to drop and front lift adapter to become erratic. Failure to comply may result in injury or death to personnel.

22. With the aid of an assistant, slowly lift up container (4) until lower corner castings are approximately 6.0 in. (152.4 mm) from container.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

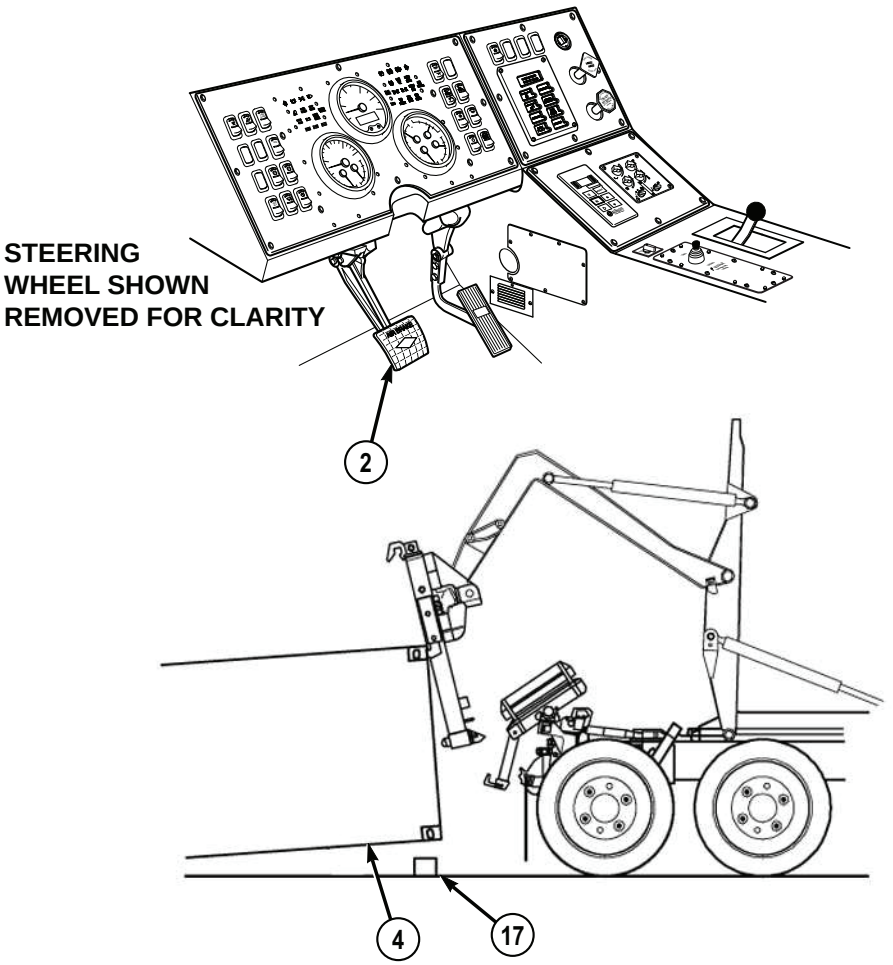


Figure 7.

23. Release service brake pedal (2) and back vehicle up approximately 12.0 in. (304.8 mm).
24. Press service brake pedal (2).
25. Repeat Steps (22) through (24) until front of container (4) is out of mud and chock blocks (17) can be positioned under container.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

WARNING



Do not put hands, arms, or any body parts under container when positioning chock blocks. Failure to comply may result in injury or death to personnel.

26. Position two chock blocks (17) under container (4) end.

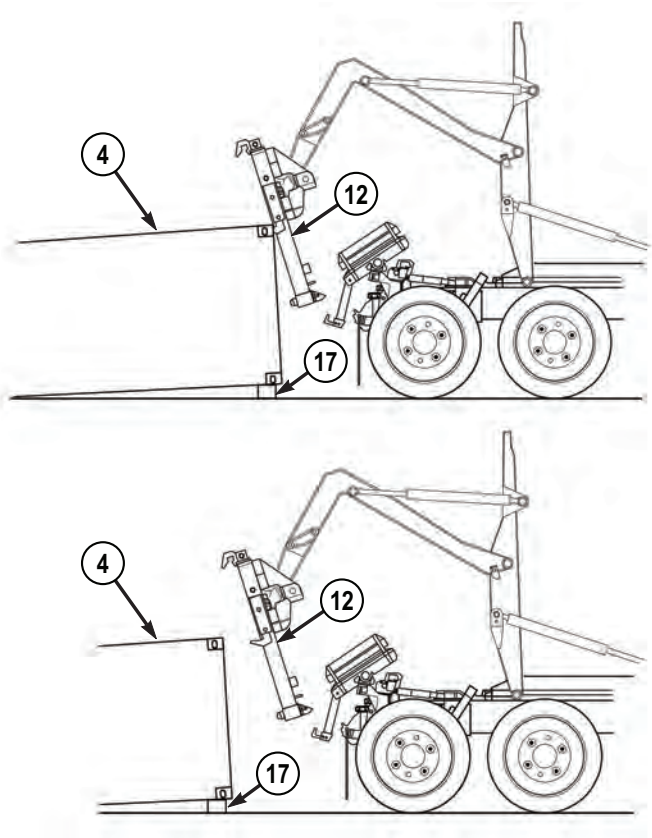


Figure 8.

27. Lower LHS to position container (4) on chock blocks (17) and disengage lift hooks (12) from container.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

28. Remove lock pin (9), collar (10), pin (11), and lift hook (12) from slide arm (13).

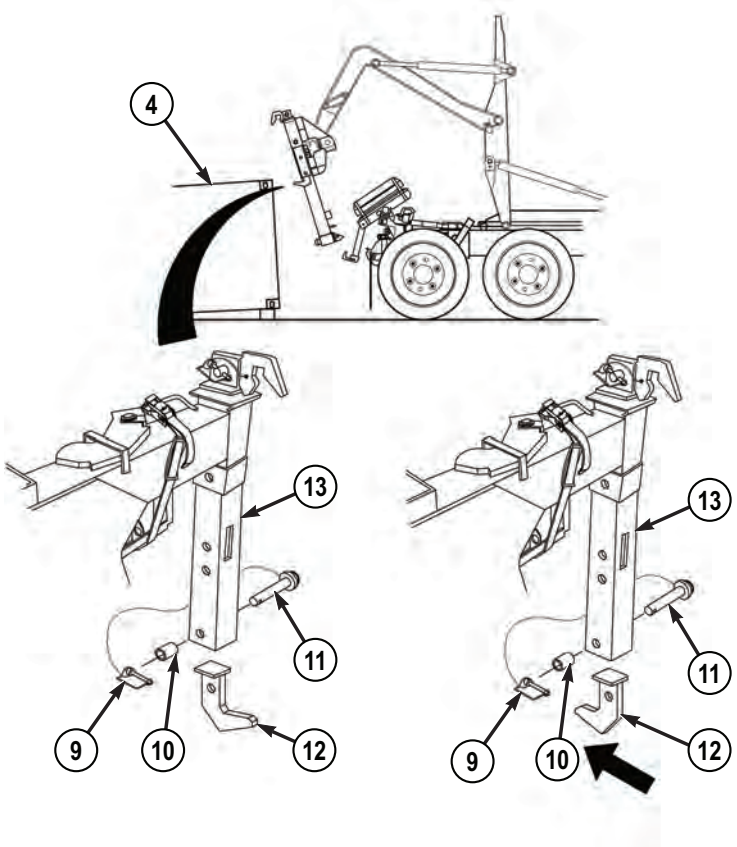


Figure 9.

29. Rotate lift hook (12) away from container (4).
30. Install lift hook (12), pin (11), collar (10) and lock pin (9) in slide arm (13).
31. Repeat Steps (28) through (30) for left side.
32. Attach lifting frame to container (4) following normal container loading procedures. Refer to 82.0 in. (2082.8 mm) or Taller (WP 0044), 72.0 in. (1828.8 mm) (WP 0045), 51.0 in. (1295.4 mm) (WP 0046), or 48.0 in. (1219.2 mm) (WP 0047) loading and unloading instructions.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

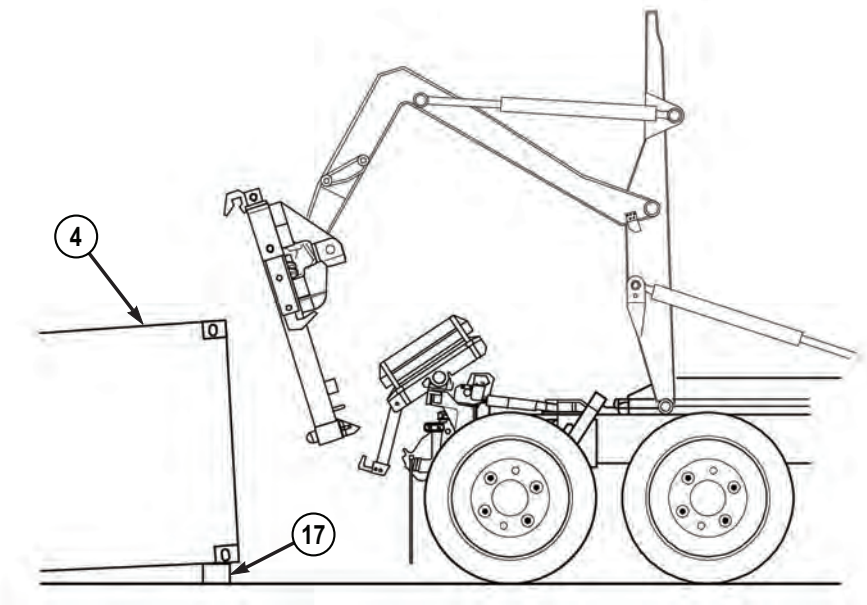


Figure 10.

33. Raise container (4) end 12.0 in. (304.8 mm).

WARNING



Do not put hands, arms, or any body parts under container when positioning chock blocks. Failure to comply may result in injury or death to personnel.

NOTE

See loading and unloading container (WP 0043) for additional instructions.

USING LIFT HOOKS TO RECOVER CONTAINER SUNK IN MUD - Continued

34. Remove and stow chock blocks (17).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION

INITIAL SETUP:

Not Applicable

SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION

1. These simplified procedures are to be used only as a guide. Full procedures for operation of the container handling unit (CHU) are to be followed.
2. Prepare PLS for CONTAINER MODE (WP 0043).
    a. Stow straps securing lifting frame to vehicle.
    b. Rotate flipper brackets to attach lifting frame to LHS; pull flipper lock pin handle and actuate air valve.
    c. Repeat Steps (a) and (b) for other side.
    d. Deploy left side slider and check for greased plates.
    e. Deploy right side slider and check for greased plates.
    f. Cycle LHS to unload so lifting frame is 12.0 in. (304.8 mm) off the ground by AUTO mode until LHS stops, then switch to MAN HA.
    g. Deploy lifting frame strut leg, pin, using second hole from the bottom.
    h. Pin flipper bracket lock plates open, right side and left side.
    i. Cycle LHS to unload and unhook lifting frame from LHS, until LHS stops by using manual hook arm mode to fully extend arm.
    j. Drive straight ahead about 12.0 in. (304.8 mm).
        (1) Rotate left side bumper supports rearward into container position.
        (2) Remove left side guide from stowed position on vehicle.
        (3) Install guide on left side slider.
    k. Repeat Steps (j) (1) through (3) for right side.
    l. Install transit lock in ready mode on sliders, left side and right side.
    m. Cycle LHS to load so hook arm is at correct height for hooking onto the bail bar, using MAN HA mode.

SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION - Continued

n. SWITCH LHS to AUTO mode.

o. Cycle LHS to load to pick up lifting frame 12.0 in. (304.8 mm).

p. Attach bail bar lock to hook arm to secure lifting frame.

q. Stow lifting frame strut leg.

r. Configure lifting frame for container to be transported. Proper hook in slide arms, slide arm un-pinned as needed.

s. Cycle LHS to load to secure lifting frame before operating vehicle.

3. Return PLS to FLATRACK MODE (WP 0049).

a. Verify lifting frame is not locked to hook arm.

b. Cycle LHS to unload so lifting frame is 12.0 in. (304.8 mm) off the ground.

(1) Remove guide from slider.

(2) Install pins in guide.

(3) Stow guide in stow bracket and pin.

(4) Rotate bumper support forward to stow.

c. Repeat Steps (b) (1) through (4) for other side.

d. Deploy lifting frame strut leg, using second hole from bottom.

e. Remove bail bar lock from hook arm and stow.

f. Cycle LHS to unload to unhook LHS from lifting frame, using auto mode, drive ahead about 12.0 in. (304.8 mm).

g. Remove transit locks from sliders and stow locks on lifting frame, do both right side and left side.

h. Remove pins and secure lifting frame slide arms right side and left side.

i. Stow left side slider.

j. Stow right side slider.

k. Verify flipper brackets are rotated out.

l. Unlock flipper bracket lock plates right side and left side, rotating handle until held up in notch.

m. Cycle LHS to unload to fully extend LHS, in auto mode LHS pivot pin should be below flipper bracket.

n. Back up until contact lifting frame with hook arm, LHS pin should be positioned to engage flipper brackets.

SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION - Continued

o. Cycle LHS to load to pick lifting frame up 12.0 in. (304.8 mm).

p. Verify lifting frame flipper bracket lock plates have locked around LHS pivot pin.

q. Lock lifting frame flipper bracket lock plates by rotating pin handle 180 degrees from notch position, both right side and left side.

r. Stow lifting frame strut leg.

s. Verify paddles are properly positioned, fore/aft to engage lifting frame.

t. Check:

(1) Lifting frame locked to LHS.

(2) Slide arms pinned.

(3) Bumpers forward.

(4) Transit locks stowed.

(5) Paddles straight.

u. Cycle LHS to load until lifting frame is in stowed position.

(1) Rotate flipper brackets to detach lifting frame from LHS; pull flipper lock pin handle and actuate air valve.

(2) Secure lifting frame strap to vehicle.

v. Repeat Steps (u) (1) and (2) for other side.

4. LOADING Container 82.0 in. (2082.2 mm) or higher (WP 0044), 72.0 in. (1828.8 mm) (WP 0045), 51.0 in. (1295 mm) (WP 0046), 48.0 in. (1219.2 mm) (WP 0047).

a. Check:

(1) Lower locks unlocked.

(2) Lifting frame configured for size container.

(3) Bumper supports rearward, slider and transit locks ready.

b. Verify that lifting frame is not locked to hook arm and vehicle is in container mode.

c. Back up to container to within 9.0 ft (2743.2 mm). Align vehicle with container.

d. Cycle LHS to unload until lifting frame upper hooks are visible just below top edge of container.

e. Ensure lifting frame configured for container.

(1) Slide arms pinned if needed.

(2) Lower container locks unlocked.

SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION - Continued

(3) Correct hook in slide arm.

f. Back vehicle up until lifting frame contacts container, aligning hooks with container corner openings.

g. Cycle LHS to load until hooks are above container.

h. Continue backing up vehicle until hooks are positioned over container.

i. Cycle LHS to unload to engage hooks in container top corners.

j. Continue to cycle LHS until lower locks are low enough to engage container bottom corners.

k. Back up vehicle to engage lifting frame lower locks in container corners. Steer vehicle to align lower locks with container.

l. Check:

(1) Upper hook thumb engaged.

(2) Lower locks flush.

(3) Sliders positioned straight ahead and clear of debris.

m. Lock lower locks to container, handle straight up, lock plate over handle and handnut.

n. Lock other side.

o. Cycle LHS to load to lift container onto vehicle.

p. Observe clearance between container and slider guides on both sides to ensure container centered during loading.

q. Fully load container until LHS not transit light goes out.

r. Pin transit locks in locked position, right side and left side.

s. Verify container is properly loaded onto the vehicle.

5. UNLOADING Container 82.0 in. (2082.2 mm) or higher (WP 0044), 72.0 in. (1828.8 mm) (WP 0045), 51.0 in. (1295 mm) (WP 0046), 48.0 in. (1219.2 mm) (WP 0047).

a. Check:

(1) Lifting frame properly attached to container.

(2) Container loaded properly.

b. Verify sufficient room and ground conditions.

c. Disengage transit locks, right side and left side. Lock transit locks in ready position.

d. Cycle LHS to unload to unload container.

SIMPLIFIED CONTAINER HANDLING UNIT (CHU) OPERATION - Continued

e. Unlock lower container locks, handle inward, handnut tightened, lock plate over handnut.

f. Unlock other side.

g. Drive forward approximately 6.0 in. (152.4 mm), to disengage lower locks.

h. Cycle LHS to load to disengage upper hooks from container.

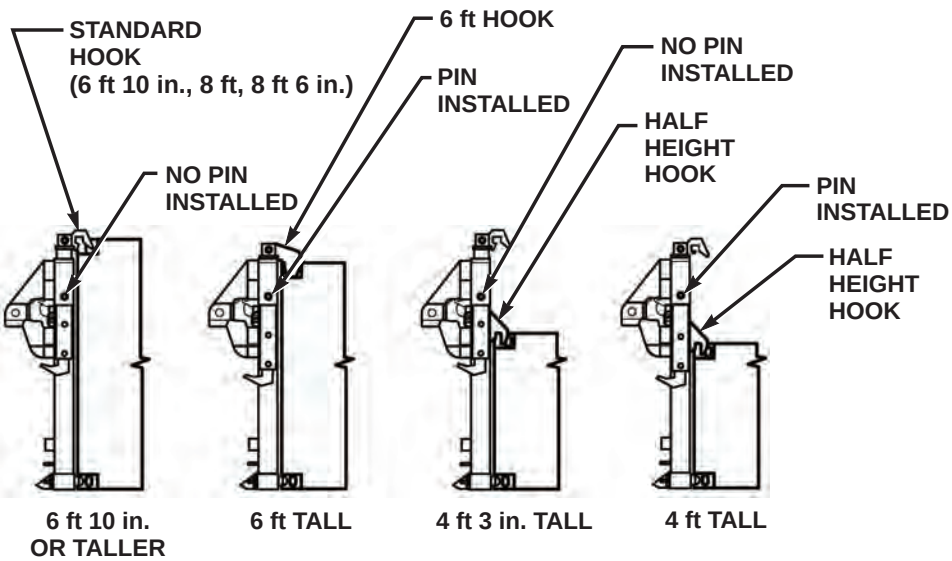


Figure 1.

i. Continue to cycle LHS fully to load until LHS no transit light goes out, and CHU is in ready mode.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SELF-RECOVERY WINCH (SRW)

INITIAL SETUP:

Not Applicable

GENERAL

NOTE

- Refer to FM 4-30.31 for additional detailed information on vehicle recovery.
- This procedure assumes transfer case is in LOW position and CTIS is in EMERGENCY position.
- Not all vehicles are equipped with self-recovery winch.

1. The self-recovery winch system is designed to allow PLS to recover itself from mired conditions. Winch may be operated from inside vehicle cab or from winch itself.
2. The self-recovery winch IN/OUT switch (in cab) is used for winching the vehicle when it is mired.
3. The right side control lever at the winch is used to pay out and reel in cable before and after winching operations.
4. Free spooling feature is for unwinding cable without hydraulic power.

END OF TASK

VEHICLE SELF-RECOVERY (WINCH TO REAR)

1. Start engine (WP 0027).
2. Apply parking brake (1).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

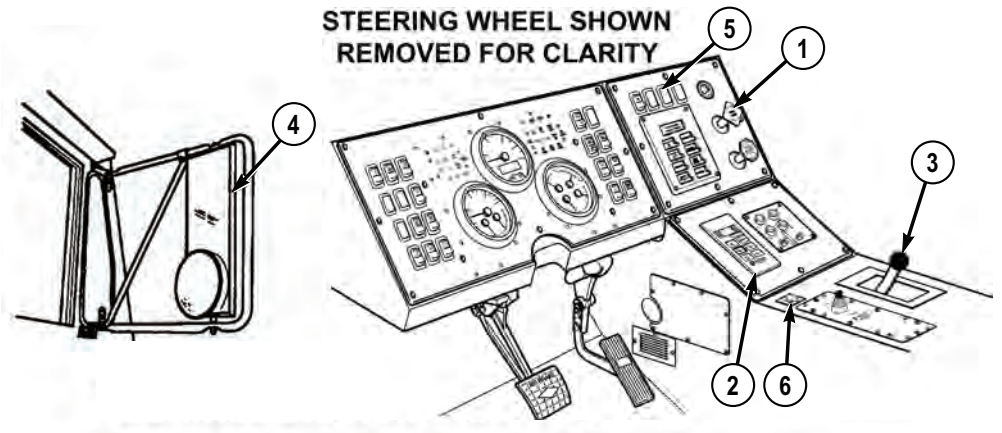


Figure 1.

3. Place transmission range selector (2) in Neutral (N).
4. Set transfer case shift lever (3) to LO (low) range.
5. Adjust right side mirror (4) so driver can see rear of vehicle.

NOTE

Only vehicles equipped with a SRW and a CRANE will have electrical power selector switch.

6. Push WINCH/CRANE switch (5) to WINCH position.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

7. Set hydraulic selector switch (6) to CRANE/SRW.
8. Move free spooling lever (7) to ENGAGE position.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

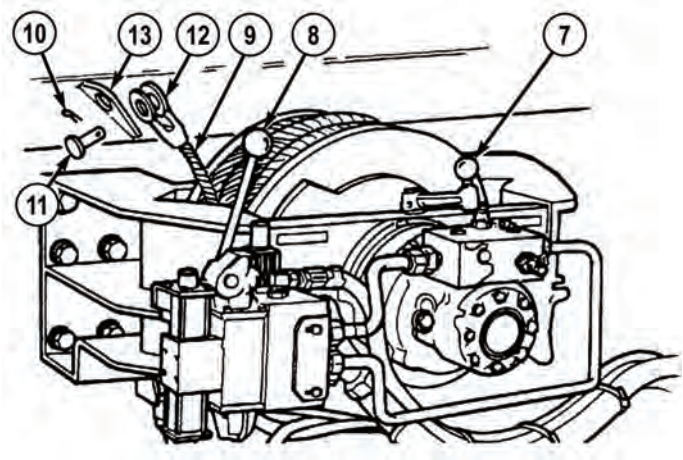


Figure 2.

9. Push winch control lever (8) forward to pay out small amount of cable (9).
10. Release winch control lever (8).
11. Remove cotter pin (10) and clevis pin (11) from clevis (12).
12. Remove clevis (12) from eyelet (13).

WARNING



Always wear heavy gloves when handling cables. Never let cable run through hands; frayed cables can cut. Never operate winch with less than five wraps of cable on winch drum. Serious injury or death could result if cable comes off drum while winching.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Avoid quick, jerking winch operation. Keep other personnel well away from vehicle involved in winching operation. Failure to comply may result in injury or death to personnel.

NOTE

Free spooling lever must be in the DISENGAGE position to pull cable by hand.

13. Pull cable (9) under winch (14) toward rear of vehicle.

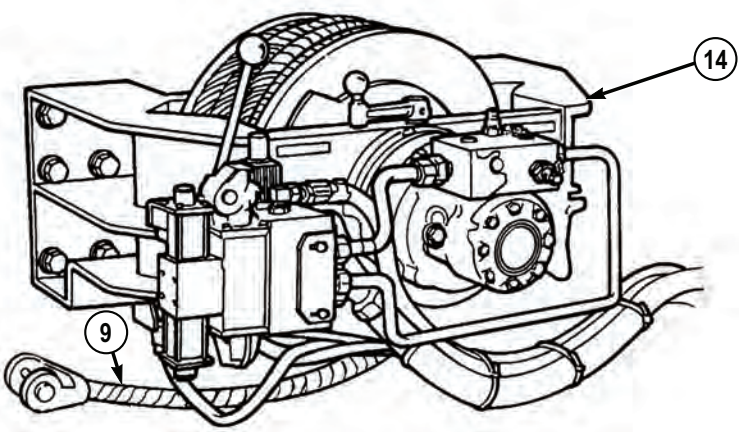


Figure 3.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Do not operate winch while personnel are working on or around cable guides. Severe injury to arms, hands, and fingers may result if cable moves while working with cable and cable guides.

NOTE

Do not place cable between tensioning pulleys at this time.

14. Route cable (9) between rollers (15) of rear cable guides (16).

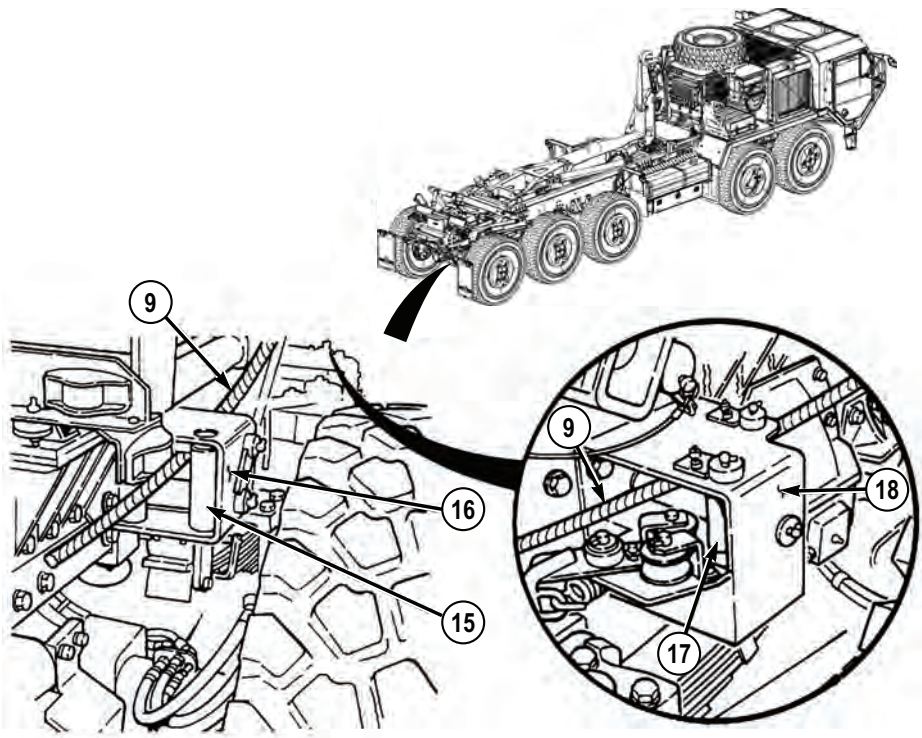


Figure 4.

15. Route cable (9) between rollers (17) of rear tensioner assembly (18).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

16. Pay out cable (9) so that cable will extend beyond rear of vehicle. Release winch control lever (8).

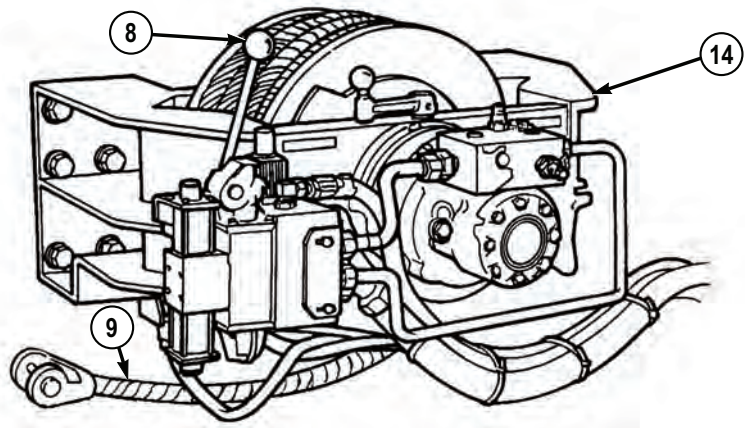


Figure 5.

17. Push winch control lever (8) forward or use the free spooling feature of winch to pull cable to stationary object.

18. When cable (9) is let out to tree, another heavy vehicle, or other stationary and heavy object, release winch control lever (8).

WARNING



Do not operate winch while personnel are working on or around cable guides. Severe injury to arms, hands, and fingers may result if cable moves while working with cable and cable guides.

NOTE

The cable is not fully mission capable 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 a 1.0 in. (25.4 mm) running length of cable. The maximum number of broken wires shall not occur consecutively in any 2.0 in. (50.8 mm) of cable. For example, if six wires are broken in 1.0 in. (25.4 mm) of cable, none would be allowed in the next consecutive inch.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

19. Inspect cable (9).
20. Check that cable (9) is not caught on vehicle or any other objects.

CAUTION

There must always be at least five wraps of cable on winch. If load is applied with less than five wraps of cable on winch, cable may come loose from anchor point on drum.

21. Check for at least five wraps of cable (9) left on winch (14). If at least five wraps of cable are not left on winch, stop using self-recovery winch.

WARNING



Avoid quick, jerking winch operation. Keep other personnel well away from vehicle involved in winching operation. Failure to comply may result in injury or death to personnel.

CAUTION

Do not exceed winch pull capacity or winch may be damaged.

22. If SRW has trouble with pull, stop using SRW and notify Field Maintenance . See Pull Capacity Table.

Table 1. Pull Capacity at 2400 Psi \(16,548 kPa\) at 12 GPM.

Layer	Pull Pounds	Line Speed ft/ minute	Cable Capacity By Layer - ft
1	20,000 (9072 kg)	18	30 (9144 mm)
2	18,000 (8165 kg)	20	63 (19202 mm)
3	16,360 (7421 kg)	22	99 (30175 mm)
4	15,000 (6804 kg)	24	139 (42367 mm)
5	13,850 (6282 kg)	26	181 (55169 mm)

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

CAUTION

When attaching cable to another vehicle, that vehicle must be used only as an anchor point or damage to equipment can result.

NOTE

If snatch block must be used, refer to the Snatch Block paragraph in this procedure.

23. Remove tow ring (19) from mounting plate (20).

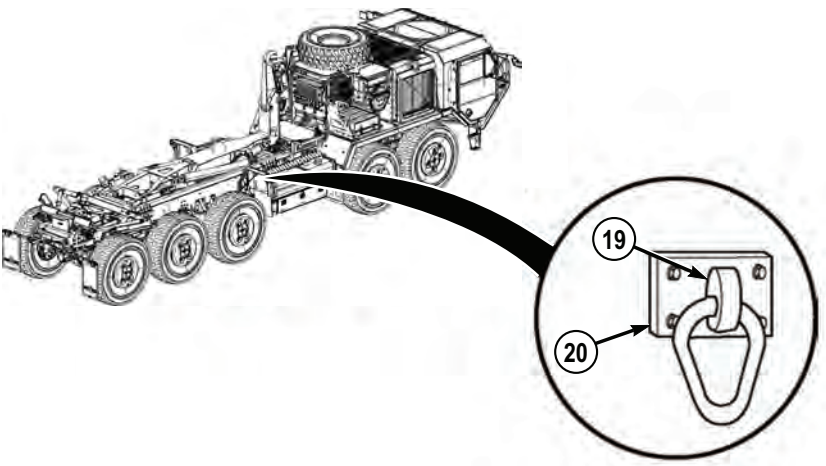


Figure 6.

NOTE

Towing shackles for front and rear are removed the same way. Rear is shown.

24. Remove cotter pin (21), pin (22), and towing shackle (23) from tow eye (24).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

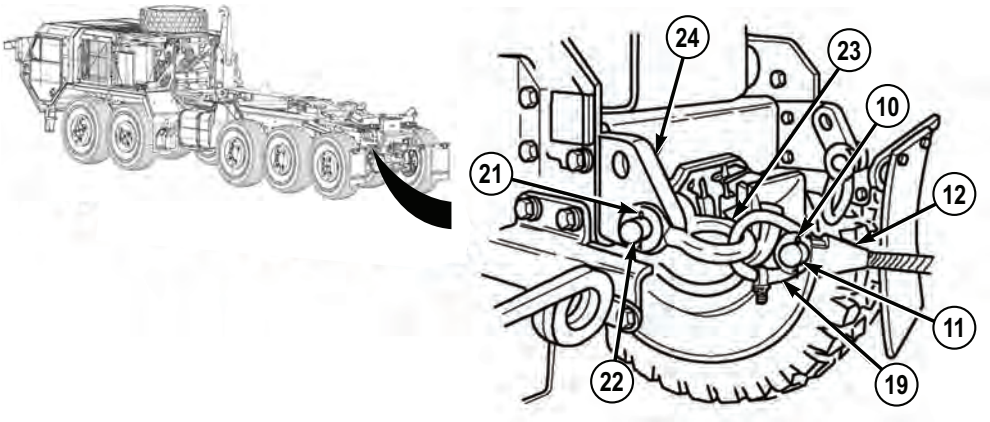


Figure 7.

25. Position towing shackle (23) through tie down ring (19).
26. Install towing shackle (23) and tie down ring (19) to tow eye (24) with pin (22) and cotter pin (21).
27. Attach clevis (12) to tie down ring (19) with clevis pin (11) and cotter pin (10).
28. If cable (9) is to be anchored to tree, rock or other stationary and heavy object, route cable around object heavy enough to withstand pull of winch.

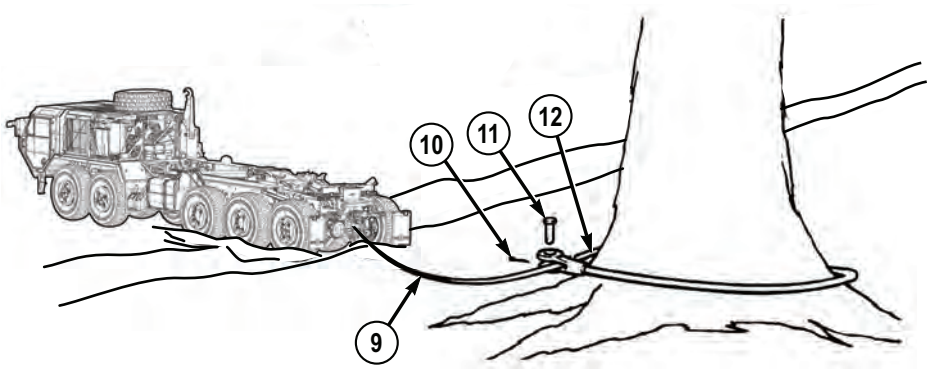


Figure 8.

29. Route cable (9) through arms of clevis (12).
30. Install clevis pin (11) and cotter pin (10) in clevis (12).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Do not operate winch while personnel are working on or around cable guides. Severe injury to arms, hands, and fingers may result if cable moves while working with cable and cable guides.

31. Pull back and hold tensioning pulley lever (25) on cable guide (16).

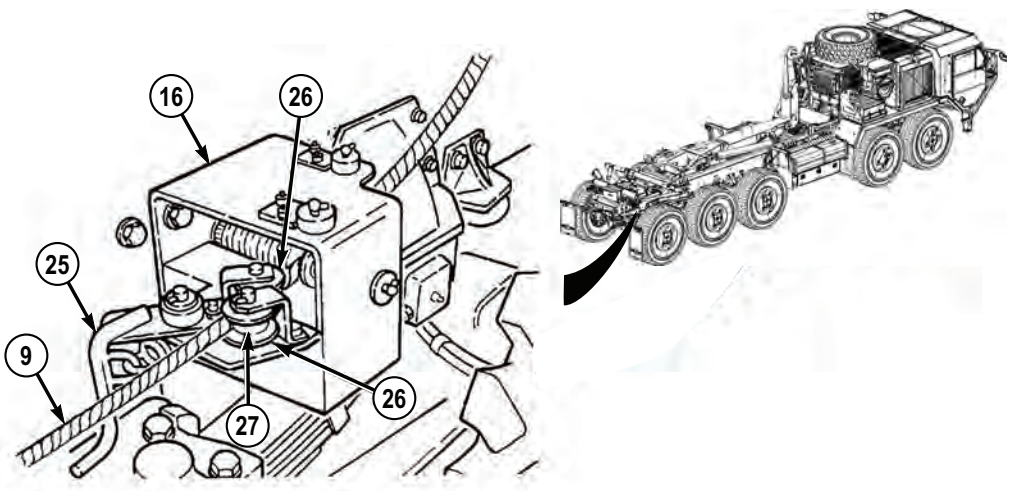


Figure 9.

32. Put cable (9) between tensioning pulleys (26).
33. Release tensioning pulley lever (25) on cable guide (16).
34. Check that cable (9) rests inside grooves (27) of tensioning pulleys (26).
35. Check that cable (9) is not caught on vehicle or any other object.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Keep all personnel clear of area near winch cable when tension is on cable. Failure to comply may result in injury or death to personnel.

CAUTION

If winch does not move the vehicle, stop using winch, overheat damage may occur.

NOTE

Ensure free spooling lever is in the ENGAGED position.

36. Push WINCH IN/OUT switch (28) to IN until slack is out of cable (9).

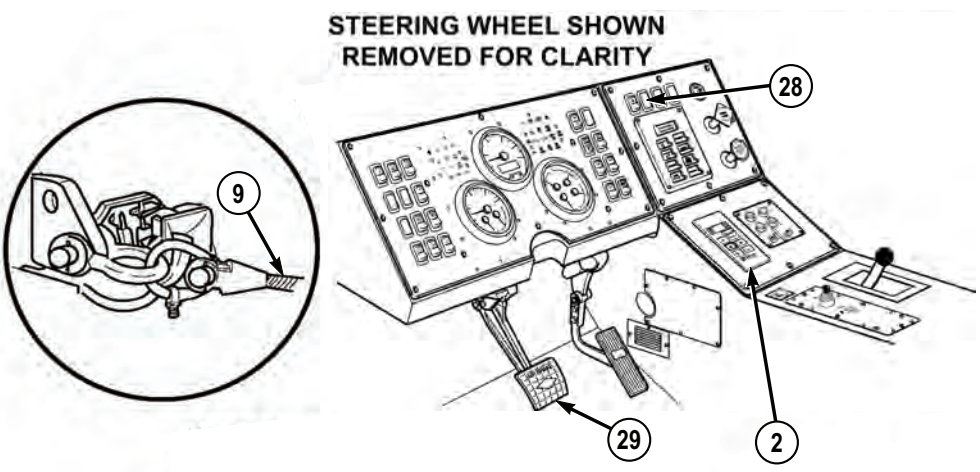


Figure 10.

37. Return WINCH IN/OUT switch (28) to center position.
38. Apply service brake pedal (29).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

CAUTION

Self-recovery winch is not designed to winch mired vehicle by itself. Vehicle drive system power must always be used with winch to self-recover the vehicle, or damage to equipment can result.

39. Set transmission range selector (2) to Reverse (R).
40. Release parking brake (1).

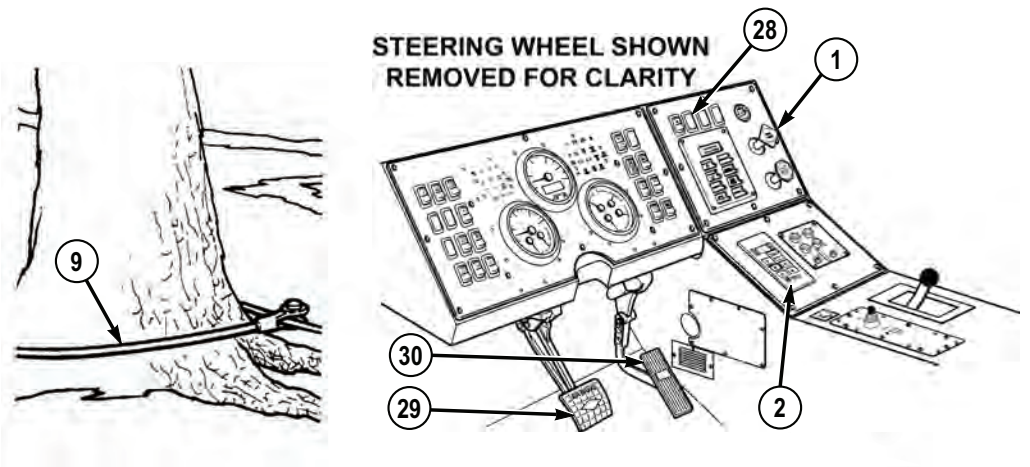


Figure 11.

41. Release service brake pedal (29).
42. Push WINCH IN/OUT switch (28) to IN and apply slight pressure to throttle control (30).

CAUTION

Keep cable tight at all times so cable does not get tangled with vehicle. Damage to equipment may result.

43. Adjust position of throttle control (30) to change engine speed as needed to keep cable (9) tight and vehicle moving.
44. When the vehicle is on solid ground, release WINCH IN/OUT switch (28).
45. Apply parking brake (1).
46. Set transmission range selector (2) to Neutral (N).
47. Push WINCH IN/OUT switch (28) to OUT and pay out cable (9) until all tension is off cable.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

48. When all tension is off cable (9), release WINCH IN/OUT switch (28) to center position.

NOTE

If cable was connected to another vehicle, perform Vehicle Self-Recovery (Winching Forward), Steps (48) through (54).

49. Ensure there is enough slack in cable (9).

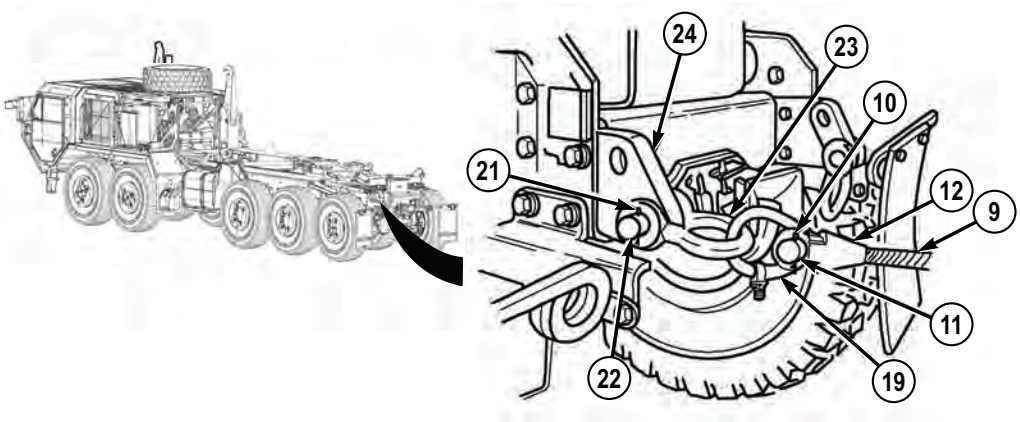


Figure 12.

50. Remove cotter pin (10) from clevis pin (11).
51. Remove clevis pin (11) and disconnect clevis (12) from towing shackle (27).
52. Remove cotter pin (21), pin (22), towing shackle (23), and tie down ring (19) from tow eye (24).
53. Remove tie down ring (19) from towing shackle (23).
54. Install towing shackle (23) to tow eye (24) with pin (22) and cotter pin (21).
55. Install tie down ring (19) to mounting plate (20).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

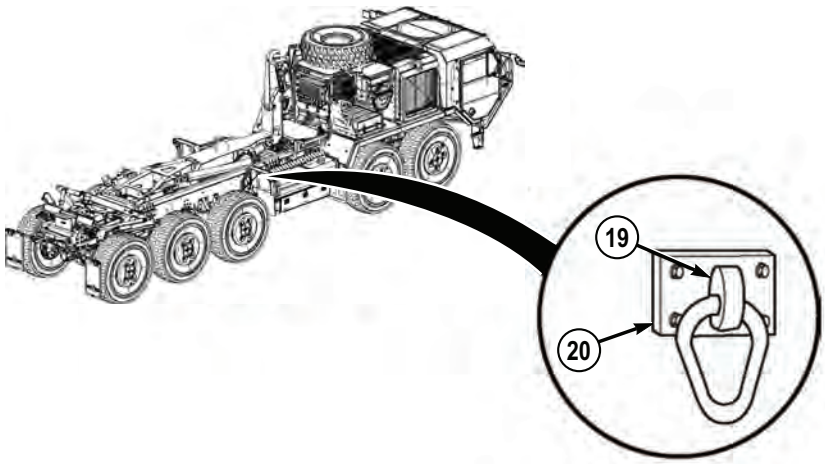


Figure 13.

56. Ensure there is enough slack in cable (9).

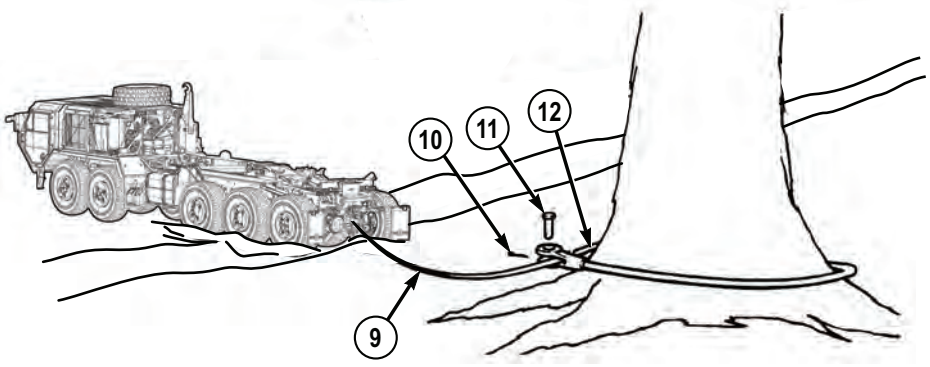


Figure 14.

57. Remove cotter pin (10) and clevis pin (11) from clevis (12).
58. Remove cable (9) from around tree, rock, or other stationary and heavy object.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Do not use winch to reel clevis end of cable through roller guides. Clevis may catch on roller guide and cause cable or roller guide to break. Failure to comply may result in injury or death to personnel.

WARNING



Keep all personnel clear of area near winch cable when tension is on cable. Failure to comply may result in injury or death to personnel.

59. Push winch control lever (8) to the rear.

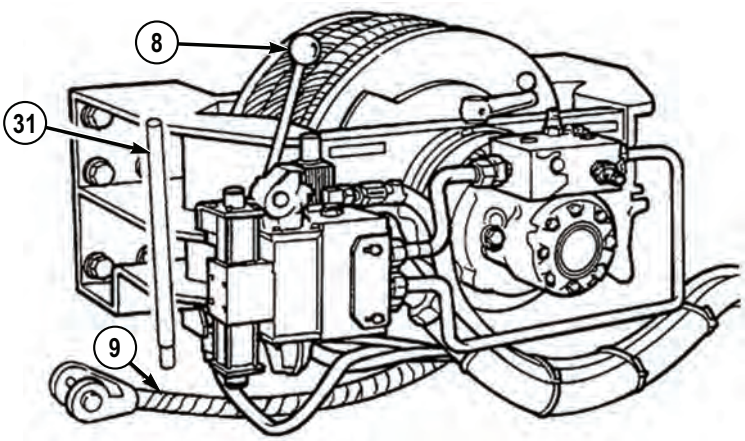


Figure 15.

60. Reel in cable (9). Use extension handle (31) to guide cable (9) onto winch so cable wraps are level across face of winch.

61. When end of cable (9) is near rear of vehicle, release winch control lever (8).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

62. Pull end of cable (9) through cable guide (16).

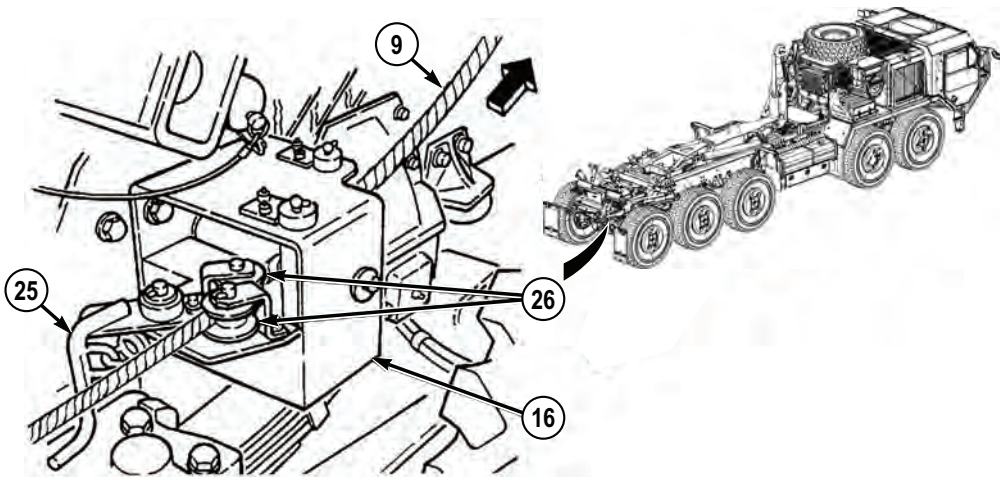


Figure 16.

63. Pull back and hold tensioning pulley lever (29).
64. Lift cable (9) out of tensioning pulleys (30).
65. Release tensioning pulley lever (29).
66. Pull cable (9) forward and out of cable guide (37).
67. Push winch control lever (8) to the rear, and reel in cable (9).

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

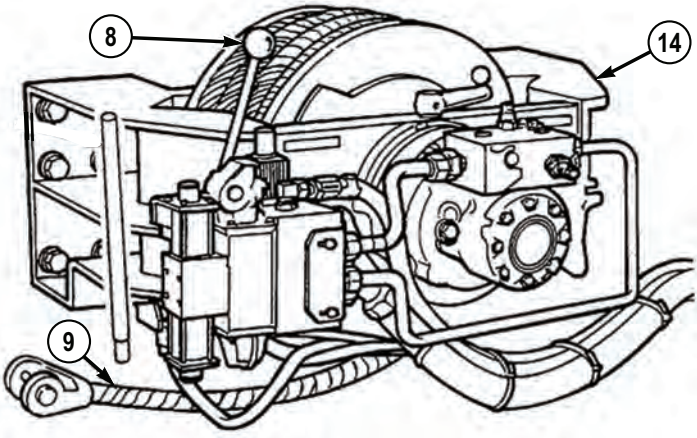


Figure 17.

68. When cable (9) is approximately 1.0 ft (305 mm) from winch, release winch control lever (8).
69. Route cable (9) to rear of winch (14).
70. Install clevis (12) to eyelet (13) with clevis pin (11) and cotter pin (10).

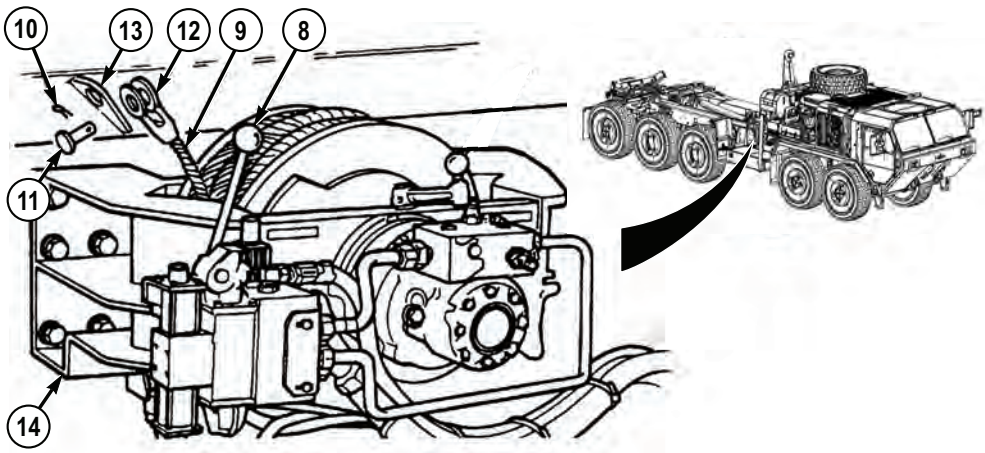


Figure 18.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued

WARNING



Keep all personnel clear of area near winch cable when tension is on cable. Failure to comply may result in injury or death to personnel.

WARNING



Do not reel in cable too tightly. If too much tension is applied, cable or eyelet can break, or winch may be damaged. Failure to comply may result in injury or death to personnel.

71. Push winch control lever (8) rearward and take out all slack in cable (9).
72. When cable (9) is stowed, release winch control lever (8).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

73. Set hydraulic selector switch (6) to OFF.

VEHICLE SELF-RECOVERY (WINCH TO REAR) - Continued



Figure 19.

74. Shut OFF engine (WP 0037).
75. Adjust mirror (4) for driving.

END OF TASK

SNATCH BLOCK

1. Installation.
    a. Remove snatch block (1) from stowage.

SNATCH BLOCK - Continued

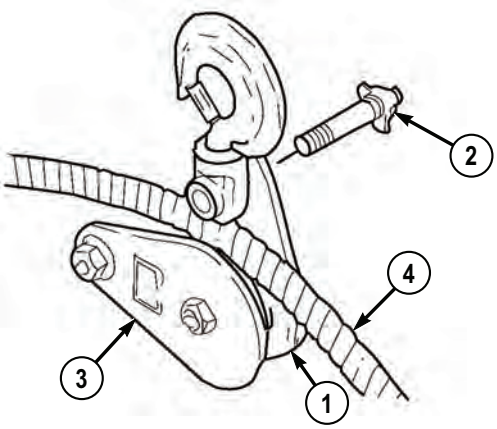


Figure 20.

b. Remove screw (2) from snatch block (1).

c. Move plate (3) to side to open snatch block (1).

WARNING



Always wear heavy gloves when handling cables. Never let cable run through hands; frayed cables can cut. Never operate winch with less than five wraps of cable on winch drum. Serious injury or death could result if cable comes off drum while winching.

d. Position cable (4) in snatch block (1).

e. Close plate (3) and align holes in snatch block (1).

f. Install screw (2) in snatch block (1).

g. Ensure screw (2) is tight and cable (4) can move freely through snatch block (1).

h. Continue with self-recovery operations.

NOTE

The snatch block is used as a mechanical advantage when the load resistance exceeds the capacity of the self-recovery winch (SRW).

SNATCH BLOCK - Continued

2. Removal.
   a. Ensure there is slack in cable (4).

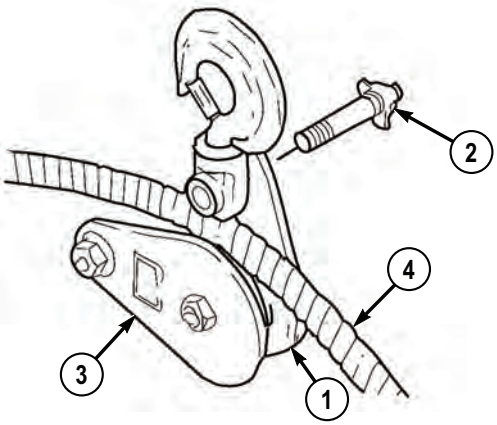


Figure 21.

   b. Remove screw (2) from snatch block (1).
   c. Move plate (3) to side to open snatch block (1).

WARNING



Always wear heavy gloves when handling cables. Never let cable run through hands; frayed cables can cut. Never operate winch with less than five wraps of cable on winch drum. Serious injury or death could result if cable comes off drum while winching.

   d. Remove cable (4) from snatch block (1).
   e. Close plate (3) and align holes in snatch block (1).
   f. Install screw (2) in snatch block (1).
   g. Return snatch block (1) to stowage.

SNATCH BLOCK - Continued

h. Continue with self-recovery operations.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING VEHICLE IN EXTREME HEAT

INITIAL SETUP:

Not Applicable

OPERATION

CAUTION

- When operating vehicle in very hot temperatures of above 100°F (38°C), extra care must be taken to prevent overheating engine (temperatures over 230°F [110°C] and transmission temperatures over 250°F [121°C]). Watch water and transmission temperature gauges closely. Failure to comply may result in damage to equipment.
- Check oil levels often and keep operating temperatures as low as possible. Vehicle cooling and lubrication systems support each other. Failure of one system may rapidly cause failure of other system.

1. Keep operating temperature as low as possible.
   a. Put the transmission range selector (1) in Neutral (N) position while engine is running. Let the engine idle for about 2 minutes before shutting down. Idling will cool the engine faster than quick shutdown and may prevent damage from remaining engine heat.

OPERATION - Continued

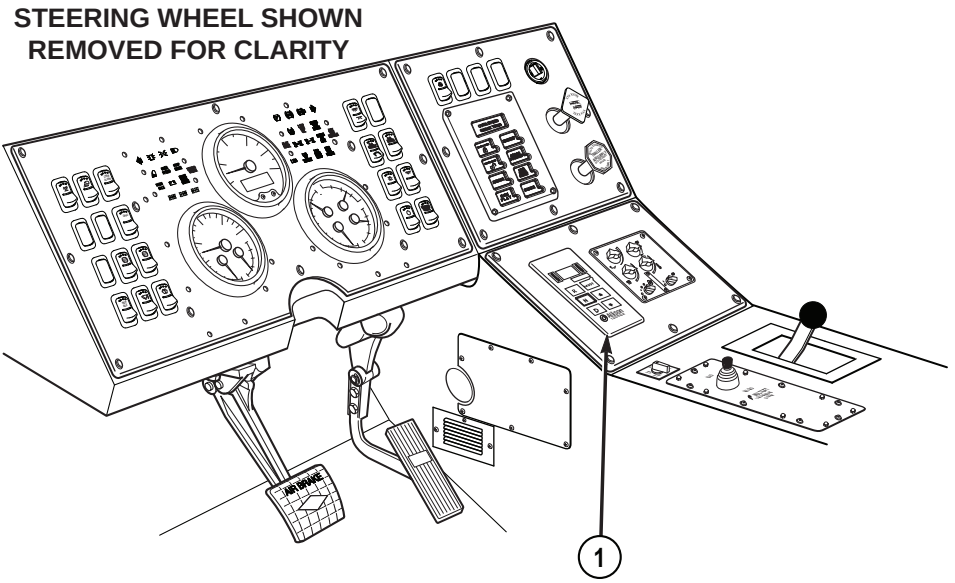


Figure 1.

b. Use low gear ranges only when necessary.

2. Stop the vehicle for cooling off periods. Idle engine as often as possible.

3. Check the oil levels often. Oil seals are more likely to leak in extreme hot weather.

NOTE

If temperature of transmission fluid is above 270°F (132°C), the CHECK TRANS light will come on and may not allow shifting into higher ranges.

4. If TRANS TEMP gauge (2) reads higher than 250°F (121°C), do the following:

OPERATION - Continued

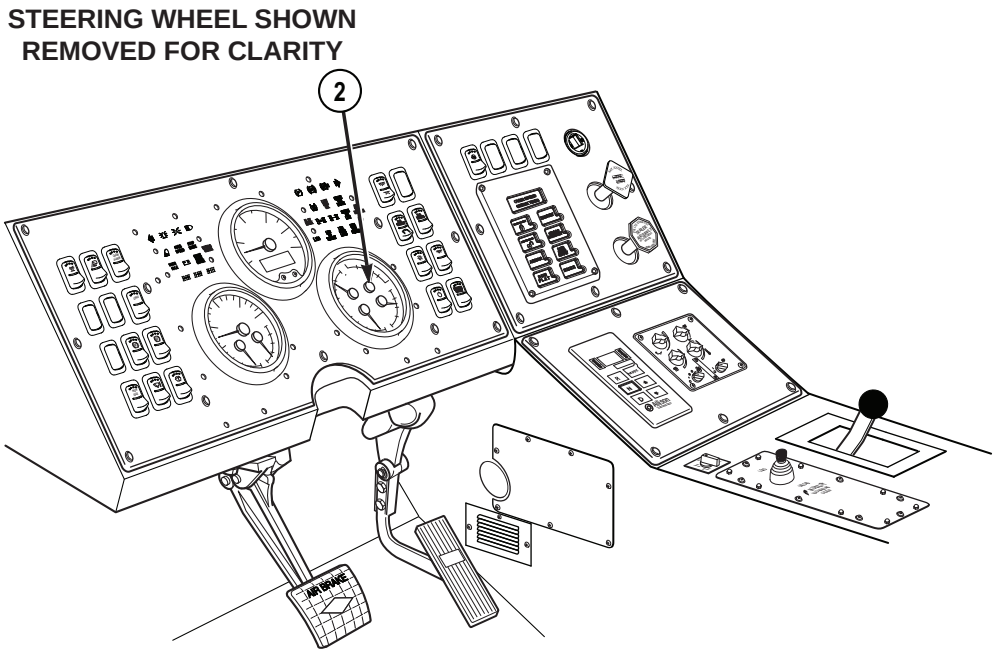


Figure 2.

a. Downshift to next lower gear range and continue operation.

b. When TRANS TEMP gauge (2) reads in normal range, up shift to normal gear range and continue operation.

c. If TRANS TEMP gauge (2) does not return to normal range, stop vehicle and let transmission cool.

d. When TRANS TEMP gauge (2) reads in normal range, shift to normal gear range and continue operation.

5. Check cooling system often. If any of the following conditions are found, notify Field Maintenance:

a. Low coolant level in radiator.

b. Leaking hose connections which have been tightened but still leak.

c. Cracked or leaking hoses.

d. Radiator fins plugged with dust, leaves, or insects that cannot be easily removed.

OPERATION - Continued

NOTE

Batteries do not hold charge well in extreme heat. Battery will be tagged for use in tropical conditions and will have a white circle printed on top. Battery specific gravity must be changed to adjust for heat.

6. Refer to TM 9-6140-200-14 (Volume 2, WP 0146) to adjust battery specific gravity.
7. Keep batteries (3) full, but do not overfill.

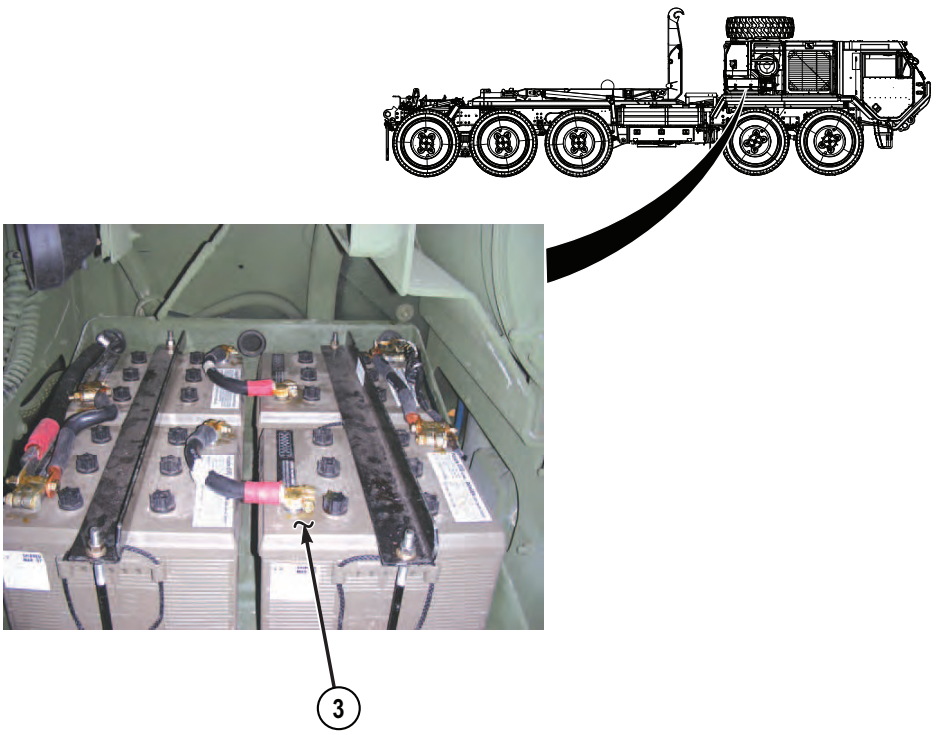


Figure 3.

8. In hot, damp climates, check body and chassis often and notify Field Maintenance if any of the following are found:
   a. Signs of pitting or paint blistering on metal surfaces.

OPERATION - Continued

b. Signs of mildew, mold, or fungus on fabrics or rubber.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING VEHICLE IN EXTREME DUST

INITIAL SETUP:

Not Applicable

OPERATION

CAUTION

Clouds of dust can scratch glass surfaces. Keep glass surfaces covered as much as possible in these conditions to prevent scratching. Failure to comply may result in damage to equipment.

1. Leave glass surfaces covered if not needed for operations. Take extra care when cleaning glass to prevent scratching surfaces.
2. Keep close watch on air filter restriction indicator (1), gauges and warning lights on driver's instrument panel (2). Ensure dust does not affect equipment.

OPERATION - Continued

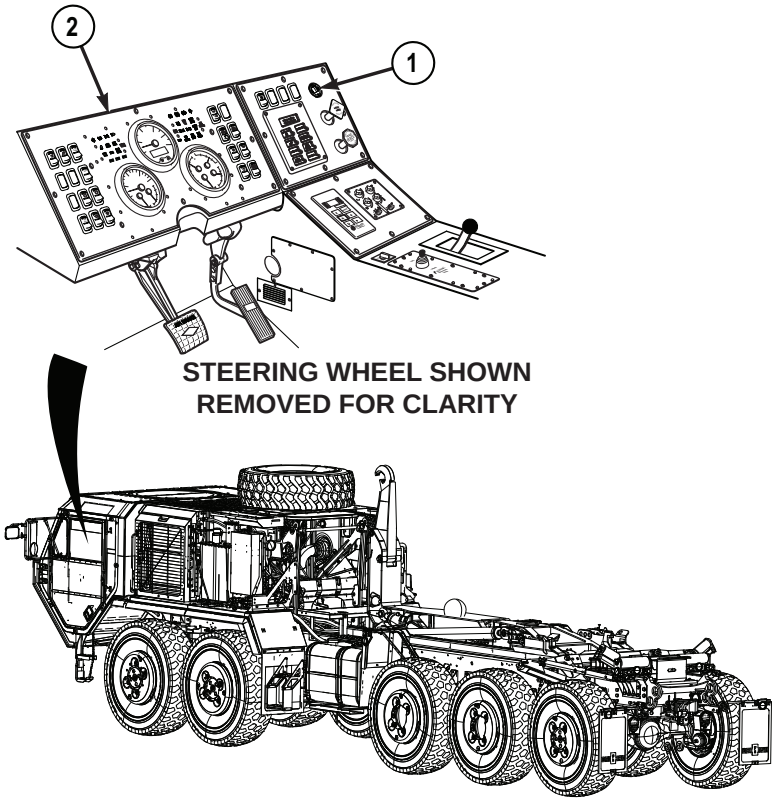


Figure 1.

3. Allow as much distance as possible between vehicles and operate at low speeds.
4. When possible, park so the vehicle does not face into wind.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING VEHICLE IN MUD, SAND, OR SNOW

INITIAL SETUP:

Not Applicable

OPERATION

CAUTION

- Before backing vehicle in mud, sand, or snow, mud flaps must be pinned on stowage hook located on mud flap bracket. If mud flap is not pinned, damage to equipment may result.
- Blowing sand may scratch glass surfaces. Glass surfaces should remain covered as much as possible in these conditions to prevent scratching. Failure to comply may result in damage to equipment.

NOTE

Driving in mud can degrade vehicle braking and speed up brake shoe wear. If braking worsens while operating in mud, dry brakes by driving vehicle approximately 500 ft (153 m) with service brakes frequently applied. This must be done with brake drums totally out of mud so that drying action can take place. If adequate braking is not restored by drying brakes, notify Field Maintenance.

1. Extra care should be taken when cleaning glass surfaces to prevent scratching surfaces.

NOTE

- Principles of driving in sand can also be applied to driving in mud.
- The best time to drive on sand is at night or early morning when sand is damp. Damp sand gives better traction.

2. Check air filter restriction indicator (1) often.

OPERATION - Continued

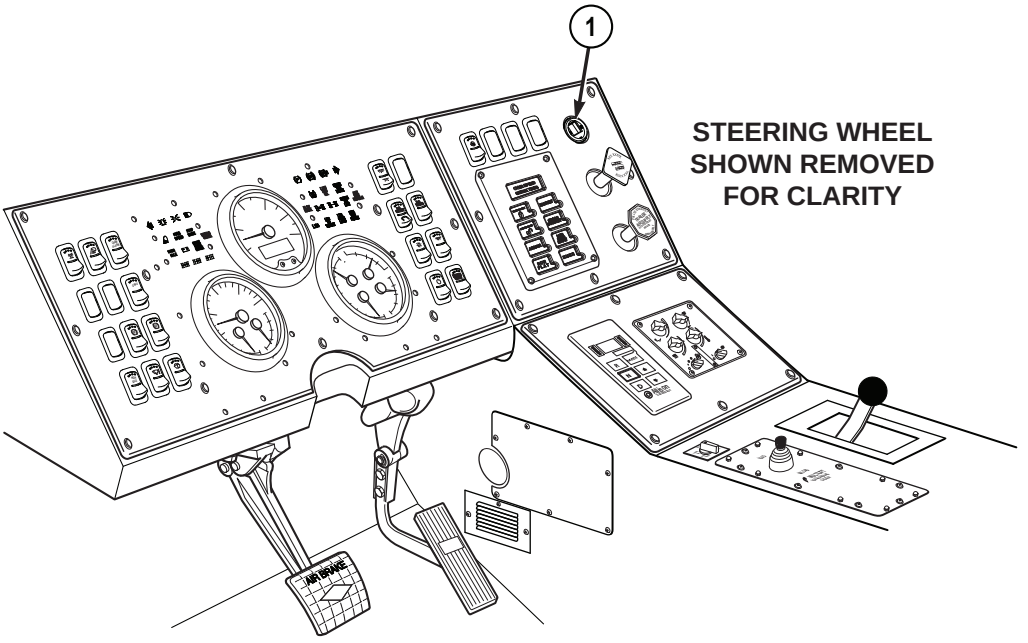


Figure 1.

3. Set CTIS switch (2) to desired position. Refer to Equipment Description and Data (WP 0002) for additional information.

OPERATION - Continued

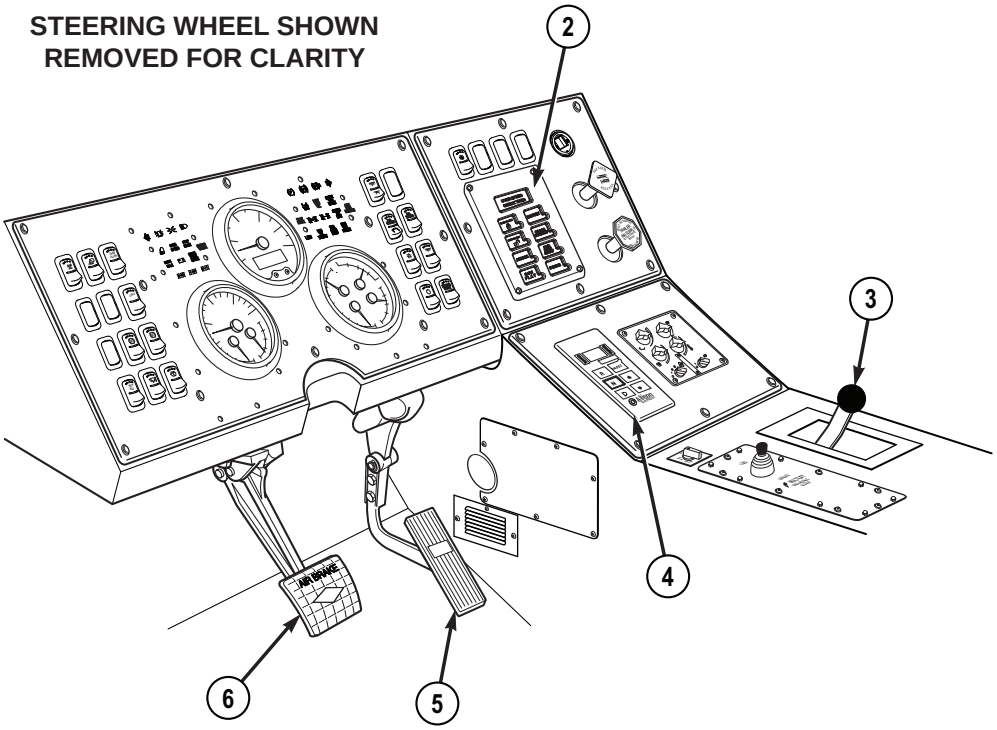


Figure 2.

4. Set transfer case shift lever (3) to LOW.
5. Start slowly. Do not spin the wheels when starting to move vehicle.
6. Set transmission range selector (4) to 2 or 1, as needed, for added traction.
7. Do not straddle sand mounds or drive on sides of two sand mounds. Loose sand will not support vehicle on steep slopes.
8. Keep throttle control (5) steady after vehicle reaches desired speed.
9. Turn the vehicle slowly when on loose sand or mud.
10. Steer the vehicle straight up and down hills if possible.
11. To move the vehicle forward and turn after vehicle is stopped in loose sand or mud, do the following:
    a. Set transmission range selector (4) to Reverse (R).
    b. Press throttle control (5) and slowly move vehicle straight back about 20.0 ft (6.1 m).

OPERATION - Continued

c. Release throttle control (5) and press service brake pedal (6).

d. Set transmission range selector (4) to 1.

e. Release service brake pedal (6) and press throttle control (5) to move the vehicle forward.

f. Turn vehicle gradually.

g. Move transmission range selector (4) to Drive (D) when vehicle picks up speed and is moving forward smoothly.

12. If vehicle starts to skid, do the following:

a. Release throttle control (5).

b. Steer in direction of skid until vehicle stops skidding.

c. Press throttle control (5) slowly and steer vehicle on straight course.

13. Set transfer case shift lever (3) to HIGH.

14. Park the vehicle as follows:

a. Whenever possible, park so the vehicle does not face into wind.

CAUTION

Do not direct high pressure water stream at glass surfaces, seals, air intake, exhaust outlet, or any other component of vehicle that could be easily damaged by high pressure water stream. Failure to comply may result in damage to equipment.

b. Clean mud and/or snow off vehicle as soon as possible.

c. Clean mud from the wheels, brakes, axles, universal joints, steering mechanism, and radiator as soon as possible.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING VEHICLE IN DESERT ENVIRONMENT

INITIAL SETUP:

Not Applicable

OPERATION

1. Principles for operating in extreme heat and extreme dust, sand or mud apply to desert environment. Refer to extreme heat (WP 0064) or mud, sand, or snow. (WP 0066)

NOTE

FM 90-3 (Volume 2, WP 0146) contains detailed instructions for living and working in the desert.

2. Temperatures may change as much as 70°F (21°C) between day and night. These changes may damage equipment if vehicle is not properly prepared. Due to expansion and contraction of all fluids and air, care should be taken when filling fuel tank and fluid reservoirs to prevent overflow when temperatures change.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING VEHICLE IN EXTREME COLD ENVIRONMENT -26°F TO -50°F (-32°C TO -46°C)

INITIAL SETUP:

Not Applicable

OPERATION

WARNING



Do not touch extremely cold metal (below -26°F, -32°C to -65°F, -54°C). Bare skin may freeze to cold metal. Failure to comply may result in injury or death to personnel.

NOTE

- Principles for operating in cold environment apply to extreme cold environment. Refer to cold environment (WP 0075) for operating in cold environment.
- Before operating vehicle in extreme cold environment make sure arctic kits are installed and vehicle has been prepared as described in FM 9-207 (Volume 2, WP 0146).

1. Operate arctic heater (WP 0041).
2. Push Ignition/Engine Stop switch (1) to Ignition position.

OPERATION - Continued

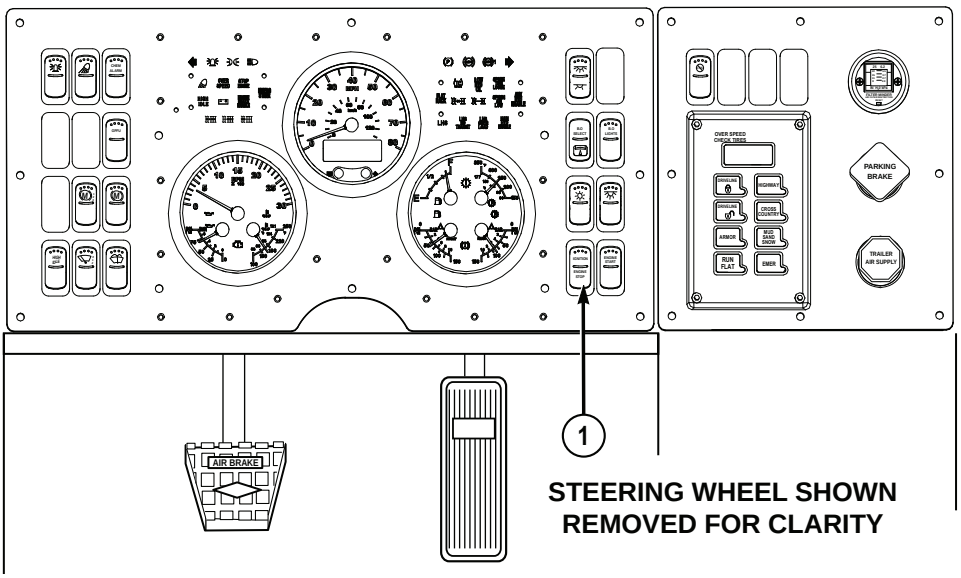


Figure 1.

CAUTION

Watch instrument panel closely. If any unusual readings occur, stop vehicle and shut off engine. Check immediately. Failure to comply may result in damage to equipment.

NOTE

If engine fails to start, wait 15 seconds before next start attempt to allow starter motor to cool.

3. Press Start switch (2) to Start for about 15 seconds. Release Start switch. Engine Start switch will spring back. Oil pressure indicator (3) and oil pressure lamp (4) may light and buzzer (5) may sound briefly.

OPERATION - Continued

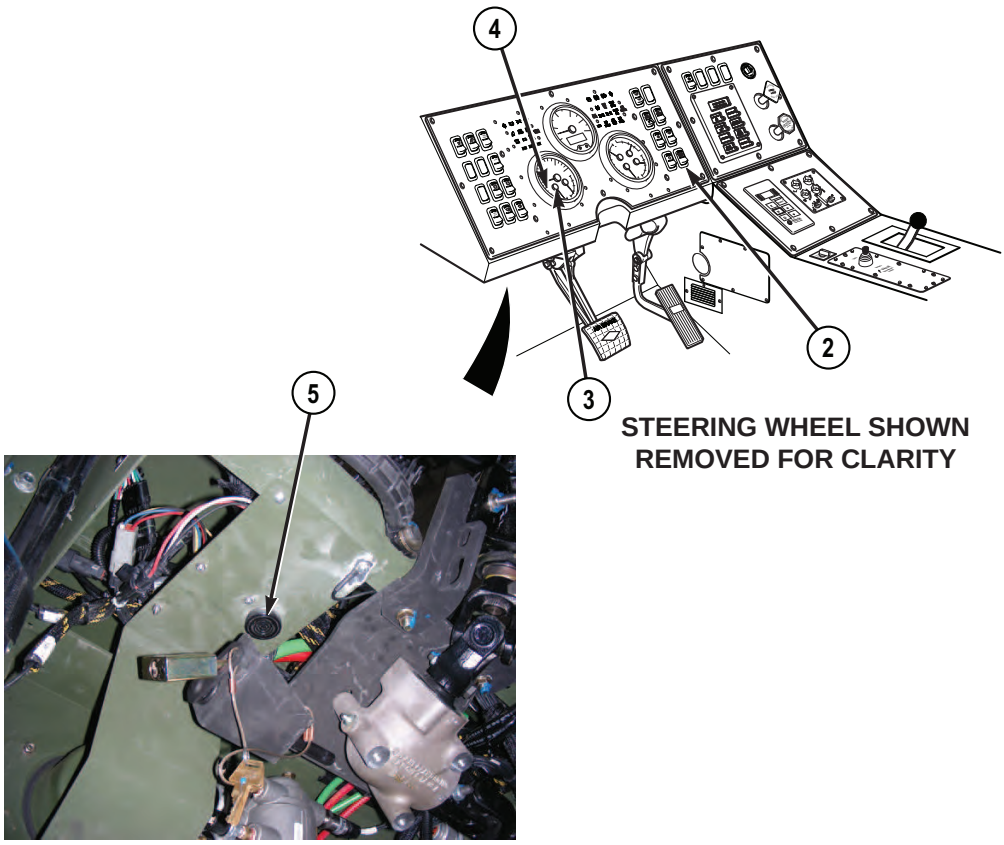


Figure 2.

NOTE

- If transmission fluid temperature is below -20°F (-29°C) TRANS CHECK and DO NOT SHIFT lights will illuminate and transmission will only operate in Neutral (N) Range.
- CTIS system should be in the ON position only when parked, during starts in extremely cold environments. CTIS will adjust tire pressure during the warm-up period while vehicle is parked.

4. Run engine for 5 minutes, then increase engine speed to 1,200 to 1,500 rpm until transmission DO NOT SHIFT light goes out.

OPERATION - Continued

CAUTION

- Fuel/water separator should be drained 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 system causing 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 critical parts if allowed to pile up. Failure to comply may result in damage to equipment.
- Special care must be used during operations in extreme cold environment. In extreme cold, engine coolant and fluid in windshield washer can freeze. Batteries can freeze and crack. Oil and grease may get thick and stiff. Rubber may crack or break easily. Failure to comply may result in damage to equipment.

5. Before crane is operated, perform warm-up as follows:

   a. Prepare crane for use (WP 0054).

   b. Turn the manual override knob on the MHC main hydraulic pressure valve counterclockwise and pull out knob (WP 0054). Run for 15 minutes.

   c. Operate right side outrigger jack control (WP 0054) fully in the DOWN position and hold until the jack descends. Extend the outrigger jack down to the pad, but do not attach the pad. Fully retract the outrigger jack.

   d. Repeat Step (c) using the left side outrigger jack.

   e. Set up the outrigger jacks (WP 0054).

CAUTION

Mast must be fully extended or damage to equipment may result.

   f. Refer to Crane Operations (WP 0054) and raise the crane to operating position using only the manual controls, and holding each respective control fully open in the appropriate direction until the crane function responds (WP 0054). Perform the following operations Steps (g) through (l) in specified sequence for 10 minutes.

   g. Lower the hook block to ground and raise to 2 ft (0.61 m) from boom nose.

   h. Raise the boom to maximum elevation of 50 degrees.

   i. Telescope the boom out fully while operating hoist down to prevent hook block from contacting boom nose.

   j. Fully retract the boom while operating hoist up to keep hook block approximately 2 ft (0.61 m) from boom nose.

OPERATION - Continued

k. Lower the boom to horizontal.

l. Rotate the crane fully counterclockwise (180 degrees) and rotate back fully clockwise.

NOTE

Perform Steps (m) and (n) if using remote control.

m. Connect the remote control (WP 0055).

n. Attempt to operate all crane functions by remote control (WP 0055), without connecting to load. If any crane function fails to respond, continue to exercise the specific function using the manual control until functions respond to the remote control.

o. Continue with operation of crane (WP 0055).

p. When crane operation is complete, disconnect and stow remote control and cable (if used) and shut down crane (WP 0055).

q. Twist and pull out main hydraulic override valve (WP 0076) and turn clockwise until knob locks in.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

6. Before operating, perform warm-up as follows:

a. Select AUTO position on hydraulic selector switch (6). Allow pump to operate for 5 minutes at idle. LHS is then ready for operation at idle.

OPERATION - Continued

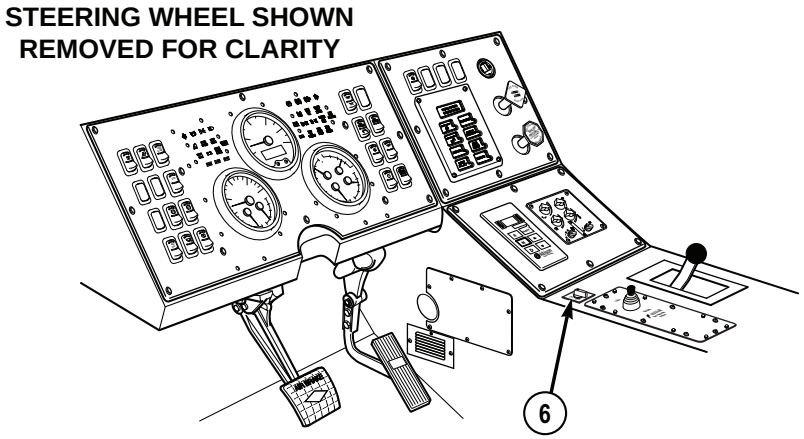


Figure 3.

b. Cycle the LHS at idle.

c. After one complete cycle at idle, the LHS is ready for normal operation.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
INSTALL/REMOVE TIRE CHAINS

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

INSTALL TIRE CHAINS

WARNING



Driver has limited vision to rear. Ground guide is required when driving vehicle in reverse. Failure to comply may result in injury or death to personnel.

CAUTION

- Use tire chains on Axles No. 3 and 4 only. Chains must not be used when driving on hard surfaces where there is no wheel slippage. Improper use of tire chains may result in severe equipment damage.
- Vehicle Central Tire Inflation System (CTIS) setting must not be set below CROSS COUNTRY setting or equipment damage may result.
- Maximum speed limit for vehicles with chains on highway is 10 mph (16 km/h), and off highway is 15 mph (24 km/h). Traveling above maximum speed may result in damage to equipment.

NOTE

The install/remove tire chains task requires two crew members.

1. Place tire chain (1) on ground with cross chain connecting links (2) facing down in front of tire (3).

INSTALL TIRE CHAINS - Continued

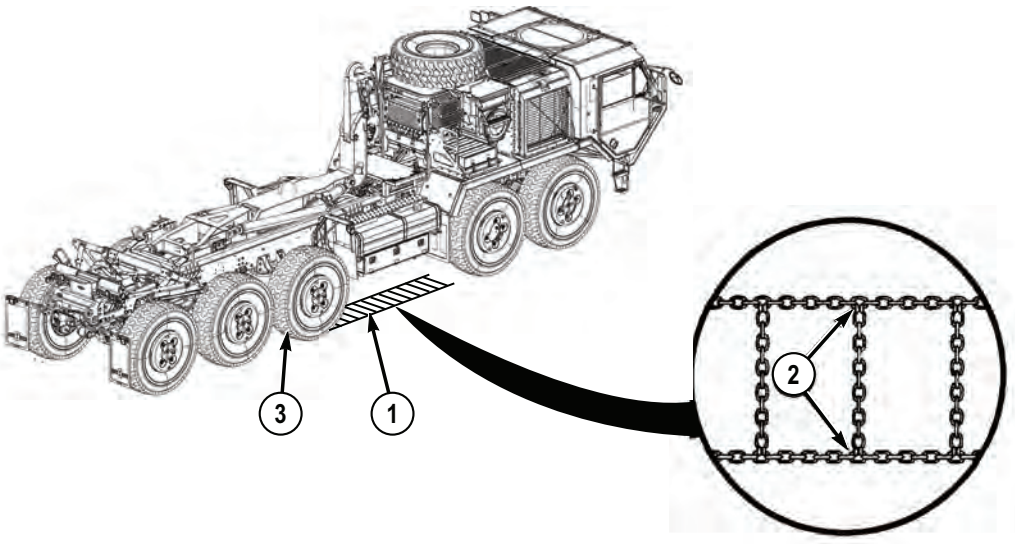


Figure 1.

2. Start vehicle (WP 0027).
3. Move vehicle onto tire chain (1) so tire (3) is about one-third of way on tire chain.
4. Apply service brake pedal (4).

INSTALL TIRE CHAINS - Continued

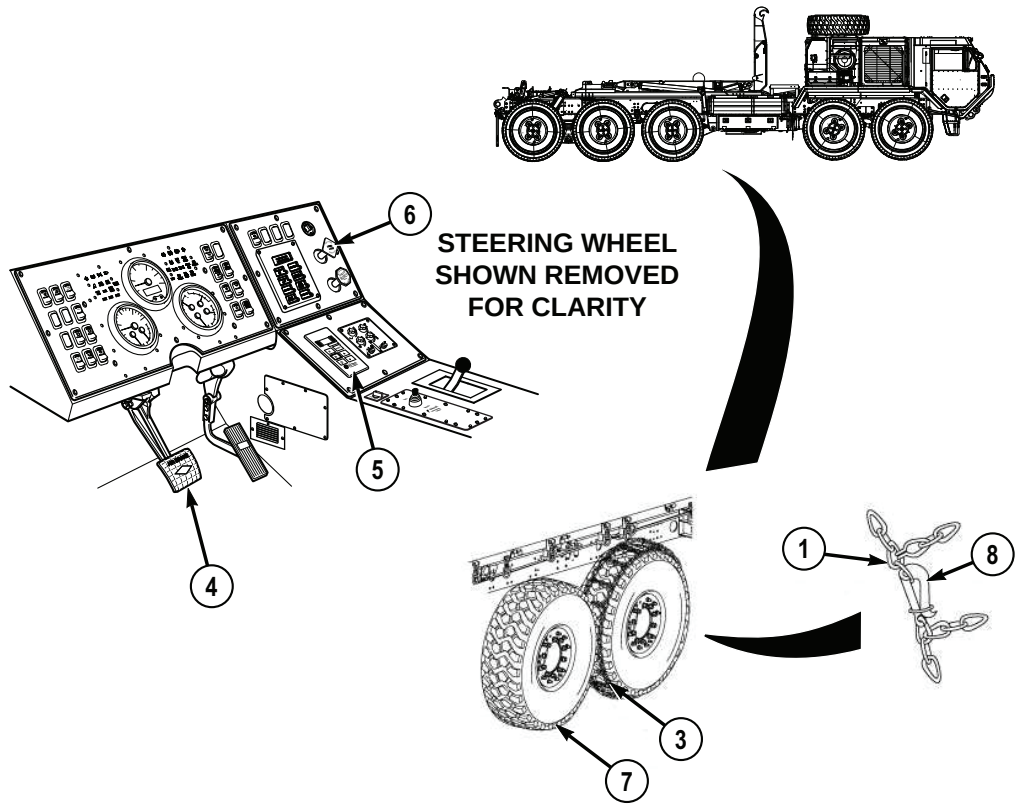


Figure 2.

5. Place transmission range selector (5) in Neutral (N).
6. Apply parking brakes (6).
7. Ensure bottom of tire (7) is not end of tire chain (1).
8. Shut OFF engine (WP 0037).
9. Wrap tire chain (1) around tire (3).
10. Connect and secure inside and outside clamps (8) so tire chain (1) is as tight as possible on tire (3).
11. Repeat Steps (1) through (10) to install tire chains (1) on tires (7), (9), and (10).

INSTALL TIRE CHAINS - Continued

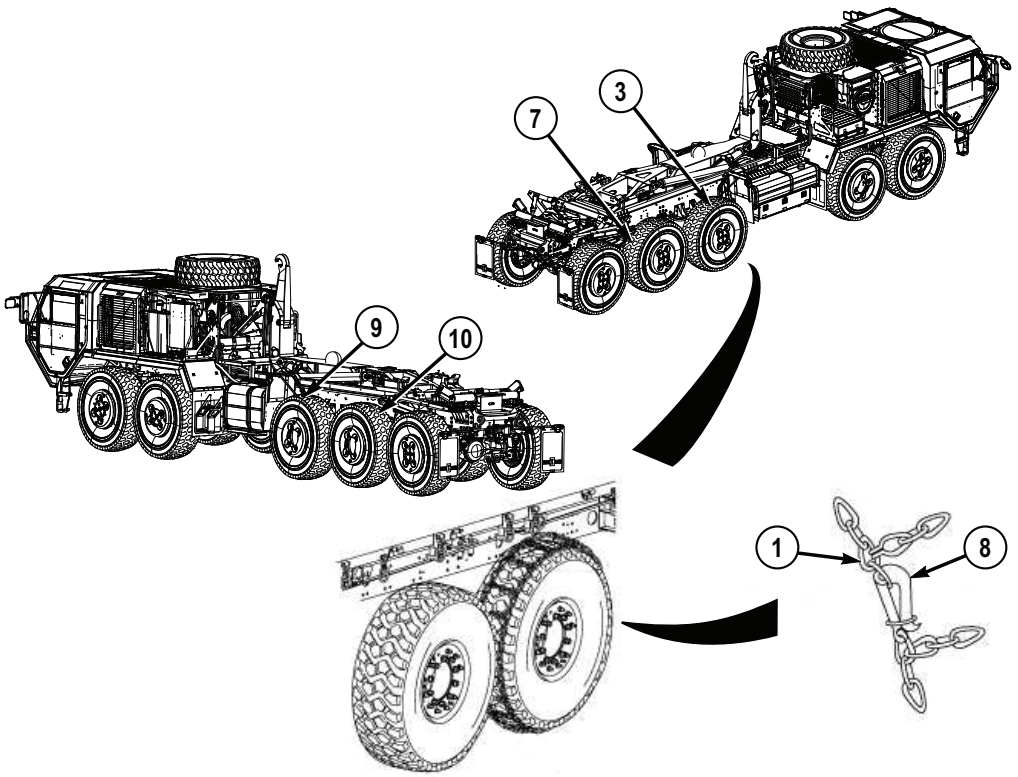


Figure 3.

END OF TASK

REMOVE TIRE CHAINS

1. Start vehicle (WP 0027).
2. Move vehicle into position so tire chain (1) clamps (8) on tire (3) are at four o'clock position.
3. Park vehicle (WP 0036).
4. Disconnect inside and outside clamps (8) of tire chain (1).
5. Unwrap tire chain (1) from tire (3) and spread tire chain out on ground behind vehicle.
6. Drive vehicle forward off tire chain (1).

REMOVE TIRE CHAINS - Continued

7. Remove tire chains (1) from tire (9) by repeating Steps (2) through (6).
8. Move vehicle into position so clamps (8) on tire (7) are at the eight o'clock position.
9. Park vehicle (WP 0036).
10. Repeat Steps (4) through (6).
11. Remove tire chain (1) from tire (10) by repeating Steps (8) through (10).
12. Shut OFF engine (WP 0037).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DEEP WATER FORDING

INITIAL SETUP:

Not Applicable

FORDING

WARNING



Do not ford water unless depth is known. Water deeper than 4 ft (1.2 m) may enter vehicle. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure both cab floor drain caps are securely in place before attempting to ford water. Failure to comply may result in damage to equipment.

1. Ensure depth of fording site is not more than 4.0 ft (1.2 m).

FORDING - Continued

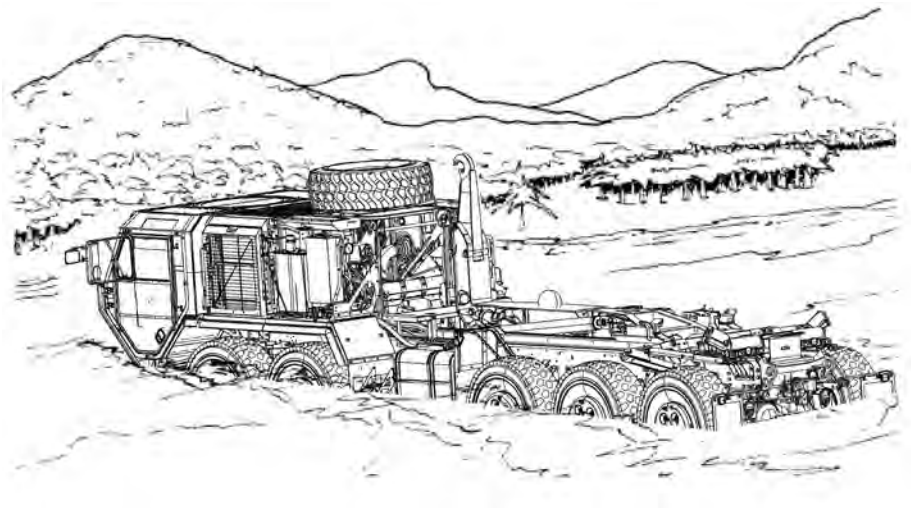


Figure 1.

2. Ensure bottom at fording site is free of obstacles, is firm enough that 4.0 ft (1.2 m) maximum fording depth will not be exceeded, and vehicle will not become mired.
3. Stop vehicle at edge of water.
4. If brakes have been used heavily and are hot, allow drums and shoes to cool before entering water if possible.
5. Ensure engine is operating correctly before entering water.
6. Set TRANSFER CASE shift lever (1) to LOW.

FORDING - Continued

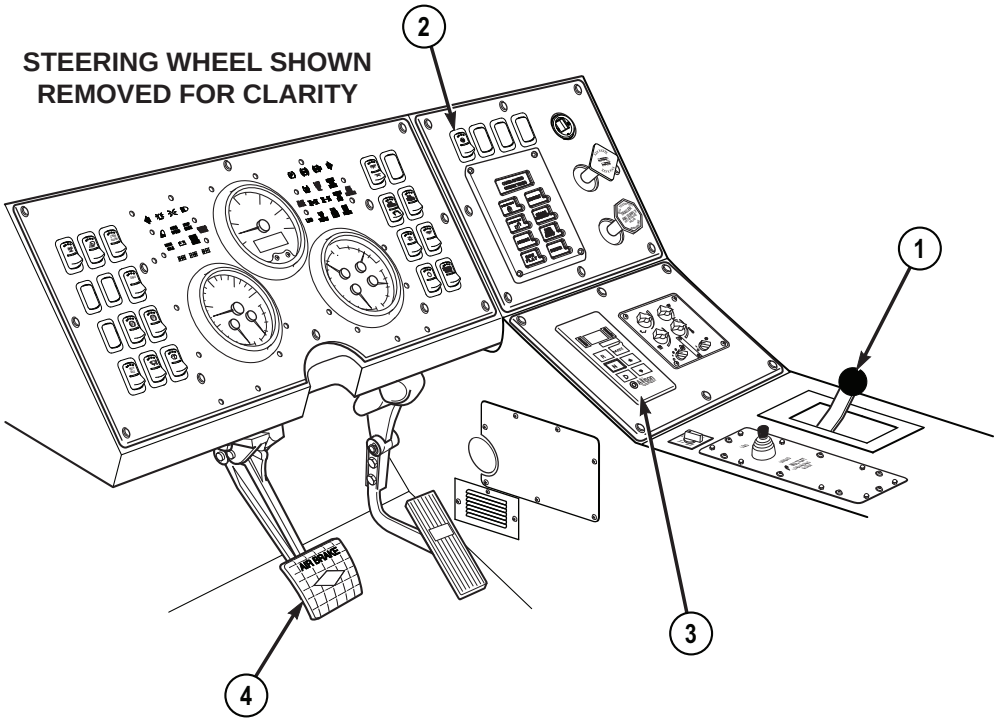


Figure 2.

7. Set CTIS switch (2) to the ON position (WP 0038). Refer to Equipment Description and Data (WP 0002) for additional information.
8. Set transmission range selector (3) to 1.
9. Drive vehicle slowly into water.
10. If engine stops, immediately attempt to restart engine. If vehicle will not start, tow or winch vehicle from water with another vehicle as soon as possible.
11. Drive vehicle 4 mph or less, through water.
12. Unless absolutely necessary, do not stop while in water.
13. If vehicle accidentally enters water deeper than 4.0 ft (1.2 m), perform the following:
    a. Press on service brake pedal (4) and hold to stop vehicle.
    b. Set transmission range selector (3) to Reverse (R).
    c. Let up on service brake pedal (4).
    d. Slowly back vehicle out of deep water.

FORDING - Continued

14. After leaving water, press service brake pedal (4) lightly and hold while driving slowly to dry out brake linings.
15. When clear of fording area, stop vehicle.
16. Apply and release parking brake (5) several times to remove water from brake components.

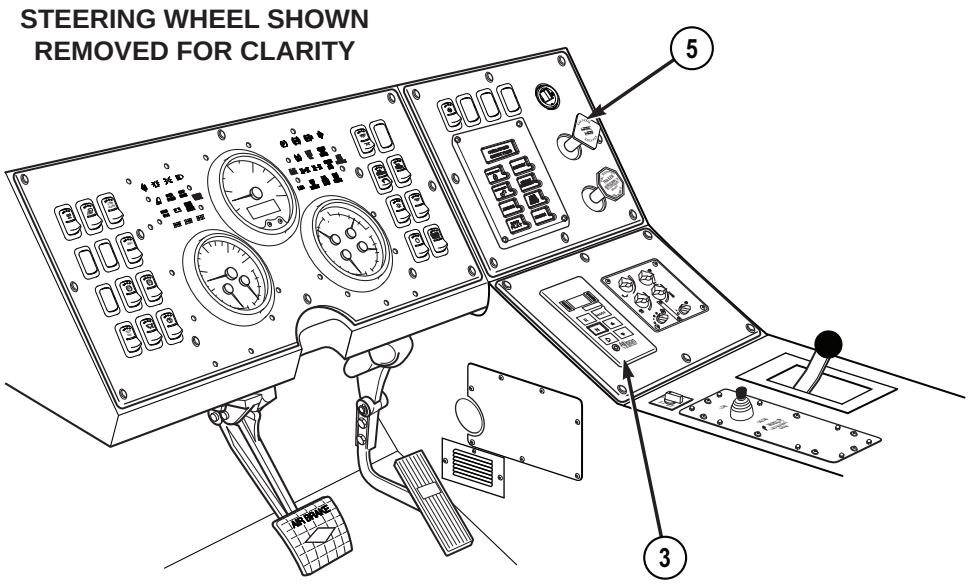


Figure 3.

17. If CTIS EMERGENCY was selected, set transmission range selector (3) to Reverse (R).
18. Back up approximately 5.0 to 10.0 ft (1.5 to 3 m) to relieve driveline loading.
19. Set transmission range selector (3) to Neutral (N).
20. Set TRANSFER CASE shift lever (1) to HIGH.
21. Remove water and clean deposits from all vehicle parts as soon as possible.
22. Deliver vehicle to field level maintenance as soon as possible.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATING HIGHWAY EMERGENCY MARKER KIT

INITIAL SETUP:

Not Applicable

OPERATION

NOTE

Highway emergency kit should be used to mark location and caution oncoming traffic whenever vehicle is disabled or must park in areas where there is other traffic.

1. Operate emergency flasher (1) as follows:

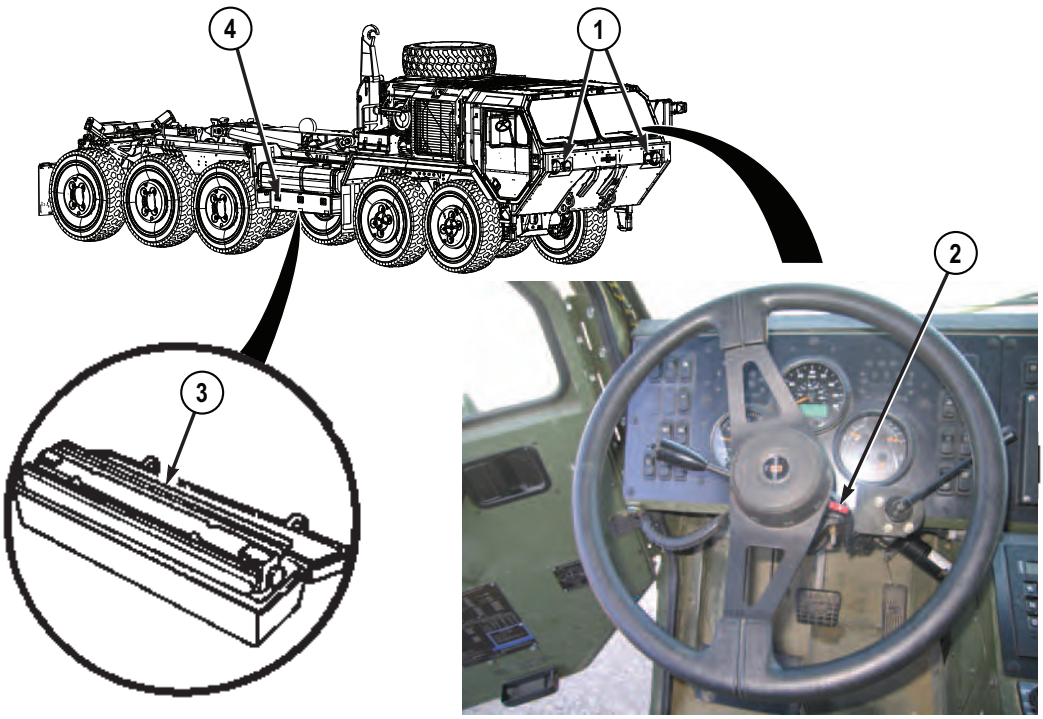


Figure 1.

OPERATION - Continued

a. Push flasher button (2) in to turn flasher on.

b. Pull flasher button (2) out to turn flasher off.

2. Prepare each marker for use.

a. Remove emergency marker kit (3) from stowage box (4) on right side of vehicle.

b. Remove markers (5) from case.

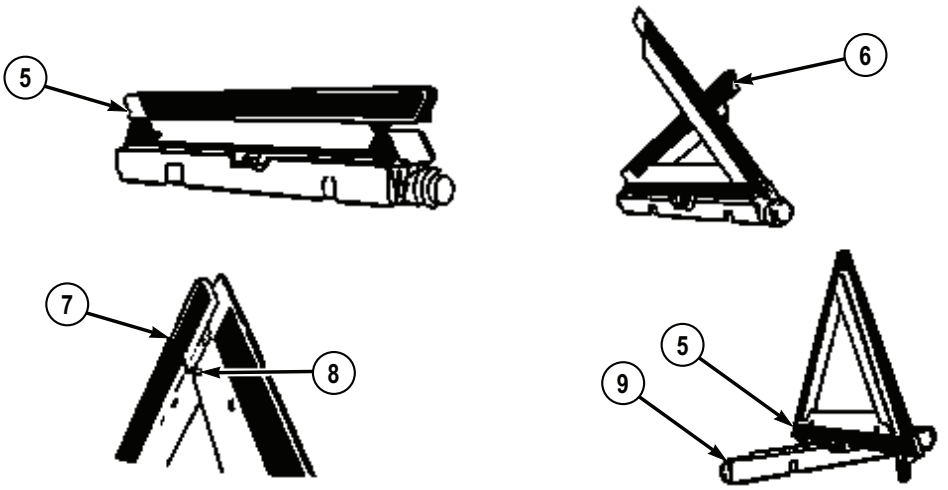


Figure 2.

c. Raise marker arms (6).

d. Snap pin (7) into slot (8).

e. Rotate marker (5) about 1/4 turn on base (9) until it stops.

NOTE

- Perform Step (3) if vehicle becomes disabled on undivided highway.
- Perform Step (4) if vehicle becomes disabled on divided highway.

3. Place markers on undivided highway:

a. Place one marker (5) about 40 paces (100 ft [30.5 m]) in front of vehicle, so marker faces traffic approaching from front.

OPERATION - Continued

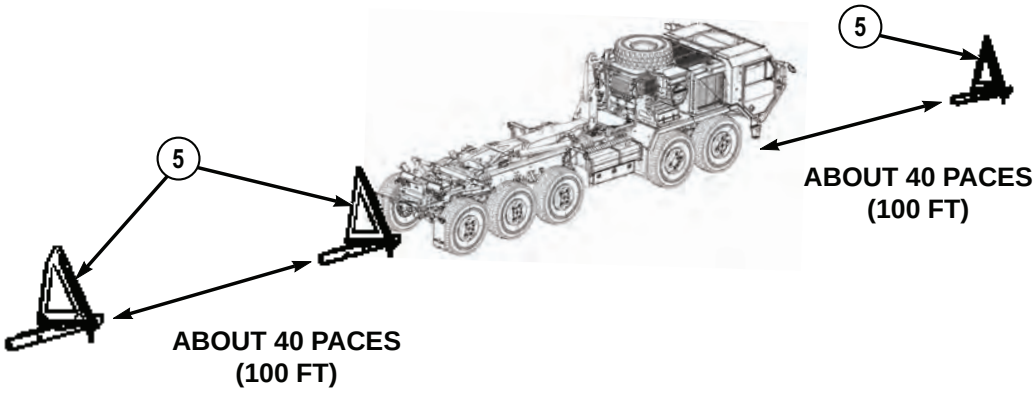


Figure 3.

b. Place another marker (5) directly behind vehicle, so marker faces traffic approaching from rear.

c. Place third marker (5) about 40 paces (100 ft [30.5 m]) behind vehicle, so marker faces traffic approaching from rear.

4. Place markers on divided highway.

a. Place one marker (5) directly behind vehicle, so marker faces traffic approaching from rear.

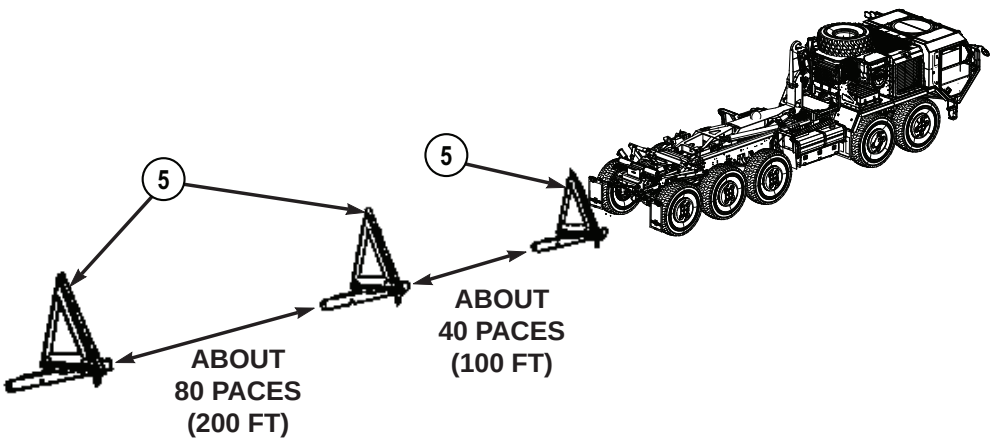


Figure 4.

b. Place second marker (5) about 40 paces (100 ft [30.5 m]) behind vehicle, so marker (5) faces traffic approaching from rear.

OPERATION - Continued

c. Place third marker (5) about 80 paces (200 ft [61 m]) behind second marker so marker faces traffic approaching from rear.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PREPARING PLS VEHICLE FOR TOWING

INITIAL SETUP:

Not Applicable

PREPARATION

WARNING



The disabled PLS vehicle being towed must have no load or less load than the PLS towing vehicle. Failure to comply may result in injury or death to personnel.

CAUTION

- When towing another vehicle, do not go over GCWR given by the data plate on driver's side door. Going over GCWR may cause damage to disabled and towing vehicle.
- When towing disabled vehicle, speed must not exceed 35 mph (56 km/h) and towing distance must not exceed 100 miles (161 km). Failure to comply may result in damage to equipment.
- Transfer case of disabled vehicle must be in Neutral (N) and in the UNLOCKED position or damage to transfer case may result.
- Transfer case lock-up of disabled vehicle must be in the OFF position or damage to equipment may result.
- Transmission of disabled vehicle must be set in Neutral (N) position or damage to transmission may result.
- CTIS of disabled vehicle must be set to highway position or damage to axles may result.

PREPARATION - Continued

- If vehicle is being towed because of a steering hydraulic failure resulting in fluid loss, both output propeller shafts from transfer case must be disconnected or damage to emergency steering pump may result. Contact Field Maintenance to remove propeller shafts.
- Tires should be inflated to highway pressure or damage to tires may result. If CTIS is inoperable, tires may need to be inflated manually or using air supply from towing vehicle.
- Do not attempt to start engine if there is obvious engine damage or damage to equipment may result.

1. Chock wheels of disabled vehicle. (WP 0036)
2. Set parking brakes (1) of disabled vehicle.

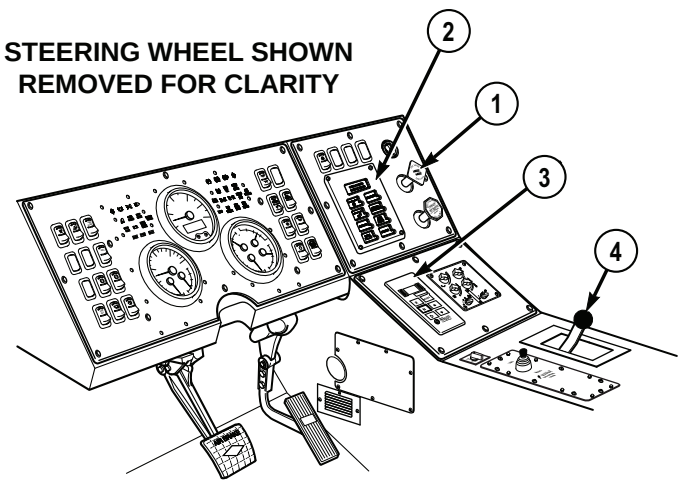


Figure 1.

3. Start engine (WP 0027) of disabled vehicle and place CTIS (2) of disabled vehicle in HIGHWAY position. If CTIS does not work or engine is inoperative, manually inflate tires. (WP 0076)
4. Place transmission (3) of disabled vehicle in Neutral (N) position.
5. Place TRANSFER CASE shift lever (4) of disabled vehicle in the NEUTRAL position.
6. Ensure TRANSFER CASE LOCKUP is not engaged.

PREPARATION - Continued

CAUTION

During lift and tow operation the mudflaps should be pinned up prior to pushing the truck rearward. Failure to comply may result in damage to equipment.

NOTE

Perform step 7 only if performing lift and tow operation.

7. Pin up mudflaps (5) of disabled vehicle.

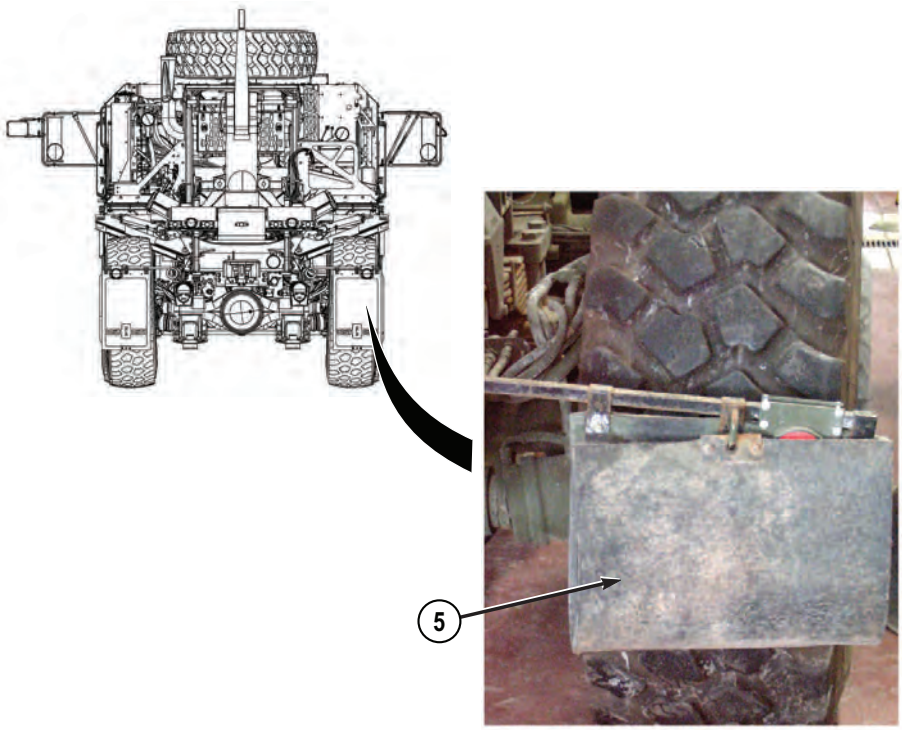


Figure 2.

PREPARATION - Continued

WARNING



If brakes on disabled vehicle must be manually released, ensure that the wheels of the disabled vehicle are chocked prior to manually releasing the brakes. Failure to comply may result in injury or death to personnel.

NOTE

If the engine of the disabled vehicle cannot be started, or if there is an air leak that cannot be repaired, or if brakes on Axle No. 3, No. 4, or No. 5 will not release, then one or all of the rear axle brake chambers on the disabled vehicle will have to be manually released.

8. Allow air pressure of disabled vehicle to build to 125 psi (862 kPa) or manually release rear brakes (WP 0073).
9. Install beacon light on towing vehicle (Volume 2, WP 0143).
10. Turn on beacon light switch (6).

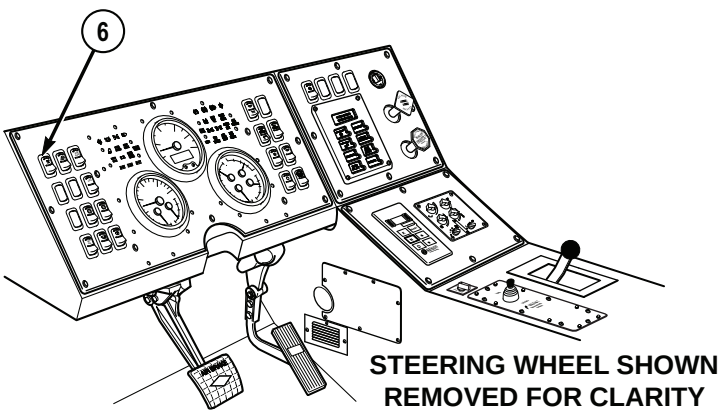


Figure 3.

11. Hookup disabled vehicle to towing vehicle (WP 0073).

PREPARATION - Continued

WARNING



Wheels on disabled vehicle must be chocked prior to disconnecting from towing vehicle. Failure to comply may result in injury or death to personnel.

12. Chock wheels of disabled vehicle prior to disconnecting towing vehicle. (WP 0036)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW HOOKUP PROCEDURES

INITIAL SETUP:

Personnel Required
Operator and Assistants (3)

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER

WARNING



The disabled PLS vehicle being towed must have no load or less load than the PLS towing vehicle. Failure to comply may result in injury or death to personnel.

WARNING



Tow bar weighs 330 lbs (150 kg). Use suitable lifting device or assistants to lift tow bar. Use extreme caution when opening coupler jaw as tow bar may jump out of coupler. Failure to comply may result in injury or death to personnel.

1. Chock wheels of disabled vehicle. (WP 0036)
2. Position legs of tow bar (1) below front access cover (5) of disabled vehicle with pin holders (6) facing up.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

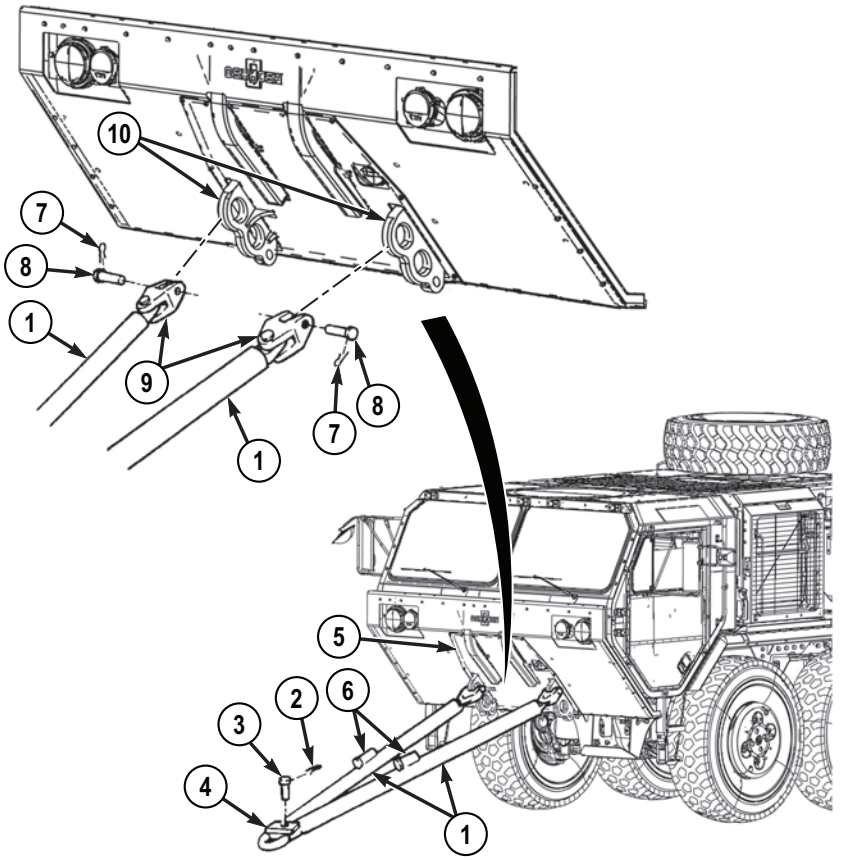


Figure 1.

3. Remove two safety pins (7) and pins (8) from pin holders (6).

WARNING



Tow bar weighs 330 lbs (150 kg). Use suitable lifting device or assistants to lift tow bar. Use extreme caution when opening coupler jaw as tow bar

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

may jump out of coupler. Failure to comply may result in injury or death to personnel.

4. With the aid of assistants, lift and hold one leg of tow bar (1) and align shackle (9) with towing eye (10).
5. Install pin (8) and safety pin (7) in towing shackle (9).
6. With the aid of assistants, lift and hold opposite leg of tow bar (1) and align shackle (9) with towing eye (10).
7. Install pin (8) and safety pin (7) in towing shackle (9).
8. Align legs of tow bar (1) at pivot point (4) and install pin (3) and safety pin (2).

NOTE

- The adapter is required when towing another PLS vehicle, M989 trailer, and the M989A1 trailer. Perform Steps (11) through (16) to install adapter.
- Adapter is not required for towing the M345 trailer.

9. With the aid of assistants, lift end of tow bar (1) approximately 16.0 in. (406.4 mm) off the ground and block using a chock block.
10. Remove adapter (11) from stowage.

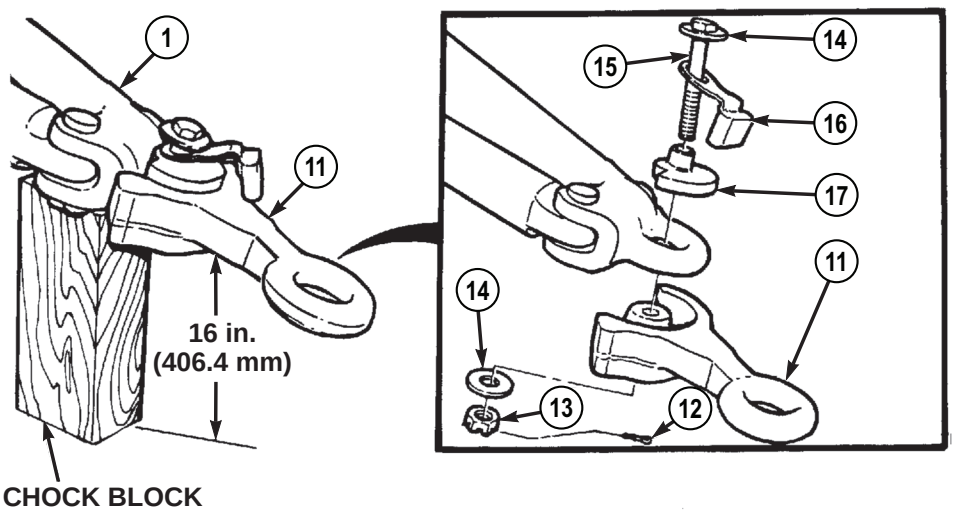


Figure 2.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

11. Remove cotter pin (12), nut (13), two washers (14), screw (15), wedge (16), and plate (17) from adapter (11).

NOTE

Wedge in Step (14) is only used for towing the M989 and M989Al trailers.

12. Position adapter (11), plate (17), and wedge (16), on tow bar (1) with two washers (14), screw (15), and nut (13).
13. Tighten nut (13) on adapter (11).
14. Install cotter pin (12) on nut (13).
15. Lift up locking gate (18) on coupler (19).

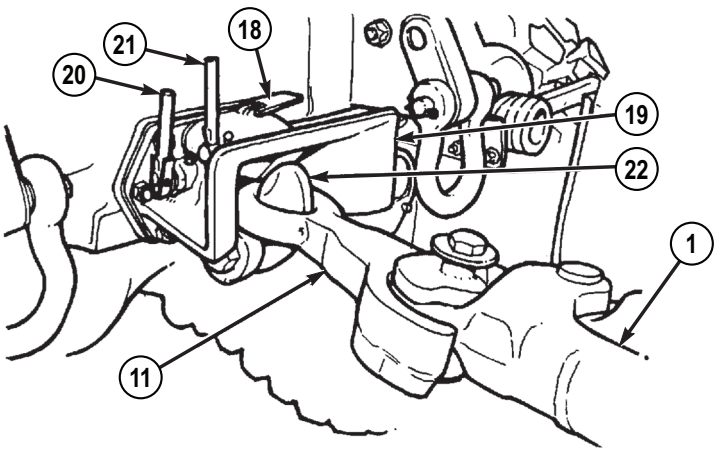


Figure 3.

WARNING



Do not put hands near coupler while aligning adapter and tow bar with coupler jaw. Failure to comply may result in injury or death to personnel.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

NOTE

- A ground guide must be used for Step (19).
- Coupler jaw will close when tow bar makes contact with coupler.

16. Pull locking lever (20) out and pull lever (21) back at same time to open coupler jaw (22).
17. With the aid of assistants, lift tow bar (1) and adapter (11) while another assistant guides towing vehicle back slowly to disabled vehicle.
18. Connect adapter (11) to coupler (19).
19. Close locking gate (18) on coupler (19).
20. Pull towing vehicle forward slightly to verify that coupler jaw (22) has locked onto adapter (11).
21. Set parking brakes (23) on towing vehicle.

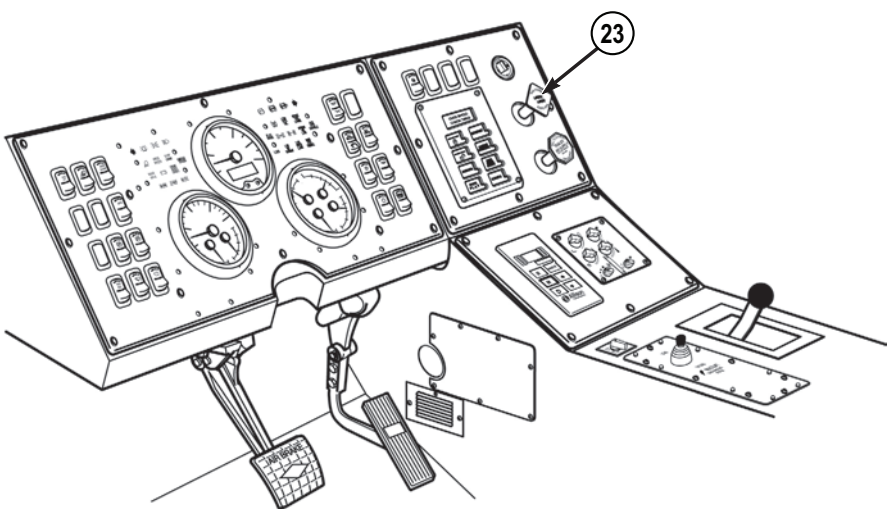


Figure 4.

22. Shut OFF engine (WP 0037) on towing vehicle.
23. Remove two safety chains (24) from stowage.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

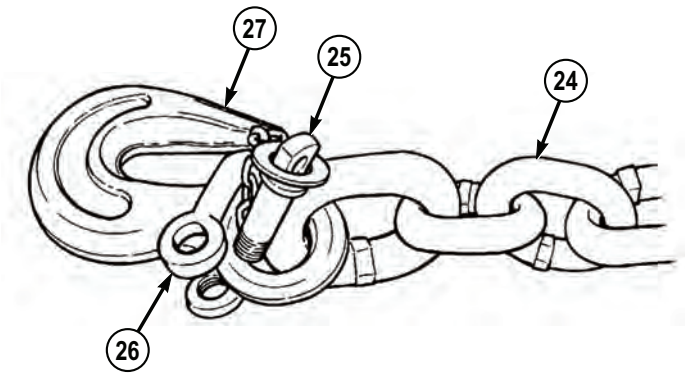


Figure 5.

24. Remove pin (25) and safety clevis (26) from hooks (27) of safety chains (24).

NOTE

- The hooks with the safety clevis must be installed on the towing vehicle's shackle.
- Adjust chain slack so chain hangs approximately 12.0 in. (304.8 mm) above the ground.

25. Route one chain (24) through right front towing shackle (28) of disabled vehicle, under tow bar (1) and through left rear towing shackle (28) of towing vehicle.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

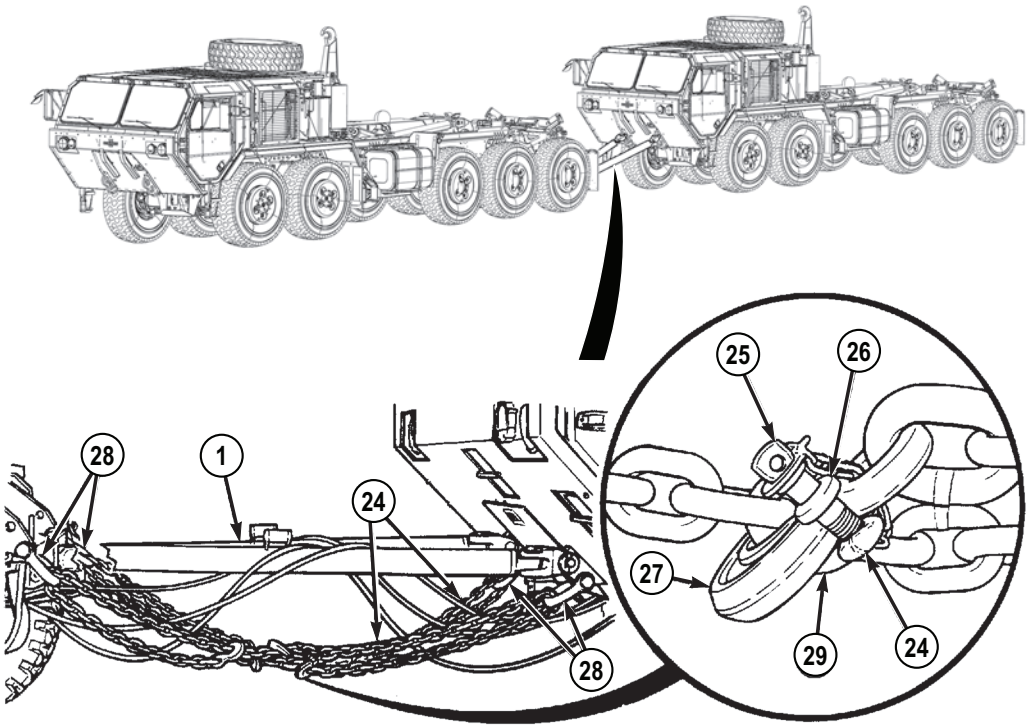


Figure 6.

26. Hook safety chain hooks (27) on links (29) of safety chain (24).
27. Route second chain (24) through left front towing shackle (28) of disabled vehicle, under tow bar (1) and through right rear towing shackle (28) of towing vehicle.
28. Hook safety chain hooks (27) on links (29) of safety chain (24).
29. Install safety clevis (26) and pin (25) to safety chain hook (27).
30. Remove trailer light cable, service air line and emergency air line from stowage.
31. Connect trailer light cable (30) to connector (31) on towing vehicle.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

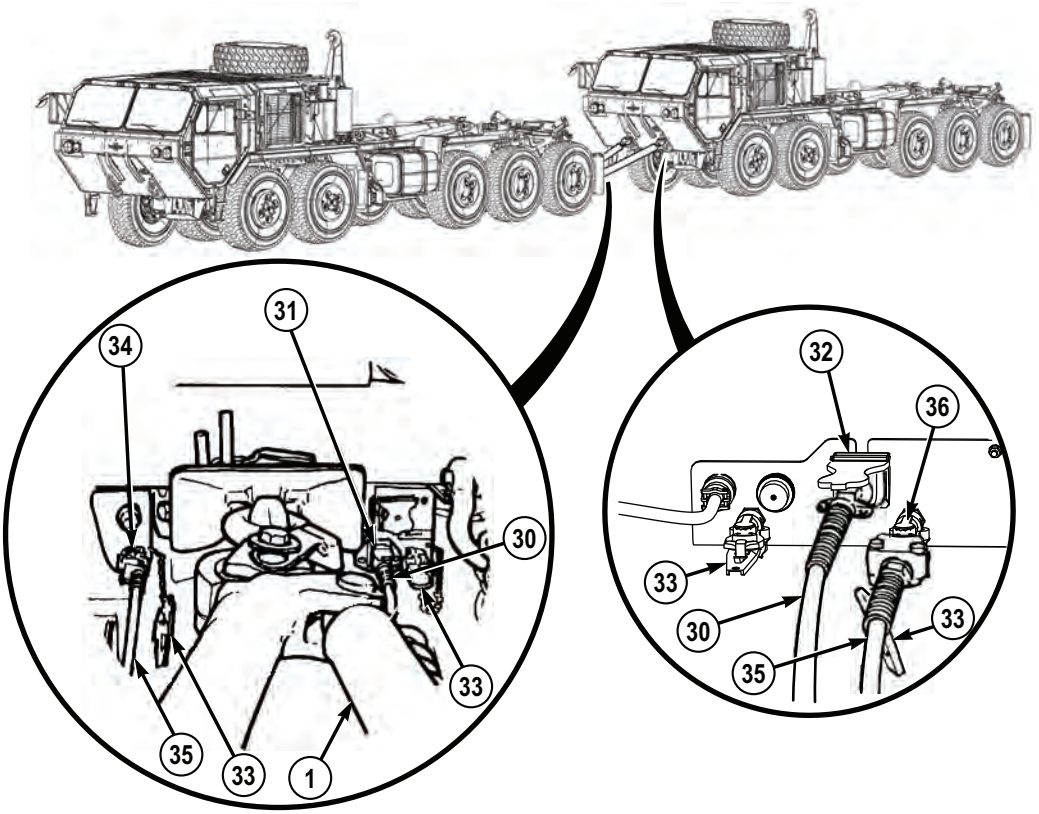


Figure 7.

32. Route trailer light cable (30) over tow bar (1) and connect to connector (32) on front of disabled vehicle.
33. Disconnect emergency dummy coupling (33) from emergency gladhand (34) on towing vehicle.
34. Connect emergency air line (35) to emergency gladhand (34) of towing vehicle.
35. Disconnect emergency dummy coupling (33) from emergency gladhand (36) at front of disabled vehicle.
36. Route emergency air line (35) over tow bar (1) and connect to emergency gladhand (36) on front of disabled vehicle.
37. Disconnect service dummy coupling (33) from service gladhand (37) on rear of towing vehicle.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

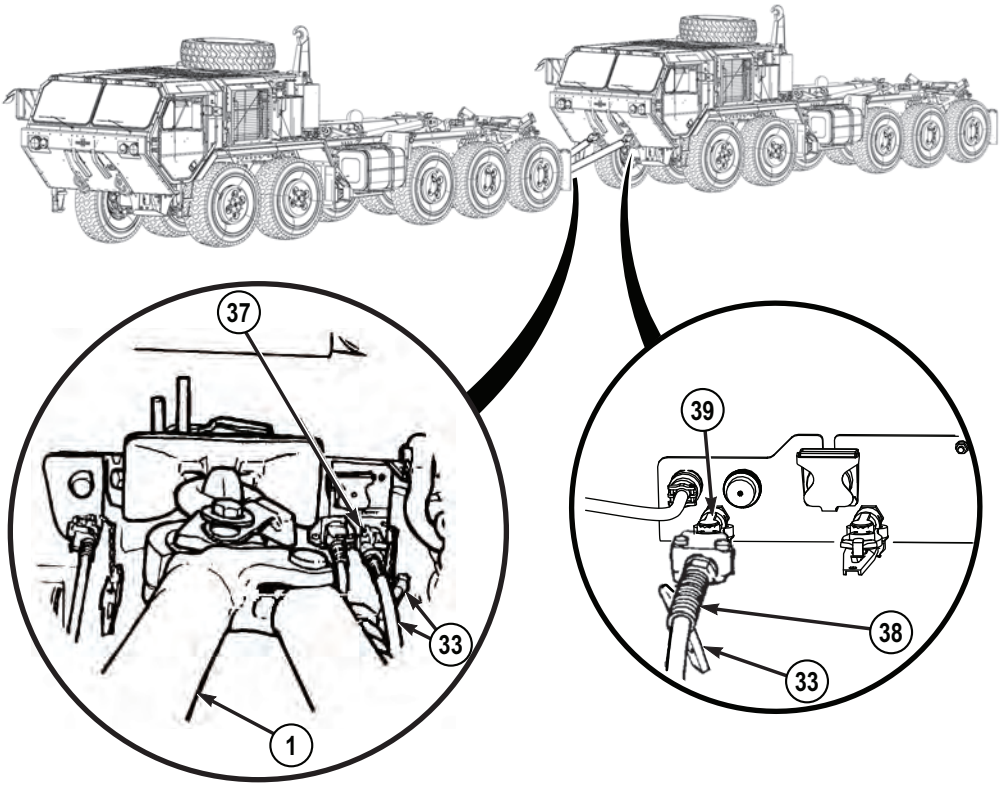


Figure 8.

38. Connect service air line (38) to service gladhand (37) at rear of towing vehicle.
39. Disconnect service dummy coupling (33) from service gladhand (39) at front of disabled vehicle.
40. Route service air line (38) over tow bar (1) and connect to service gladhand (39) on front of disabled vehicle.
41. Start engine (WP 0027) on towing vehicle.
42. Push in TRAILER AIR SUPPLY KNOB (40) on towing vehicle.

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

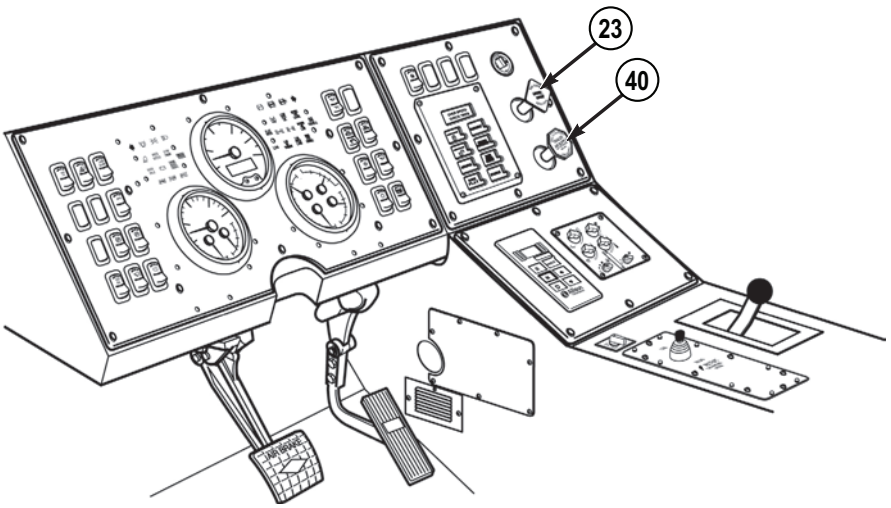


Figure 9.

43. Remove wheel chocks from disabled vehicle. (WP 0037)

WARNING



- Operation at speeds over 15 mph (24 km/h) on paved road can be achieved when the Operator determines that the disabled vehicle being towed has braking capability and the terrain allow safe operation. Under these conditions, speeds over 35 mph (56 km/h) will not be allowed. Excessive speed can cause damage to disabled vehicle. Failure to comply may result in injury or death to personnel.
- When towed disabled vehicle does not have braking capability, stopping distances will increase greatly. Do not exceed 25 mph (40 km/h) on paved surfaces. Failure to comply may result in injury or death to personnel.
- Extreme caution must be used when towing PLS off road. Side slopes and steep grades can cause loss of control resulting in injury or death. Under these conditions, speeds over 15 mph (24 km/h) will not be

TOW HOOKUP PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

allowed. Excessive speed can cause damage to disabled vehicle. Failure to comply may result in injury or death to personnel.

44. Transport disabled vehicle.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER

1. Park towing vehicle (WP 0036).
2. Pull out TRAILER AIR SUPPLY knob (40) on towing vehicle.

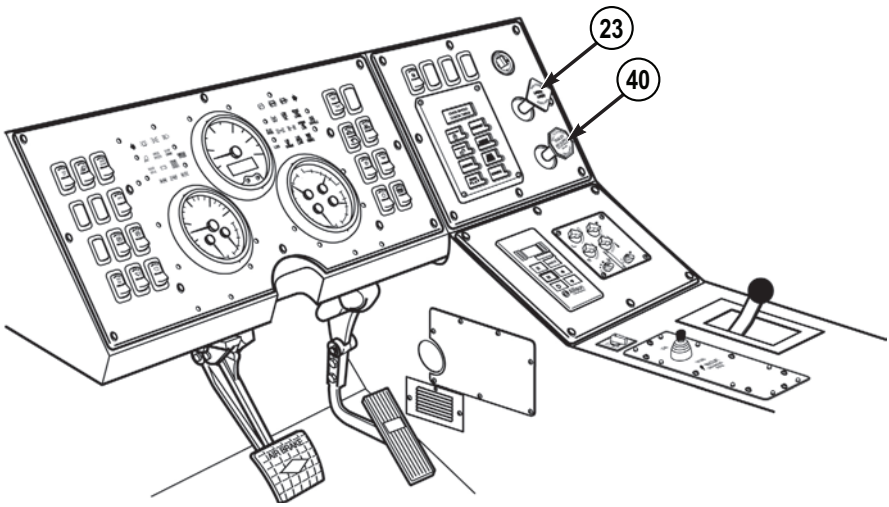


Figure 10.

3. Apply parking brake (23) on disabled vehicle.
4. Chock wheels of disabled vehicle. (WP 0036)
5. Disconnect service air line (38) from service gladhand (39) on disabled vehicle.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

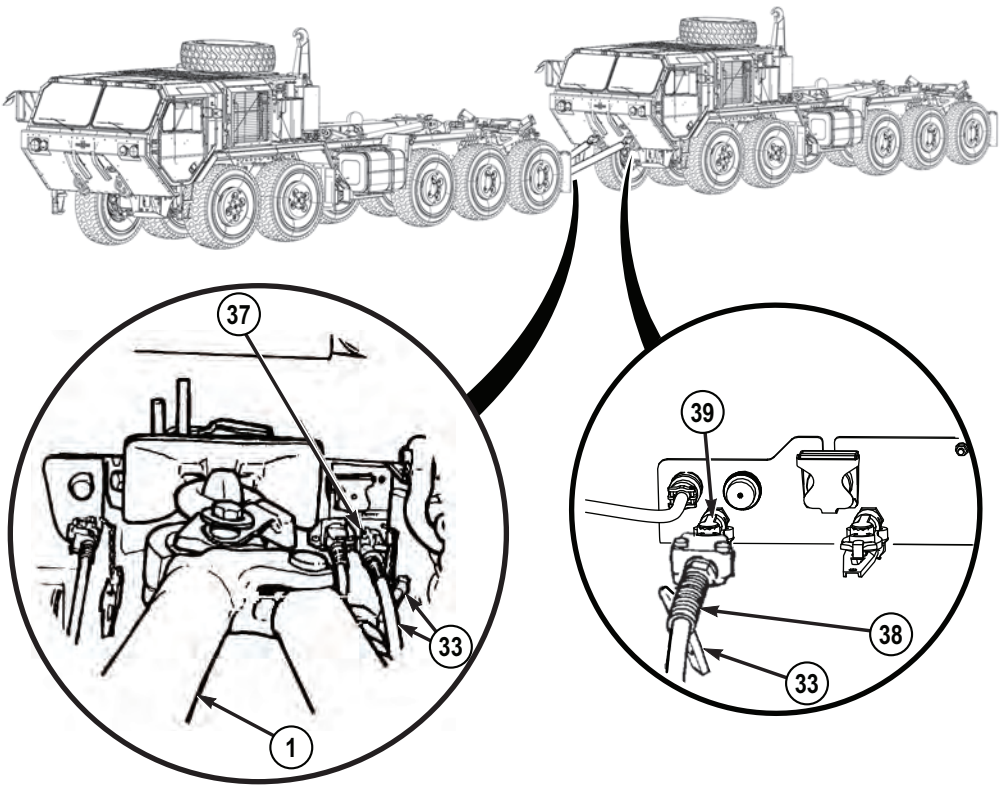


Figure 11.

6. Connect service dummy coupling (33) on service gladhand (39) of disabled vehicle.
7. Disconnect service air line (38) from service gladhand (37) of towing vehicle and return to stowage.
8. Connect service dummy coupling (33) on service gladhand (37) on towing vehicle.
9. Disconnect emergency air line (35) from emergency gladhand (36) on disabled vehicle.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

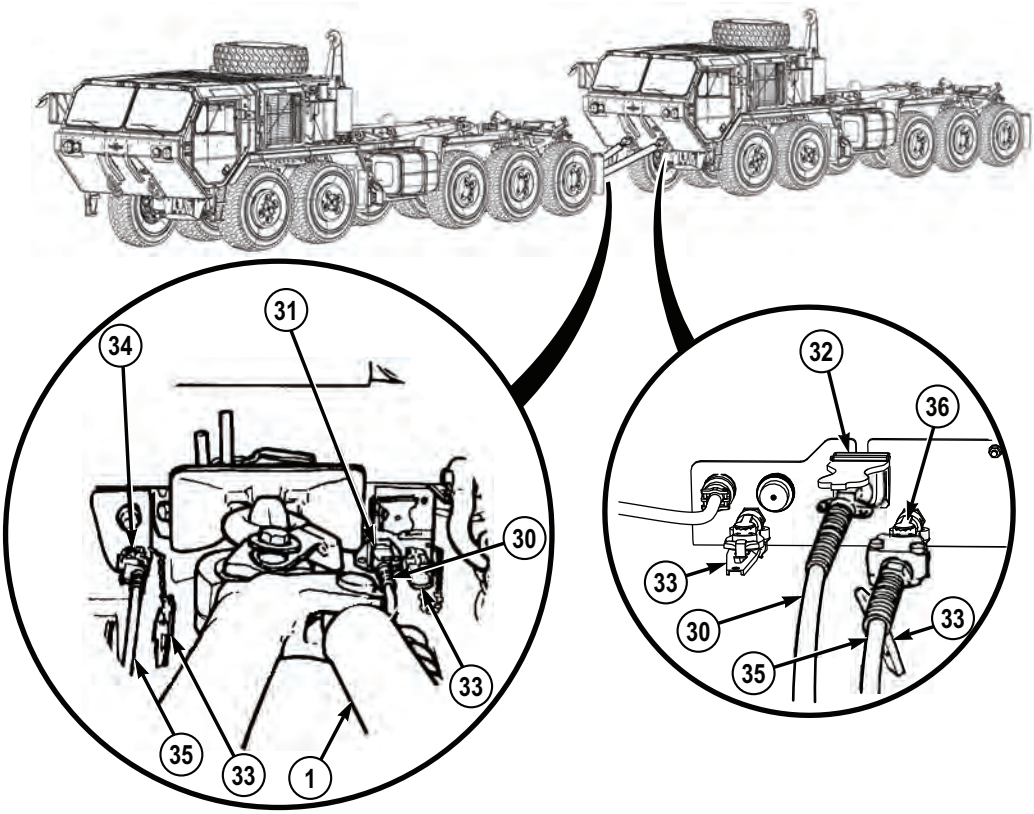


Figure 12.

10. Connect emergency dummy coupling (33) on emergency gladhand (36) of disabled vehicle.
11. Disconnect emergency airline (35) from emergency gladhand (34) of towing vehicle and return to stowage.
12. Connect emergency dummy coupling (33) on emergency gladhand (34) on towing vehicle.
13. Disconnect trailer light cable (30) from connector (32) on disabled vehicle.
14. Disconnect trailer light cable (30) from connector (31) on towing vehicle and return to stowage.
15. Remove pins (25) and safety clevises (26) from chain hooks (27).

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

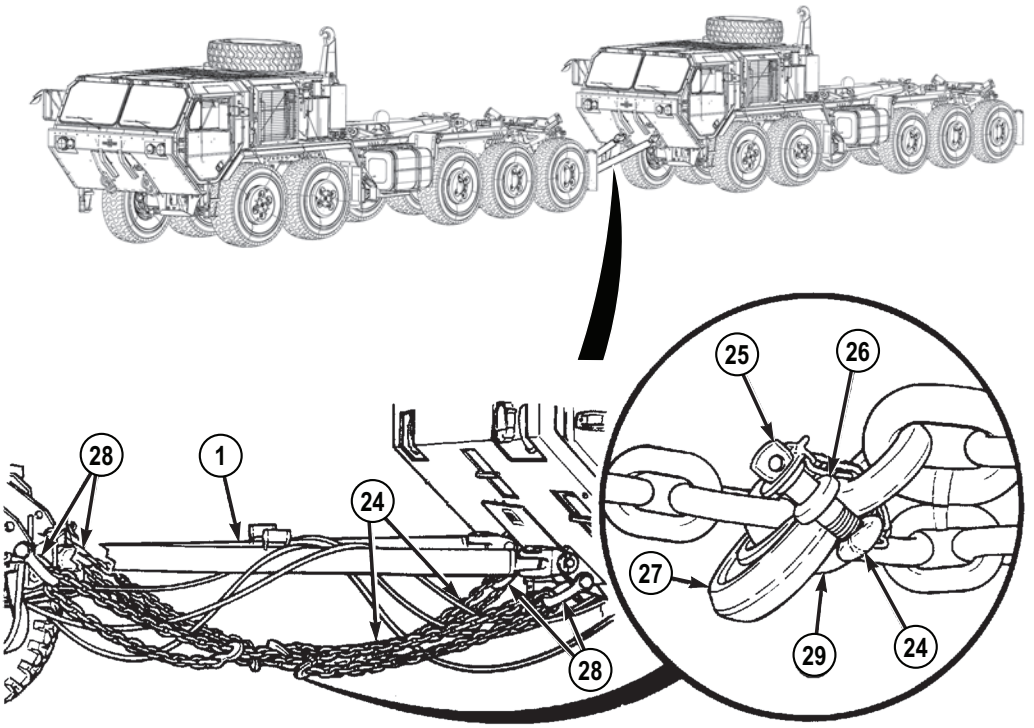


Figure 13.

16. Remove safety chain hooks (27) from links (29) of safety chains (24).
17. Remove one safety chain (24) from right towing shackle (28) of disabled vehicle and from left towing shackle (28) of towing vehicle.
18. Remove second safety chain (24) from left towing shackle (28) of disabled vehicle and from right towing shackle (28) of towing vehicle.
19. Install pins (25) and safety clevises (26) to chain hooks (27).
20. Return two safety chains (24) to stowage.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

WARNING



Tow bar weighs 330 lbs (150 kg). Use suitable lifting device or assistants to lift tow bar. Use extreme caution when opening coupler jaw as tow bar may jump out of coupler. Failure to comply may result in injury or death to personnel.

21. Open locking gate (18) on coupler (19).

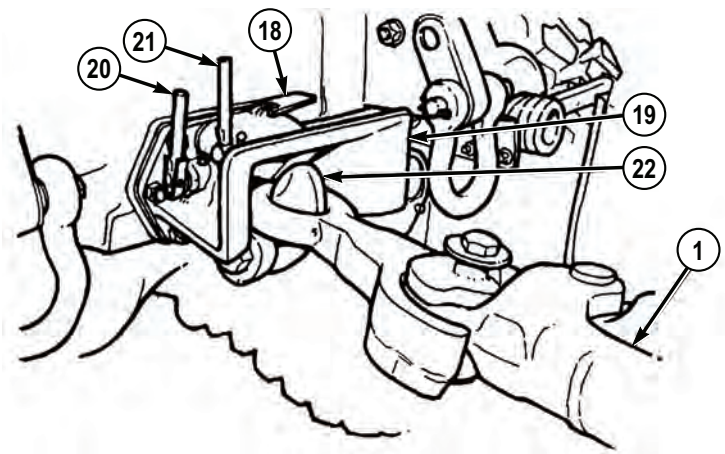


Figure 14.

22. Pull locking lever (20) out and pull lever (21) back at the same time to open coupler jaw (22).
23. Slowly pull towing vehicle forward until tow bar (1) drops from coupler (19).
24. Push up on coupler jaw (22) to close coupler (19).
25. Close locking gate (18) on coupler (19).

NOTE

Perform Steps (26) through (30) if adapter was installed.

26. With the aid of assistants, lift end of tow bar (1) approximately 16.0 in. (406.4 mm) off the ground and block using a chock block.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

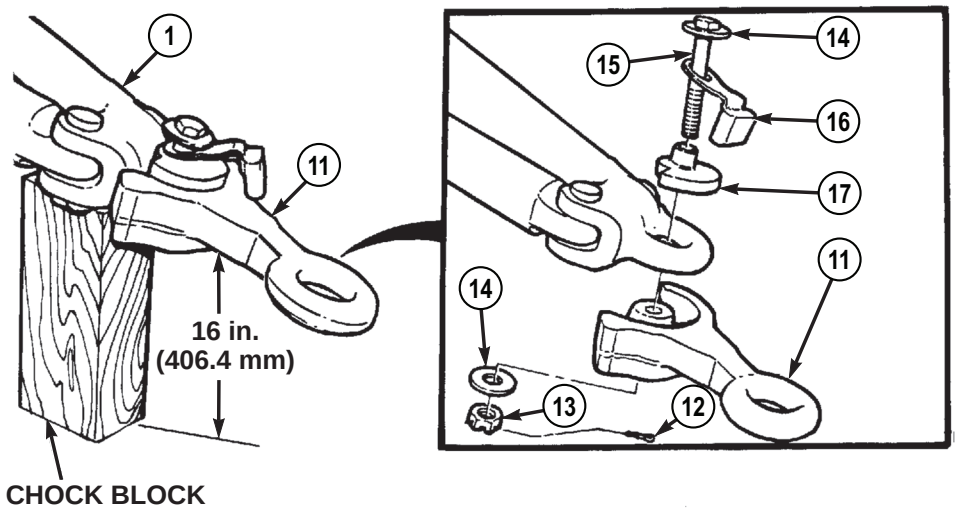


Figure 15.

NOTE

Wedge in Step (27) is only used for towing M989 and M989Al trailers.

27. Remove cotter pin (12), nut (13), two washers (14), screw (15), wedge (16), and plate (17) from adapter (11).
28. Remove adapter (11) from tow bar (1).
29. Install plate (17) and wedge (16) on adapter (11) with two washers (14), screw (15), nut (13), and cotter pin (12).
30. Stow adapter (11).

WARNING



Tow bar weighs 330 lbs (150 kg). Use suitable lifting device or assistants to lift tow bar. Use extreme caution when opening coupler jaw as tow bar may jump out of coupler. Failure to comply may result in injury or death to personnel.

TOW DISCONNECT PROCEDURES WHEN TOWING ANOTHER PLS VEHICLE OR AN M345, M989, OR M989A1 TRAILER - Continued

31. Remove safety pin (2), pin (3), and separate tow bar (1) at pivot point (4).

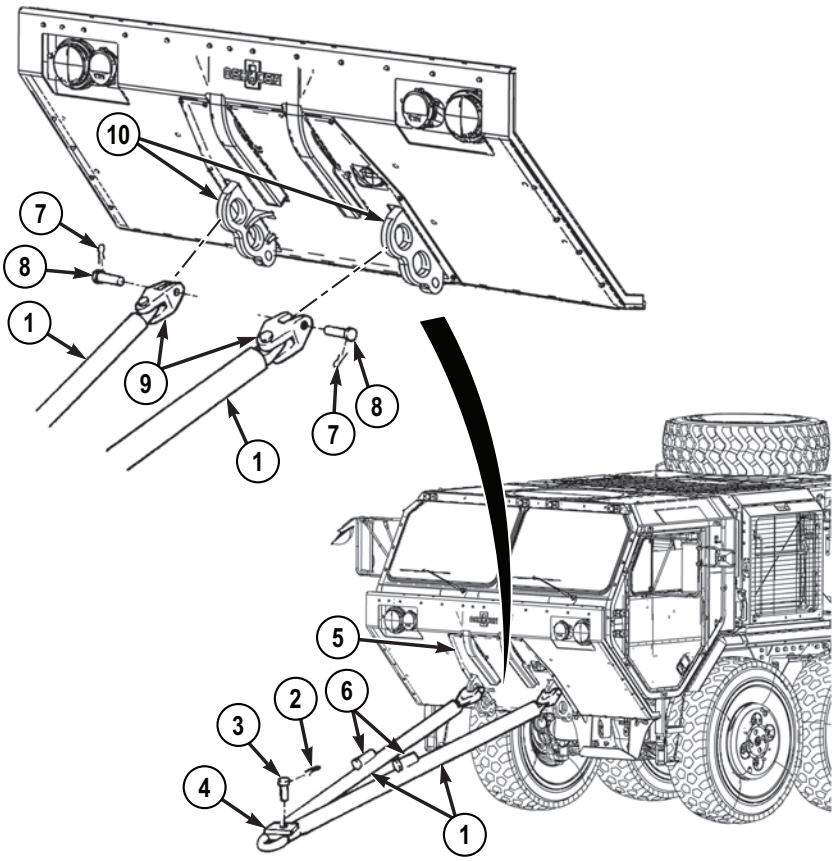


Figure 16.

32. With the aid of assistants, hold one leg of tow bar (1) and remove safety pin (7), pin (8), and tow bar shackle (9) from towing eye (10).
33. With the aid of assistants, hold the other leg of tow bar (1) and remove safety pin (7), pin (8), and tow bar shackle (9) from towing eye (10).
34. Install two pins (8) and safety pins (7) on pin holders (6).
35. Align legs of tow bar (1) at pivot point (4) and install pin (3) and safety pin (2).
36. Stow tow bar (1).

MANUALLY RELEASE AND SET SPRING BRAKES (BRAKE CHAMBERS)

WARNING



Ensure vehicle is parked on level ground and/or wheels are chocked before releasing spring brakes manually. Failure to comply may result in injury or death to personnel.

1. Turn caging screw (1) clockwise.

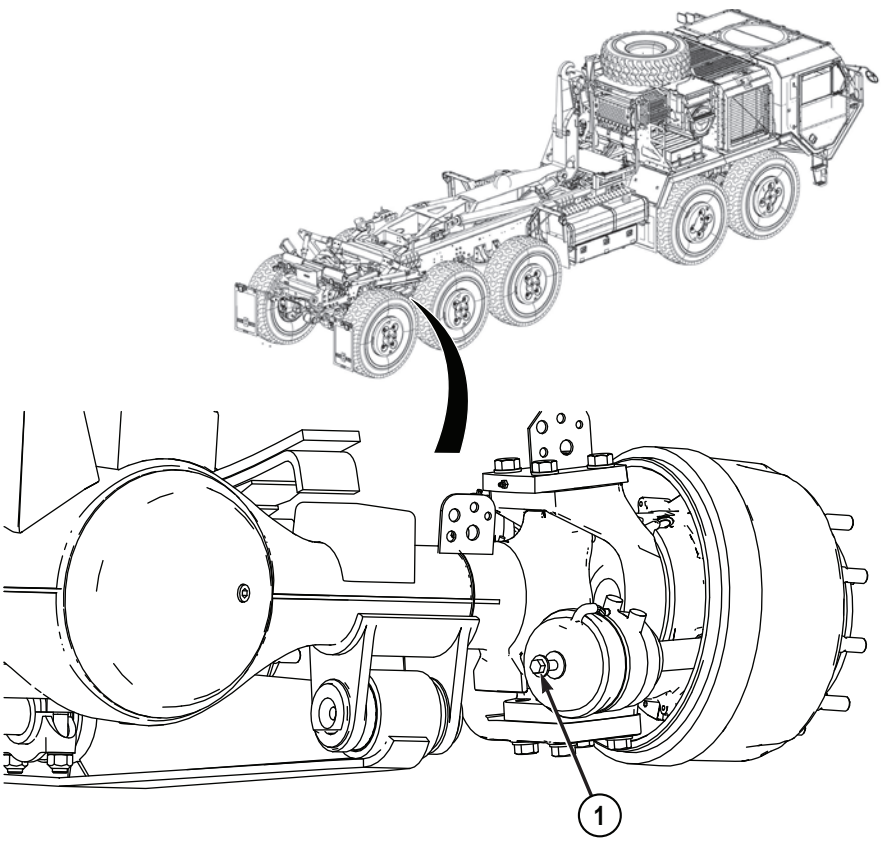


Figure 17.

MANUALLY RELEASE AND SET SPRING BRAKES (BRAKE CHAMBERS) - Continued

NOTE

Brake is fully released when screw stops turning.

2. The procedure for setting the brakes is as follows:

NOTE

Brake is fully set when screw stops turning.

Turn caging screw (1) counterclockwise.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SECURE VEHICLE

INITIAL SETUP:

Not Applicable

LOCK VEHICLE

1. Remove lock (1) from stowage bracket (2) and locking pin (3).

LOCK VEHICLE - Continued

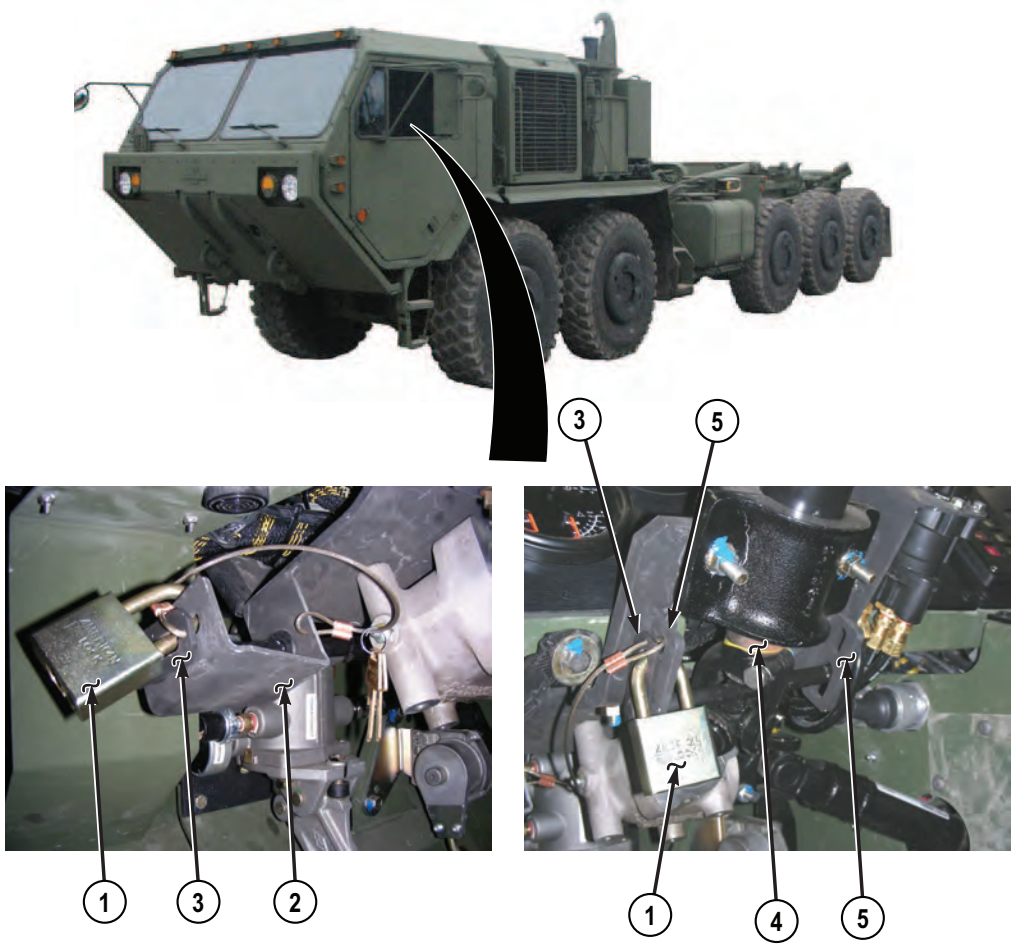


Figure 1.

2. Rotate steering column (4) until locking pin (3) can slide directly through steering column (4).
3. Rotate locking bracket (5) upwards until lock can be installed through locking gate.
4. Secure lock (1).

END OF TASK

UNLOCK VEHICLE

1. Unlock lock (1).

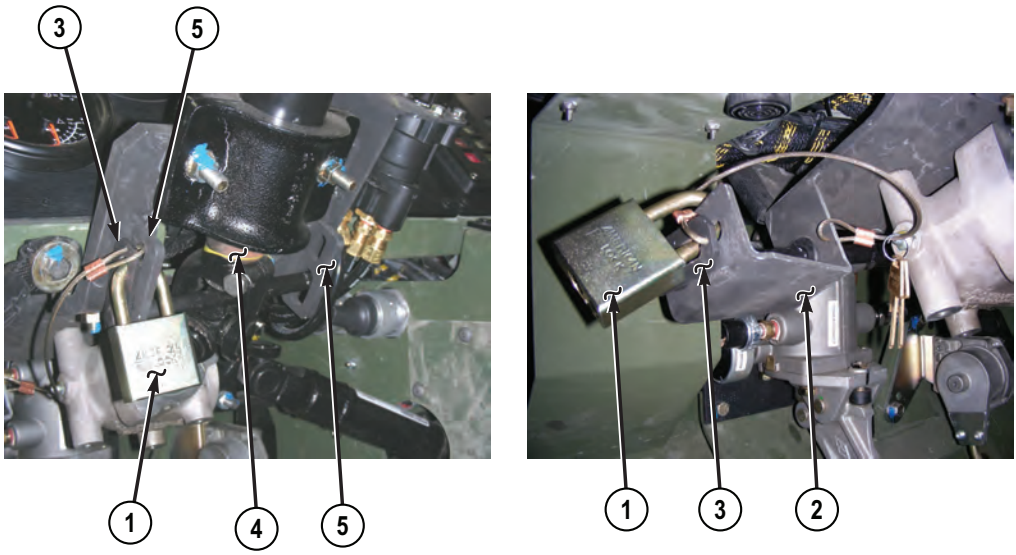


Figure 2.

2. Remove lock (1) from locking pin (3) and locking bracket (5) on steering column (4).
3. Install lock (1) through locking pin (3) and stowage bracket (2).
4. Secure lock (1).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C)

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C)

WARNING



Do not touch extremely cold metal (below -26°F, -32°C to -65°F, -54°C). Bare skin may freeze to cold metal. Failure to comply may result in injury or death to personnel.

CAUTION

- Before operating vehicle in extreme cold environment, ensure engine arctic kit is installed and vehicle has been prepared as described in FM 9-207 (Volume 2, WP 0146). Refer to FM 31-70 (Volume 2, WP 0146), FM 31-71 (Volume 2, WP 0146), and FM 21-305 (Volume 2, WP 0146) for additional information on operations in extreme cold environment.
- Watch instrument panel closely. If any unusual readings occur, stop vehicle and shut off engine. Check engine immediately. Failure to comply may result in damage to equipment.
- Park in shelter when possible. If shelter is not available, park so vehicle does not face into wind. Place planks or brush under wheels so vehicle will not freeze in place.
- Fuel filter should be drained 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 system.

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C) - Continued

- All snow and ice should be removed from vehicle as soon as possible. Snow and ice may slow or stop movement of critical parts if allowed to pile up. Failure to comply may result in damage to equipment.
- Special care must be used during operations in extreme cold environment. In extreme cold, engine coolant and fluid in windshield washer can freeze. Batteries can freeze and crack. Oil and grease may get thick and stiff. Rubber and metal parts may crack or become brittle and break easily.
- Proper component lubrication (Volume 2, WP 0149) is a must for extreme cold operation.

1. Install tire chains (WP 0069) (as needed).
2. Start engine (WP 0027) and allow engine to warm up thoroughly.

NOTE

Positioning TRANSFER CASE shift lever to LO automatically activates 10X10 drive.

3. Set TRANSFER CASE shift lever (1) to LO. 10X10 DRIVE indicator (2) will illuminate.

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C) - Continued

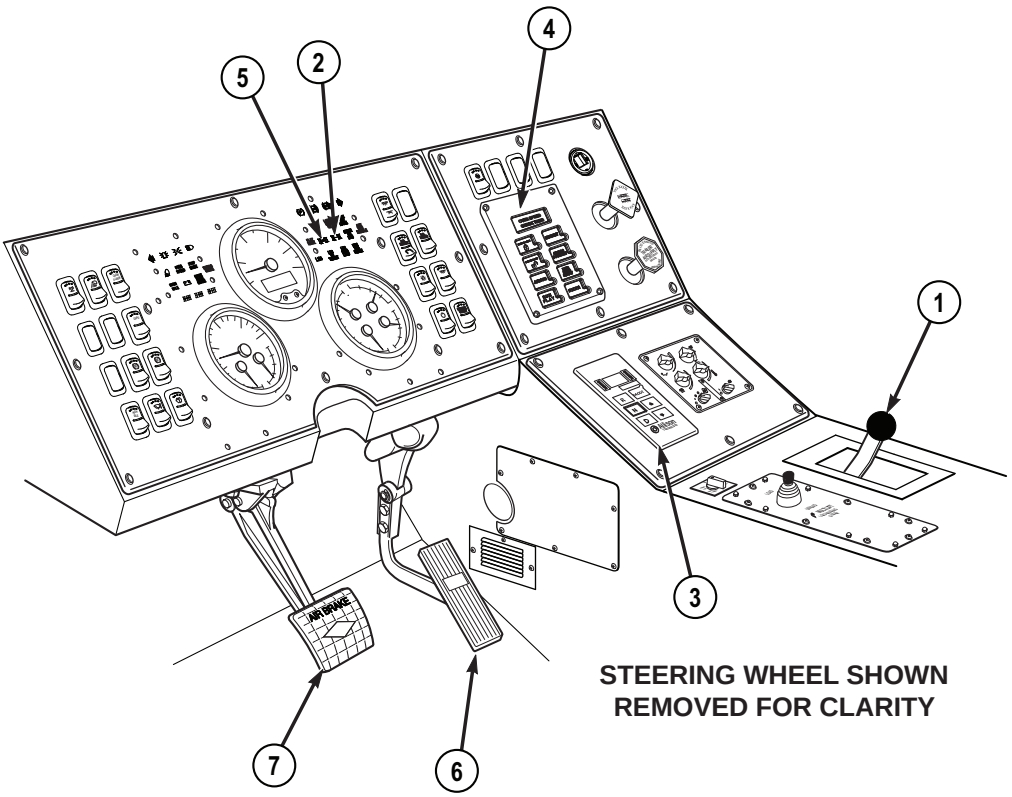


Figure 1.

4. Set transmission range selector (3) to 1 (1st gear range) and drive at lowest possible speed to warm driveline components and tires.

5. Drive on mud, snow, ice, and slippery surfaces as follows:

NOTE

- CTIS/differential lock should be set to 10X10 when transfer case shift lever is set to HI range while driving on slippery surfaces.
- Positioning TRANSFER CASE shift lever to LO automatically activates 10X10 drive.

a. Set TRANSFER CASE shift lever (1) to LO for added traction. 10X10 DRIVE indicator (2) will illuminate.

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C) - Continued

NOTE

CTIS/differential lock should be set to INTER AXLE when transfer case shift lever is set to LO range while driving on slippery surfaces.

b. Set CTIS/differential lock (4) to INTER AXLE (when LO range is used - recommended) or 10X10 (if HI range is required), as needed, when driving on slippery surfaces. INTER-AXLE LOCK indicator (5) and/or 10X10 DRIVE indicator (2) will illuminate as applicable.

c. Press throttle pedal (6) slowly when changing speed.

d. Keep throttle pedal (6) steady after vehicle reaches desired speed.

e. Turn vehicle slowly when on slippery surfaces.

f. Steer vehicle away from ruts and large snowbanks.

g. Steer vehicle straight up and down hills if possible.

h. Use gear range 2 (2nd) or 3 (3rd) to go down medium grades.

i. Use gear range 1 (1st) to go down steep or very slippery grades.

j. Drive at slower speeds and stay back twice normal distance from vehicle ahead.

k. Signal turns sooner than normal to give vehicles behind ample time to safely slow down.

WARNING



Do not use engine brake when vehicle is on slippery surface. If engine brake is used incorrectly, vehicle may skid out of control. Failure to comply may result in injury or death to personnel.

NOTE

Pressing service brake pedal lightly will help keep vehicle from skidding.

l. Apply brakes sooner, and press service brake pedal (7) lightly to give early warning that vehicle will slow or stop.

m. Downshift, if necessary, when slowing or stopping vehicle on slick surfaces.

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C) - Continued

n. Keep windshield, windows, mirrors, headlights, stoplights, and marker lights clean and free of snow and ice. Use defroster and windshield wipers to keep windshield free of snow and ice.

o. Drive slowly and test brakes after driving through slush or water. If brakes slip, do the following:

(1) Continue to drive slowly.

(2) Apply moderate pressure on service brake pedal (7) to cause slight brake drag.

(3) When brakes are dry and no longer slip, release service brake pedal (7).

(4) Resume normal driving speed for conditions.

p. If fully necessary for better traction, lower vehicle tire pressure to emergency air pressure limit:

(1) Make sure each tire has a valve cap.

(2) Drive at low speed when tire pressures are reduced.

q. If rear of vehicle skids, do the following:

(1) Ease up on throttle pedal (6).

(2) Steer in same direction that vehicle is skidding.

(3) When vehicle is under control, lightly apply service brake pedal (7).

(4) Steer vehicle on a straight course and slowly apply throttle pedal (6).

r. If vehicle starts to slide while climbing a grade, do the following:

(1) Ease up on throttle pedal (6).

(2) Steer in same direction that vehicle is skidding.

(3) Slowly apply throttle pedal (6) and steer vehicle on a straight course.

s. If vehicle becomes stuck, do the following:

(1) Shovel a clear path ahead of each tire.

(2) Put boards, brush, or similar material in cleared paths to get better traction.

(3) If vehicle remains stuck, use another vehicle to winch or tow stuck vehicle clear.

6. Park vehicle (WP 0036) as follows:

OPERATE VEHICLE IN COLD ENVIRONMENT+45°F TO -25°F (+7°C TO -32°C) - Continued

NOTE

If no shelter is available, park vehicle so it does not face into the wind. Vehicle facing opposite of the direction of the wind is optimal.

a. Park vehicle in sheltered area, out of wind if possible.

NOTE

If no high, dry ground is available, spread out planks, brush, etc., to create a raised area so that vehicle tires will not freeze in snow, water, ice, or mud.

b. Park vehicle on high, dry ground if possible.

c. Park vehicle on level ground so vehicle body does not twist.

d. Leave transfer case shift lever (1) in LO.

CAUTION

Do not hit axle breathers when cleaning mud, snow, and ice from axles. Failure to comply may result in damage to equipment.

7. Clean snow, ice, and mud off vehicle as soon as possible.
8. Clean mud, snow, and ice from wheels, brakes, axles, universal joints, mirrors, steering mechanism, and radiator as soon as possible.
9. Ensure axle breather vent caps move freely on breather body.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
EMERGENCY PROCEDURES

INITIAL SETUP:

Personnel Required
Operator and Assistant (2)

SLAVE START VEHICLE

CAUTION

Ensure CTIS On/Off switch is in the OFF position and the LHS selector switch is in the OFF position on both vehicles while performing the slave starting procedure. Failure to comply may result in damage to equipment.

NOTE

Slave starting is a two person task.

1. Start vehicle A (WP 0027).
2. Move vehicle A into position beside vehicle B so slave receptacles (1) on both vehicles are side-by-side.

SLAVE START VEHICLE - Continued

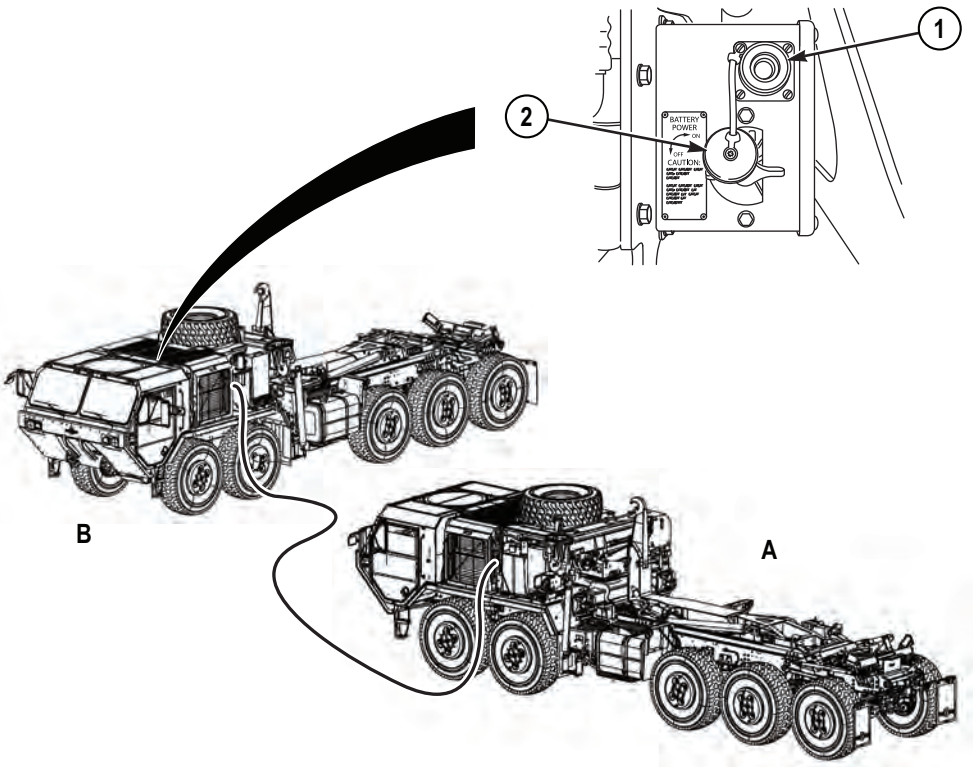


Figure 1.

3. Park vehicle A (WP 0036).
4. Shut OFF vehicle A (WP 0037).
5. Remove caps (2) from slave receptacles (1) on vehicles A and B.

WARNING



Remove all jewelry such as rings, ID tags, bracelets, etc. prior to working on or around vehicle. Jewelry and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

SLAVE START VEHICLE - Continued

WARNING



Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Wear rubber apron to prevent clothing from being damaged. Failure to comply may result in injury or death to personnel.

CAUTION

Ensure connectors and receptacles are free of dirt, sand, and debris. Failure to comply may result in damage to equipment.

6. Plug NATO slave cable connectors (3) into slave receptacles (1) on vehicles A and B.

SLAVE START VEHICLE - Continued

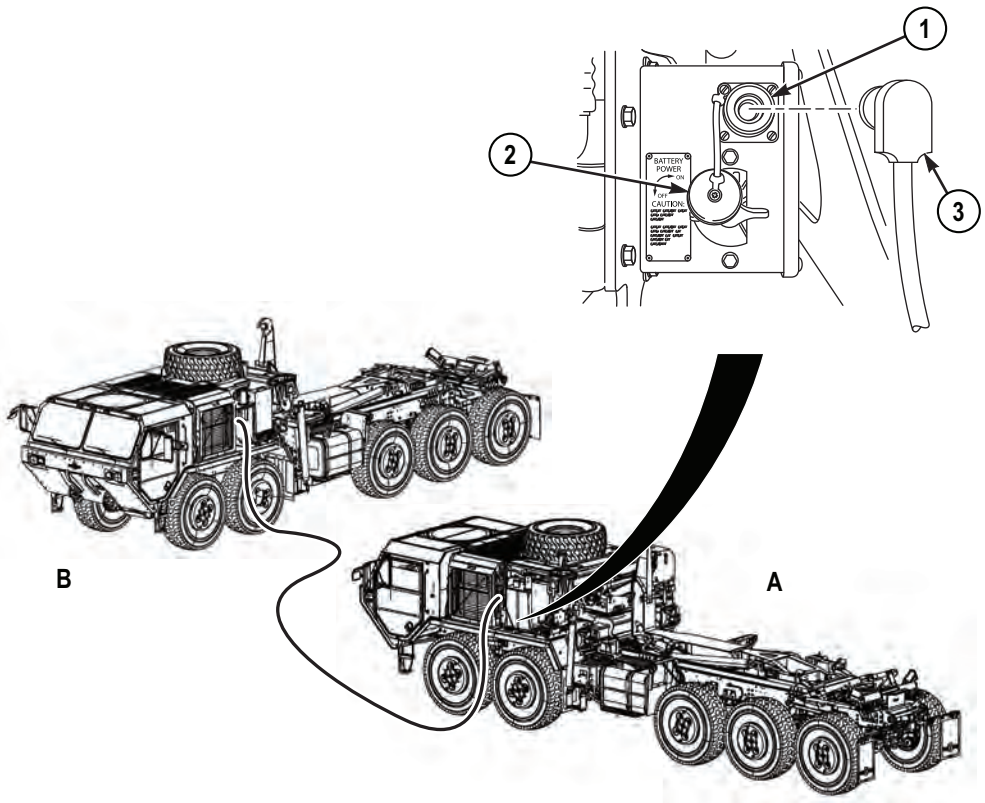


Figure 2.

7. Start vehicle A (WP 0027).
8. Operate vehicle A at more than 1,000 rpm while attempting to start vehicle B engine (WP 0027).
9. When engine is running smoothly, remove NATO slave cable connectors (3) from slave receptacles (1) on vehicles A and B.
10. Install caps (2) on slave receptacles (1) of both vehicles.
11. Move and park vehicle A (WP 0036).
12. Shut OFF vehicle A (WP 0037).

END OF TASK

LOSING AIR SYSTEM PRESSURE

1. If brake system failure (LOW AIR) indicator (1) illuminates and warning buzzer sounds while driving vehicle, check both FRONT (2) and REAR (3) air pressure gauges.

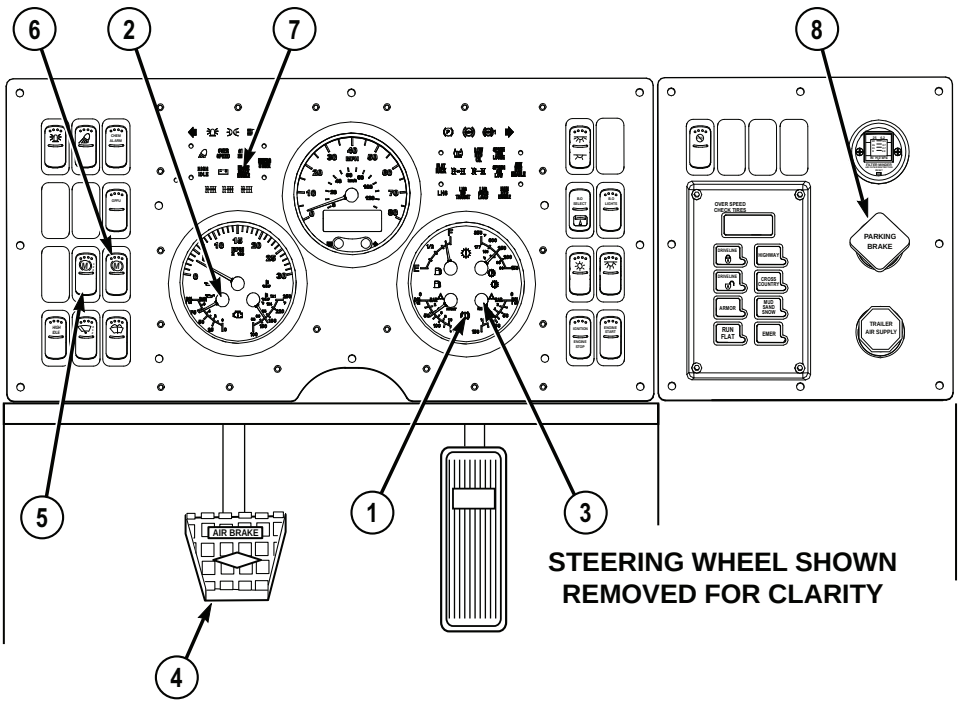


Figure 3.

NOTE

If both FRONT and REAR air pressure gauges read zero, skip to Step (4).

2. If REAR air pressure gauge (3) reads zero and FRONT air pressure gauge (2) reads normal air pressure of 100 to 130 psi (7 to 9 bar), complete the following:

   a. Continue operation of vehicle. Brakes on all eight wheels and trailer (if applicable) will operate.

   b. Notify Field Maintenance as soon as possible.

WARNING

When REAR air pressure gauge reads zero, vehicle braking capability is greatly reduced. Extra care must be taken to avoid collision. Failure to comply may result in injury or death to personnel.

LOSING AIR SYSTEM PRESSURE - Continued

NOTE

If both FRONT and REAR air pressure gauges read zero, skip to Step (4).

3. If FRONT air pressure gauge (2) is at zero and REAR air pressure gauge (3) shows normal air pressure of 100 to 130 psi (7 to 9 bar), complete the following:

   Continue operation of vehicle. Brakes on No. 3 and No. 4 axles and trailer (if applicable) will operate. Use caution, and comply with the following:

   (1) Leave additional distance between vehicles.

   (2) Apply service brake pedal (4) earlier than usual when slowing vehicle.

   (3) Downshift as necessary when slowing vehicle.

WARNING



Do not use engine brake when vehicle is on slippery surface. If engine brake is used incorrectly, vehicle may skid out of control. Failure to comply may result in injury or death to personnel.

   (4) If necessary to slow vehicle, set engine brake high/medium/low switch (5) to low position and set engine brake On/Off switch (6) to ON. ENGINE BRAKE ENABLE indicator (7) will illuminate.

   (5) Notify Field Maintenance as soon as possible.

4. If both FRONT (2) and REAR (3) air pressure gauges read zero, complete the following:

   a. Look for a place to stop vehicle without blocking other traffic.

   b. Downshift as needed to control vehicle speed until place is found to stop.

WARNING

Use of service brake pedal will not slow or stop vehicle when both FRONT and REAR air pressure gauges read zero. Use the following procedure to safely stop vehicle after loss of air pressure. Failure to comply may result in injury or death to personnel.

LOSING AIR SYSTEM PRESSURE - Continued

NOTE

- When spring brakes are applied, vehicle will stop quickly. Vehicle cannot be driven again until malfunction is repaired and there is enough air supply for operation of service brakes.
- Dashboard parking brake indicator will illuminate when PARKING BRAKE control is applied.

c. When suitable area is found to stop vehicle, pull out PARKING BRAKE control (8) to apply spring brakes on four rear wheels.

d. Notify Field Maintenance.

END OF TASK

CRANE EMERGENCY PROCEDURES

CAUTION

Do not try to operate any electrical equipment on vehicle or crane if electrical failure has occurred. Damage to equipment could result.

Crane emergency operations with electrical failure:

NOTE

- This procedure will provide emergency hydraulic power to lower crane and load when electrical power has failed.
- Failure of hydraulic system will stop operation of any crane, winch or hydraulic motor on vehicle. All cranes and winches are equipped with automatic locking mechanisms to hold cranes and winches in position they were in before hydraulics failed.

a. Twist and pull out MHC main hydraulic override valve (1). Remove safety wire (2) and push in and hold MHC hydraulic system manual override button (3). Retain safety wire for reinstallation.

CRANE EMERGENCY PROCEDURES - Continued

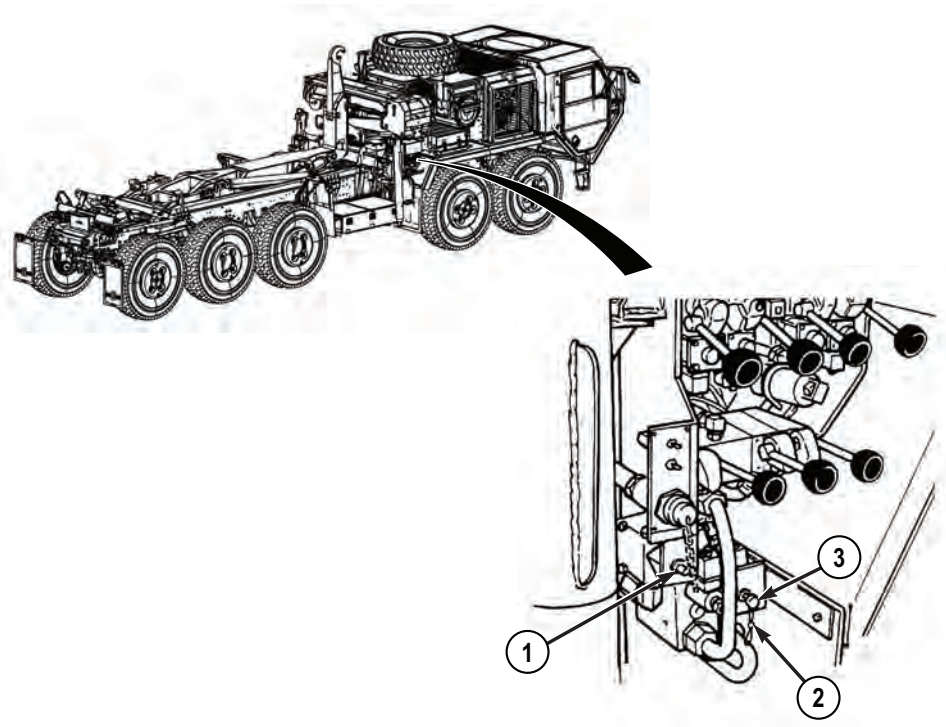


Figure 4.

b. Stow crane (WP 0054).

c. Notify Field Maintenance.

END OF TASK

CRANE EMERGENCY OPERATION WITH HYDRAULIC FAILURE

NOTE

This is a two person task. One person operates hand pump while other person operates manual controls.

1. Remove pump handle (1) from stowage box.

CRANE EMERGENCY OPERATION WITH HYDRAULIC FAILURE - Continued

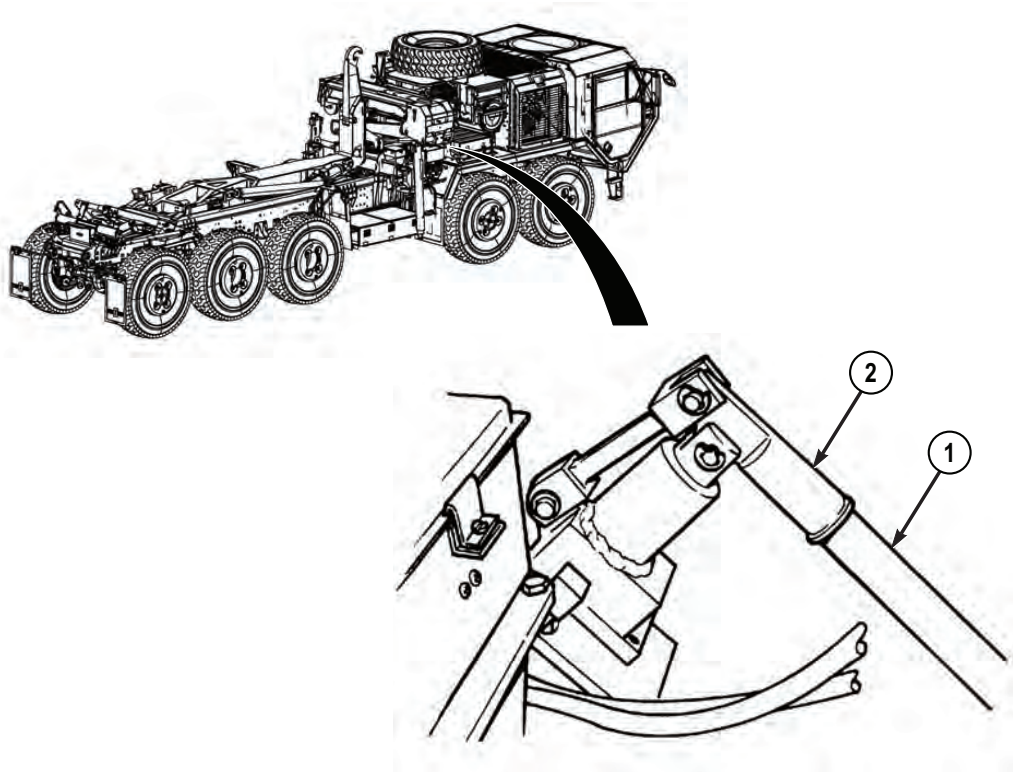


Figure 5.

2. Install pump handle (1) on hand pump (2).

NOTE

- This procedure can only be done with manual controls.
- Crane functions will operate very slowly.

3. Operate pump handle (1) with steady up and down pressure while assistant operates crane controls until crane is in proper position.
4. Remove pump handle (1) and put in stowage box.
5. Stow crane (WP 0054).
6. Notify Field Maintenance.

END OF TASK

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY

CAUTION

If LHS system on disabled vehicle is not in fully stowed (transport position), hydraulic tank cap from operable vehicle should be removed prior to starting the task to allow excess hydraulic oil to enter tank. Failure to comply may result in damage to hydraulic tank or hydraulic system.

NOTE

- This procedure can only be used if there are no leaks or breaks in the hydraulic system.
- This procedure is used to remove the load from a PLS vehicle with a failed hydraulic pump or other failure which prevents operation of the hydraulic system.
- Each PLS A1 vehicle is equipped with one hydraulic slave hose, one straight adapter, and two 45 degree adapters. Each PLS Base vehicle is equipped with one hydraulic slave hose. Two hoses and two 45 degree adapters are required to perform slave hydraulics. Remove hoses and 45 degree adapters from stowage boxes of both vehicles.

1. Move operable vehicle (1) into position with disabled vehicle (2) so that LHS control box (3) on both vehicles are side-by-side.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

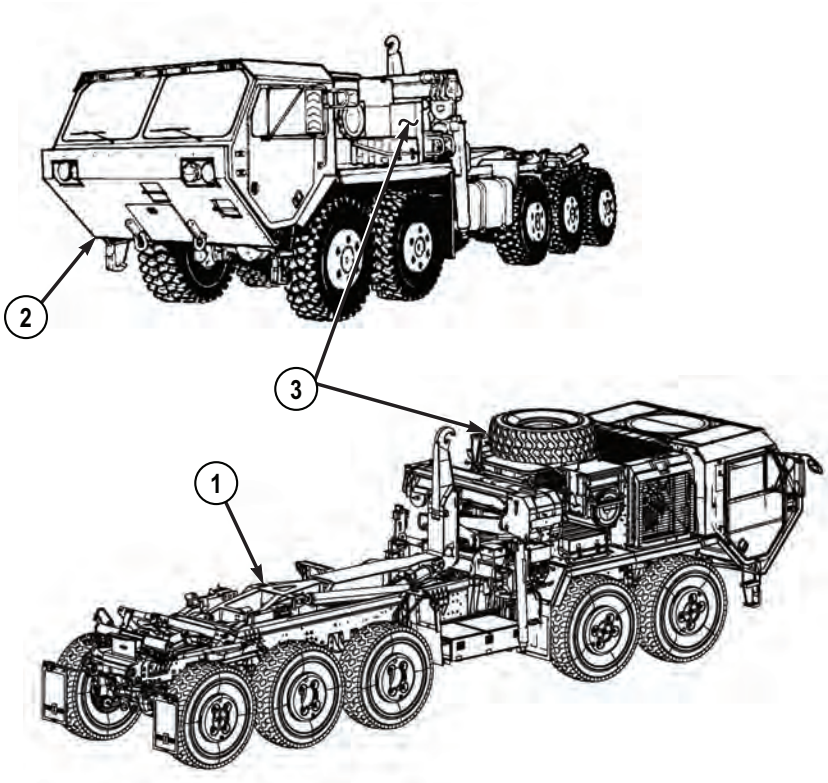


Figure 6.

2. Park both vehicles (WP 0036).
3. Shut OFF engines (WP 0037).
4. Remove hydraulic tank cap (4) from operable vehicle (1).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

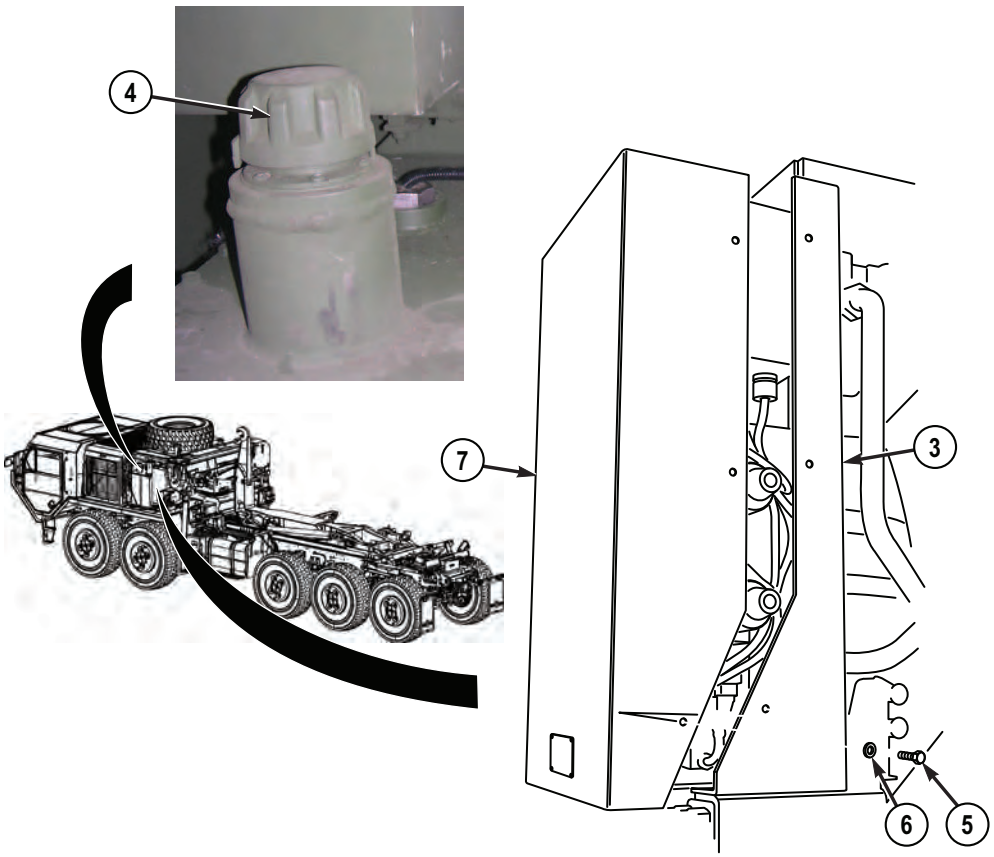


Figure 7.

NOTE

Only remove center screw on left side of LHS control box cover (3) on PLSA1 vehicle.

5. Remove four screws (5), lockwashers (6) and LHS control box cover (7) from LHS control box (3) on both vehicles.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

WARNING



The hydraulic system operates at high pressures. Never disconnect any hydraulic line or fitting without first dropping pressure to zero. Be sure to wear proper eye protection. Failure to comply may result in injury or death to personnel.

NOTE

Connecting and disconnecting hoses and adapters may be difficult. The aid of an assistant may be required.

6. Attach male end of hose to female 45 degree adapter (8) to female connection on disabled vehicle (2).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

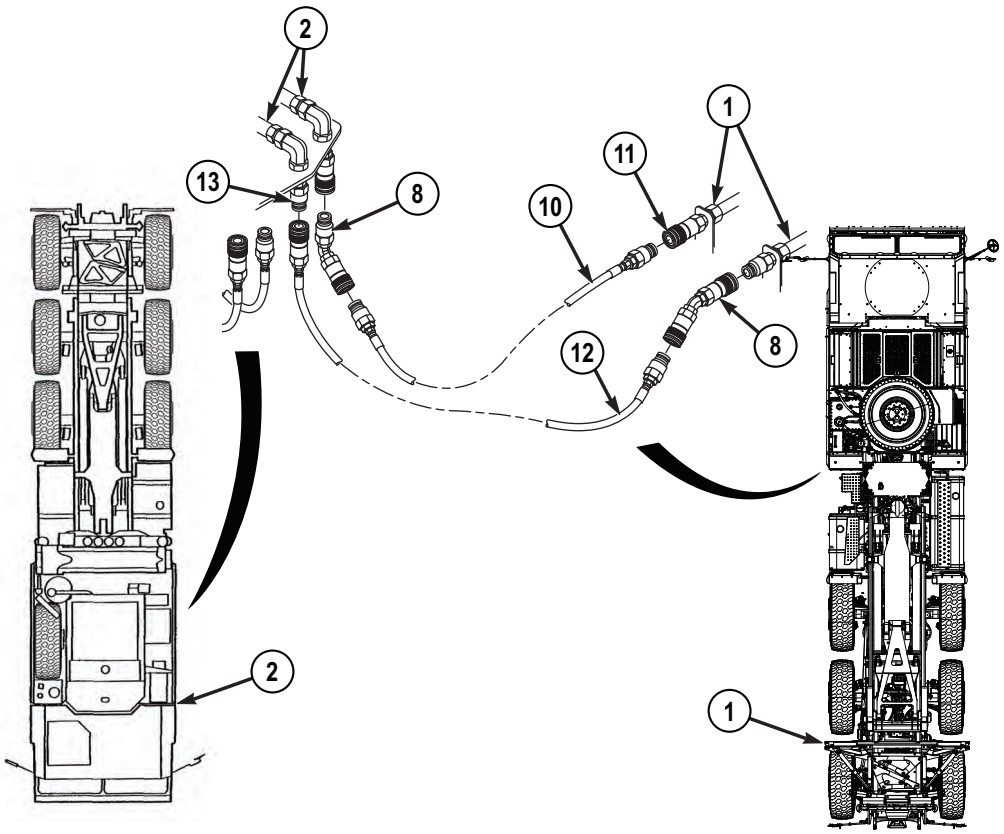


Figure 8.

7. Attach female to female 45 degree adapter (9) to male connection on operable vehicle (1).
8. Attach A1 cable (10) from male to female 45 degree adapter (8) on disabled vehicle (2) to female connection (11) on operable vehicle (1).
9. Attach Base cable (12) from female to female adapter (9) on operable vehicle (1) to male connection (13) on disabled vehicle (2).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

10. Start engine (WP 0037) on operable vehicle (1) and turn hydraulic selector switch (14) to AUTO position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

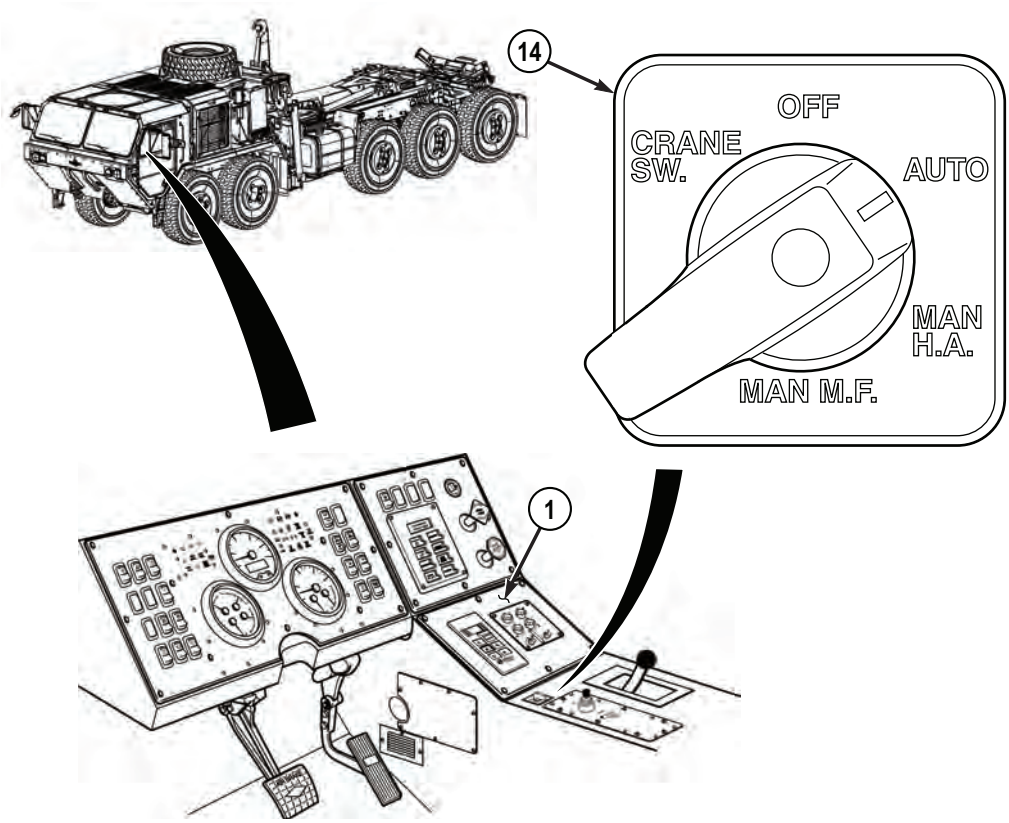


Figure 9.

11. Place hydraulic selector switch (14) on disabled vehicle (2) in the AUTO position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

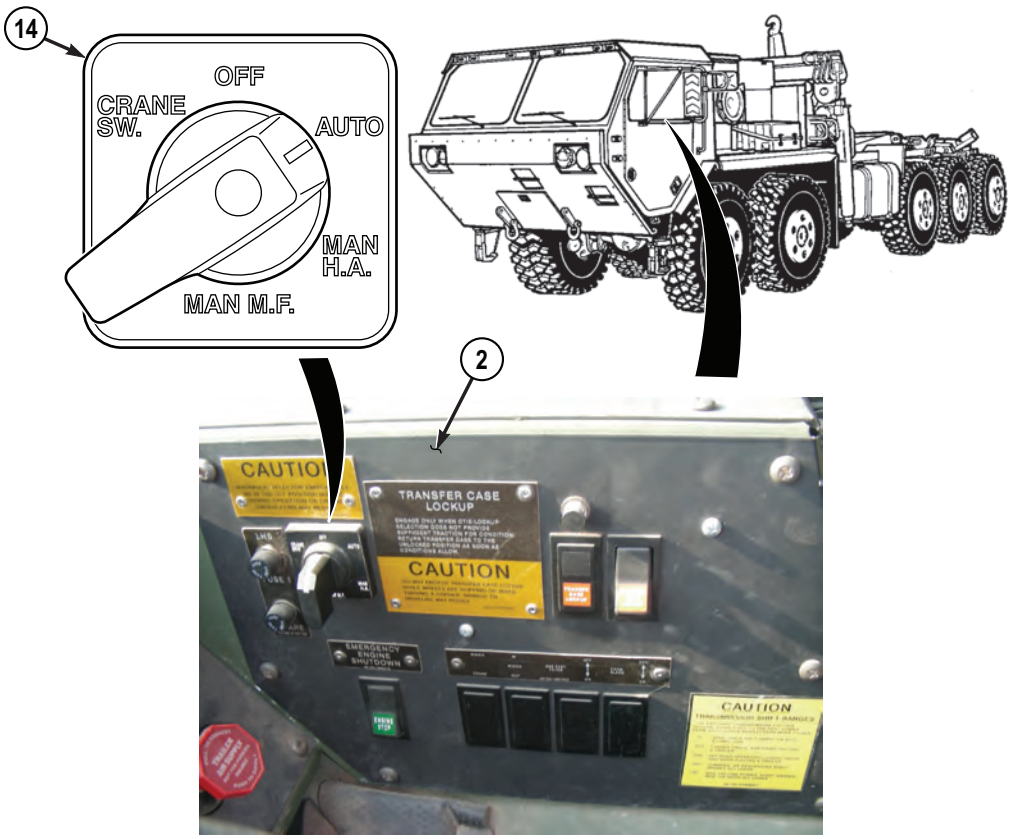


Figure 10.

NOTE

The following step is to supply electrical power to disabled vehicle (2). Do not start the vehicle.

12. Turn ignition switch (15) on disabled vehicle (2) to the ON position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

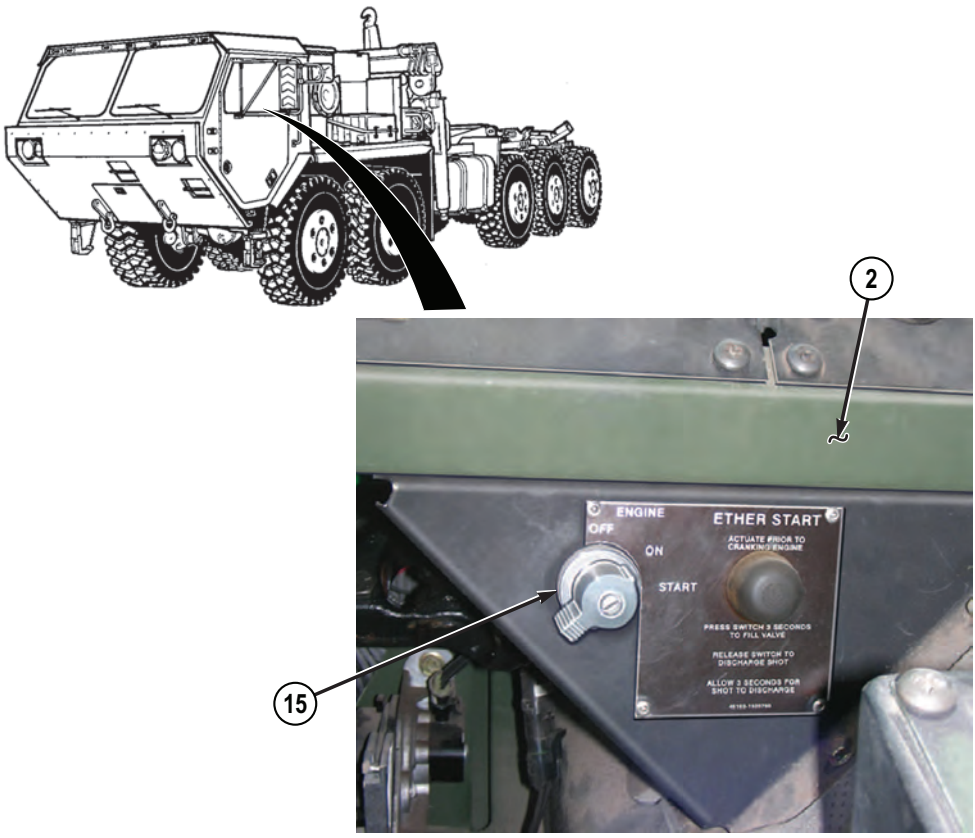


Figure 11.

13. Using free flow tool, Press and hold free flow valve override button (16) on operable vehicle (1).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

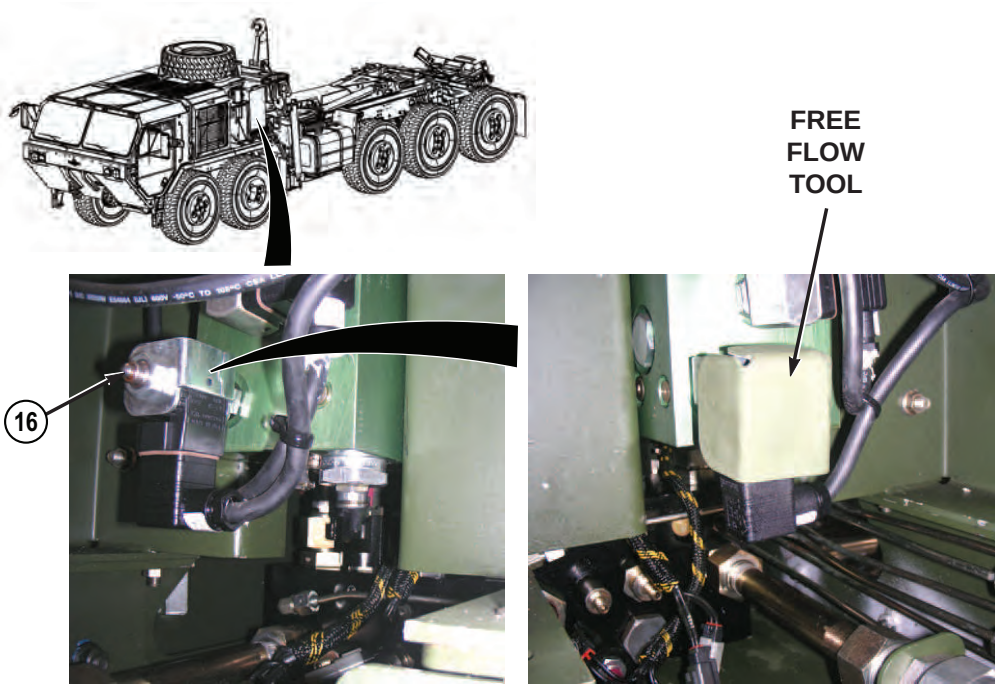


Figure 12.

14. Using LHS joystick (17) on disabled vehicle (2) remove load and return LHS system to transit configuration.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

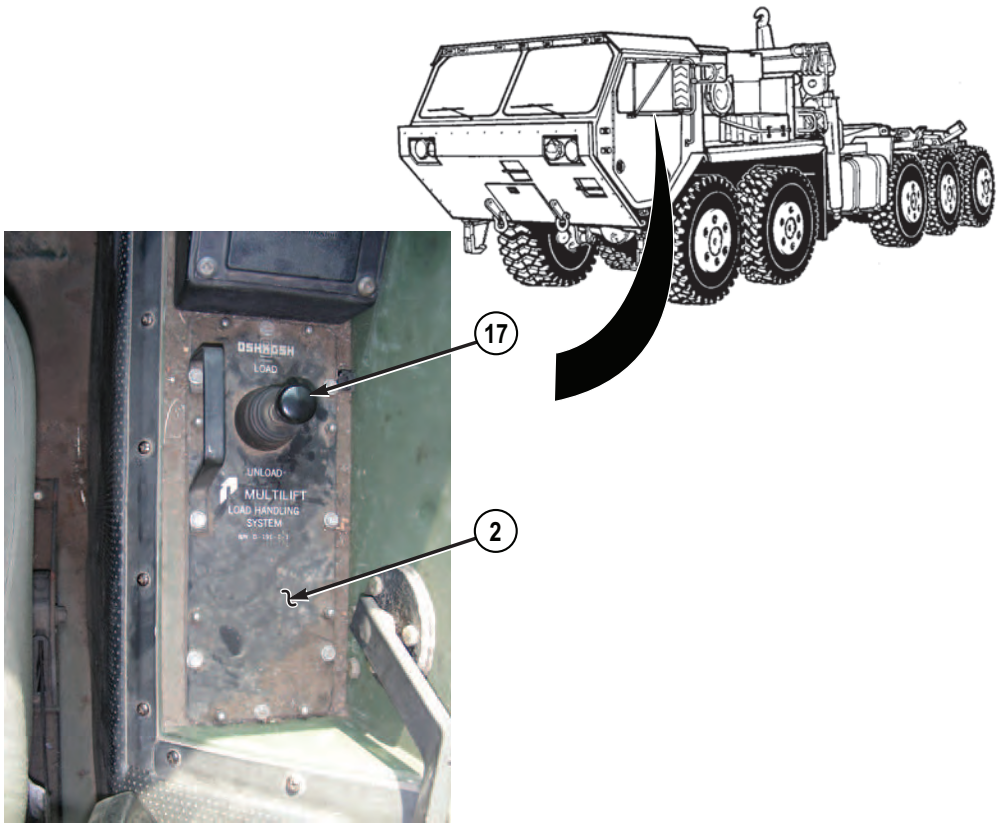


Figure 13.

15. Turn ignition switch (15) on disabled vehicle (2) to the OFF position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

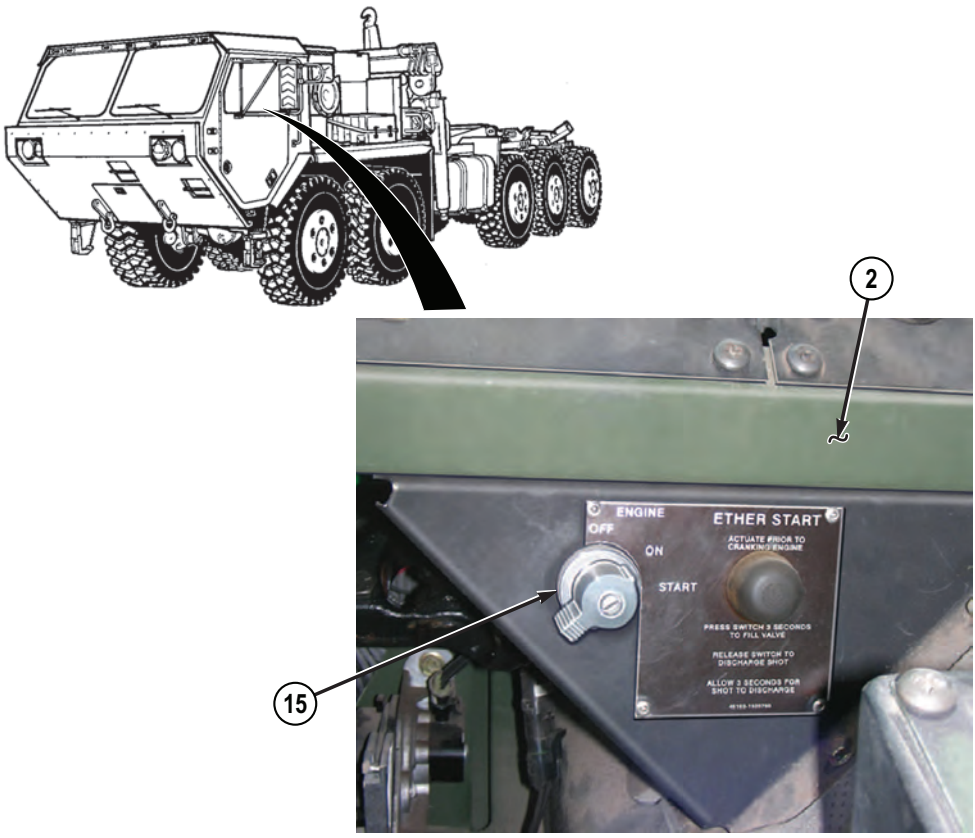


Figure 14.

NOTE

The following steps are to return both vehicles to transit configuration.

16. Shut OFF engine (WP 0037) on operable vehicle (1).
17. Disconnect both cables (10) and (12) and adapters (8) and (9) from vehicles (1) and (2) and stow.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

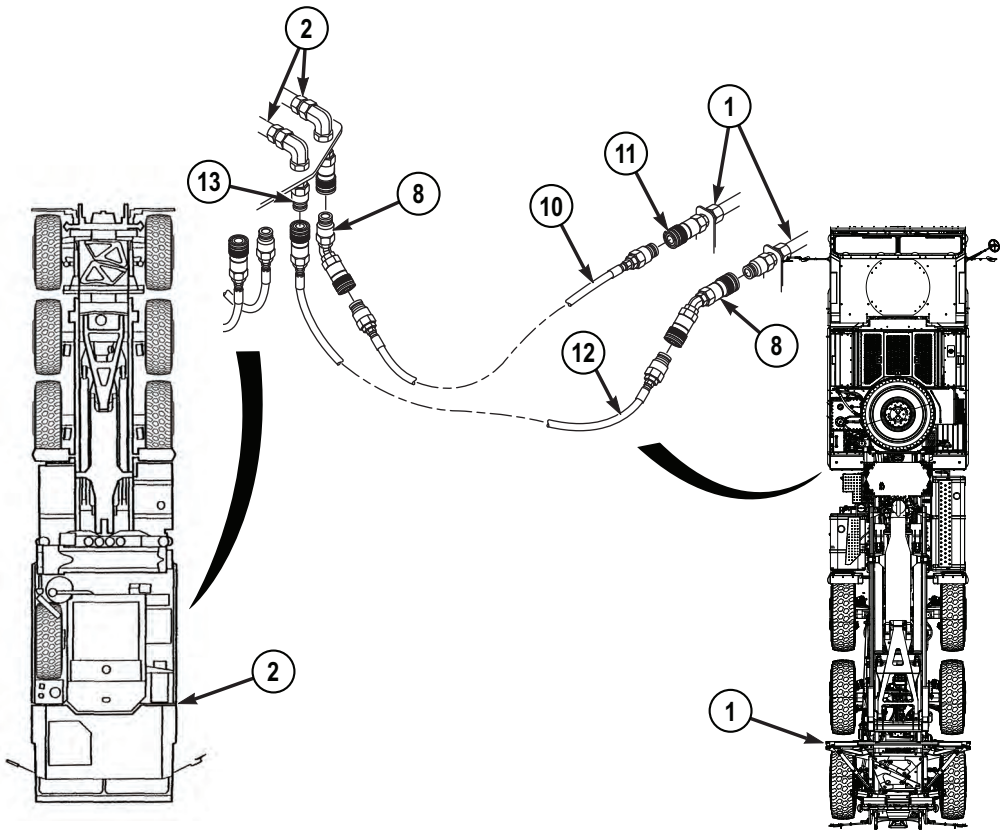


Figure 15.

18. Return hydraulic selector switch (14) on disabled vehicle (2) to the OFF position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

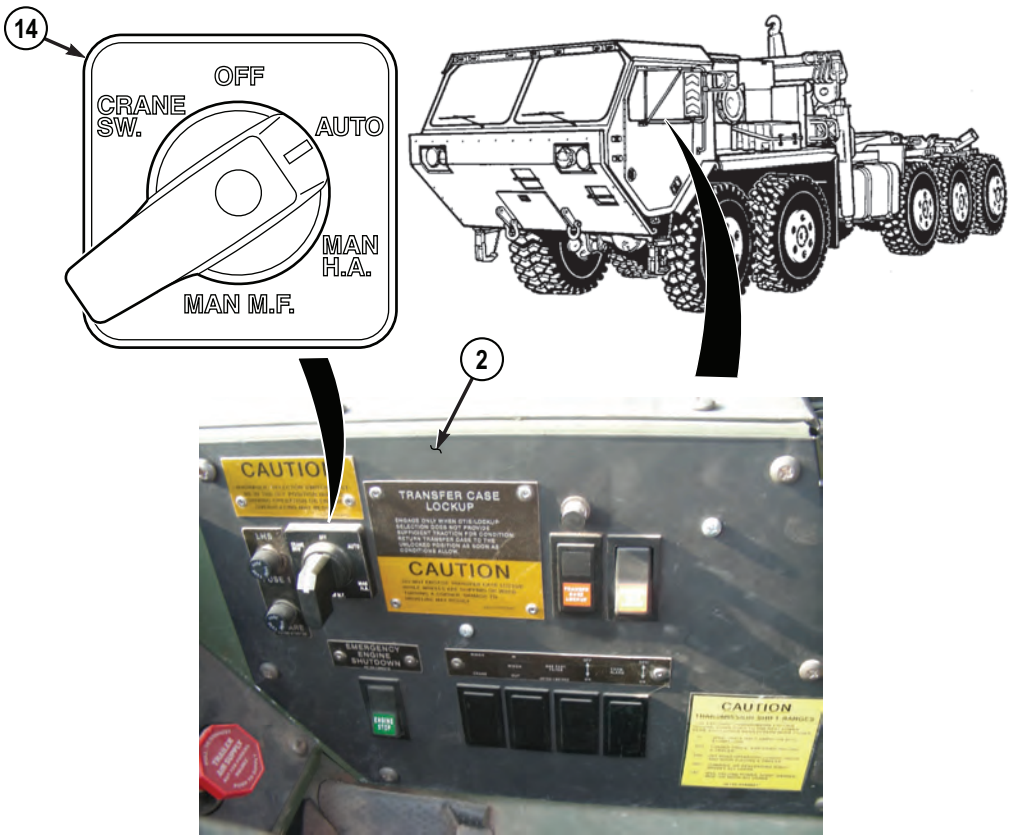


Figure 16.

19. Return hydraulic selector switch (14) on operable vehicle (1) to the OFF position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

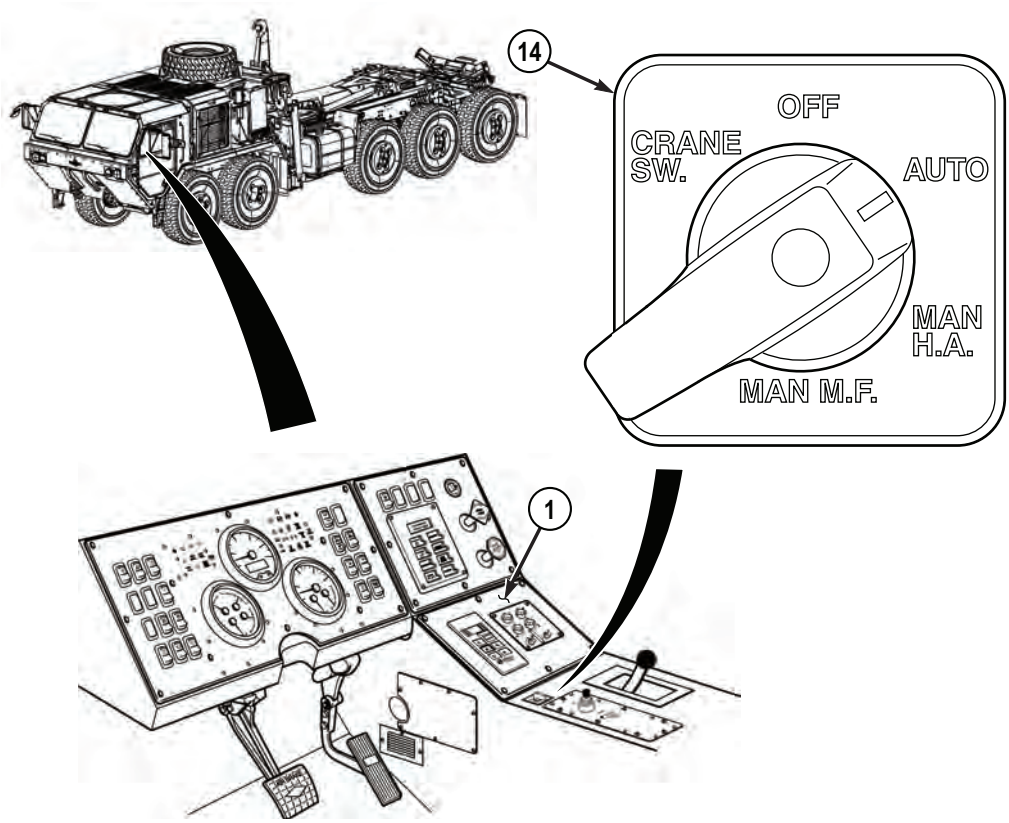


Figure 17.

20. Install four screws (5), lockwashers (6), and LHS control box cover (7) to LHS control box (3) on both vehicles.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

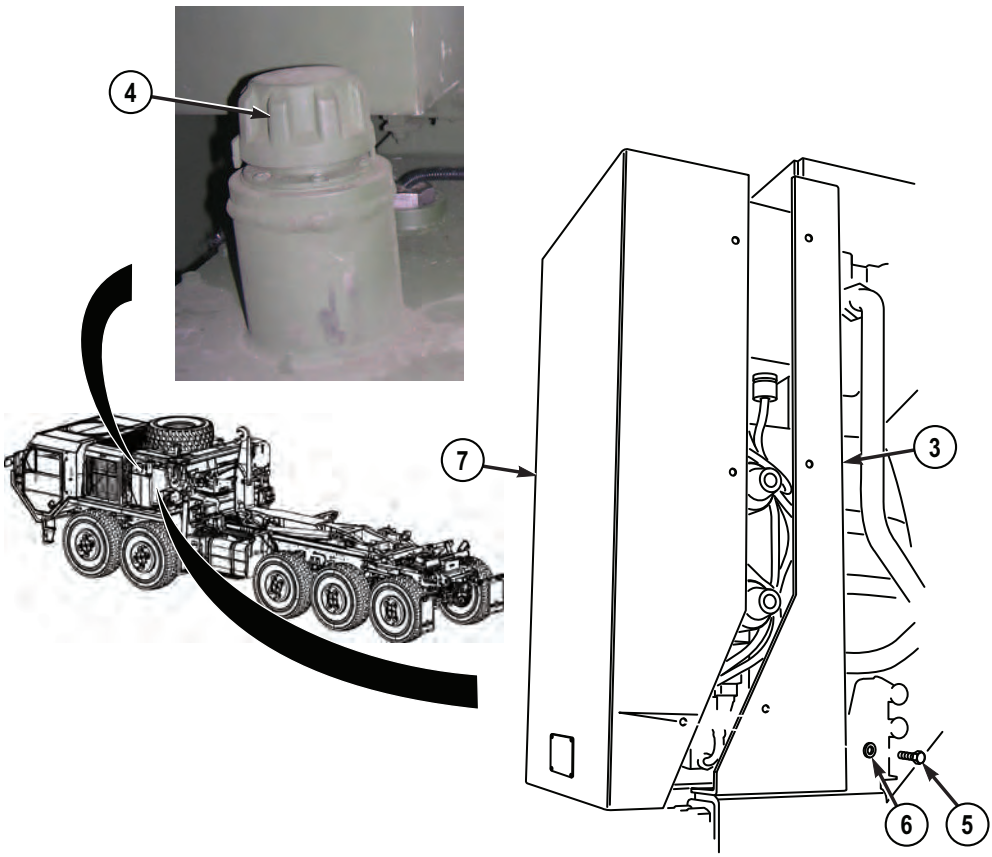


Figure 18.

21. Install hydraulic tank cap (4) on operable vehicle (1).

END OF TASK

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE

CAUTION

If LHS system on disabled vehicle is not in fully stowed (transport position), hydraulic tank cap from operable vehicle should be removed prior to starting the task to allow excess hydraulic oil to enter tank. Failure to comply may result in damage to hydraulic tank or hydraulic system.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

NOTE

- This procedure can only be used if there are no leaks or breaks in the hydraulic system.
- This procedure is used to remove the load from a PLS vehicle with a failed hydraulic pump or other failure which prevents operation of the hydraulic system.
- Each PLS A1 vehicle is equipped with one hydraulic slave hose, one straight adapter, and two 45 degree adapters. Each PLS Base vehicle is equipped with one hydraulic slave hose. Two hoses and two 45 degree adapters are required to perform slave hydraulics. Remove hoses and 45 degree adapters from stowage boxes of both vehicles.

1. Move operable vehicle (1) into position with disabled vehicle (2) so that LHS control box (3) on both vehicles are side-by-side.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

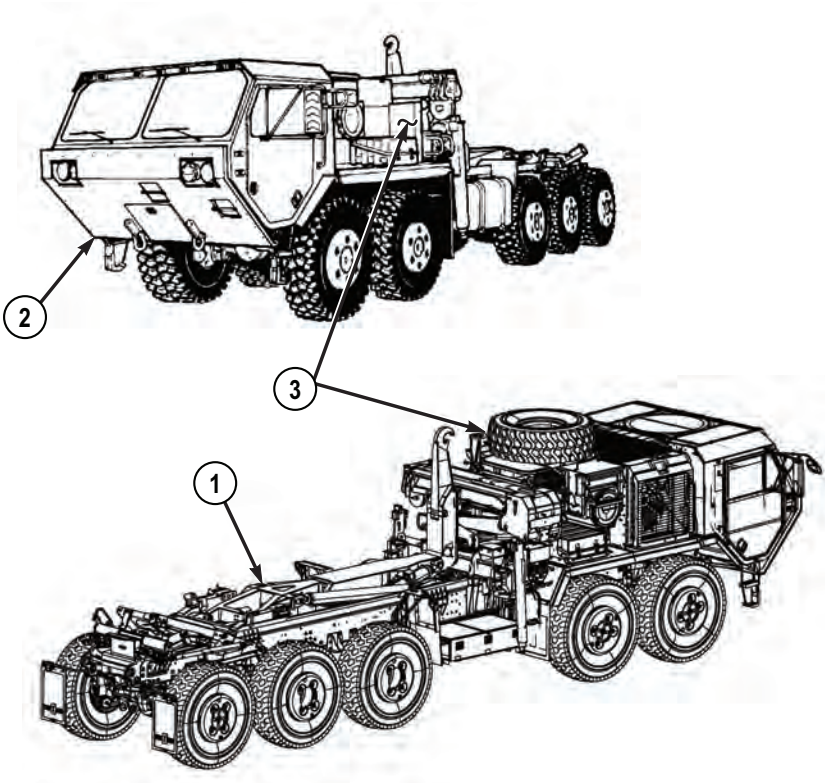


Figure 19.

2. Park both vehicles (WP 0036).
3. Shut OFF engines (WP 0037).
4. Remove hydraulic tank cap (4) from operable vehicle (1).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

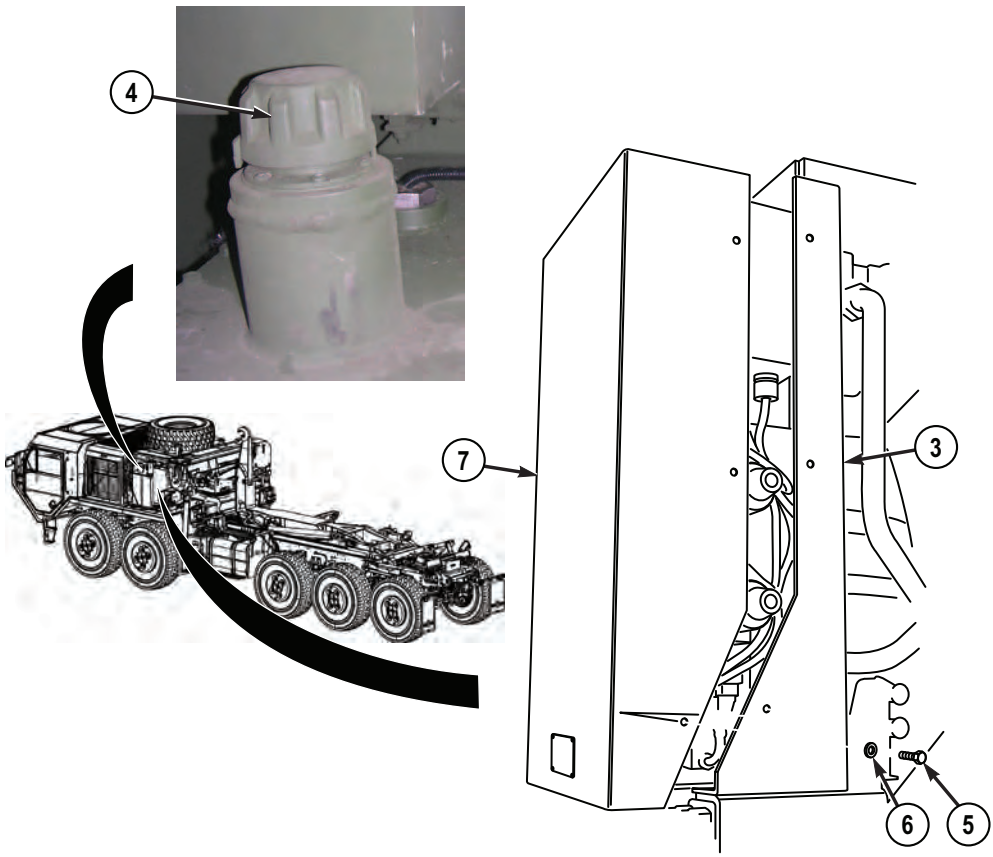


Figure 20.

NOTE

Only remove center screw on left side of LHS control box cover (3) on PLSA1 vehicle.

5. Remove four screws (5), lockwashers (6) and LHS control box cover (7) from LHS control box (3) on both vehicles.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

WARNING



The hydraulic system operates at high pressures. Never disconnect any hydraulic line or fitting without first dropping pressure to zero. Be sure to wear proper eye protection. Failure to comply may result in injury or death to personnel.

NOTE

Connecting and disconnecting hoses and adapters may be difficult. The aid of an assistant may be required.

6. Attach male end of hose to female 45 degree adapter (8) to female connection on disabled vehicle (2).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

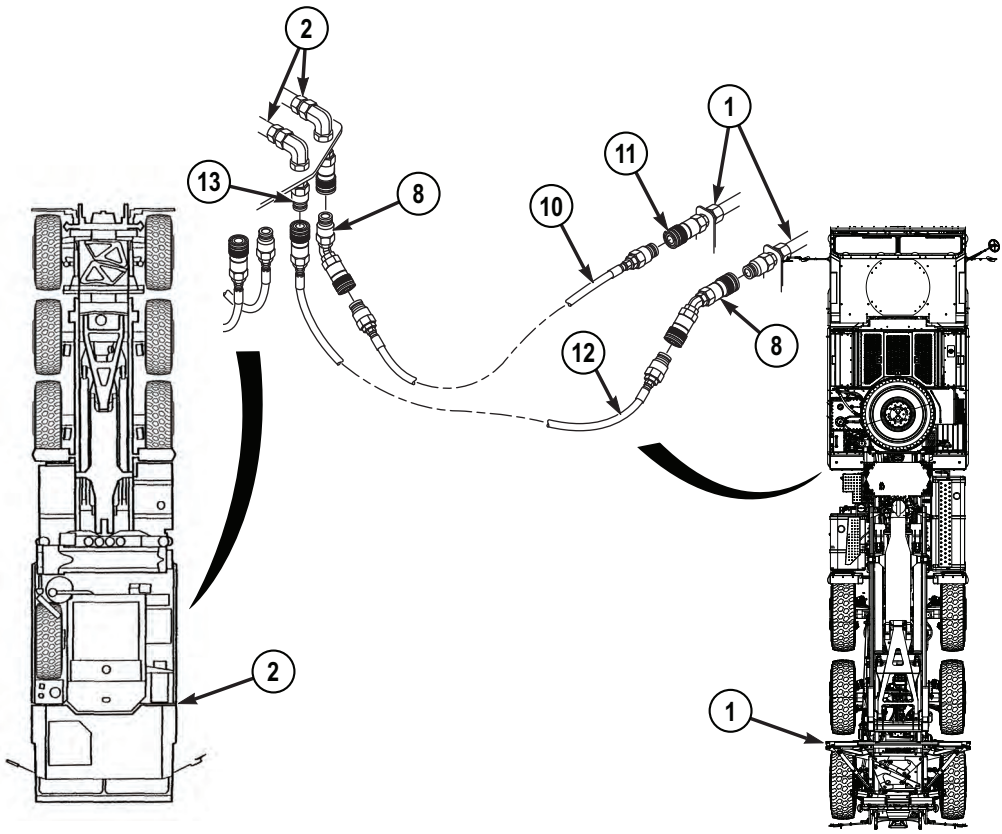


Figure 21.

7. Attach female to female 45 degree adapter (9) to male connection on operable vehicle (1).
8. Attach A1 cable (10) from male to female 45 degree adapter (8) on disabled vehicle (2) to female connection (11) on operable vehicle (1).
9. Attach Base cable (12) from female to female adapter (9) on operable vehicle (1) to male connection (13) on disabled vehicle (2).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

10. Start engine (WP 0037) on operable vehicle (1) and turn hydraulic selector switch (14) to AUTO position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

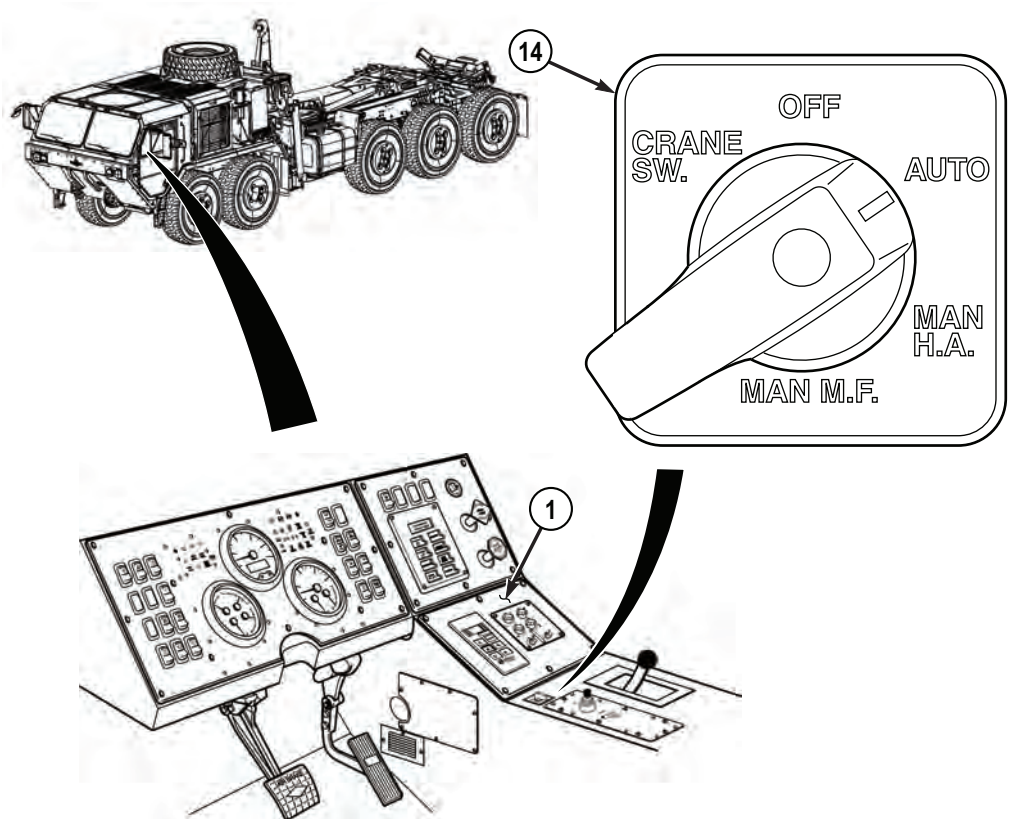


Figure 22.

11. Place hydraulic selector switch (14) on disabled vehicle (2) in the AUTO position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

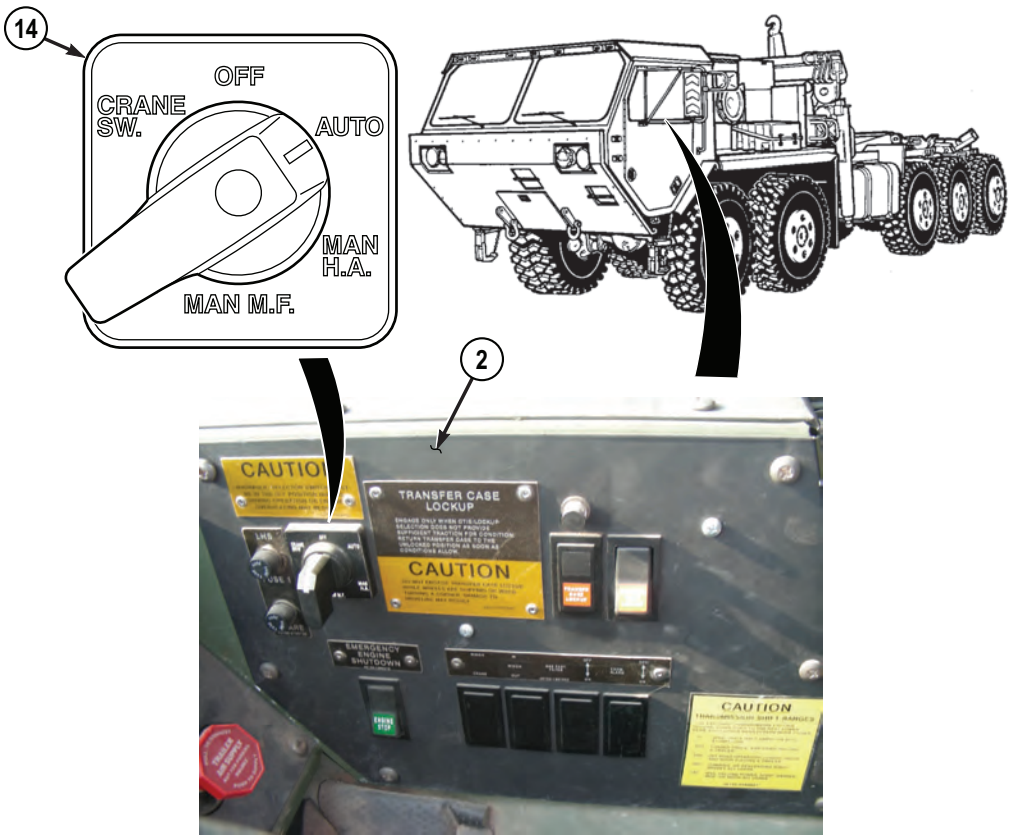


Figure 23.

12. Using free flow tool, press and hold free flow valve override button (15) on operable vehicle (1).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

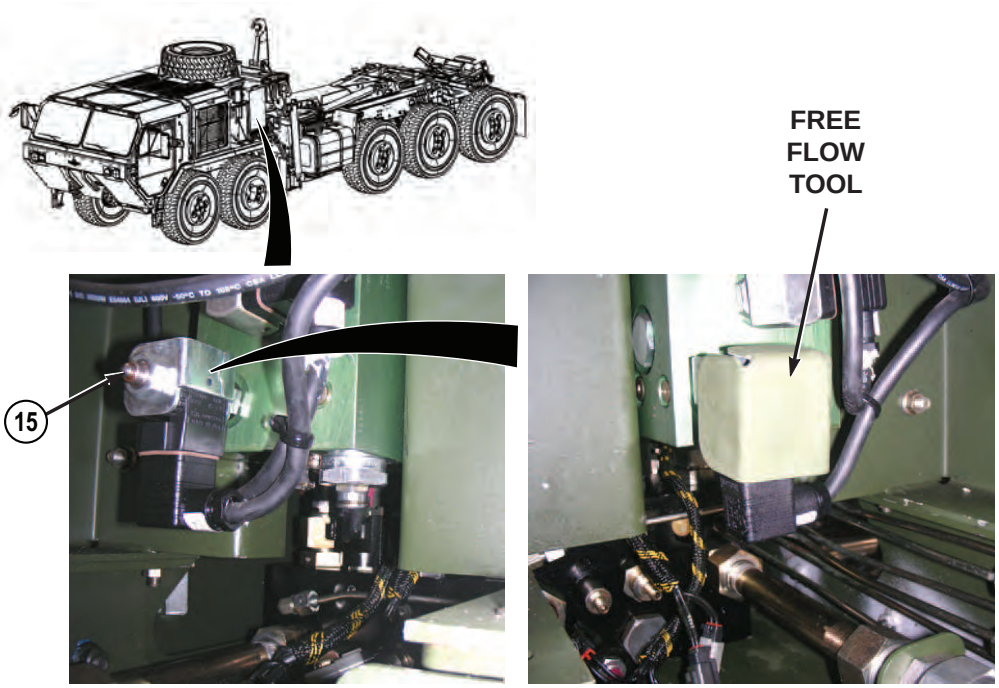


Figure 24.

13. Press and hold free flow valve override button (15) using free flow tool on disabled vehicle (2) while pressing one or more of the following buttons on disabled vehicle at the same time to return LHS to stowed position: hook arm UP (16), hook arm DOWN (17), main frame UP (18), main frame DOWN (19).

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

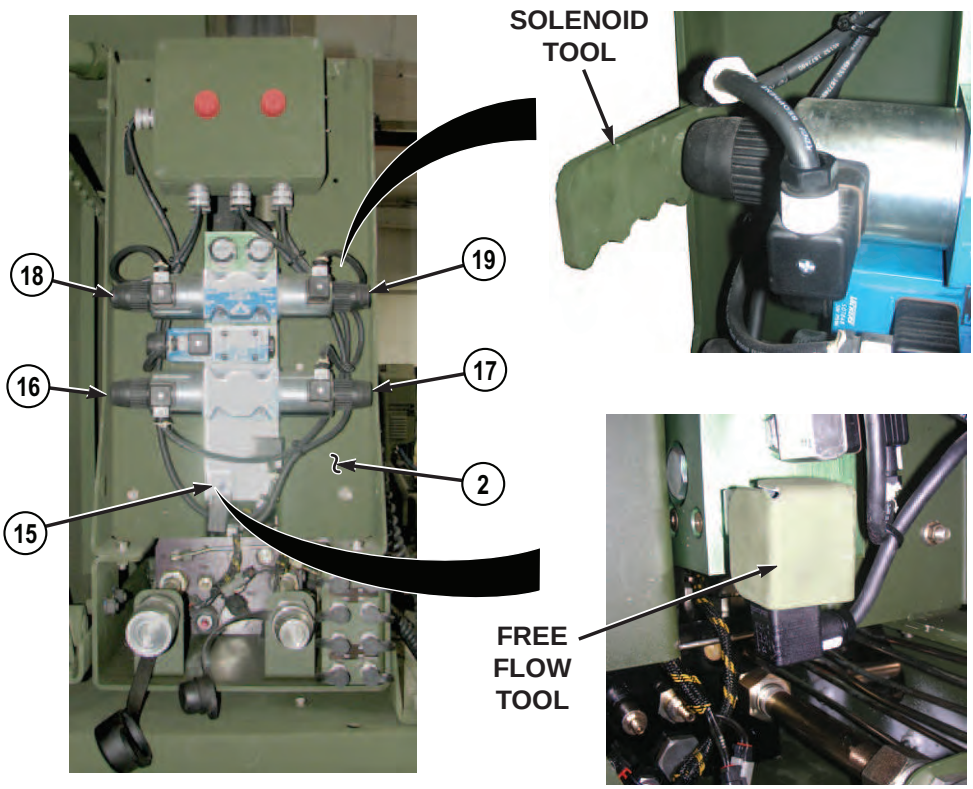


Figure 25.

NOTE

The following steps are to return both vehicles to transit configuration.

14. Shut OFF engine (WP 0037) on operable vehicle (1).
15. Disconnect both hoses (10) and (12) and adapters (8) and (9) from vehicles (1) and (2) and stow.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

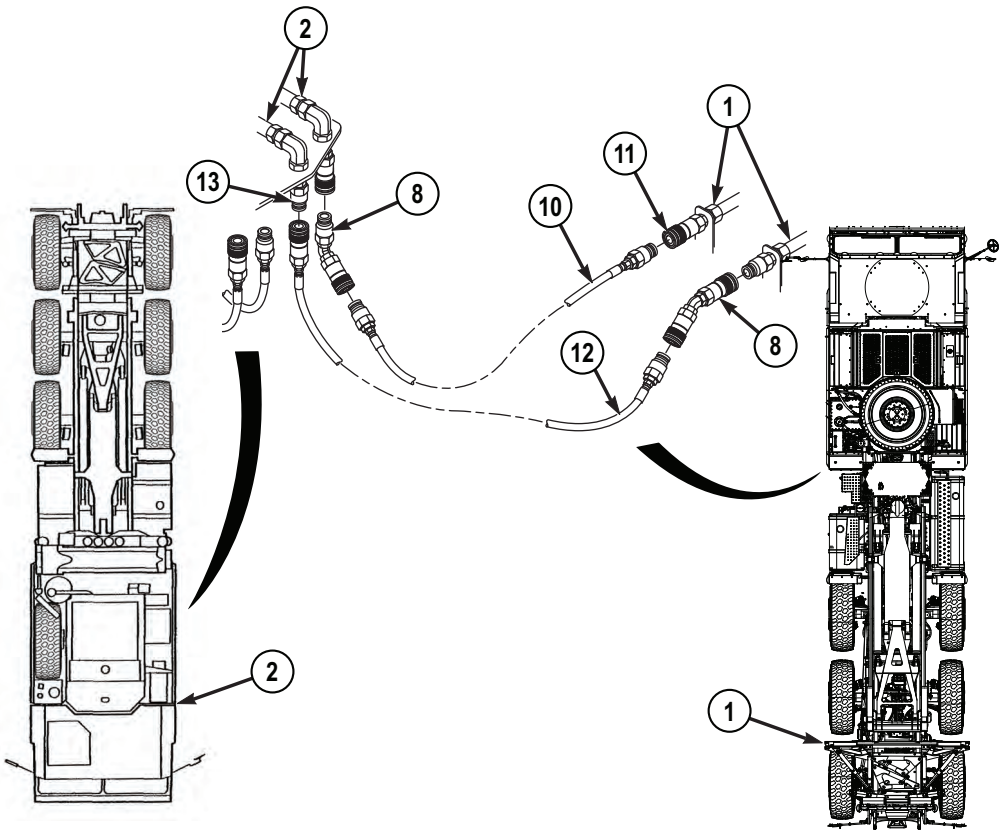


Figure 26.

16. Return hydraulic selector switch (14) on disabled vehicle (2) to the OFF position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

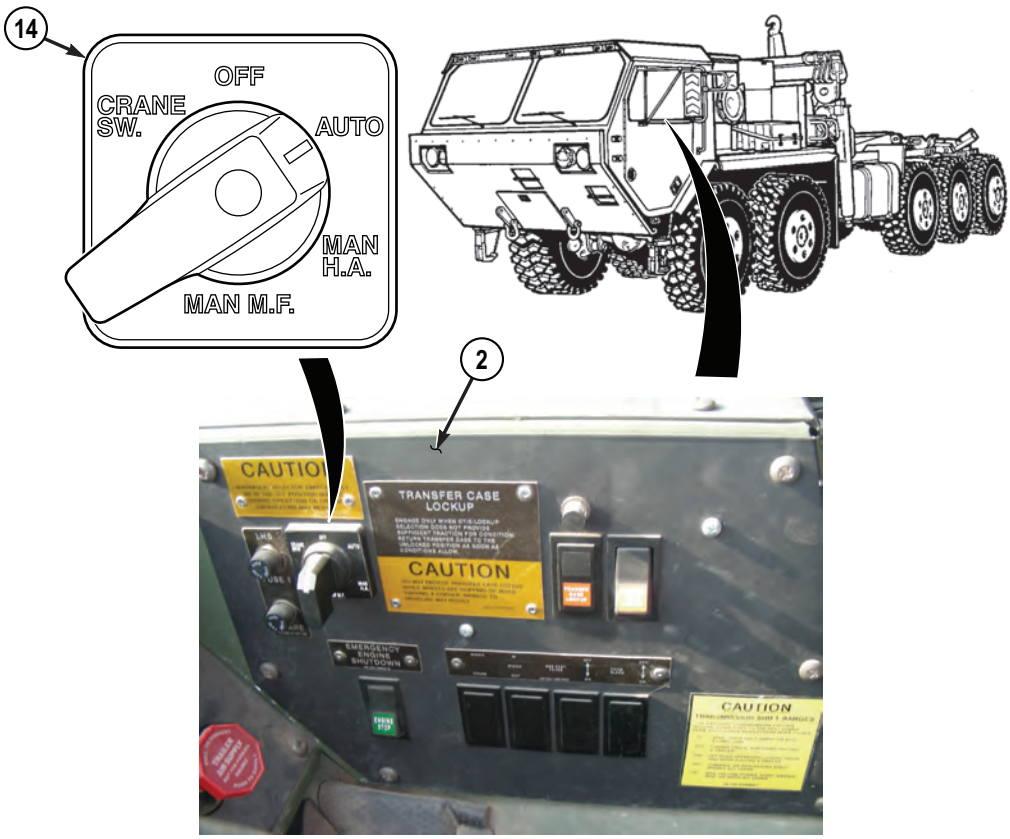


Figure 27.

17. Return hydraulic selector switch (14) on operable vehicle (1) to the OFF position.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

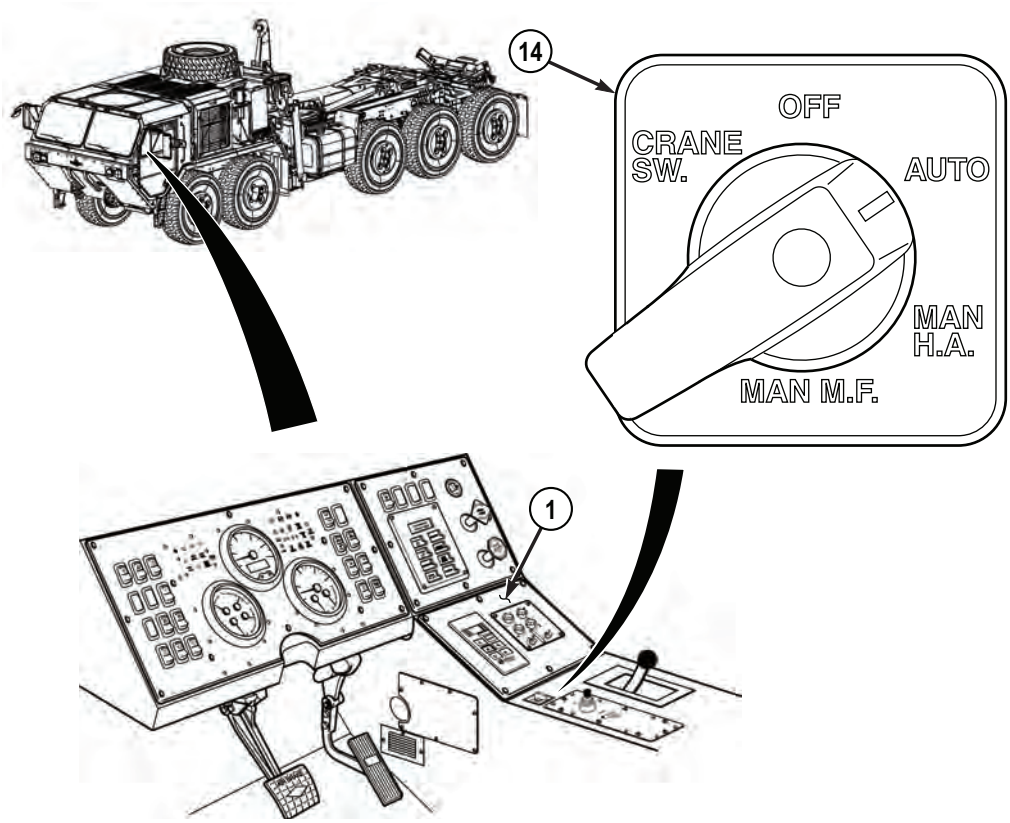


Figure 28.

18. Install four screws (5), lockwashers (6), and LHS control box cover (7) to LHS control box (3) on both vehicles.

OPERABLE A1 TO DISABLED BASE SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

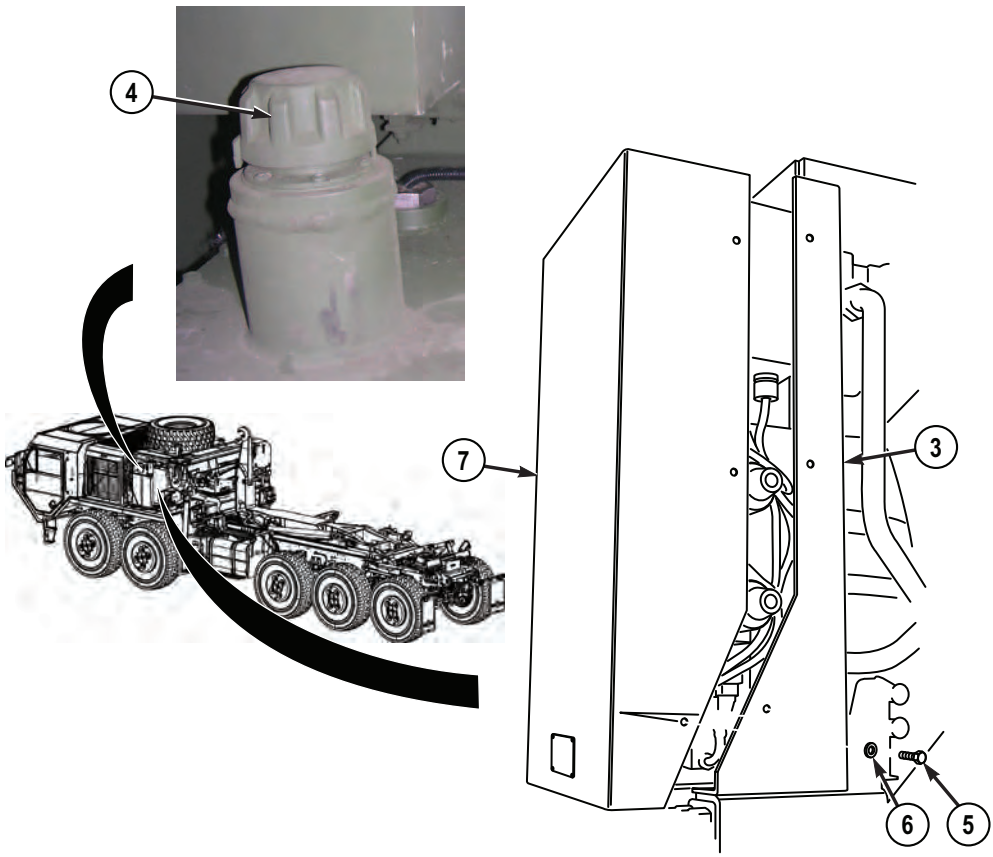


Figure 29.

19. Install hydraulic tank cap (4) on operable vehicle (1).

END OF TASK

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE

CAUTION

- Slaving procedure should only be performed once per operable vehicle or hydraulic reservoir may overflow. Failure to comply may result in damage to equipment.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

- If LHS system on disabled vehicle is not in fully stowed (transport position), hydraulic tank cap from operable vehicle should be removed prior to starting the task to allow excess hydraulic oil to enter tank. Failure to comply may result in damage to hydraulic tank or hydraulic system.

NOTE

- This procedure can only be used if there are no leaks or breaks in the hydraulic system.
- This procedure is used to remove the load from a PLS vehicle with a failed hydraulic pump or other failure which prevents operation of the hydraulic system.
- Each PLS A1 vehicle is equipped with one hydraulic slave hose, one straight adapter, and two 45 degree adapters. Two hoses and two straight adapters (one of each from both vehicles) are required to perform slave hydraulics. Remove hoses and straight adapters from stowage boxes of both vehicles.

1. Move operable vehicle (1) into position with disabled vehicle (2) so that LHS control box (3) on both vehicles are side-by-side facing opposite directions.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

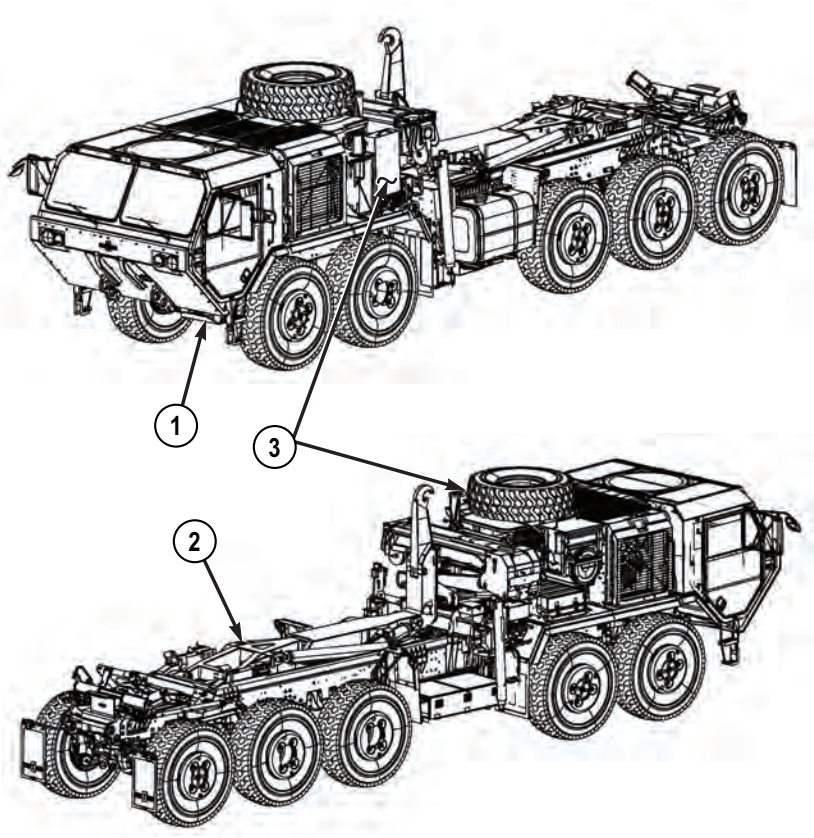


Figure 30.

2. Park both vehicles (WP 0036).
3. Shut OFF engines (WP 0037).
4. Remove hydraulic tank cap (4) from operable vehicle (1).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

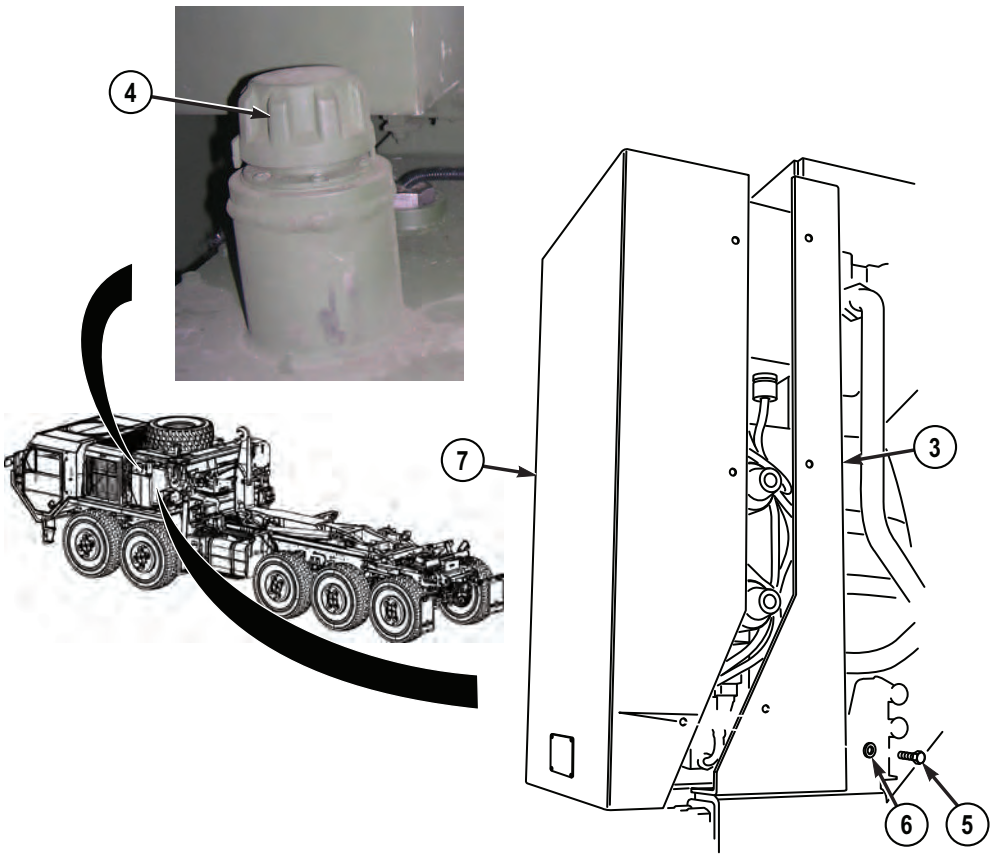


Figure 31.

NOTE

Only remove center screw on left side of LHS control box cover (3).

5. Remove four screws (5), lockwashers (6), and LHS control box cover (7) from LHS control box (3) on both vehicles.

NOTE

- Jam knob (8) and On/Off valve knob (9) will only be adjusted on disabled vehicle (2).
- On/Off valve knob (9) will be labeled NV2 on multi-function manifold.

6. Turn jam knob (8) on disabled vehicle (2) counter clockwise.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

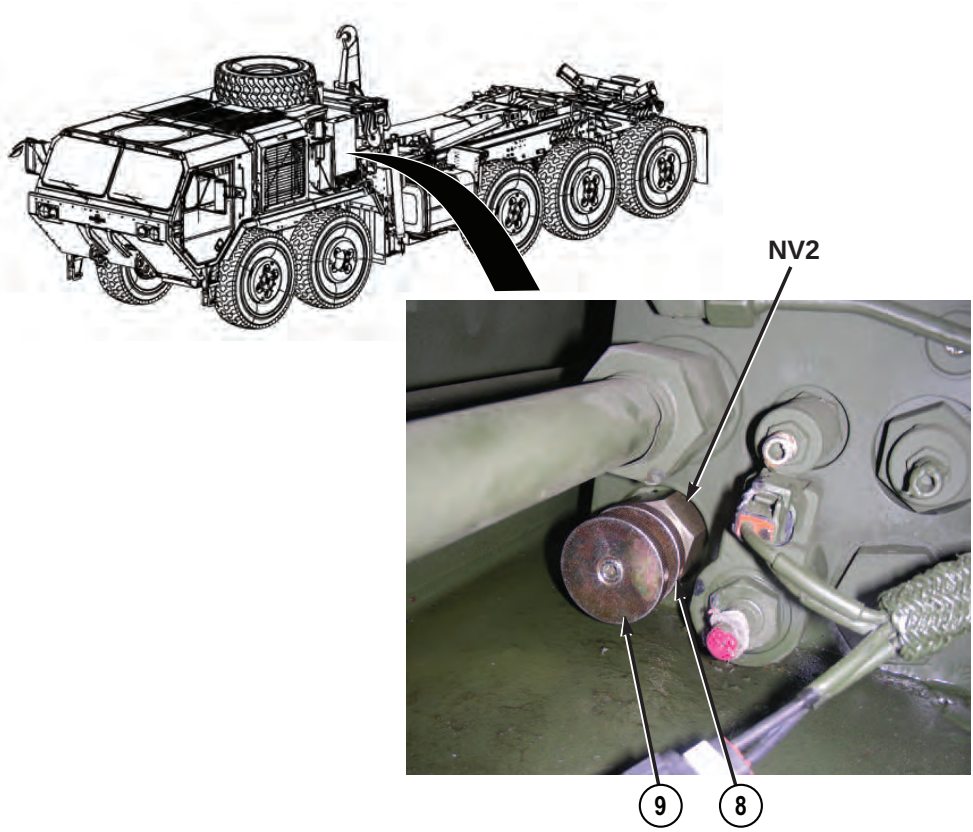


Figure 32.

7. Turn On/Off valve knob (9) on disabled vehicle (2) clockwise to close valve.
8. Attach 2 straight adapters (10) to male connections on both vehicles (1) and (2).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

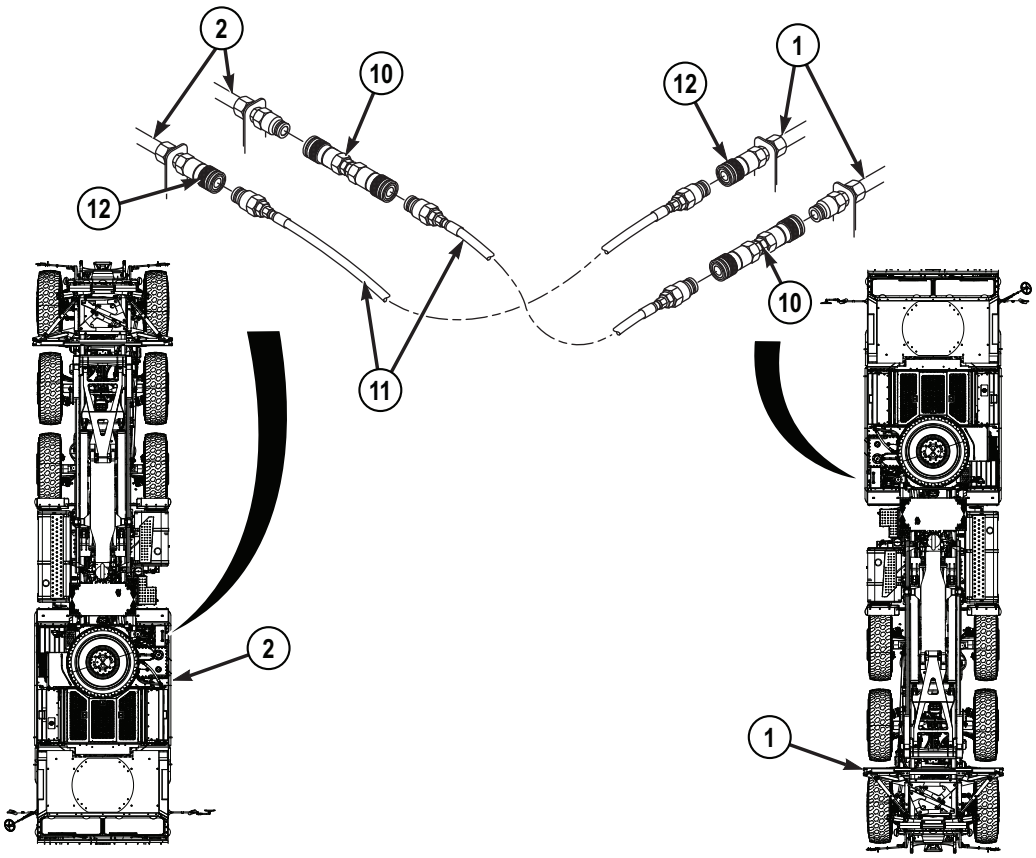


Figure 33.

9. Attach hose (11) from female connection (12) on disabled vehicle (2) to female connection (12) on operable vehicle (1).
10. Attach second hose (11) from straight adaptor (10) on disabled vehicle (2) to straight adaptor (10) on operable vehicle (1).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

11. Start engine (WP 0037) on operable vehicle (1) and turn hydraulic selector switch (13) to AUTO position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

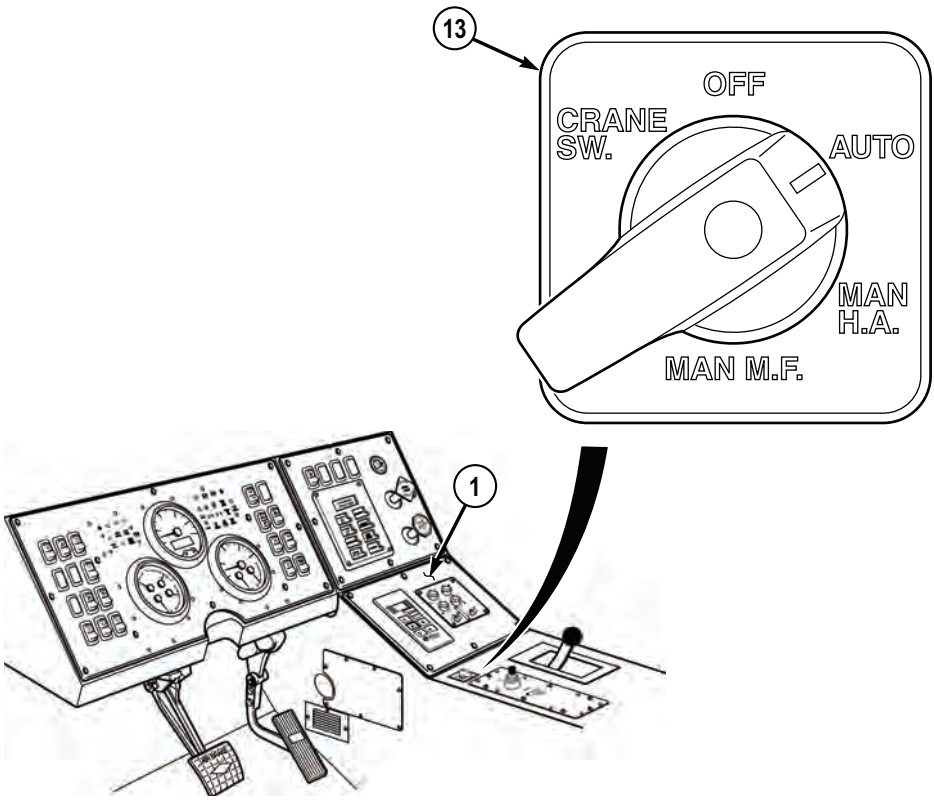


Figure 34.

12. Place hydraulic selector switch (13) on disabled vehicle (2) in the AUTO position.
13. Using free flow tool, press and hold free flow valve override button (14) on operable vehicle (1).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

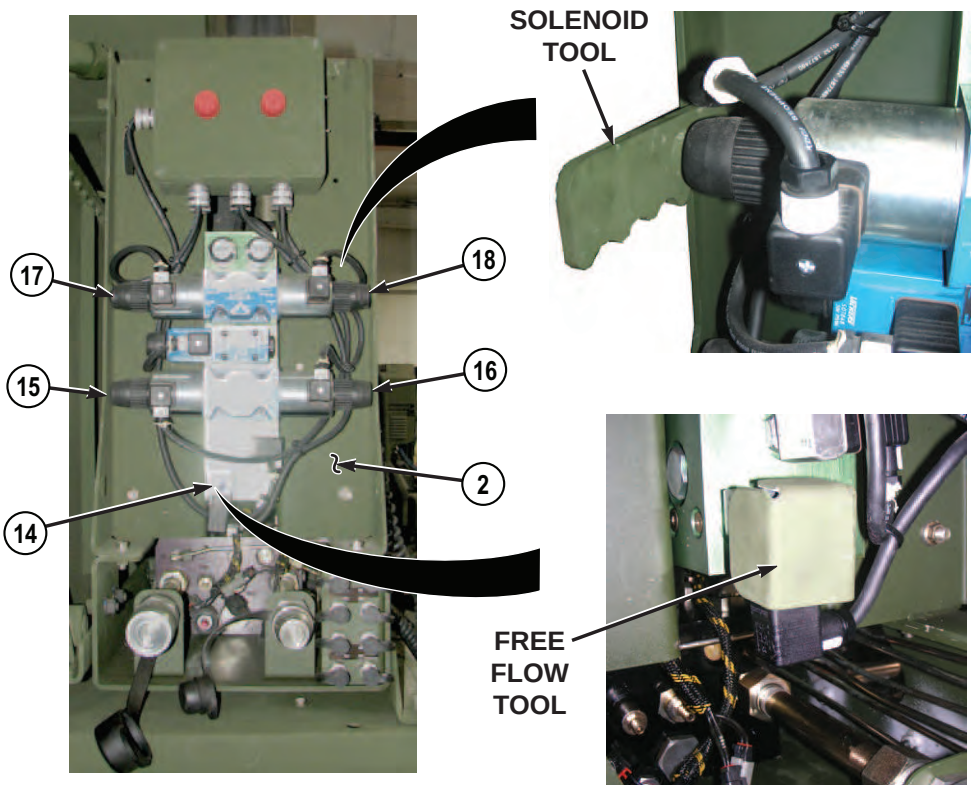


Figure 35.

14. Press and hold free flow valve override button (14) using free flow tool on disabled vehicle (2) while pressing one or more of the following buttons on disabled vehicle at the same time to return LHS to stowed position: hook arm UP (15), hook arm DOWN (16), main frame UP (17), main frame DOWN (18).

NOTE

The following steps are to return both vehicles to transit configuration.

15. Shut OFF engine (WP 0037) on operable vehicle (1).
16. Disconnect both hoses (11) and adapters (10) from vehicles (1) and (2) and stow.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

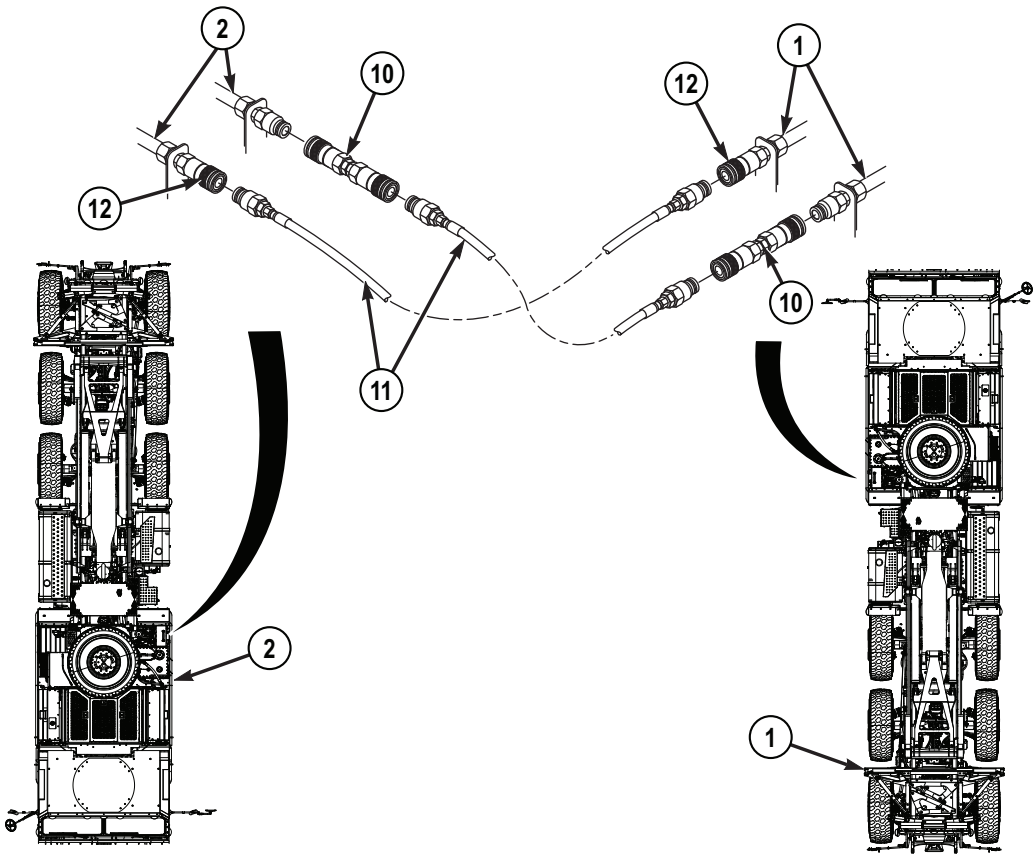


Figure 36.

P

17. Turn On/Off valve knob (9) on disabled vehicle (2) counterclockwise until seated.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

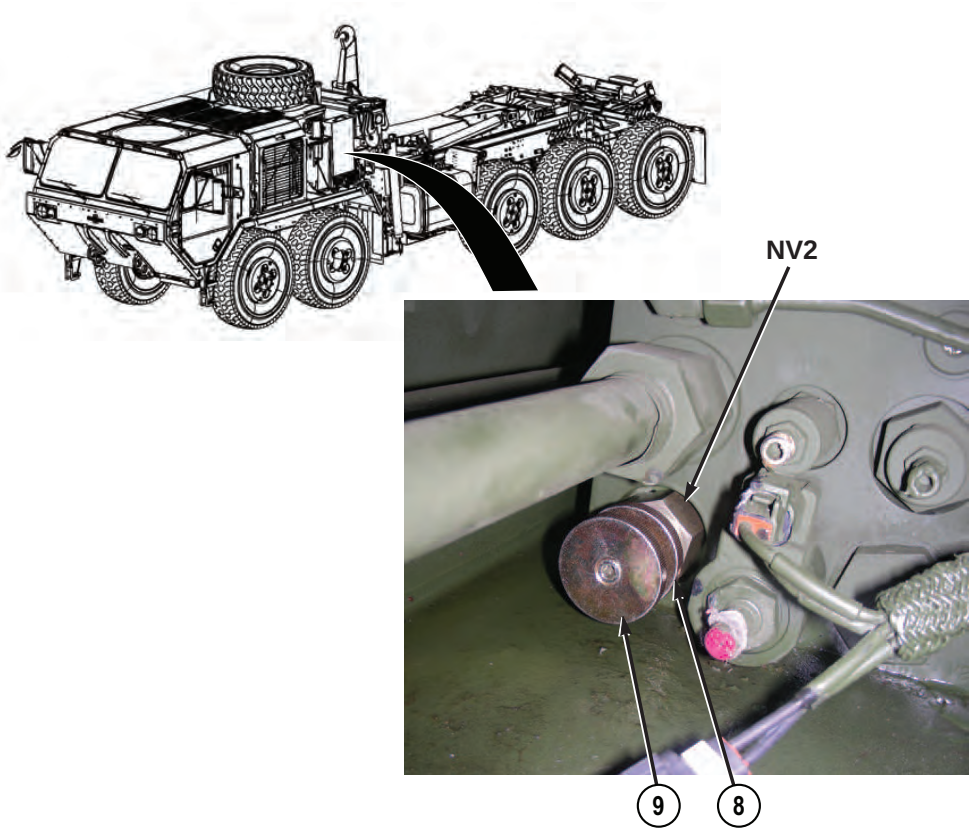


Figure 37.

18. Tighten jam knob (8) on disabled vehicle (2) clockwise.
19. Return hydraulic selector switch (13) on operable vehicle (1) to the OFF position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

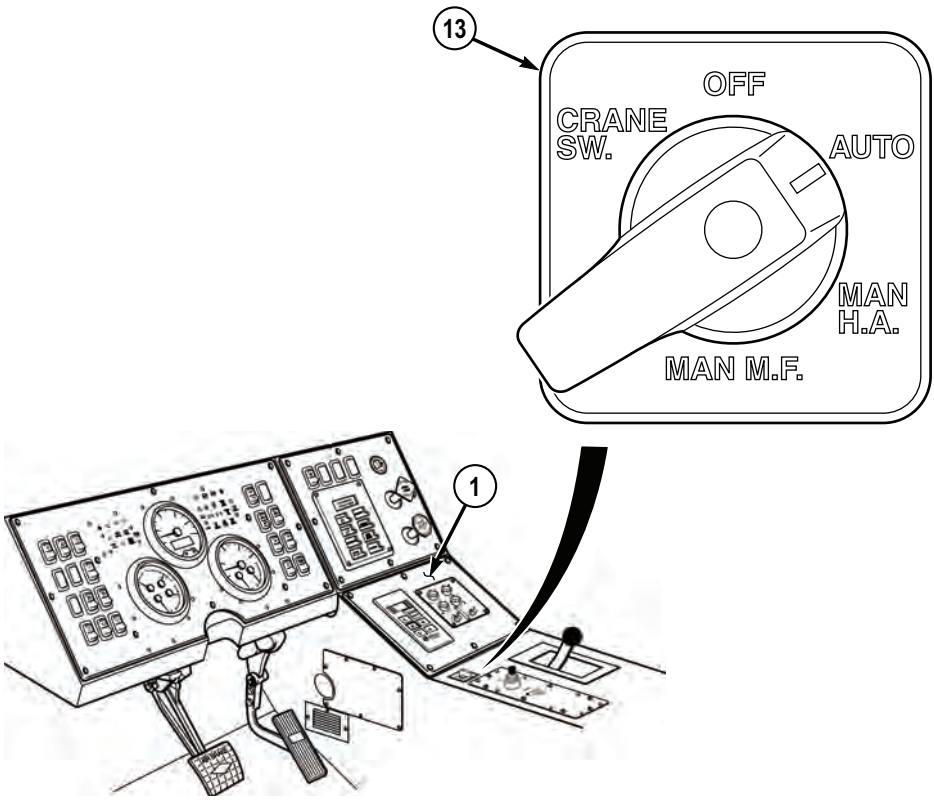


Figure 38.

20. Return hydraulic selector switch (13) on disabled vehicle (2) to the OFF position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

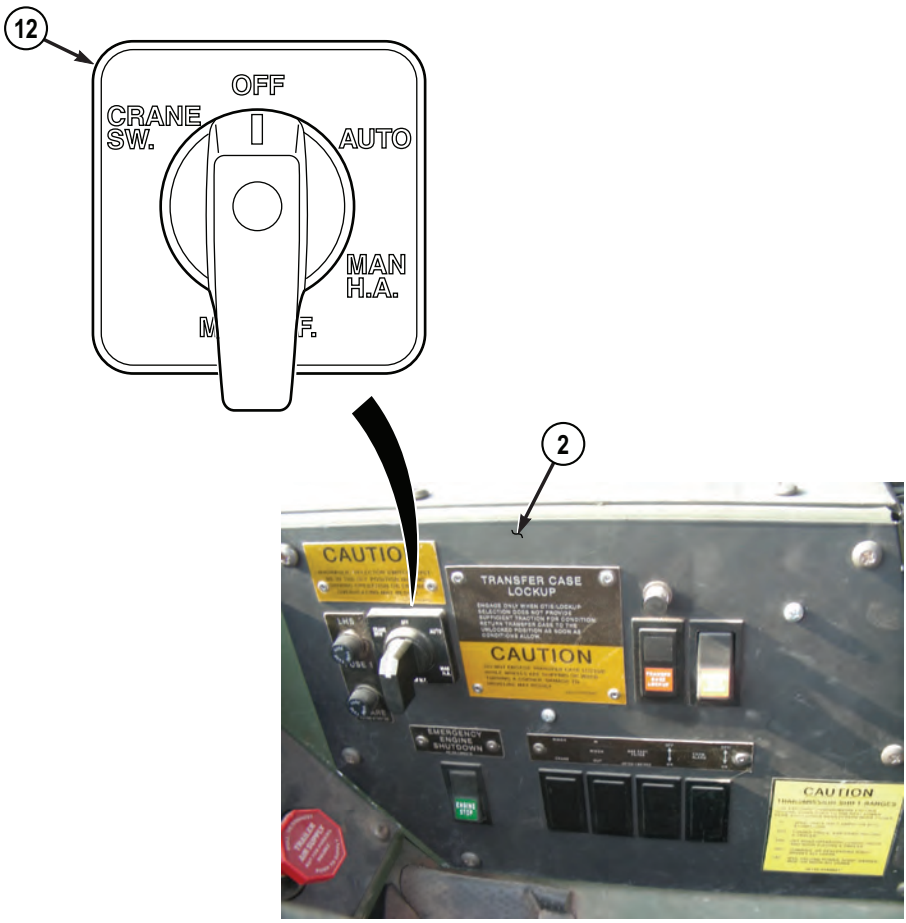


Figure 39.

21. Install four screws (5), lockwashers (6), and LHS control box cover (7) to LHS control box (3) on both vehicles.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC AND ELECTRIC FAILURE - Continued

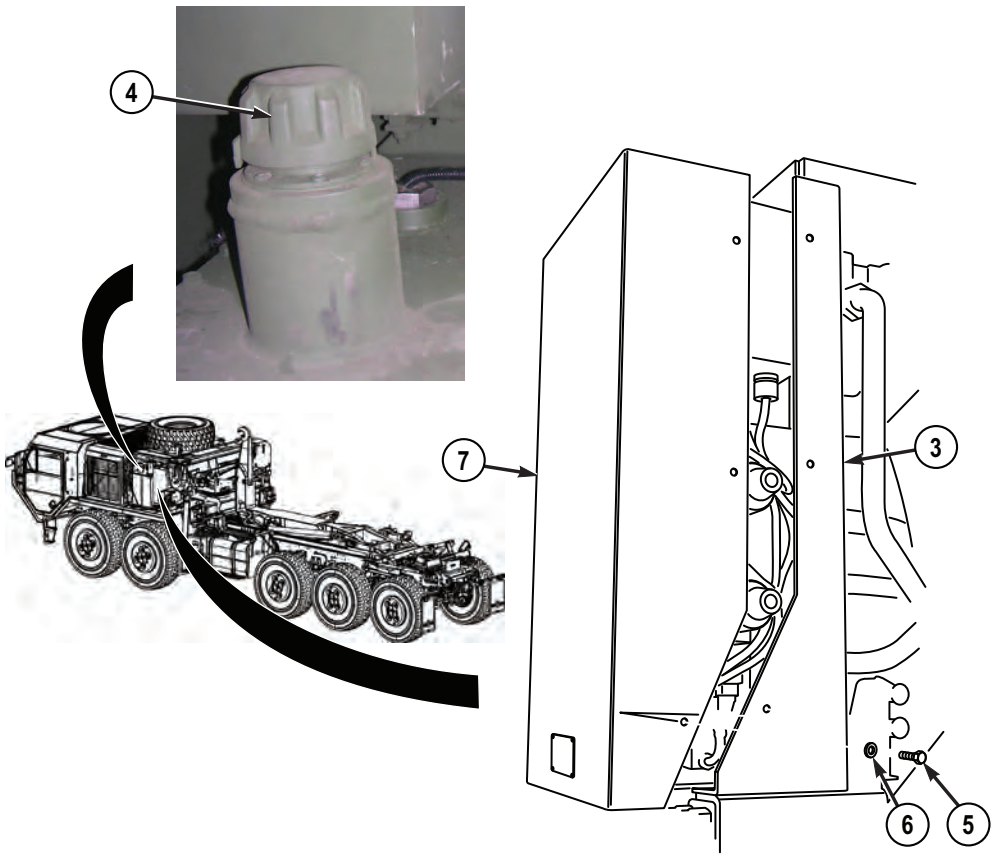


Figure 40.

22. Install hydraulic tank cap (4) on operable vehicle (1).

END OF TASK

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY

CAUTION

If LHS system on disabled vehicle is not in fully stowed (transport position), hydraulic tank cap from operable vehicle should be removed prior to starting the task to allow excess hydraulic oil to enter tank. Failure to comply may result in damage to hydraulic tank or hydraulic system.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

NOTE

- This procedure can only be used if there are no leaks or breaks in the hydraulic system.
- This procedure is used to remove the load from a PLS vehicle with a failed hydraulic pump or other failure which prevents operation of the hydraulic system.
- Each PLS A1 vehicle is equipped with one hydraulic slave hose, one straight adapter, and two 45 degree adapters. Two hoses and two straight adapters (one of each from both vehicles) are required to perform slave hydraulics. Remove hoses and straight adapters from stowage boxes of both vehicles.

1. Move operable vehicle (1) into position with disabled vehicle (2) so that LHS control box (3) on both vehicles are side-by-side facing opposite directions.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

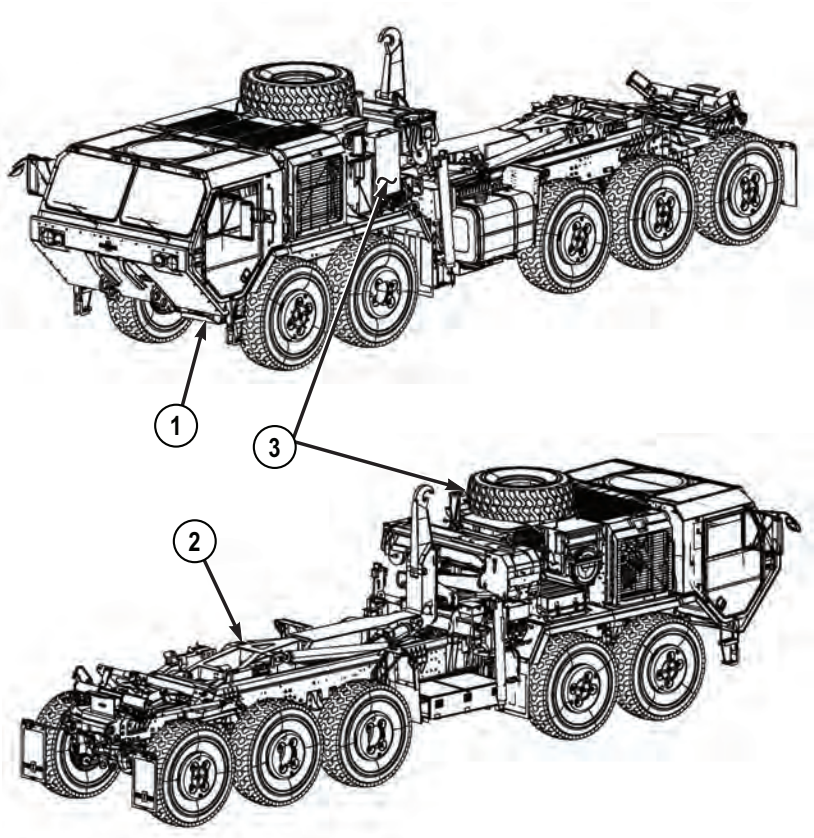


Figure 41.

2. Park both vehicles (WP 0036).
3. Shut OFF engines (WP 0037).
4. Remove hydraulic tank cap (4) from operable vehicle (1).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

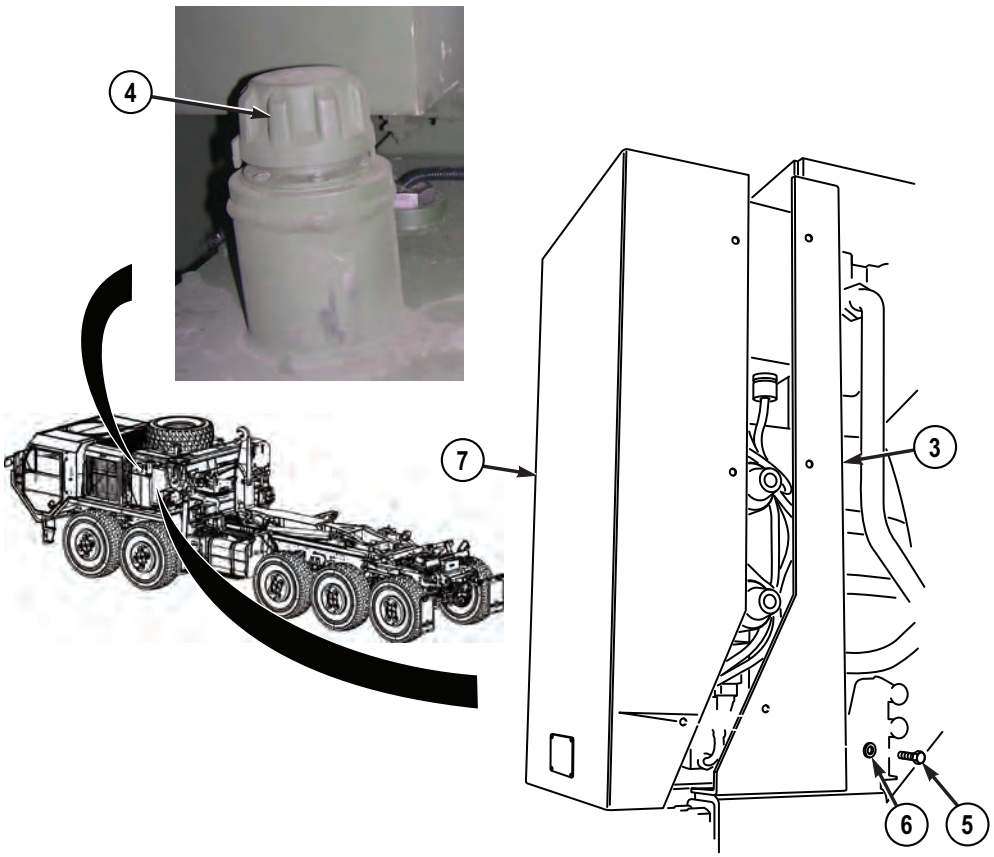


Figure 42.

NOTE

Only remove center screw on left side of LHS control box cover (3).

5. Remove four screws (5), lockwashers (6), and LHS control box cover (7) from LHS control box (3) on both vehicles.

NOTE

- Jam knob (8) and On/Off valve knob (9) will only be adjusted on disabled vehicle (2).
- On/Off valve knob (9) will be labeled NV2 on multi-function manifold.

6. Turn jam knob (8) on disabled vehicle (2) counter clockwise.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

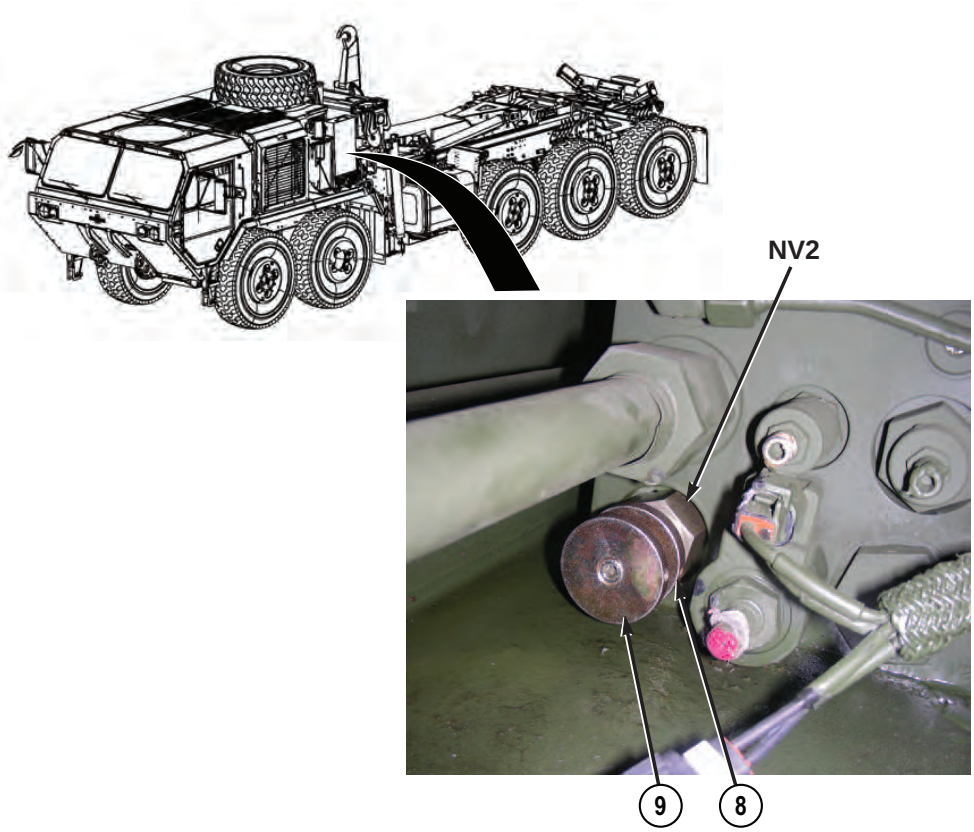


Figure 43.

7. Turn On/Off valve knob (9) on disabled vehicle (2) clockwise to close valve.
8. Attach 2 straight adapters (10) to male connections on both vehicles (1) and (2).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

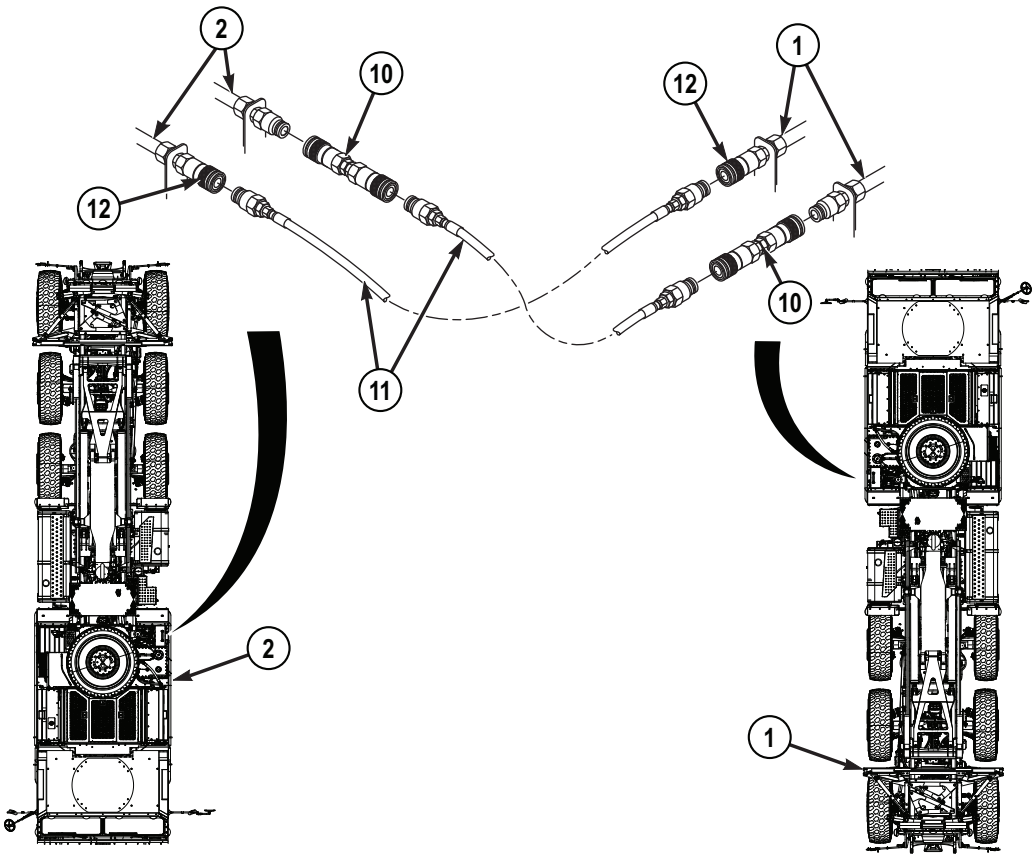


Figure 44.

9. Attach hose (11) from female connection (12) on disabled vehicle (2) to female connection (12) on operable vehicle (1).
10. Attach second hose (11) from straight adaptor (10) on disabled vehicle (2) to straight adaptor (10) on operable vehicle (1).

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

11. Start engine (WP 0037)on operable vehicle (1) and turn hydraulic selector switch (13) to AUTO position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

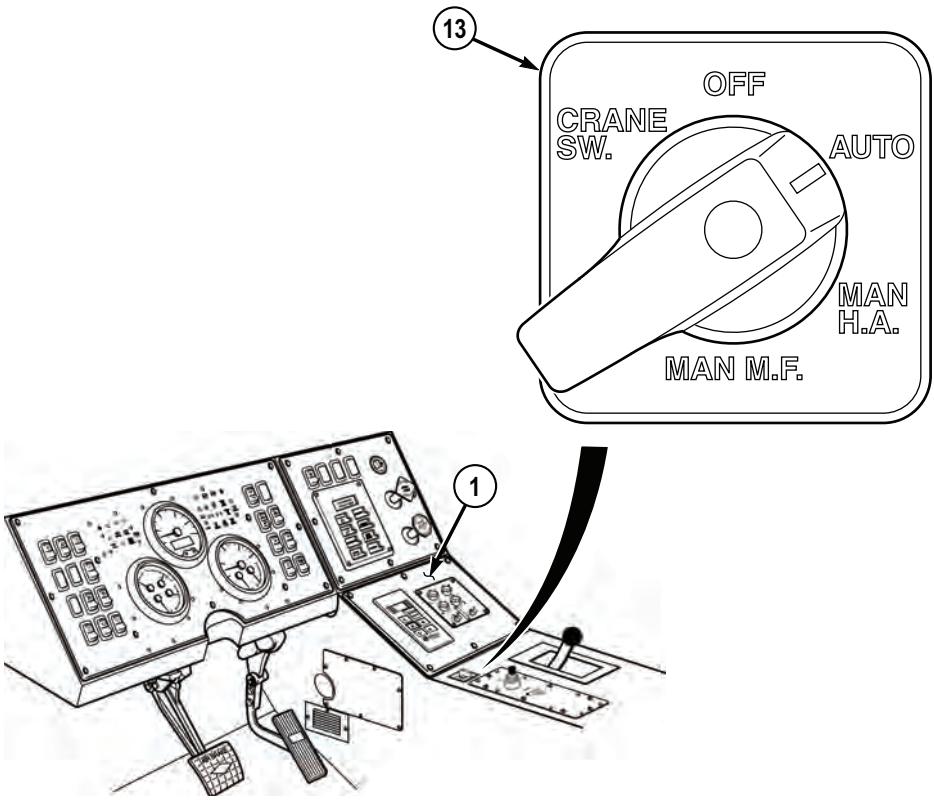


Figure 45.

12. Place hydraulic selector switch (13) on disabled vehicle (2) in the AUTO position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

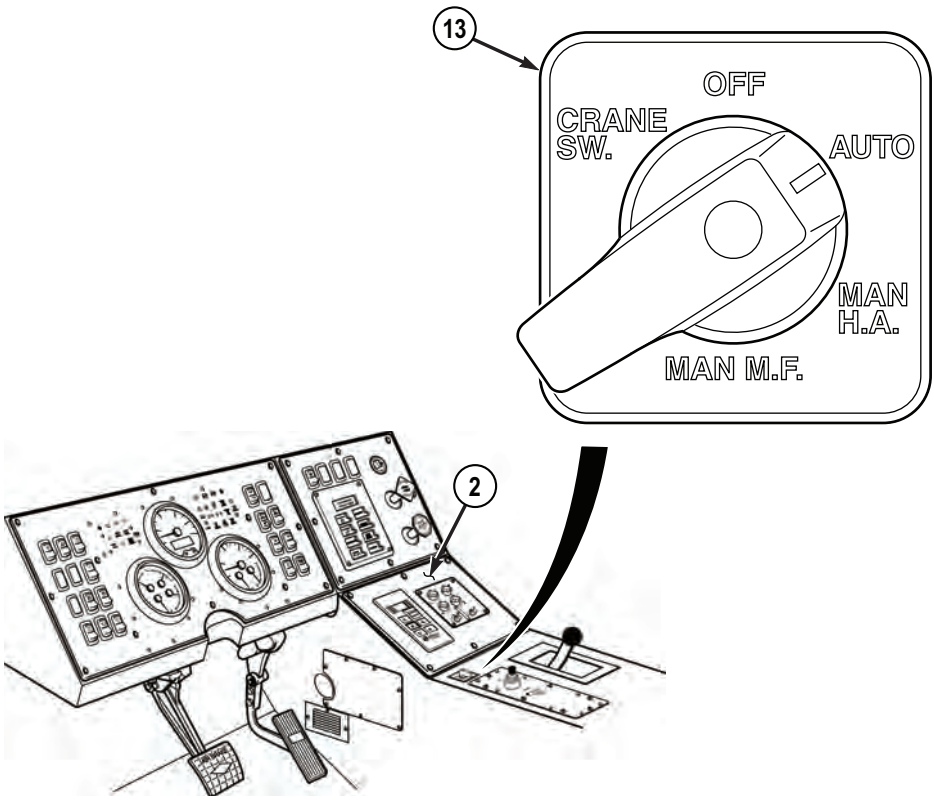


Figure 46.

NOTE

The following step is to supply electrical power to disabled vehicle (2). Do not start the vehicle.

13. Press ignition button (14) on disabled vehicle (2).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

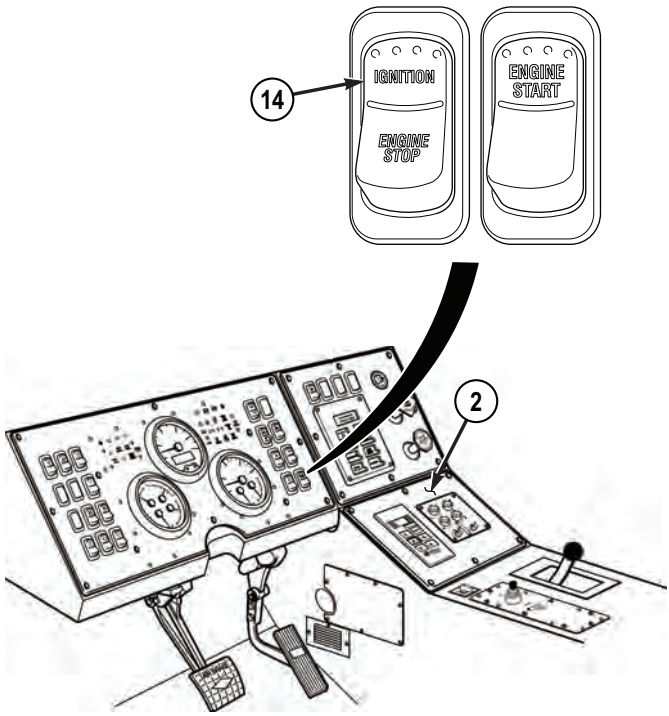


Figure 47.

14. Press and hold free flow valve override button (15) on operable vehicle (1).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

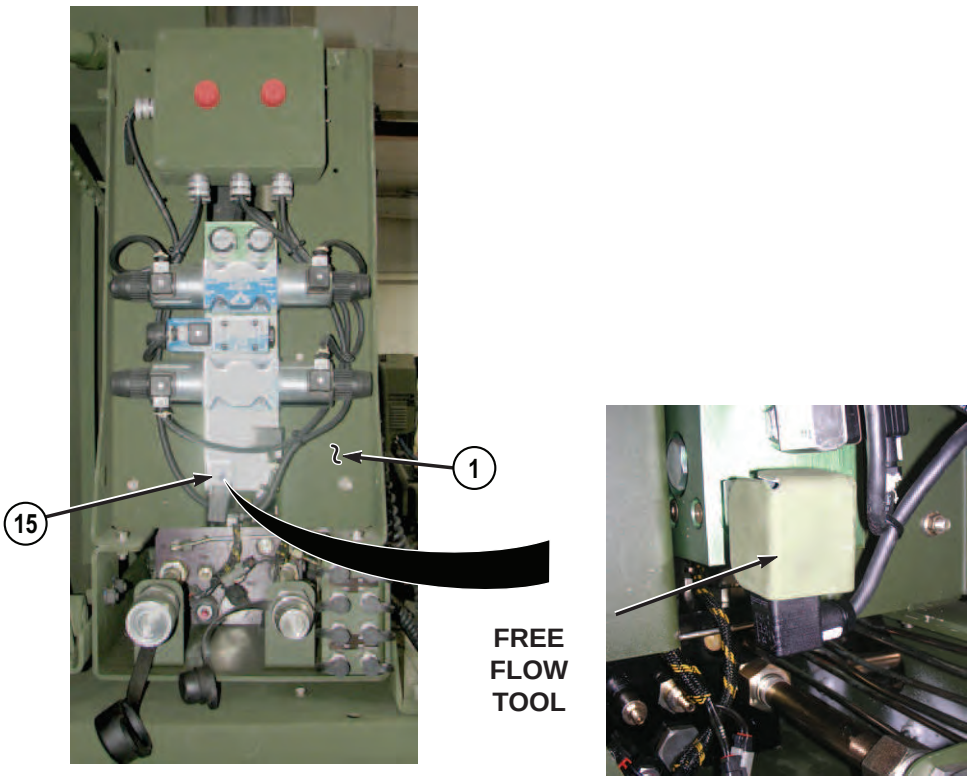


Figure 48.

15. Using LHS joystick (16) on disabled vehicle (2) remove load and return LHS system to transit configuration.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

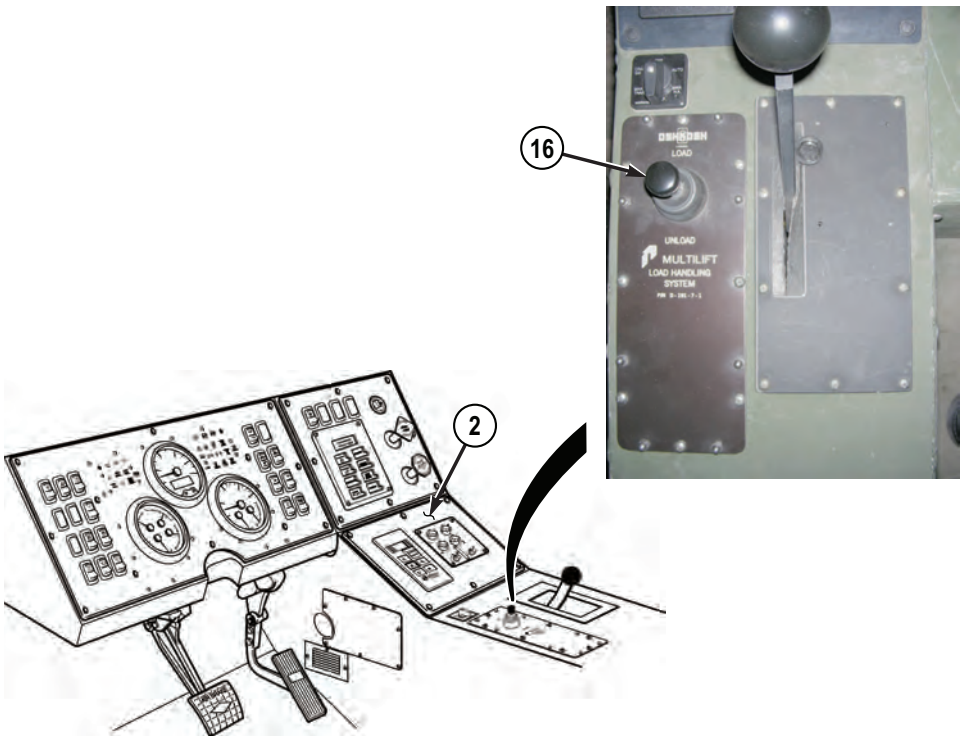


Figure 49.

16. Press engine stop button (17) on disabled vehicle (2).

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

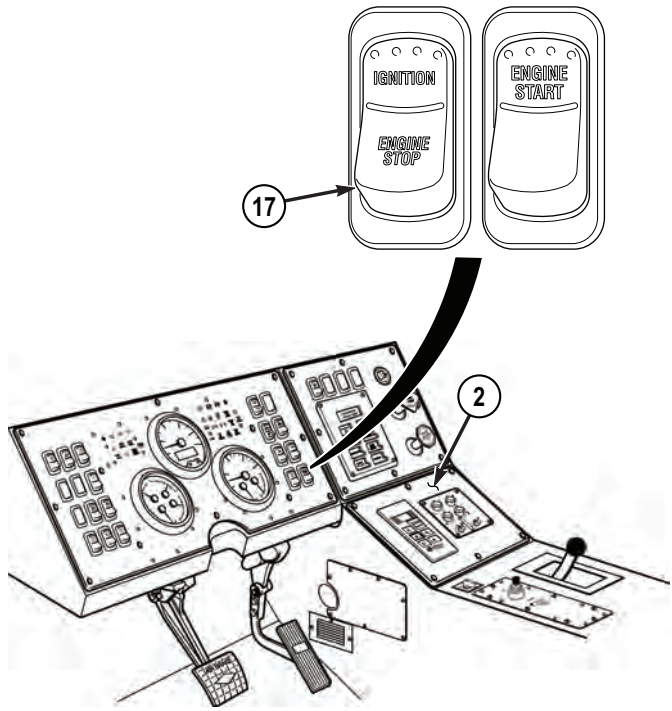


Figure 50.

NOTE

The following steps are to return both vehicles to transit configuration.

17. Shut OFF engine (WP 0037) on operable vehicle (1).
18. Disconnect both hoses (10) and adapters (9) from vehicles (1) and (2) and stow.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

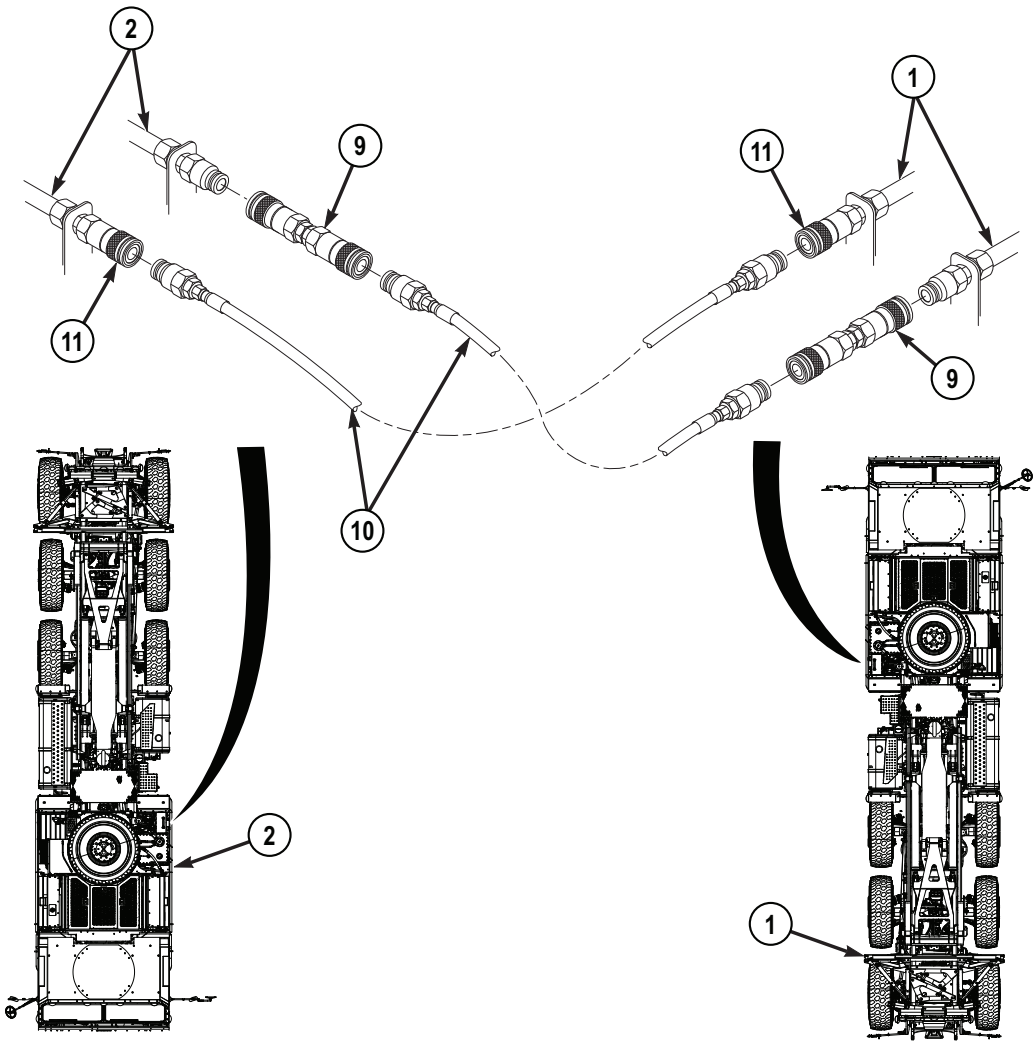


Figure 51.

19. Turn On/Off valve knob (9) on disabled vehicle (2) counterclockwise until seated.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

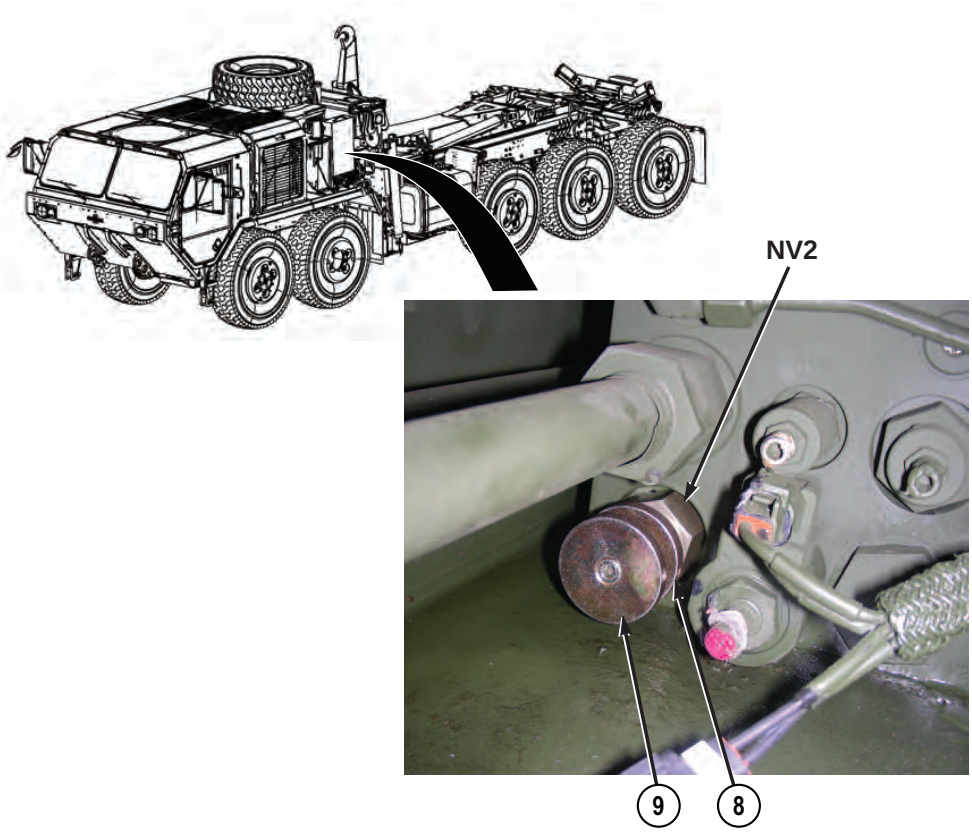


Figure 52.

20. Tighten jam knob (8) on disabled vehicle (2) clockwise.
21. Return hydraulic selector switch (13) on disabled vehicle (2) to the OFF position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

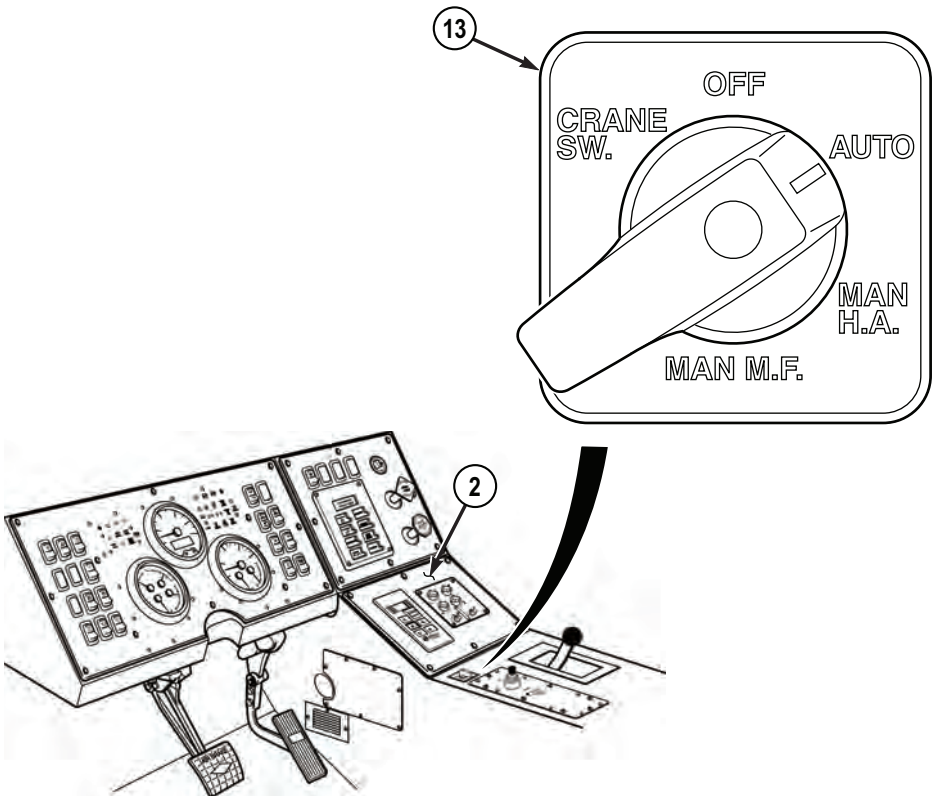


Figure 53.

22. Return hydraulic selector switch (13) on operable vehicle (1) to the OFF position.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

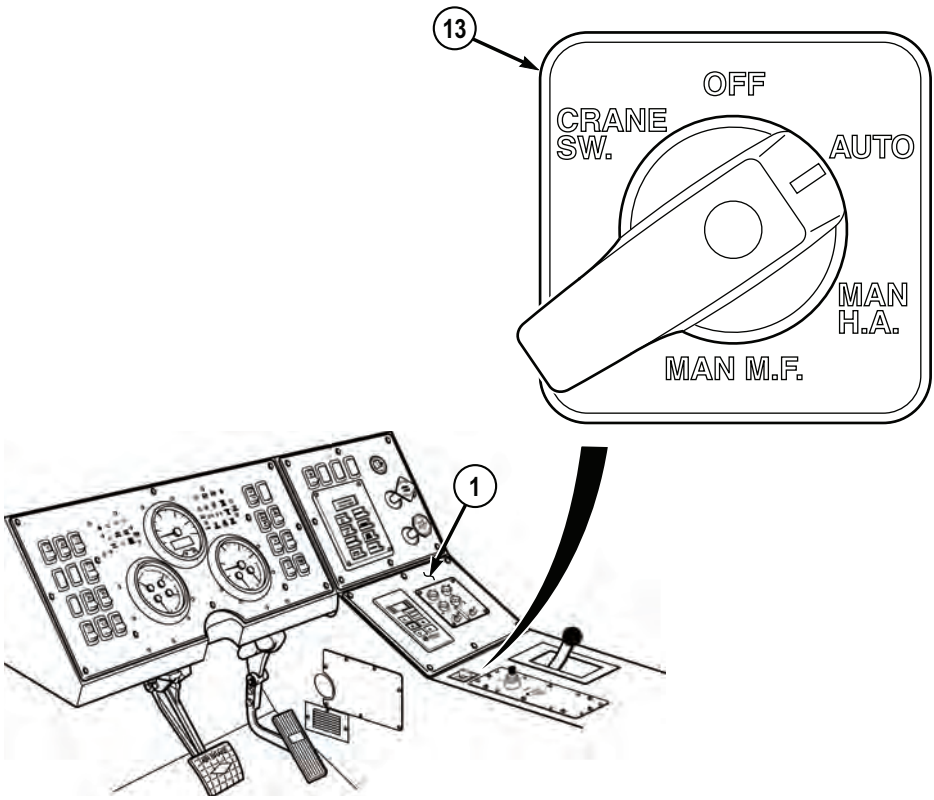


Figure 54.

23. Install four screws (4), lockwashers (5), and LHS control box cover (6) to LHS control box (3) on both vehicles.

A1 TO A1 SLAVE HYDRAULICS OPERATION WITH HYDRAULIC FAILURE ONLY - Continued

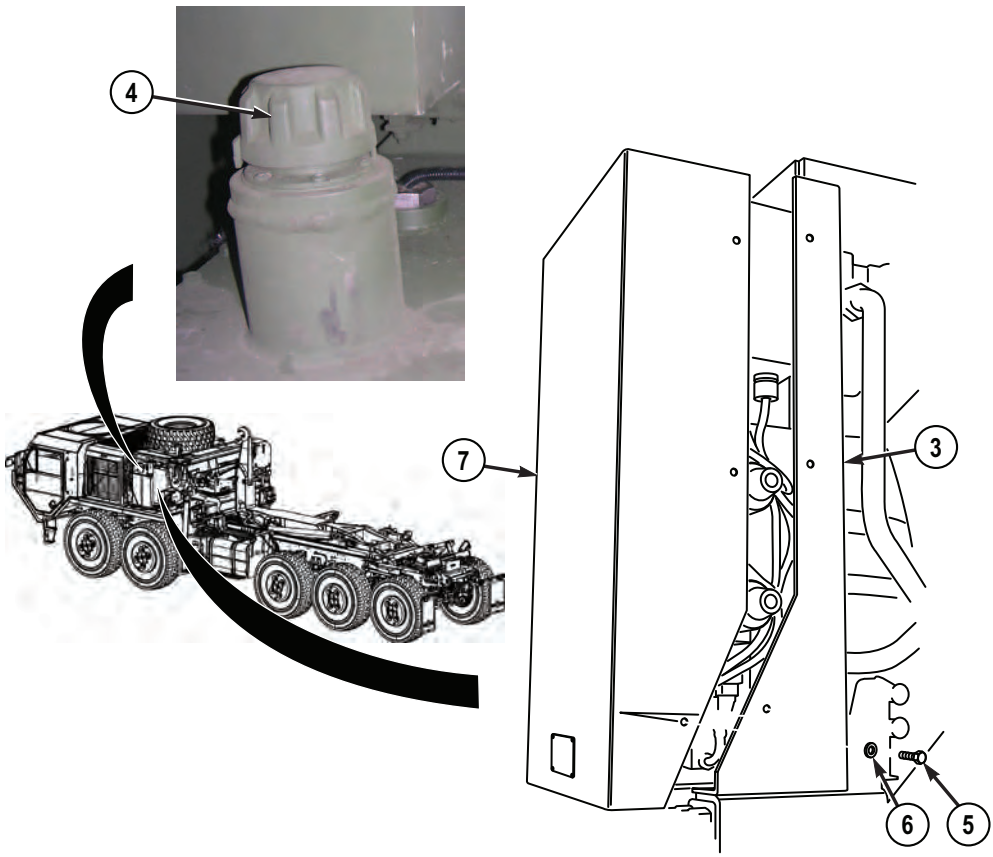


Figure 55.

END OF TASK

MANUAL HYDRAULIC OPERATION (LHS)

WARNING



Ensure operator, objects, and other personnel are clear of LHS and vehicle during LHS operation. Failure to comply may result in injury or death to personnel.

NOTE

In the event of electrical failure during loading or unloading, manual operation of main manifold directional control valves will allow LHS operation until electrical failure can be repaired.

1. Apply vehicle parking brakes (1) and place transmission range selector (2) in Neutral (N).

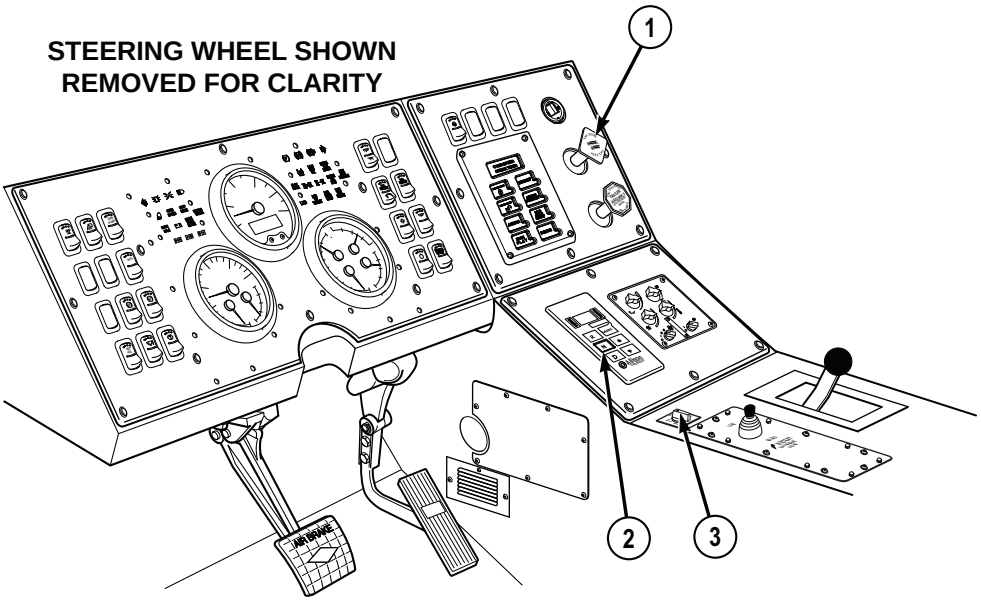


Figure 56.

MANUAL HYDRAULIC OPERATION (LHS) - Continued

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

2. Set hydraulic selector switch (3) to MAN H.A., MAN M.F., or AUTO position.
3. Remove 7/16 in. and 1/2 in. combination wrenches from stowage box.
4. Remove four screws (4), lockwashers (5) and LHS control box cover (6) from LHS control box (7) on vehicle.

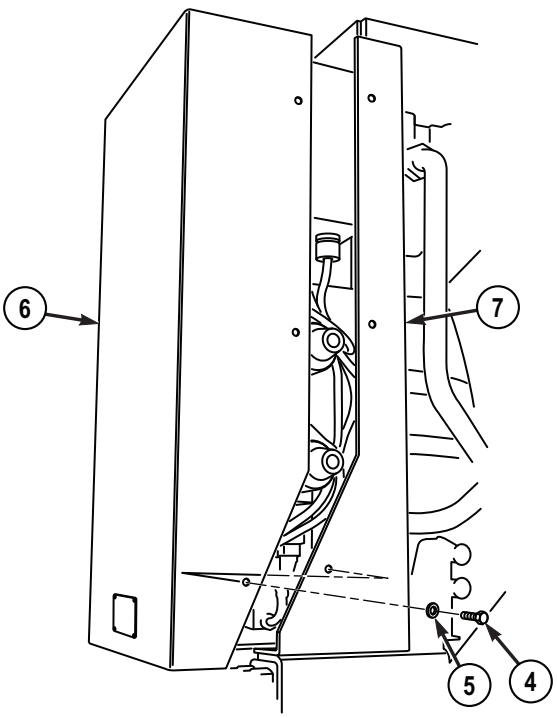


Figure 57.

5. Unload flatrack from vehicle as follows:

CAUTION

Engine speed must be at idle before hook arm cylinders are fully extended. Damage to equipment may result.

MANUAL HYDRAULIC OPERATION (LHS) - Continued

a. Press and hold free flow valve override button (8) and manual hook arm UP button (9) and extend hook arm cylinders (10) until hook arm cylinders are fully extended.

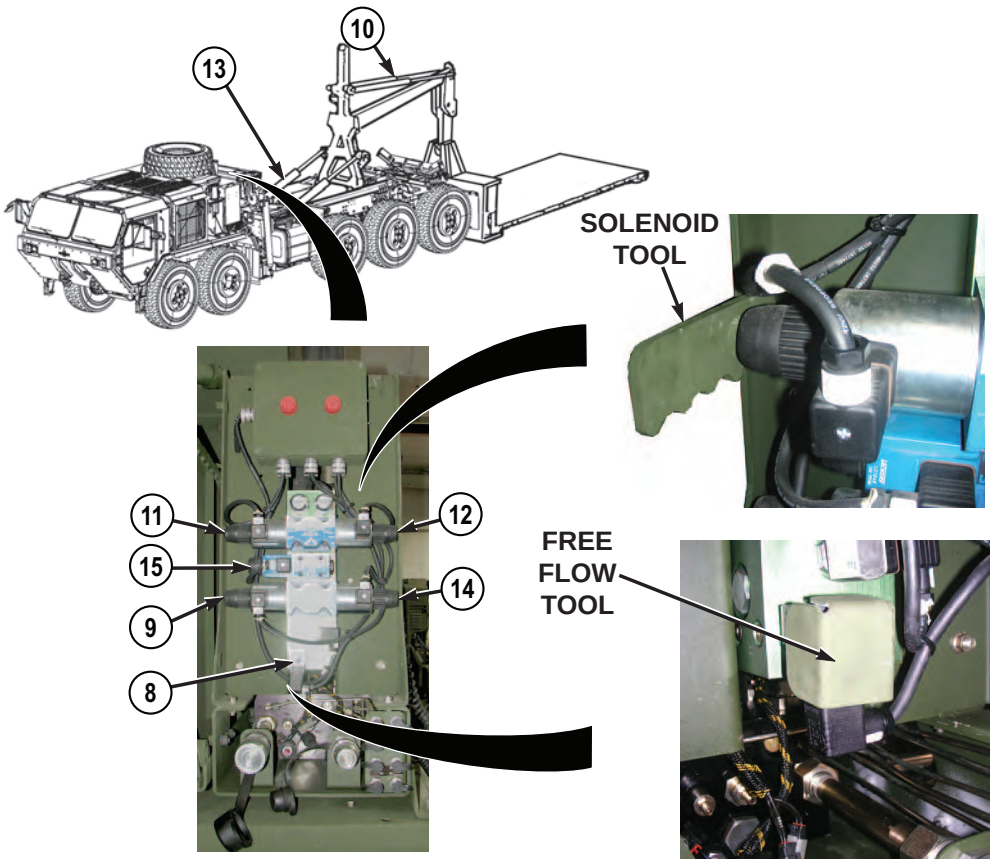


Figure 58.

b. Press and hold free flow valve override button (8) and manual main frame UP button (11) until unloaded.

CAUTION

To avoid equipment damage, ensure that main frame cylinders do not complete full retraction while operating at engine speeds above idle.

6. Load flatrack onto vehicle as follows:

MANUAL HYDRAULIC OPERATION (LHS) - Continued

a. Press and hold manual free flow valve override button (8). Press manual main frame DOWN button (12) until main frame cylinders (13) are fully retracted.

b. Press and hold manual free flow override button (8) and depress manual hook arm DOWN button (14) until flatrack is in transit position.

c. Press transit valve button (15) before moving vehicle.

CAUTION

Engine speed must be at idle before using hydraulic selector switch, or damage to equipment may result.

d. Place hydraulic selector switch (3) to MAN TRANS.

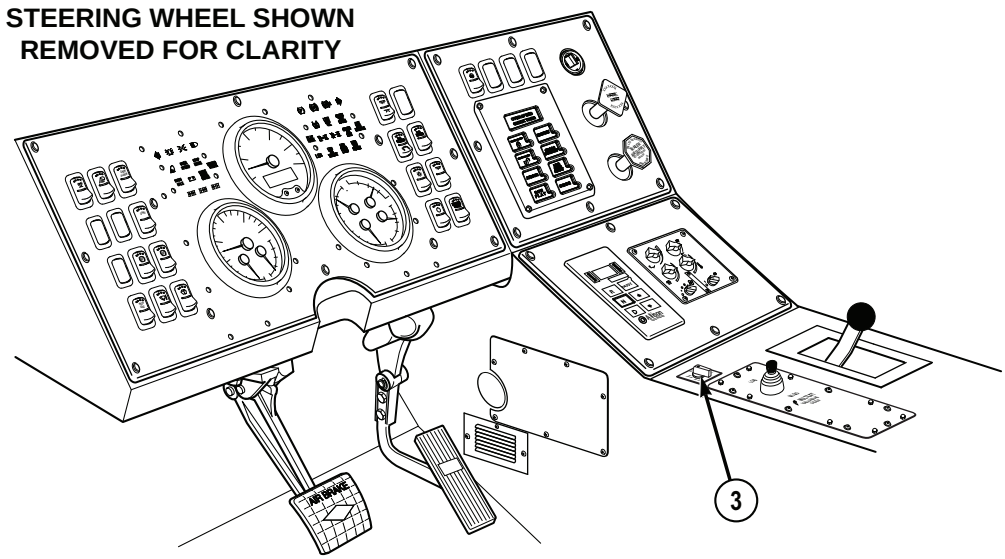


Figure 59.

7. Install four screws (4), lockwashers (5) and LHS control box cover (6) on LHS control box (7) on vehicle.

MANUAL HYDRAULIC OPERATION (LHS) - Continued

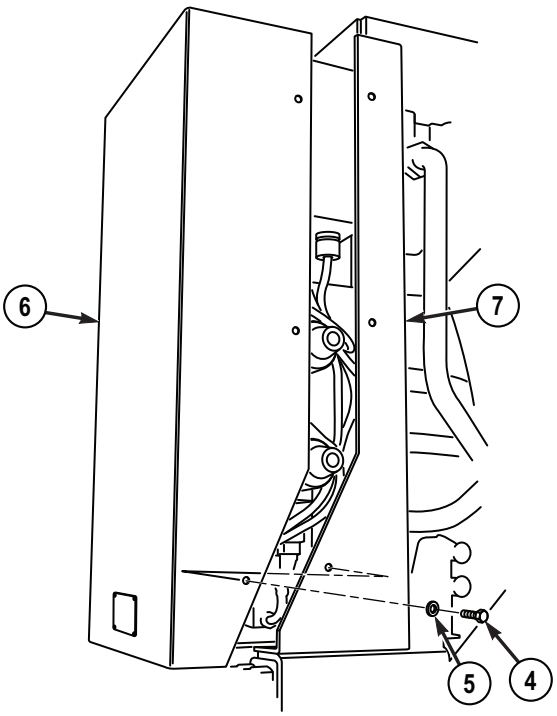


Figure 60.

8. Place combination wrenches in stowage box.

END OF TASK

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE)

WARNING



Ensure operator, objects, and other personnel are clear of LHS and vehicle during LHS operation. Failure to comply may result in injury or death to personnel.

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

NOTE

In event of hydraulic failure during loading or unloading, load control valves fitted into system will stop LHS operation. To recover from this, solenoid valves are operated, which, when open, bypass cylinder load control valves causing LHS to move under its own weight to load or unload position.

1. Apply vehicle parking brakes (1).

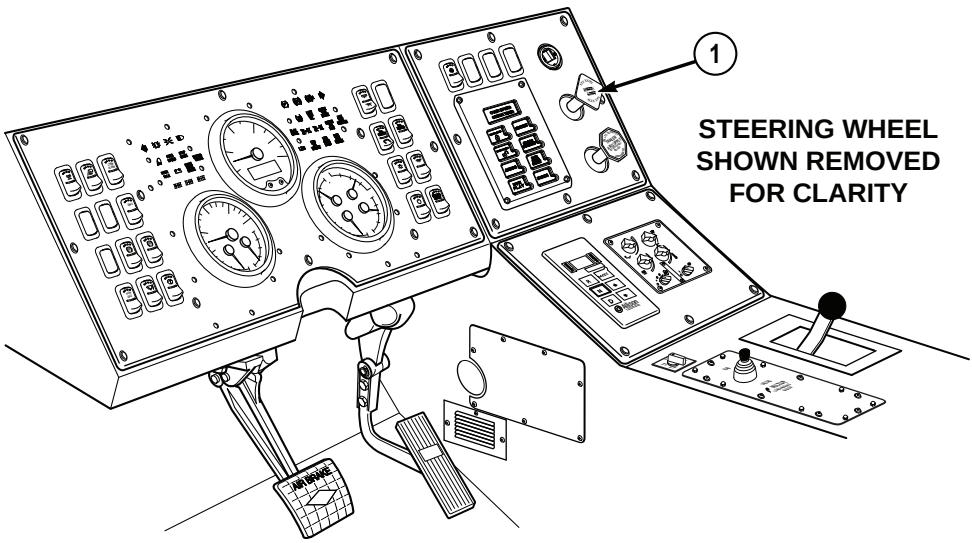


Figure 61.

2. Remove four screws (2), washers, and LHS control box cover (3).

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

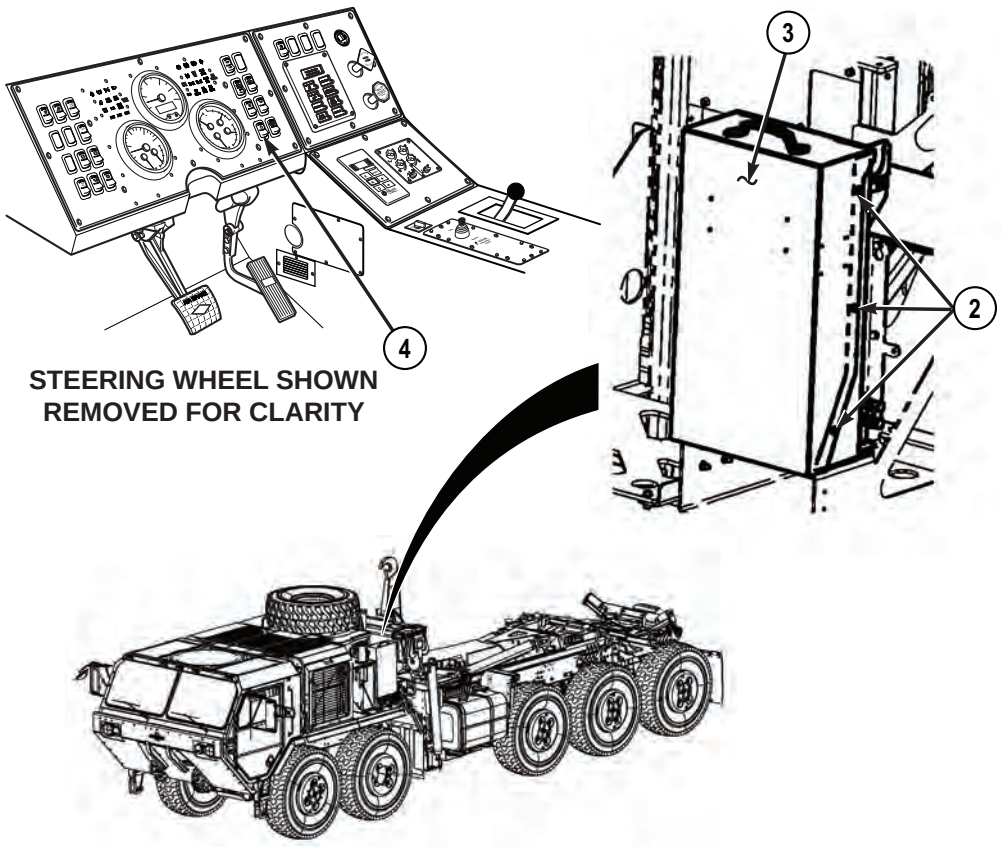


Figure 62.

3. Turn ignition switch (4) to ON position to allow power to electrical system, but do not start engine.

NOTE

Operate electrical lowering override buttons by pressing and releasing buttons, which controls movement of LHS.

4. Locate electrical hook arm override button (5) and middle frame safe lowering button (6).

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

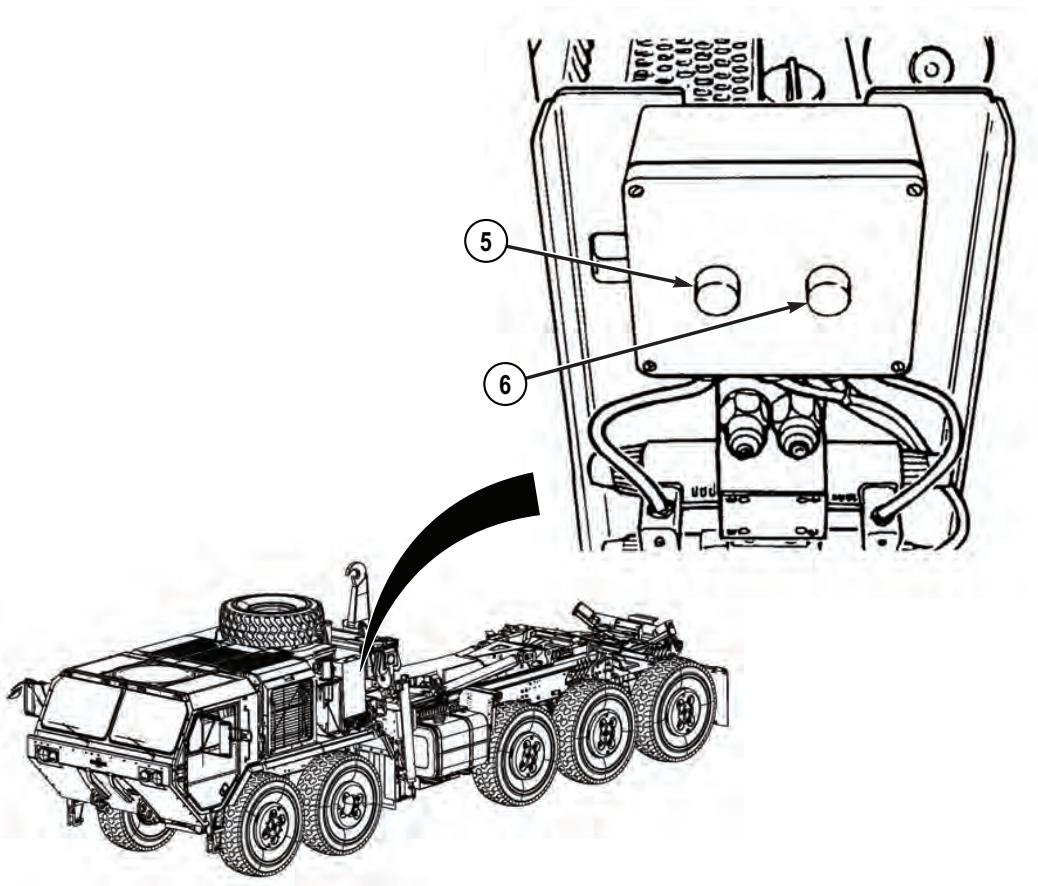


Figure 63.

CAUTION

Before depressing electrical lowering override buttons, direction of LHS payload movement (load or unload) must be known. Failure to comply may result in damage to equipment.

5. If flatrack load center-of-gravity is over vehicle, load will return to transport position. If flatrack load center-of-gravity is over rear of vehicle, flatrack will lower to the ground.

NOTE

Under certain circumstances, an assist vehicle may be needed to aid in pulling payload back, if dug in.

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

6. Press middle frame safe lowering button (6) for unloading. Ground conditions will determine if flatrack rolls/slides across ground or digs in. In event of digging in, operator should stop electrical override button operation. If this condition exists, the load will have to be unloaded manually.
7. As flatrack unloads, operator continues using middle frame safe lowering button (6). Weight of flatrack and payload will continue until load is on ground. Operator will have to exercise caution during this procedure. If flatrack is not fully on ground, the electrical hookarm override button (5) may be pressed until flatrack is on ground.
8. In event of load returning to transport position on vehicle during main frame electrical hookarm override button (5) operation, the operation continues using the electrical and LHS movement stops. The operator then presses the middle frame safe lowering button (6) until the hookarm cylinders are in transport position. Operator then moves hydraulic selector switch (7) to MAN TRANS position, which allows vehicle to be driven. Flatrack and payload must be manually off-loaded. Refer to MANUAL REMOVAL OF FLATRACK, below.

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

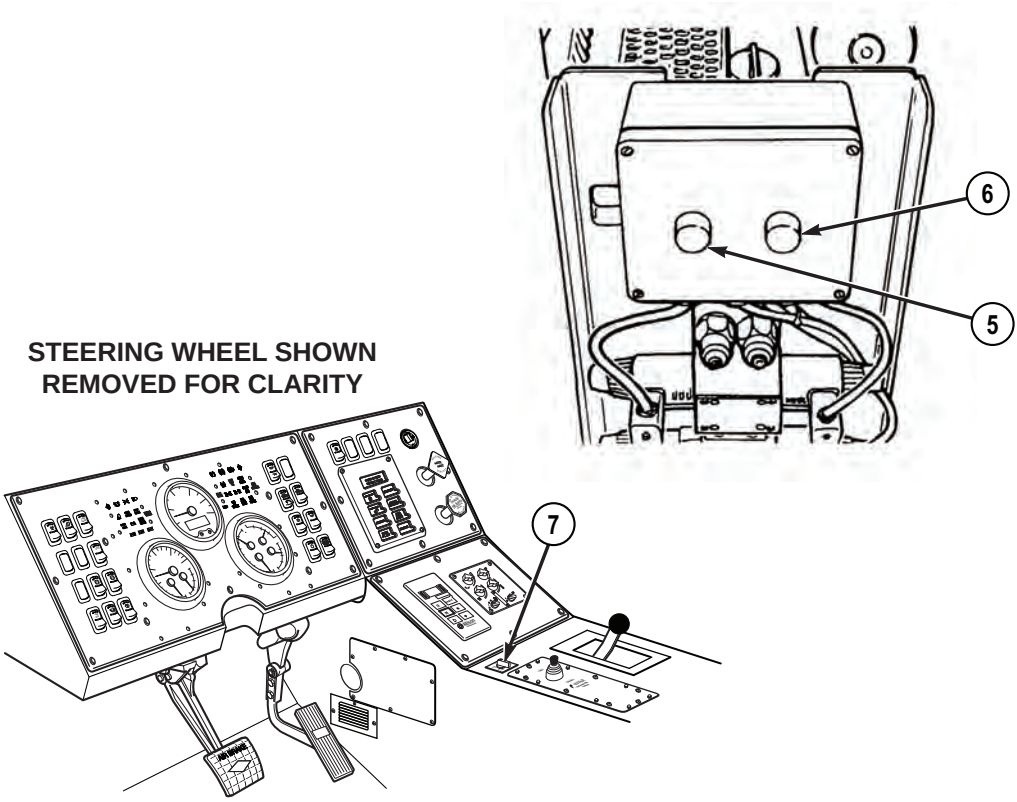


Figure 64.

9. Install four screws (8) and LHS control box cover (9).

LOWERING THE FLATRACK DURING COMPLETE HYDRAULIC FAILURE (HYDRAULIC RELEASE) - Continued

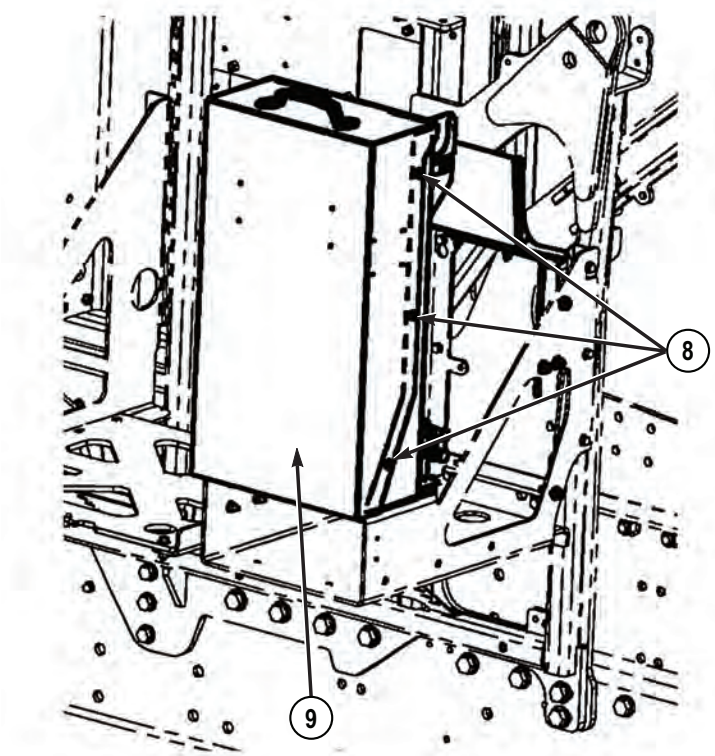


Figure 65.

END OF TASK

MANUAL REMOVAL OF FLATRACK

WARNING



M1077 flatrack weighs 3,200 lbs (1,452 kg). M1077A1 flatrack weighs 3,900 lbs (1,769 kg). Do not attempt to lift or move flatrack without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

CAUTION

It is not possible to load a flatrack onto a vehicle in this manner equipment damage may result.

NOTE

If complete system failure or hydraulic failure as described in this procedure does not allow normal operation, remove payload or flatrack and payload from vehicle.

1. Remove flatrack with lifting device as follows:
   a. Secure lifting slings to flatrack lifting eyes (1).

MANUAL REMOVAL OF FLATRACK - Continued

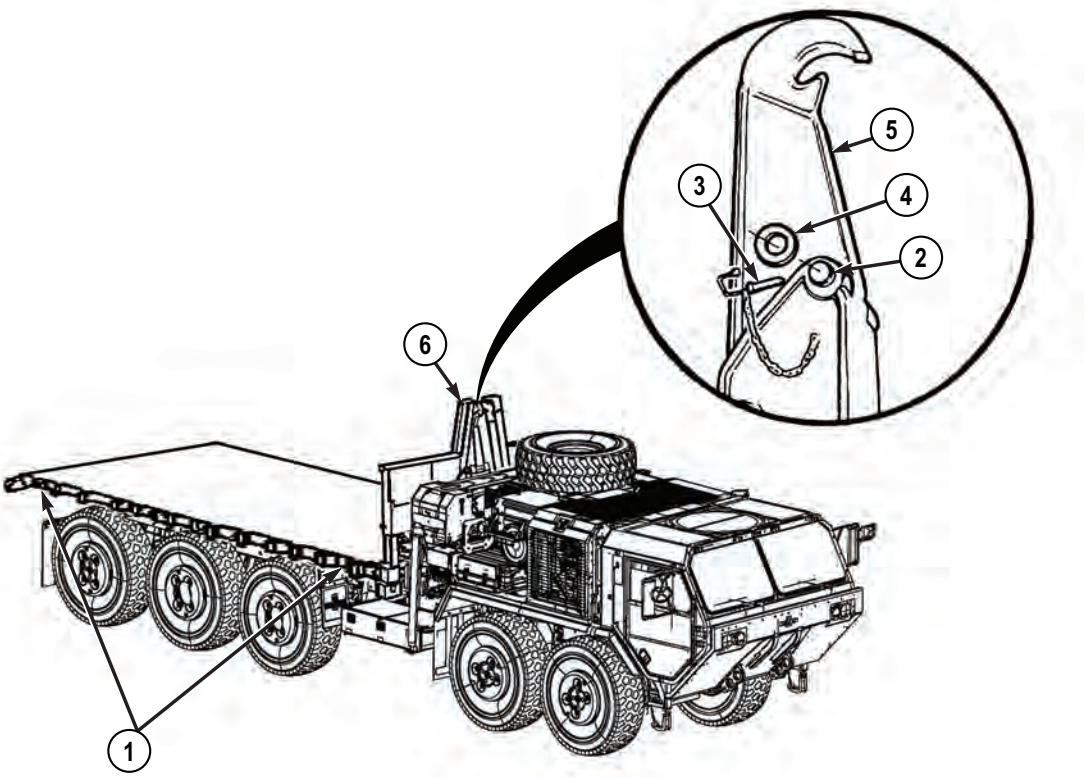


Figure 66.

WARNING



Lift hook weighs 200 lbs (91 kg). Do not attempt to lift or move lift hook without the aid of an assistant and a lifting device. Failure to comply may result in injury or death to personnel.

b. Apply tension to sling and lift flatrack slightly to relieve pressure on locking pin (2). Remove pin (3), washer (4), and locking pin (2) from lift-hook (5).

MANUAL REMOVAL OF FLATRACK - Continued

c. Using a lifting device, lift flatrack slightly. (Flatrack will not rise due to flatrack hook bar being engaged under lift-hook (5) and load locks being engaged.)

WARNING



Stand clear of flatrack and lift hook areas during manual unload and load procedures. Failure to comply may result in injury or death to personnel.

d. Using another vehicle or an anchor point, pull flatrack rearwards from lift-hook (5) until lift-hook clears and falls free of flatrack hook bar (6).

2. Move lift-hook (5) back into position and install locking pin (2), washer (4), and pin (3) in lift-hook.

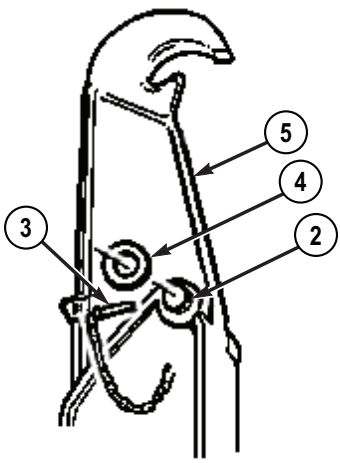


Figure 67.

END OF TASK

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK

CAUTION

- Attempting to unload flatrack with LHS rear load locks engaged will result in damage to flatrack and possible damage to LHS.
- Flatrack must be empty before attempting to re-engage hook and hook bar or damage to equipment may result.

NOTE

Flatrack is considered engaged in LHS rear load locks when any part of flatrack lock is under LHS lock.

Re-engage flatrack hook-bar as follows:

a. Visually inspect LHS rear load lock (1) and flatrack load lock (2) to determine if flatrack (3) is engaged or disengaged.

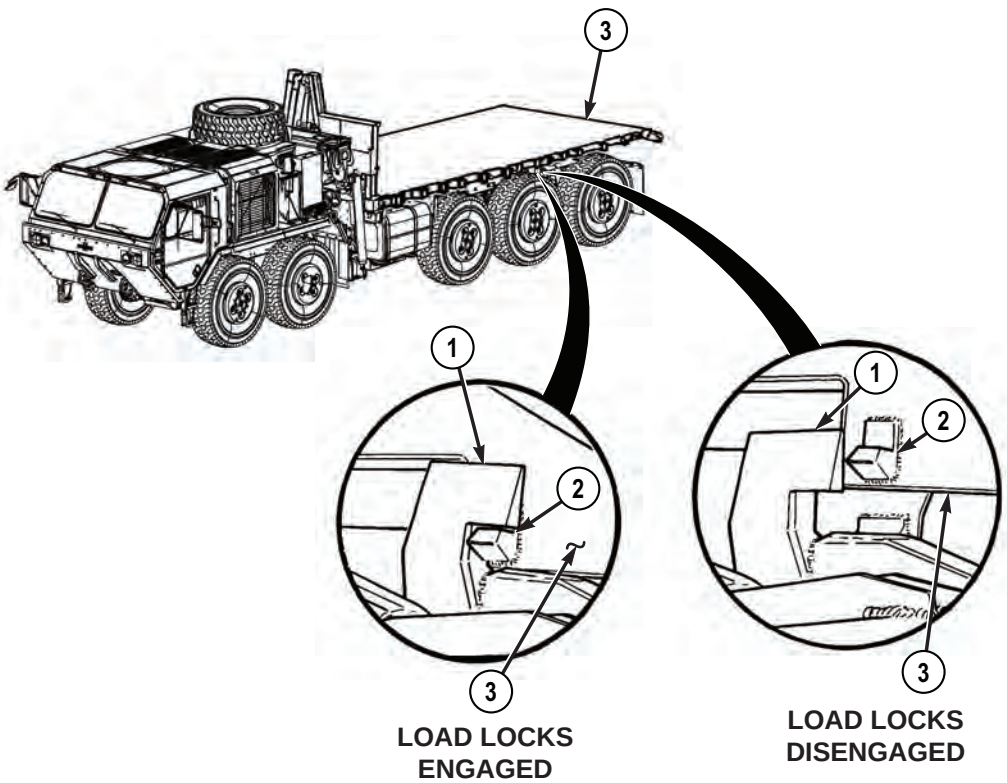


Figure 68.

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK - Continued

b. If flatrack load lock (2) is not engaged in LHS rear load locks (1), go to Step (m).

c. If flatrack load lock (2) is engaged in LHS rear load locks (1), go to Step (d).

d. With the aid of an assistant, position vehicle so rear of vehicle is about 5 ft (1524 mm) from another stationary vehicle and apply parking brakes (4) on both vehicles.

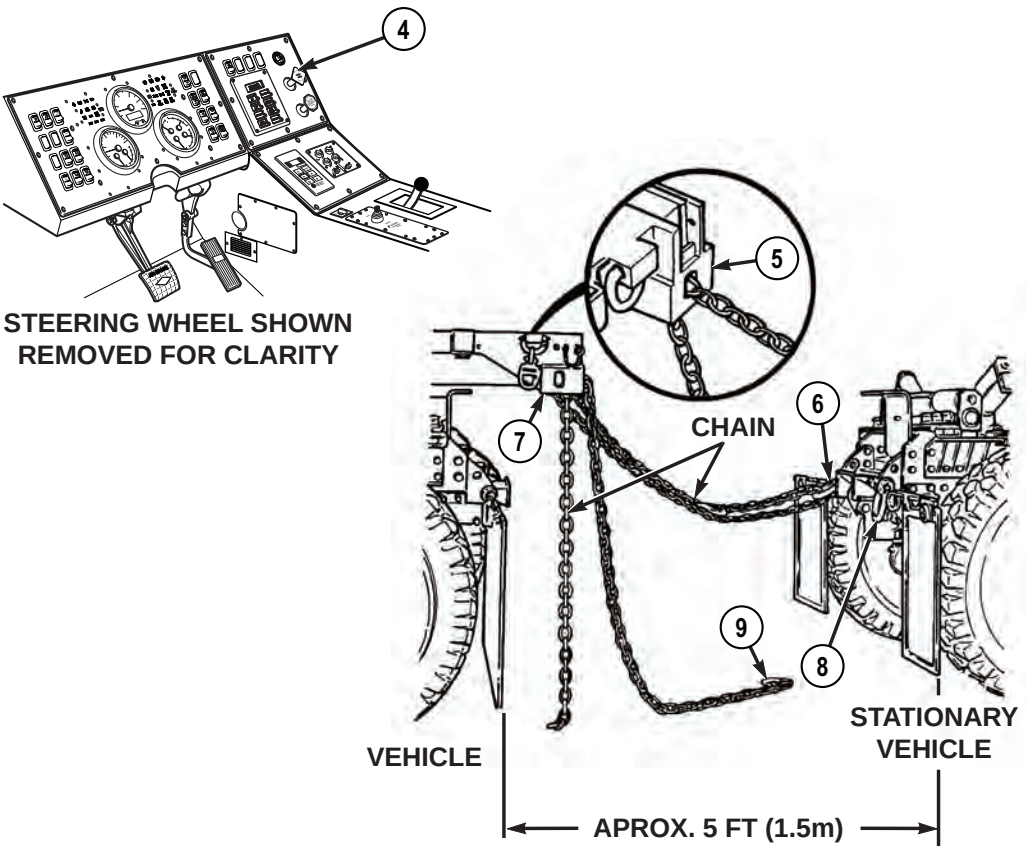


Figure 69.

CAUTION

Use of a chain at each flatrack corner casting is required, or damage to equipment can result.

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK - Continued

NOTE

Use of the 14 ft (4267 mm) chain from the vehicle BII and another chain of equal length and strength is required.

e. Route one chain through right ISO corner casting (5) of vehicle and through left tow eye shackle (6) on the stationary vehicle.

f. Route the second chain through left flatrack ISO corner casting (7) of vehicle and through right tow eye shackle (8) on the stationary vehicle.

g. Adjust chains to equal lengths and hook chain hooks (9) on chains.

WARNING



Keep all personnel away from rear of flatrack and chains while attempting to disengage the load locks. Chains will be under great tension and could unhook or fail. Failure to comply may result in injury or death to personnel.

CAUTION

Vehicle should be driven forward slowly or damage to equipment can result.

NOTE

Ensure that both chains tighten evenly when moving vehicle forward.

h. With the aid of an assistant, release parking brake (4) and move vehicle forward to take slack out of chains.

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK - Continued

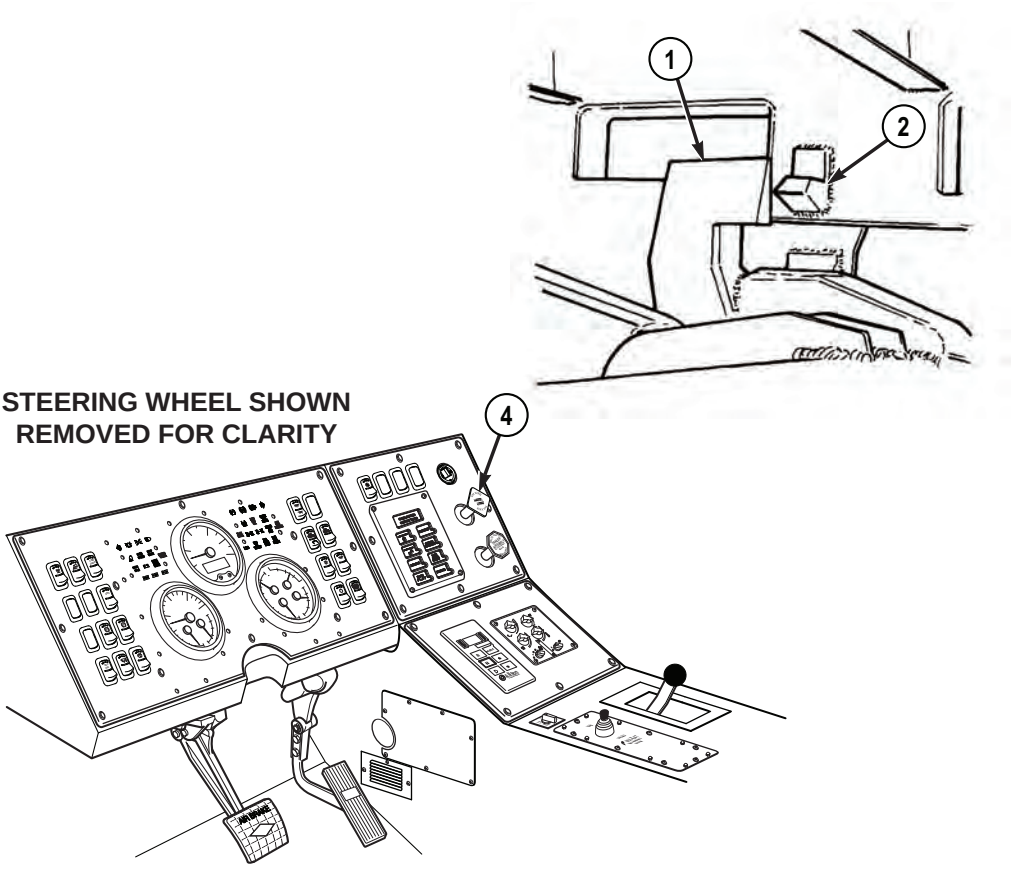


Figure 70.

i. Increase engine speed until flatrack load lock (2) disengages from LHS rear load locks (1).

j. Move vehicle rearward to relieve tension on chains and apply parking brake (4).

k. Remove and stow both chains.

l. Release parking brake (4) and drive vehicle forward to allow room for removal of flatrack (3).

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK - Continued

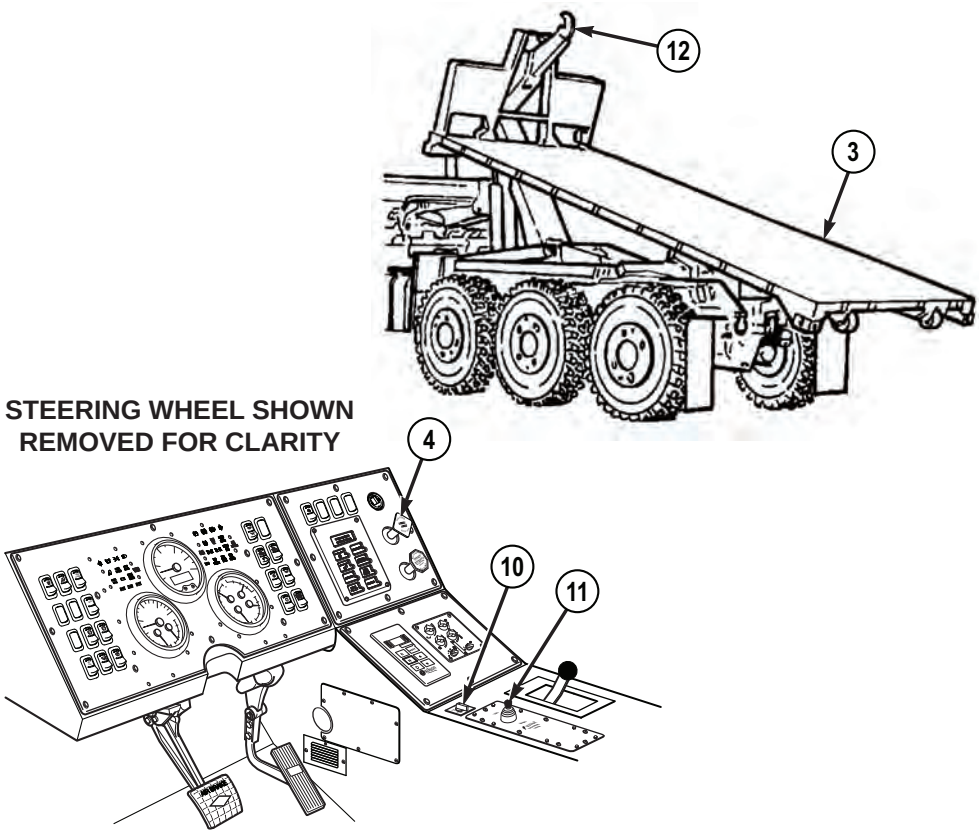


Figure 71.

m. Apply parking brake (4) and turn hydraulic selector switch (10) to AUTO.

WARNING



Stand clear of flatrack and lift hook areas during manual unload and load procedures. Failure to comply may result in injury or death to personnel.

MANUALLY RE-ENGAGE FLATRACK HOOKBAR TO LHS HOOK - Continued

NOTE

Lift hook will raise with flatrack hookbar outside of lift hook. As the hookarm raises, the flatrack will move rearward and engage the lift hook.

n. Move joystick (11) to UNLOAD until flatrack (3) engages lift hook (12).

o. Refer to standard loading and unloading procedures (WP 0042).

END OF TASK

EMERGENCY STEERING SYSTEM

WARNING



If EMERGENCY STEER light illuminates when driving, immediately pull vehicle over to side of road and stop. Failure to comply may result in injury or death to personnel.

NOTE

If EMERGENCY STEER light illuminates, there is a problem in the primary hydraulic steering system and the emergency steering backup hydraulic system has been activated. As vehicle speed gets below approximately 15 mph, increased steering effort will be required to steer vehicle. Notify Field Maintenance.

1. If EMERG STEER indicator light (1) illuminates:

EMERGENCY STEERING SYSTEM - Continued

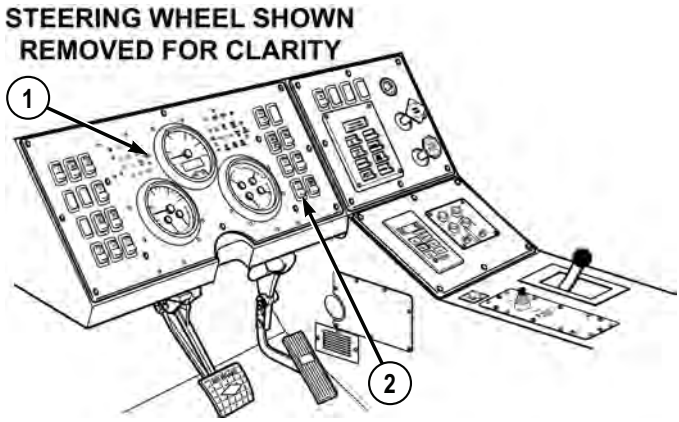


Figure 72.

a. Bring vehicle to safe stop and park vehicle (WP 0036).

b. Press ignition switch (2) to OFF position.

2. Notify Field Maintenance.

END OF TASK

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE

1. Turn CTIS On/Off switch (1) to OFF position.

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE - Continued

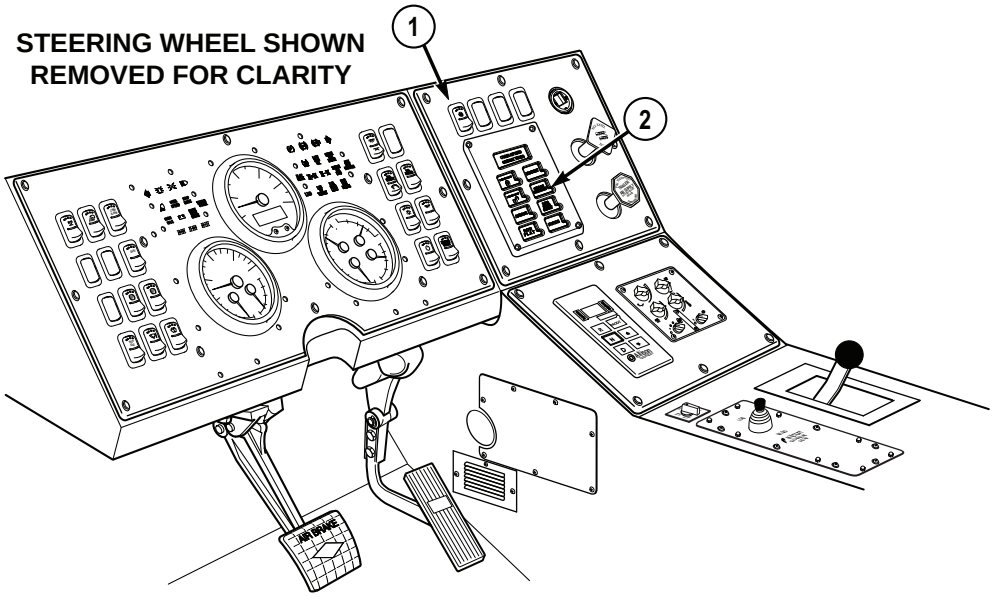


Figure 73.

CAUTION

Tire pressure must be manually deflated or inflated to match CTIS rotary selection switch setting during CTIS failure. Failure to comply may result in damage to driveline components.

2. Set CTIS selector switch (2) to the appropriate road condition (WP 0002).
3. Refer to tire pressure chart (WP 0038) for correct tire pressure.

WARNING



Hold end of air line when disconnecting from quick-disconnect coupling. Air line is under pressure and can fly out at fast rate of speed. Failure to comply may result in injury or death to personnel.

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE - Continued

NOTE

If CTIS is not working, tires may be inflated manually. Inflate tires only when they are cool. Inflate to proper pressure for terrain conditions.

4. Remove air hose assembly (3) and inflator gauge (4) from stowage box.

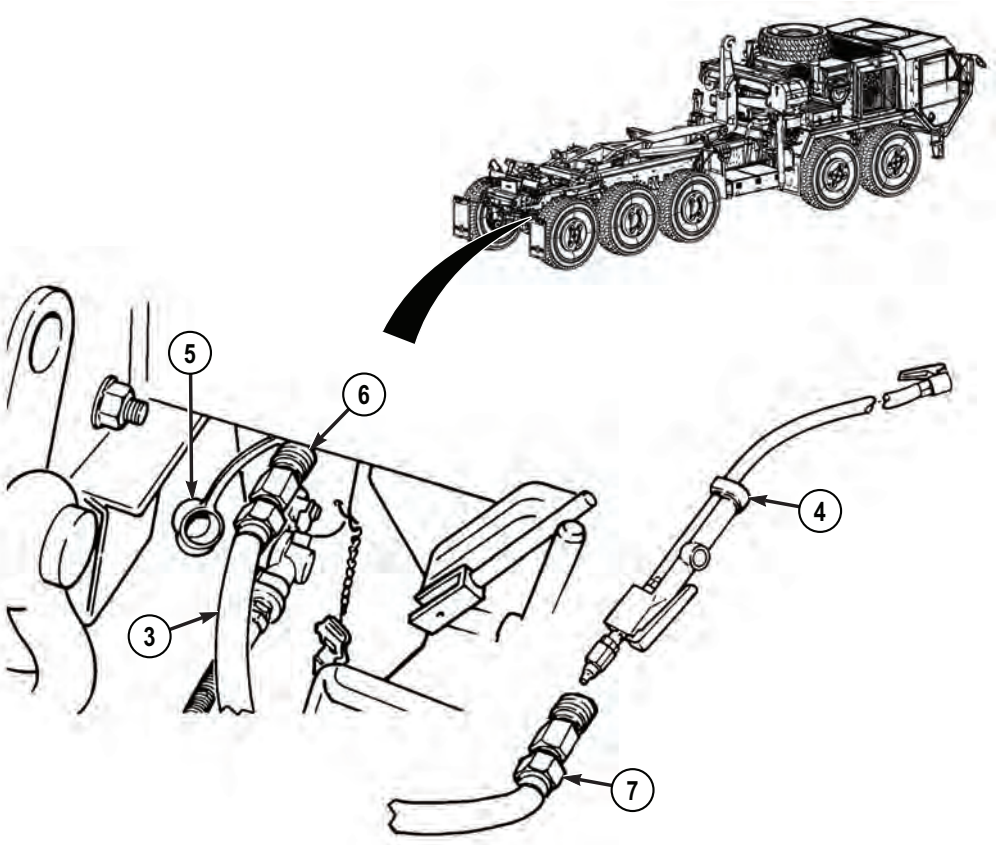


Figure 74.

5. Remove cover (5) from quick-disconnect coupling (6).
6. Connect air hose assembly (3) to quick-disconnect coupling (6).
7. Connect inflator gauge (4) to quick-disconnect coupling (7) on air hose assembly (3).
8. Start engine (WP 0027).
9. Remove valve cap (8) from valve stem (9).

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE - Continued

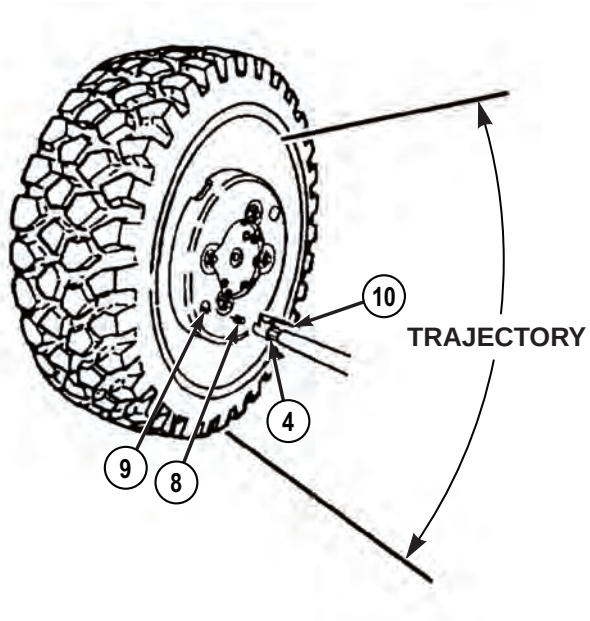


Figure 75.

NOTE

- Inflator gauge must clamp securely with no air leaks or the air pressure gauge reading will be inaccurate.
- Trajectory area as shown applies to all wheel/tire assemblies.

10. Push latch handle (10) inward, while pushing air chuck assembly (4) onto valve stem (9). Release latch handle and immediately step out of trajectory area. Read tire air pressure gauge on inflator gauge and compare to Unsafe Inflation Pressures Table (Table 1).

WARNING



- Tire air must be checked properly. Failure to comply may result in injury or death to personnel.

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE - Continued

- If spare tire is under-inflated, over-inflated, or if wheel or tire has obvious or suspect damage, tire must be completely deflated by removing valve core from valve stem. Do not attempt to inflate an under-inflated, over-inflated, or damaged spare tire. Failure to comply may result in injury or death to personnel.
- Prior to inflating or deflating tire, stand clear of trajectory area. Failure to comply may result in injury or death to personnel.

11. Inflate/deflate tire to proper pressure. Refer to tire pressure chart (WP 0038).
12. Push in latch handle (10) and disconnect air chuck assembly (4) from valve stem (9).
13. Install valve cap (8) on valve stem (9).

WARNING



Hold end of air line when disconnecting from quick-disconnect coupling. Air line is under pressure and can fly out at fast rate of speed. Failure to comply may result in injury or death to personnel.

14. Remove air hose assembly (3) from quick-disconnect coupling (6).

MANUAL INFLATE/DEFLATE TIRES WITH CTIS FAILURE - Continued

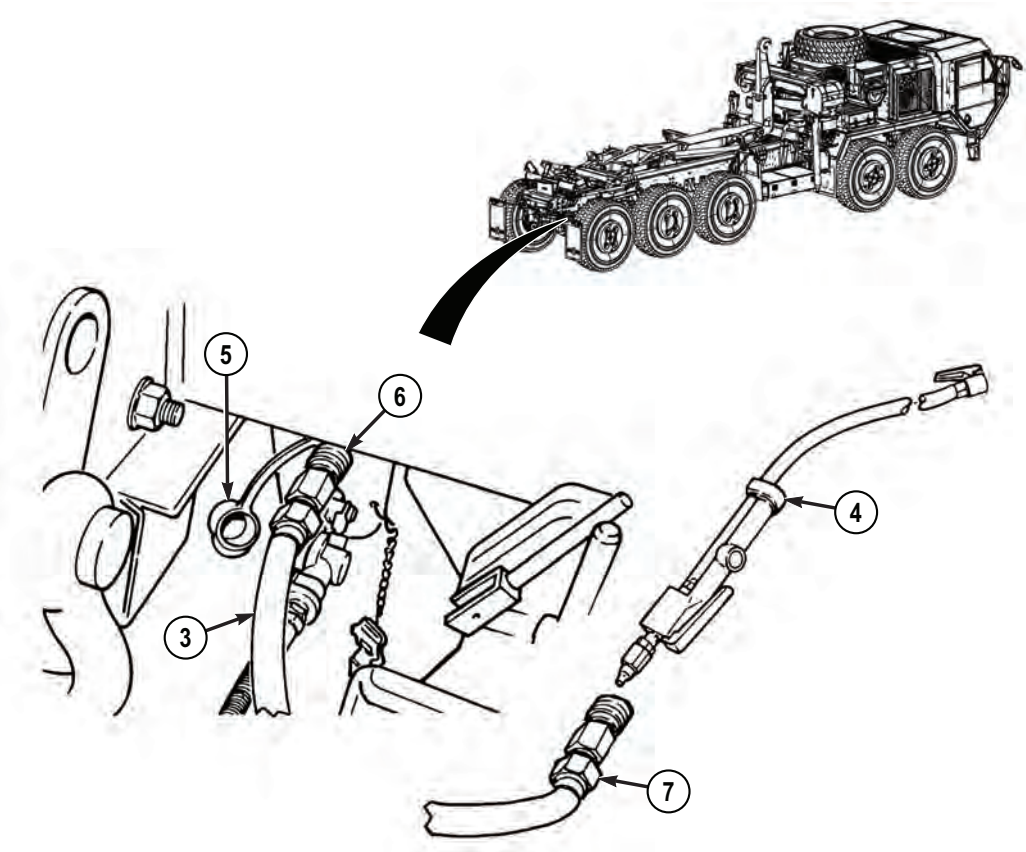


Figure 76.

15. Install cover (5) on quick-disconnect coupling (6).
16. Remove air chuck assembly (4) from quick-disconnect coupling (7) on air hose assembly (3).
17. Stow air hose assembly (3) and air chuck assembly (4) in stowage box.
18. Shut OFF engine (WP 0037).

END OF TASK

UNSAFE TIRE INFLATION PRESSURES

WARNING



If tire has been run flat, or is over or under inflated when tire is measured and operating terrain is compared to Unsafe Tire Inflation Pressures, or if wheel/tire assembly has obvious or suspected damage, it is not safe to adjust tire pressure. Completely deflate tire and remove tire from axle. Failure to follow these procedures may result in injury or death to personnel.

Unsafe tire inflation pressures are as follows:

Table 1. Unsafe Tire Inflation Pressures.

	Spare Tire is:	Spare Tire is:	Front Tires Are:	Front Tires Are:	Rear Tires Are:	Rear Tires Are:
	Over-inflated. Tire pressure measured is 25% or more above the standard tire pressure. Do not adjust pressure if above pressure shown below.	Under-inflated. Tire pressure measured is 80% or less than the standard tire pressure. Do not adjust pressure if below pressure shown below.	Over-inflated. Tire pressure measured is 25% or more above the standard tire pressure. Do not adjust pressure if above pressure shown below.	Under-inflated. Tire pressure measured is 80% or less than the standard tire pressure. Do not adjust pressure if below pressure shown below.	Over-inflated. Tire pressure measured is 25% or more above the standard tire pressure. Do not adjust pressure if above pressure shown below.	Under-inflated. Tire pressure measured is 80% or less than the standard tire pressure. Do not adjust pressure if below pressure shown below.
Highway	94 psi (648 kPa)	60 psi (414 kPa)	81 psi (558 kPa)	94 psi (648 kPa)	52 psi (359 kPa)	60 psi (414 kPa)

UNSAFE TIRE INFLATION PRESSURES - Continued

Table 1. Unsafe Tire Inflation Pressures. - Continued

Cross Country	94 psi (648 kPa)	60 psi (414 kPa)	43 psi (296 kPa)	48 psi (331 kPa)	27 psi (186 kPa)	30 psi (207 kPa)
Mud, Sand, and Snow	94 psi (648 kPa)	60 psi (414 kPa)	25 psi (172 kPa)	29 psi (200 kPa)	16 psi (110 kPa)	18 psi (124 kPa)
Emergency	94 psi (648 kPa)	60 psi (414 kPa)	15 psi (103 kPa)	18 psi (124 kPa)	15 psi (103 kPa)	18 psi (124 kPa)

END OF TASK

INTERFACE EMERGENCY PROCEDURES

Interface emergency operation with electrical failure:

NOTE

- This procedure will provide emergency hydraulic power to auxiliary supply valve when solenoid fails until electrical power can be restored.
- Manual override button cannot be turned on until it is pulled out past the notches located behind button. Visually check when performing this procedure.

a. Pull out manual override button (1) past notches (2) and turn clockwise.

INTERFACE EMERGENCY PROCEDURES - Continued

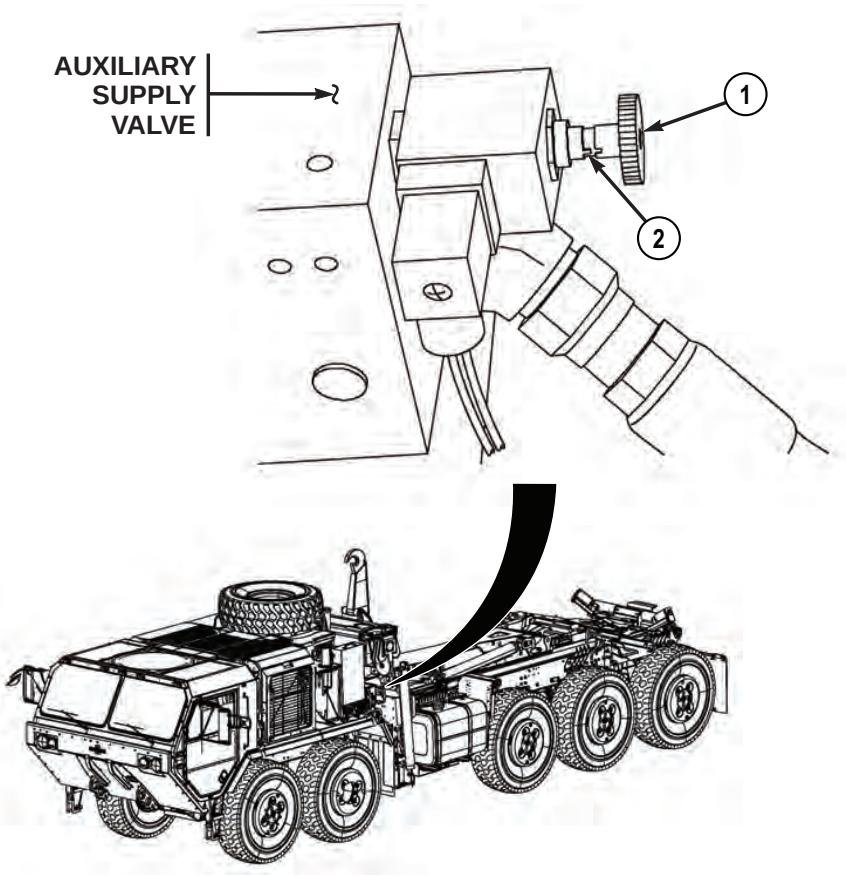


Figure 77.

b. Operate system hydraulics.

c. Turn manual override button (1) counterclockwise and engage notches (2) in manual override button.

d. Notify Field Maintenance.

END OF TASK

LIMP HOME PROCEDURE/NO AIR PRESSURE

NOTE

This procedure will provide emergency air pressure to CTIS when system pressure drops below 85 psi (586 kPa) due to leaking air bag on Axle No. 3.

1. Shut OFF engine (WP 0037).
2. Chock wheels. (WP 0036)
3. Close ball valve (1) located on top of crossmember (2).

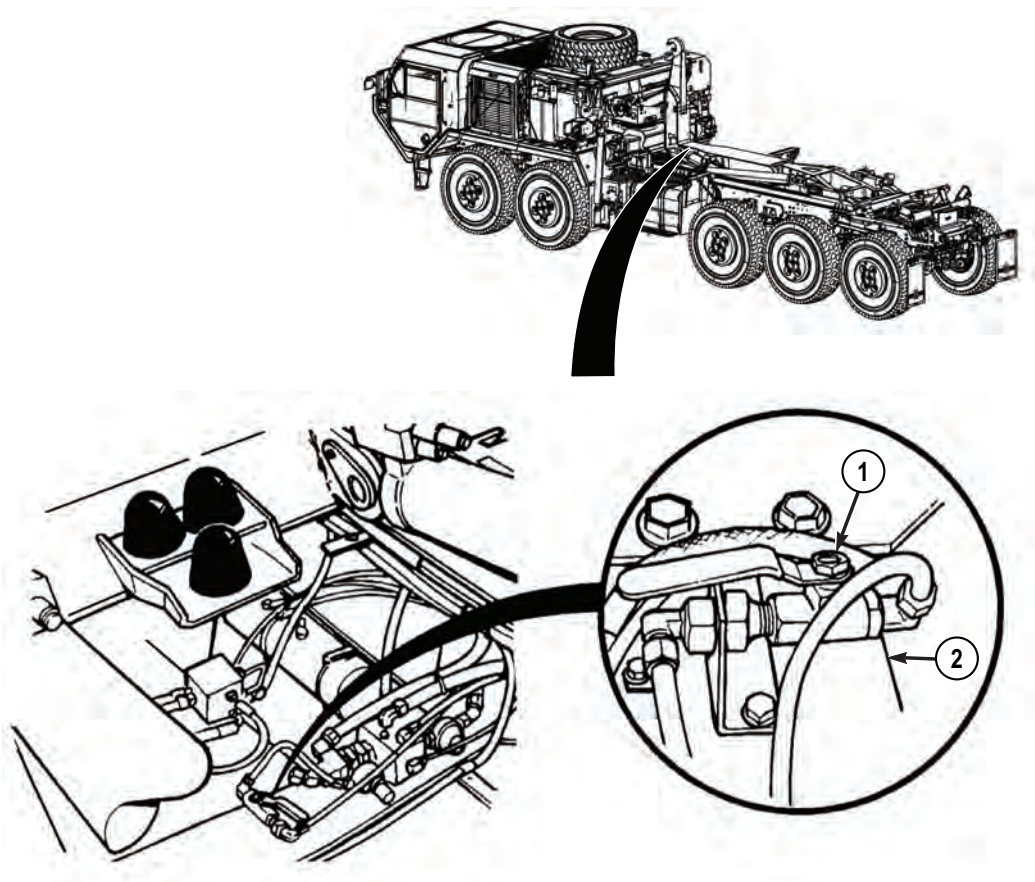


Figure 78.

4. Open air drain valve (3) to drain air tanks (Volume 2, WP 0130).

LIMP HOME PROCEDURE/NO AIR PRESSURE - Continued

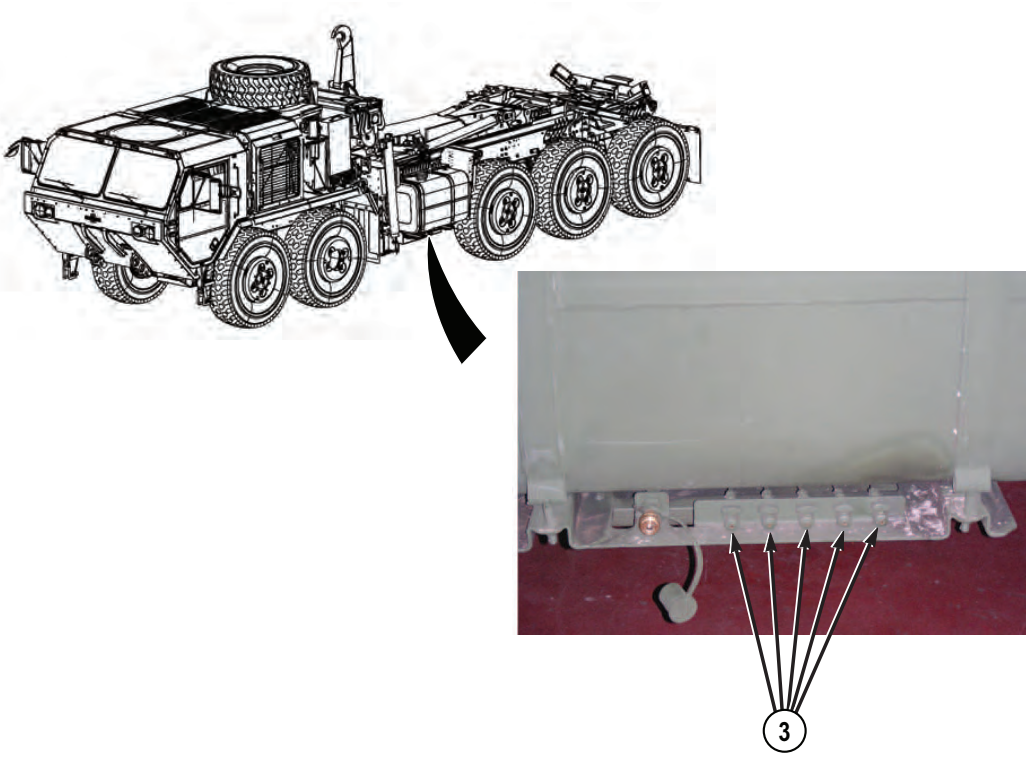


Figure 79.

5. Close air drain valve (3).
6. Start engine (WP 0027).
7. Remove wheel chocks. (WP 0033)

CAUTION

Maximum speed of PLS in limp home mode is 5 mph (8 km/hr) off-road and 15 mph (24 km/hr) on-road. Driving at speeds exceeding this may result in damage to PLS.

8. Start engine. (WP 0027)
9. Notify Field Maintenance.

END OF TASK

LIMP HOME/TRANSMISSION FAULT PROCEDURE

CAUTION

If transmission range selector flashes current range selection while operating vehicle (shift selection is inhibited), DO NOT SHUT OF ENGINE or attempt to change range selection. Shutting off engine may result in the inability of selecting a drive range at startup, and diagnostic data may be lost. Move vehicle to safe place and notify Field Maintenance as soon as possible.

NOTE

When transmission oil is below 19°F (-7°C) the only gears available are R (Reverse), N (Neutral), and 3 (Third Gear Range) when D (Drive) is selected. The remaining gears in D (Drive) will not be available until transmission oil in sump warms above 19°F (-7°C).

1. If check transmission indicator (1) illuminates when operating vehicle, apply service brake pedal (2) and stop vehicle.

NOTE

DO NOT shift transmission to N (Neutral).

2. Set transmission range selector (3) to R (Reverse):
   a. If vehicle DOES shift into R (Reverse):
      (1) Set transmission range selector (3) to appropriate position.
      (2) Continue with mission, and notify Field Maintenance when mission is completed.
   b. If vehicle DOES NOT shift into R (Reverse):

NOTE

The operator must be aware that once the engine is turned off, the vehicle will not be operable until the problem is corrected.

      (1) The transmission may be locked into specific gear, and may not come out of that gear until the engine is turned off.

LIMP HOME/TRANSMISSION FAULT PROCEDURE - Continued

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.

NOTE

The operator should consider the following guidelines carefully with regard to type of mission, environment, terrain, etc., when deciding on whether to continue the mission, deadline, or return vehicle to Field Maintenance.

(2) No additional damage to the transmission will occur. The operator can continue to operate vehicle in limp home mode and complete mission. However, the operator must be aware of the following guidelines:

(a) DO NOT shut off engine until the decision is made to deadline vehicle. Once the engine is shut 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 vehicle is deadlined.

(c) The vehicle will not be able to operate in R (Reverse).

(d) Depending on gear range the transmission is locked into, the operator may not be able to drive vehicle up steep grades.

(e) The service brake pedal (2) may need to be applied slightly earlier than normal when stopping the vehicle.

(f) Depending upon the gear range the transmission is locked into and the terrain the vehicle is operating in, the engine and/or transmission may overheat. The operator must closely monitor the engine coolant temperature gauge (4) and the transmission oil temperature gauge (5).

CAUTION

If overheating occurs when operating in the transmission limp home mode, the operator should stop the vehicle (do

LIMP HOME/TRANSMISSION FAULT PROCEDURE - Continued

no shut off 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 shut off engine and notify Field Maintenance. Failure to comply may result in damage to equipment.

(g) Notify Field Maintenance as soon as possible.

END OF TASK

END OF WORK PACKAGE

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OPERATOR MAINTENANCE
VEHICLE EQUIPMENT LOADING PLAN

Introduction

Scope

This work package shows stowage locations for equipment necessary to support the vehicle.

General

Stowage locations are given for equipment that must accompany the vehicle at all times. The BII and COEI items are covered in another work package.

Vehicle Equipment Loading Plan

Figure 1. Load Plan (Inside Cab)

Item No.	Item Name
1	Bag, Storage, Remote Control Cable (M1074A1 only)
2	Cable, Remote Control (M1074A1 only)
3	Extinguisher, Fire

Figure 2. Load Plan (Inside Cab)

Item No.	Item Name
4	Kit, First Aid
5	Padlock W/O Chain
6	Bag, Tool
7	Bag, Tool
8	Book, Log
9	Extension, Wrench
10	Gauge, Tire Inflator/Deflator
11	Hammer
12	Handle, Extension, Jack
13	Handle, Sliding
14	Handle, Winch
15	Pliers, 10 in.
16	Screwdriver, Hand
17	Screwdriver, Standard
18	Socket, 33 MM

Vehicle Equipment Loading Plan - Continued

Item No.	Item Name
19	Socket, 1-1/2 in.
22	Wrench, Open End 3/4 in. and 7/8 in.
23	Wrench, Plier Curved
24	Wrench, Plier Standard
25	Wrench, Tube 3/4 in.
26	Harness Assembly, Worklamp
27	Hose Assembly
28	Strap, Rachet 10 ft
29	Wrench, Impact, Pneumatic (W/Hose)
30	Wrench, Adjustable, 8 in.
31	Wrench, Adjustable, 12 in.
32	Wrench, Combination, 7/16 in.
33	Wrench, Combination, 1/2 in.
34	Valve Tool, Weldment
35	Bracket, Free Flow Tool
36	Slave Adapter Assembly
37	Slave Adapter Assembly
38	Slave Adapter Assembly

Figure 3. Load Plan on Vehicle

Item No.	Item Name
39	Chain, Utility
40	Chock, Wheel
41	Jack, Hydraulic (12 Ton)
42	Plate, Mounting
43	Shackle, Hard Lift
44	Shackle, Towing
45	Warning Kit, Highway
46	Ladder
47	Padlock W/Chain
48	Slave Hose Assembly
49	Ramp, Wheel

END OF WORK PACKAGE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS **For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.**	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 **2028**

REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)*	DATE

PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	FEDERAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPROTED	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.)*

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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

TO CHANGE	TO	MULTIPLY BY
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

TO CHANGE	TO	MULTIPLY BY
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
Metrication	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: 085605-000