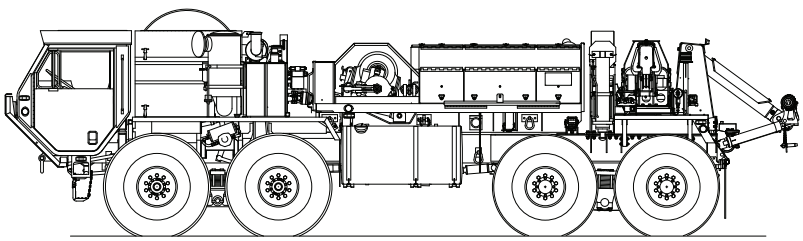
*TM 9-2320-431-10-1

TECHNICAL MANUAL
OPERATOR'S MANUAL
FOR

TRUCK, WRECKER, 8X8
M984A1
NSN 2320-01-195-7641 (EIC B2B)



*SUPERSEDURE NOTICE - TM 9-2320-431-10-1 and TM 9-2320-431-10-2 dated 15 June 2009; supersedes TM 9-2320-279-10-2, dated 15 Jun 87, including all changes.
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HEADQUARTERS, DEPARTMENT OF THE ARMY
15 JUNE 2009

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.

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 show that the material will cause burns or irritation to human skin or tissue.
	CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin and tissue.

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

WARNING ICON	DESCRIPTION
	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

WARNING ICON	DESCRIPTION
	FIRE EXTINGUISHER - 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 aid of assistant(s) and/or lifting device (as required).
	HEAVY PARTS - hand with heavy object on top shows that heavy parts can crush and harm.
	HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm.
	HEAVY PARTS - moving heavy object pinning human figure against stationary object shows that heavy, moving parts/objects present a danger to life or limb.

Table 1. Warning Icons Used In This Manual.

WARNING ICON	DESCRIPTION
	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.
	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.

Table 1. Warning Icons Used In This Manual.

WARNING ICON	DESCRIPTION
	RADIATION - three circular wedges show 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 if conditions are not avoided, presenting a danger to life or limb.
	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.

Table 1. Warning Icons Used In This Manual.

WARNING ICON	DESCRIPTION
	SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger of falling.
	STEAM HAZARD - human engulfed in steam cloud shows steam hazard exists that could injure/burn human tissue.
	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).

Table 1. Warning Icons Used In This Manual.

WARNING ICON	DESCRIPTION
	WIRE CABLE/ROPE - human hand with frayed wire cable/rope running across shows injury to unprotected (bare) hands may result.
	EAR PROTECTION - headphones over ears show that noise level will harm ears.

FOR INFORMATION ON FIRST AID:

Reference FM 4-25.11. (Volume 2, WP 0200)

WARNING

MODIFICATION HAZARD

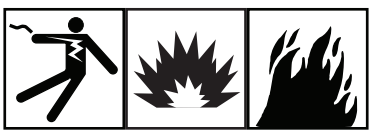
- Unauthorized modifications to, alterations to, or installations on this equipment are prohibited and are in violation of AR 750-10.
- Failure to comply may result in injury or death to personnel or damage to equipment.

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.
- Never disconnect any hydraulic hose or part 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 to personnel.
- The HEMTT vehicles contain hydraulic systems operating at oil pressures up to 3,000 psi (20 685 kPa) and 3,200 psi (22 064 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.

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.

- Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment.

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 of 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 to 198°F (61 to 92°C), and Type III is 200 to 241°F (93 to 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.

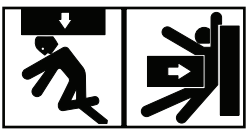
WARNING

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.

- When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET OF VEHICLE.
- 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.

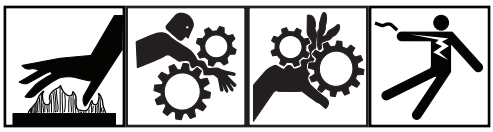
WARNING



LIFTING OPERATIONS This section is applicable to all lifting operations regardless of lifting equipment (crane, LHS, etc.) used.

- 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

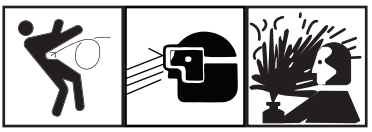
- Use extreme care when operating or working near moving machinery including running engine, rotating shafts, and other moving parts. Failure to comply may result in injury or death to personnel.
- Use extreme care when measuring voltage while engine is running. Avoid contact with rotating fan blade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



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 weigh 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.
- 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.
- Refuse to 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.
- Boom has a 370 degree rotation and is mechanically stopped at five degrees on either side of the left outrigger beam. Swing operations must be slowed no later than 15 degrees prior to contacting the stop.
- 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.
- Keep fingers clear of top of lift-hook. Failure to comply could result in personnel injury.

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 followed 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.

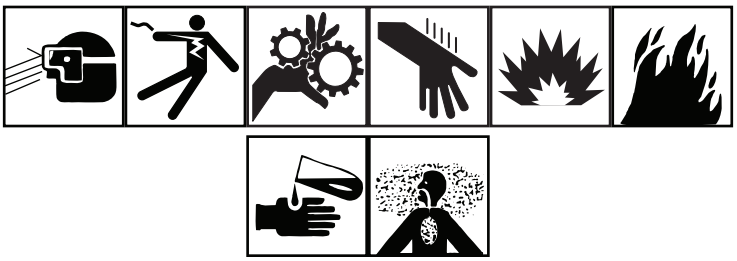
WARNING

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



LEAD-ACID BATTERIES

- Wear proper eye protection when working around batteries. Failure to comply may result in injury or death to personnel.
- Use extreme care not to short out battery terminals. 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.
- Batteries produce explosive gases. Do not smoke or use open flame near batteries. Do not allow hot, sparking, or glowing objects near batteries. If batteries are giving off gases, presence of a heat, flame, or spark may cause fire and/or explosion. Failure to comply may result in injury or death to personnel.
- Battery electrolyte is harmful to skin, and eyes. Avoid battery electrolyte contact with skin, eyes, or clothing. If battery electrolyte spills, take immediate action to stop burning effects:

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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.

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 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 in case of accident.
- Operation at 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.
- 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.
- 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 purposes will not exceed 30 psi (207 kPa).
- Use only with effective chip guarding and personal protective equipment, goggles, shield, and gloves.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE:

TM 9-2320-431-10-1 and TM 9-2320-431-10-2 dated 15 June 2009 supersedes 9-2320-279-10-1, 21 Nov 86 and 10-2, 15 Jun 87 including all changes. Zero in the Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 15 June 2009

TOTAL NUMBER OF VOLUMES IS 2, TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 280 AND TOTAL NUMBER OF WORK PACKAGES IS 203, CONSISTING OF THE FOLLOWING:

Page/WP No.	Change No.	Page/WP No.	Change No.
Volume 1		WP 0020 (4 pages)	0
Front Cover	0	WP 0021 (2 pages)	0
Warning Summary	0	WP 0022 (6 pages)	0
i-lxxxvi	0	WP 0023 (6 pages)	0
Chp 1 - General Information,		WP 0024 (6 pages)	0
Equipment Description and		WP 0025 (2 pages)	0
Theory of Operation	0	WP 0026 (4 pages)	0
WP 0001 (12 pages)	0	WP 0027 (6 pages)	0
WP 0002 (8 pages)	0	WP 0028 (2 pages)	0
WP 0003 (2 pages)	0	WP 0029 (4 pages)	0
WP 0004 (4 pages)	0	WP 0030 (2 pages)	0
WP 0005 (2 pages)	0	WP 0031 (4 pages)	0
WP 0006 (10 pages)	0	WP 0032 (2 pages)	0
WP 0007 (2 pages)	0	WP 0033 (4 pages)	0
WP 0008 (4 pages)	0	WP 0034 (2 pages)	0
WP 0009 (4 pages)	0	WP 0035 (4 pages)	0
WP 0010 (2 pages)	0	WP 0036 (2 pages)	0
WP 0011 (2 pages)	0	WP 0037 (4 pages)	0
WP 0012 (4 pages)	0	WP 0038 (4 pages)	0
WP 0013 (4 pages)	0	WP 0039 (4 pages)	0
WP 0014 (2 pages)	0	WP 0040 (6 pages)	0
WP 0015 (2 pages)	0	WP 0041 (4 pages)	0
WP 0016 (2 pages)	0	WP 0042 (2 pages)	0
WP 0017 (2 pages)	0	WP 0043 (30 pages)	0
WP 0018 (2 pages)	0	WP 0044 (8 pages)	0
Chp 2 - Operator Instructions	0	WP 0045 (2 pages)	0
WP 0019 (2 pages)	0	WP 0046 (2 pages)	0

Page/WP No.	Change No.	Page/WP No.	Change No.
WP 0047 (2 pages)	0	WP 0091 (2 pages)	0
WP 0048 (4 pages)	0	WP 0092 (2 pages)	0
WP 0049 (2 pages)	0	WP 0093 (2 pages)	0
WP 0050 (2 pages)	0	WP 0094 (2 pages)	0
WP 0051 (4 pages)	0	WP 0095 (8 pages)	0
WP 0052 (4 pages)	0	WP 0096 (8 pages)	0
WP 0053 (4 pages)	0	WP 0097 (6 pages)	0
WP 0054 (2 pages)	0	WP 0098 (4 pages)	0
WP 0055 (4 pages)	0	WP 0099 (4 pages)	0
WP 0056 (2 pages)	0	WP 0100 (2 pages)	0
WP 0057 (2 pages)	0	WP 0101 (2 pages)	0
WP 0058 (6 pages)	0	WP 0102 (4 pages)	0
WP 0059 (4 pages)	0	WP 0103 (2 pages)	0
WP 0060 (32 pages)	0	WP 0104 (4 pages)	0
WP 0061 (28 pages)	0	WP 0105 (2 pages)	0
WP 0062 (26 pages)	0	WP 0106 (30 pages)	0
WP 0063 (40 pages)	0	WP 0107 (14 pages)	0
WP 0064 (30 pages)	0	WP 0108 (20 pages)	0
WP 0065 (28 pages)	0	WP 0109 (6 pages)	0
WP 0066 (28 pages)	0	WP 0110 (2 pages)	0
WP 0067 (30 pages)	0	WP 0111 (12 pages)	0
WP 0068 (28 pages)	0	WP 0112 (8 pages)	0
WP 0069 (28 pages)	0	WP 0113 (4 pages)	0
WP 0070 (30 pages)	0	WP 0114 (2 pages)	0
WP 0071 (28 pages)	0	WP 0115 (18 pages)	0
WP 0072 (30 pages)	0	WP 0116 (2 pages)	0
WP 0073 (28 pages)	0	WP 0117 (4 pages)	0
WP 0074 (28 pages)	0	WP 0118 (2 pages)	0
WP 0075 (28 pages)	0	WP 0119 (18 pages)	0
WP 0076 (26 pages)	0	WP 0120 (4 pages)	0
WP 0077 (26 pages)	0	WP 0121 (4 pages)	0
WP 0078 (38 pages)	0	WP 0122 (6 pages)	0
WP 0079 (4 pages)	0	WP 0123 (2 pages)	0
WP 0080 (8 pages)	0	WP 0124 (6 pages)	0
WP 0081 (4 pages)	0	WP 0125 (4 pages)	0
WP 0082 (2 pages)	0	WP 0126 (2 pages)	0
WP 0083 (2 pages)	0	WP 0127 (2 pages)	0
WP 0084 (2 pages)	0	WP 0128 (6 pages)	0
WP 0085 (2 pages)	0	WP 0129 (4 pages)	0
WP 0086 (4 pages)	0	WP 0130 (16 pages)	0
WP 0087 (2 pages)	0	WP 0131 (8 pages)	0
WP 0088 (4 pages)	0	WP 0132 (4 pages)	0
WP 0089 (4 pages)	0	WP 0133 (2 pages)	0
WP 0090 (4 pages)	0	WP 0134 (2 pages)	0

Page/WP No.	Change No.
WP 0135 (8 pages)	0
Volume 2	
Chp 3 - Troubleshooting Procedures	0
WP 0136 (8 pages)	0
WP 0137 (8 pages)	0
WP 0138 (6 pages)	0
WP 0139 (4 pages)	0
WP 0140 (6 pages)	0
WP 0141 (6 pages)	0
WP 0142 (4 pages)	0
WP 0143 (4 pages)	0
WP 0144 (6 pages)	0
WP 0145 (6 pages)	0
WP 0146 (6 pages)	0
WP 0147 (4 pages)	0
WP 0148 (4 pages)	0
WP 0149 (4 pages)	0
WP 0150 (4 pages)	0
WP 0151 (4 pages)	0
WP 0152 (4 pages)	0
WP 0153 (10 pages)	0
WP 0154 (4 pages)	0
WP 0155 (6 pages)	0
WP 0156 (4 pages)	0
WP 0157 (4 pages)	0
WP 0158 (4 pages)	0
WP 0159 (8 pages)	0
WP 0160 (4 pages)	0
WP 0161 (6 pages)	0
WP 0162 (4 pages)	0
WP 0163 (6 pages)	0
WP 0164 (4 pages)	0
WP 0165 (6 pages)	0
WP 0166 (6 pages)	0
WP 0167 (4 pages)	0
WP 0168 (10 pages)	0
WP 0169 (8 pages)	0
WP 0170 (4 pages)	0
WP 0171 (4 pages)	0
WP 0172 (4 pages)	0
WP 0173 (4 pages)	0
WP 0174 (4 pages)	0
WP 0175 (2 pages)	0
WP 0176 (2 pages)	0
WP 0177 (6 pages)	0
WP 0178 (4 pages)	0
WP 0179 (4 pages)	0
WP 0180 (2 pages)	0
Chp 4 - Preventive Maintenance Checks and Services (PMCS)	0
WP 0181 (4 pages)	0
WP 0182 (40 pages)	0
WP 0183 (46 pages)	0
WP 0184 (66 pages)	0
WP 0185 (74 pages)	0
WP 0186 (42 pages)	0
WP 0187 (18 pages)	0
Chp 5 - Maintenance Instructions	0
WP 0188 (16 pages)	0
WP 0189 (4 pages)	0
WP 0190 (6 pages)	0
WP 0191 (2 pages)	0
WP 0192 (20 pages)	0
WP 0193 (2 pages)	0
WP 0194 (6 pages)	0
WP 0195 (8 pages)	0
WP 0196 (6 pages)	0
WP 0197 (4 pages)	0
WP 0198 (2 pages)	0
WP 0199 (2 pages)	0
Chp 6 - Supporting Information	0
WP 0200 (8 pages)	0
WP 0201 (32 pages)	0
WP 0202 (6 pages)	0
WP 0203 (10 pages)	0

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 JUNE 2009

TECHNICAL MANUAL

OPERATOR'S MANUAL
TRUCK, WRECKER, 8X8
M984A1 (NSN 2320-01-195-7641)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is https://aeps.ria.army.mil. The DA Form 2028 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 to your comments and better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-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.

*SUPERSEDURE NOTICE - TM 9-2320-431-10-1 and TM 9-2320-431-10-2 dated 15 June 2009; supersedes TM 9-2320-279-10-2, dated 15 Jun 87, including all changes.

TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

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TABLE OF CONTENTS - Continued

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TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

HOW TO USE THIS MANUAL

USABLE ON CODE (UOC) INFORMATION

Usable On Code (UOC) - the user should be aware that the BASE model M984 Cargo HEMTT series vehicle (with self-recovery winch installed) UOC is "H40". Dependent on the format used for printing this manual, the user may or may not see instructions printed in this manual stating what information is applicable to which model HEMTT 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 Heavy Expanded Mobility Tactical Truck (HEMTT). Listed below are some features included in this manual to help locate and use the required information:

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

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

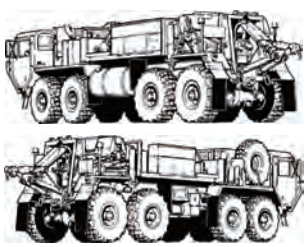
GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

OPERATOR MAINTENANCE
INTRODUCTION

SCOPE

This manual is used for operation and operator-performed maintenance of HEMTT series vehicles which consist of a number of different models all built on similar chassis, but specially equipped to perform different missions.

Table 1. Overview.

M984A1 WRECKER	DESCRIPTION
 *Figure 1.*	Wrecker vehicle with 95,000 lbs (43 000 kg) GVWR and 114,000 lbs (51 700 kg) GCWR that can be increased to 155,000 lbs (70 370 kg) GCWR under certain conditions. Vehicle is equipped with material handling crane with 6,000 lbs (2 722 kg) load capacity at 18.2 ft. (5.5 m) boom radius, 60,000 lbs (27 240 kg) recovery winch, and equipment body with 10 stowage compartments.

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) Users Manual. (Volume 2, WP 0200)

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) AND QUALITY DEFICIENCY REPORTING (QDR).

The quarterly TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest (Volume 2, WP 0200) contains valuable field information on equipment covered in this manual. Information in the TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest (Volume 2, WP 0200) is compiled from some of the Equipment Improvement Reports (EIR) that have been prepared on vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that were submitted to the EIR program. TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest (Volume 2, WP 0200) contains

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) AND QUALITY DEFICIENCY REPORTING (QDR). - Continued

information on equipment improvements, minor alterations, proposed Modification Work Orders (MWOs), warranties (if applicable), actions taken on some of the DA Form 2028's (Volume 2, WP 0200) (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. Refer to the TB 43-0001-62 (series) Equipment Improvement Report and Maintenance Digest (Volume 2, WP 0200) periodically for the most current and authoritative information on the equipment. The information will help to do a better job and will advise of the latest changes to this manual. Also refer to DA PAM 25-30, (Volume 2, WP 0200) Consolidated Index of Army Publications and Blank Forms at http://www.army.mil/usapa/2530.html, and reference section (Volume 2, WP 0200) of this manual. If you have a change recommendation to this manual, submit a DA Form 2028's (Volume 2, WP 0200) (Recommended Changes to Publications) via e-mail to: ROCK-TACOM-TECH-PUBS@conus.army.mil.

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 0200) (Recommended Changes to Equipment Technical Publications) 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 0200) 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 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 0200) direct to: TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP / TECH PUBS, TACOM–RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is ROCK-TACOM-TECH-PUBS@conus.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

HAND RECEIPT (HR) INFORMATION

The is a companion document to this manual which consists of preprinted hand receipts (DA Form 2062) (Volume 2, WP 0200) that list end item related equipment (COEI, BII, (Volume 2, WP 0201) and AAL (Volume 2, WP 0202)) 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, (Volume 2, WP 0200) 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

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.

CORROSION PREVENTION AND CONTROL - Continued

If a corrosion problem is identified, it can be reported using SF 368 (Volume 2, WP 0200). 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

Procedures for the destruction of Army materiel to prevent enemy use are contained in TM 750-244-6 (Volume 2, WP 0200).

PREPARATION FOR STORAGE OR SHIPMENT

See information on preparing the HEMTT series vehicle for storage or shipment.

WARRANTY INFORMATION

The HEMTT series vehicles are warranted by Oshkosh Truck Corporation for 12 months or 12,000 miles (19 308 km), whichever comes first. The warranty starts on the date found in block 23 of DA Form 2408-9 (Volume 2, WP 0200) in the vehicle logbook. Report all defects in material or workmanship to the supervisor, who will take appropriate action through the field level maintenance shop.

NOMENCLATURE CROSS-REFERENCE LIST

Table 2. Common Nomenclature.

COMMON NAME	OFFICIAL NOMENCLATURE
Brake Pedal	Service Brake Pedal
Cable/Hoist Cable	Wire Rope
Cold Start System	Ether Quick-Start System
Electrical Control Box	Junction Box
Engine Coolant	Antifreeze, Ethylene Glycol Mixture
Glad Hand	Quick Disconnect Coupling
High Idle Switch	Engine Speed Control Switch
Jake Brake, Jacobs® Brake	Engine Retarder, Engine Brake

NOMENCLATURE CROSS-REFERENCE LIST - Continued

Table 2. Common Nomenclature. - Continued

COMMON NAME	OFFICIAL NOMENCLATURE
Manual Controls	Directional Control Valves
O-Ring	Preformed Packing
Snap Ring	Retaining Ring

LIST OF ABBREVIATIONS

Table 3. Common Abbreviations.

ABBREVIATION	OFFICIAL NOMENCLATURE
AAL	Additional Authorization List
AMDF	Army Master Data File
amp	Ampere
BAP	Bridge Adapter Pallet
bar	Barometric Pressure
BII	Basic Issue Items
BL	Bottom Load
BOI	Basis of Issue
C	Celsius
CAGEC	Commercial And Government Entity/Code
CARC	Chemical Agent Resistant Coating
CBR	Chemical, Biological, Radiological
CBT	Common Bridge Transporter

LIST OF ABBREVIATIONS - Continued

Table 3. Common Abbreviations. - Continued

ABBREVIATION	OFFICIAL NOMENCLATURE
CCA	Cold Cranking Amperes
CHU	Container Handling Unit
CID	Cubic Inch Displacement
CKT	Circuit
cm	Centimeter
COEI	Components of End Item
CPC	Corrosion Prevention Control
CROP	Container Roll-In/Out Platform
CTA	Common Table of Allowance
DA	Department of the Army
dia.	Diameter
DS	Direct Support
EIR	Equipment Improvement Recommendations
F	Fahrenheit
FHTV	Family of Heavy Tactical Vehicles
FLA	Front Lift Adapter
fl. oz.	Fluid Ounce
FR	Flatrack
FRS	Forward Repair System
ft.	Foot

LIST OF ABBREVIATIONS - Continued

Table 3. Common Abbreviations. - Continued

ABBREVIATION	OFFICIAL NOMENCLATURE
GAA	Grease, Automotive, and Artillery
gal	Gallon
GCWR	Gross Combination Weight Rating
GMT	Guided Missile Transport
GPFU	Gas Particulate Filter Unit
gpm	Gallons Per Minute
GS	General Support
GVWR	Gross Vehicle Weight Rating
HDI	Hexamethylene Diisocyanate
HEMTT	Heavy Expanded Mobility Tactical Truck
hp	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
IBC	Improved Boat Cradle
I.D.	Inside Diameter
in.	Inch
ISO	International Standards Organization
JTA	Joint Table of Allowances
kg	Kilogram
km	Kilometer
Kmh or km/h	Kilometer per Hour

LIST OF ABBREVIATIONS - Continued

Table 3. Common Abbreviations. - Continued

ABBREVIATION	OFFICIAL NOMENCLATURE
kPa	Kilopascals
kw	Kilowatt
L	Liter
lbs	Pound
lb-ft	Pound-Foot
lb-in	Pound-Inch
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left-Hand
LHS	Load Handling System
M	Meter
MAC	Maintenance Allocation Chart
mi	Mile
ml	Milliliter
MLC	Military Load Class
mm	Millimeter
Mph	Miles Per Hour
MTOE	Modified Tables of Organization and Equipment
NBC	Nuclear, Biological, Chemical
NIIN	National Item Identification Number

LIST OF ABBREVIATIONS - Continued

Table 3. Common Abbreviations. - Continued

ABBREVIATION	OFFICIAL NOMENCLATURE
Nm	Newton Meter
NOC	Not Usable-On Code
NSN	National Stock Number
O.D.	Outside Diameter
OEA	Oil, Engine, Arctic
OE/HDO	Oil, Engine/Hydraulic Oil
O/R	Outrigger
OTC	Oshkosh Truck Corporation
Oz	Ounce
PLS	Palletized Load System
PMCS	Preventive Maintenance Checks and Services
psi	Pounds per Square Inch
pt.	Pint
PTO	Power Take-Off
qt.	Quart
Qty. Recm.	Quantity Recommended
Qty. Rqr.	Quantity Required
RCU	Remote Control Unit
RFI	Radio-Frequency Interference
RH	Right-Hand

LIST OF ABBREVIATIONS - Continued

Table 3. Common Abbreviations. - Continued

ABBREVIATION	OFFICIAL NOMENCLATURE
rpm	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
SAE	Society of Automotive Engineers
SMR	Source, Maintenance, and Recoverability
SRA	Specialized Repair Activity
SRW	Self-Recovery Winch
TAMMS	The Army Maintenance Management System
TDA	Tables of Distribution and Allowance
TM	Technical Manual
TMDE	Test, Measuring, and Diagnostic Equipment
TOE	Tables of Organization and Equipment
u/m	Unit of Measure
UOC	Usable-On Code
Vdc	Volts Direct Current
XHD	Extra Heavy-Duty

SAFETY, CARE, AND HANDLING

Significant hazards and safety recommendations are listed in the table below.

SAFETY, CARE, AND HANDLING - Continued

Table 4. Significant Hazard And Safety Recommendations.

HAZARD	SAFETY RECOMMENDATION OR PRECAUTION	OPERATING CONDITION
Low air pressure for brakes.	Do not drive vehicle while low air pressure warning buzzer is sounding or red light is on.	Abnormal
Vehicle instability with crane use.	Ensure that outriggers are down on firm ground, side slope does not exceed 5 degrees, and crane is not overloaded.	Abnormal
Connecting towing devices.	Do not go between vehicles until vehicles are stopped and brakes are set.	Normal
Refueling vehicle.	Shut off engine and no smoking when filling tank.	Normal

NOTE

Category of hazards as to whether or not they may be expected under normal or abnormal operating conditions.

NOTE

- Material handling cranes have overload shutdown and/or tilt warning (unstable) systems. Always apply PARKING BRAKE control (WP 0045) prior to crane operation.
- Crane has a yellow caution light at a fixed operator's station and an audible warning signal that alerts the operator when an unstable crane condition occurs.

SAFETY, CARE, AND HANDLING - Continued

Table 4. Significant Hazard And Safety Recommendations. - Continued

HAZARD	SAFETY RECOMMENDATION OR PRECAUTION	OPERATING CONDITION
• Crane has an overload shutdown system which senses lift cylinder pressure to prevent overloading the crane. The system will shut down the crane to prevent hoisting, boom extension, or boom raising when an overload condition exists. Load lowering and boom retraction functions will not be affected. • When crane is overloaded, the overload system will automatically shut off power to telescope boom out, raise boom, or hoist load higher. Overload system will also prevent lowering the boom. An overload condition can be corrected by lowering load to ground or other supporting surface. All crane functions will be restored in approximately six seconds. **NOTE** • The crane operating instruction plates are located on the heater compartment cover in the cab and at each of the fixed operating station. • The outrigger leg plates are located on each of the outrigger cylinders. • The load capacity signs are located at the main and auxiliary control panels, they are also located on the wrecker body rear stowage box doors.		

METRIC SYSTEM

The equipment described herein contains metric components and requires metric, common, and special tools. Therefore, metric units and English units will be used throughout this publication. An English-to-metric conversion table is included as the last page of this manual inside the back cover.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
WARRANTY PROGRAM

General

This work package provides implementation instructions for the warranty on the HEMTT. It contains instructions for obtaining services and/or supplies covered under warranty. This work package also describes methods of processing warranty claims. For additional warranty information on the HEMTT or any U.S. Army Tank-Automotive and Armaments Command (TACOM) equipment, contact your local Warranty Control Office/Officer (WARCO) or TACOM Logistics Assistance Representative (LAR). If your WARCO or TACOM LAR is not available, or if additional information is required, contact TACOM.

Explanation of Terms

Abuse

The improper use, maintenance, repair or handling of warranted items that may cause the warranty of those items to become void (for example, not following service intervals, using the vehicle for other than what is intended).

Acceptance

The execution of the acceptance block and signing of DD Form 250 (Volume 2, WP 0200), by the authorized Government representative, unless end items are placed in storage in which case acceptance shall mean date of shipment from storage facility as reflected on DD Form 1149 (Volume 2, WP 0200) or DD Form 1348-1. (Volume 2, WP 0200)

Acceptance Date

The date an item of equipment is accepted into the Army's inventory by the execution of the acceptance block and signing of a DD Form 250 (Volume 2, WP 0200) or approved acceptance document, by an authorized representative of the Government.

Contractor

The supplier of equipment who enters into an agreement directly with the Government to furnish supplies.

Correction

The elimination of a defect.

Explanation of Terms - Continued

Defect

Any condition or characteristic in any supplies furnished by the contractor that does not otherwise function, or threatens not to function, as intended.

Failure

A part, component, or end item that fails to perform its intended use.

Manufacturer's Recall

Safety Recall An item is recalled to repair or replace a defective part or assembly which may affect safety.

Service Recall An item is recalled to repair or replace a defective part(s) or assembly which does not affect the safe use of this item.

Owning Unit

The Army Unit authorized to operate, maintain, and use the equipment.

Reimbursement

A written provision in this warranty in which the Using/Support Unit may make the necessary repairs, with or without prior approval from the contractor, and the Government will be reimbursed for the repair parts and labor costs.

Repair

A maintenance action required to restore an item to serviceable condition without affecting the warranty.

Supplies

The end item and all assemblies/parts furnished by the contractor.

Supporting Repair Facility

The repair activity authorized to accomplish warrantable repairs at the appropriate level of maintenance identified in the Maintenance Allocation Chart.

WARCO

Serves as the intermediary between the troops owning the equipment and the local dealer, contractor, or manufacturer. All warranty claim actions will be processed through the WARCO.

Explanation of Terms - Continued

Warranty

A written agreement between a contractor and the Government which outlines the rights and obligations of both parties for defective supplies.

Warranty Claim

Action started by the equipment user for authorized warranty repair reimbursement.

Warranty Expiration Date

The date the warranty is no longer valid. This date will be 13 months from the contractor shipment date. This warranty period covers the basic 12 months plus on additional month for shipping time.

Warranty Period

Time during which the warranty is in effect; normally measured as the maximum number of years, months, days, miles, or hours used.

Warranty Start Date

The day shipment is put into effect (Contractor Shipment Date).

Coverage-Specific

This work package applies to:

Table 1. Vehicle Information

Noun	Model	NSN	Cage
Truck, Wrecker, Recovery	M984A1 (with winch)	2320-01-195-7641	45152

NOTE

The item is manufactured by Oshkosh Truck Corporation (OTC), under contract #W56HZV-07-C-0248. Inquiries to OTC can be made by calling (920) 235-9151.

The contractor warrants the supplies are free from defects in design, material, and workmanship for a period of thirteen (13) months from warranty start date.

Coverage-Specific - Continued

If a Safety recall defect occurs during the vehicle warranty period, the contractor agrees to extend the terms of the warranty to the time required to make necessary safety defect corrections. Also, if the contractor or his supplier(s) provide a greater warranty for the supplies furnished, the contractor will provide the greater warranty to the Government.

If a defect/failure is caused by or falls within any of the following categories, it is not considered warrantable and a claim should not be initiated:

1. Misuse or negligence
2. Accidents
3. Improper operation
4. Improper storage
5. Improper transport
6. Improper or insufficient maintenance
7. Improper alterations or repairs
8. Defect/failure discovered or occurring after warranty expiration date.
9. Fair wear and tear items (brake shoes, pads, armatures, brushes, etc.).

In addition to the 13 month warranty, the vehicles will be warranted for a total service life of 10 years including extended periods in a corrosion hazard military environment. During this 10 year service life, there will be no damage caused by corrosion requiring repair or replacement of parts. No actions beyond normal washing or replacement of accident-damaged paint shall be necessary to maintain the corrosive protection in place.

This 13 month warranty is extended up to nine (9) months from date of acceptance if the vehicle is put into government storage before use. In this case, the warranty starts when the vehicle is either taken out of storage or until nine (9) months from the warranty start date shown on the warranty data plate, whichever occurs first. Refer to preparation for storage.

Contractor Responsibilities

When the owning unit has directed the contractor to correct the supplies, the contractor will furnish all material required to correct the defective supplies. Repairs and parts shall be initiated/provided within ten (10) working days after receipt of written claim notification. Furthermore, the contractor will provide a copy of the work order to owning unit upon completion of repair.

When the contractor receives written notification requiring contractor repair, they will have the option:

1. Correct the supplies in the field.
2. Return the vehicle or parts to the contractor's designated facility for correction.

When the contractor corrects the supplies, all labor involved shall be borne by the contractor. Additionally, the contractor shall arrange and bear all transportation costs of the supplies to its facility and return to user.

Contractor Responsibilities - Continued

The contractor, within five (5) working days of receiving such notice, shall notify the warranty claimant by telephone as to the method of correction, date(s) work is to be performed and by whom.

Government Responsibilities

The Major Subordinate Command for the HEMTT is the U.S. Army Tank-Automotive and Armaments Command (TACOM), Warren, MI 48397-5000. TACOM is responsible for managing and implementing the warranty.

TACOM will:

Insure the contractor performs in accordance to the terms of the contract.

Equipment owning unit will:

1. Identify defects/failures and verify the defects/failures are warrantable.
2. Submit warranty claims, using DA Form 2407 (Volume 2, WP 0200) or DA Form 2407-1 (Volume 2, WP 0200) to your local Warranty Coordinator.
3. Tag and retain (IAW DA PAM 750-8 and this work package) (Volume 2, WP 0200) parts, pieces of parts and/or assemblies removed at the owning unit level and as a result of a warrantable defect/failure and/or correction.

Supporting repair facility will:

1. Identify defects/failures as warrantable (if owning unit has not already identified them). Verify defects/failures are warrantable.
2. Review, process, and submit valid warranty claims to the local WARCO if the DA Form 2407 (Volume 2, WP 0200) is complete and correctly filled out.
3. Reject invalid warranty claims or request additional information for incomplete and incorrect claims.
4. Coordinate with the owning unit and decide which option for repair is desired to correct the warrantable defect/failure.
5. Depending on which repair option was chosen (Government or contract repair) provide labor/parts required to accomplish the warrantable repairs.
6. Tag and retain (IAW DA PAM 750-8 and this work package) (Volume 2, WP 0200) all parts, pieces, or parts and/or assemblies removed as a result of warrantable defect/failure and/or correction.

Local WARCO will:

1. Verify, review, process, and if valid and complete, submit claims (reimbursable and/or disputes) to the contractor.
2. Reject claims that are not valid, and send them back to the local Unit with a short explanation of why the claim is rejected.
3. Request additional information for incomplete claims.

Government Responsibilities - Continued

4. Provide warranty claim acknowledgment closeout and/or parts/assemblies disposition instructions to the local Unit.
5. Insure the contractor performs in accordance to the terms of the contract.
6. Verify, administer and process warranty claims.
7. Act as a liaison between owning unit, the contractor, supporting repair facility and TACOM.
8. Notify the owning units of all warranty claim acknowledgments/close-outs, information and/or instructions received from TACOM or the contractor.
9. Act as a liaison between local dealers and the Army.
10. Enter all open and closed WCAs into the Army Electronics Product Support (AEPS), Electronic Deficiency Reporting System.
11. The information/data provided on the DA Form 2407 (Volume 2, WP 0200) are placed into the AEPS Deficiency Reporting System (DRS) at the installation WARCO office to facilitate MSC management and tracking of warranties.

Alterations/Modifications

Alterations/modifications shall not be applied unless authorized by TACOM.

Warranty Data Plate

All vehicles will have a warranty data plate. The contractor is required to mount his data plate within clear view of the operator.

When the vehicle is received, the owning unit should locate the warranty data plate and check the warranty start date with date shown on the applicable DD Form 250 (Volume 2, WP 0200) or DD Form 1149. (Volume 2, WP 0200) If these dates differ, disregard the data plate. The date shown on the DD Form 250 (Volume 2, WP 0200) or DD Form 1149. (Volume 2, WP 0200) is the date to be used as a warranty start date.

Claim Procedures

The procedures for reporting warranty claims are found in DA PAM 750-8 (Volume 2, WP 0200) and this work package. Responsibilities of the MACOM are found in AR 700-139. (Volume 2, WP 0200) All Warranty Claim Actions are processed on DA Form 2407 (Volume 2, WP 0200) and DA Form 2407-1. (Volume 2, WP 0200) It is very important to fill in the blocks on the forms as accurately as possible.

The contractor shall be notified in writing within 30 days, utilizing DA Form 2407 (Volume 2, WP 0200) by the local Warranty Control Office/Officer (WARCO) following the discovery of a defect in supplies which requires contractor repair and/or replacement parts. This shall constitute formal notification of a warranty claim, and initiate the time period for contractor responsibilities and action under the warranty. This notification shall include, but not be limited to furnishing of the equipment serial number, operating hours, part number or NSN

Claim Procedures - Continued

of the defective part and circumstances surrounding the defect(s). At this time, the contractor will further be informed whether the owning unit has elected:

1. To correct the defect themselves.
2. To direct the contractor to correct the defect.

Upon completion of contractor repair, forward completed warranty claims (Information Only) electronically to AEPS (Army Electronic Product Support) http://aeps.ria.army.mil.

The contractor shall reimburse the government for the cost of labor and/or replacement parts involved in the government correction of the defect. The government's Maintenance Allocation Chart (MAC) determines the times. Additionally, the cost of replacement parts obtained through the Government's supply channels will be determined by the amount identified in the contractor's current commercial dealer net price or Army Master Data File (AMDF) price, whichever is less. Furthermore, the owning unit may direct the contractor to provide the replacement parts that prove to be defective within the warranty period, without costs to the government, directly to their location or F.O.B., U.S. Port of Embarkation for OCONUS. The contractor shall furnish replacement parts within 10 working days after receipt of written claim notification. DO NOT submit warranty claims for reimbursement where repair labor costs and replacement parts costs combined do not exceed $150.00 for any one failure.

Identification Of Failed Items. Failed warranty items shall be tagged/identified to prevent improper repair or use. Documents that describe the use of DA Form 2402 Maintenance Tag (Volume 2, WP 0200) and DA Form 2407 Maintenance Request (Volume 2, WP 0200) shall be referenced. Items requiring special handling, storage, or shipment during the processing of claims shall be identified.

Disposition. The repair activity shall retain defective supplies for thirty (30) days following receipt of acknowledgment of warranty claim from WARCO or contractor. If receipt of acknowledgment is not received, inquiries should be made to your local WARCO. If receipt of acknowledgment is received but no instructions are forthcoming within thirty (30) days of receipt, supplies may be disposed.

Invalid Warranty Claims. When supplies are inspected by the contractor and found to be non-warrantable due to abuse or improper maintenance, or the supplies are found to be serviceable, the repair activity submitting the claim will be required to make reimbursement for contractor services. All failed items returned for warranty claim action will be monitored by the WARCO. Additionally, regarding contractor repair, the local WARCO must stipulate at the time of request for services that either no non-warranty work be done or be prepared to pay for such work.

Reimbursement for Army Repair

In the event that the repair activity should receive any reimbursement from the contractor, the monies must be forwarded to the following address: Defense Accounting Office, DAOTACOM, ATTN: DFAS-IN/EM-BED, TACOM, Warren, Michigan 48397-5000.

Claim Denial/Disputes

All denials or disputes will be handled by TACOM.

Reporting

Reporting or recording action on a failed item shall be specified in DA PAM 750-8. (Volume 2, WP 0200) Contractor or repair activity unique forms shall not be used.

Storage/Shipment/Handling

Storage

See coverage-specific data above (last paragraph) and preparation for storage for further information.

Shipment

See contractor responsibilities data above (second paragraph), claim procedures (third paragraph), and preparation of equipment for transportation/shipment for further information.

Handling

See contractor responsibilities data above (second paragraph), claim procedures (third paragraph), and safety, care, and handling for further information.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

EQUIPMENT CHARACTERISTICS

The M984A1 vehicle is used as a multipurpose vehicle capable of recovering and towing a full spectrum of loaded, wheeled vehicles. This vehicle has lift and reach capability to perform maintenance assistance associated with removing and replacing power packs and heavy components from a wide range of wheeled and tracked vehicles.

EQUIPMENT CAPABILITIES

NOTE

Trailer/semitrailer may affect maximum fording depth. Refer to applicable trailer/semitrailer operator manual for further information on fording depth restrictions.

1. All models are capable of operating in temperatures from -25 to 120°F (-32 to 49°C) and to -50 to 120°F (-46 to 49°C) with arctic kit installed.
2. All models can ford water up to 48 in. (1 219 mm) deep for 5 minutes without damage or without requiring maintenance before operation can continue.
3. Normal operating range of all models is 300 miles (483 km), based upon 154 gallons (583 L) of fuel and 100,000 lbs (45 400 kg) GCWR, traveling over mixed terrain. Varying loads, prolonged idle, use of power takeoff (PTO), off-road driving, and climatic conditions affect operating range.
4. All models are provided with sufficient tie down points located so vehicles can be restrained in all directions during air transport in C-130, C-5A, and C-17 type aircraft.
5. All models are also capable of being transported by highway, rail, and sea.

EQUIPMENT FEATURES

1. Detroit Diesel eight-cylinder, V-Type, 2-cycle, fuel injected, turbocharged diesel engine.
2. Automatic transmission with one reverse speed and four forward speeds.
3. Operator controlled 4-wheel/8-wheel drive and high and low range transfer case for positive traction in areas of unimproved road surfaces.
4. Power steering system consists of basic manual steering system with hydraulic boost. Mechanical linkage also provides operator control in event of hydraulic oil pressure loss.
5. Fuel system includes one fuel tank, fuel lines, fuel/water separator, fuel pump, secondary filter, fuel pipes, and fuel injectors.
6. Two front and two rear towing eyes.

EQUIPMENT FEATURES - Continued

7. Manual-release-type rear pintle hook which will allow towing of a trailer.
8. Radio frequency interference suppression to permit voice radio communications during all phases of operation.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

VEHICLE COMPONENT LOCATION

Table 1. HEMTT Series Vehicle Common Component Location.

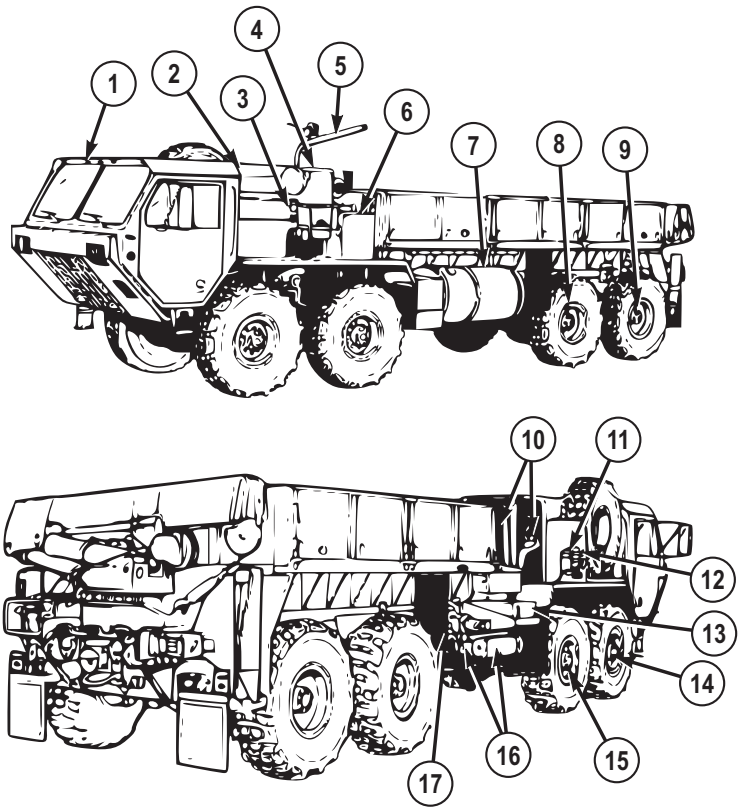


Figure 1.

1	**Personnel Cab.** Provides protection from weather for crew and vehicle controls, gauges, and indicators.

VEHICLE COMPONENT LOCATION - Continued

Table 1. HEMTT Series Vehicle Common Component Location. - Continued

2	**Engine Compartment.** Engine supplies power to move vehicle and operate equipment and accessories.
3	**Ether Canister.** Contains ether for use as cold weather starting aid.
4	**Air Cleaner.** Filters out dust and debris from air entering air induction system.
5	**Tire Davit (shown assembled).** Used to raise and lower spare tire.
6	**Hydraulic Reservoir.** Stores, cools, and filters oil used in hydraulic and power steering systems.
7	**Fuel Tank.** Stores fuel used to operate engine. Receives excess fuel not used by engine fuel injection system.
8	**No. 3 Driving Axle.** Supports weight of vehicle, and transmits power to hubs to turn rear wheels.
9	**No. 4 Driving Axle.** Supports weight of vehicle, and transmits power to hubs to turn rear wheels.
10	**Tire Davit (shown in stowed position).** Used to raise and lower spare tire.
11	**Air Dryer.** Used to remove dirt and moisture from compressed air before air enters air reservoirs.
12	**Fuel/Water Separator.** Acts as primary fuel filter and removes any water from fuel before entering engine.
13	**Battery Box.** Houses and protects four storage batteries.
14	**No. 1 Driving Axle.** Controls direction of vehicle when in motion. When needed, transmits power to hubs to turn wheels.
15	**No. 2 Driving Axle.** Controls direction of vehicle when in motion. When needed, transmits power to hubs to turn wheels.
16	**Air Reservoirs.** Used to store air system air.
17	**Self-Recovery Winch (not used on all vehicles).** Used to help vehicle pull itself free of obstructions.

VEHICLE COMPONENT LOCATION - Continued

Table 2. M984A1 Wrecker-Recovery Vehicle Specific Component Location.

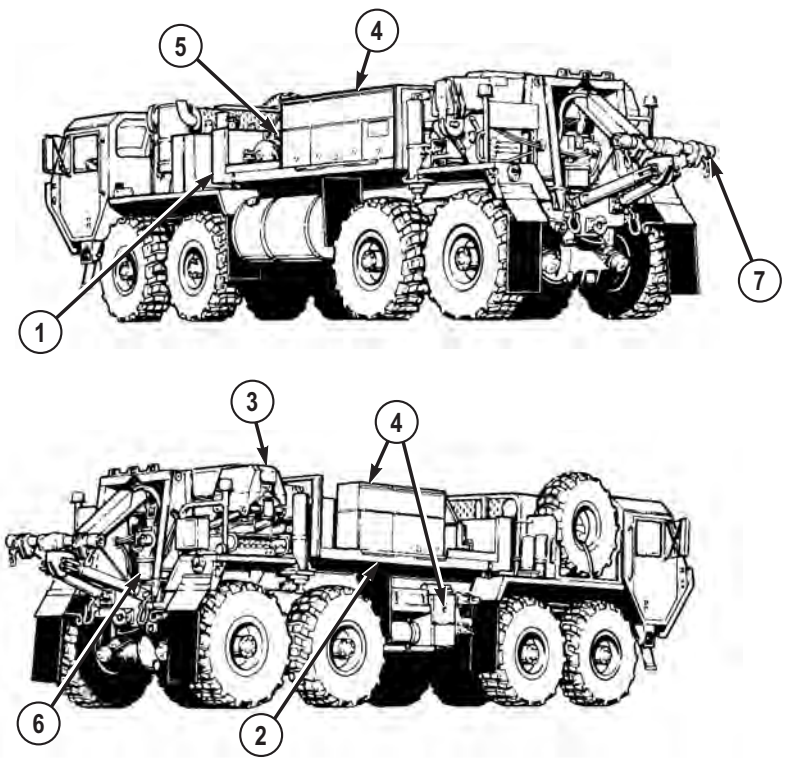


Figure 2.

1	**Equipment Body.** Used to carry COEI, BII, (Volume 2, WP 0201)AAL, (Volume 2, WP 0202) and repair parts.
2	**Access Ladder.** Used by crew to clean window, check oil, or perform other tasks requiring access to parts of vehicle out of normal reach.
3	**Material Handling Crane.** Used to load and unload equipment and cargo.
4	**Stowage Boxes.** Used to stow COEI, BII, (Volume 2, WP 0201)AAL, (Volume 2, WP 0202) and other mission essential items.

VEHICLE COMPONENT LOCATION - Continued

Table 2. M984A1 Wrecker-Recovery Vehicle Specific Component Location. - Continued

5	**Heavy-Duty Winch.** Used to pull vehicle out of ditches, mud, and other areas as needed.
6	**Fairlead Tensioner.** Used to help guide and feed heavy-duty winch cable out with hydraulic motor. Used also to keep tension on cable when reeling cable back in as needed.
7	**Retrieval System.** Used for lifting and towing disabled vehicles.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DIFFERENCES BETWEEN MODELS

Table 1. Differences Between HEMTT BASE Models.

Equipment	Model							
	M977 (Note 1)	M978 (Note 1)	M983 (Note 2)	M984 (Note 2)	M985 (Note 1)	M985 E1 (Note 2)	M1120 LHS (Note 1)	M1977 CBT (Note 1)
10 ft. (3.05 m) Equipment Body				•				
18 ft. (5.49 m) Cargo Body	•				•	•		
Cargo Cover Kit	•				•	•		
Heavy-Duty Winch				•				
Rear Beacon Lights (Note 4)				•				
Work Lights (Note 5)			•	•				•
MHC977 Grove Crane	•							
MHC985 Grove Crane					•			
MHC984				•				

Table 1. Differences Between HEMTT BASE Models. - Continued

Equipment	Model							
	M977 (Note 1)	M978 (Note 1)	M983 (Note 2)	M984 (Note 2)	M985 (Note 1)	M985 E1 (Note 2)	M1120 LHS (Note 1)	M1977 CBT (Note 1)
Grove Crane								
8108/-2 HIAB Crane (Note 6)						•		
Fifth Wheel			•					
3.5 inch (89 mm) Kingpin			•					
Semitrailer Spare Tire Carrier			•					
Load Handling System							•	•

Table 2. Notes.

Note:

1. Vehicle can be equipped in either of two configurations: with or without optional self-recovery winch.
2. Vehicle equipped with self-recovery winch.
3. Self-recovery winch not available for this model.
4. All HEMTT series vehicles are authorized to carry portable beacon light as an optional accessory.
5. All HEMTT series vehicles are authorized to carry portable work lamp as an optional accessory.
6. See data plate on base of crane loader body unit to determine model number.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
EQUIPMENT DATA

EQUIPMENT DATA

Table 1. Vehicle Operation.

Operating Mode: On- and off-road
Operating Temperature w/o Arctic Kit: -25 to 120°F (-32 to 49°C)
Operating Temperature w/Arctic Kit: -50 to 120°F (-46 to 49°C)

Table 2. M984A1 Wrecker Vehicle Dimensions.

Width (overall): 96 in. (2 438 mm)
Height (overall): 112 in. (2 845 mm)
Height (reduced for shipping): 102 in. (2 591 mm)
Length (overall): 392 in. (9 957 mm)
Wheelbase: 191 in. (4 851 mm)
Turn Circle (curb to curb): 100 ft. (30.5 m)
Ground Clearance: 24 in. (610 mm)
Center of Gravity: See shipping data plate on outside of driver side rear of cab or inside of driver side door.

Table 3. M984A1 Wrecker Vehicle Weight.

Curb Weight: 50,900 lbs (23 109 kg)
Gross Vehicle Weight Rating (GVWR): 95,000 lbs (43 130 kg)
Gross Combination Weight Rating (GCWR): 114,000 lbs (51 756 kg) (off-road, LO range, 30% maximum grade)

EQUIPMENT DATA - Continued

Table 3. M984A1 Wrecker Vehicle Weight. - Continued

114,000 lbs (51 756 kg) (primary or secondary road , LO or HI range, 7% maximum grade) 155,000 lbs (70 370 kg)) (primary road LO range)

Table 4. M984A1 Wrecker Vehicle Weight Distribution.

Front Tandem Axles-Curb: 23,900 lbs (10 851 kg)
Front Tandem Axles-Loaded: 30,000 lbs (13 620 kg)
Rear Tandem Axles-Curb: 27,000 lbs (12 258 kg)
Rear Tandem Axles-Loaded (maximum): 65,000 lbs (29 510 kg)

Table 5. Vehicle Performance.

Cruising Range at GCWR: 300 mi. (483 km)
Maximum Sustained Forward Speed (at 2100 rpm) - 3rd Gear: 41 mph (66 km/h)
Maximum Sustained Forward Speed (at 2100 rpm) - 2nd Gear: 28 mph (45 km/h)
Maximum Sustained Forward Speed (at 2100 rpm) - 1st Gear: 15 mph (24 km/h)
Speed on 3% Grade at GCWR: 25 mph (40 km/h)
Speed on 3% Grade at GVWR: 40 mph (64 km/h)
Speed on 30% Grade at GCWR: 3 mph (5 km/h)
Speed on 30% Grade at GVWR: 5 mph (8 km/h)
Maximum Grade at GCWR: 30 percent
Maximum Grade at GVWR: 60 percent
Maximum Side Slope w/Adequate Traction Surface: 30 percent
Maximum Towed Speed (refer to FM 4-30.31): 15 mph (24 km/h)
Maximum Ford Depth: 48 in. (1 219 mm)

EQUIPMENT DATA - Continued

Table 5. Vehicle Performance. - Continued

Approach Angle: 41 degrees
Departure Angle: 45 degrees
Limp Home Speed: 10 mph (16 km/h) for up to 30 miles (48 km)

Table 6. Fluid Capacities.

Refer to lubrication instructions in operator's PMCS (Volume 2, WP 0188) for vehicle fluid capacities.

Table 7. Engine.

Make: Detroit Diesel Corporation
Model: 8V92TA
Type: 2-Stroke, V-Type Diesel
Cylinders: 8
Bore: 4.84 in. (123 mm)
Stroke: 5 in. (127 mm)
Displacement: 736 cid (12 L)
Torque:
Model No. 8087-7899: 1250 lb-ft (1695 Nm) at 1300 rpm
Model No. 8083-7493: 1330 lb-ft (1803 Nm) at 1200 rpm
Maximum Brake Horsepower (at 2100 rpm):
Model No. 8087-7899: 445 BHP (332 kW)
Model No. 8083-7493: 450 BHP (336 kW)
Maximum Governed Engine Speed - Loaded: 2050 - 2150 rpm

EQUIPMENT DATA - Continued

Table 7. Engine. - Continued

Maximum Governed Engine Speed - No Load: 2225 - 2275 rpm
Oil Filter Type: Full flow, replaceable element
Oil Filter Quantity: 1

Table 8. Fuel System.

Type: Diesel Injection
Tank Quantity: 1
Air Cleaner Type: Dry element
Element Quantity: (1 primary, 1 secondary)

Table 9. Electrical System.

Voltage: 24
Alternator (amps): 65
RFI Suppression Ability: Yes
Number of Batteries: 4
Battery Voltage (each): 12 volts
Battery Connection: Series - parallel
Battery Capacity (at 20 hour rate): 900 amp
Battery Reserve Capacity (each, at 80°F/27°C): 180 minutes
Battery Cold Cranking Amps (each, at 80°F/27°C): 575 CCA
Battery Amp Hours (each, at 20 hour rate): 100 amp

EQUIPMENT DATA - Continued

Table 10. Cooling System.

Radiator Working Pressure: 7 psi (48 kPa)

Table 11. Transmission.

Make: Allison
Model: HT740D
Type: Automatic
Number of Forward Speeds: 4
Number of Reverse Speeds: 1

Table 12. Transfer Case.

Make: Oshkosh
Model: 55000
Type: Air-operated front tandem disconnect
Ratios: 0.98:1 and 2.66:1

Table 13. Front Tandem Axles.

Front Tandem
Make: Oshkosh/Dana Heavy Axle
Differential Carrier Model Nos.: No. 1 axle: RS480, No. 2 axle: DS480-P
Maximum Steering Angle: 32 degrees

Table 14. Rear Tandem Axles.

Make: Dana Heavy Axle
Differential Carrier Model Nos.: No. 3 axle: DS650-P, No. 4 axle: RS650

EQUIPMENT DATA - Continued

Table 15. Brake System.

Actuation: Air
Number of Brake Chambers: 8
Pressure Range: 60 - 120 psi (414 - 827 kPa)

Table 16. Wheels.

Type: Two-piece bolt together wheel
Quantity: 8
Spare Quantity: 1
Rim Size: 20 x 10
Stud Quantity Per Wheel: 10

Table 17. Tires.

Type: Radial without tube
Quantity: 8
Spare Quantity: 1
Tread Type: Radial traction, non-directional
Size: 16.00R x 20 in.
Load Range: M

Table 18. Steering System.

Type: Dual gear with integrated hydraulic power assist

Table 19. Towing Eyes.

Quantity: 4 (2 front, 2 rear)

EQUIPMENT DATA - Continued

Table 19. Towing Eyes. - Continued

Maximum Load Capacity Each: 60,000 lbs (27 240 kg)

Table 20. Pintle Hook.

Type: Manual Release
Maximum Load Capacity - Pulling: 100,000 lbs (45 400 kg)
Maximum Load Capacity - Vertical: 20,000 lbs (9 080 kg)

Table 21. Cab.

Windshield: Tinted, two-piece, safety glass
Personnel Capacity: 2

Table 22. Self-Recovery Winch.

Make: DP Manufacturing
Model: 20K-HEMTT
Wire Rope Diameter: 9/16 in. (14.3 mm)
Wire Rope Length: 200 ft. (61 m)
Line Pull - 1st Layer (Five Wraps Minimum): 20,000 lbs (9 080 kg)
Line Pull - 2nd Layer: 18,173 lbs (8 251 kg)
Line Pull - 3rd Layer: 16,663 lbs (7 565 kg)
Line Pull - 4th Layer: 15,361 lbs (6 974 kg)
Line Pull - 5th Layer: 14,254 lbs (6 471 kg)

Table 23. Material Handling Crane.

Make: Grove

EQUIPMENT DATA - Continued

Table 23. Material Handling Crane. - Continued

Model: MHC984
Maximum Capacity at Boom Length of 18.2 ft. (5.5 m): 6000 lbs (2 722 kg)

Table 24. Recovery (Heavy-Duty) Winch.

Make: DP Manufacturing
Model: 51022 60K
Type: Automatic Two Speed
Wire Rope Diameter: 1 in. (25 mm)
Wire Rope Length: 220 ft. (67 m)
Line Pull - First Layer (with five wraps): 60,000 lbs (27 240 kg)
Line Pull -Third Layer: 45,000 lbs (20 430 kg)

Table 25. Auxiliary Equipment.

Arctic Engine Heater Kit
Chemical Alarm
Decontamination Unit
Gas Particulate Filter Unit
Machine Gun Ring
Radio Installation Kit
Rifle Mounting Kit
Note: Vehicle may or may not be equipped with any of these items depending on mission, climate, or other factors.

EQUIPMENT DATA - Continued

Table 26. Load Classification.

MODEL	UNLOADED (TONS)	FULL LOAD (TONS)	WITH TRAILER LOADED (TONS)
M977	16	28	
M978	15	25	
M983	14		C-29 (w/Patriot)
M984A1	19		C-48 (towing loaded M985)
M985	17	28	C-38 (towing HEMAT M989)
M985 E1	17	28	
M1120 LHS	18	28	

TIRE PRESSURES

Table 27. Tire Pressures.

TIRE	HIGHWAY	CROSS-COUNTRY (DRY)	CROSS-COUNTRY (WET)	SANDY TERRAIN
Front Tire Pressure				
STANDARD (XZL) TIRE	60 psi (414 kPa)	35 psi (241 kPa)	20 psi (138 kPa)	30 psi (207 kPa)
SAND TIRE	60 psi (414 kPa)	NA	NA	25 psi (172 kPa)
Rear Tire Pressure				
STANDARD (XZL) TIRE	100 psi (690 kPa)	100 psi (690 kPa)	100 psi (690 kPa)	30 psi (207 kPa) 80 psi (551 kPa) when towing

TIRE PRESSURES - Continued

Table 27. Tire Pressures. - Continued

TIRE	HIGHWAY	CROSS-COUNTRY (DRY)	CROSS-COUNTRY (WET)	SANDY TERRAIN
SAND TIRE	100 psi (690 kPa)	NA	NA	30 psi (207 kPa) 80 psi (551 kPa) when towing

OPERATING SPEEDS

Table 28. Operating Speeds.

	HIGHWAY	CROSS-COUNTRY (DRY)	CROSS-COUNTRY (WET)	SANDY TERRAIN
Maximum Speed				
STANDARD (XZL) TIRE	55 mph (88 km/h)	40 mph (64 km/h)	20 mph (32 km/h)	20 mph (32 km/h)
SAND TIRE	55 mph (88 km/h)	NA	NA	20 mph (32 km/h)
M984A1 (when towing another vehicle)				
STANDARD (XZL) TIRE	15 mph (24 km/h)*	15 mph (24 km/h)	15 mph (24 km/h)	15 mph (24 km/h)
SAND TIRE	15 mph (24 km/h)*	NA	NA	15 mph (24 km/h)
*Operation at speeds over 15 mph (24 km/h) on paved road can be achieved when the operator determines that the vehicle being towed and the terrain allow for safe operation. Under no condition can speeds exceed 35 mph (55 km/h) on paved roads and 15 mph (24 km/h) off paved roads.				

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SELF-RECOVERY WINCH

SELF-RECOVERY WINCH

The self-recovery winch, where used, is mounted on the passenger side chassis frame rail between the second and third axles.

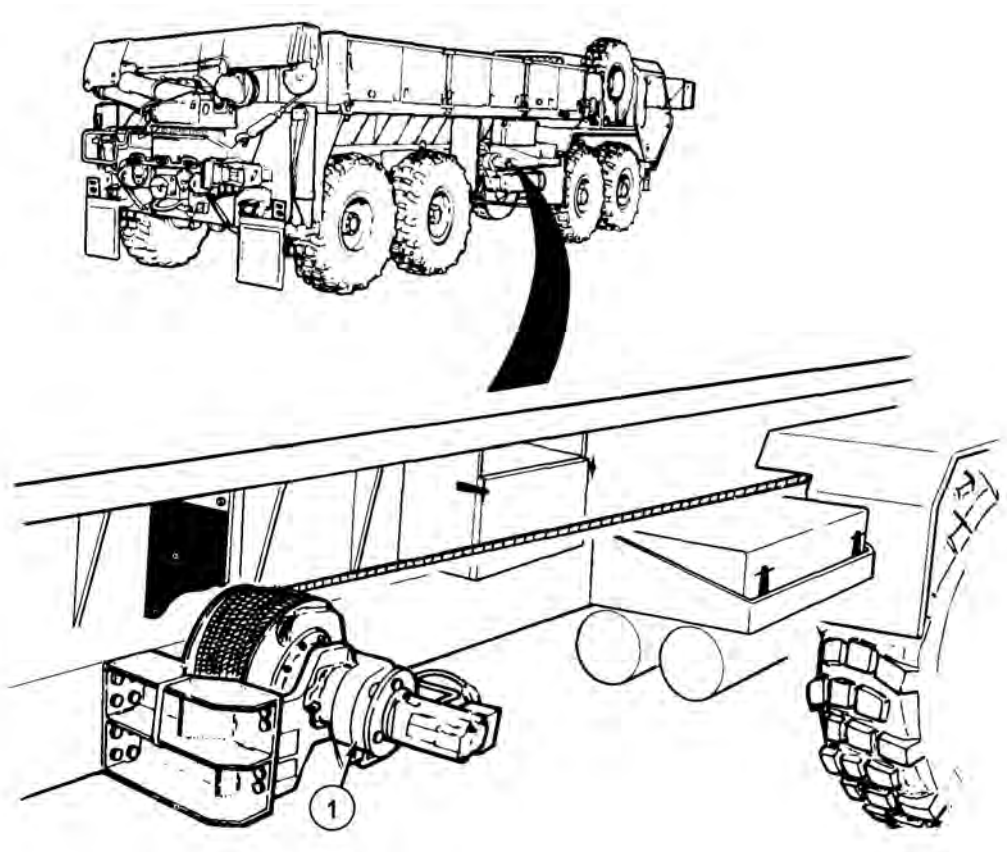


Figure 1.

The winch is powered by a reversible hydraulic motor which drives the winch drum through a planetary gearbox.

It is equipped with an automatic brake that is applied whenever the cab control lever is in the center position.

SELF-RECOVERY WINCH - Continued

NOTE

The M984A wrecker equipped with a self-recovery winch does not employ an operator controlled, two-position hydraulic selector valve to activate the reversible winch motor.

All vehicles (except the M984A wrecker) equipped with a self-recovery winch (1) have an operator controlled, two-position hydraulic selector valve to activate the reversible winch motor.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ELECTRICAL SYSTEM

NOTE

- Wiring harnesses are used to carry current to operate equipment and accessories.
- The electrical system is a 24 VDC system.

Four 12 VDC storage batteries (1) are connected in series-parallel with the negative terminal grounded.

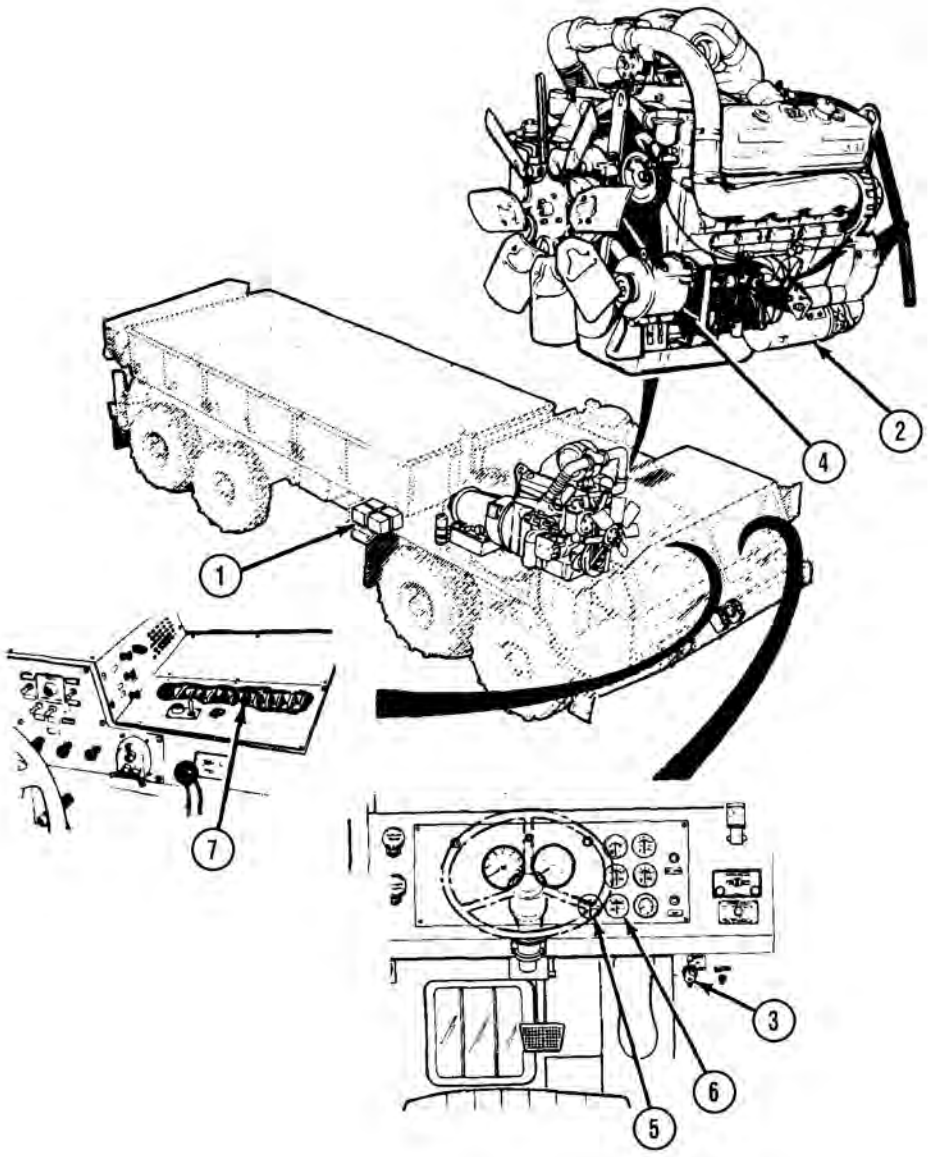


Figure 1.

The starting motor (2) operates directly from the 24 VDC source through the engine start switch (3).

A belt-driven 24 VDC alternator (4) having a capacity of 65 amps (M983 - 100 amps) or 130 amps maintains the charge on the batteries.

The AMPERES gauge (5) shows the alternator output.

The BATTERY gauge (6) shows the state of charge of the batteries and alternator voltage output.

The vehicle electrical circuits are protected against overloads by automatic reset circuit breakers (7) located below the heater compartment panel.

MAJOR ELECTRICAL SYSTEM COMPONENT LOCATION

The voltage and the current for the electrical system are indicated by a battery gauge (1) and an ammeter (2) located on the dash panel inside the driver's compartment.

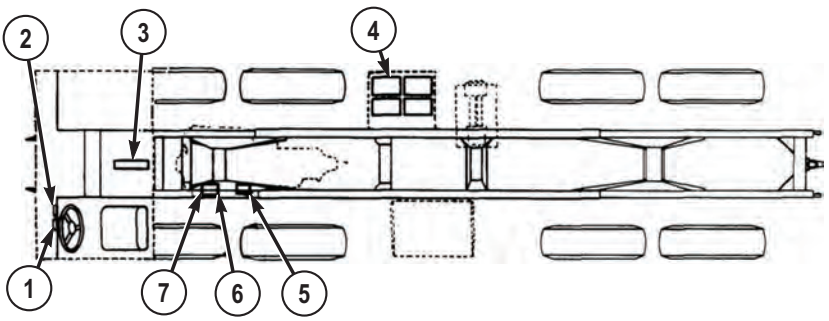


Figure 2.

Circuit breakers (3) located in the cab protect the main circuits.

Electrical power is provided by four 12-volt series-parallel connected batteries (4).

NOTE

Power is distributed throughout the vehicle by wiring harnesses. The harnesses are interconnected by pin connectors. Connectors are provided at the rear of the vehicle to supply power for towed loads.

A heavy-duty starting motor (5) is mounted on the engine flywheel housing and provides the cranking power necessary for starting the engine.

The voltage regulator (6) is mounted on the belt driven alternator (7) and maintains a 24-volt level for battery charging.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
AIR SYSTEM

AIR SYSTEM

The air system consists of an engine-driven air compressor (1) and four air reservoirs (2, 3, 4, and 5). Reservoir (4) is used on all vehicles except the M983 tractor, which has a reservoir (6) instead.

AIR SYSTEM - Continued

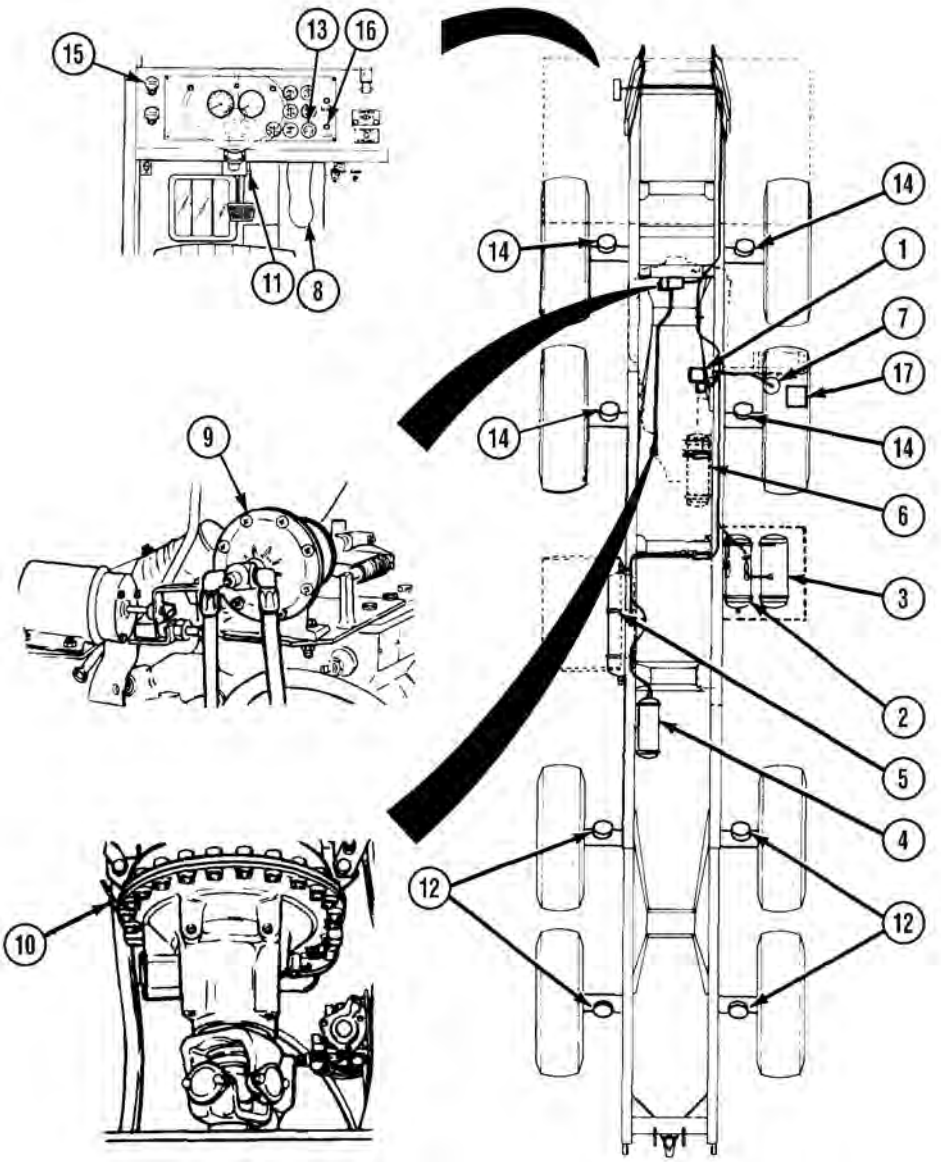


Figure 1.

AIR SYSTEM - Continued

NOTE

The air system includes the necessary valves and air lines to control the vehicle's air-operated parts.

Pressurized air from the air compressor (1) is passed through the air dryer (7) to the quick buildup reservoir (2).

The air dryer (7) removes dirt and moisture from the pressurized air. Air from reservoir (2) goes to the throttle treadle (8).

Depending on how far the throttle treadle is depressed, 0 to 60 psi (0 to 414 kPa) is supplied to the engine throttle air cylinder (9) and to the transmission modulator (10). This air pressure control the vehicle speed.

Once air pressure in reservoir (2) rises above 75 psi (517 kPa), a valve opens and allows reservoirs (3, 4, or 6, and 5) to be pressurized up to 120 psi (827 kPa).

Air from reservoir (4 or 6) goes to the brake treadle valve (11). This air controls the rear axle service parking brakes (12).

Air pressure in this system is shown by the red needle on the AIR PRESS gauge (13).

Air from reservoir (3) goes to the brake treadle valve.

This air controls the front axle service brakes (14).

Air pressure in this system is shown by the green needle on the AIR PRESS gauge.

The PARKING BRAKE valve (15) controls air from reservoirs (3 and 5) and applies or releases the rear axle service (parking) brakes.

Reservoirs (3, 4, or 6, and 5) are interconnected so that if one reservoir fails, air is supplied to release the rear axle service (parking) brakes from whichever reservoir is functioning. If air pressure falls below 60 to 75 psi (414 kPa to 517 kPa), a buzzer will sound and the AIR indicator (16) will illuminate.

Specific to the M984A1, the front brake actuator valve (17) is used to apply the front axle service brakes when using heavy-duty winch.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
MAIN HYDRAULIC SYSTEM

MAIN HYDRAULIC SYSTEM

The main hydraulic system consists of a power take-off (PTO) driven hydraulic pump (1) and a fluid reservoir (2) shared with the power steering hydraulic system.

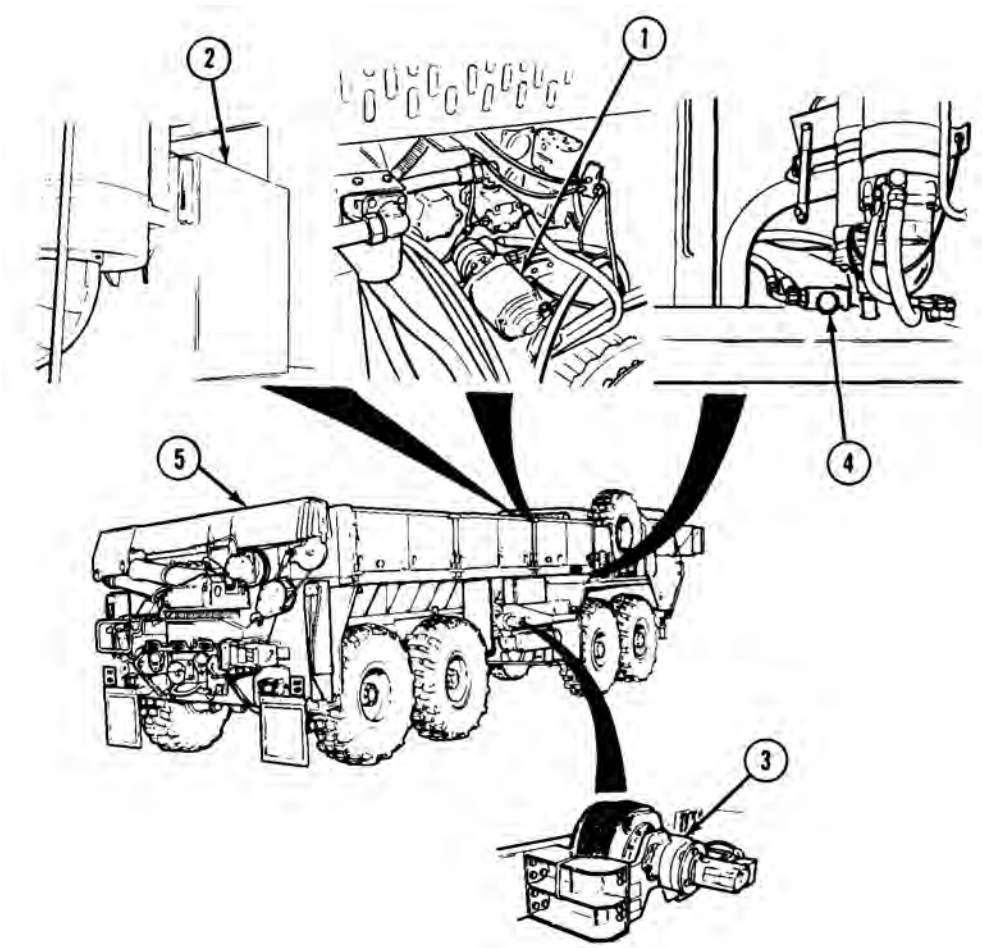


Figure 1.

Any vehicle may also be equipped with a self-recovery winch (3) and a selector valve (4).

MAIN HYDRAULIC SYSTEM - Continued

The main hydraulic system includes the material handling crane (5) on the HEMTT series vehicle.

The fuel pump on the M978 tanker is part of the main hydraulic system.

FLUID SYSTEM

Pump (1) mounted on the rear of engine provides the fluid power to operate the power steering (2) only.

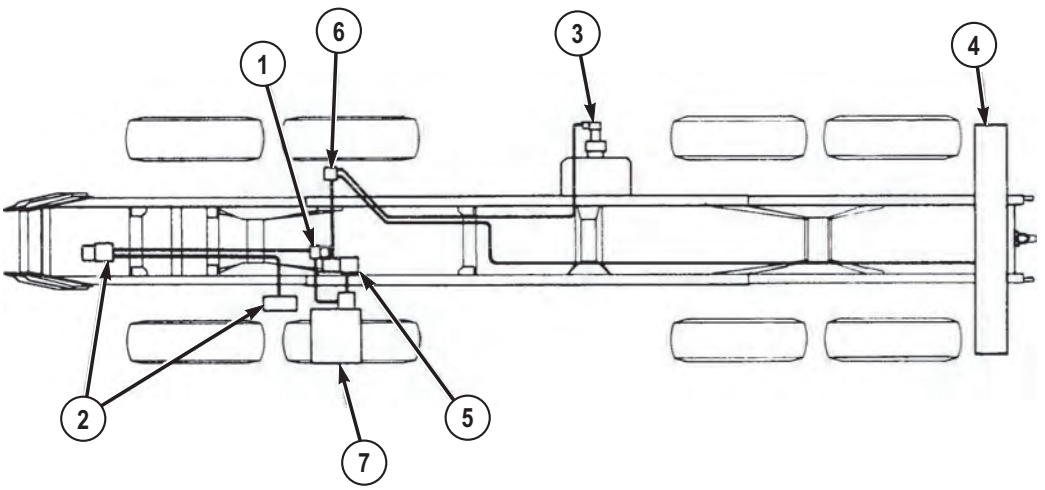


Figure 2.

Fluid power for the self-recovery winch (3), crane (4), and fuel tanker dispensing components (M978 only) is provided by a hydraulic pump (5) driven by the power take-off (PTO) mounted on the transmission.

A manually-operated selector valve (6) is used to activate either the self-recovery winch (3), crane (4), fuel tanker dispensing components (M978 only), or load handling system (LHS) on M1120 LHS and M1977 CBT.

Both pumps (1) and (5) share the same reservoir (7).

END OF WORK PACKAGE

OPERATOR MAINTENANCE
STEERING SYSTEM

POWER STEERING HYDRAULIC SYSTEM

Power is supplied to the main steering gear (1) by an engine-driven pump (2).

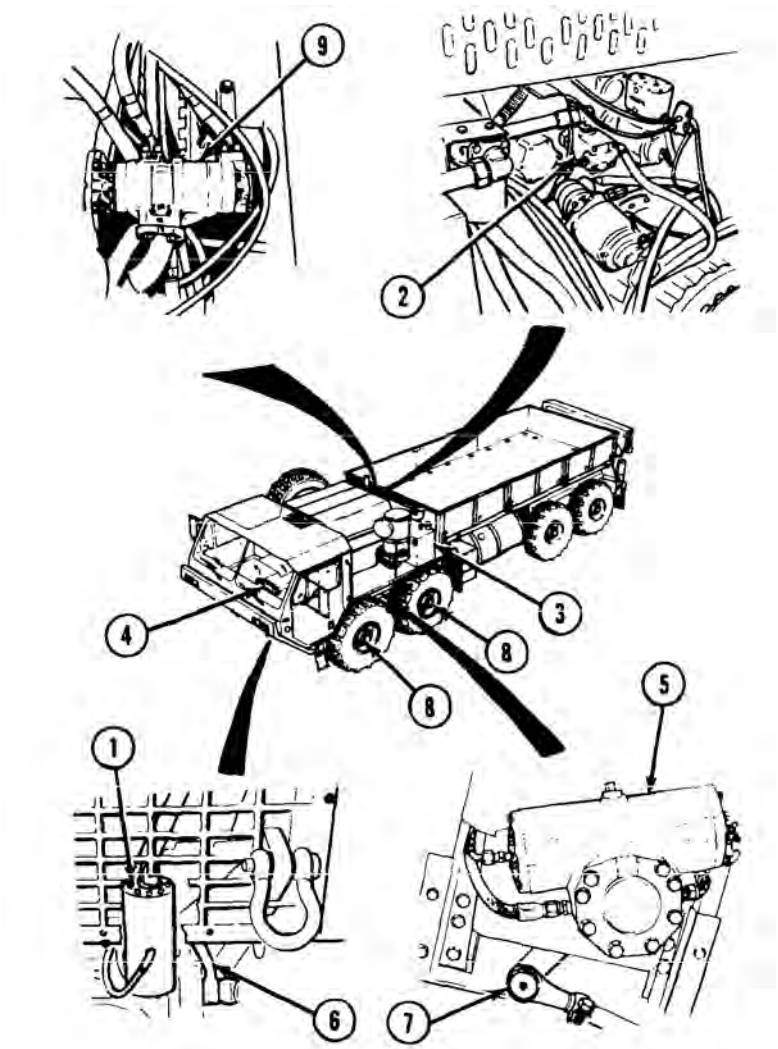


Figure 1.

POWER STEERING HYDRAULIC SYSTEM - Continued

The fluid reservoir (3) is shared with the main hydraulic system.

The steering wheel (4) rotates a gear that positions a spool in the main steering gear. This motion is hydraulically sent to a piston in the slave gear (5) causing it to follow the rotation of the main steering gear.

The main gear pitman arm (6) is mechanically connected to the slave gear pitman arm (7).

These pitman arms move the steering mechanism on the front axles (8) left or right causing the vehicle to steer left or right.

On Model M984A1 wrecker, the power is supplied to the main steering gear by an engine drive steering/tensioner pump (9).

END OF WORK PACKAGE

OPERATOR MAINTENANCE
POWER TRAIN

POWER TRAIN

The drivetrain control system consists of the engine and transmission systems.

Power for the vehicle is provided by a diesel engine (1), which is coupled directly to an automatic transmission (2).

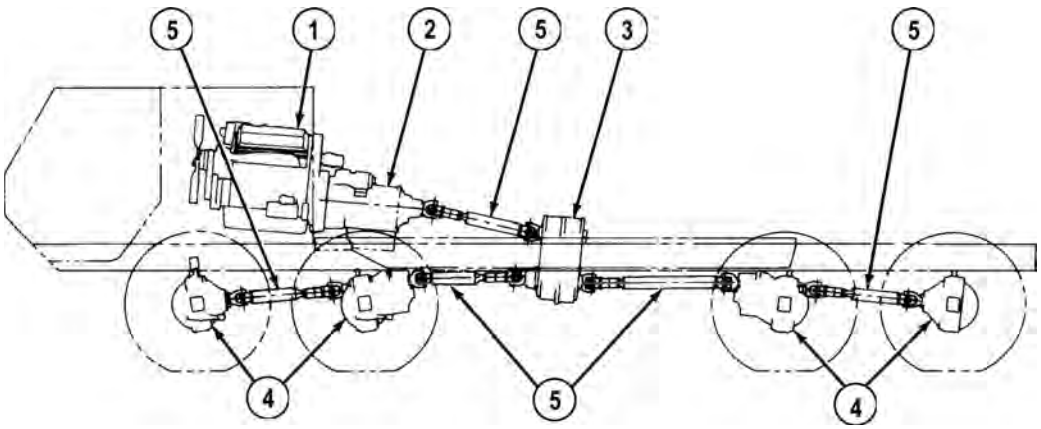


Figure 1.

Power from the transmission is transferred to the transfer case (3) and on to front and rear tandem axles (4) through a series of drive shafts and universal joints (5).

AUTOMATIC TRANSMISSION

The automatic transmission (1) provides four speeds forward and one reverse.

AUTOMATIC TRANSMISSION - Continued

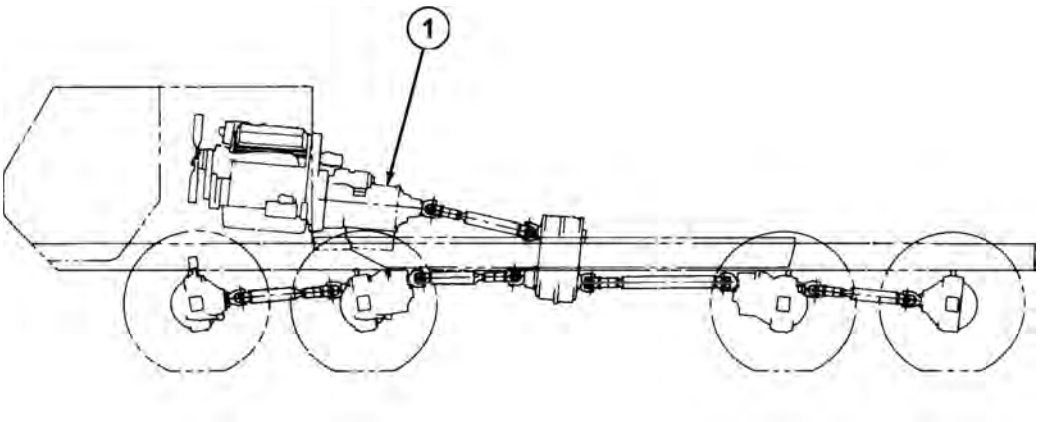


Figure 2.

Drive (D) is used for all normal driving conditions.

The vehicle will start moving in 1st gear, and as the accelerator is depressed, transmission will upshift to 2nd gear, 3rd gear, and 4th gear automatically.

As the vehicle slows down, the transmission will downshift to the correct gear automatically.

Placing the range selector lever in the 3 or 2 position will prevent the transmission from upshifting past the 3rd or 2nd gear, respectively.

This is useful if road or load conditions require low gear operation.

When conditions improve, the range selector lever can be returned to the normal (D) driving position.

Drive vehicle (Operations under usual conditions) (WP 0050) provides full operating instructions for the transmission.

The transmission includes an electrically controlled power takeoff (PTO).

The PTO provides power to a hydraulic pump, which powers the vehicle's hydraulic system.

The hydraulic system operates the self-recovery winch, the material handling crane, the heavy-duty recovery winch, and the pumping equipment, depending on how the vehicle is equipped.

TRANSFER CASE

The transfer case (1) connects the drivetrain to the No.1 and No. 2 axles (2) when 8-wheel drive is needed.

TRANSFER CASE - Continued

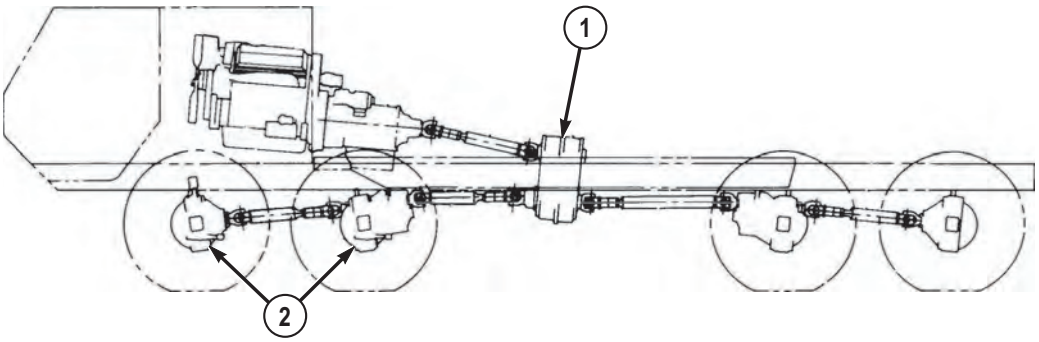


Figure 3.

The transfer case has two gear ratios (high and low) and neutral. The vehicle must be stopped before the transfer case can be shifted between ranges because the gears are not synchronized.

Engagement of the transfer case in low range will automatically engage the drivetrain to the front axles.

TANDEM AXLES AND SUSPENSION

Front and rear tandem axles (1) are single reduction, full floating axle shaft type.

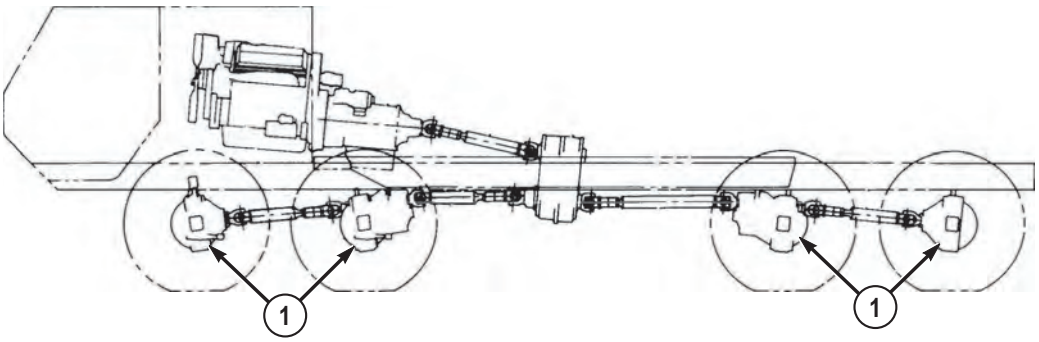


Figure 4.

The front tandem provides steering

The rear tandem is non-steering.

Both front and rear tandems are equipped with wheel differentials and inter-axle differentials.

TANDEM AXLES AND SUSPENSION - Continued

The inter-axle differential have driver-controlled lockouts for positive drive to all axles in low range.

The rear tandem is equipped with permanently engaged controller traction differentials.

The front and rear suspensions are tandem axle type with leaf springs and equalizing beams.

PROPELLER SHAFTS AND UNIVERSAL JOINTS

The propeller shafts and universal joints (1) transmit engine power to the axles.

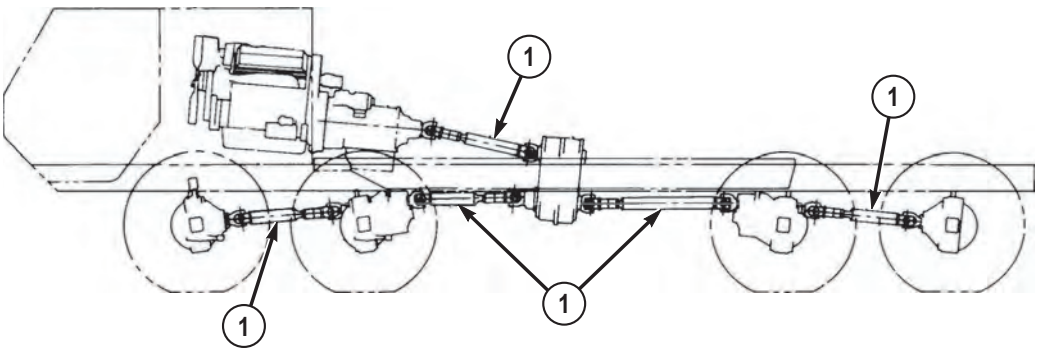


Figure 5.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ENGINE SYSTEMS

ENGINE

The vehicle is equipped with a Detroit Diesel Corporation (DDC) Model 8V92TA engine.

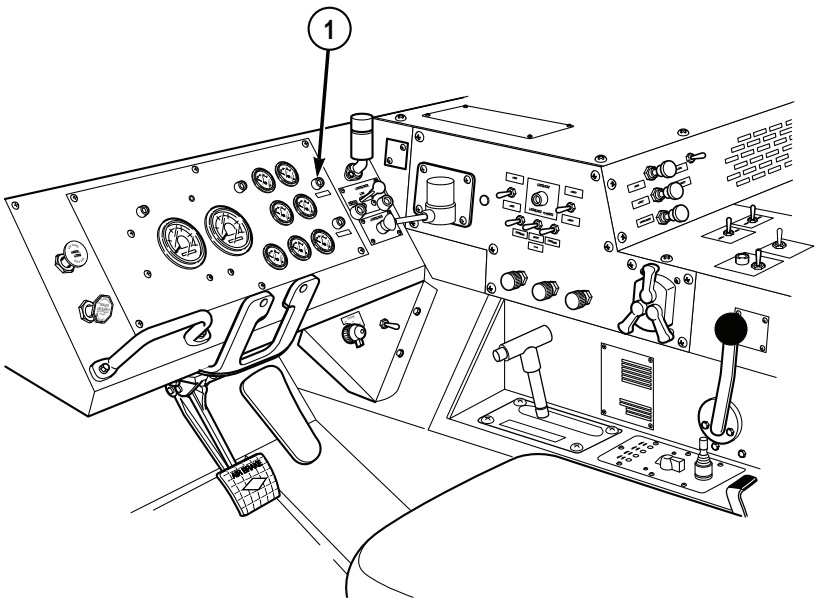


Figure 1.

An oil/water light (1) will light up when a critical fault occurs. Immediately shut vehicle off.

AIR INTAKE SYSTEM

The air intake system consists of a dry type air cleaner (1), turbocharger (2), engine blower (3), and an aftercooler (4).

AIR INTAKE SYSTEM - Continued

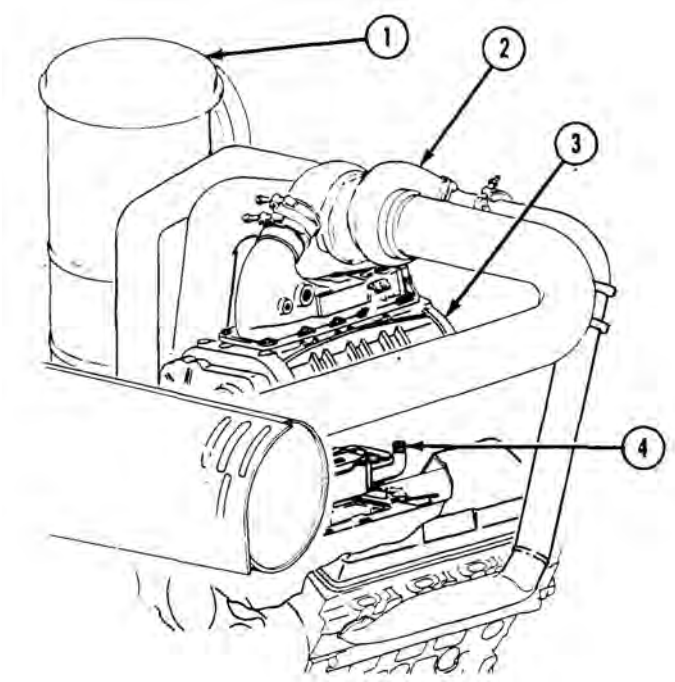


Figure 2.

Engine exhaust gases flow through the turbocharger (2) driving a turbine wheel.

A compressor wheel on the opposite end of the turbine wheel shaft rotates and draws in fresh air through the air cleaner (1), compresses the air, and delivers it to the engine blower (3).

Air from the engine blower (3) flows through the aftercooler (4) which cools the air before it is delivered to the engine cylinders.

FUEL SYSTEM

Fuel drawn from the fuel tank (1) passes through the supply line (2) to a fuel/water separator (3), fuel pump (4), and secondary filter (5) to the engine fuel injectors (6).

FUEL SYSTEM - Continued

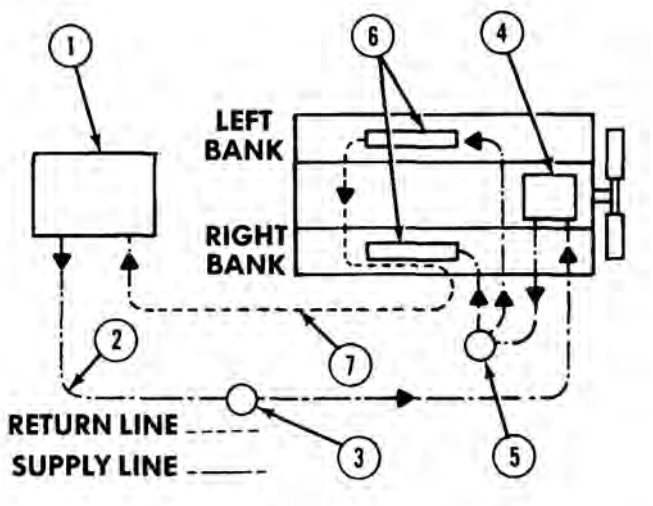


Figure 3.

Surplus fuel from injectors is returned to the fuel tank (1) through the return line (7).

NOTE

The fuel/water separator removes water and large solid particles from the fuel.

The finer particles are removed by the secondary filter (5) before they can enter the fuel injectors.

COOLING SYSTEM

NOTE

The pressure type cooling system protects the engine by removing heat generated during the combustion process.

Pressure within the cooling system is regulated by a pressure release in the radiator filler cap (1).

COOLING SYSTEM - Continued

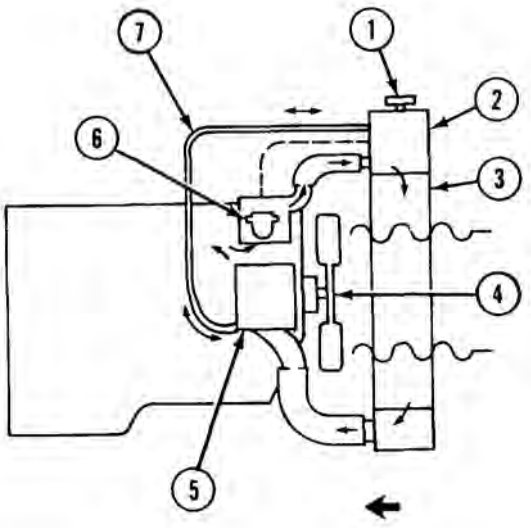


Figure 4.

The hot coolant flows from the engine to top of radiator tank (2) and through radiator core (3) where a stream of air removes heat.

This stream of air is drawn through the core by an air-activated fan (4).

A water pump (5) draws the coolant from the bottom of the radiator and pushes it through the engine repeating the cooling process.

Thermostats (6), mounted in each coolant outlet elbow, remain closed until the coolant approaches a predetermined temperature at which time they open.

NOTE

When the coolant temperature drops below the thermostatic rating, the thermostats close.

An air vent line (7) between the radiator (2) and the water pump (5) inlet removes air trapped in the engine when the cooling system is being filled.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CAB

CAB

The cab (1) contains all of the driving controls and gauges, operating controls for some of the mounted equipment, and adjustable seats for a crew of two. For explanation of cab controls, refer to vehicle controls and indicators.

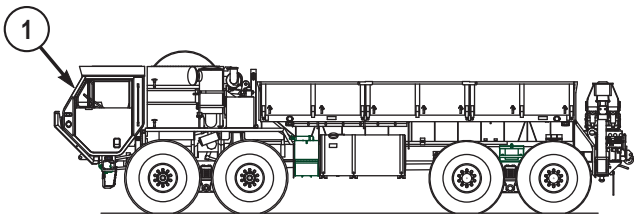


Figure 1.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
WHEELS AND TIRES

WHEELS AND TIRES

There are four front and four rear steel disc, 20.00 x 10.00 wheels (1) with 16.00 R20, tubeless, radial traction, non-directional tires.

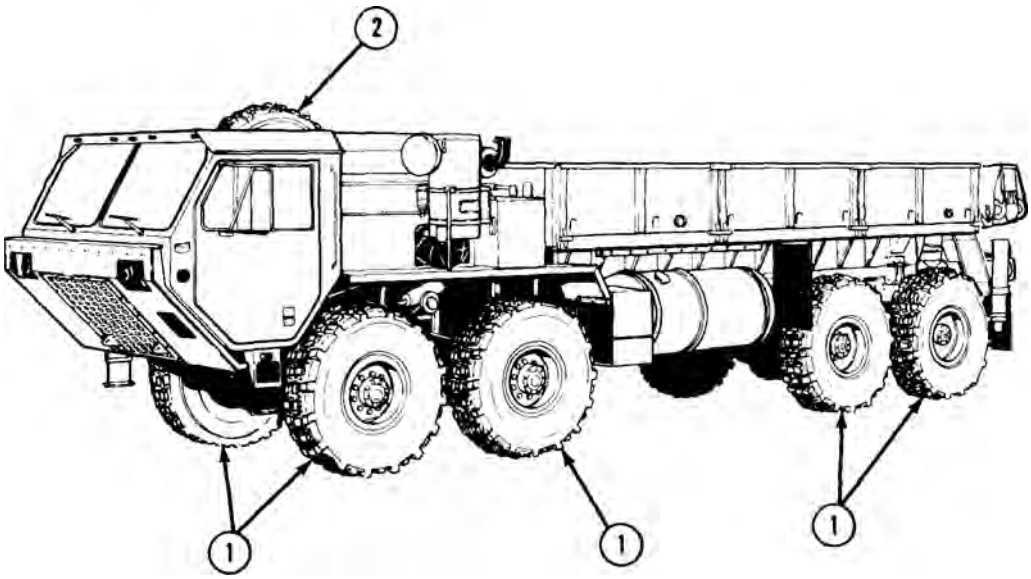


Figure 1.

One spare tire (2) is mounted to the passenger side of vehicle.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CRANE

CRANE OVERVIEW

The cranes are operated by two functional systems: the electrical system and the hydraulic system.

A number of cranes are used on the HEMTT series vehicles:

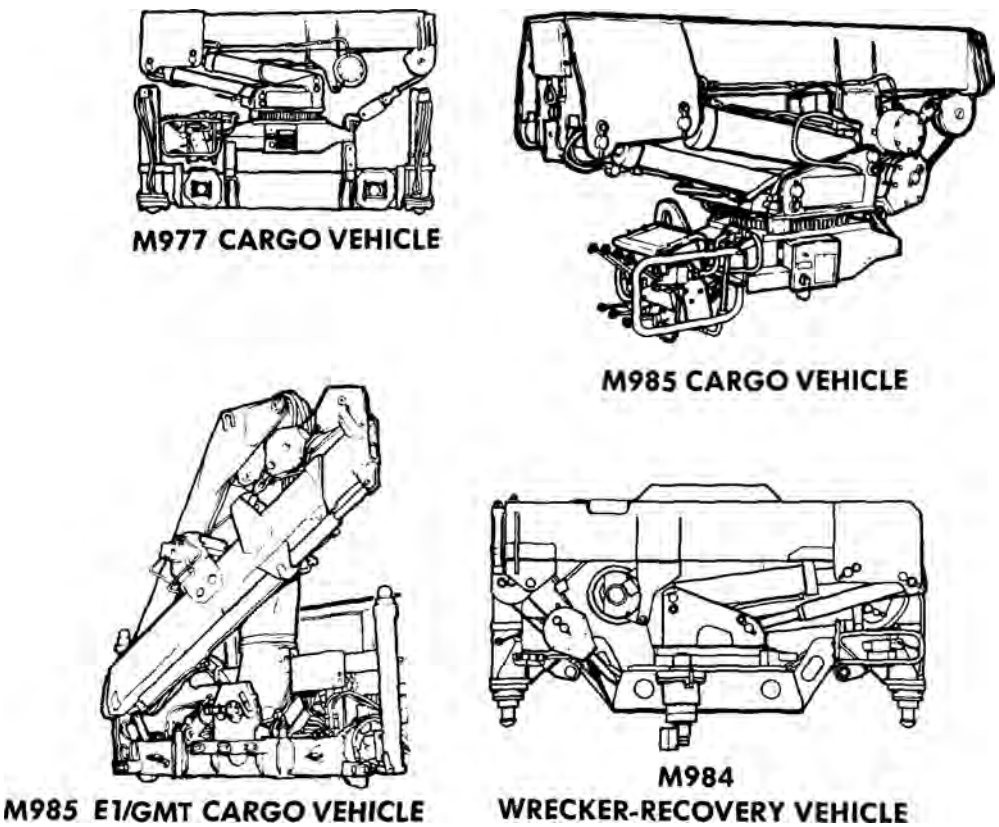


Figure 1.

Refer to operator's manuals for specifications, dimensions, and operating procedures for the different crane models.

The cranes are completely hydraulic powered and their principles of operation are the same.

CRANE OVERVIEW - Continued

Individual control panels, boom-hydraulic cylinder arrangements, and lifting capacities are different.

All cranes are powered from the vehicle's hydraulic system.

All are equipped with outriggers for stability during operation.

All cranes use a combination of hinged joints and telescoping members to give them their motions.

The hydraulic-powered hoisting winch has an automatic brake to prevent accidental lowering of the load.

CRANE OPERATING INSTRUCTION PLATE LOCATIONS

NOTE

Refer to stowage and decal/data plate guide for more information on plate locations.

The crane operating instruction plates are located on the heater compartment cover in the cab at each of the fixed operating stations.

The outrigger leg signs are located on each of the outrigger cylinders.

The load capacity signs are located at the main and auxiliary control panels, and on M984A they are located on the wrecker body rear stowage box doors.

CRANE ELECTRICAL SYSTEM

Material handling cranes for models M977, M984A, and M985 all have overload shutdown and/or tilt warning (unstable) systems.

When M977, M985, and M984A cranes are overloaded, the overload system will automatically shut off power to telescope boom out, raise boom, or hoist load higher. The M977 and M984A overload system will also prevent lowering the boom. An overload condition can be corrected by lowering the boom. An overload condition can be corrected by lowering load to ground or other supporting surface. All functions will be restored in approximately six seconds.

The crane electrical system is supplied with power by the vehicle 24 VDC system.

The junction box on the crane connects and distributes the various control circuits of the crane.

Tilt warning, outrigger extended warning, and remote control systems are electronically controlled.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
HEAVY-DUTY WINCH

HEAVY-DUTY WINCH

The heavy-duty winch assembly (1) is mounted onto chassis frame, between the equipment body and crane. It is powered by an automatic two-speed hydraulic motor which drives the winch drum through a planetary gearbox.

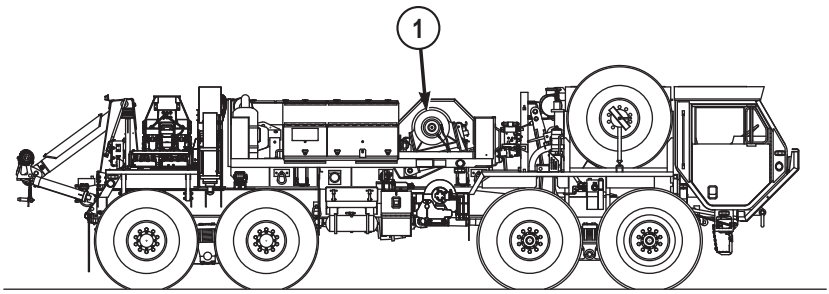


Figure 1.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RETRIEVAL SYSTEM

RETRIEVAL SYSTEM

The retrieval system is shown below, mounted on rear frame and is powered from wrecker hydraulic system. The retrieval system is operator-controlled from retrieval control assembly (1) located about driver side rear fender.

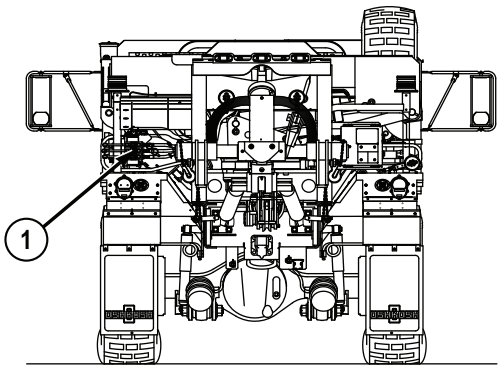


Figure 1.

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 HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about cab-mounted foot controls.

Table 1. Cab-Mounted Foot Controls.

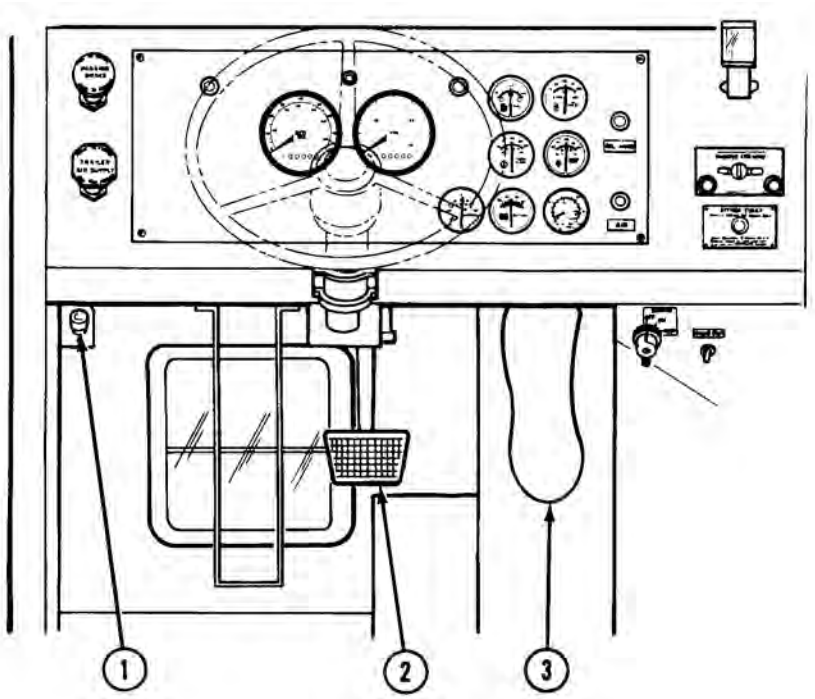
Key	Control/ Indicator	Function
		
1	Headlight Dimmer Switch	Press switch to raise or lower headlight beams. High beam indicator will illuminate (red) when high beams are on (WP 0023).
2	Service Brake Pedal	Applies service brakes. If vehicle is properly coupled to a trailer, trailer brakes will also operate when vehicle service brakes are applied.
3	Throttle Pedal	Controls vehicle speed.

Figure 1.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CAB-MOUNTED HAND CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of cab-mounted hand controls which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about cab-mounted hand controls.

Table 1. Cab-Mounted Hand Controls.

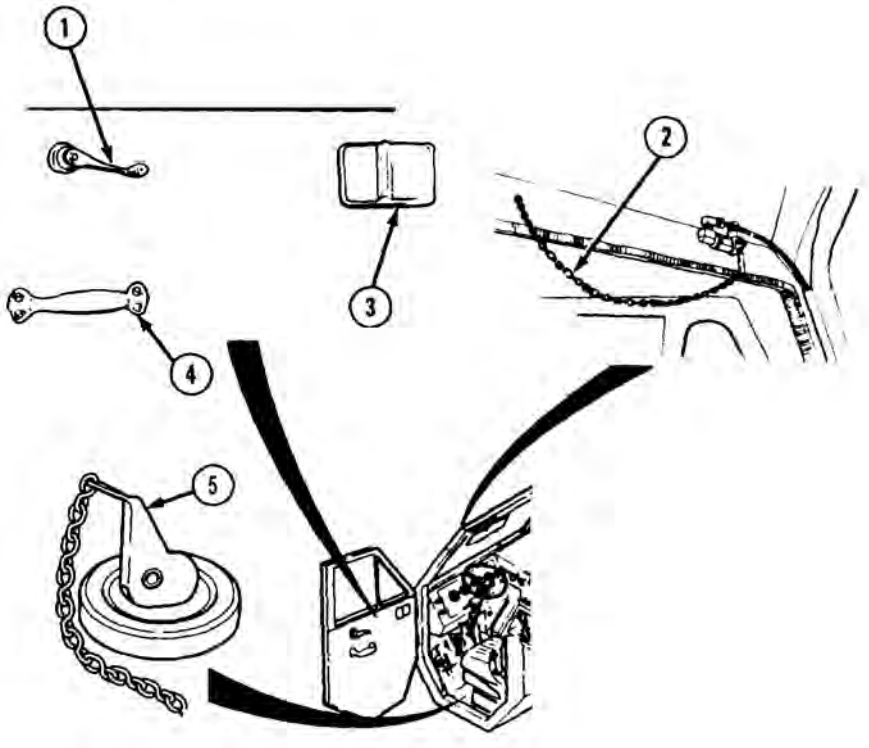
Key	Control/ Indicator	Function
		

Figure 1.

1	Cab Door Window Glass Regulator (one on each door)	Rotate driver side regulator counterclockwise to lower left window glass, clockwise to raise left window glass. Rotate passenger side regulator clockwise to lower right window glass, counterclockwise to raise right window glass.
2	Air Horn Chain	Pull chain to sound air horn. Release chain to silence air horn.
3	Cab Door Inside Handle	Pull to open cab door from inside of cab.

Table 1. Cab-Mounted Hand Controls. - Continued

Key	Control/ Indicator	Function
	(one on each door)	
4	Cab Door Handle (one on each door)	Pull to close cab door from inside of cab.
5	Drain Plug (one under both operator seat and crew seat)	Pull up on lever to remove drain plug and drain liquid from floor of cab.

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 HEMTT 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 HEMTT 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

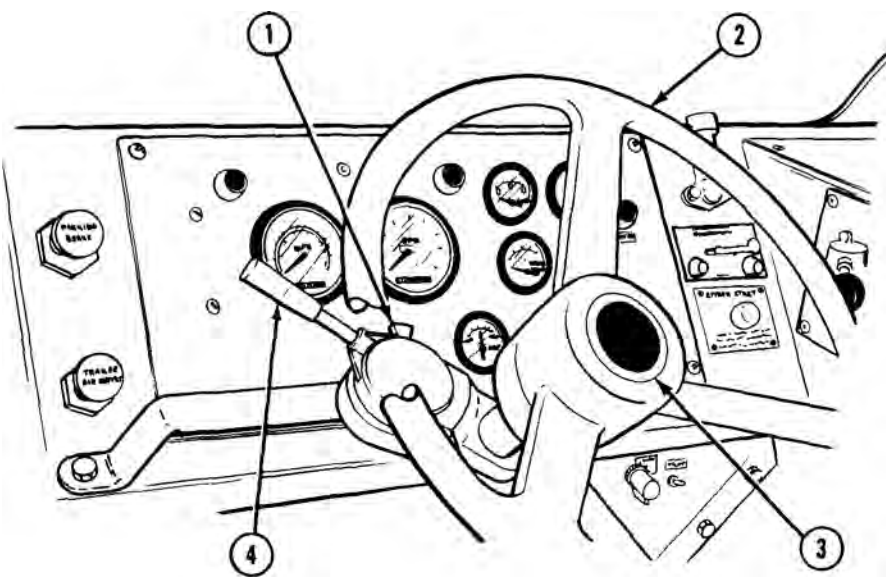


Figure 1.

1	Emergency Flasher Control	To turn on emergency flashers, light control must be in STOP LIGHT or SER DRIVE (WP 0024). Simultaneously press emergency flasher control (1) down and push turn signal lever

Table 1. Steering Column Mounted Controls. - Continued

Key	Control/ Indicator	Function
		(4) up past the right turn position as far as it will go. To turn emergency flashers off, push turn signal lever (4) down to center position.
2	Steering Wheel	Controls direction of vehicle.
3	Horn Button	Sounds electric horn when pressed. Release to silence horn.
4	Turn Signal Lever	Push up to signal right turn. Pull down to signal left turn. When turn is complete, return lever to center position.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TUNNEL PANEL CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of tunnel panel controls and indicators which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about tunnel panel controls and indicators.

Table 1. Tunnel panel controls and indicators.

Key	Control/ Indicator	Function

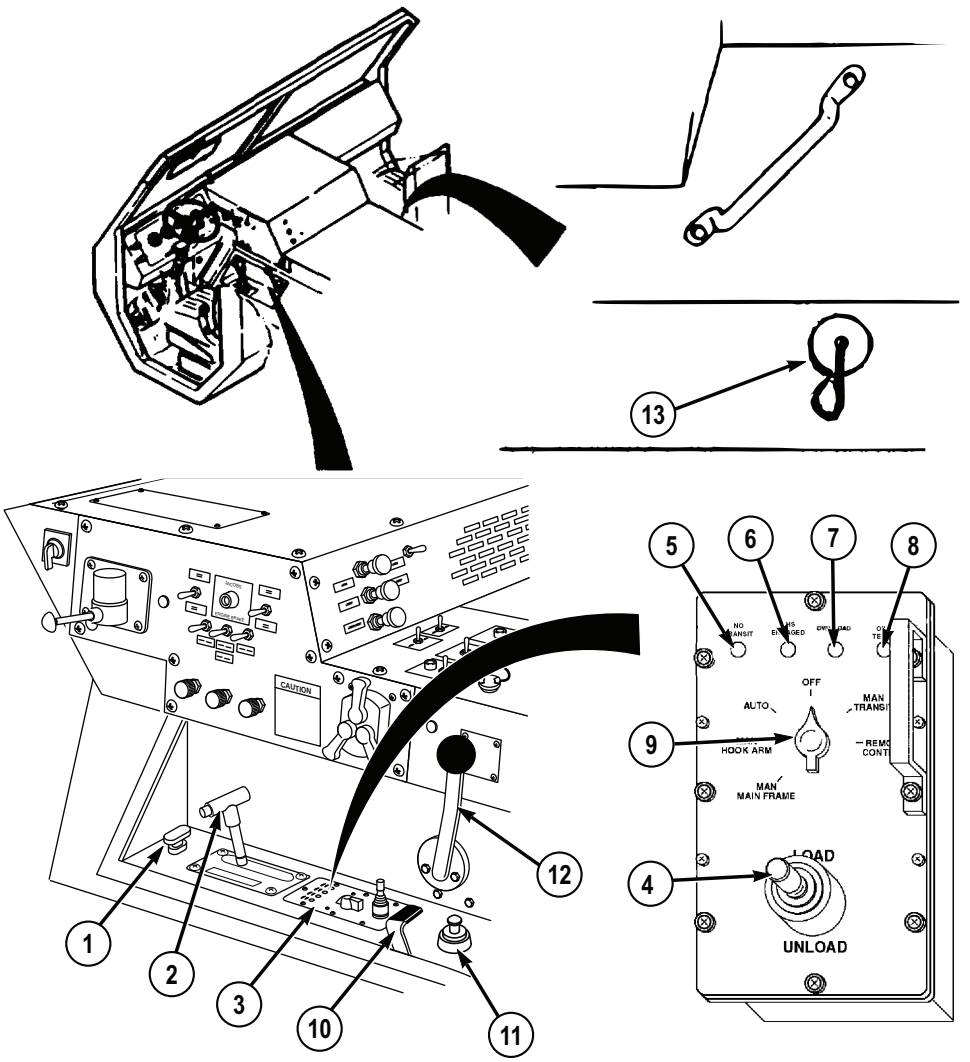


Figure 1.

Table 1. Tunnel panel controls and indicators. - Continued

Key	Control/ Indicator	Function
1	Shut Down Handle	Used to shutdown engine in emergencies. Not included in later base models.
2	Transmission Range Selector	R (reverse) - Used to back up vehicle.
		N (neutral) - Used when starting vehicle, parking vehicle, or if vehicle controls are left unattended while engine is running.
		D (drive) - Used for all normal driving conditions. When vehicle is in motion, transmission will upshift/downshift automatically.
		3 - Low gear range. 2 - Lower gear range. 1 - Lowest gear range.
3	CBT Control Panel (M1977 only)	Used to control CBT load handling system (LHS) operations.
4	Joystick (M1977 only)	Used to operate the LHS from the cab. The function being controlled is determined by the LHS MODE SELECT switch.
5	NO TRANSIT Indicator (M1977 only)	Illuminates when the hook arm assembly is not in the completely stowed position. The CBT is not to be driven except in the immediate loading and unloading area as long as NO TRANSIT indicator is illuminated.
6	LHS ENGAGED	Illuminates when hydraulic pressure is supplied to the LHS.

Table 1. Tunnel panel controls and indicators. - Continued

Key	Control/ Indicator	Function
	Indicator (M1977 only)	
7	OVERLOAD Indicator (M1977 only)	Illuminates whenever main hydraulic relief valve is opened during loading or unloading. Indicates LHS has reached an overload condition or that hydraulic system is lifting very near maximum capacity. If the LHS is overloaded, the light illuminates and the LHS is automatically locked out.
8	OIL TEMP Indicator (M1977 only)	Illuminates when LHS oil temperature exceeds limits.
9	LHS MODE Select Switch (M1977 only)	OFF - The LHS is not operational. This setting is used for transport.
		AUTO - Provides automatic operation of the LHS during NATO flatrack retrieval.
		MAN HOOK ARM - Places the LHS in manual mode for moving the hook arm when the AUTO mode electric circuit is malfunctioning.
		MAN MAIN FRAME - Places the LHS in manual mode for moving the main frame when the AUTO mode electric circuit is malfunctioning.
		REMOTE CONTROL - Energizes the LHS remote-control unit.

Table 1. Tunnel panel controls and indicators. - Continued

Key	Control/ Indicator	Function
		TRANSPORT - Provides for safe travel when the AUTO mode electric circuit has failed and the MAN HOOK ARM and/or MAN MAIN FRAME modes have been used.
10	Self-Recovery Winch (SRW) Lever	Used to pay out (push lever forward) and take up (pull lever aft) winch cable. Lever will return to neutral (center) position when released. Lever not included in vehicles without SRW.
11	LHS Joystick (M1120 only)	Controls loading (LOAD) and unloading (UNLOAD) operations of vehicle LHS.
12	TRANSFER CASE Shift Lever	Used to select high (HI) or low (LO) range. Center position is neutral (NEUT).
13	STE/ICE Receptacle	Receptacle for connecting simplified test equipment/internal combustion engine (STE/ICE).

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 HEMTT 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 HEMTT 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

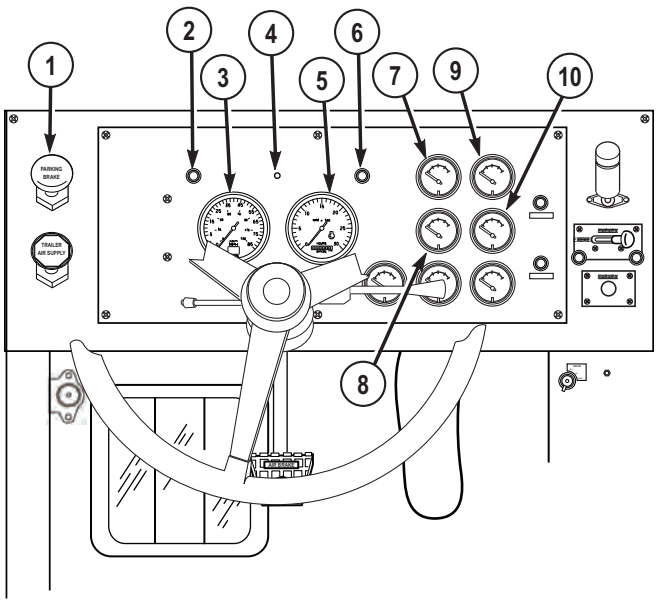


Figure 1.

Table 1. Instrument Panel Controls and Indicators. - Continued

Key	Control/ Indicator	Function
1	PARKING BRAKE Control	Applies and releases vehicle parking brakes.
2	Left Turn Indicator	Flashes (green) when left turn signal is on.
3	Speedometer/ Odometer	Shows vehicle traveling speed (in MPH and Km/h) and total miles traveled.
4	High Beam Indicator	Illuminates (red) when vehicle headlights are on high beam.
5	Tachometer/ Hourmeter	Displays engine operating speed (RPM x 100) and total operating time (HOURS).
6	Right Turn Indicator	Flashes (green) when right turn signal is on.
7	FUEL Gauge	Displays amount of fuel in fuel tank.
8	TRANS TEMP Gauge	Displays transmission fluid temperature in degrees Fahrenheit (°F) and Celsius (°C).
9	OIL PRESS Gauge	Displays engine oil pressure (psi and kPa).

Table 1. Instrument Panel Controls and Indicators. - Continued

Key	Control/ Indicator	Function
10	WATER TEMP Gauge	Displays engine coolant temperature in degrees Fahrenheit (°F) and Celsius (°C).

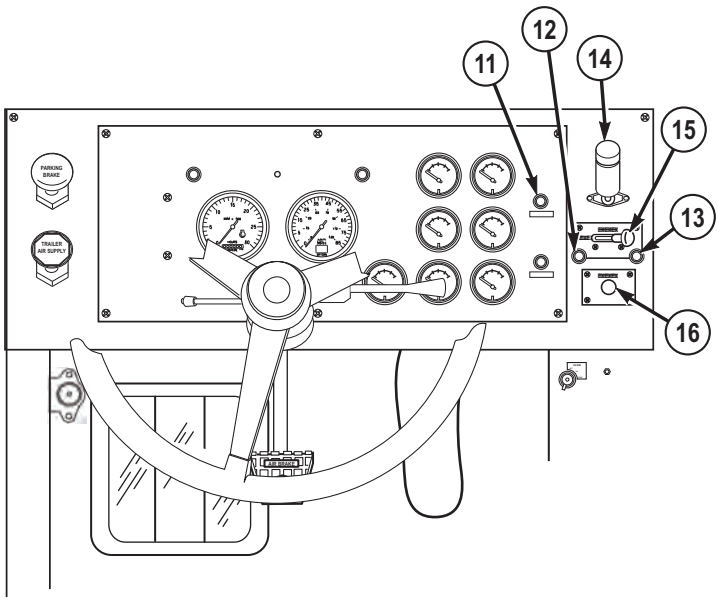


Figure 2.

11	OIL-WATER Indicator	Illuminates (red) when engine oil pressure is too low or when engine coolant temperature too high. Buzzer sounds at the same time.
12	INTER-AXLE DIFF. LOCK Indicator	Indicator illuminates (orange) when TRACTION CONTROL is in INTER-AXLE DIFF. LOCK position.
13	8x8 DRIVE Indicator	Illuminates (orange) when TRACTION CONTROL is in 8x8 DRIVE position or when TRANSFER CASE is in LO.

Table 1. Instrument Panel Controls and Indicators. - Continued

Key	Control/ Indicator	Function
14	Air Filter Restriction Indicator	Displays condition of air cleaner filter. Indicator window will show red when filter becomes clogged. VACUUM INCHES H^2O window displays degree of restriction. Push button on top of gauge to reset.
15	TRACTION CONTROL Lever	Lever in left position (INTER-AXLE DIFF. LOCK) locks inter-axle differentials in front and rear tandems. Lever in right position (8x8 DRIVE) engages transfer case drive to front axles.
16	ETHER START Control	Injects ether into engine intake manifold for cold weather starting.

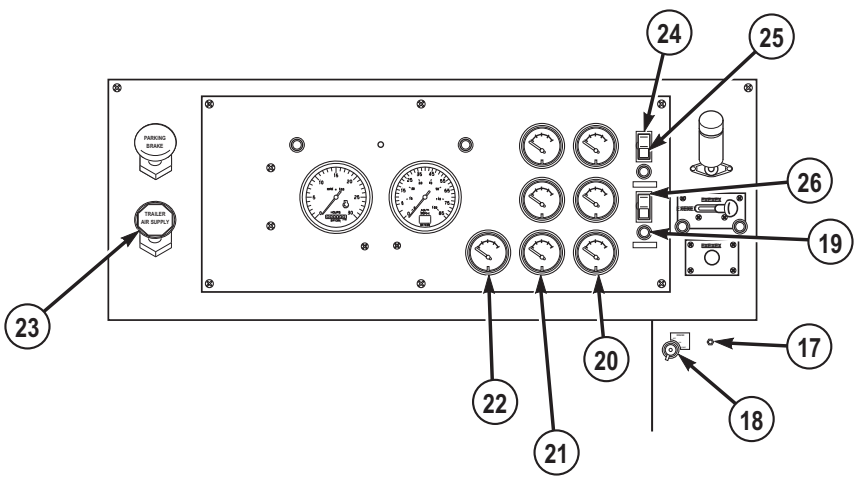


Figure 3.

17	ENGINE STOP Switch (Momentary)	Push down and hold to stop engine. Release when engine stops. Switch returns to run position when released.

Table 1. Instrument Panel Controls and Indicators. - Continued

Key	Control/ Indicator	Function
18	ENGINE Switch (Three-Position)	Straight up is OFF position. ON position operates electrical system. Hold switch in START position to operate engine cranking circuit. When switch is released after engine starts, switch will return to ON position.
19	AIR Indicator	Illuminates (red) and remains lit until airbrake air pressure in each section of dual system is between 60 psi (414 kPa) to 75 psi (517 kPa). Buzzer will sound anytime indicator is lit.
20	AIR PRESS Gauge	Displays air pressure (in psi and kPa) in both sections of airbrake system. Green needle shows front section air pressure. Red needle shows rear section air pressure.
21	BATTERY Gauge	Displays state of charge of batteries and alternator voltage output.
22	AMPERES Gauge	Displays alternator output in Amperes.
23	TRAILER AIR SUPPLY Control	Supplies air to (push in) and shuts off (pull out) air to trailer brake system. When TRAILER AIR SUPPLY control is applied (pushed in), vehicle PARKING BRAKE control activates/deactivates the trailer parking brakes in concert with the vehicle.
24	LHS NO TRANSIT Indicator (M1120 only)	Illuminates (red) when LHS system is not properly stowed in transport position.

Table 1. Instrument Panel Controls and Indicators. - Continued

Key	Control/ Indicator	Function
25	LHS OVER LOAD Indicator (M1120 only)	Illuminates (yellow) 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. OVER LOAD indicator will come on any time main relief valve is cracked 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. Off-load/on-load flatrack, and attempt second operation. If, during this second attempt, the LHS shuts down, stop operation and redistribute weight or reduce payload before attempting load or unload. When attempting to load/unload Forward Repair System (FRS), manual procedures must be followed or LHS overload system will shut down the LHS system.
26	LHS Indicator (M1120 only)	Illuminates (green) when Hydraulic Selector Switch is in AUTO, MAN H.A., or MAN M.F. positions.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
HEATER COMPARTMENT CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of heater compartment controls and indicators which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about heater compartment controls and indicators.

Table 1. Heater Compartment Controls and Indicators.

Key	Control/ Indicator	Function

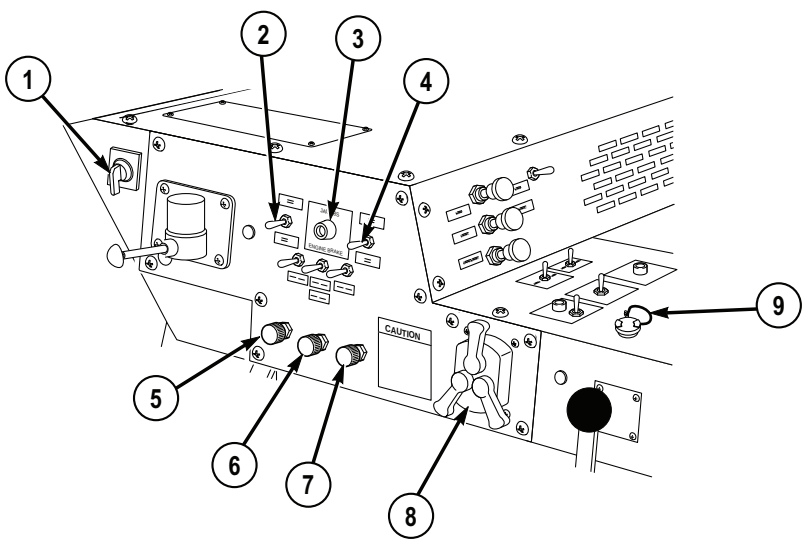


Figure 1.

1	Hydraulic Selector	OFF position: The LHS is not operational. This mode is used for transport.

Table 1. Heater Compartment Controls and Indicators. - Continued

Key	Control/ Indicator	Function
	Switch (M1120 only)	
		AUTO position: For normal loading/unloading operations.
		MAN H.A. (Manual Hook Arm): Places the LHS in manual mode for moving the hook arm when the AUTO mode electronic circuits fail. Also used during loading/unloading operations to/from trailer or docks.
		MAN M.F. (Manual Main Frame) position: Places the LHS in manual mode for moving the main frame when the AUTO mode electronic circuits fail. Also used during loading/ unloading operations to/from trailer or docks.
		MAN TRANS (Manual Transit) position: This position must be selected if vehicle is to travel after the LHS AUTO mode electronic circuit has failed and the MAN H.A. and/or MAN M.F. modes have been used.
		CRANE/SRW position: Not used on this vehicle.
2	JACOBS ® ENGINE BRAKE ON/ OFF Switch	Supplies or shuts off electrical power to JACOBS ® ENGINE BRAKE.
3	JACOBS ® ENGINE BRAKE Indicator	Illuminates (green) when JACOBS ® ENGINE BRAKE ON-OFF switch is in ON position.

Table 1. Heater Compartment Controls and Indicators. - Continued

Key	Control/ Indicator	Function
4	JACOBS ® ENGINE BRAKE HIGH/ LOW Switch	Selects number of engine cylinders used for engine braking action. HIGH position provides maximum braking. LOW position provides less engine braking.
5	Wiper Control (Driver Side)	Controls operation of driver side windshield wiper.
6	Wiper Control (Passenger Side)	Controls operation of passenger side windshield wiper.
7	WASHER Control	Controls spray of cleaning fluid on windshield.
8	Light Control	Controls all electrical power to all parts of lighting system.

Table 1. Heater Compartment Controls and Indicators. - Continued

Key	Control/ Indicator	Function
9	Utility Outlet	Supplies electrical power to operate portable beacon light (WP 0097) and portable work lamp. (WP 0086)

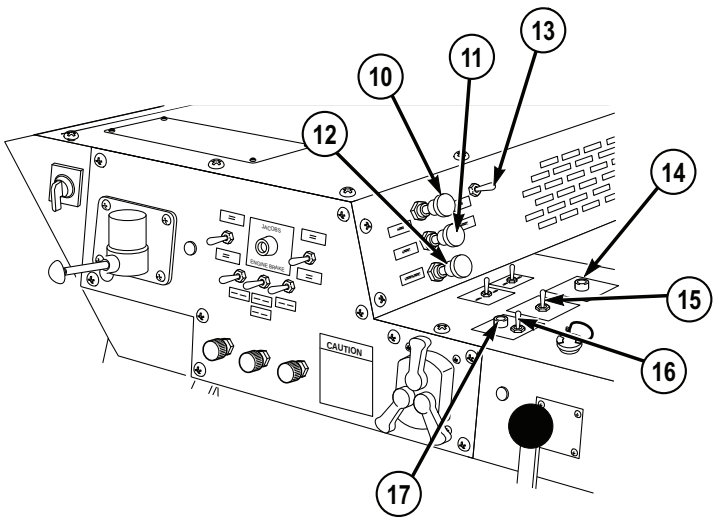


Figure 2.

10	AIR Control	Controls amount of outside air entering cab through fresh air vent.
11	HEAT Control	Controls amount of hot air entering cab.
12	DEFROST Control	Controls amount of hot air blown on windshield.
13	FAN Control	Controls speed of heater fan.
14	CRANE OUTRIGGER EXTENDED	Illuminates (red) when HIAB crane outriggers are extended.

Table 1. Heater Compartment Controls and Indicators. - Continued

Key	Control/ Indicator	Function
	Indicator (M985E1only)	
15	High Idle Switch (M1977 only)	When set to ON position, increases engine speed (RPM) from low to high for operating CBT/LHS equipment.
16	PTO ENGAGE Control	Turns electrical power to power take-off (PTO) ON/OFF.
17	PTO ENGAGE Indicator	Illuminates (red) when PTO ENGAGE control is set to ON position.

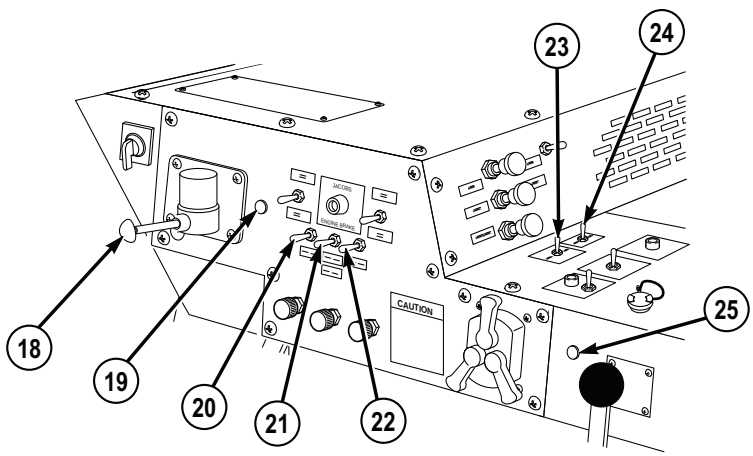


Figure 3.

18	Trailer Handbrake Control	Used to test the trailer brakes. Pull control lever back to apply, push forward to release trailer brakes.

Table 1. Heater Compartment Controls and Indicators. - Continued

Key	Control/ Indicator	Function
19	LHS System Circuit Breaker (M1120 only)	Protects LHS System from electrical overload.
20	CL LPS Switch	Light control (8) must be in STOP LIGHT or SER DRIVE position for CL LPS switch to work. Up position turns clearance lights on. Down position turns clearance lights off.
21	DOME Light Switch	Light control (8) must be in STOP LIGHT or SER DRIVE position for CL LPS switch to work. Up position turns cab dome light on. Down position turns cab dome light off.
22	WORK LIGHT Switch (M983, M984A1, and M1977 only)	Light control (8) must be in STOP LIGHT or SER DRIVE position for CL LPS switch to work. Up position turns on work lights. Down position turns work lights off.
23	GAS ALARM Switch	Turns M-8 chemical alarm ON/OFF.
24	GPFU Switch	Turns gas particulate filter unit (GPFU) ON/OFF.
25	Auxiliary Equipment Circuit Breaker	Protects auxiliary equipment from electrical overload.

END OF WORK PACKAGE

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

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of operator and crew four-point seatbelt/air-ride seat adjustment controls which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about operator and crew four-point seatbelt/air-ride seat adjustment controls.

Table 1. Operator and Crew Four-Point Seatbelt/Air-Ride Seat Adjustment Controls.

Key	Control/ Indicator	Function

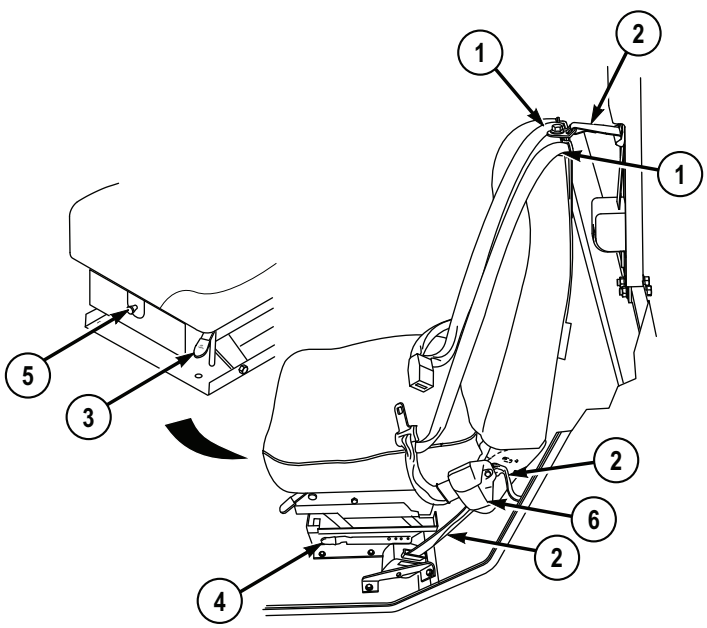


Figure 1.

Table 1. Operator and Crew Four-Point Seatbelt/Air-Ride Seat Adjustment Controls. - Continued

Key	Control/ Indicator	Function
1	Seatbelt	Secures personnel to seat.
2	Seat Connector Straps	Secures seat to cab frame.
3	Height Adjustment Control	Used to adjust seat height.
4	Forward/ Backward Adjustment Control	Used to move seat forward or backward on slides.
5	Ride Adjustment Control	Used to adjust seat tension and ride firmness.
6	Retractor	Locks seatbelt in event of accident, stows belt when not in use.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATOR AND CREW THREE-POINT SEATBELT/SEAT ADJUSTMENT CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of operator and crew three-point seatbelt/seat adjustment controls which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about operator and crew three-point seatbelt/seat adjustment controls.

Table 1. Operator And Crew Three-Point Seatbelt/Seat Adjustment Controls.

Key	Control/ Indicator	Function

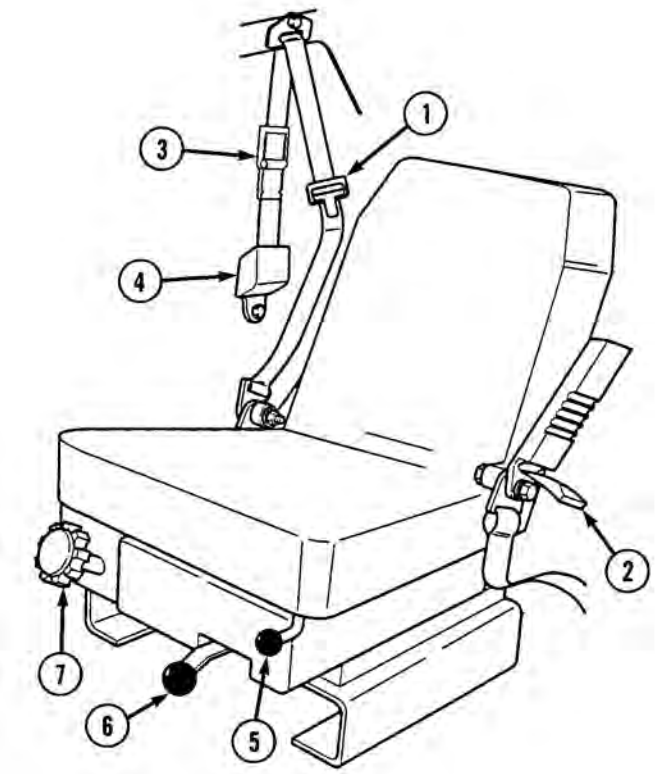


Figure 1.

1	Seatbelt	Secures personnel to seat.
2	Seat Connector Strap	Secures seat to cab frame.
3	Comfort Latch Buckle	Adjusts shoulder belt pressure.

Table 1. Operator And Crew Three-Point Seatbelt/Seat Adjustment Controls. - Continued

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

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GROVE CRANE CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of grove crane controls which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about grove crane controls.

Table 1. Grove Crane Controls.

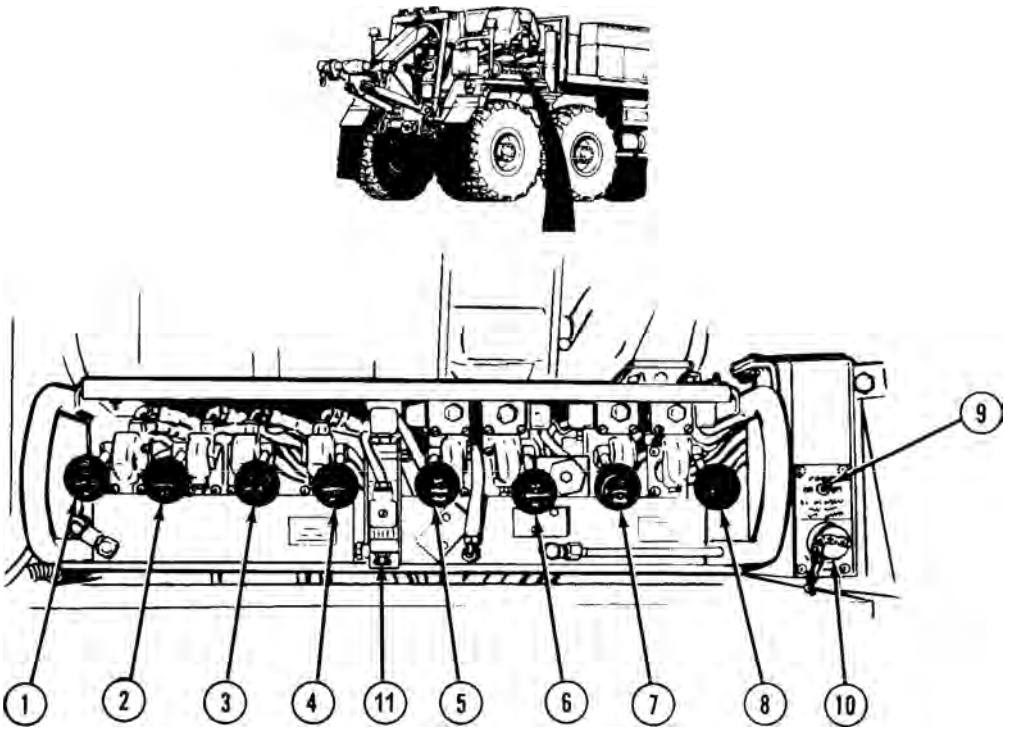
Key	Control/ Indicator	Function
		
1	LH O/R JACK Control Lever	Lowers (DOWN) and raises (UP) left outrigger jack.
2	MAST Control Lever	Raises (UP) mast to operating position and lowers (DOWN) mast to stowage position.
3	O/R EXT. Control Lever	Extends (OUT) and retracts (IN) outrigger beams.

Figure 1.

Table 1. Grove Crane Controls. - Continued

Key	Control/ Indicator	Function
4	RH O/R JACK Control Lever	Lowers (DOWN) and raises (UP) right outrigger jack.
5	SWING Control Lever	Moves crane clockwise (CW) and counterclockwise (CCW).
6	TELESCOPE Control Lever	Extends (OUT) and retracts (IN) first and second stages of boom.
7	BOOM Control Lever	Raises (UP) and lowers (DOWN) boom.
8	HOIST Control Lever	Reels in and pays out hoist cable.
9	POWER Switch	Turns electrical power to crane ON/OFF.
10	R.H. REMOTE CONTROL HOOK-UP	Receptacle for connecting remote-control unit cable.

Table 1. Grove Crane Controls. - Continued

Key	Control/ Indicator	Function
11	Shut-Down Solenoid Valve Button	Provides emergency hydraulic power when electrical power fails.

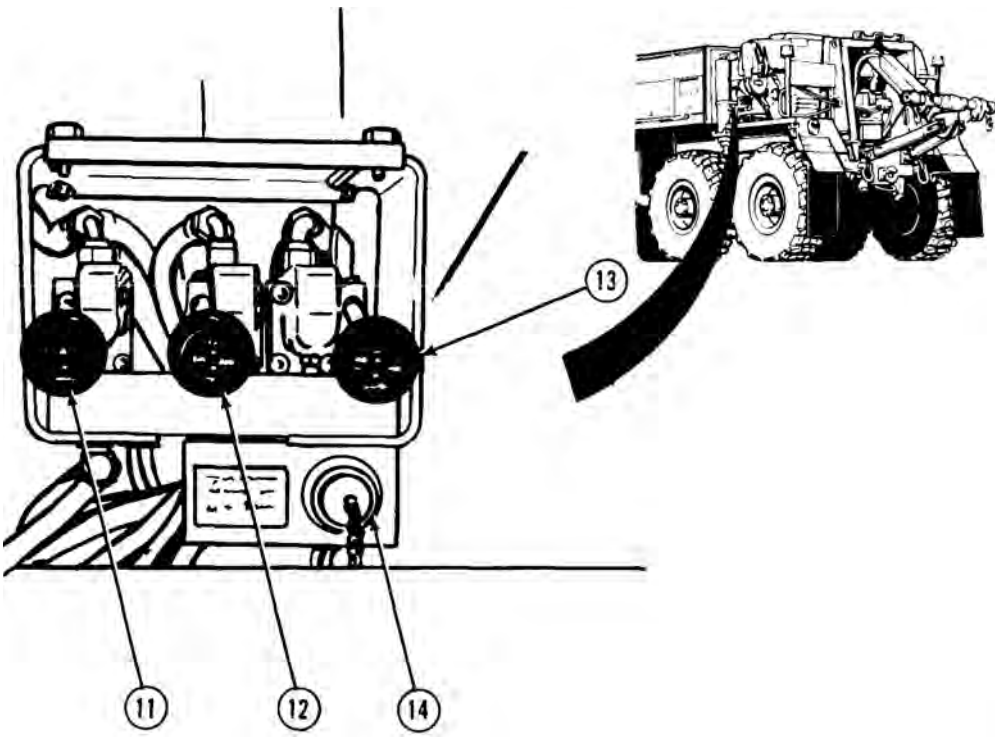


Figure 2.

11	LH O/R JACK Control Lever (driver side of vehicle)	Lowers (DOWN) and raises (UP) left outrigger jack.
12	O/R EXT. Control Lever	Extends (OUT) and retracts (IN) outrigger beams.

Table 1. Grove Crane Controls. - Continued

Key	Control/ Indicator	Function
	(driver side of vehicle)	
13	RH O/R JACK Control Lever (driver side of vehicle)	Lowers (DOWN) and raises (UP) right outrigger jack.
14	L.H. REMOTE CONTROL HOOK-UP	Receptacle for connecting remote-control unit cable.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GROVE CRANE REMOTE-CONTROL UNIT

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Grove Crane Remote-Control Unit which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about Grove Crane Remote-Control Unit.

Table 1. Grove Crane Remote-Control Unit.

Key	Control/ Indicator	Function

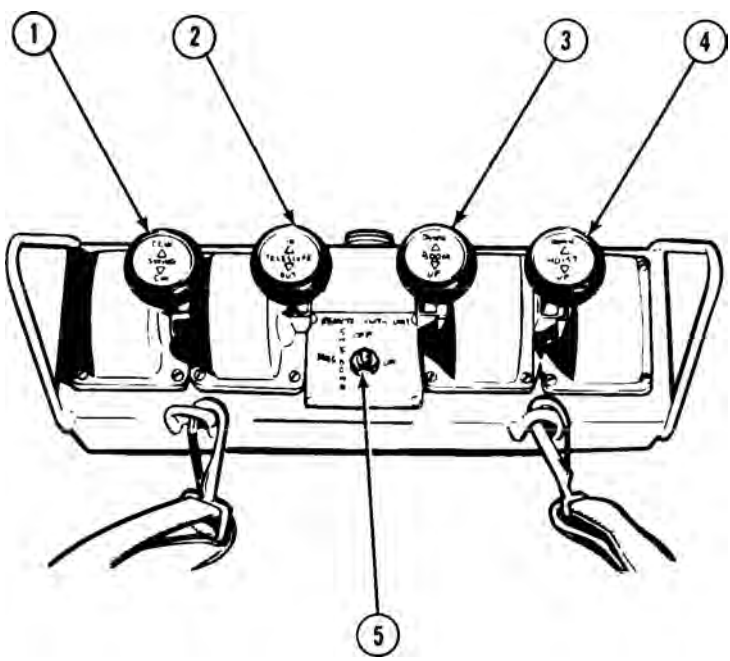


Figure 1.

Table 1. Grove Crane Remote-Control Unit. - Continued

Key	Control/ Indicator	Function
1	SWING Control Lever	Moves boom clockwise (CW) and counterclockwise (CCW).
2	TELESCOPE Control Lever	Extends (OUT) and retracts (IN) first and second stages of boom.
3	BOOM Control Lever	Raises (UP) and lowers (DOWN) boom.
4	HOIST Control Lever	Reels in (UP) and pays out (DOWN) hoist cable.
5	REMOTE-CONTROL UNIT ON/OFF Switch	Turns remote-control unit ON/OFF.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GROVE CRANE POWER DISTRIBUTION BOX CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of grove crane power distribution box controls and indicators which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about grove crane power distribution box controls and indicators.

Table 1. Grove Crane Power Distribution Box Controls and Indicators.

Key	Control/ Indicator	Function

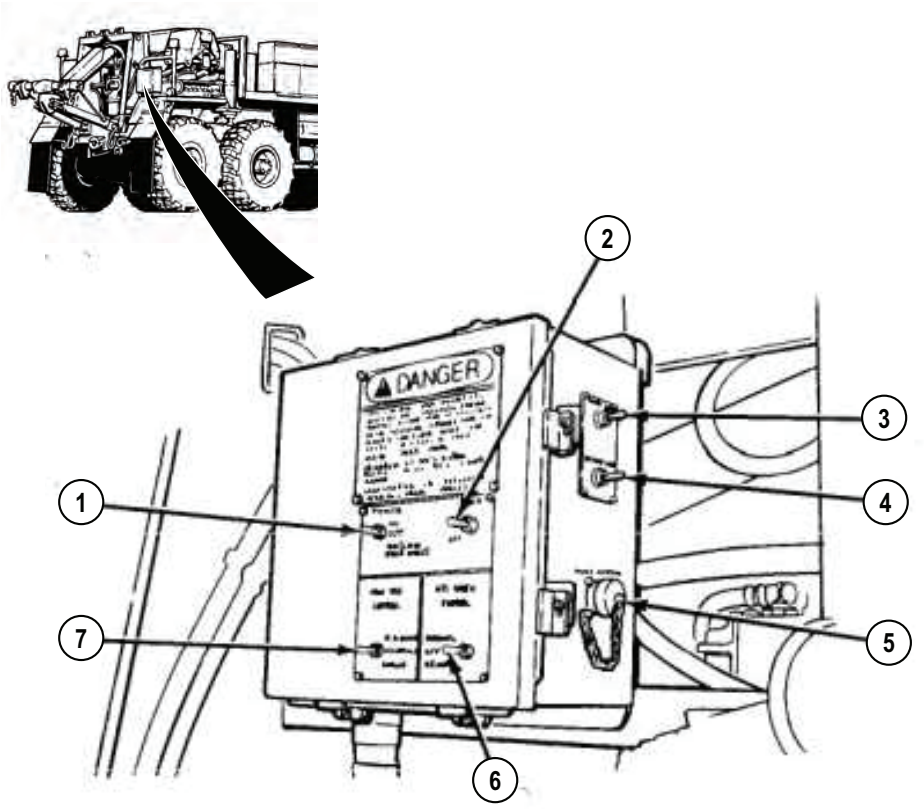


Figure 1.

1	POWER Switch	Turns electrical power to power distribution box ON/OFF.
2	LATCH Switch (Momentary)	Locks in power switch circuits for operation when positioned to ON and released. Switch will automatically return to OFF position when released.

Table 1. Grove Crane Power Distribution Box Controls and Indicators. - Continued

Key	Control/ Indicator	Function
3	WORK LIGHT Switch	Turns work lights ON/OFF.
4	BEACON LIGHTS Switch	Turns rear beacon lights ON/OFF.
5	WINCH CONTROL Remote Outlet	Receptacle to hook-up heavy-duty winch remote-control unit.
6	H.D. WINCH CONTROL Switch (Three-Position)	Allows the operator to supply power for either MANUAL control (up position) or REMOTE control (down position) for winch. Center position is OFF.
7	HIGH IDLE CONTROL Switch (Three-Position)	Allows the operator to select high idle setting for crane remote control (CRANE), winch remote-control (H.D. WINCH), or CONTINUOUS operation.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RETRIEVAL SYSTEM CONTROLS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of retrieval system controls which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about retrieval system controls.

Table 1. Retrieval System Controls.

Key	Control/ Indicator	Function

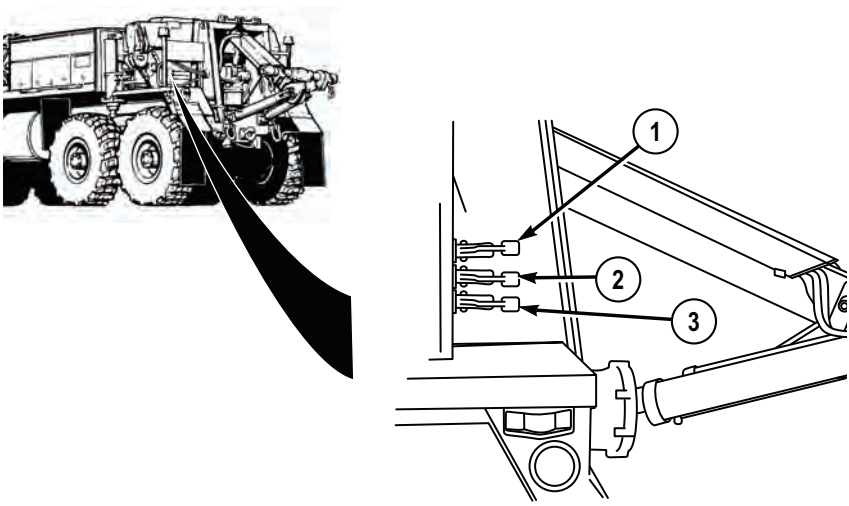


Figure 1.

Table 1. Retrieval System Controls. - Continued

Key	Control/ Indicator	Function
1	RIGHT TOW CYLINDER Control Lever	Extends (OUT) and retracts (IN) right cylinder to align tow adapters.
2	LEFT TOW CYLINDER Control Lever	Extends (OUT) and retracts (IN) left cylinder to align tow adapters.
3	LIFT CYLINDER Control Lever	Extends (OUT) and retracts (IN) lift cylinder to raise and lower crosstube.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RIFLE STOWAGE MOUNT

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Rifle Stowage Mounts which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about Rifle Stowage Mount.

Table 1. Rifle Stowage Mount.

Key	Control/ Indicator	Function

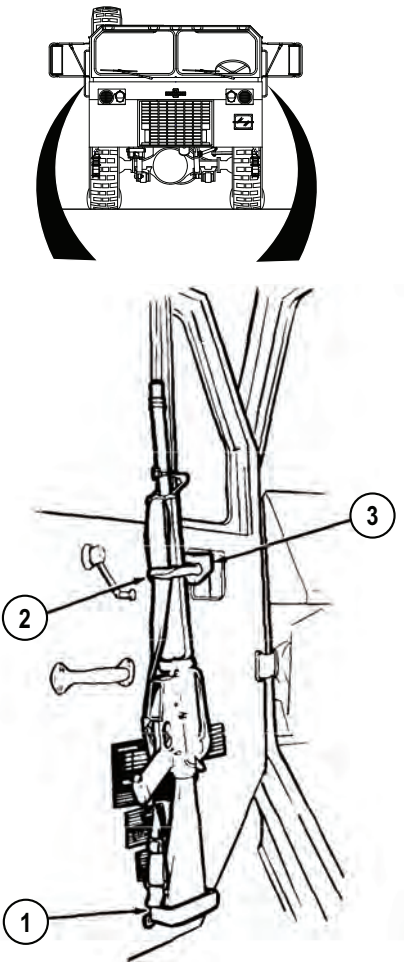


Figure 1.

1	Lower Rifle Mount	Holds butt of rifle.

Table 1. Rifle Stowage Mount. - Continued

Key	Control/ Indicator	Function
2	Rifle Mount Handle	Secures heat guard of rifle against top rifle mount.
3	Top Rifle Mount	Holds heat guard of rifle.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ARCTIC ENGINE HEATER CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Arctic Engine Heater controls and indicators (optional accessory) which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about Arctic Engine Heater controls and indicators (optional accessory).

Table 1. Arctic Engine Heater Controls And Indicators.

Key	Control/ Indicator	Function

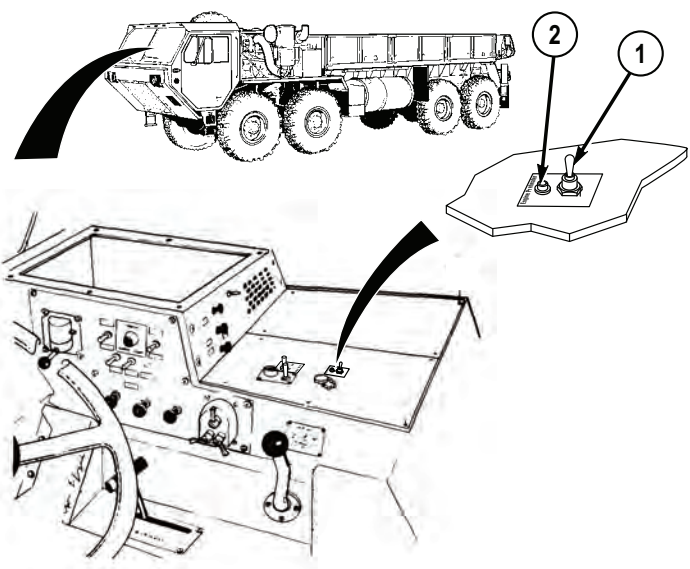


Figure 1.

Table 1. Arctic Engine Heater Controls And Indicators. - Continued

Key	Control/ Indicator	Function
1	ON/OFF Switch	Two position switch starts operation of arctic engine heater.
2	Arctic Engine Heater Light Indicator	Light illuminates when arctic engine heater switch is placed in ON position. If light does not illuminate or if light flashes intermittently, arctic engine heater is malfunctioning.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GAS PARTICULATE FILTER UNIT (GPFU) CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Gas Particulate Filter Unit (GPFU) controls and indicators which is used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about Gas Particulate Filter Unit (GPFU) controls and indicators.

Table 1. Gas Particulate Filter Unit (GPFU) Controls And Indicators.

Key	Control/ Indicator	Function

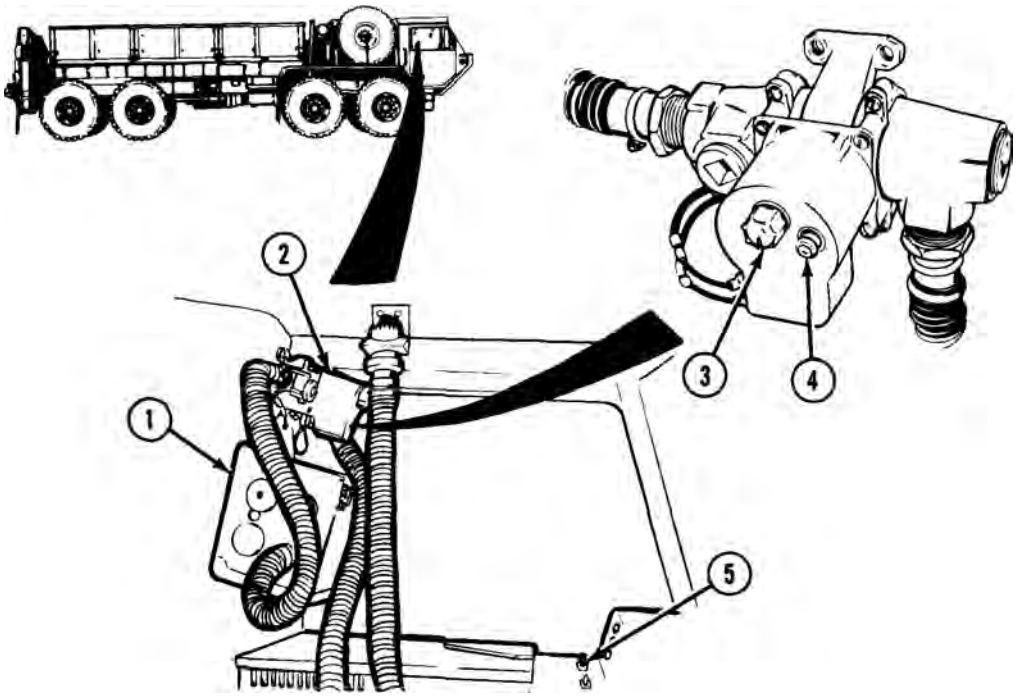


Figure 1.

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

Table 1. Gas Particulate Filter Unit (GPFU) Controls And Indicators. - Continued

Key	Control/ Indicator	Function
5	GAS PARTICULATE FILTER UNIT Switch	Turns GPFU ON/OFF.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
MACHINE GUN MOUNT

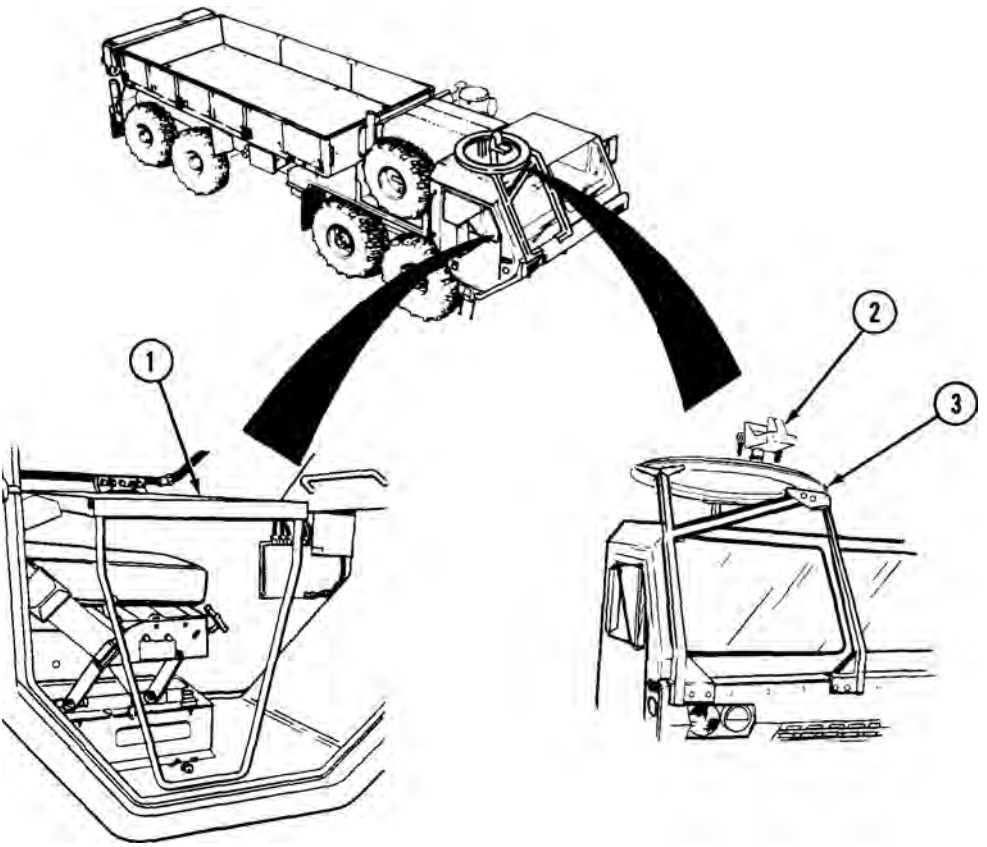
CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of Machine Gun Mount (Optional Accessory) which is used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about Machine Gun Mount (Optional Accessory).

Table 1. Machine Gun Mount.

Key	Control/ Indicator	Function
		
	Figure 1.	
1	Machine Gun Mount	Secures machine gun to machine gun ring.
2	Machine Gun Ring	Allows machine gun to turn 360 degrees.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
M-8 CHEMICAL ALARM CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of M-8 Chemical Alarm controls and indicators which are used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about M-8 Chemical Alarm controls and indicators.

Table 1. M-8 Chemical Alarm Controls And Indicators.

Key	Control/ Indicator	Function

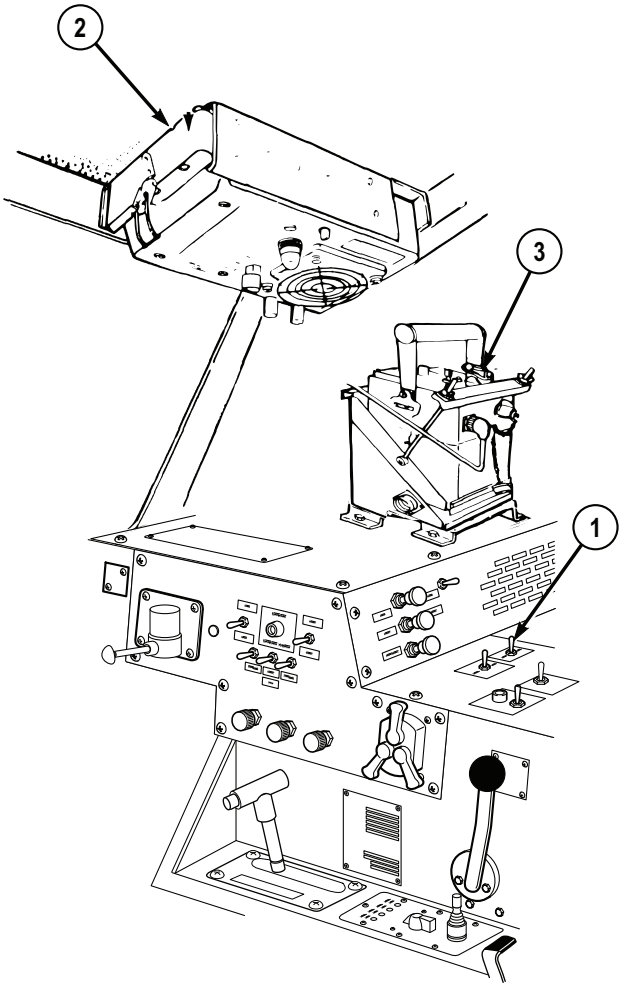


Figure 1.

1	M-8 Chemical Alarm Switch	Operates alarm.

Table 1. M-8 Chemical Alarm Controls And Indicators. - Continued

Key	Control/ Indicator	Function
2	M-8 Chemical Alarm	Sounds alarm when chemicals are detected.
3	Chemical Detector	Detects presence of chemical in the air.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
M-13 DECONTAMINATION KIT

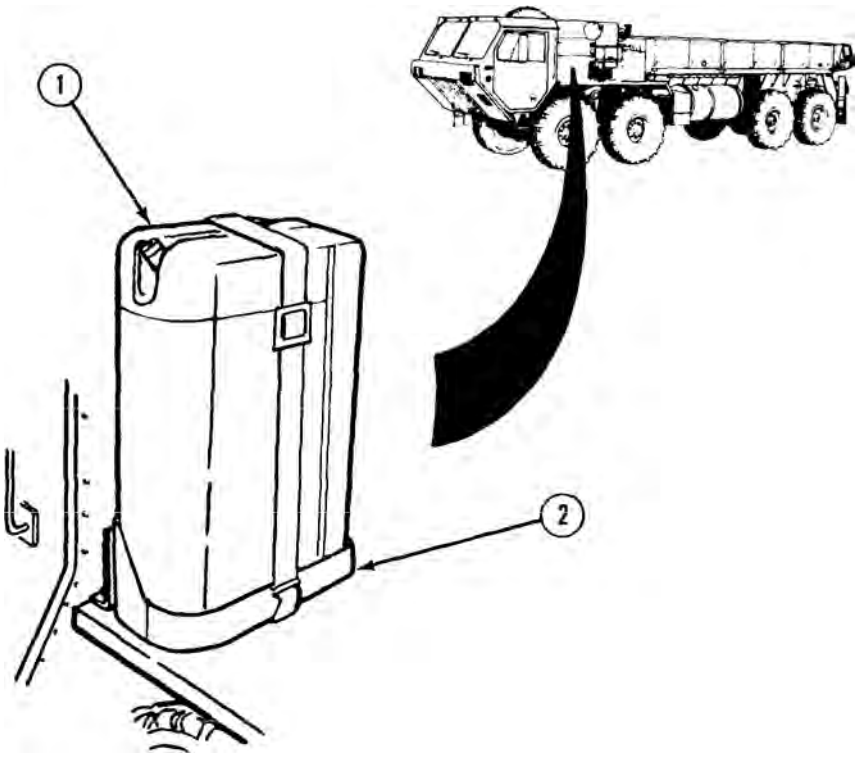
CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of M-13 Decontamination Kit which is used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about M-13 Decontamination Kit.

Table 1. M-13 Decontamination Kit.

Key	Control/ Indicator	Function
		
	Figure 1.	
1	M-13 Decontamination Unit	Holds and dispenses decontaminant.
2	Decontamination Unit Mount	Holds decontamination unit.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RADIO INSTALLATION HARDWARE

CONTROLS AND INDICATORS INTRODUCTION

This section displays the location and describes the use of radio installation hardware which is used in the operation of HEMTT 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 HEMTT series vehicles. Separate illustrations with keys are provided for learning about radio installation hardware.

Table 1. Radio Installation Hardware.

Key	Control/ Indicator	Function

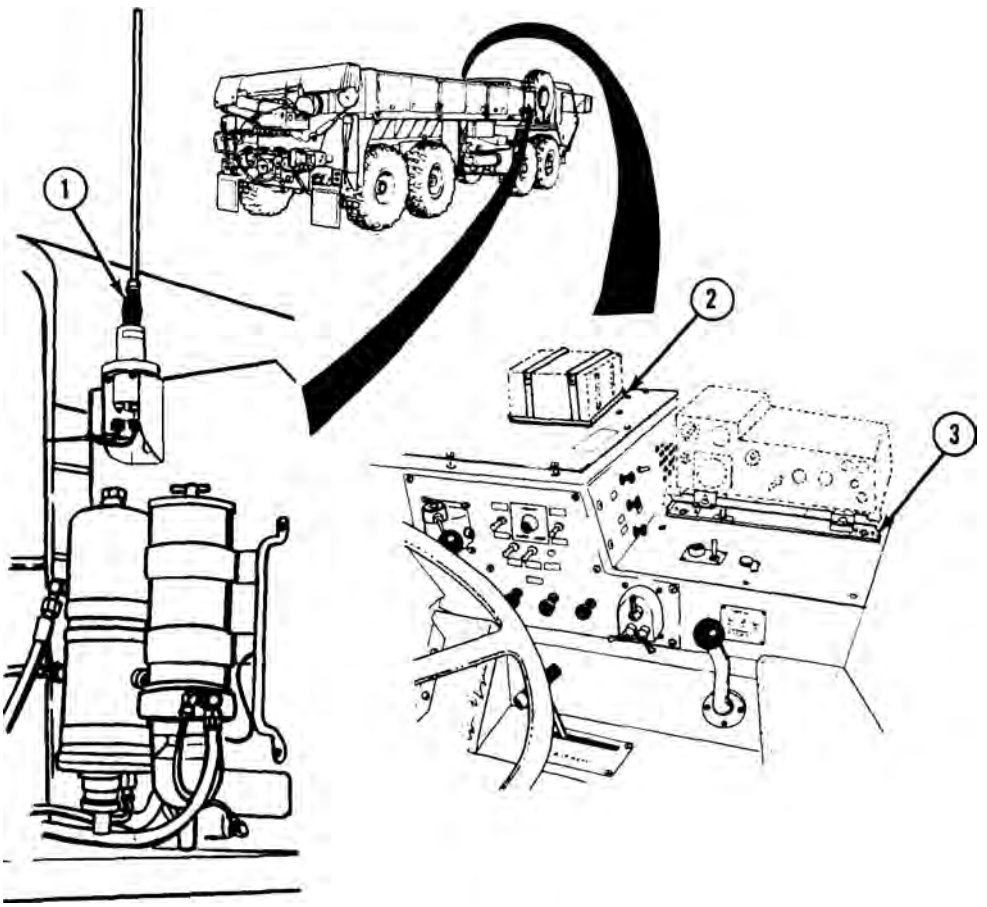


Figure 1.

1	Antenna Matching Unit	Holds antenna.
2	Security Unit Mount	Holds security unit.

Table 1. Radio Installation Hardware. - Continued

Key	Control/ Indicator	Function
3	Receiver/ Transmitter Mount	Holds receiver/transmitter.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE WINDSHIELD WIPERS/WASHER

INITIAL SETUP:

Not Applicable

OPERATE WINDSHIELD WIPERS

NOTE

- Some earlier vehicles are equipped with pull and turn control controls.
- ENGINE switch must be positioned to ON for windshield wipers to operate.

1. Turn WIPER control (1) clockwise to start and control speed of driver side windshield wiper.

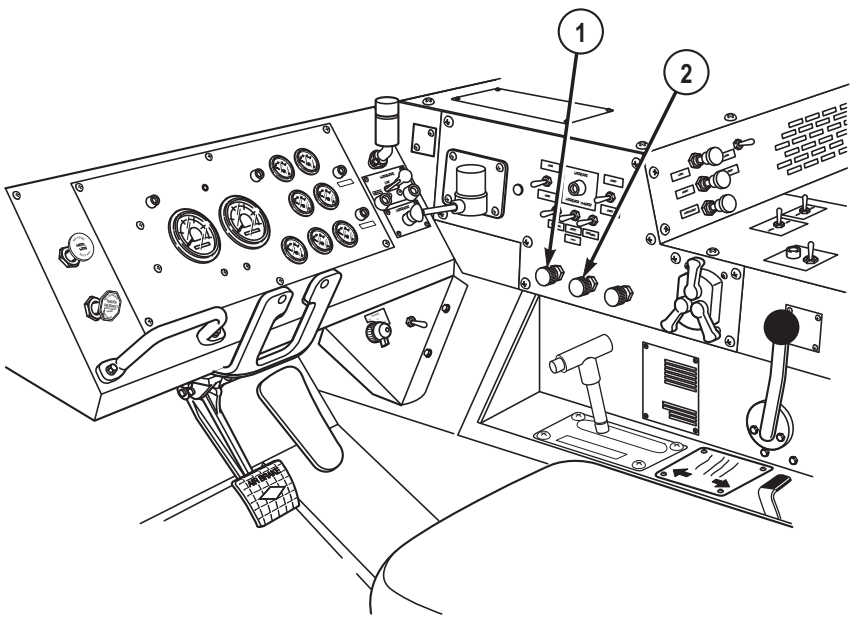


Figure 1.

OPERATE WINDSHIELD WIPERS - Continued

2. Turn WIPER control (2) clockwise to start and control speed of passenger side windshield wiper.
3. Turn WIPER control (1) counterclockwise to stop driver side windshield wiper.
4. Turn WIPER control (2) counterclockwise to stop passenger side windshield wiper.
5. If wiper stops in middle of windshield:
   a. Turn appropriate WIPER control (1 or 2) clockwise until wiper is at bottom of windshield.
   b. Turn appropriate WIPER control (1 or 2) counterclockwise to stop wiper.

OPERATE WINDSHIELD WASHER

NOTE

- Some earlier vehicles are equipped with pull and turn control controls.
- ENGINE switch must be positioned to ON for windshield washer to operate.

1. Push in and hold WASH control (1) to spray cleaning fluid on windshield.

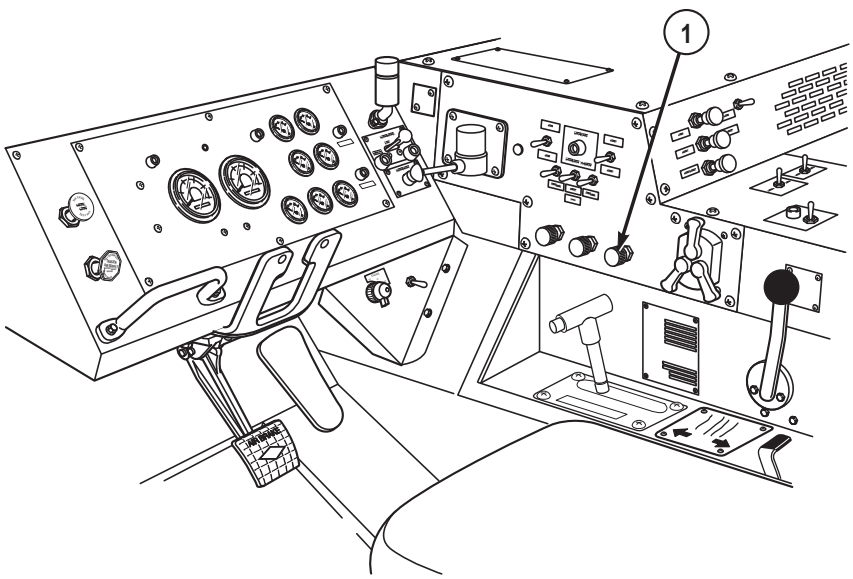


Figure 2.

OPERATE WINDSHIELD WASHER - Continued

2. Release WASH control (1) to stop washer spray.

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.
- Air temperature is controlled by position of HEAT control.
- Pull HEAT control out to increase temperature.
- Push HEAT control in to decrease temperature.

1. Pull out HEAT control (1) to desired position.
2. Set FAN switch (2) to LO or HI airflow.

OPERATE PERSONNEL HEATER - Continued

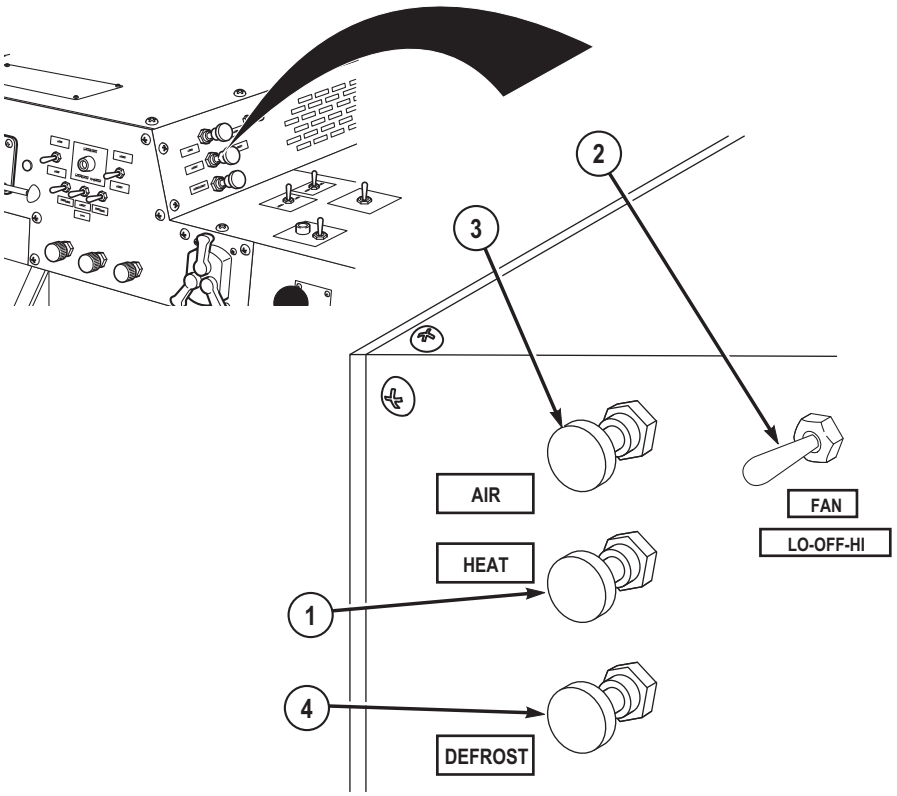


Figure 1.

NOTE

On later model vehicles, the AIR control has a "TURN TO LOCK" function which holds the vent open at the desired level when the control is rotated clockwise. Rotate control CCW until it stops to unlock the vent.

3. Adjust AIR control (3) as desired to control outside airflow for cab ventilation. Unlock, and push AIR control (3) all the way in to shut outside air ventilation off.
4. When personnel heater is no longer required:
   a. Push in HEAT control (1) to turn heater off.
   b. Set FAN switch (2) to OFF.

OPERATE WINDSHIELD DEFROST

NOTE

If windshield defrost does not blow hot air, ensure heater valves are open.

1. Pull out DEFROST control (4) to turn on.

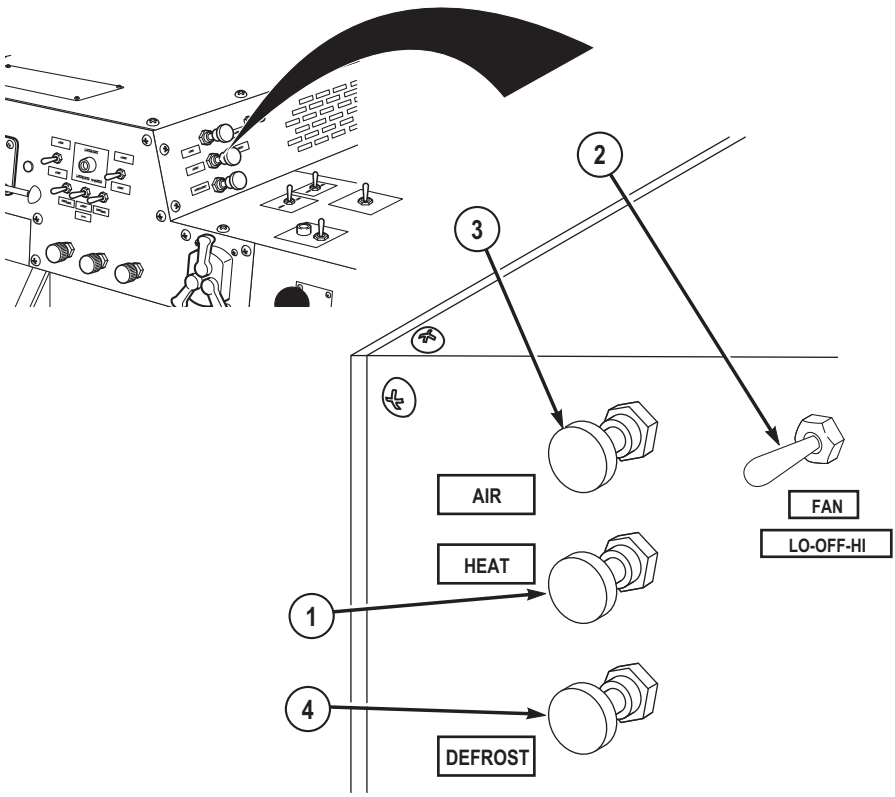


Figure 2.

2. Pull out HEAT control (1) to desired position.
3. Set FAN switch (2) to desired position.
4. When defrost is no longer required:
   a. Push in DEFROST control (4) to turn off.
   b. Push in HEAT control (1) to turn heater off.

OPERATE WINDSHIELD DEFROST - Continued

c. Set FAN switch (2) to OFF.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE FIRE EXTINGUISHER

INITIAL SETUP:

Not Applicable

REMOVE FIRE EXTINGUISHER FROM CAB

NOTE

Fire extinguisher is located on rear bulkhead on inside of cab, just inboard of driver's seat.

1. Pull up top clamp (1) and disengage from top hook (2).

REMOVE FIRE EXTINGUISHER FROM CAB - Continued

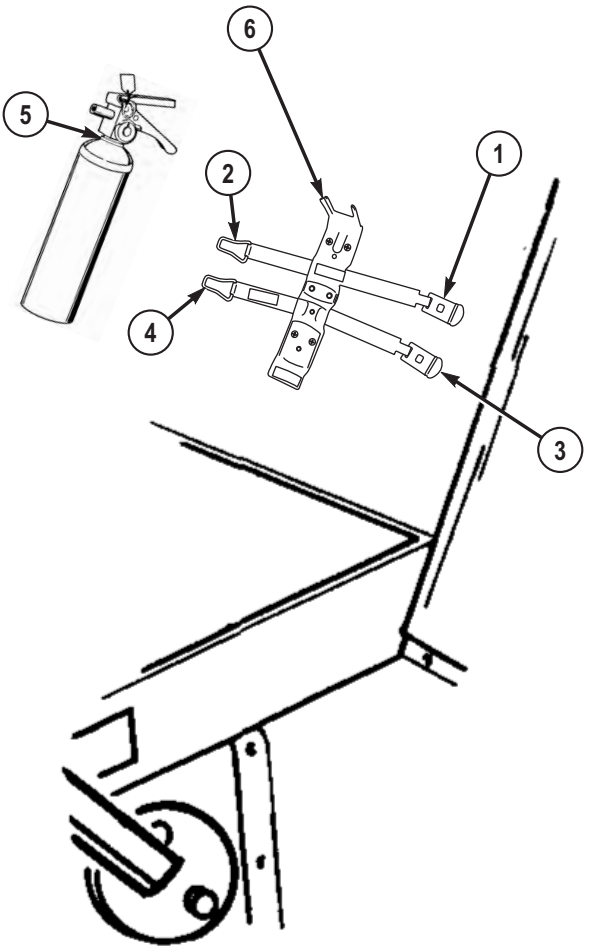


Figure 1.

2. Pull up bottom clamp (3) and disengage from bottom hook (4).
3. Remove fire extinguisher (5) from bracket (6).

REMOVE FIRE EXTINGUISHER FROM PASSENGER SIDE STOWAGE BOX

1. Pull up clamp (1) and unhook strap (2).

REMOVE FIRE EXTINGUISHER FROM PASSENGER SIDE STOWAGE BOX - Continued

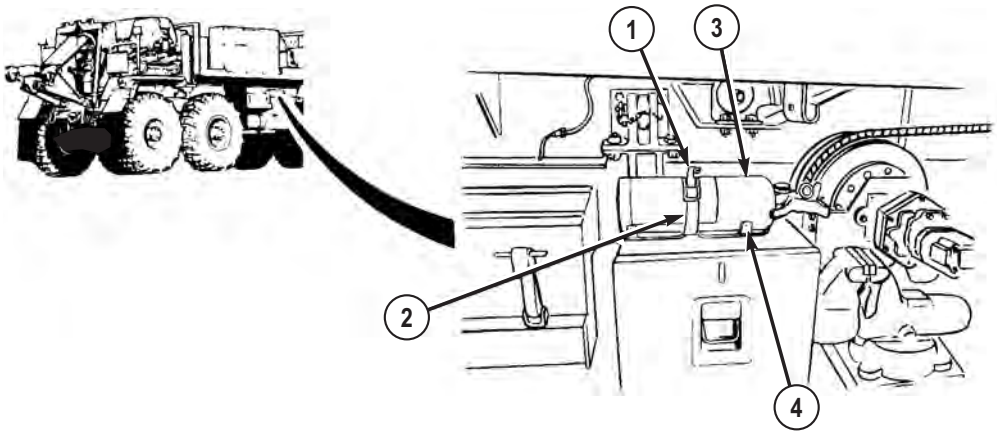


Figure 2.

2. Remove fire extinguisher (3) from bracket (4).

EXTINGUISH FIRE

NOTE

- Fire extinguisher is a dry chemical type. Refer to MSDS for specific extinguisher warnings and cautions for use.
- Remember the word "PASS" to operate fire extinguisher:

.

1. Hold fire extinguisher (1) upright and pull safety pin (2) to break plastic tie (3).

EXTINGUISH FIRE - Continued

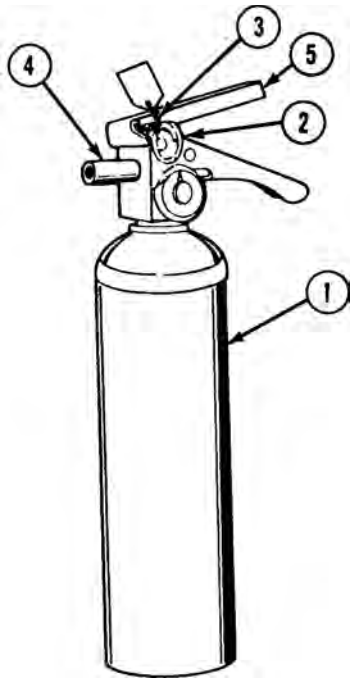


Figure 3.

2. Point nozzle (4) at base of fire.
3. Press down on stop lever (5) and spray discharge in a side-to-side motion at base of fire.
4. Let go of stop lever (5) when fire is out.
5. Notify field level maintenance to replace fire extinguisher.

INSTALL FIRE EXTINGUISHER IN CAB

1. Put neck of fire extinguisher (1) on bracket (2).

INSTALL FIRE EXTINGUISHER IN CAB - Continued

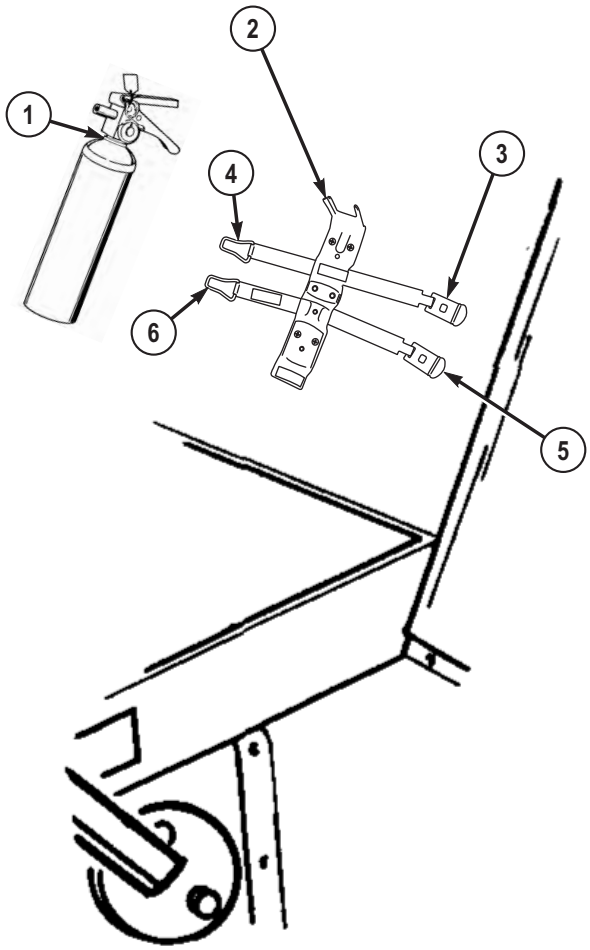


Figure 4.

2. Hook top clamp (3) on top hook (4) and push top clamp (3) down, tightening strap.
3. Hook bottom clamp (5) on bottom hook (6) and push bottom clamp (5) down, tightening strap.

INSTALL FIRE EXTINGUISHER ON PASSENGER SIDE STOWAGE BOX

1. Place fire extinguisher (1) on bracket (2).

INSTALL FIRE EXTINGUISHER ON PASSENGER SIDE STOWAGE BOX - Continued

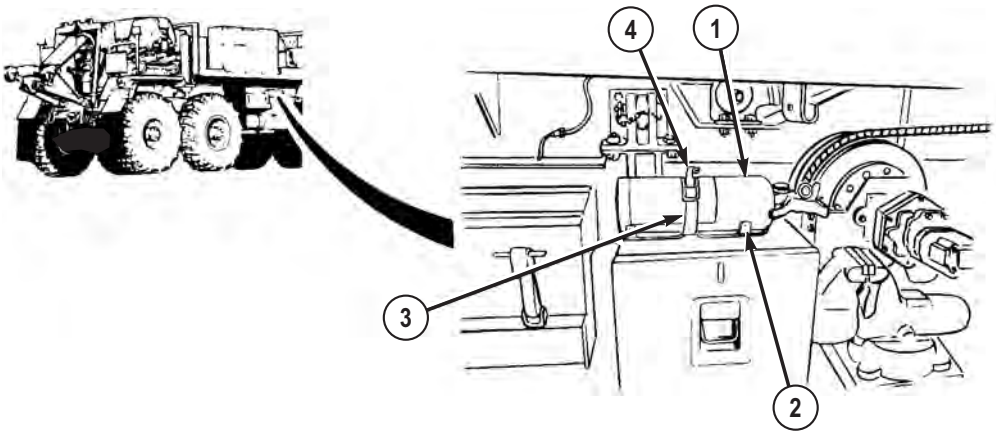


Figure 5.

2. Hook strap (3) onto clamp (4).
3. Push clamp (4) down, securing strap (3).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE ACCESS LADDER

INITIAL SETUP:

Not Applicable

INSTALL ACCESS LADDER

1. Remove quick pin (1) and pin (2).

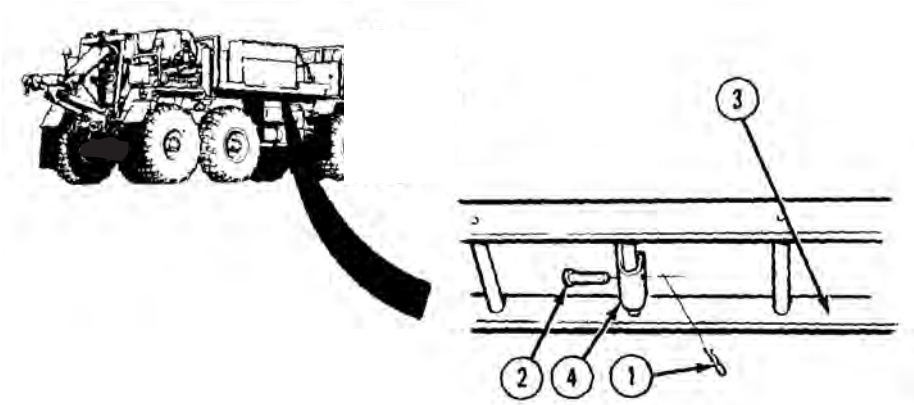


Figure 1.

2. Remove access ladder (3) from bracket (4).
3. Reinstall pin (2) and quick pin (1) in bracket (4).

CAUTION

Do not hit fuel/water separator when installing access ladder on passenger side front fender. If access ladder hooks hit fuel/water separator, glass may break.

4. Install access ladder (3) hooks (5) in front skid plate holes (6), driver side front fender holes (7), or passenger side front fender holes (8), as required. Keep access ladder (3) clear of fuel/water separator (9).

INSTALL ACCESS LADDER - Continued

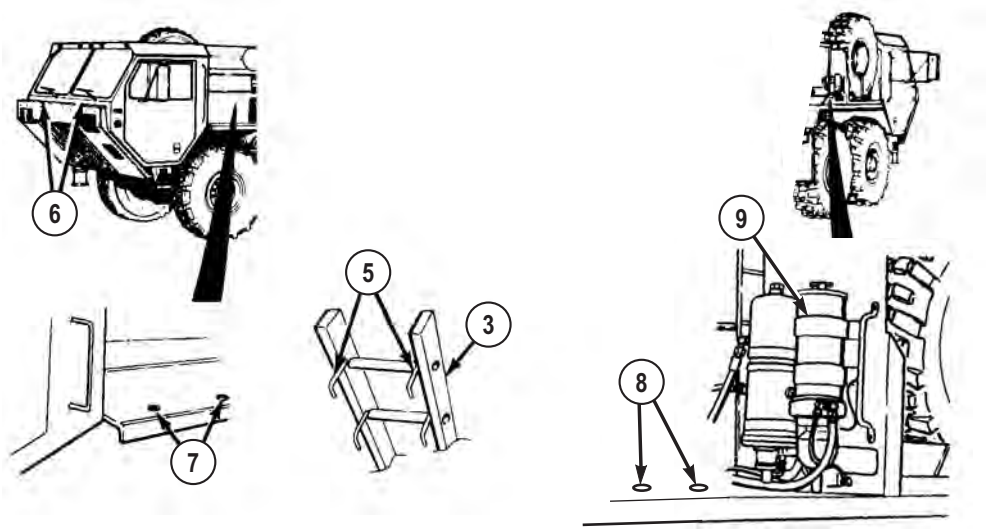


Figure 2.

STOW ACCESS LADDER

1. Remove quick pin (1) and pin (2) from bracket (4).

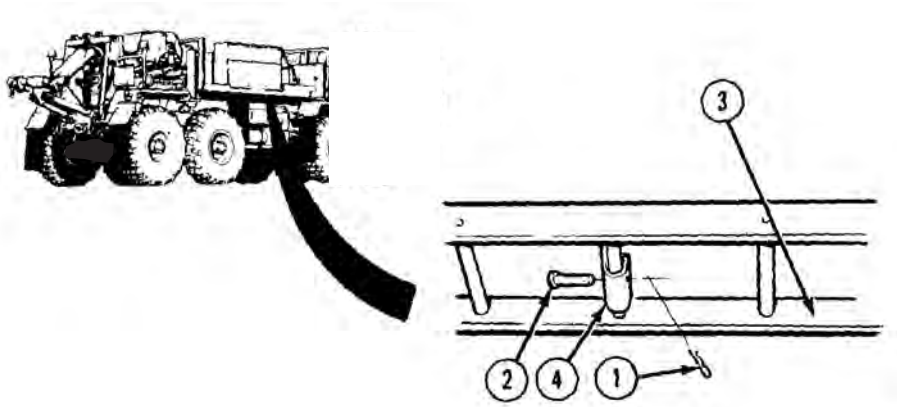


Figure 3.

STOW ACCESS LADDER - Continued

2. Put access ladder (3) in bracket (4). Reinstall pin (2) and quick pin (1).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE DRAIN PLUG

INITIAL SETUP:

Not Applicable

REMOVE DRAIN PLUG

NOTE

There are two drain plugs. One located on each side of cab floor, just below operator/crew seats.

1. Pull up on lever (1).

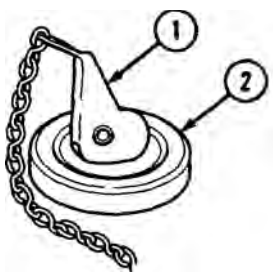


Figure 1.

2. Remove drain plug (2) to drain any liquid from floor of cab.

INSTALL DRAIN PLUG

1. Push drain plug (2) in opening on cab floor.

INSTALL DRAIN PLUG - Continued

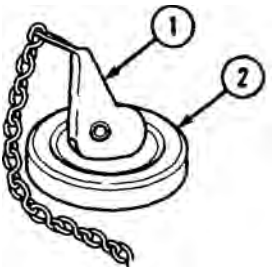


Figure 2.

2. Press down on lever (1) to secure drain plug (2).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
HEAVY-DUTY WINCH OPERATION

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

PREPARE TO OPERATE HEAVY-DUTY WINCH

WARNING

Excessive noise levels are present any time the heavy-duty winch, crane, or retrieval system is operating. Wear single hearing protection (earplugs or equivalent) while working around equipment when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem.

NOTE

This procedure is a two soldier task.

1. Start engine. (WP 0044)
2. If possible, always position vehicle for straight pull on solid ground so tires have good traction.
3. Set transmission range selector (1) to N (neutral).

PREPARE TO OPERATE HEAVY-DUTY WINCH - Continued

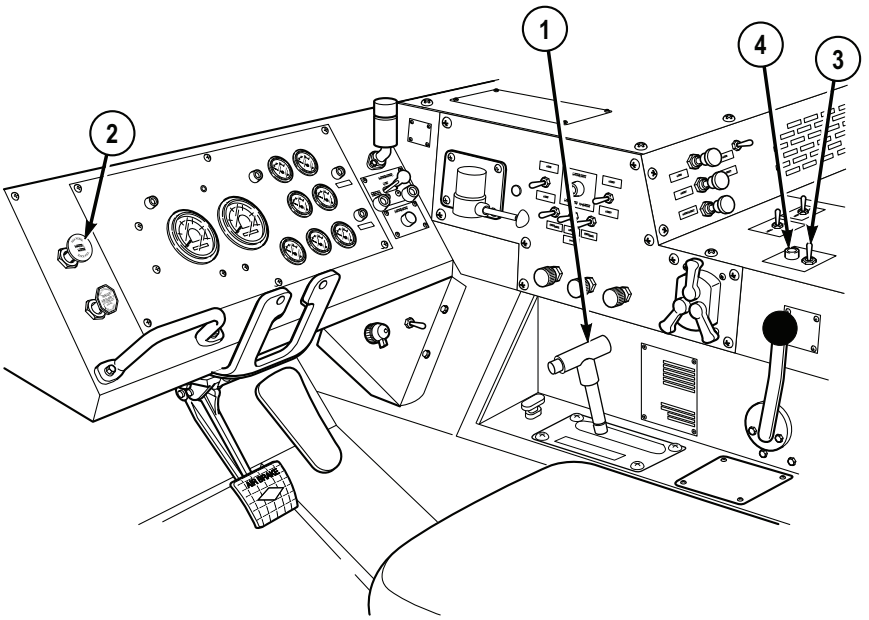


Figure 1.

4. Pull out PARKING BRAKE control (2).
5. Set up rear beacon lights. (WP 0096)
6. Set PTO ENGAGE switch (3) to ON position. Indicator light (4) will illuminate.
7. Push in FRONT BRAKE APPLICATION control (5).

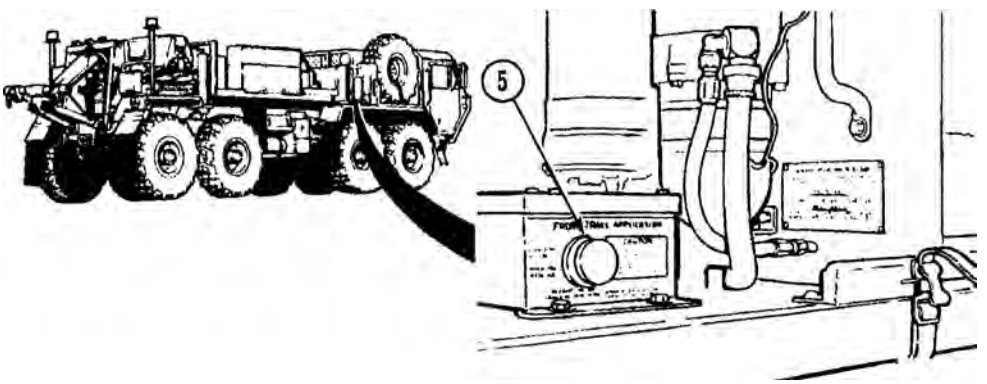


Figure 2.

PREPARE TO OPERATE HEAVY-DUTY WINCH - Continued

8. Set ON/OFF POWER switch (6) to ON.

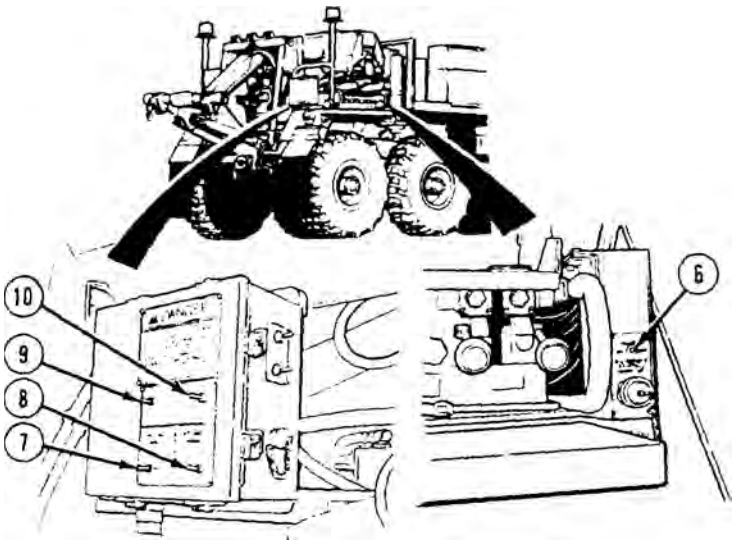


Figure 3.

9. Set HIGH IDLE CONTROL switch (7) to CONTINUOUS.
10. Set H.D. WINCH CONTROL switch (8) to OFF.
11. Set POWER switch (9) to ON.
12. Push LATCH switch (10) to ON, and release. Engine idle should increase to approximately 1500 rpm.
13. Pull RIGHT TOW CYLINDER control lever (11) and LEFT TOW CYLINDER control lever (12) to fully extend right tow cylinder (13) and left tow cylinder (14).

PREPARE TO OPERATE HEAVY-DUTY WINCH - Continued

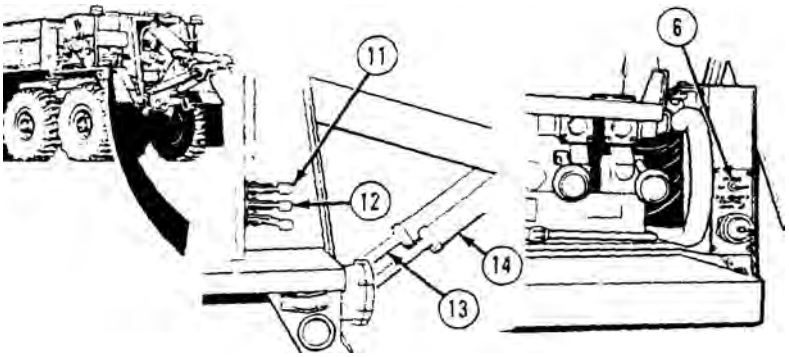


Figure 4.

14. Set ON/OFF POWER switch (6) to OFF.

NOTE

If retrieval system is equipped with a winch clevis tie down, perform Steps (15) and (16). If retrieval system is NOT equipped with a winch clevis tie down, skip to Step (17).

15. Loosen ratchet (15) and remove hook (16) from winch clevis (17).

PREPARE TO OPERATE HEAVY-DUTY WINCH - Continued

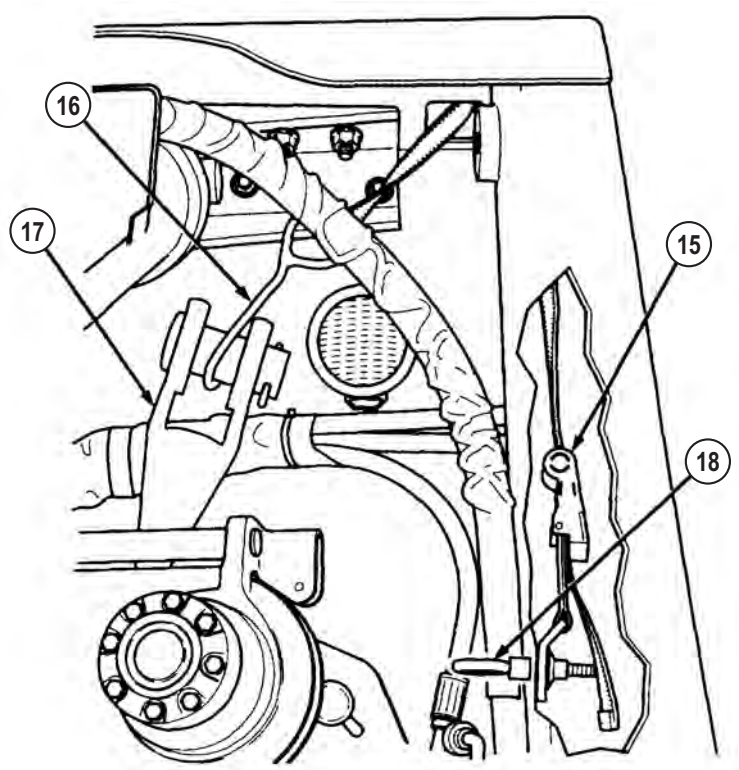
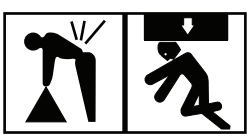


Figure 5.

16. Stow tie down by inserting hook (16) in eyebolt (18) and tightening ratchet (15).

WARNING



Fairlead/tensioner is very heavy and rotates, making it difficult to raise and lower. Hold fairlead/tensioner tight and always use an assistant whenever raising or lowering. Failure to comply may result in injury or death to personnel.

PREPARE TO OPERATE HEAVY-DUTY WINCH - Continued

NOTE

There is a pin on each side of the fairlead/tensioner which locks the fairlead/tensioner in place. Only passenger side is shown.

17. Hold fairlead/tensioner (19) in place while assistant removes two quick pins (20) and pins (21).

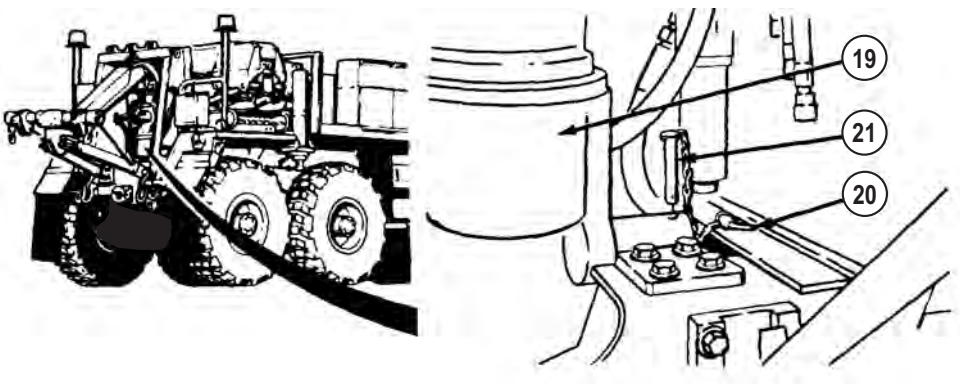


Figure 6.

18. With aid of an assistant, lower fairlead/tensioner (19).
19. Install two pins (21) and quick pins (20).

PAYOUT CABLE AND CONNECT TO MIRED VEHICLE

1. Set HIGH IDLE CONTROL switch (1) to H.D. WINCH.

PAYOUT CABLE AND CONNECT TO MIRED VEHICLE - Continued

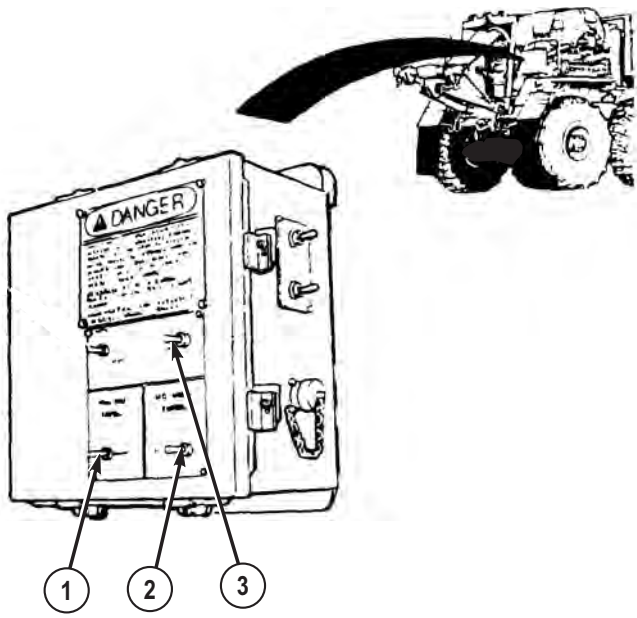


Figure 7.

2. Set H.D. WINCH CONTROL switch (2) to MANUAL.
3. Push LATCH switch (3) to ON and release.
4. Set HIGH IDLE switch (4) to ON. Engine idle should increase to approximately 1500 rpm.

PAYOUT CABLE AND CONNECT TO MIRED VEHICLE - Continued

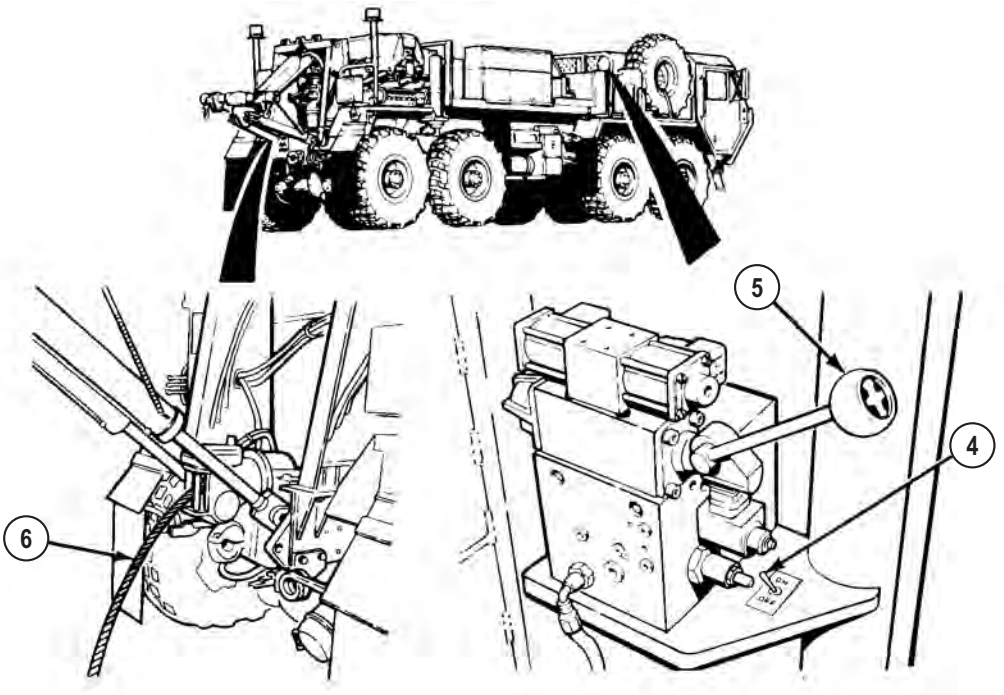


Figure 8.

WARNING

- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut severely. Failure to comply may result in injury or death to personnel.
- Do not operate winch with heavy-duty winch drum guard open. Failure to comply may result in injury or death to personnel.
- Do not place hands or feet near heavy-duty winch drum or fairlead/ tensioner sheave during heavy-duty winch operation. Failure to comply may result in injury or death to personnel.

PAYOUT CABLE AND CONNECT TO MIRED VEHICLE - Continued

CAUTION

Do not allow other vehicles to run over heavy-duty winch cable. Heavy-duty winch cable may be damaged. Failure to comply may result in damage to equipment.

5. Move WINCH control lever (5) to OUT and pay out winch cable (6) while assistant routes cable to mired vehicle.
6. Set HIGH IDLE switch (4) to OFF.
7. Position fairlead/tensioner (7) for type of pull being made.

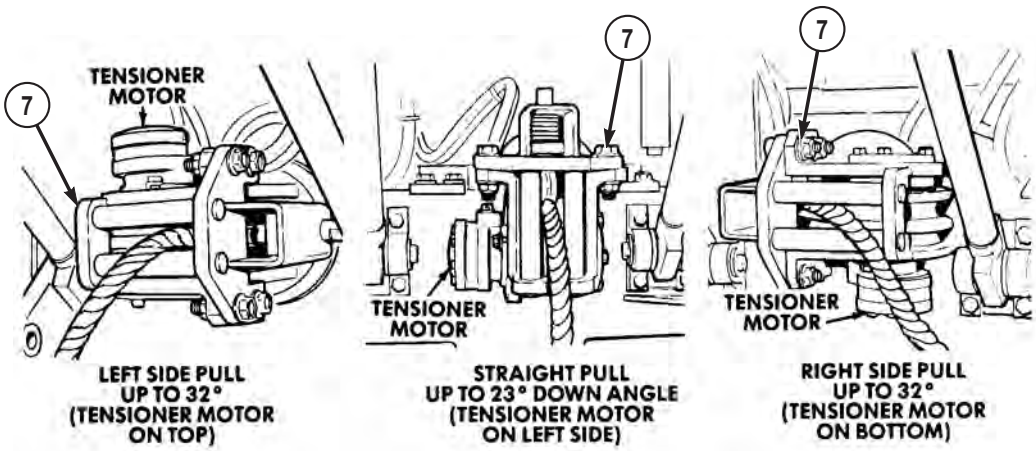


Figure 9.

CAUTION

Always be sure there are at least seven wraps of cable on winch drum. If there are less than seven wraps of cable on winch drum, cable may come loose and damage equipment.

8. Check that there are at least seven wraps of winch cable on winch. If there are not at least seven wraps of winch cable left on winch, move recovery vehicle closer to mired vehicle and continue recovery or shut down winch.

PAYOUT CABLE AND CONNECT TO MIRED VEHICLE - Continued

Table 1. Heavy-Duty Winch Pull Capacity.

Winch Type	Cable Layer	Cable on Drum	Capacity
60,000 lbs	1	0-48 ft. (0-14.64 m)	60,000 lbs (27 240 kg)
	2	49-105 (14.95-32.03 m)	49,780 lbs (22 600 kg)
	3	106-172 (32.33-52.46 m)	42,545 lbs (19 315 kg)
	4	173-250 (52.77-76.25 m)	37,140 lbs (16 862 kg)

9. Make sure weight of mired vehicle and amount of winch cable left on winch does not go over pull capacity (refer to FM 4-30.31 (Volume 2, WP 0200) and Heavy-Duty Winch Pull Capacity table above).
10. If 60-ton tackle block must be used for recovery, attach 60-ton tackle block to disabled vehicle and winch cable. (WP 0109)Remove snatch block from winch cable (WP 0116) and tree, another vehicle, or heavy object (refer to FM 4-30.31). (Volume 2, WP 0200)
11. Connect end of winch cable to rear tow eye of wrecker, another vehicle, or other heavy object. (Volume 2, WP 0200)
12. Connect winch cable to mired vehicle.

RECOVER MIRED VEHICLE

NOTE

- If using remote-control unit, skip to Step (2).
- If using vehicle mounted (manual) controls, continue with Step (1).

1. **VEHICLE MOUNTED (MANUAL) CONTROLS:**
   a. Set POWER switch (1) to ON (LOW IDLE ONLY).

RECOVER MIRED VEHICLE - Continued

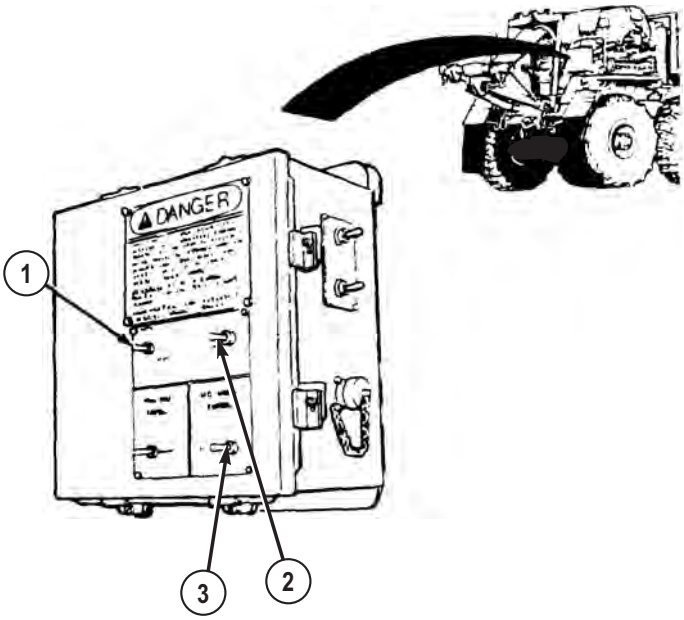


Figure 10.

b. Push and release LATCH switch (2) to ON.

c. Set H.D. WINCH CONTROL switch (3) to MANUAL.

d. Set HIGH IDLE switch (4) to ON position.

RECOVER MIRED VEHICLE - Continued

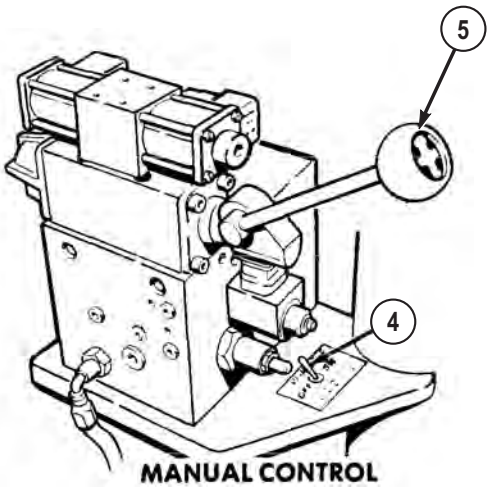


Figure 11.

WARNING

- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Keep recovery vehicle in stable position at all times. Do not allow any tire to raise off ground. Vehicle could turn over. Failure to comply may result in injury or death to personnel.

CAUTION

Apply power gradually to avoid high impact loading of winch cable.

e. Move WINCH control lever (5) to IN and slowly tighten winch cable.

f. Set HIGH IDLE switch (4) to ON position.

g. Set POWER switch (1) to ON.

RECOVER MIRED VEHICLE - Continued

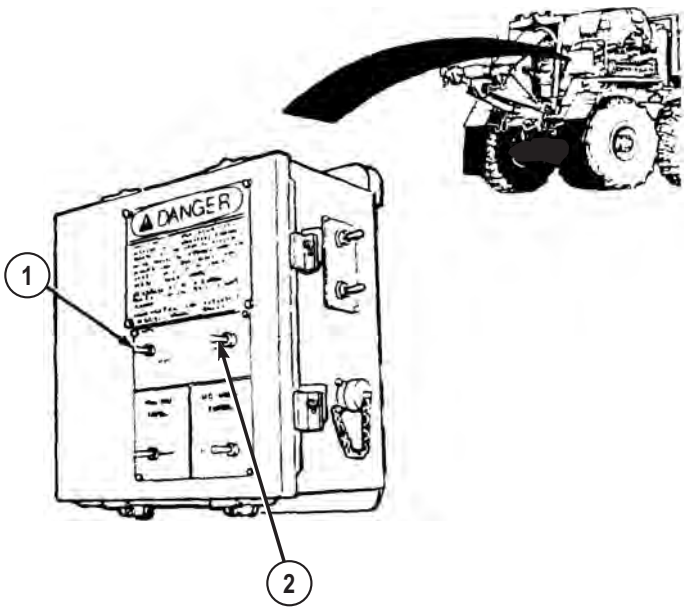


Figure 12.

h. Push LATCH switch (2) to ON and release.

i. Make sure recovery area is clear of personnel.

NOTE

Recheck your rigging.

j. Set HIGH IDLE switch (4) to ON. Engine idle should increase to approximately 1500 rpm.

RECOVER MIRED VEHICLE - Continued

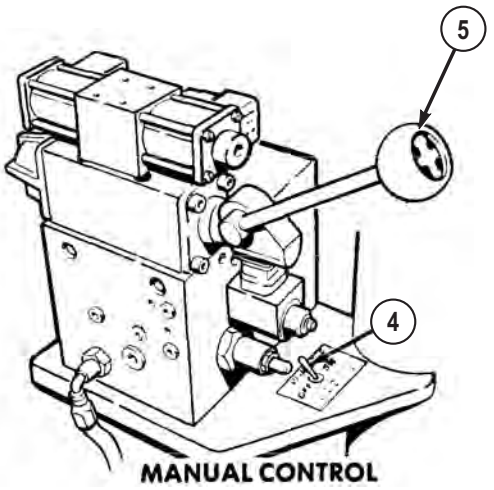


Figure 13.

WARNING

- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Keep recovery vehicle in stable position at all times. Do not allow any tire to raise off ground. Vehicle could turn over. Failure to comply may result in injury or death to personnel.

NOTE

If M984A tires do not provide enough traction to recover mired vehicle, use tow spades (WP 0108).

k. Move WINCH control lever (5) to IN and recover mired vehicle.

l. When mired vehicle is fully recovered, move WINCH control lever (5) to OUT to allow enough slack in winch cable to disconnect.

m. Set HIGH IDLE switch (4) to OFF position.

n. If tow spades were used, remove and stow tow spades remove and stow tow spades. (WP 0108)

RECOVER MIRED VEHICLE - Continued

NOTE

Complete Step (2) if using remote-control unit.

2. **REMOTE CONTROL UNIT:**

a. Remove HEAVY DUTY WINCH REMOTE CONTROL (6) and remote control cable (7) from stowage.

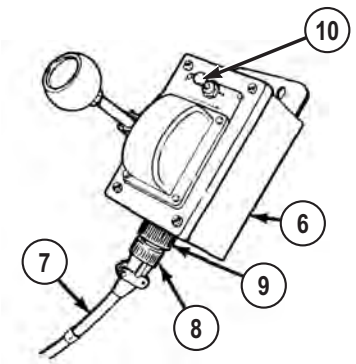


Figure 14.

b. Clean any dirt and water from remote control cable plug (8) and receptacle (9).

c. Connect remote control cable plug (8) to HEAVY DUTY WINCH REMOTE CONTROL receptacle (9). Check that HEAVY DUTY WINCH switch (10) is set to OFF.

d. Remove cover (11) from receptacle (12).

RECOVER MIRED VEHICLE - Continued

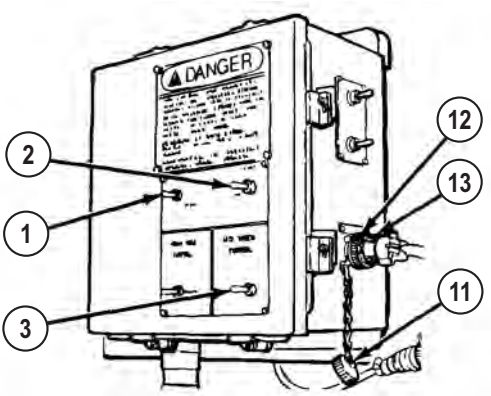


Figure 15.

e. Connect remote control cable plug (13) to receptacle (12).

f. Set POWER switch (1) to ON (LOW IDLE ONLY).

g. Push and release LATCH switch (2) to ON.

h. Set H.D. WINCH CONTROL switch (3) to REMOTE.

i. Set HEAVY DUTY WINCH switch (10) to ON.

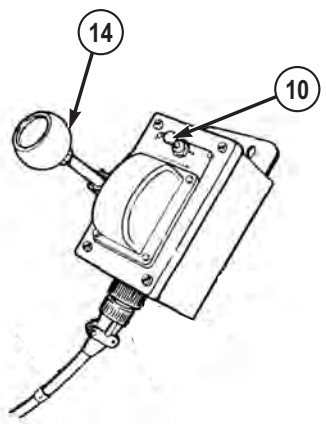


Figure 16.

RECOVER MIRED VEHICLE - Continued

WARNING

- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Keep recovery vehicle in stable position at all times. Do not allow any tire to raise off ground. Vehicle could turn over. Failure to comply may result in injury or death to personnel.

CAUTION

Apply power gradually to avoid high impact loading of winch cable.

j. Move WINCH control lever (14) to IN and slowly tighten winch cable.

k. Set HEAVY DUTY WINCH switch (10) to OFF.

l. Set POWER switch (1) to ON.

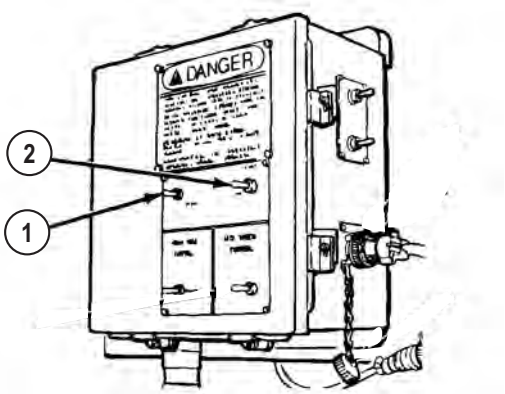


Figure 17.

m. Push LATCH switch (2) to ON and release.

n. Make sure recovery area is clear of personnel.

NOTE

Recheck your rigging.

RECOVER MIRED VEHICLE - Continued

o. Set HEAVY DUTY WINCH switch (10) to ON. Engine idle should increase to approximately 1500 rpm.

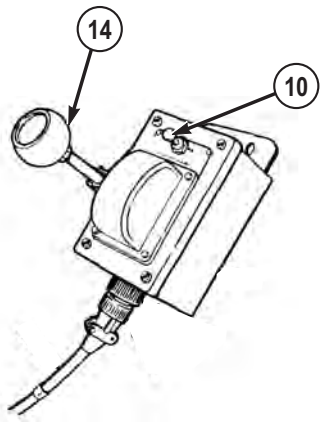


Figure 18.

WARNING

- Keep all personnel clear of area when tension is on winch cable. Winch cable could come loose or break. Failure to comply may result in injury or death to personnel.
- Keep recovery vehicle in stable position at all times. Do not allow any tire to raise off ground. Vehicle could turn over. Failure to comply may result in injury or death to personnel.

NOTE

If M984A tires do not provide enough traction to recover mired vehicle, use tow spades. (WP 0108)

p. Move WINCH control lever (14) to IN and recover mired vehicle.

q. When mired vehicle is fully recovered, move WINCH control lever (14) to OUT to allow enough slack in winch cable to disconnect.

r. Set HEAVY DUTY WINCH switch (10) to OFF.

s. If tow spades were used, remove and stow tow spades.

DISCONNECT CABLE, AND STOW

NOTE

- If using remote-control unit, skip to Step (2).
- If using vehicle mounted (manual) controls, continue with Step (1).

1. **VEHICLE MOUNTED (MANUAL) CONTROLS:**

WARNING

- Always wear protective gloves when handling winch cable. Never let cable run through hands. Frayed cable can cut severely. Failure to comply may result in injury or death to personnel.
- Do not operate winch with heavy-duty winch drum guard open. Failure to comply may result in injury or death to personnel.
- Do not place hands or feet near heavy-duty winch drum or fairlead/tensioner sheave during heavy-duty winch operation. Failure to comply may result in injury or death to personnel.

a. Disconnect winch cable (1) from M984A, another vehicle, or other heavy object. (Volume 2, WP 0200)

DISCONNECT CABLE, AND STOW - Continued

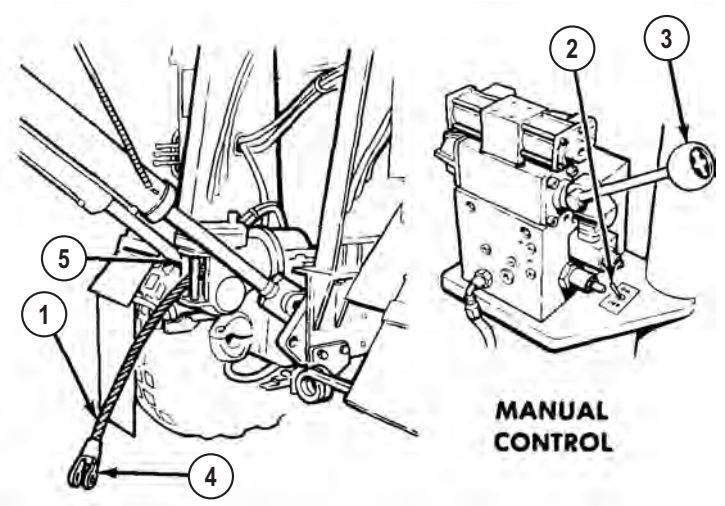


Figure 19.

b. Disconnect 60-ton tackle block from winch cable (1) and disabled vehicle.

c. Set HIGH IDLE switch (2) to ON. Engine idle should increase to approximately 1500 rpm.

CAUTION

Do not dead-end winch cable into fairlead/tensioner. Damage to fairlead/tensioner can result.

d. Move WINCH control lever (3) to IN and reel in winch cable (1).

e. Allow approximately 2 in. (50 mm) between clevis (4) and rollers (5).

f. Set HIGH IDLE switch (2) to OFF.

g. Set H.D. WINCH CONTROL switch (6) to OFF.

DISCONNECT CABLE, AND STOW - Continued

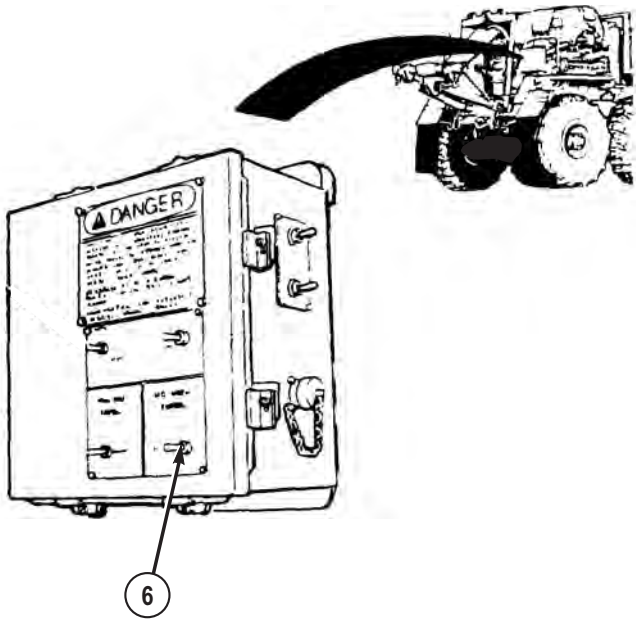


Figure 20.

h. Position fairlead/tensioner (7) with tensioner motor (8) on bottom.

DISCONNECT CABLE, AND STOW - Continued

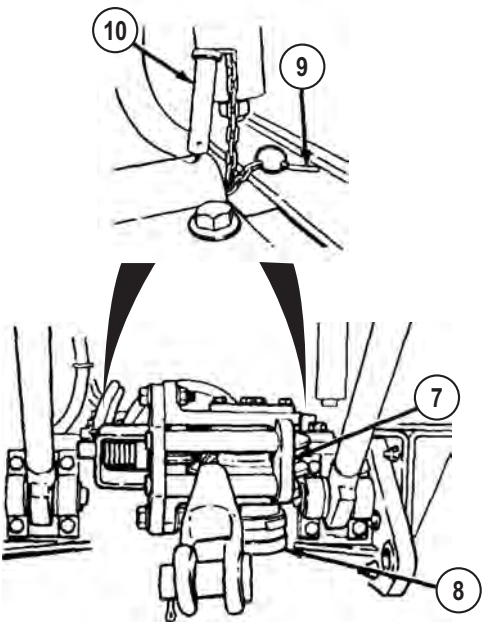
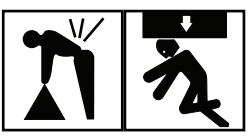


Figure 21.

i. Remove two quick pins (9) and pins (10).

WARNING



Fairlead/tensioner is very heavy and rotates, making it difficult to raise and lower. Hold fairlead/tensioner tight and always use an assistant whenever raising or lowering. Failure to comply may result in injury or death to personnel.

j. With aid of an assistant, raise fairlead/tensioner (7) to stowed position.

k. Hold fairlead/tensioner (7) in place while assistant installs two pins (10) and quick pins (9).

NOTE

If retrieval system is equipped with a winch clevis tie down, perform Steps (l) and (m) prior to performing Steps (n) through (v).

DISCONNECT CABLE, AND STOW - Continued

l. Loosen ratchet (11) and remove hook (12) from eyebolt (13).

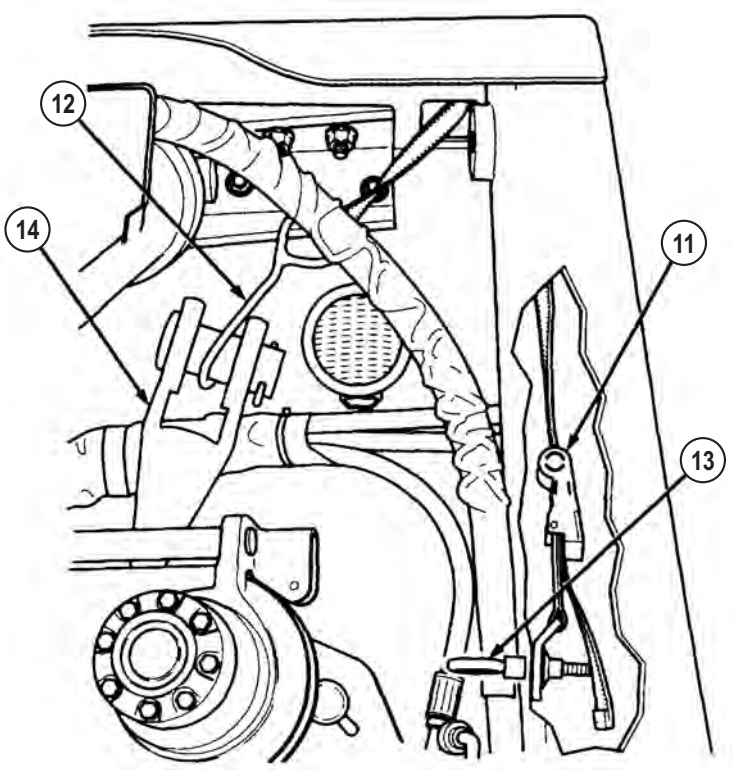


Figure 22.

m. Attach hook (12) to winch clevis (14) and tighten rachet (11) to secure winch clevis in place.

n. Set POWER switch (15) to ON.

DISCONNECT CABLE, AND STOW - Continued

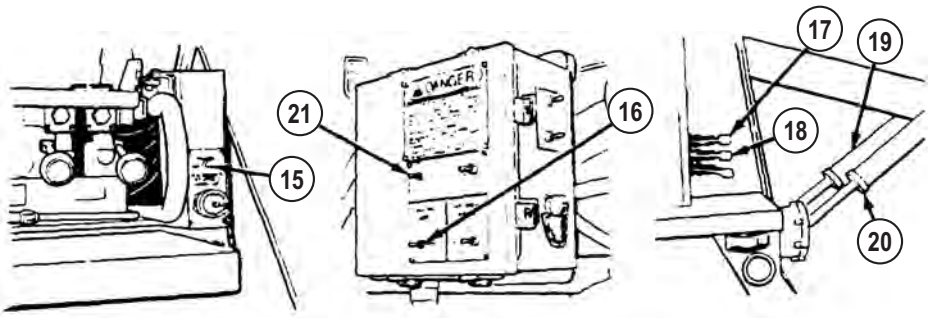


Figure 23.

o. Set HIGH IDLE CONTROL switch (16) to CONTINUOUS. Engine idle should increase to approximately 1500 rpm.

p. Push RIGHT TOW CYLINDER control lever (17) and LEFT TOW CYLINDER control lever (18) and fully retract right tow cylinder (19) and left tow cylinder (20).

q. Set POWER switch (15) to OFF.

r. Set POWER switch (21) to OFF.

s. Pull FRONT BRAKE APPLICATION control (22) to release front brakes.

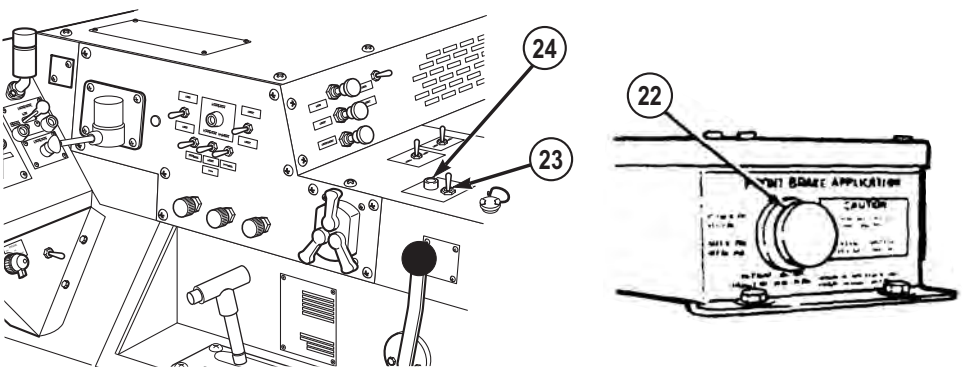


Figure 24.

t. Set PTO ENGAGE switch (23) to OFF position. Indicator light (24) will go out.

u. Shut OFF rear beacon lights.

DISCONNECT CABLE, AND STOW - Continued

v. Shut OFF engine.

NOTE

Complete Step (2) if using remote-control unit.

2. **REMOTE-CONTROL UNIT:**

a. Disconnect winch cable (1) from M984A, another vehicle, or other heavy object. (Volume 2, WP 0200)

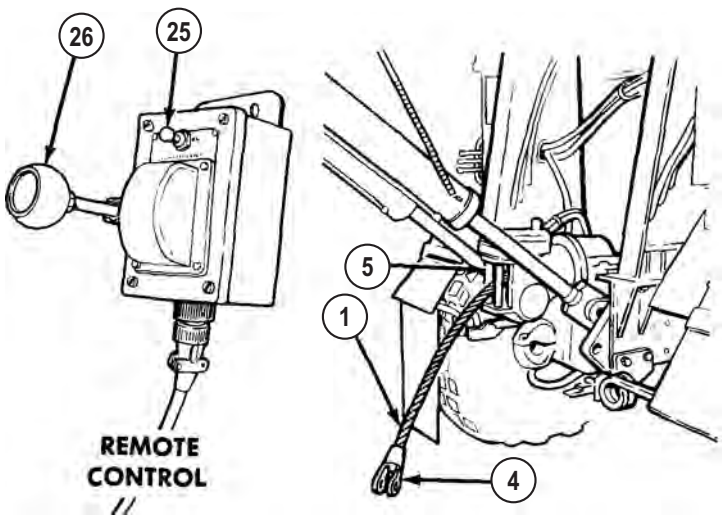


Figure 25.

b. Disconnect 60-ton tackle block from winch cable (1) and disabled vehicle.

c. Set HEAVY DUTY WINCH switch (25) to ON, engine idle should increase to approximately 1500 rpm.

CAUTION

Do not dead-end winch cable into fairlead/tensioner. Damage to fairlead/tensioner can result.

d. Move WINCH control lever (26) to IN and reel in winch cable (1).

e. Allow approximately 2 in. (50 mm) between clevis (4) and rollers (5).

f. Set HEAVY DUTY WINCH switch (25) to OFF.

g. Set H.D. WINCH CONTROL switch (6) to OFF.

DISCONNECT CABLE, AND STOW - Continued

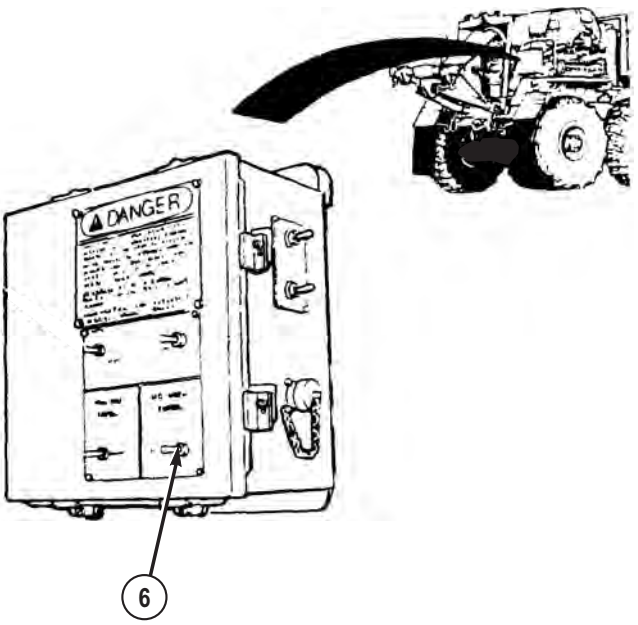


Figure 26.

h. Disconnect remote control cable plug (27) from receptacle (28).

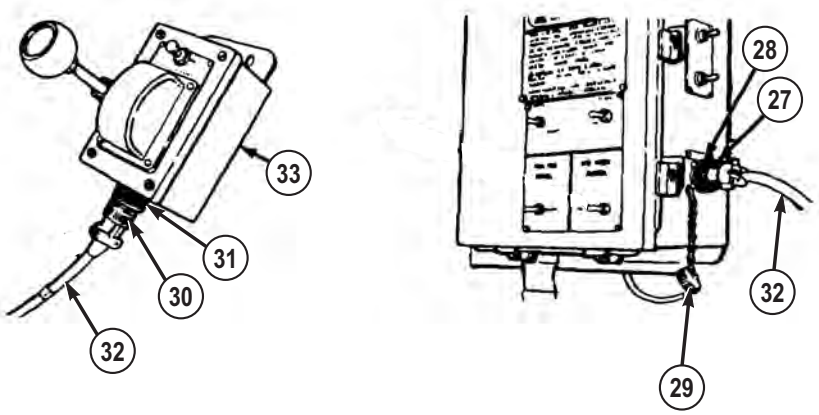


Figure 27.

i. Install cover (29) on receptacle (28).

DISCONNECT CABLE, AND STOW - Continued

j. Disconnect remote control cable plug (30) from HEAVY DUTY WINCH REMOTE CONTROL (31).

k. Return remote control cable (32) and HEAVY DUTY WINCH REMOTE CONTROL (33) in stowage.

l. Position fairlead/tensioner (7) with tensioner motor (8) on bottom.

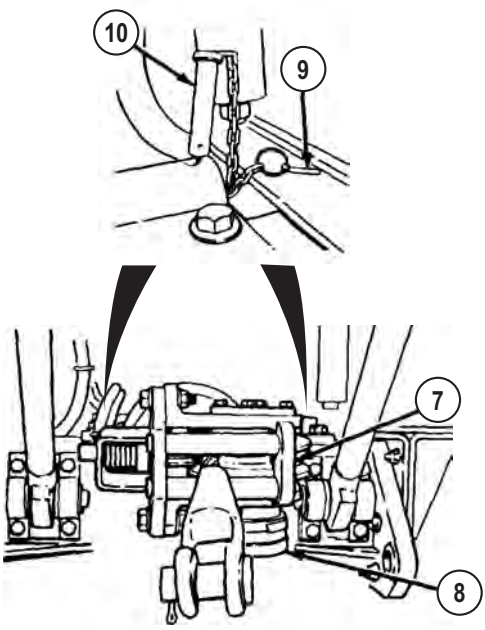
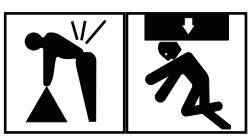


Figure 28.

m. Remove two quick pins (9) and pins (10).

WARNING



Fairlead/tensioner is very heavy and rotates, making it difficult to raise and lower. Hold fairlead/tensioner tight and always use an assistant whenever raising or lowering. Failure to comply may result in injury or death to personnel.

n. With aid of an assistant, raise fairlead/tensioner (7) to stowed position.

DISCONNECT CABLE, AND STOW - Continued

o. Hold fairlead/tensioner (7) in place while assistant installs two pins (10) and quick pins (9).

NOTE

If retrieval system is equipped with a winch clevis tie down, perform Steps (p) and (q) prior to performing Steps (r) through (z).

p. Loosen ratchet (11) and remove hook (12) from eyebolt (13).

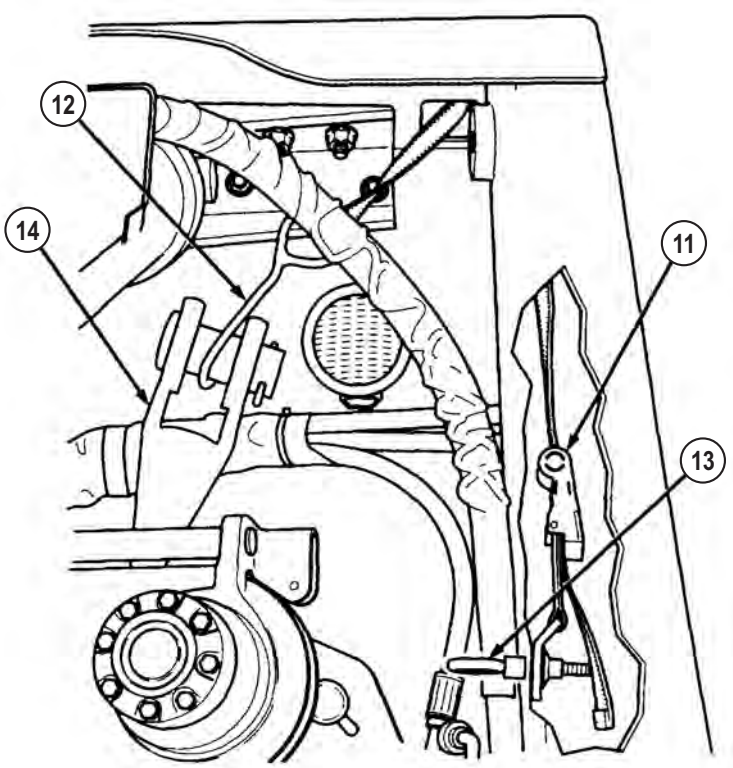


Figure 29.

q. Attach hook (12) to winch clevis (14) and tighten rachet (11) to secure winch clevis in place.

r. Set POWER switch (15) to ON.

DISCONNECT CABLE, AND STOW - Continued

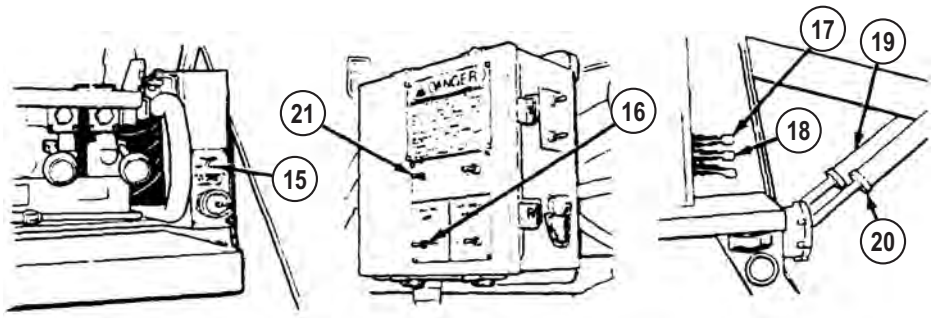


Figure 30.

s. Set HIGH IDLE CONTROL switch (16) to CONTINUOUS. Engine idle should increase to approximately 1500 rpm.

t. Push RIGHT TOW CYLINDER control lever (17) and LEFT TOW CYLINDER control lever (18) and fully retract right tow cylinder (19) and left tow cylinder (20).

u. Set ON/OFF POWER switch (15) to OFF.

v. Set POWER switch (21) to OFF.

w. Pull FRONT BRAKE APPLICATION control (22) to release front brakes.

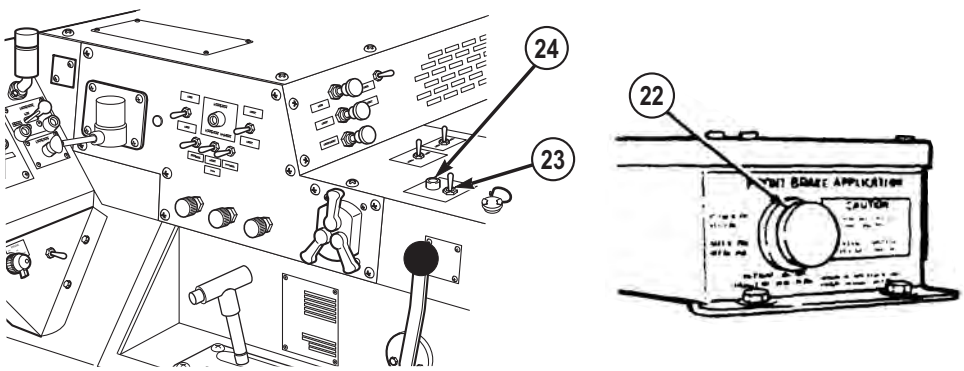


Figure 31.

x. Set PTO ENGAGE switch (23) to OFF position. Indicator light (24) will go out.

y. Shut OFF rear beacon lights.

DISCONNECT CABLE, AND STOW - Continued

z. Shut OFF engine.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
START ENGINE

INITIAL SETUP:

Not Applicable

START COLD ENGINE

WARNING

Do not start, crank engine, or move vehicle when anyone is near, working on, or working under vehicle. Failure to comply may result in injury or death to personnel.

WARNING

Keep away from moving engine parts, alternator belts, and pulleys while engine is running. Failure to comply may result in injury or death to personnel.

1. Pull out PARKING BRAKE control (1).

START COLD ENGINE - Continued

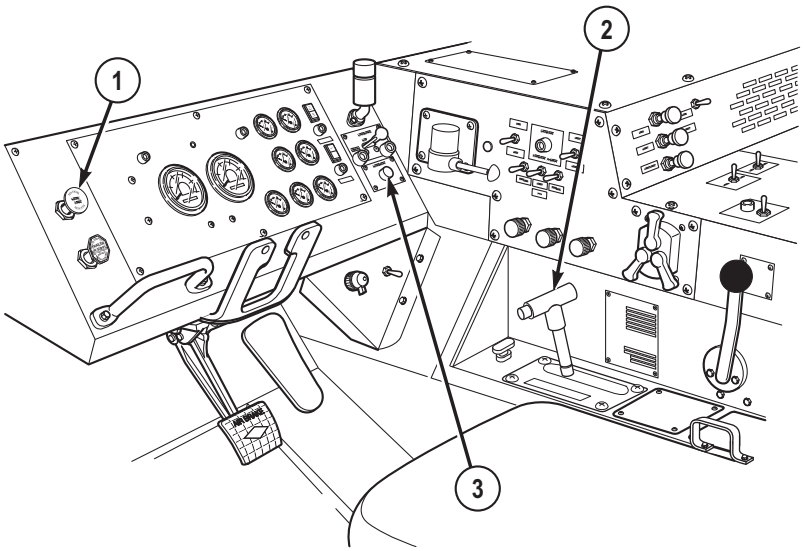


Figure 1.

2. Set transmission range selector (2) to N (neutral).

CAUTION

- Do not press ETHER START button more than three times in a single starting attempt. Failure to comply may result in damage to equipment.
- Do not turn ENGINE switch to START position while engine is still running. Failure to comply may result in damage to equipment.
- If engine fails to start, wait 15 seconds before next start attempt to allow starter motor to cool. Failure to comply may result in damage to equipment.

3. If outside temperature is above 45°F (7°C), go to Step (5). If outside temperature is below 45°F (7°C), go to Step (4).

NOTE

- Do Step (4):
  - One time for temperatures between 45°F and 10°F (7°C and -12°C).
  - Two times for temperatures between 10°F and -10°F (-12°C and -23°C).

START COLD ENGINE - Continued

- Three times for temperatures between -10°F and -25°F (-23°C and -32°C).

- Repeat Steps (4) and (5) up to four times. If engine fails to start after four starting attempts, notify field level maintenance.
- Under extreme cold temperatures, it may be necessary to press the ETHER START button two or three times in a single starting attempt. Wait approximately three seconds between each press.

4. Press and hold ETHER START button (3) for three seconds, release, and wait three seconds.
5. Turn ENGINE switch (4) to START for no more than 15 seconds, or until engine starts.

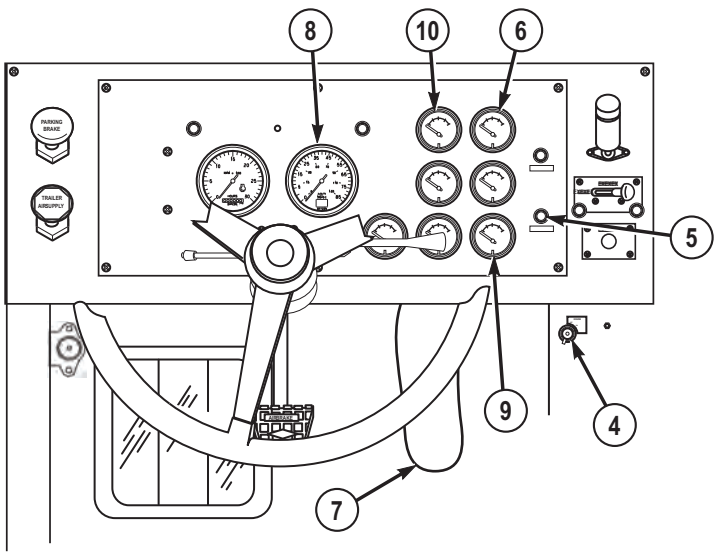


Figure 2.

NOTE

- ENGINE switch will spring back to ON position when released.
- AIR indicator may illuminate and buzzer may sound upon engine start.

6. Release ENGINE switch (4). Air indicator (5) may light and buzzer may sound.

START COLD ENGINE - Continued

CAUTION

- Do not turn ENGINE switch to START position while engine is still running. Failure to comply may result in damage to equipment.
- If OIL PRESS gauge does not show engine oil pressure within 10 to 15 seconds after starting engine, immediately shut off engine (WP 0057) and notify field level maintenance. Failure to comply may result in damage to equipment.
- If engine fails to start, repeat Step (3) up to seven times. If engine doesn't start after eight starting attempts, notify field level maintenance.

7. Check that OIL PRESS gauge (6) reads 5 to 10 psi (34 to 69 kPa) at idle.
8. Press throttle pedal (7) until tachometer (8) reads 800-1000 rpm.
9. Run engine at 800-1000 rpm for about 5 minutes.

CAUTION

If red and green needles on AIR PRESS gauge do not read 60 to 120 psi (414 to 827 kPa) after warm-up, shut off engine (WP 0057) and notify field level maintenance. Failure to comply may result in damage to equipment.

10. Check that AIR PRESS gauge (9) reads 60 to 120 psi (414 to 827 kPa). AIR indicator (5) will light and buzzer will sound until both needles reach 60 to 75 psi (414 to 517 kPa).
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 230°F (110°C).

START COLD ENGINE - Continued

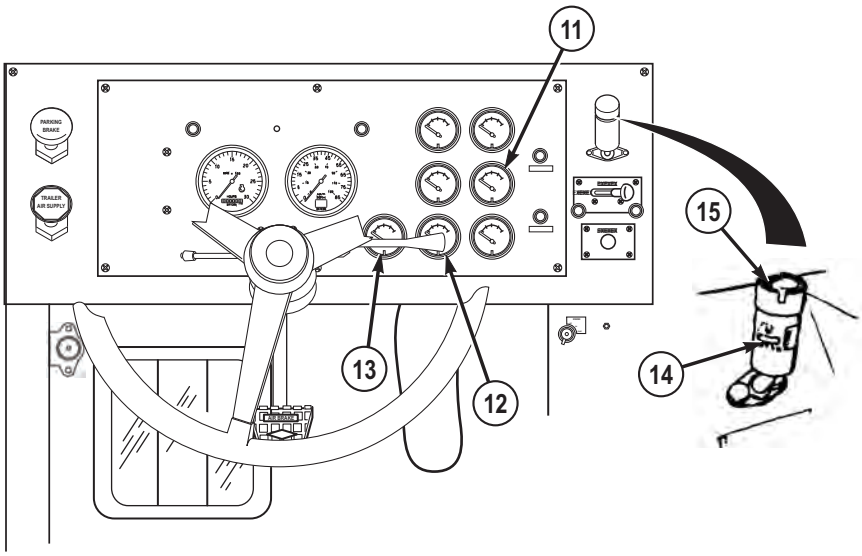


Figure 3.

13. Check that BATTERY gauge (12) reads between 24 and 30 volts.
14. Check that AMPERES gauge (13) shows positive reading.
15. Check that air filter restriction indicator (14) shows yellow.
16. If air filter restriction indicator (14) shows red, press button (15).
17. If air filter restriction indicator (14) still shows red and/or VACUUM INCHES H2O window shows 18, shut off engine (WP 0057) and clean air filter elements. (Volume 2, WP 0194)

START WARM ENGINE

WARNING

Do not start, crank engine, or move vehicle when anyone is near, working on, or working under vehicle. Failure to comply may result in injury or death to personnel.

START WARM ENGINE - Continued

WARNING

Keep away from moving engine parts, alternator belts, and pulleys while engine is running. Failure to comply may result in injury or death to personnel.

1. Pull out PARKING BRAKE control (1).

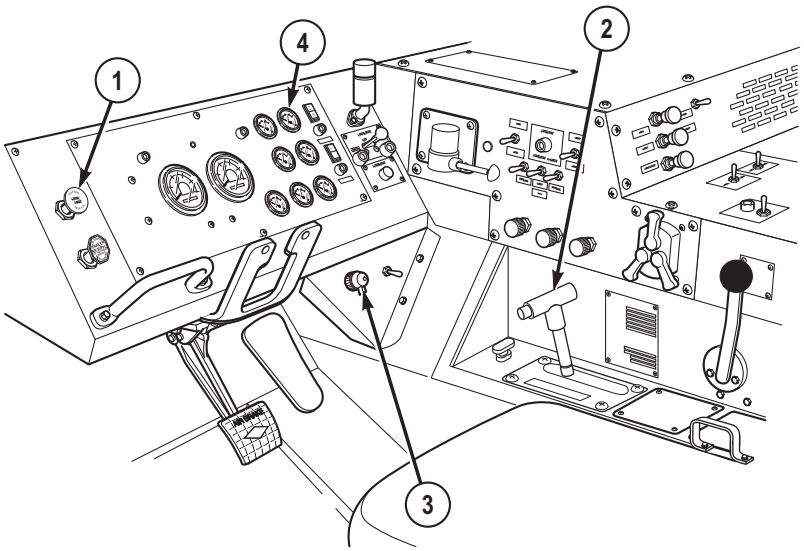


Figure 4.

2. Set transmission range selector (2) to N (neutral).
3. Turn ENGINE switch (3) to START for no longer than 10 seconds, or until engine starts.

NOTE

ENGINE switch will spring back to ON position when released.

4. Release ENGINE switch (3).

START WARM ENGINE - Continued

CAUTION

If OIL PRESS gauge does not show engine oil pressure within 10 to 15 seconds after starting engine, shut off engine (WP 0057) immediately and notify field level maintenance. Failure to comply may result in damage to equipment.

NOTE

- Minimum engine oil pressure for safe operation (vehicle moving) is 30 psi (207 kPa).
- At idle, engine oil pressure can drop as low as 5 psi (34 kPa), this is a normal condition.

5. Check that engine OIL PRESS gauge (4) indicates normal operating range of 40 to 70 psi (276 to 483 kPa) at 1800 to 2100 rpm.
6. AIR PRESS gauge (5) reads 60 to 120 psi (414 to 827 kPa). AIR indicator (6) will light and buzzer will sound until both needles reach 60 to 75 psi (414 to 517 kPa).

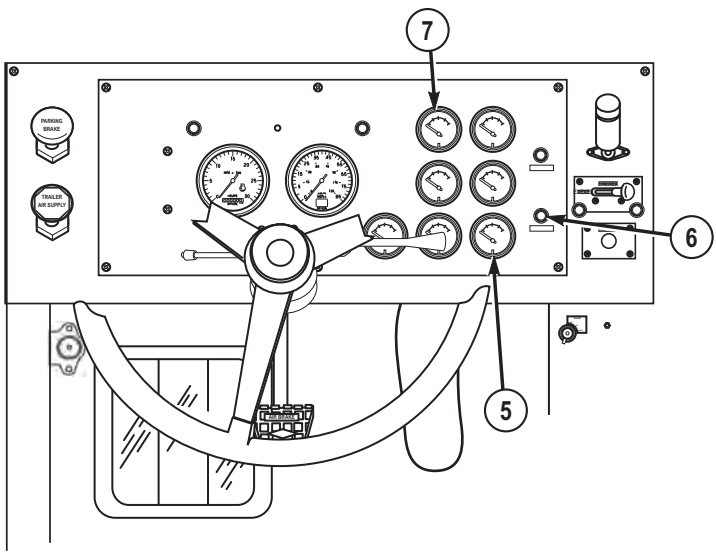


Figure 5.

7. Check that FUEL gauge (7) shows enough fuel to complete mission.

NOTE

WATER TEMP gauge may not show reading at engine idle.

START WARM ENGINE - Continued

8. Check that WATER TEMP gauge (8) does not read over 230°F (110°C).

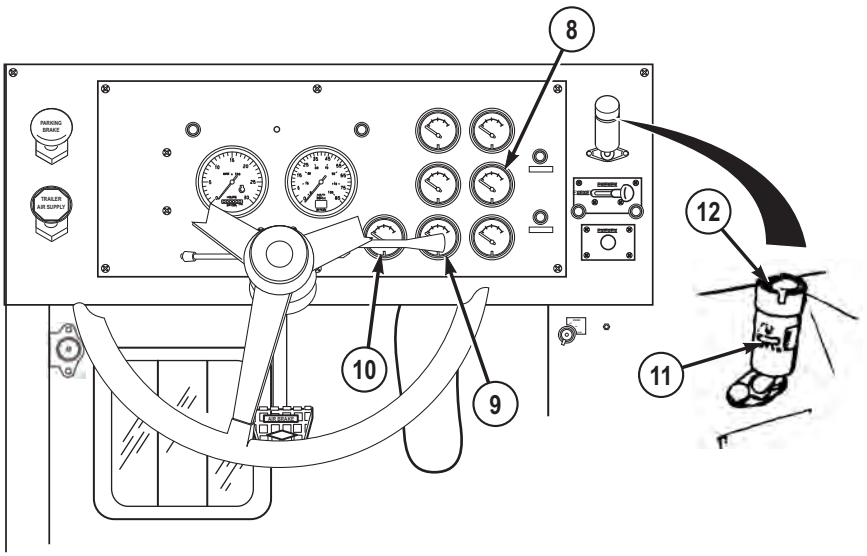


Figure 6.

9. Check that BATTERY gauge (9) reads between 24 and 30 volts.
10. Check that AMPERES gauge (10) shows positive reading.
11. Check that air filter restriction indicator (11) shows yellow.
12. If air filter restriction indicator (11) shows red, press button (12).
13. If air filter restriction indicator (11) still shows red and/or VACUUM INCHES H2O window shows 18, shut off engine (WP 0057) and clean air filter elements. (Volume 2, WP 0194)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE PARKING BRAKES

INITIAL SETUP:

Not Applicable

OPERATE PARKING BRAKES

NOTE

- Vehicle may be equipped with manual parking brake valve (round/ black knob) or automatic parking brake valve (square/yellow knob).
- Manual parking brake valve shown.

1. Pull out PARKING BRAKE control (1) to apply.

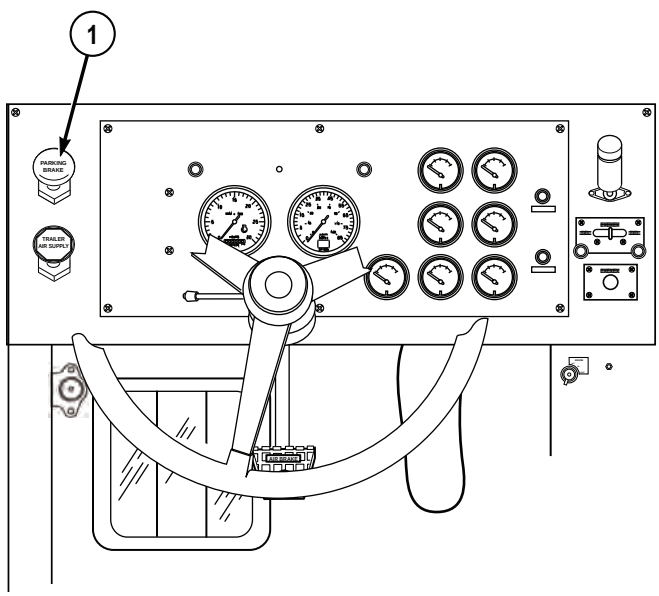


Figure 1.

OPERATE PARKING BRAKES - Continued

2. Push in PARKING BRAKE control (1) to release.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE SERVICE 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 both needles (red and green) of AIR PRESS gauge (1) read at at least 100 psi (690 kPa) before operating vehicle.

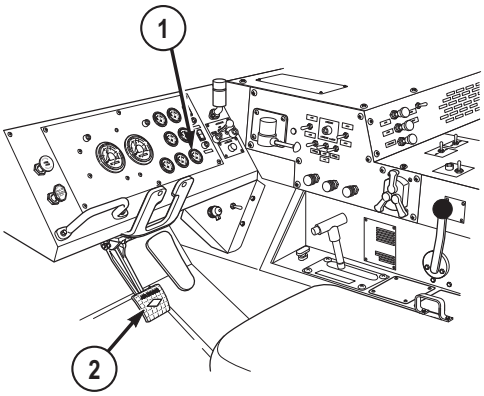


Figure 1.

OPERATE SERVICE BRAKES - Continued

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

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE TRAILER BRAKES

INITIAL SETUP:

Not Applicable

OPERATE TRAILER BRAKES

WARNING

Trailer handbrake control is used only when testing trailer brakes. Do not use trailer handbrake control while driving or the trailer may skid and jackknife, causing an accident. Failure to comply may result in injury or death to personnel.

1. Slowly pull back trailer handbrake control (1) to test application of trailer brakes.

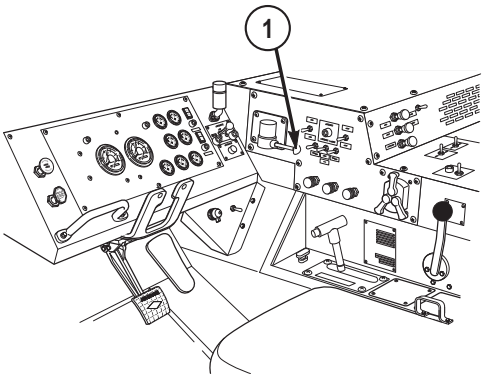


Figure 1.

OPERATE TRAILER BRAKES - Continued

2. Push trailer handbrake control (1) forward to test release of trailer brakes.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE TRANSMISSION AND TRANSFER CASE

INITIAL SETUP:

Not Applicable

OPERATE TRANSMISSION

1. Push in button (1) and move transmission range selector (2) to desired position:
   a. Select R (reverse) to:

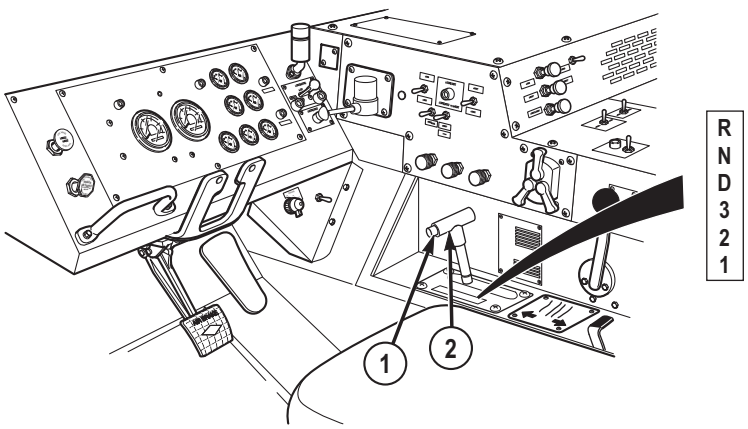


Figure 1.

      (1) Drive vehicle in reverse. (WP 0051)
   b. Select N (neutral) to:
      (1) Start engine. (WP 0044)
      (2) Park vehicle. (WP 0056)
      (3) Perform stationary power takeoff.
      (4) Shift transfer case.
   c. Select D (drive) to:
      (1) Drive in normal conditions.

OPERATE TRANSMISSION - Continued

(2) Drive vehicle forward (WP 0050) from a stop.

d. Select 3 (third gear range) to:

(1) Drive vehicle in off-road conditions. (WP 0053)

(2) Drive vehicle in city traffic and on highway. (WP 0052)

(3) Haul a heavy load.

e. Select 2 (second gear range) to:

(1) Drive down moderate grades.

(2) Control vehicle speed.

f. Select 1 (first gear range) to:

(1) Drive vehicle in slippery conditions. (WP 0055)

(2) Drive vehicle up/down steep grade. (WP 0054)

(3) Give maximum vehicle speed control.

OPERATE TRANSFER CASE

1. Start engine. (WP 0044)

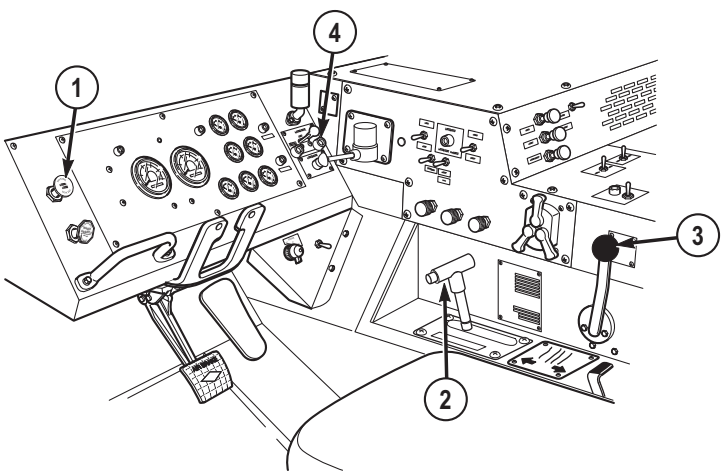


Figure 2.

2. Push in PARKING BRAKE control (1). (WP 0045)
3. Set transmission range selector (2) to N (neutral).

OPERATE TRANSFER CASE - Continued

CAUTION

- Do not force TRANSFER CASE shift lever. Lever may work hard if there is drive line windup. 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.

4. Select transfer case position.

NOTE

If TRANSFER CASE shift lever is hard to move, set transmission range selector to D, then back to N. If transfer case will not shift, refer to troubleshooting procedures. (Volume 2, WP 0177)

5. Set TRANSFER CASE shift lever (3) to H (HI) for highway driving.

NOTE

Selecting L (LO) position automatically selects 8X8 drive in the vehicle traction control system.

6. Set TRANSFER CASE shift lever (3) to L (LO) for off-road driving, 8X8 indicator light (4) will illuminate.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE ENGINE BRAKE

INITIAL SETUP:

Not Applicable

OPERATE 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.

NOTE

Service brakes must be used in addition to engine brake for optimum braking capability.

1. Set JACOBS® ENGINE BRAKE HIGH/LOW switch (1) to LOW.

OPERATE ENGINE BRAKE - Continued

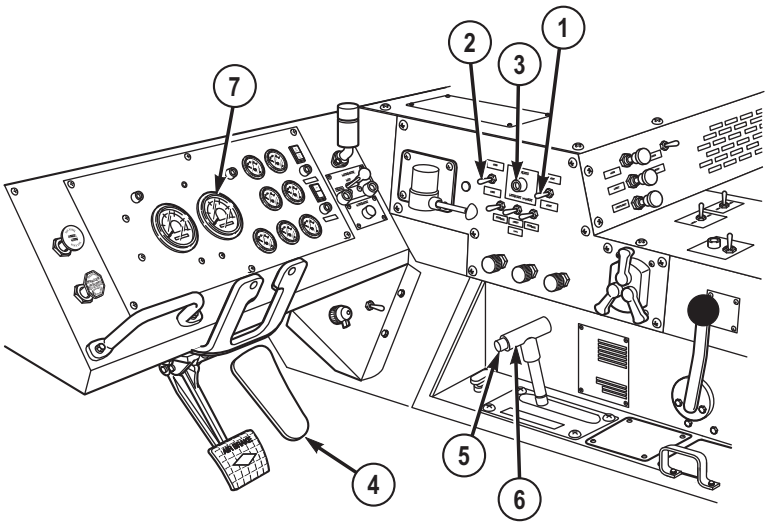


Figure 1.

2. Set JACOBS® ENGINE BRAKE ON/OFF switch (2) to ON. JACOBS® ENGINE BRAKE indicator light (3) will come on.
3. Lift foot off throttle pedal (4). Engine brake will automatically slow vehicle.
4. If too much braking occurs, push in button (5) and set transmission range selector (6) to a higher range.
5. If more braking is required, set JACOBS® ENGINE BRAKE HIGH/LOW switch (1) to HIGH.

NOTE

Engine brake operates best when engine speed is between 1650 and 2100 rpm.

6. Check that tachometer (7) reads between 1650 and 2100 rpm whenever engine brake is used.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE FORWARD

INITIAL SETUP:

Not Applicable

PREPARE VEHICLE

NOTE

If vehicle has less than 500 miles (805 km), check controls and indicators often during operation and listen for unusual noises or vibrations. Notify field level maintenance of any problems.

1. Remove and stow wheel chocks. (WP 0100)
2. Ensure grove crane, outriggers, and outrigger pads are secured in stowed position. (WP 0106)
3. Ensure heavy duty winch cables clevis is retracted to fairlead/tensioner. (WP 0043)
4. Ensure fairlead/tensioner is in stowed position. (WP 0043)
5. Ensure retrieval cylinders are fully retracted. (WP 0043)
6. Ensure equipment body doors are closed.
7. Ensure vise is returned to stowed position. (WP 0110)
8. Ensure all equipment in equipment body is securely stowed.
9. Adjust seat and mirrors as needed. (WP 0102)
10. Adjust air-ride seat and mirrors as needed. (WP 0104)
11. Adjust three-point seatbelt as needed. (WP 0103)
12. Adjust four-point seatbelt as needed. (WP 0105)
13. Start engine. (WP 0044)
14. Turn on lights as required.

PREPARE VEHICLE - 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.

15. Ensure both needles (red and green) AIR PRESS gauge (1) read at least 100 psi (690 kPa) before driving vehicle.

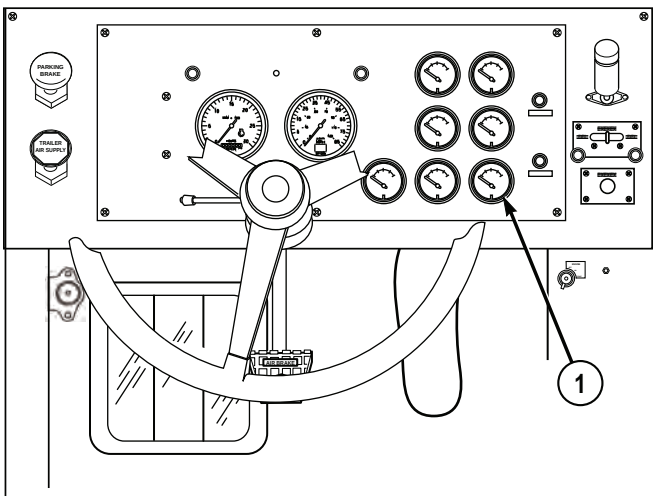


Figure 1.

DRIVE VEHICLE FORWARD

1. Drive vehicle in city traffic and on highway. (WP 0052)
2. Drive vehicle in off-road conditions. (WP 0053)
3. Drive vehicle in slippery conditions. (WP 0055)
4. Drive vehicle up/down steep grade. (WP 0054)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE IN REVERSE

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

PREPARE VEHICLE

1. Remove and stow wheel chocks.
2. Adjust seat and mirrors as needed.
3. Adjust air-ride seat and mirrors as needed. (WP 0104)
4. Adjust three-point seatbelt as needed. (WP 0103)
5. Adjust four-point seatbelt as needed. (WP 0105)
6. Start engine. (WP 0044)
7. Turn on lights as required.

DRIVE VEHICLE IN REVERSE

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. Make sure both needles (red and green) on AIR PRESS gauge (1) read at least 100 psi (690 kPa) before driving vehicle.

DRIVE VEHICLE IN REVERSE - Continued

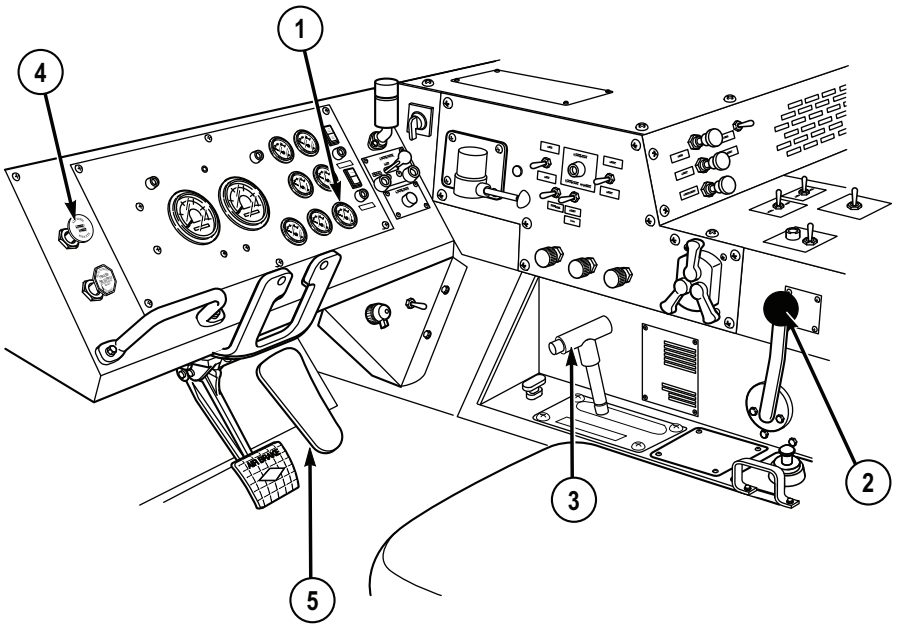


Figure 1.

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

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

2. Set TRANSFER CASE shift lever (2) to HI.

NOTE

Reverse alarm will not sound if blackout lighting is selected.

3. Set transmission range selector (3) to R (reverse).

DRIVE VEHICLE IN REVERSE - Continued

4. Push in PARKING BRAKE control (4).
5. Slowly apply throttle pedal (5).
6. Follow direction from ground guide (as required).

CAUTION

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

7. Accelerate, brake, and steer as required.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE IN CITY TRAFFIC AND ON HIGHWAY

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE

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.

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.

1. Set TRANSFER CASE shift lever (1) to HI.

OPERATE VEHICLE - Continued

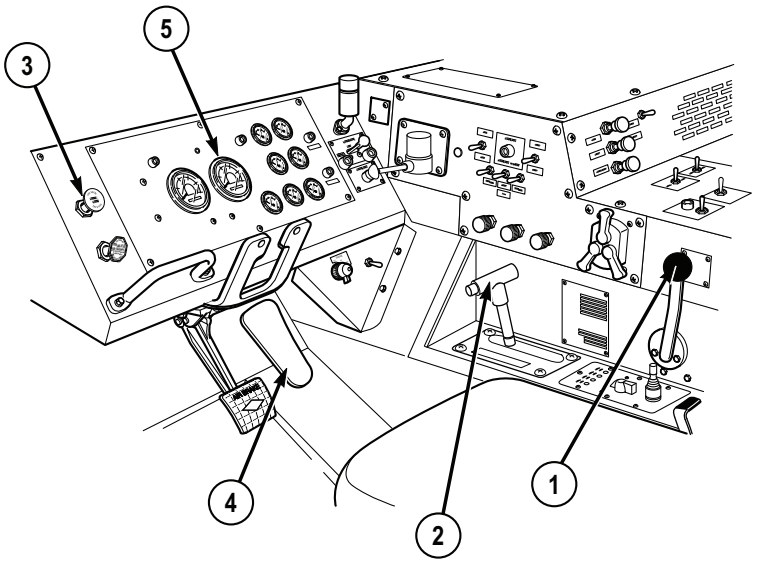


Figure 1.

2. Set transmission range selector (2) to D (drive).
3. Push in PARKING BRAKE control (3).

CAUTION

Maximum no-load governed engine speed is approximately 2250 rpm. Do not let engine speed go above this figure. Under full load, governed speed is approximately 2100 rpm. If engine speed goes above governed speeds, serious engine damage can result.

4. Slowly depress throttle pedal (4) until vehicle reaches desired speed. Tachometer (5) should read 1650 to 2100 rpm.

CAUTION

Do not hold steering wheel at full left or full right position for longer than 10 seconds. Power steering oil can overheat and pump can be damaged.

5. Accelerate, brake, and steer as required.

NOTE

Check system gauges often during vehicle operation. If gauges read other than normal, stop engine and troubleshoot problem.

OPERATE VEHICLE - Continued

6. Check that FUEL gauge (6) shows enough fuel to complete mission.

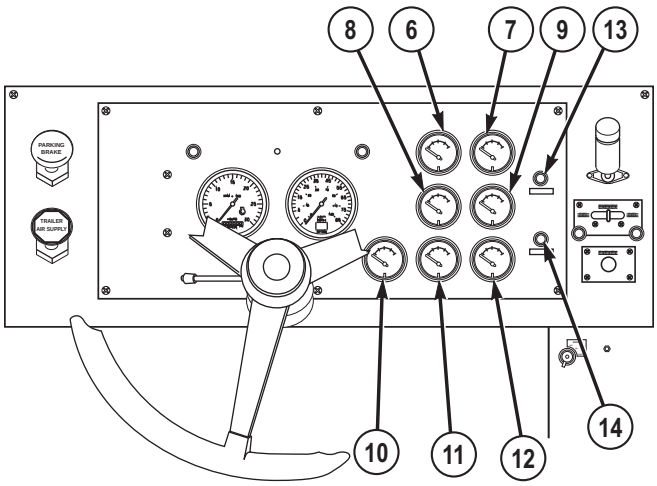


Figure 2.

7. Check that OIL PRESS gauge (7) reads 40 to 70 psi (276 to 483 kPa).
8. Check that TRANS TEMP (transmission temperature) gauge (8) reads 160 to 220° F (71 to 104° C).
9. Check that WATER TEMP gauge (9) reads 180 to 200° F (82 to 93° C).
10. Check that AMPERES gauge (10) reads about zero.
11. Check that BATTERY gauge (11) reads 24 to 28 volts.
12. Check that AIR PRESS gauge (12) red and green needles read 100 to 120 psi (690 to 827 kPa).
13. If OIL-WATER indicator (13) illuminates and buzzer sounds, park vehicle (WP 0056) and notify field level maintenance.
14. If WATER TEMP gauge (9) reads over 230°F (110° C), idle engine until water temperature cools. If water does not cool, shut off engine (WP 0057) and notify field level maintenance.
15. If OIL PRESS gauge (8) reads over 70 psi (483 kPa) or lower than 28 psi (193 kPa), park vehicle (WP 0056), shut off engine (WP 0057), and notify field level maintenance.

OPERATE VEHICLE - Continued

16. If AIR indicator (14) illuminates (red), perform immediate action for loss of air supply system pressure emergency procedures. (WP 0132)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE IN OFF-ROAD CONDITIONS

INITIAL SETUP:

Not Applicable

DRIVE WRECKER IN OFF-ROAD CONDITIONS

CAUTION

Raise and hook mud flaps before operating vehicle off-road. Rear mud flaps can be torn off when working in off-road conditions.

NOTE

- Driver and passenger side mud flaps are raised the same.
- Remove dirt from hole in mud flap before installing to off-road position.

1. Lift up mud flap (1) and turn toward vehicle fender (2).

DRIVE WRECKER IN OFF-ROAD CONDITIONS - Continued

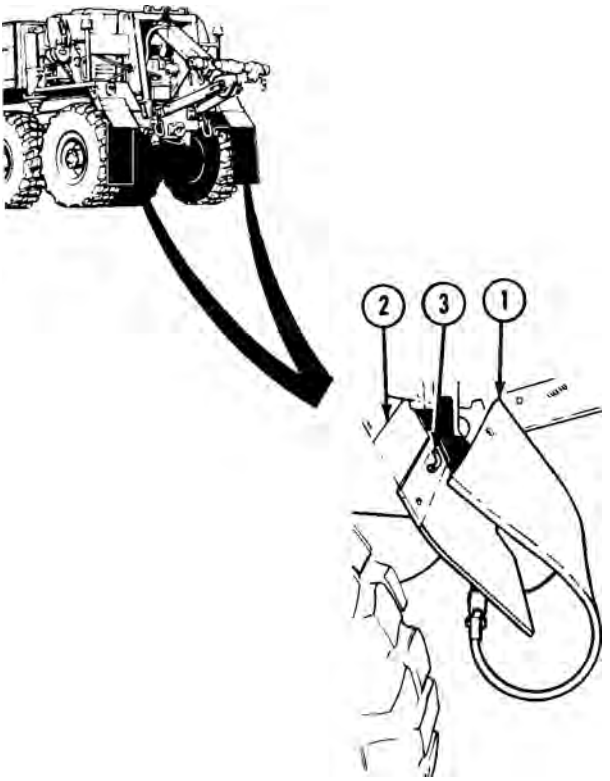


Figure 1.

2. Install mud flap (1) on hook (3).

CAUTION

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

NOTE

8x8 DRIVE indicator (WP 0023) will illuminate when TRANSFER CASE shift lever is positioned to L (LO).

3. Set TRANSFER CASE shift lever (4) to L (LO).

DRIVE WRECKER IN OFF-ROAD CONDITIONS - Continued

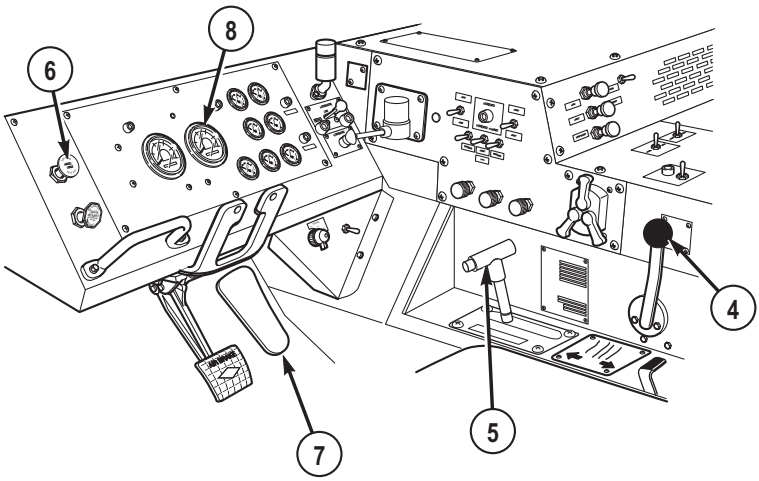


Figure 2.

4. Set transmission range selector (5) to 2 (2nd gear range) or 1 (1st gear range), depending on ground condition. (WP 0048)
5. Push in PARKING BRAKE control (6).

CAUTION

Never let engine exceed maximum no-load governed engine speed (approximately 2250 rpm) or maximum governed engine speed under load (approximately 2100 rpm). If engine is allowed to go over governed engine speeds, serious engine damage may result.

6. Slowly depress throttle pedal (7) until vehicle reaches desired speed. Tachometer (8) should read 1650 to 2100 rpm.

CAUTION

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

7. Accelerate, brake, and steer as required.

NOTE

- When off-road driving is completed, remove mud flaps from off-road position.
- Driver and passenger side mud flaps are removed the same.

DRIVE WRECKER IN OFF-ROAD CONDITIONS - Continued

8. Remove mud flap (1) from hook (3) on vehicle fender (2).

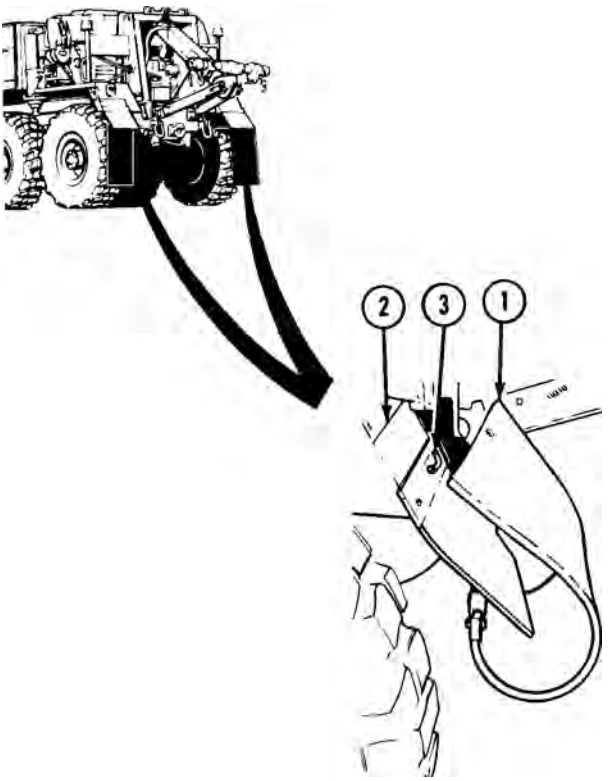


Figure 3.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE UP/DOWN STEEP GRADE

INITIAL SETUP:

Not Applicable

DRIVE VEHICLE UP STEEP GRADE

Press and hold throttle pedal (1) all the way down as vehicle moves up grade. Transmission will automatically downshift gears as needed.

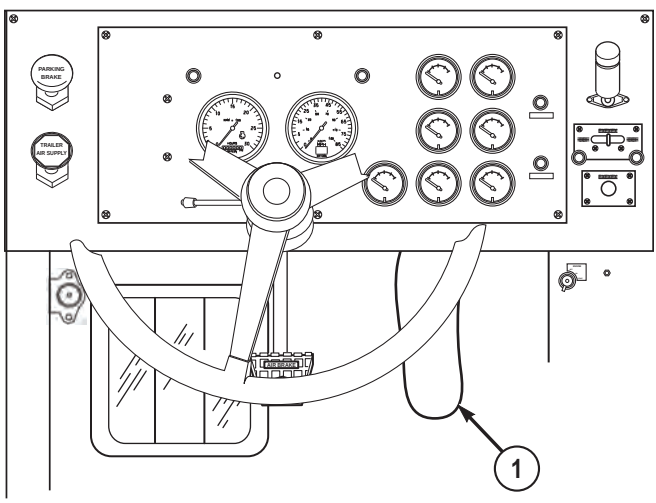


Figure 1.

DRIVE VEHICLE DOWN STEEP GRADE

CAUTION

- Do not allow speed to go above 2100 RPM when driving downhill, or damage to engine can result.
- Engine brake operates best when engine speed is between 1650 and 2100 RPM. Transmission torque converter lockup valve may disengage below 1650 RPM resulting in loss of engine power.

DRIVE VEHICLE DOWN STEEP GRADE - Continued

1. Set transmission range selector (1) to lower range as needed to keep engine speed on tachometer (2) between 1650 and 2100 RPM.

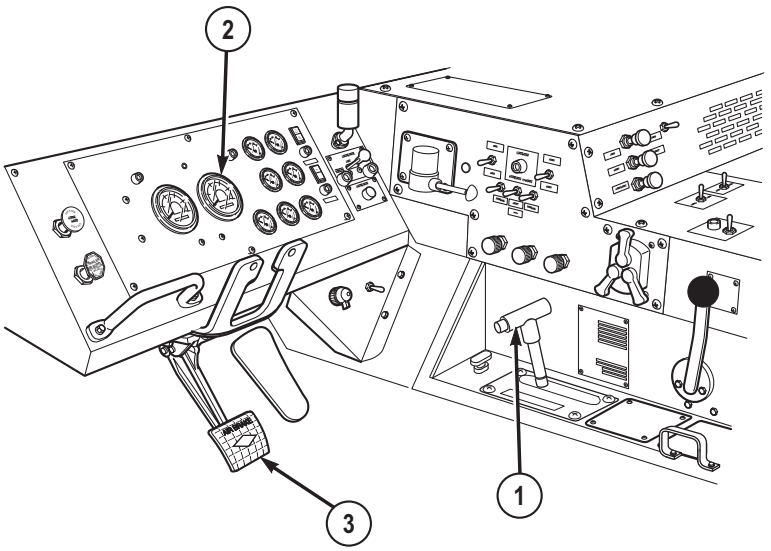


Figure 2.

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.

2. Use service brake pedal (3) as needed to control vehicle speed.
3. Operate engine brake (WP 0049) as required.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
DRIVE VEHICLE IN SLIPPERY CONDITIONS

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE

CAUTION

Do not shift TRACTION CONTROL lever while vehicle is moving. Damage to drive line may result.

NOTE

After TRACTION CONTROL lever is shifted, let vehicle creep forward several feet to allow shift collars to fully engage.

1. If TRANSFER CASE shift lever (1) is set to LO, 8X8 DRIVE is automatically engaged and indicator light (2) will illuminate. Set TRACTION CONTROL lever (3) to INTER-AXLE DIFF. LOCK. Indicator light (4) will illuminate.

OPERATE VEHICLE - Continued

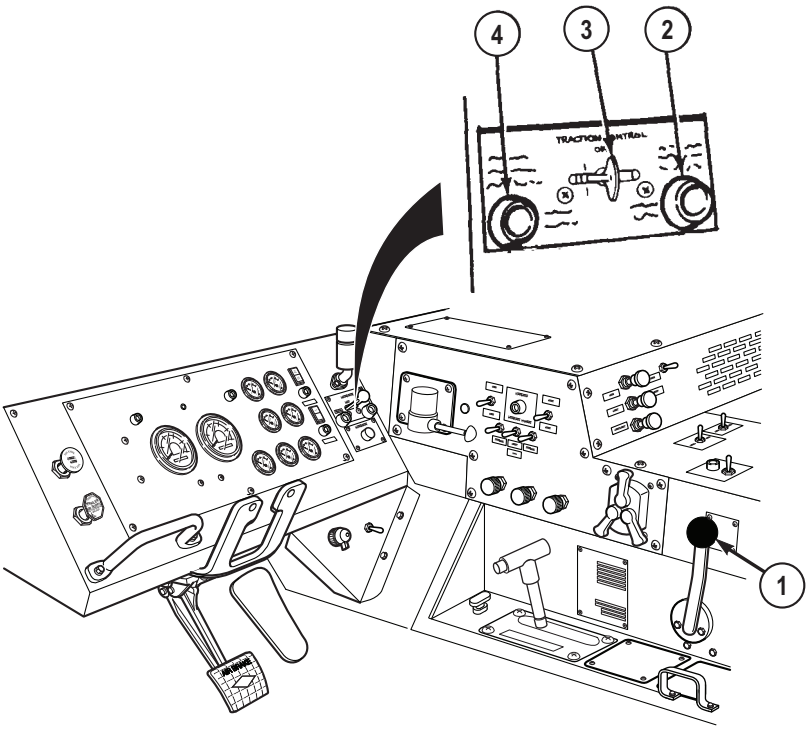


Figure 1.

2. If TRANSFER CASE shift lever (1) is set to HI, set TRACTION CONTROL lever (3) to 8X8 DRIVE. Indicator light (2) will illuminate.

CAUTION

Do not shift TRACTION CONTROL lever while vehicle is moving. Damage to drive line may result.

NOTE

After TRACTION CONTROL lever is set to OFF position, let vehicle creep forward several feet to allow shift collars to fully disengage.

OPERATE VEHICLE - Continued

3. When vehicle gets good traction again, stop vehicle and set TRACTION CONTROL lever (3) to OFF. Indicator light (2 or 4 as applicable) will go out.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PARK VEHICLE

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE

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

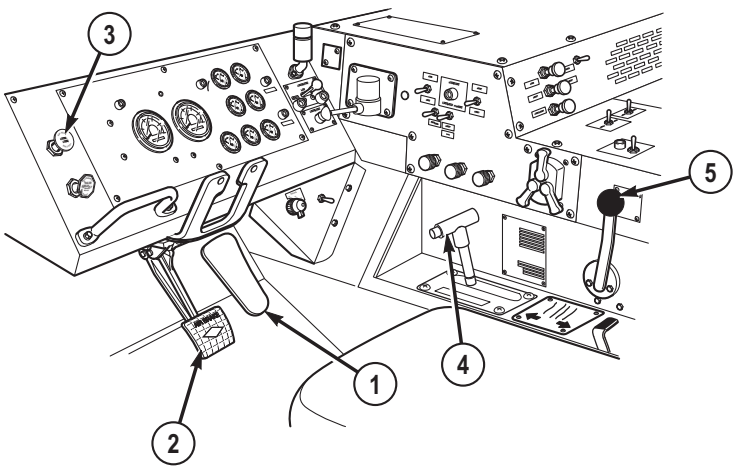


Figure 1.

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.

2. Push down on service brake pedal (2) until vehicle comes to complete stop.
3. Pull out PARKING BRAKE control (3).

OPERATE VEHICLE - Continued

4. Set transmission range selector (4) to N (neutral).
5. Leave TRANSFER CASE shift lever (5) set to HI or LO.
6. Align front tires in straight-ahead position.
7. Install wheel chocks (WP 0100) as required.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SHUT OFF ENGINE

INITIAL SETUP:

Not Applicable

SHUT OFF ENGINE

1. Park vehicle. (WP 0056)

CAUTION

Before shutting down engine, run at reduced speed (800 to 1000 rpm) at no-load for three to five 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 pedal (1) until tachometer (2) reads 800 to 1000 rpm for three to five minutes.

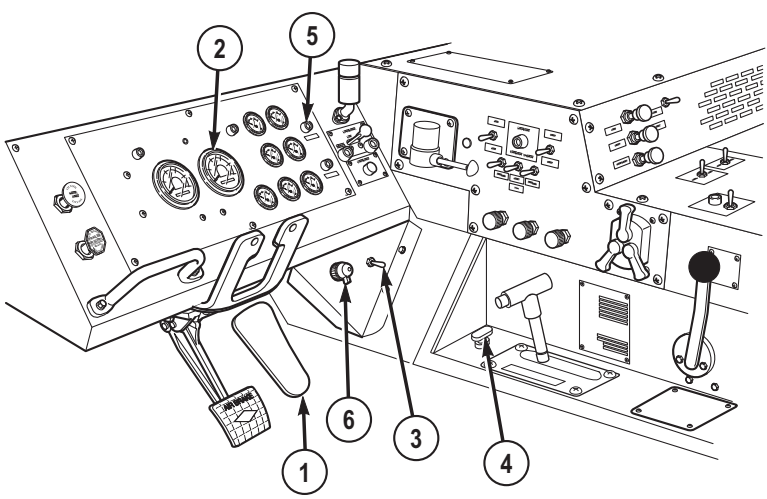


Figure 1.

3. Lift foot off throttle pedal (1).

SHUT OFF ENGINE - Continued

NOTE

Vehicle may have either ENGINE STOP switch or engine shut down handle, it will never have both.

4. Hold ENGINE STOP switch (3) all the way down, or pull engine shut down handle (4) all the way up until engine shuts down. Buzzer will sound, and OIL-WATER indicator (5) will light.
5. Release ENGINE STOP switch (3) or push engine shut down handle (4) back in.
6. Turn ENGINE switch (6) to OFF. Buzzer and OIL-WATER indicator (5) will go out.

CAUTION

Failure to place light switches in OFF position when vehicle is not in use may cause damage to equipment.

7. Turn off lights as required.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RETRIEVAL TOWING SYSTEM

INITIAL SETUP:

Not Applicable

INTRODUCTION

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

CAUTION

- Extreme care must be used when towing the disabled vehicle to prevent further damage to disabled vehicle. Failure to comply may result in damage to equipment.
- Both tow cylinders must be fully retracted before towing the disabled vehicle, or damage to tow cylinders may result.
- Both rear towing shackles must be removed from rear tow eyes on M984A wrecker before performing retrieval operations or damage to tow cylinder may result.
- Ensure vehicle to be towed does not exceed wrecker maximum weight restrictions. Operator should take into account vehicle to be towed payload, and armor configuration - both of which may add a significant amount of weight. Failure to comply may result in damage to equipment.

INTRODUCTION - Continued

NOTE

- When possible, front towing is preferred for larger vehicles, because braking can be controlled to the rear of most vehicles with the towing air lines.
- The disabled vehicle's operator manual must be checked for towing preparation before the vehicle is towed.
- For detailed instructions on towing procedures refer to FM 4-30.31.
- Because of M984A wrecker rigid retrieval system, ALL OFF-ROAD TOWING must be performed with towed vehicle's front or rear tires lifted off ground.

The M984A wrecker is capable of towing a wide range of vehicles. The towing cylinders and crosstube attach to the disabled vehicle by means of adapters that mount on the crosstube. The lift and tow cylinders are used to position the adapters, raise/lower and tow the disabled vehicle. Chains are attached between the wrecker and disabled vehicle for safety purposes.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

TOWING CATEGORIES

1. The M984A wrecker will perform two types of towing.
   a. Lift and Tow (OFF ROAD) - With the retrieval system attached to one end (front or rear) of the disabled vehicle, it is raised as high as possible, but (lifted tires) not more than 1 ft. (30 cm) above the ground.
   b. Tow (HIGHWAY) - With the retrieval system attached (same as lift and tow) to the front of the disabled vehicle, it is towed with all tires on the ground. If required, front or rear of disabled vehicle may be lifted (lifted tires) not more than 1 ft. (30 cm) above the ground. Refer to FM 4-30.31 (Volume 2, WP 0200) for more information.

VEHICLES AND VEHICLE SERIES THE M984A1 WRECKER WILL TOW

Table 2. Vehicles and Vehicle Series.

1. M977	5. M35	9. M966
2. M1074/M1075	6. M911	10. M1008
3. M1070	7. M915	
4. M984A	8. M939	

DISABLED VEHICLE ADAPTERS

NOTE

Refer to M984A Components of End Item (COEI) List (Volume 2, WP 0201) for more information on adapters.

Table 3. Tow Adapters.

Vehicle	Towing Attachment	Adapter	Adapter Stowage Location
M977	Front	A	Crosstube
	Rear	B	Equipment Body
M1074	Front	A	Crosstube
	Rear	B	Equipment Body
M1070	Front	D	Equipment Body
	Rear	B	Equipment Body
M35	Front	F	Equipment Body
	Rear	C	Equipment Body
M911	Front	D	Equipment Body
	Rear	C	Equipment Body
M915	Front	D	Equipment Body

DISABLED VEHICLE ADAPTERS - Continued

Table 3. Tow Adapters. - Continued

Vehicle	Towing Attachment	Adapter	Adapter Stowage Location
	Rear	C	Equipment Body
M939	Front	F	Equipment Body
	Rear	C	Equipment Body
M966	Front	D and G	Equipment Body
	Rear	D and G	Equipment Body
M1008	Front	F	Equipment Body
	Rear	E	Equipment Body

DISABLED VEHICLE ADAPTERS - Continued

Table 3. Tow Adapters. - Continued

Vehicle	Towing Attachment	Adapter	Adapter Stowage Location

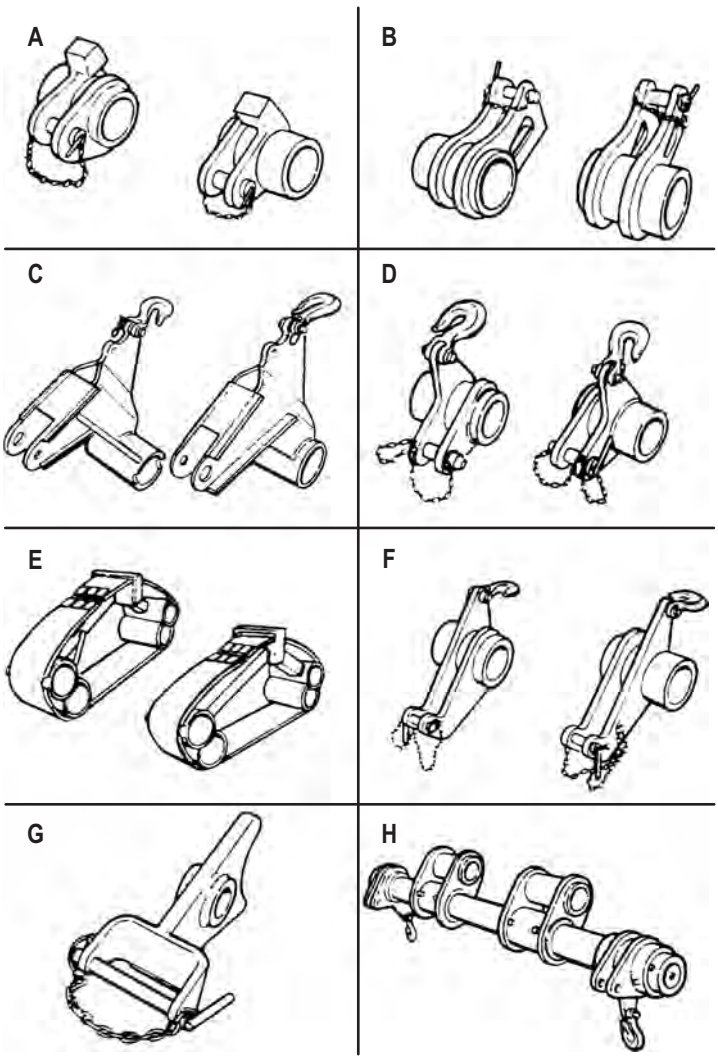


Figure 1.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
RETRIEVAL SYSTEM OPERATION

INITIAL SETUP:

Not Applicable

PREPARE RETRIEVAL SYSTEM FOR OPERATION

1. Set up rear beacon lights. (WP 0096)
2. Start engine. (WP 0044)
3. Set PTO ENGAGE switch (1) to ON position. Indicator light (2) will illuminate.

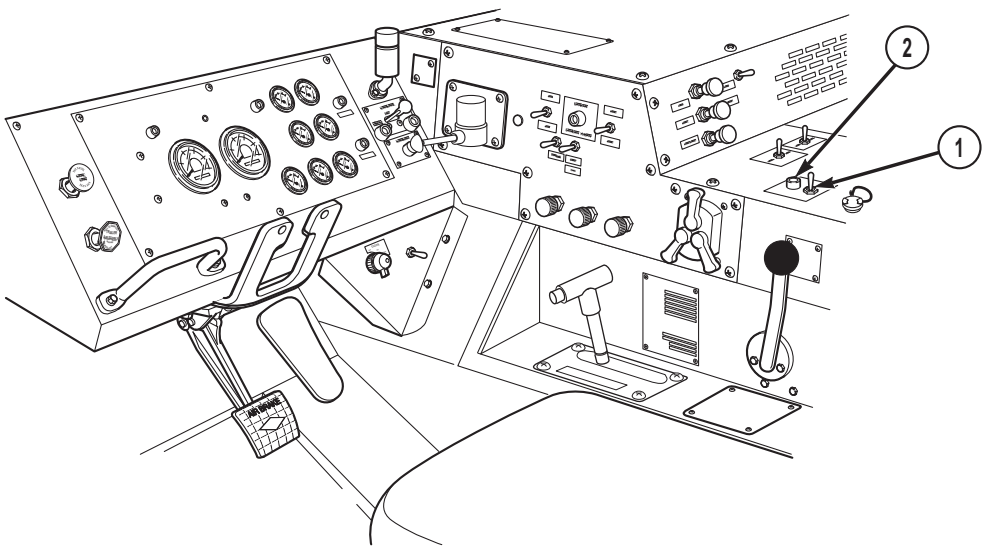


Figure 1.

4. Position M984A wrecker in front of disabled vehicle as required.
5. Set POWER switch (3) to ON position.

PREPARE RETRIEVAL SYSTEM FOR OPERATION - Continued

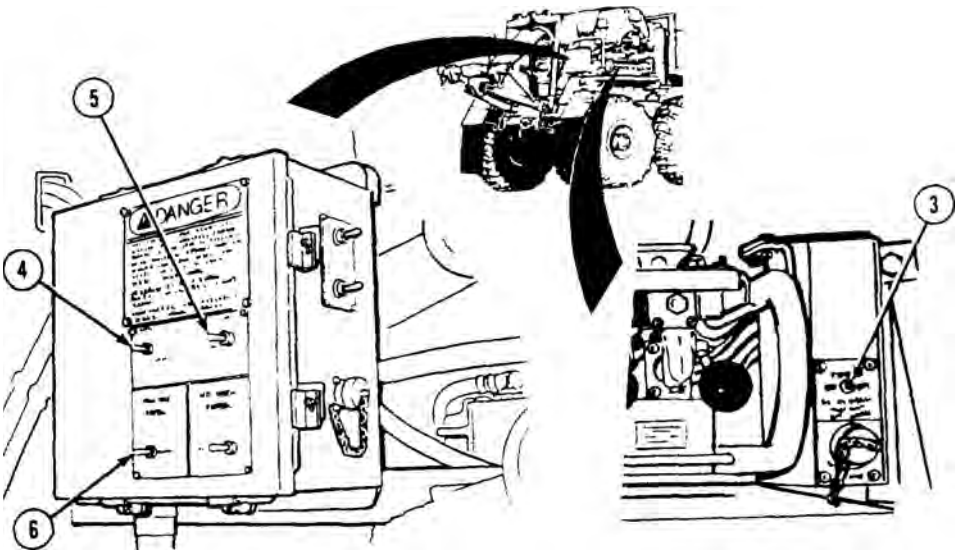


Figure 2.

6. Set POWER switch (4) to ON position (LOW IDLE ONLY).
7. Set HIGH IDLE switch (6) to CONTINUOUS.
8. Push and release LATCH switch (5). Engine speed will increase to approximately 1500 rpm.

POSITION RETRIEVAL SYSTEM

1. To operate right tow cylinder, push RIGHT TOW CYLINDER control lever (1) in to retract right tow cylinder (2), and pull RIGHT TOW CYLINDER control lever out to extend right tow cylinder.

POSITION RETRIEVAL SYSTEM - Continued

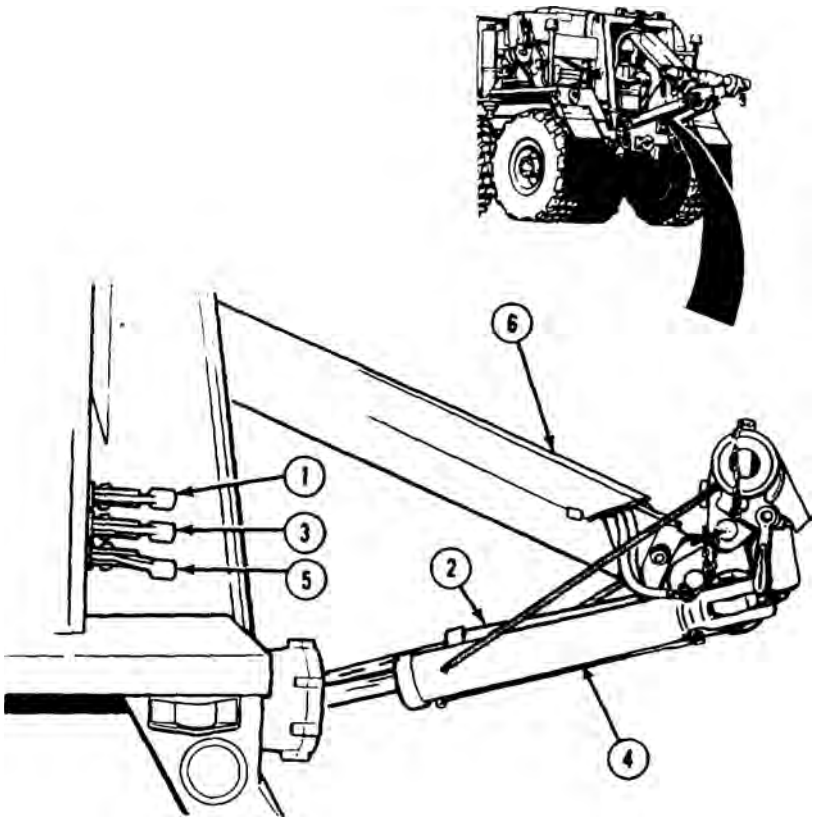


Figure 3.

2. To operate left tow cylinder, push LEFT TOW CYLINDER control lever (3) in to retract left tow cylinder (4), and pull LEFT TOW CYLINDER control lever out to extend left tow cylinder.
3. To operate lift cylinder, push LIFT CYLINDER control lever (5) in to retract lift cylinder (6) and pull LIFT CYLINDER control lever out to extend lift cylinder.

STOW LIFT CYLINDER

Fully retract lift cylinder (6), then operate LIFT CYLINDER CONTROL lever (5) forward just enough to relieve pressure.

STOW LIFT CYLINDER - Continued

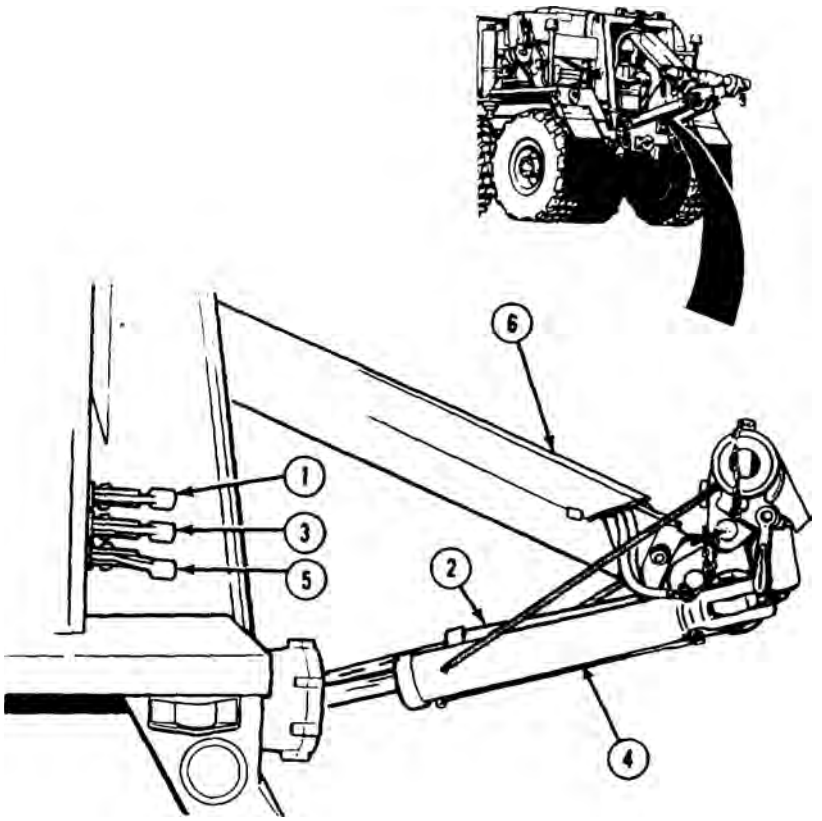


Figure 4.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW HEMTT- FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

2. Remove two rear towing shackles from wrecker:

HOOKUP - Continued

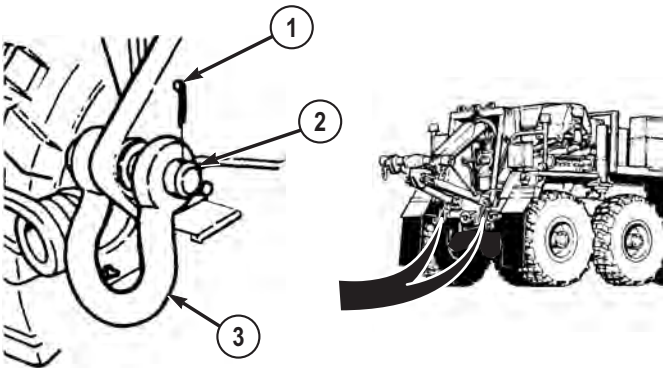


Figure 1.

a. Remove cotter pin (1), pin (2), and towing shackle (3).

b. Replace pin (2) in shackle (3), and cotter pin (1) in pin (2).

c. Repeat Steps (a) and (b) for opposite side towing shackle (3).

d. Stow two rear towing shackles on wrecker vehicle.

3. Pull LIFT CYLINDER control lever (4) to lower cross tube (5) to approximately 3 ft. (1 m) above ground.

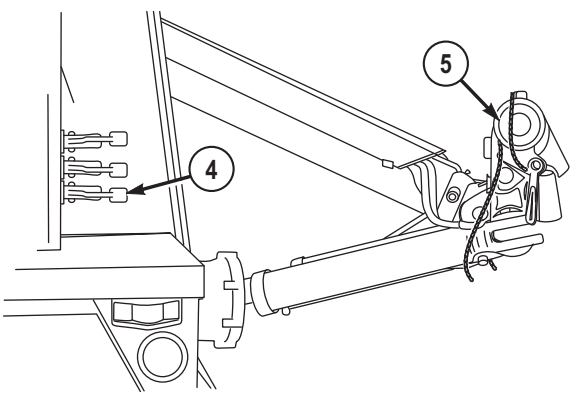


Figure 2.

HOOKUP - Continued

4. Position wrecker so that cross tube (5) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.
5. Turn adapters (6) so pins (7) are on top. Remove two quick pins (8) and pins (7) from adapters (6).

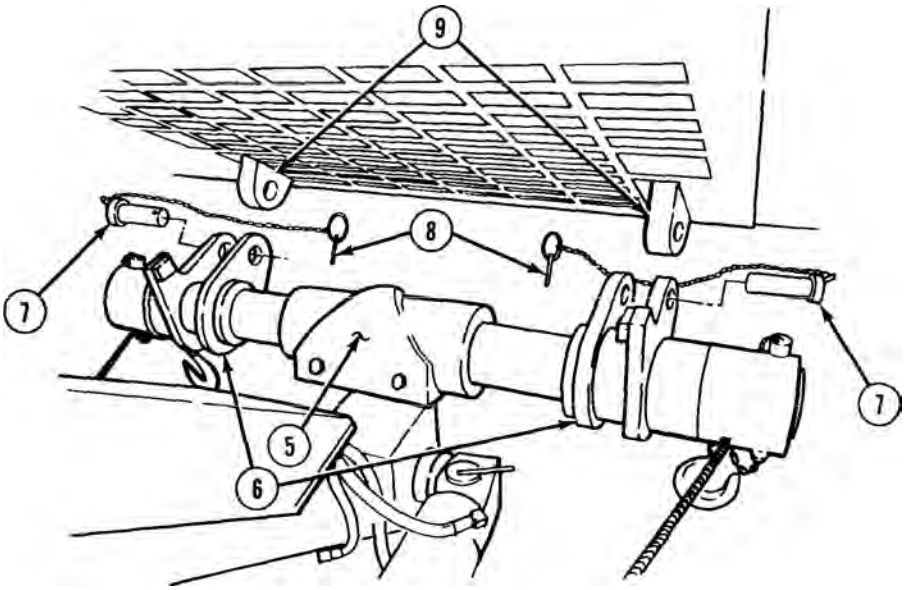
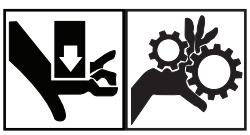


Figure 3.

WARNING



Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

6. Operate retrieval system, and with aid of an assistant position cross tube (5) so holes in adapters (6) align with holes of front tow eyes (9).
7. Insert two pins (7) through adapters (6) and holes of front tow eyes (9). Install quick pins (8) in pins (7).

HOOKUP - Continued

NOTE

If disabled vehicle air system is inoperative, manually release spring brakes (WP 0129).

8. Push in PARKING BRAKE control (10) on disabled vehicle.

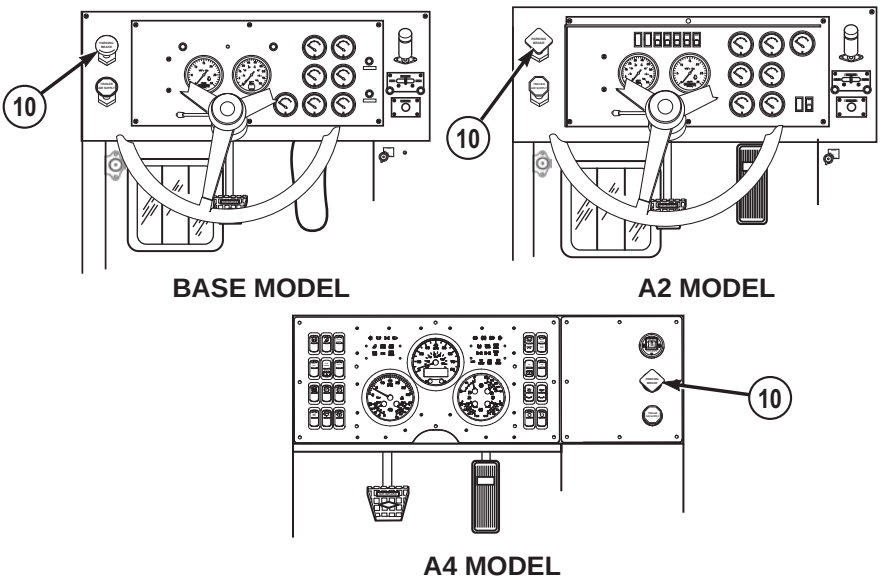


Figure 4.

9. Operate retrieval system until tow cylinders (11) are fully retracted.

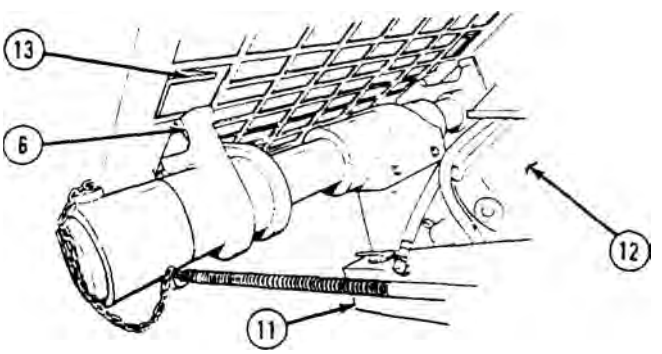


Figure 5.

HOOKUP - Continued

10. Operate retrieval system and retract lift cylinder (12) until adapters (6) contact frame (13) of disabled vehicle.
11. Remove two air lines (14) from stowage and attach to rear gladhands (15) on wrecker.

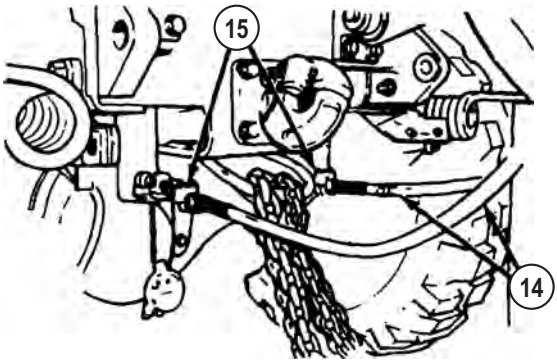


Figure 6.

CAUTION

Do not route air lines between retrieval cylinders or damage to equipment may result.

NOTE

- Driver side rear air line from wrecker must be connected to driver side front gladhand on disabled vehicle. Passenger side rear air line from wrecker must be connected to passenger side front gladhand on disabled vehicle.
- gladhands on all models of HEMTT series vehicle are similar in appearance and location. BASE/A2 model shown.

12. Route air lines (14) over cross tube (5) and attach to front gladhands (16) on disabled vehicle.

HOOKUP - Continued

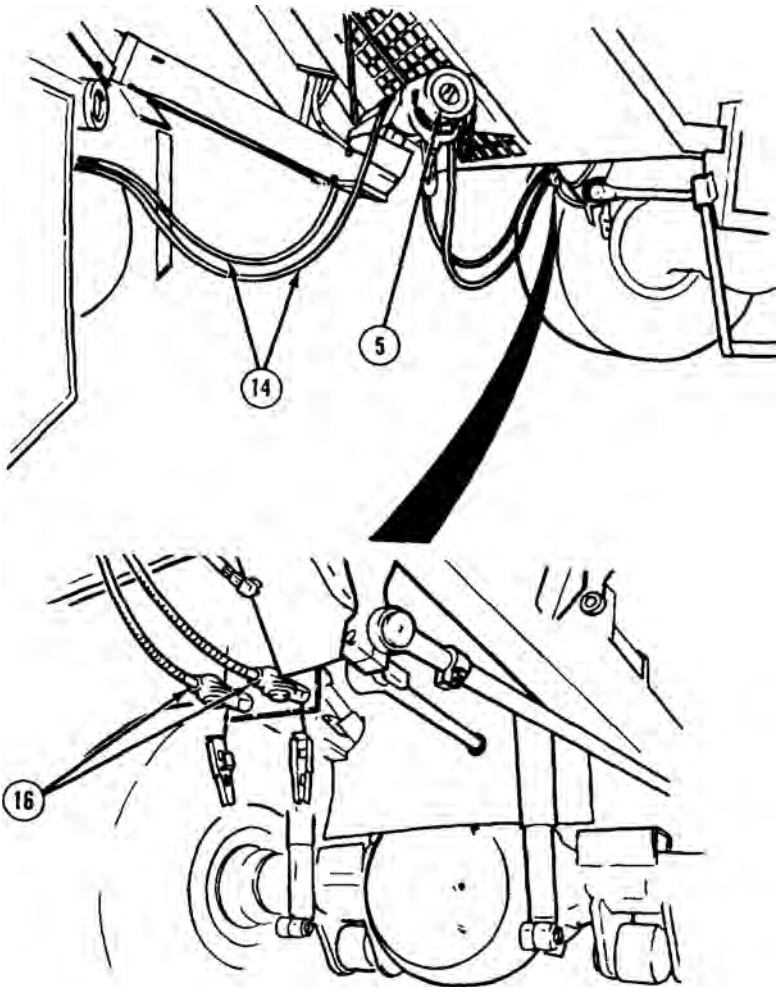


Figure 7.

13. Remove two 16 ft. (5 m) safety chains (17) from wrecker stowage.

CAUTION

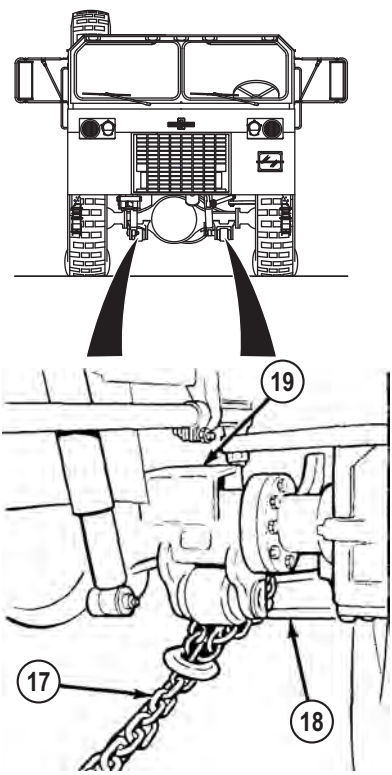
Care must be taken to identify which model of HEMTT series vehicle is being towed (refer to data plate on inside of driver side door). Safety chain attachment points depend on model of HEMTT series vehicle. Failure to comply may result in damage to equipment.

HOOKUP - Continued

NOTE

- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (15).
- If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (16).

14. Route end of 16 ft. (5 m) safety chain (17) without safety shackle over walking beam (18) behind No. 1 axle (19) on disabled vehicle and hook 16 ft. (5 m) safety chain (17) back into itself under walking beam (18) as shown.



BASE/A2 MODELS

Figure 8.

CAUTION

Special care should be taken when connecting 16 ft. (5 m) safety chain to tie down ring. The procedure listed below routes the 16 ft. (5 m) safety

HOOKUP - Continued

chain in such a way to minimize excessive contact with vehicle air suspension air springs during towing. Failure to comply may result in damage to equipment.

NOTE

Both driver side and passenger side tie down rings are same. Driver side shown.

15. Connect 16 ft. (5 m) safety chain (17) to disabled vehicle tie down ring (20):

    a. Route end (without safety shackle) of 16 ft. (5 m) safety chain (17) through tie down ring (20) from inboard to outboard until grab hook (21) hangs just below bottom of air spring (22).

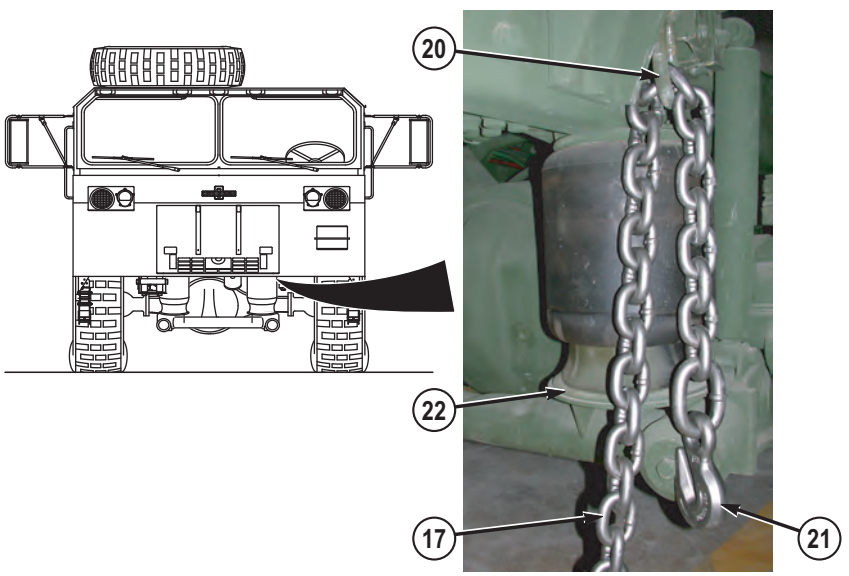


Figure 9.

    b. Hook 16 ft. (5 m) safety chain (17) back to itself. Grab hook (21) should open towards ground (shown) when tension is applied to 16 ft. (5 m) safety chain (17).

HOOKUP - Continued

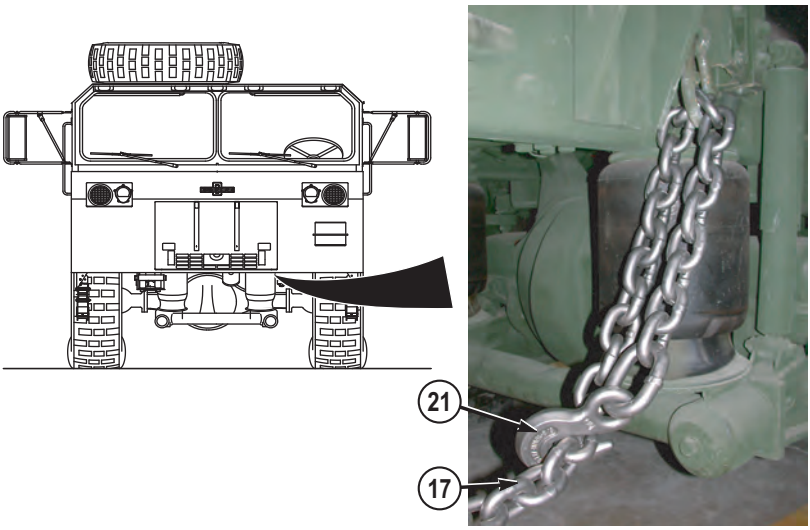


Figure 10.

16. Repeat Step (15) or (16) for other side of disabled vehicle (as applicable).

NOTE

Adjust chain slack so safety chains are approximately 6 in. (15 cm) above the ground.

17. Route two safety chains (17) through safety chain hoop (23) on wrecker, hook 16 ft. (5 m) safety chain (17) back to itself, and secure grab hook (24) with safety shackle (25).

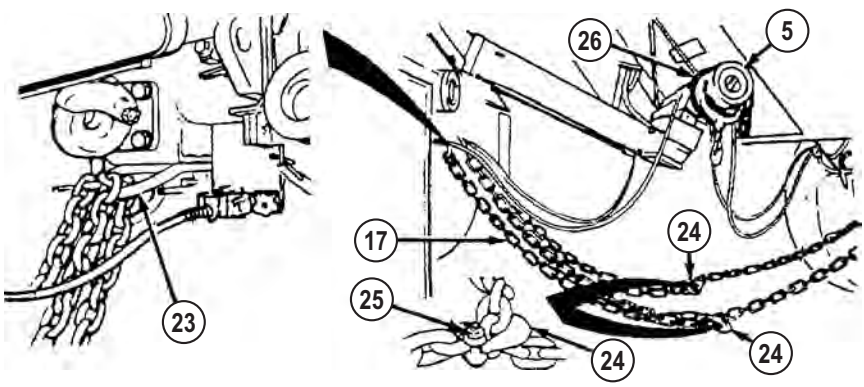


Figure 11.

HOOKUP - Continued

18. Wrap two springs (26) around cross tube (5) and secure.
19. Prepare disabled vehicle for towing. (Volume 2, WP 0190)
20. Remove emergency tow lights (27) and two brackets (28) from wrecker stowage.

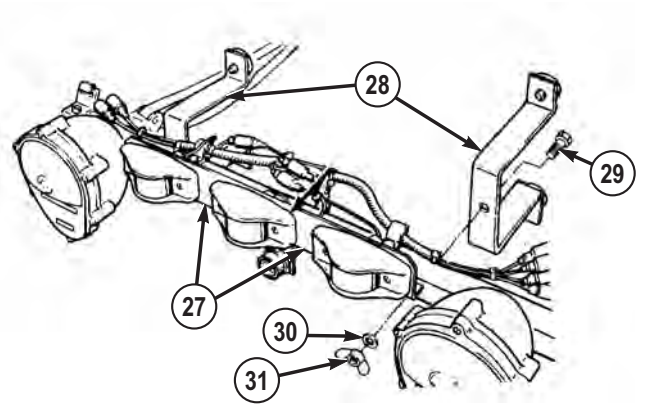


Figure 12.

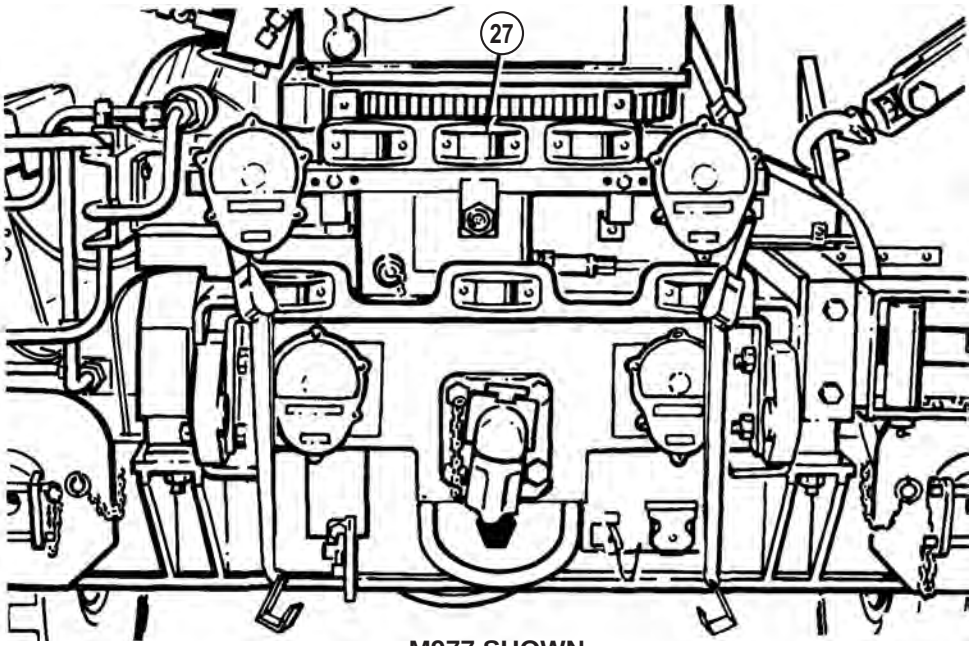
21. Install two brackets (28) in outside holes of emergency tow lights (27) with two screws (29), washers (30), and nuts (31).

NOTE

Exact placement of emergency light straps varies from model to model. Secure emergency light straps to parts of disabled vehicle that will not move during towing.

22. Position emergency tow lights (27) and straps (32) securely on disabled vehicle:

HOOKUP - Continued



M977 SHOWN

Figure 13.

a. Press in handle (33) on strap clamp (34) and pull strap (32) to lengthen.

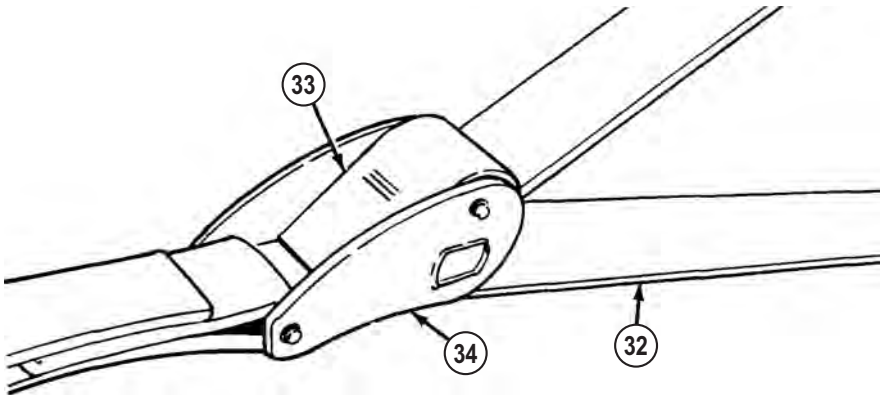


Figure 14.

b. Secure top strap hooks to area of vehicle (M977 shown) that will not move and lower strap hooks (35) to safety chain hoop (23).

HOOKUP - Continued

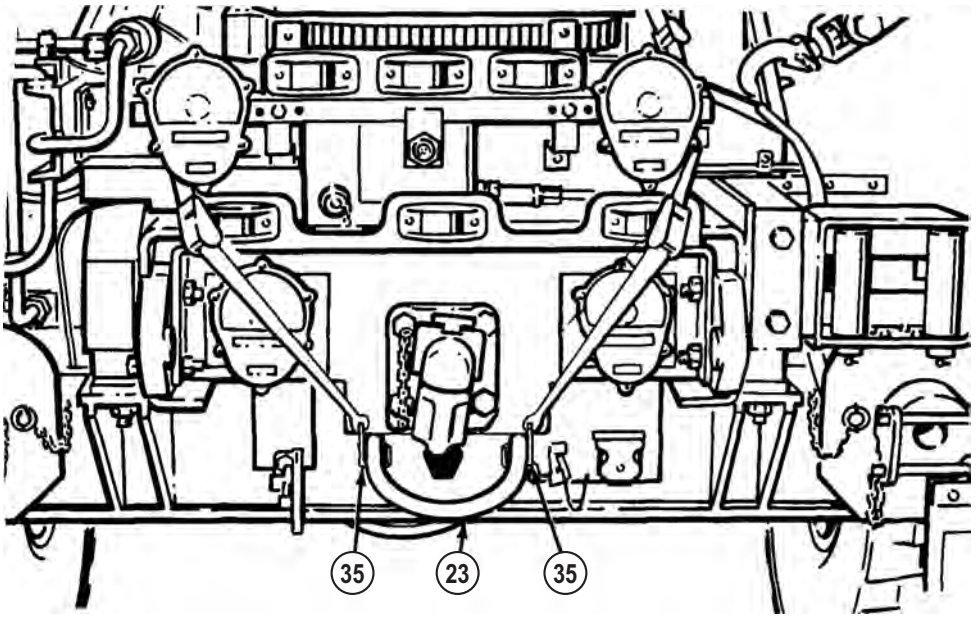


Figure 15.

23. Remove tow light cable (36) from stowage and connect to rear electrical connector (37) on wrecker.

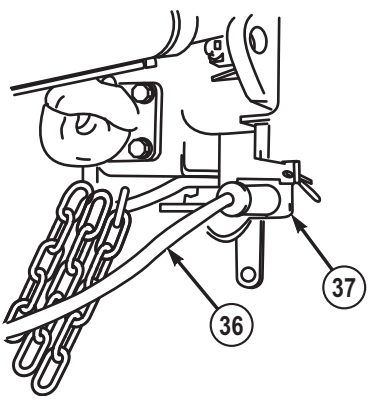


Figure 16.

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

24. Route other end of tow light cable (36) to emergency tow lights (27) on disabled vehicle, and plug in at connector (38).

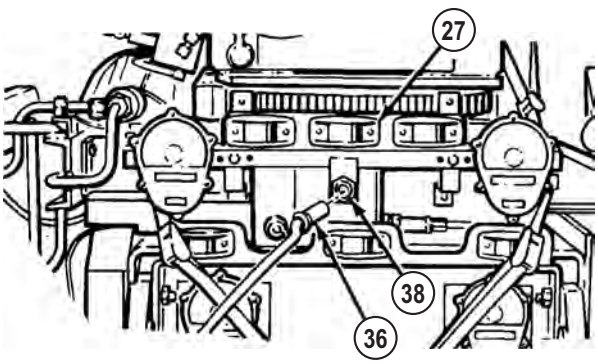


Figure 17.

CAUTION

If disabled vehicle is to be towed with all tires in contact with road, this procedure can be accomplished on paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (27).

25. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Skip to Step (30).

NOTE

- If disabled vehicle is BASE/A2 HEMTT series vehicle (refer to data plate on inside of drivers door) continue with Step (27).
- If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of drivers door) skip to Step (28).

26. Install steering lock bracket (39) on disabled vehicle:

HOOKUP - Continued

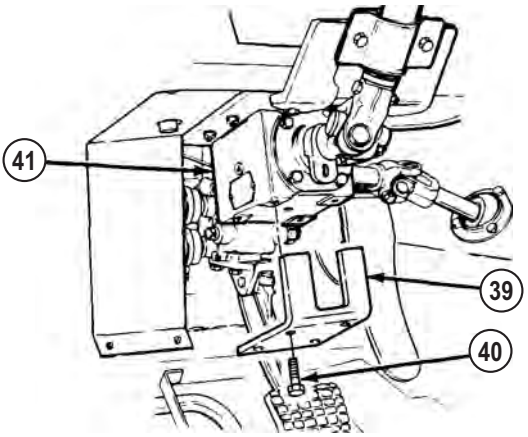


Figure 18.

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 10 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lock bracket (39) and four screws (40) from stowage.

c. Install steering lock bracket (39) on 90 degree gearbox (41) with four screws (40).

NOTE

If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of drivers door) continue with Step (28).

27. Install steering lockpin (42) on disabled vehicle:

HOOKUP - Continued

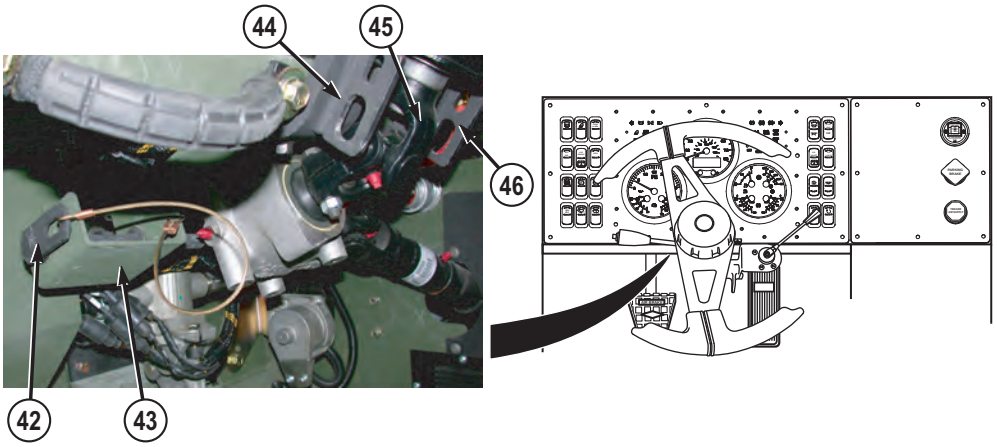


Figure 19.

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 10 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lockpin (42) from stowage bracket (43) under driver side dash panel.

NOTE

It may be necessary to turn steering wheel to line up steering column yoke with holes in locking bracket.

c. Install steering lockpin (42) through left hole (44) of lock bracket, steering column yoke (45), and right hole (46) of lock bracket.

d. Rotate steering lockpin (42) to align hole in steering lockpin handle with upper hole in lock bracket and install lock (47).

HOOKUP - Continued

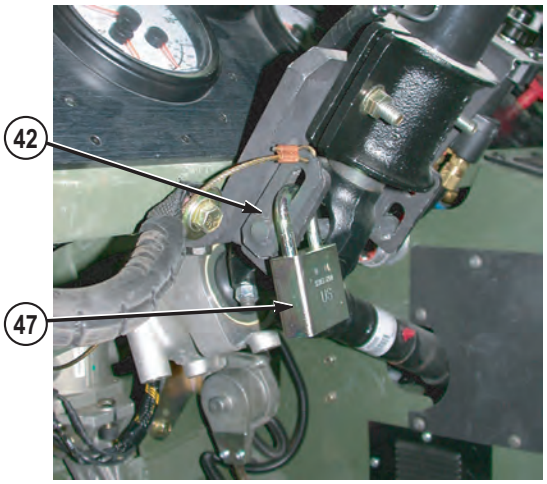


Figure 20.

CAUTION

When lifting and towing an A4 HEMTT series vehicle (refer to data plate on inside of drivers side door) special care must be taken to avoid causing damage to the vehicle air suspension system. Always turn No. 1 axle (front lift only) air suspension ball valves OFF prior to lifting the A4 HEMTT series vehicle (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information). Failure to comply may result in damage to equipment.

NOTE

- If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (29).
- If disabled vehicle is BASE or A2 HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (29).

28. Position disabled vehicle No. 1 axle driver side (shown) and passenger side ball valve handles (48) OFF (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information).

HOOKUP - Continued

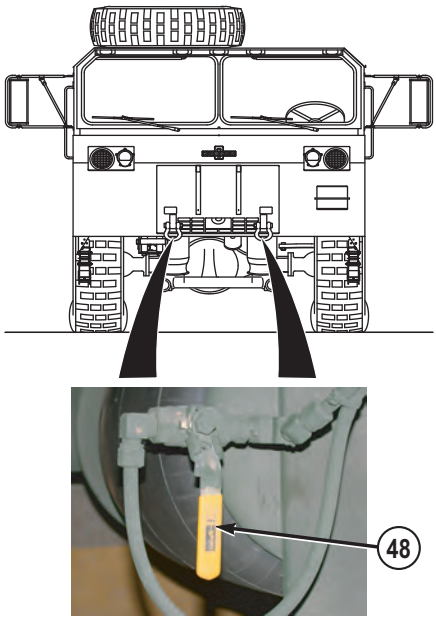


Figure 21.

29. Set POWER switch (49) to ON position.

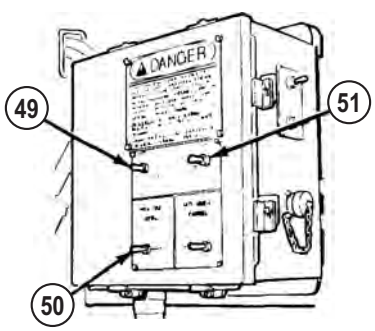


Figure 22.

30. Set HIGH IDLE switch (50) to CONTINUOUS.
31. Push and release LATCH switch (51). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

32. Push LIFT CYLINDER control lever (4) to retract lift cylinder (12) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

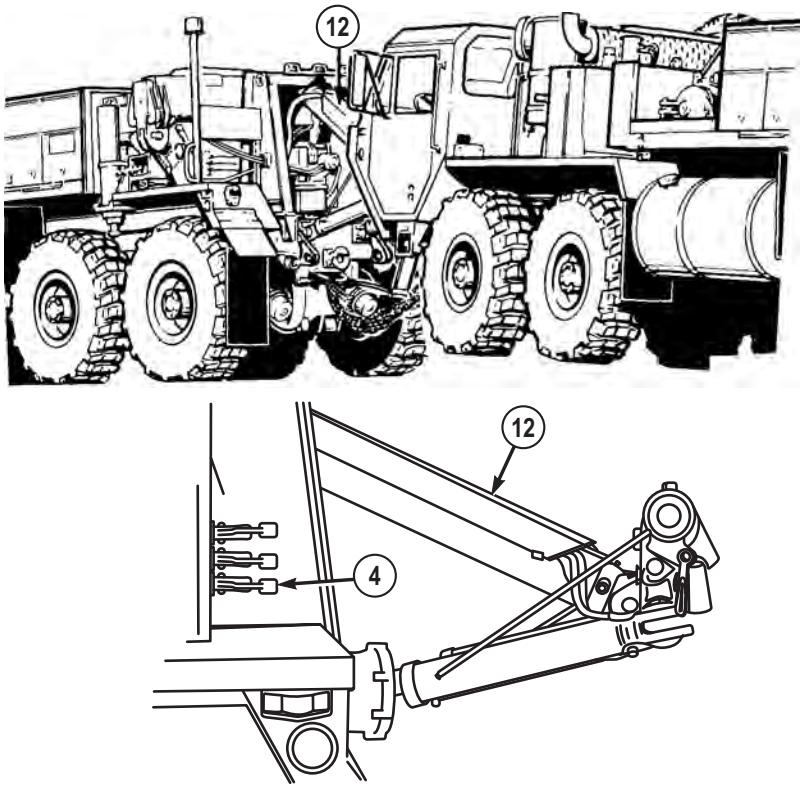


Figure 23.

33. Set POWER switch (52) to OFF position.

HOOKUP - Continued

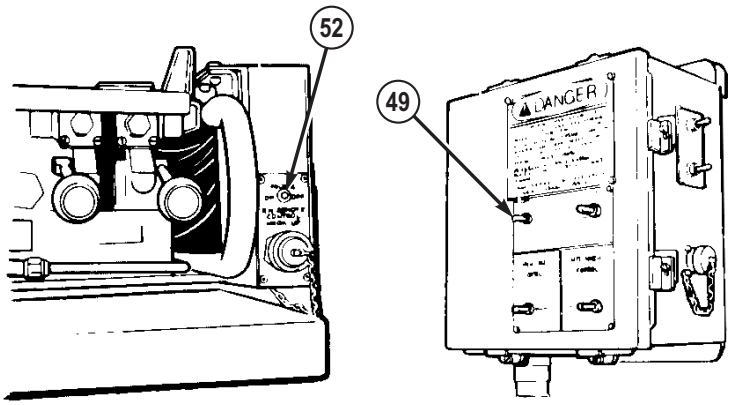


Figure 24.

34. Set POWER switch (49) to OFF position.
35. Set PTO ENGAGE switch (53) to OFF position. Indicator light (54) will go out.

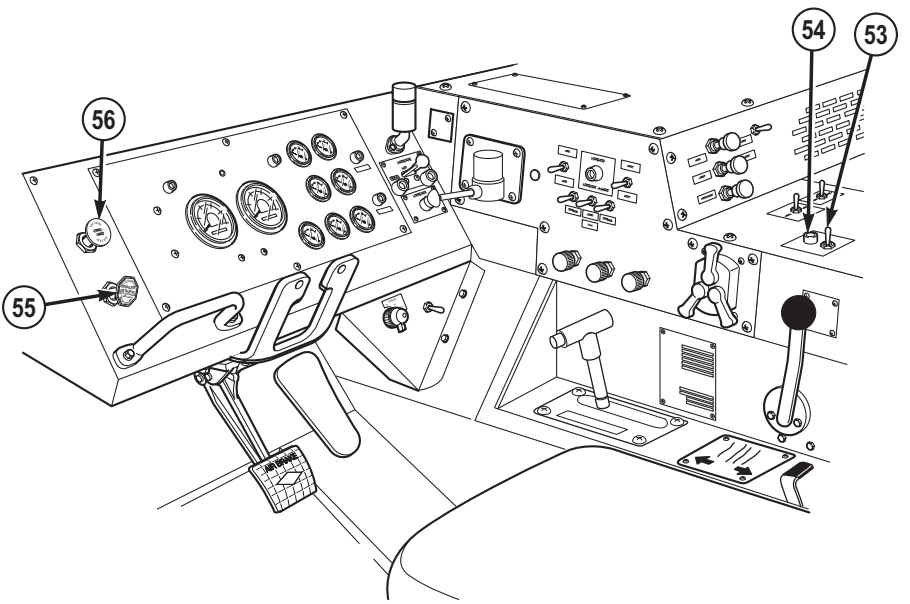


Figure 25.

36. Push in TRAILER AIR SUPPLY control (55).
37. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

38. Turn on wrecker emergency flashers. (WP 0099)
39. Turn on disabled vehicle emergency flashers (refer to operator's manual).
40. Push in PARKING BRAKE control (56).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

41. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

DISCONNECT - Continued

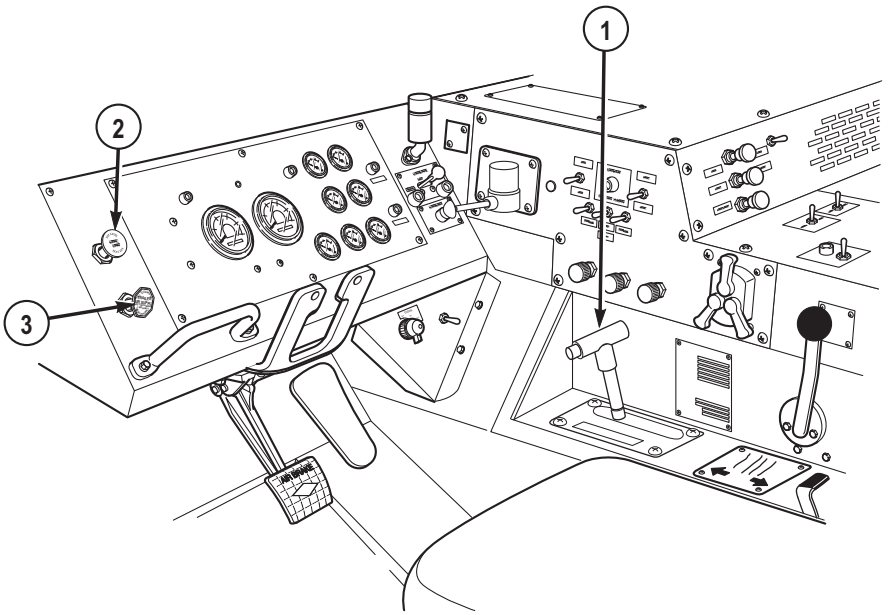


Figure 26.

2. Pull out PARKING BRAKE control (2).
3. Pull out TRAILER AIR SUPPLY control (3).

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 in. (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation (WP 0059) and pull LIFT CYLINDER control lever (4) and lower disabled vehicle to ground.

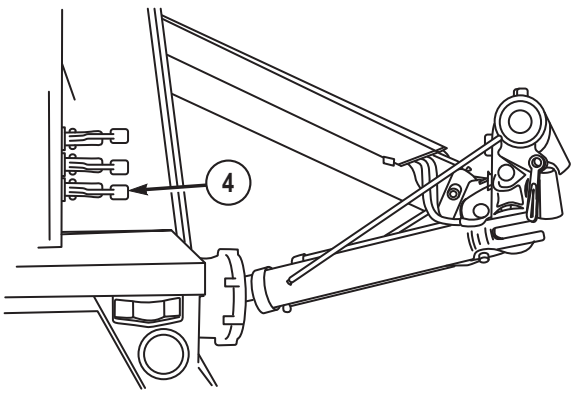


Figure 27.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

5. Pull out PARKING BRAKE control (5) on disabled vehicle.

DISCONNECT - Continued

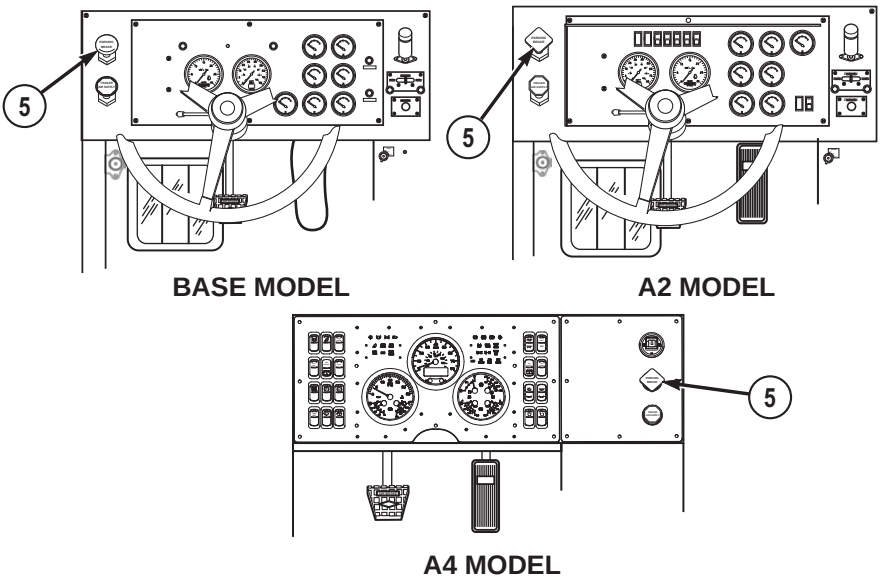


Figure 28.

6. Remove tow light cable (6) from wrecker.

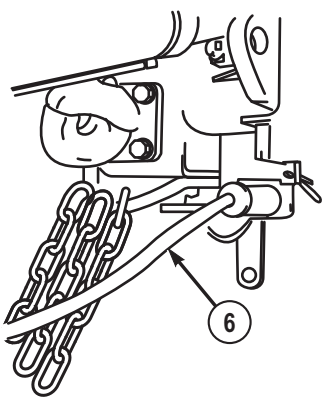


Figure 29.

7. Remove tow light cable (6) from connector (7) and return to wrecker stowage.

DISCONNECT - Continued

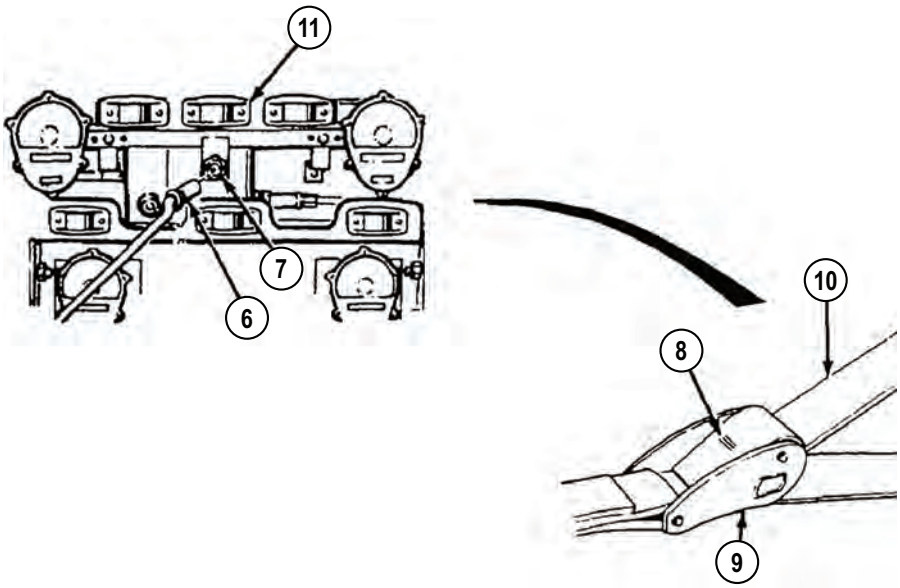


Figure 30.

8. Press in handle (8) on strap clamp (9). Pull strap (10) to loosen straps on emergency tow lights (11).
9. Remove emergency tow lights (11) from disabled vehicle.
10. Remove two nuts (12), washers (13), screws (14), and brackets (15) from emergency tow lights (11).

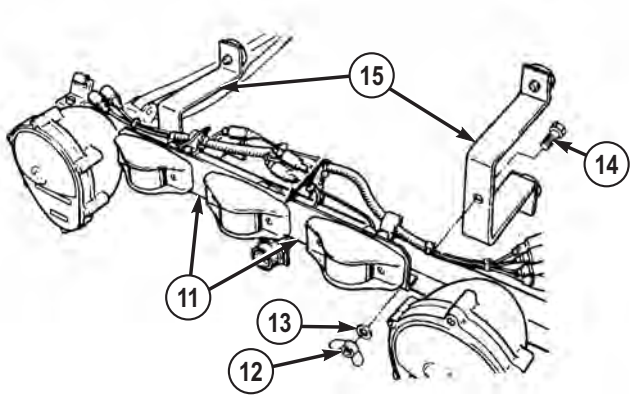


Figure 31.

DISCONNECT - Continued

11. Return emergency tow lights (11) and brackets (15) to wrecker stowage.
12. Remove two 16 ft. (5 m) stow safety chains (16) and air lines (17) from wrecker and disabled vehicle. Return two 16 ft. (5 m) stow safety chains (16) and air lines (17) to wrecker stowage.

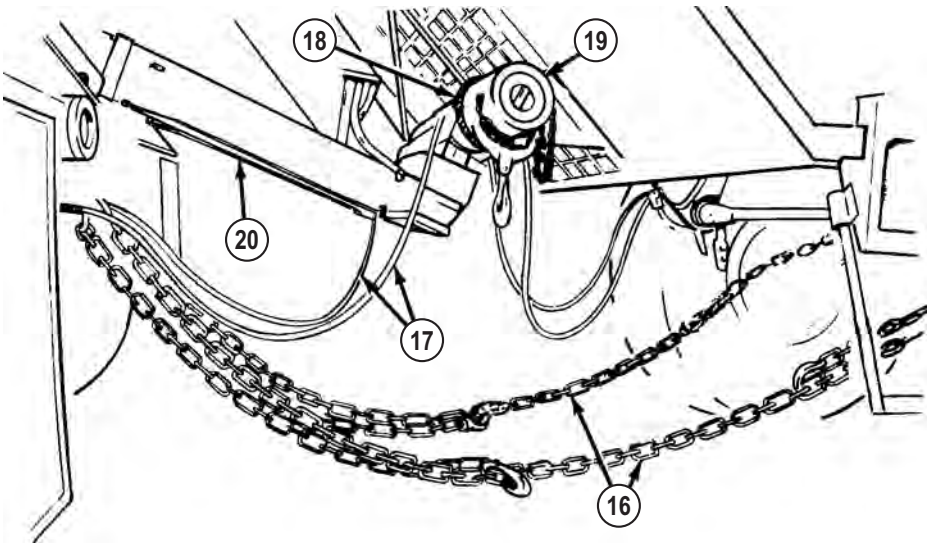


Figure 32.

13. Unwrap two springs (18) from cross tube (19).
14. Connect two springs (18) to tow cylinders (20).
15. Operate retrieval system, and with the aid of an assistant position cross tube (19) to relieve tension from adapters (21).

DISCONNECT - Continued

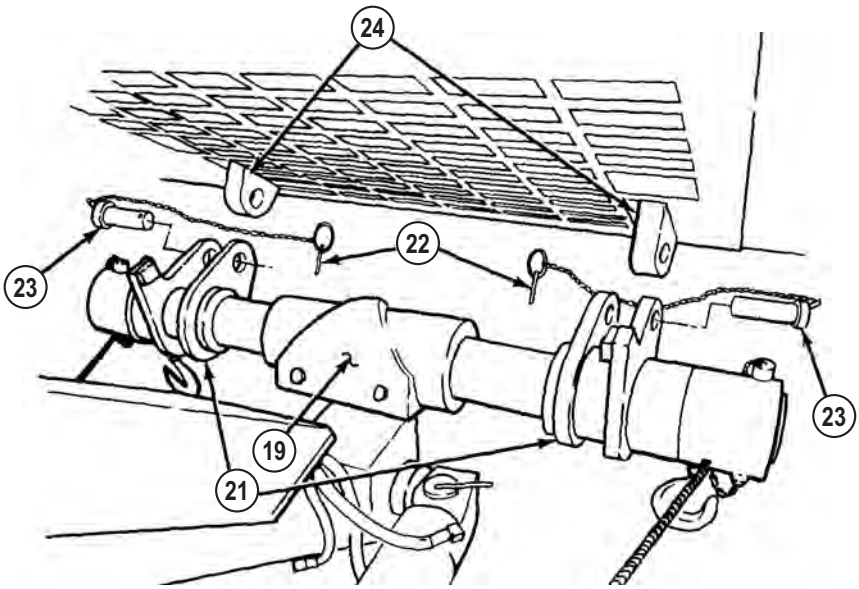


Figure 33.

16. Remove two quick pins (22) and pins (23) from adapters (21).
17. Remove two adapters (21) from tow eyes (24) on disabled vehicle.
18. Install two pins (23) in adapters (21).
19. Install two quick pins (22) in pins (23).
20. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)
21. Operate retrieval system and fully retract lift cylinder (25) and tow cylinders (26).

DISCONNECT - Continued

Figure 34.

22. Set POWER switch (30) to OFF position.

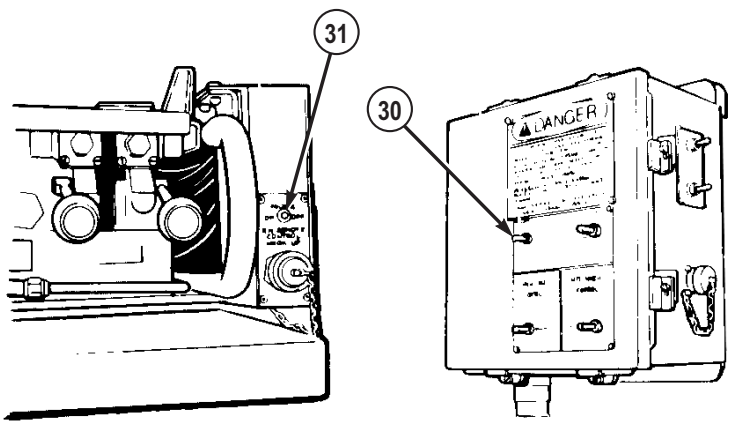


Figure 35.

23. Set POWER switch (31) to OFF position.
24. Turn off wrecker service drive lights. (WP 0090)
25. Turn off wrecker emergency flashers. (WP 0099)
26. Set PTO ENGAGE switch (32) to OFF position. Indicator light (33) will go out.

DISCONNECT - Continued

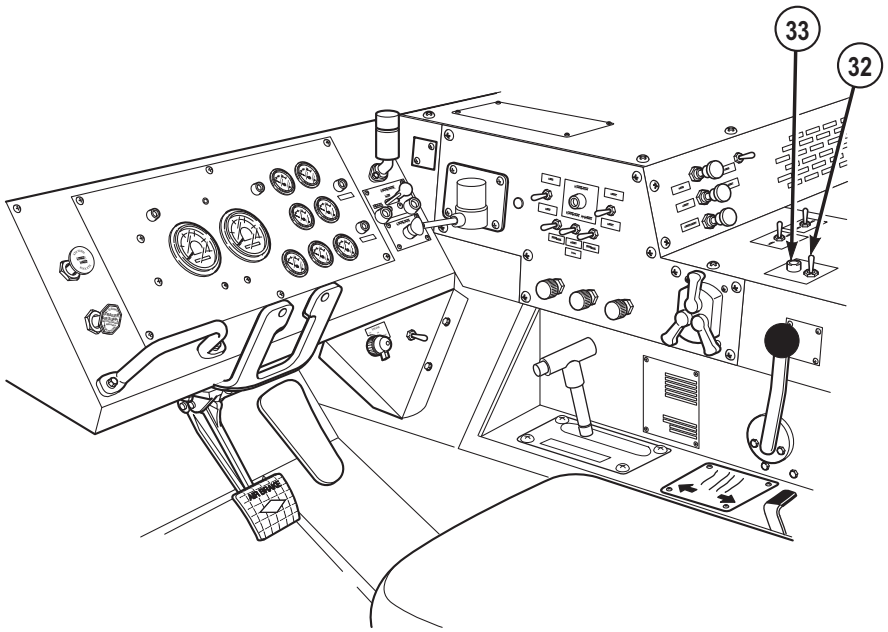


Figure 36.

27. Remove and stow portable beacon lights. (WP 0097)
28. Shut off wrecker engine. (WP 0057)

NOTE

- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of drivers door), complete Step (30).
- If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of drivers door), skip to Step (31).

29. Perform the following on BASE or A2 model HEMTT series disabled vehicle:
    a. Turn off disabled vehicle emergency flashers (refer to operator's manual). (WP 0099)
    b. Remove four screws (34) and steering lock bracket (35) from 90 degree gearbox (36) and return to wrecker stowage.

DISCONNECT - Continued

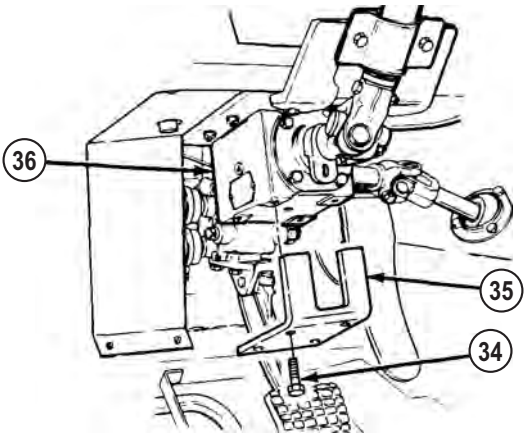


Figure 37.

NOTE

If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (31).

30. Perform the following on A4 model HEMTT series disabled vehicle:

    a. Turn off disabled vehicle emergency flashers (refer to operator's manual). (WP 0099)

    b. Remove lock (37) and steering lockpin (38).

DISCONNECT - Continued

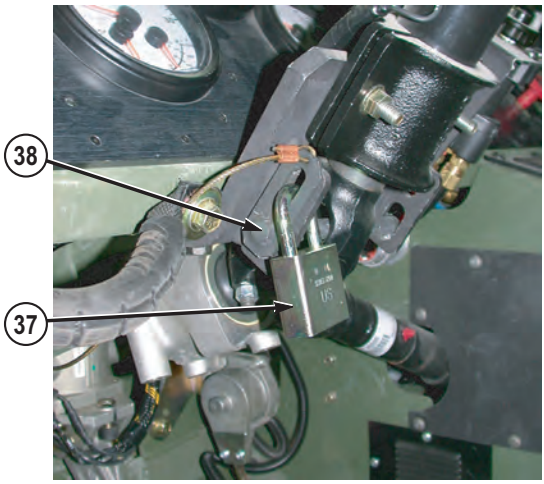


Figure 38.

c. Install steering lockpin (38) in stowage bracket (39) located under driver side dash panel.

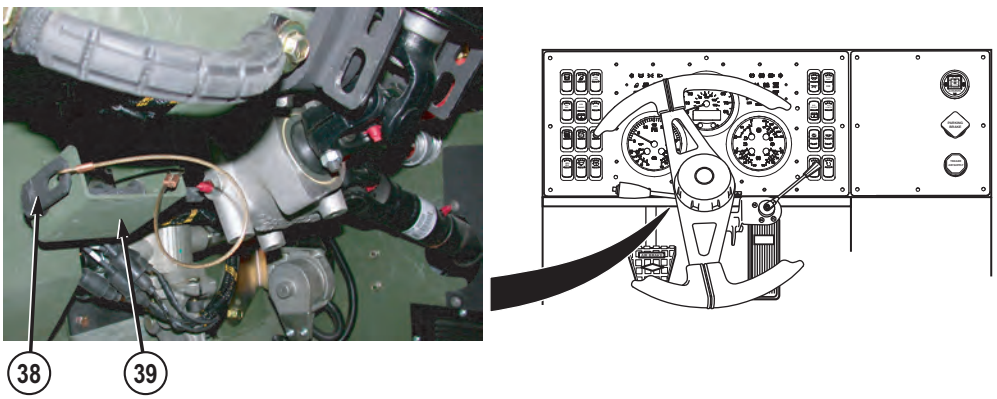


Figure 39.

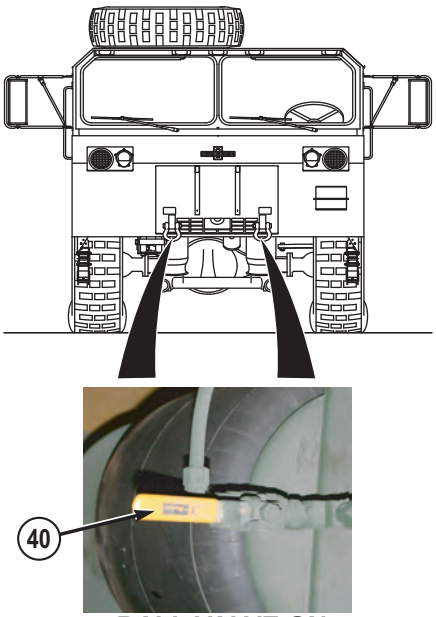
CAUTION

When lifting and towing an A4 HEMTT series vehicle (refer to data plate on inside of driver side door) special care must be taken to avoid causing damage to the vehicle air suspension system. Always turn No. 1 axle air suspension ball valves ON before abandoning disabled A4 HEMTT series vehicle (refer to "operate air suspension

DISCONNECT - Continued

ball valves" in HEMTT A4 operator's manual for more information). Failure to comply may result in damage to equipment.

d. Position disabled vehicle No. 1 axle driver side (shown) and passenger side ball valve handles (40) ON (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information).



BALL VALVE ON

Figure 40.

31. Perform post towing procedure to disabled vehicle.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1074/M1075 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

CAUTION

- When lifting and towing a PLS (Palletized Load System) with an M1077 flatrack, the flatrack must be empty, or if stacked, no more than three high or damage to equipment may result.
- When lifting and towing a PLS with an M1 flatrack, the flatrack must be empty with both end walls folded, or if stacked, no more than three high or damage to equipment may result.

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

2. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

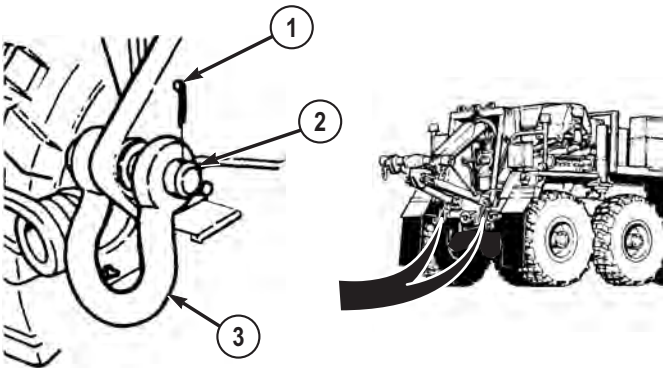


Figure 1.

a. Remove cotter pin (1), pin (2), and towing shackle (3).

b. Replace pin (2) in shackle (3), and cotter pin (1) in pin (2).

c. Repeat Steps (a) and (b) for opposite side towing shackle (3).

d. Stow two rear towing shackles on wrecker vehicle.

3. Remove two cotter pins (4), pins (5), and towing shackles (6) from disabled vehicle and stow.

HOOKUP - Continued

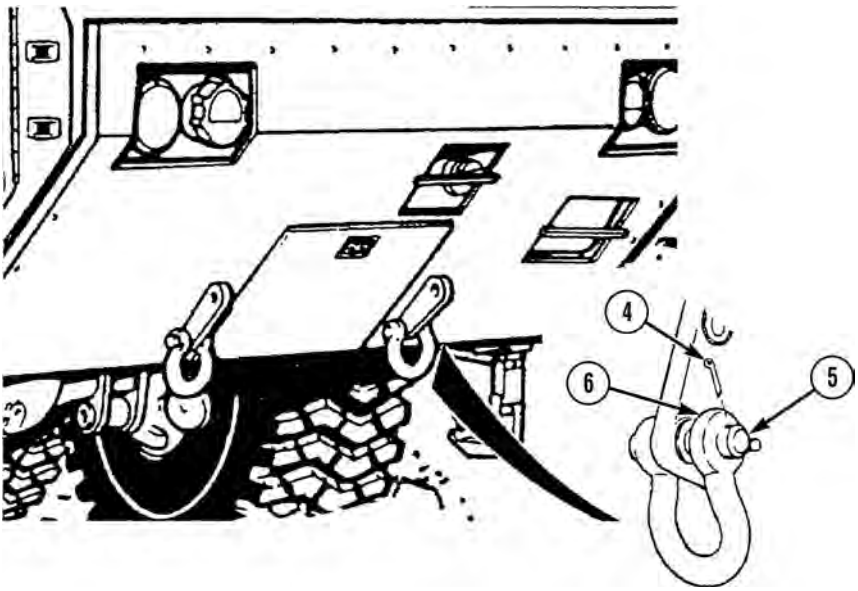


Figure 2.

4. Pull LIFT CYLINDER control lever (7) to lower cross tube (8) to approximately 3 ft. (1 m) above ground.

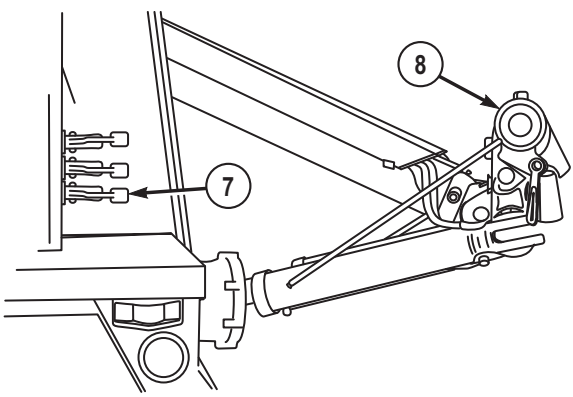


Figure 3.

5. Position wrecker so that cross tube (8) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

6. Turn adapters (9), so pins (10) are on top. Remove two quick pins (11) and pins (10) from adapters.

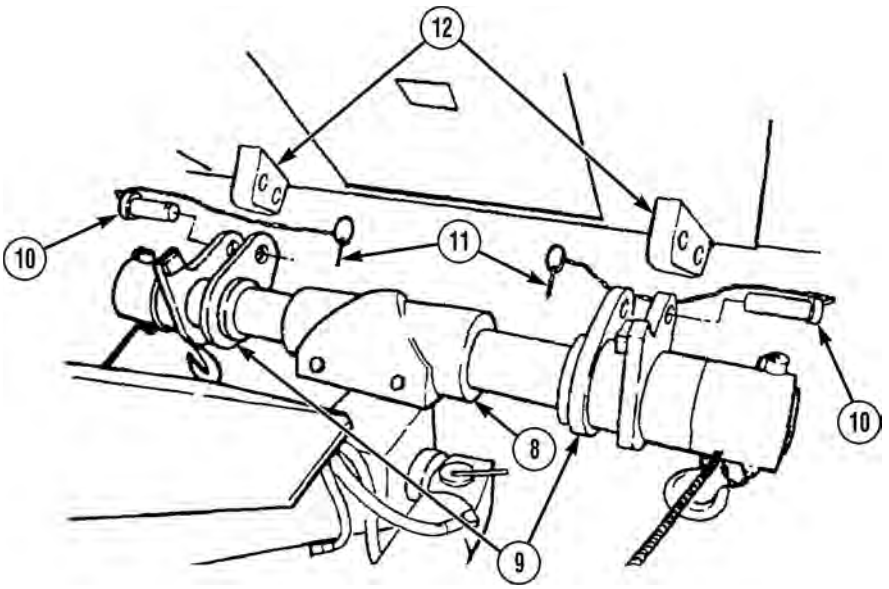


Figure 4.

WARNING

- Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.
- Adapters must be connected to lower holes of front tow eyes or disabled vehicle may contact M984 Wrecker during towing operations. Failure to comply may result in injury or death to personnel and damage to equipment.

7. Operate retrieval system, and with aid of an assistant position cross tube (8) so holes in adapters (9) align with lower holes of front tow eyes (12).

8. Insert two pins (10) through adapters (9) and lower holes of front tow eyes (12), and install two quick pins (11) in pins (10).

HOOKUP - Continued

NOTE

If disabled vehicle air system is inoperative, manually release spring brakes (refer to operator's manual).

9. Push in PARKING BRAKE control (13) on disabled vehicle.

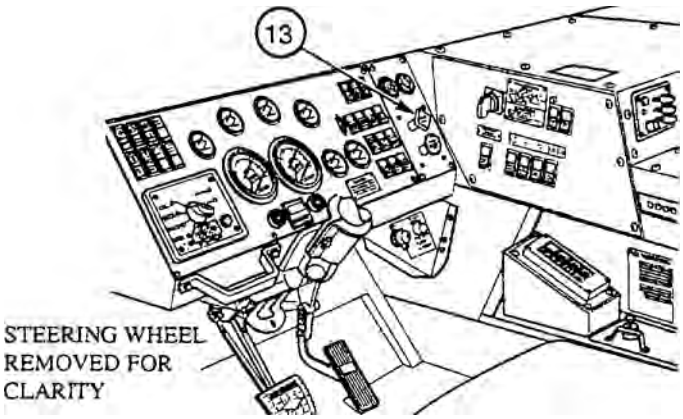


Figure 5.

10. Turn disabled vehicle steering axles straight forward and install lock on steering column (refer to operator's manual).
11. Prepare disabled vehicle for towing (refer to operator's manual).
12. Operate retrieval system until tow cylinders (14) are fully retracted.

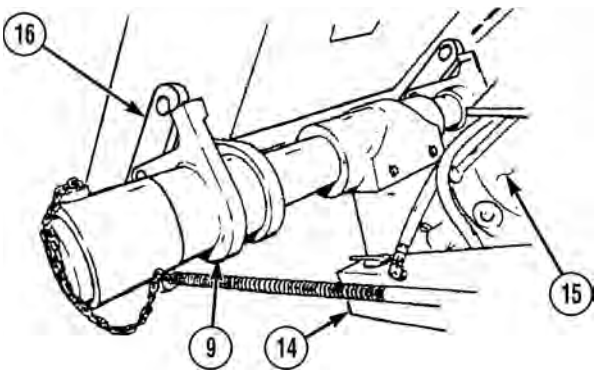


Figure 6.

HOOKUP - Continued

13. Operate retrieval system to retract lift cylinder (15) until adapters (9) contact tow eyes (16).
14. Remove two air lines (17) from stowage and attach to rear gladhands (18) on wrecker.

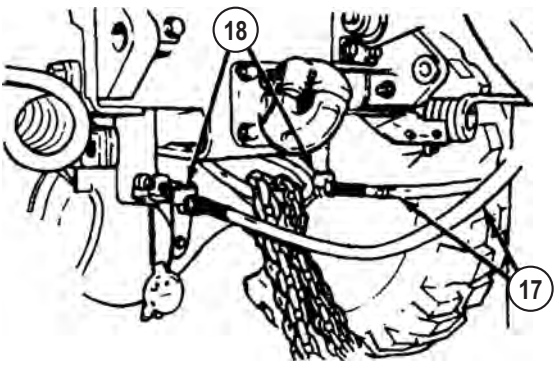


Figure 7.

CAUTION

Do not route air lines between retrieval cylinders or damage to equipment may result.

NOTE

Driver side rear air line from wrecker must be connected to driver side front gladhand on disabled vehicle. Passenger side rear air line from wrecker must be connected to passenger side front gladhand on disabled vehicle.

15. Route air lines (17) over cross tube (8) and attach to front gladhands (19) on disabled vehicle.

HOOKUP - Continued

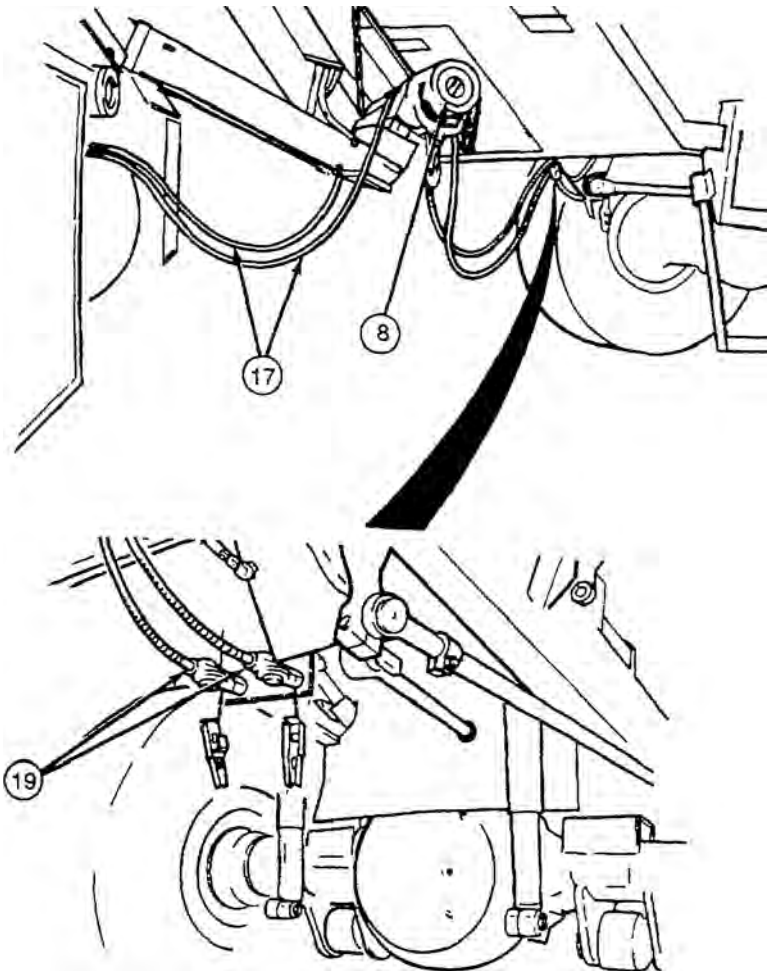


Figure 8.

16. Remove two 16 ft. (5 m) safety chains (20) from wrecker stowage.

HOOKUP - Continued

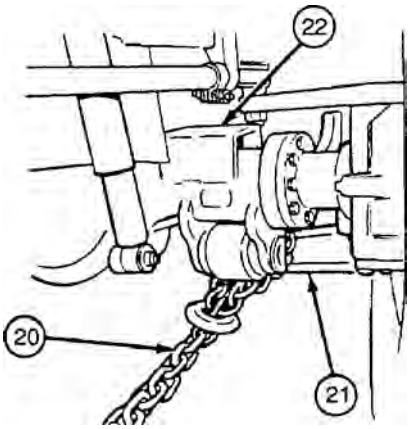


Figure 9.

17. Route chain end without safety shackle, over walking beam (21) behind No. 1 axle (22) on disabled vehicle.
18. Hook 16 ft. (5 m) safety chain (20) together under walking beam (21).
19. Repeat Steps (18) and (19) for other side of disabled vehicle.

NOTE

- Safety chains are connected to wrecker safety chain hoop.
- Adjust chain slack so chains are approximately 6 in. (15 cm) above the ground.

20. Route two 16 ft. (5 m) safety chains (20) through safety chain hoop (23) on wrecker and secure grab hook (24) with safety shackle (25).

HOOKUP - Continued

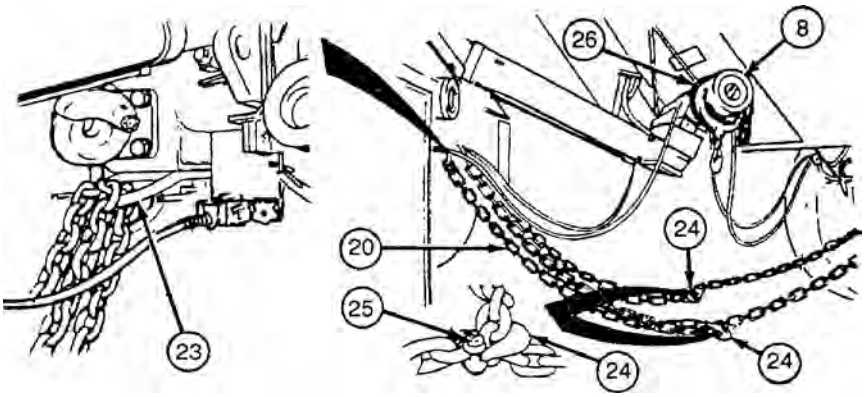


Figure 10.

21. Wrap two springs (26) around cross tube (8) and secure.
22. Remove emergency tow lights (27) and two brackets (28) from wrecker stowage.

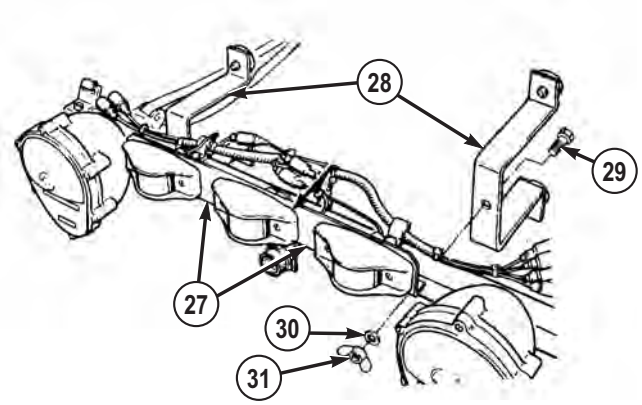


Figure 11.

23. Install two brackets (28) in inside holes of emergency tow lights (27) with two screws (29), washers (30), and nuts (31).
24. Position emergency tow lights (27) securely on disabled vehicle (32).

HOOKUP - Continued

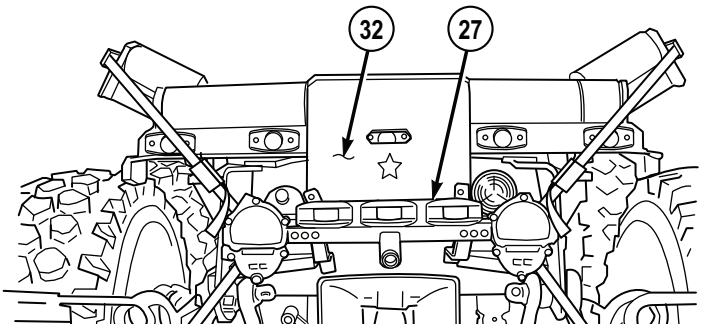


Figure 12.

25. Press in handle (33) on strap clamp (34) and pull strap (35) to lengthen.

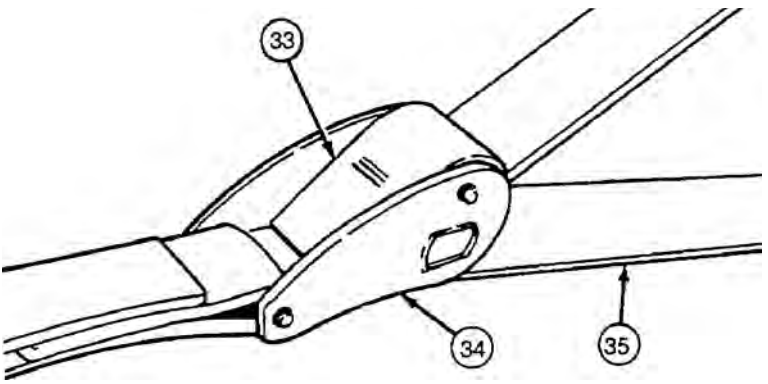


Figure 13.

26. Install top right strap hook (36) on right-angled roller assembly (32) of disabled vehicle.

HOOKUP - Continued

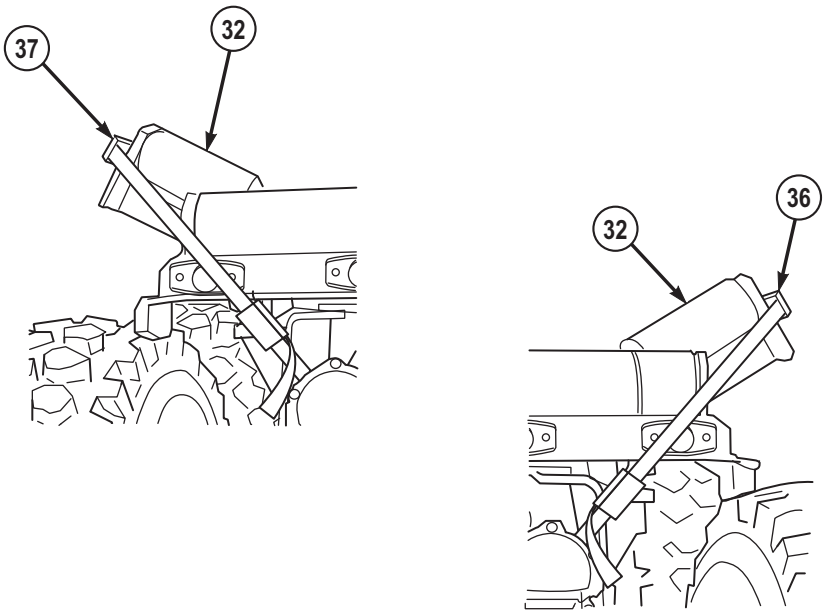


Figure 14.

27. Install top left strap hook (37) on left angled roller assembly (32) of disabled vehicle.
28. Install lower left and lower right strap hooks (38) to driver side and passenger side mud flap mounting brackets. Tighten straps.

HOOKUP - Continued

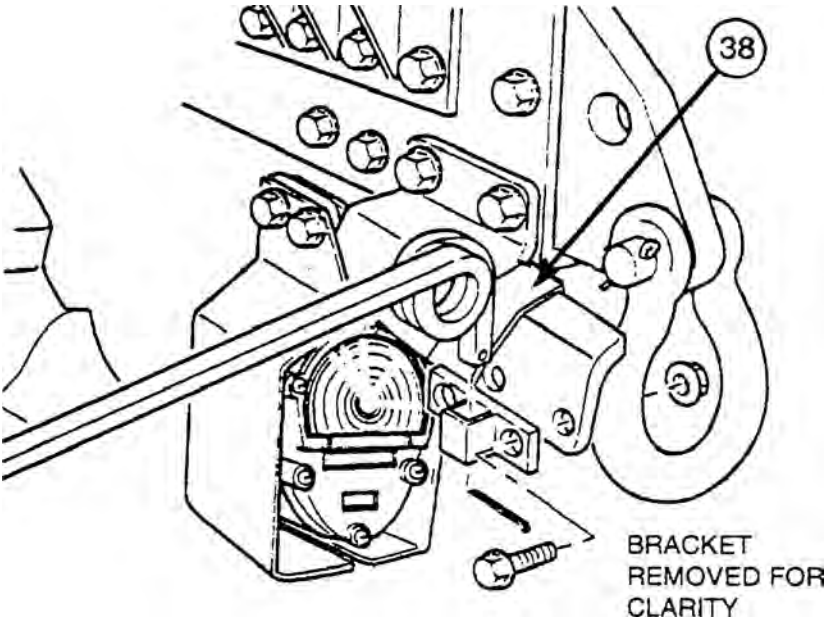


Figure 15.

29. Remove tow light cable (39) from stowage and connect to rear electrical connector (40) on wrecker.

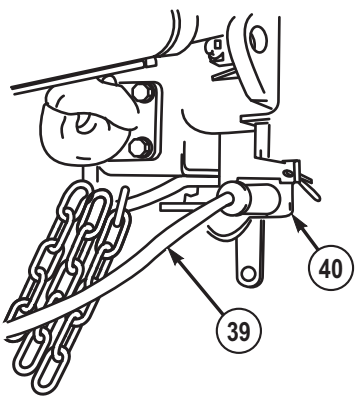


Figure 16.

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

30. Route other end of tow light cable (39) to emergency tow lights (27) on disabled vehicle, remove dust cap (41), and plug in at connector (42).

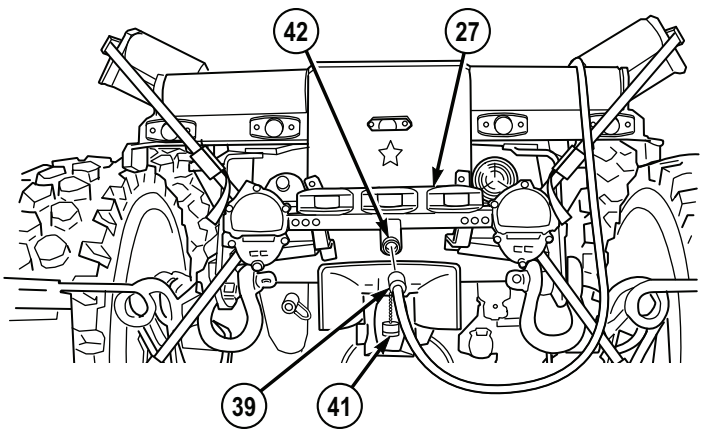


Figure 17.

CAUTION

If disabled vehicle is to be towed with all tires in contact with road, this procedure can be accomplished on paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (32).

31. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Proceed to Step (38).

HOOKUP - Continued

WARNING

Steering axles must be turned straight forward or disabled vehicle will not track properly. Failure to comply may result in injury or death to personnel.

WARNING

Driveshafts can weigh up to 100 lbs (45 kg). Properly support driveshafts when removing screws. After screws and brackets are removed, driveshaft can fall. Failure to comply may result in injury or death to personnel.

NOTE

- To remove driveshaft screw, use wrench located in PLS BII storage box.
- Both PLS No. 3 axle driveshaft ends are removed the same way.

32. Support No. 3 axle driveshaft (43) while assistant removes eight screws (44) and four brackets (45).

HOOKUP - Continued

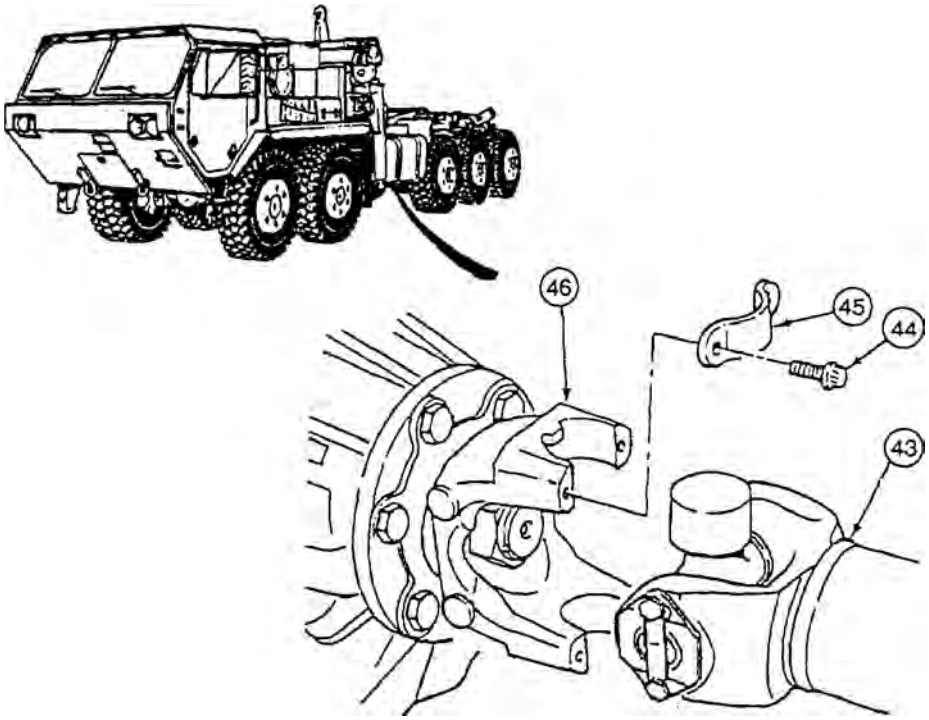


Figure 18.

33. Remove No. 3 axle driveshaft (43) from flange (46) of No. 3 axle and transfer case.
34. Install eight screws (44) and four brackets (45) on driveshaft (43) to prevent loss.
35. Stow driveshaft (43) in passenger side of disabled vehicle cab.
36. Set POWER switch (47) to ON position.

HOOKUP - Continued

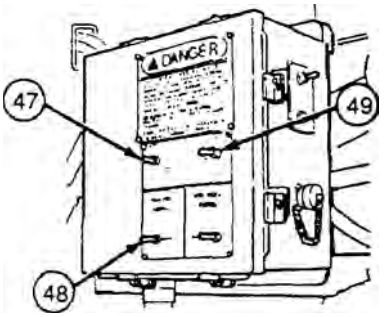


Figure 19.

37. Set HIGH IDLE switch (48) to CONTINUOUS.
38. Push and release LATCH switch (49). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

HOOKUP - Continued

39. Push LIFT CYLINDER control lever (7) to retract lift cylinder (15) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

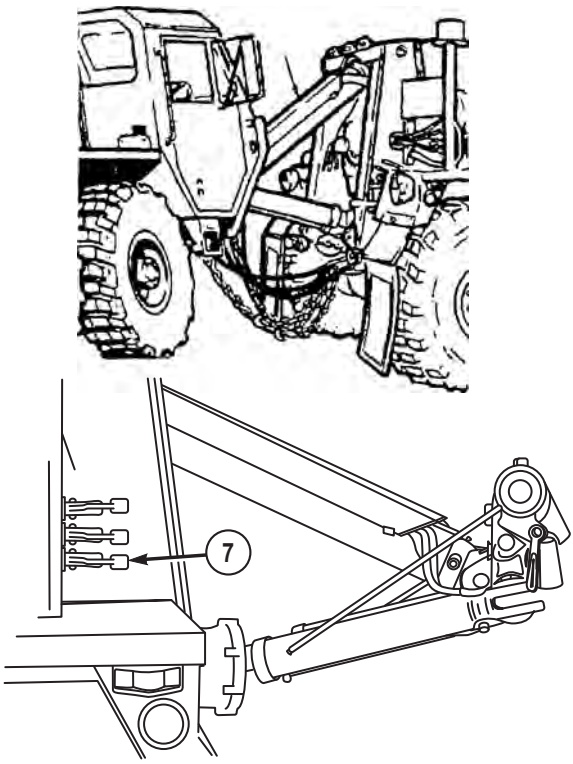


Figure 20.

40. Set POWER switch (47) to OFF position.

HOOKUP - Continued

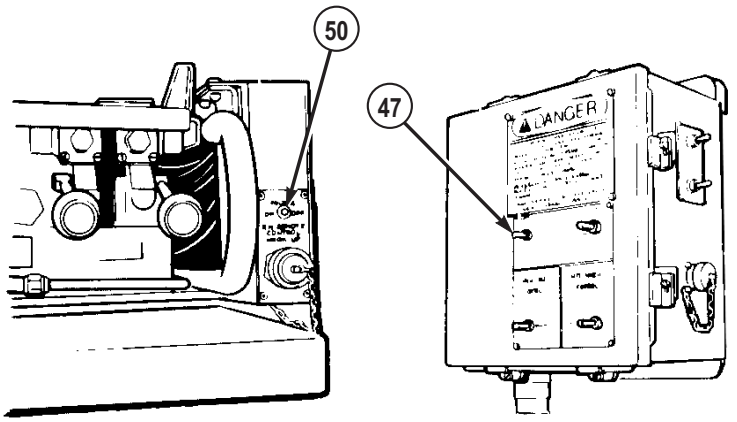


Figure 21.

41. Set POWER switch (50) to OFF position.
42. Set PTO ENGAGE switch (51) to OFF position. Indicator light (52) will go out.

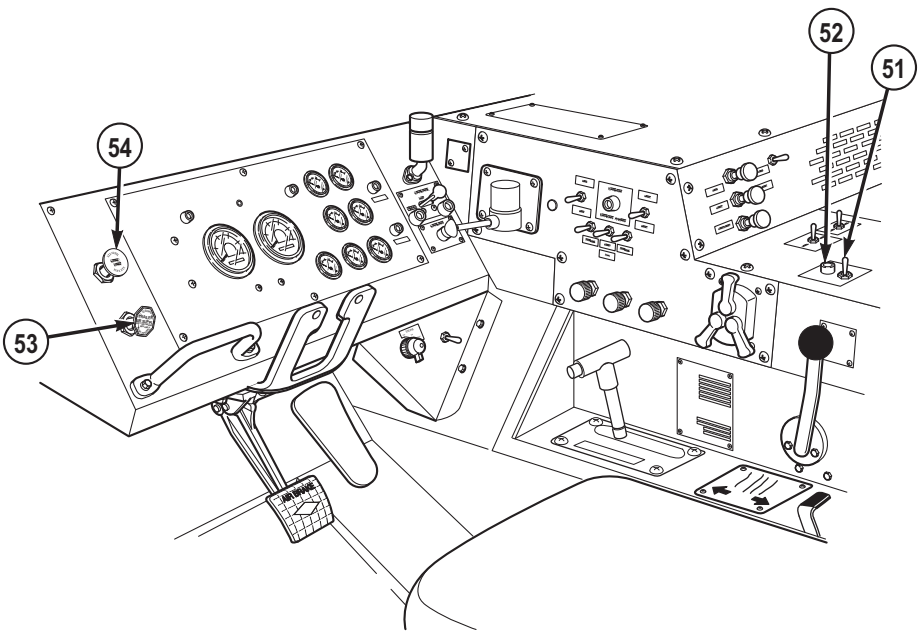


Figure 22.

43. Push in TRAILER AIR SUPPLY control (53).

HOOKUP - Continued

44. Turn on wrecker service drive lights. (WP 0090)
45. Turn on wrecker emergency flashers. (WP 0099)
46. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
47. Push in PARKING BRAKE control (54).

NOTE

Dashboard parking brake indicator will go out when PARKING BRAKE control is released.

48. Push in PARKING BRAKE control (54).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

49. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

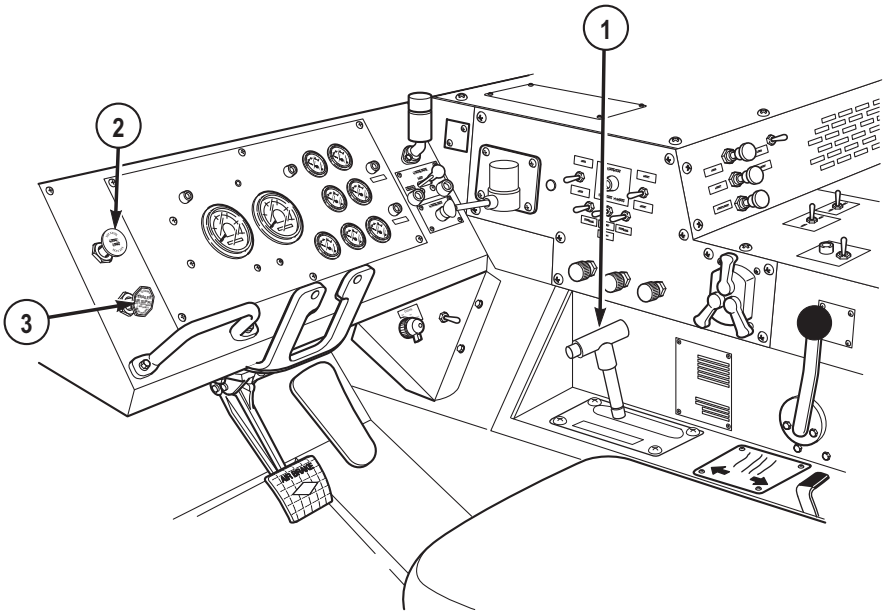


Figure 23.

2. Pull out PARKING BRAKE control (2).
3. Pull out TRAILER AIR SUPPLY control (3).

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation (WP 0059) and pull LIFT CYLINDER control lever (4) and lower disabled vehicle to ground.

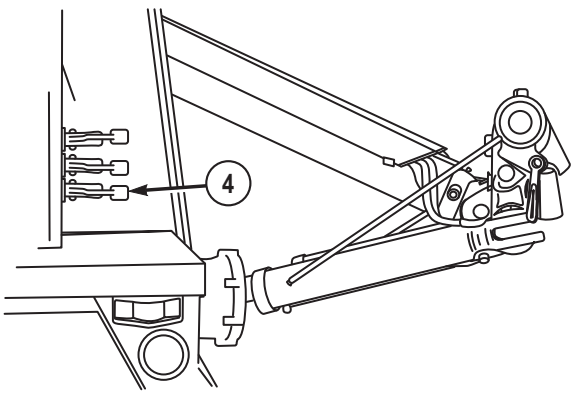


Figure 24.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

5. Engage (pull out) PARKING BRAKE control on disabled vehicle (refer to operator's manual).
6. Remove tow light cable (5) from wrecker.

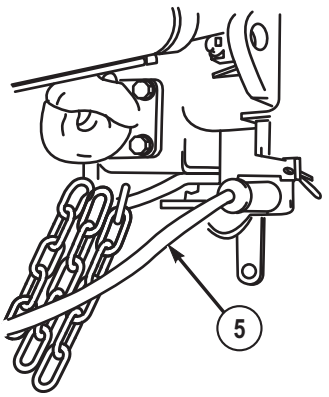


Figure 25.

7. Remove tow light cable (5) from connector (6), install caps (7) on both ends, and stow.

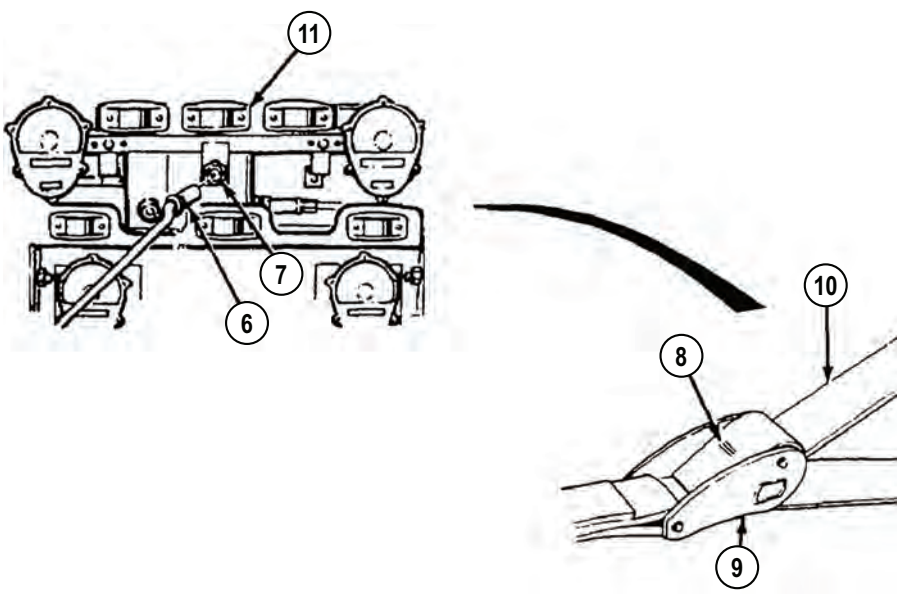


Figure 26.

DISCONNECT - Continued

8. Press in handle (8) on strap clamp (9). Pull strap (10) to loosen straps on emergency tow lights (11).
9. Remove emergency tow lights (11) from disabled vehicle.
10. Remove two nuts (12), washers (13), screws (14), and brackets (15) from emergency tow lights (11).

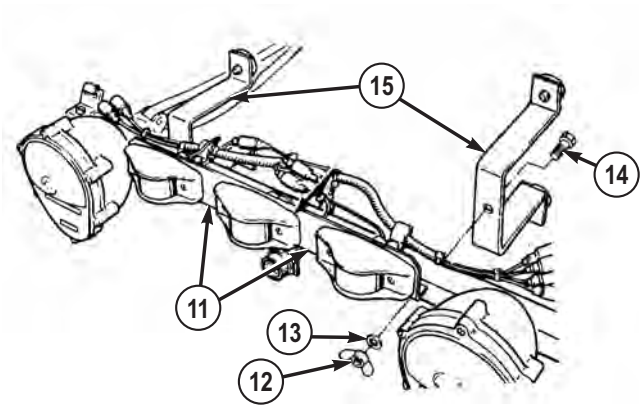


Figure 27.

11. Stow emergency tow lights (11) and brackets (15).
12. Remove and stow safety chains (16) and air lines (17).

DISCONNECT - Continued

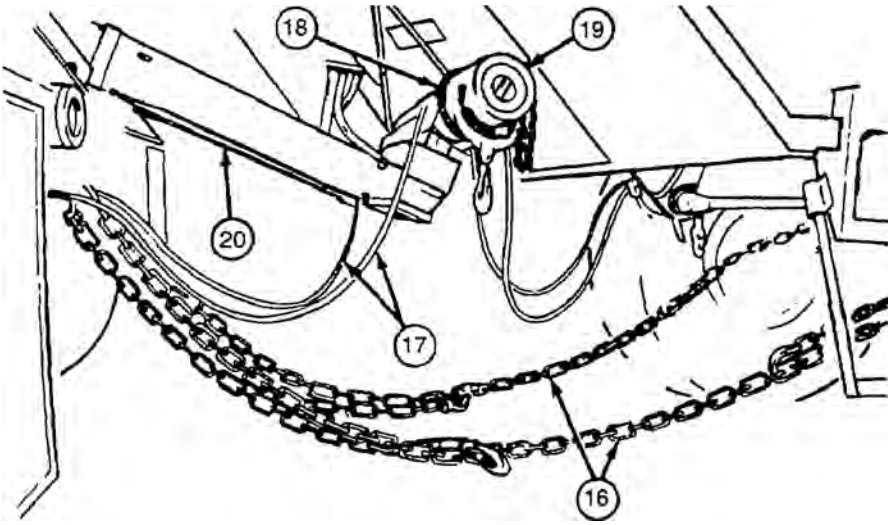


Figure 28.

13. Unwrap two springs (18) from cross tube (19).
14. Connect two springs (18) to tow cylinders (20).
15. Operate retrieval system, and with aid of an assistant position cross tube (19) to relieve tension from adapters (21).

DISCONNECT - Continued

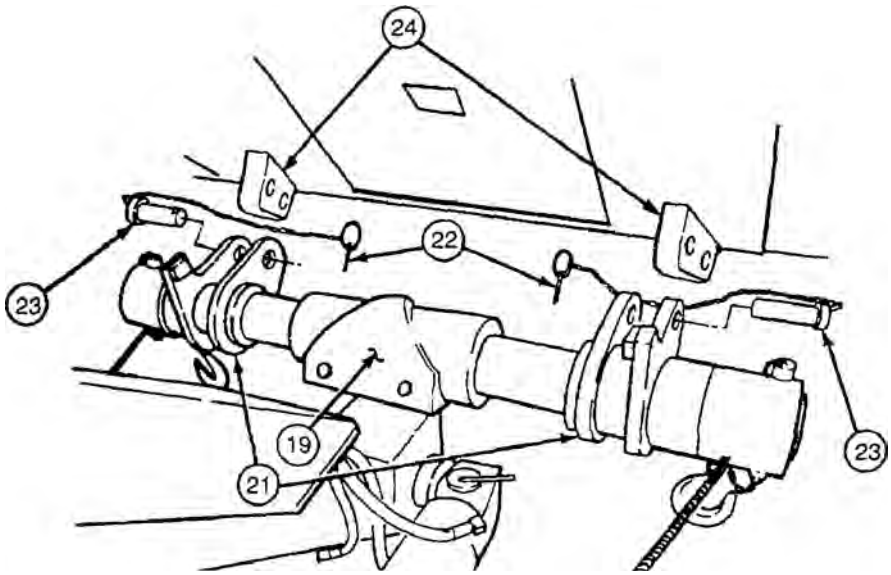


Figure 29.

16. Remove two quick pins (22) and pins (23) from adapters (21).
17. Remove two adapters (21) from tow eyes (24) on disabled vehicle.
18. Install pins (23) in adapters (21).
19. Install quick pins (22) in pins (23).
20. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)
21. Operate retrieval system and fully retract lift cylinder (25) and tow cylinders (26).

DISCONNECT - Continued

Figure 30.

NOTE

Driver side and passenger side towing shackles are installed the same way.

22. Install two rear towing shackles (27), pins (28) and cotter pins (29).

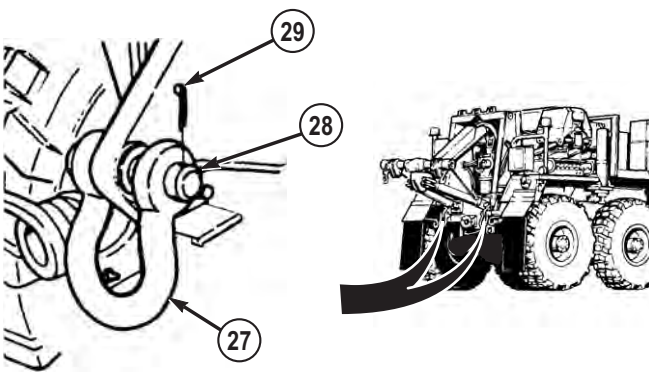


Figure 31.

23. Set POWER switch (30) to OFF position.

DISCONNECT - Continued

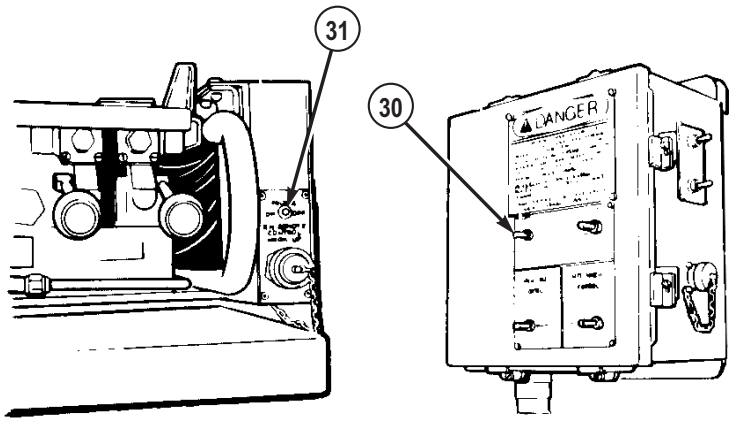


Figure 32.

24. Set POWER switch (31) to OFF position.
25. Turn off wrecker service drive lights. (WP 0090)
26. Turn off wrecker emergency flashers. (WP 0099)
27. Set PTO ENGAGE switch (32) to OFF position. Indicator light (33) will go out.

DISCONNECT - Continued

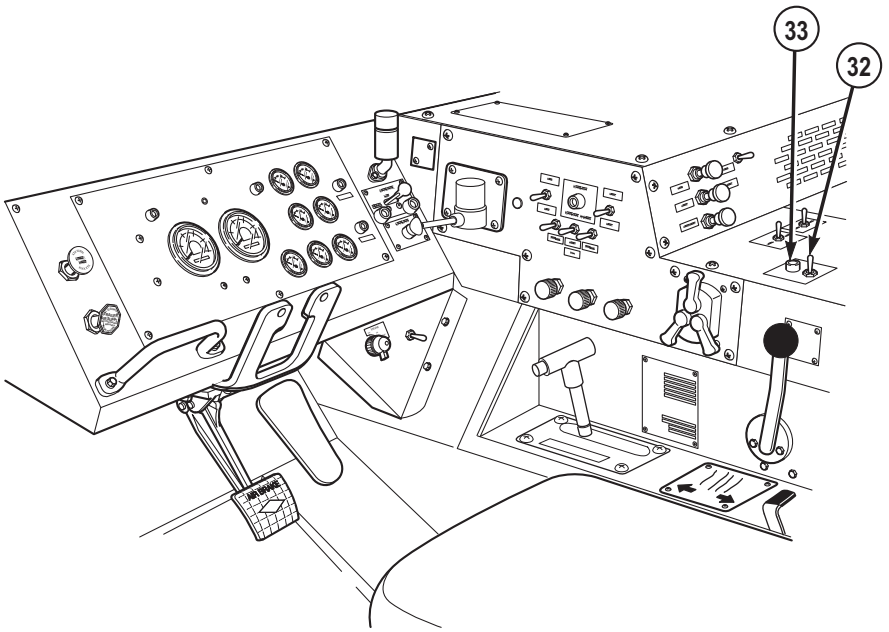


Figure 33.

28. Remove and stow portable beacon lights. (WP 0097)
29. Shut off engine. (WP 0057)
30. Turn off disabled vehicle emergency flashers and remove lock from steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1070 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

WARNING

Do not conduct lift and tow operations on side slopes in excess of 25%. Vehicle may roll over. Failure to comply may result in injury or death to personnel and damage to equipment.

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)
2. Set PARKING BRAKE and chock wheels on disabled vehicle (refer to operator's manual).

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.

HOOKUP - Continued

- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

3. Disconnect two springs (1) from tow cylinders (2).

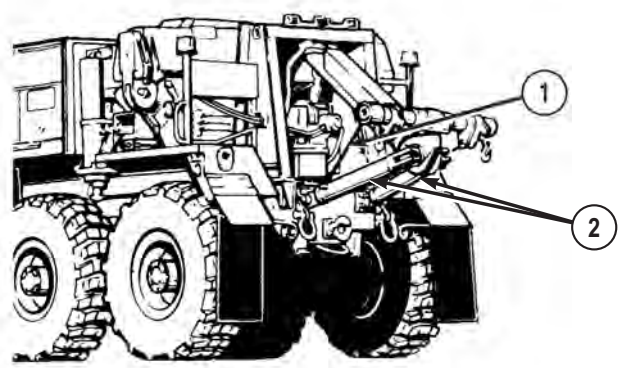


Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

4. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

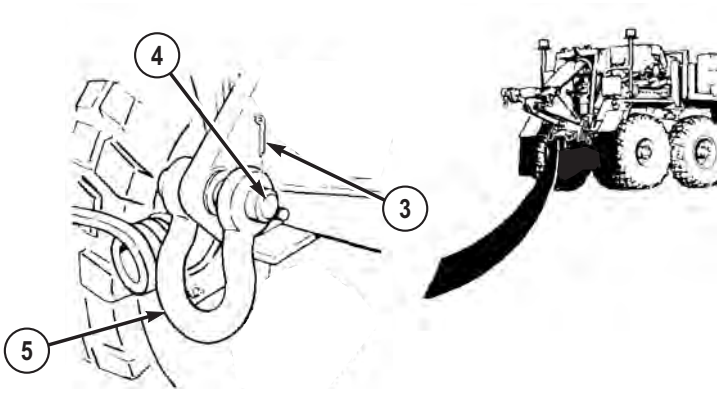


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

5. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above the ground.

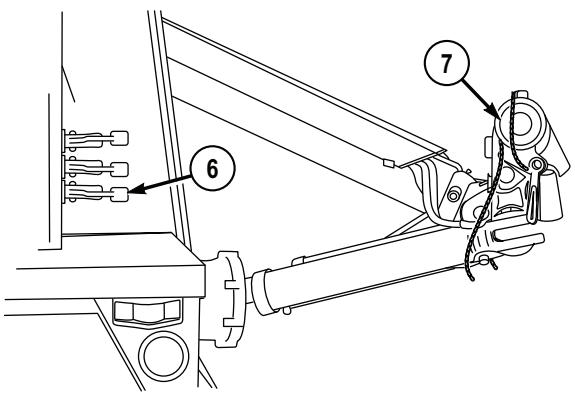


Figure 3.

6. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

7. Remove two quick pins (8) and pins (9) from end caps (10).

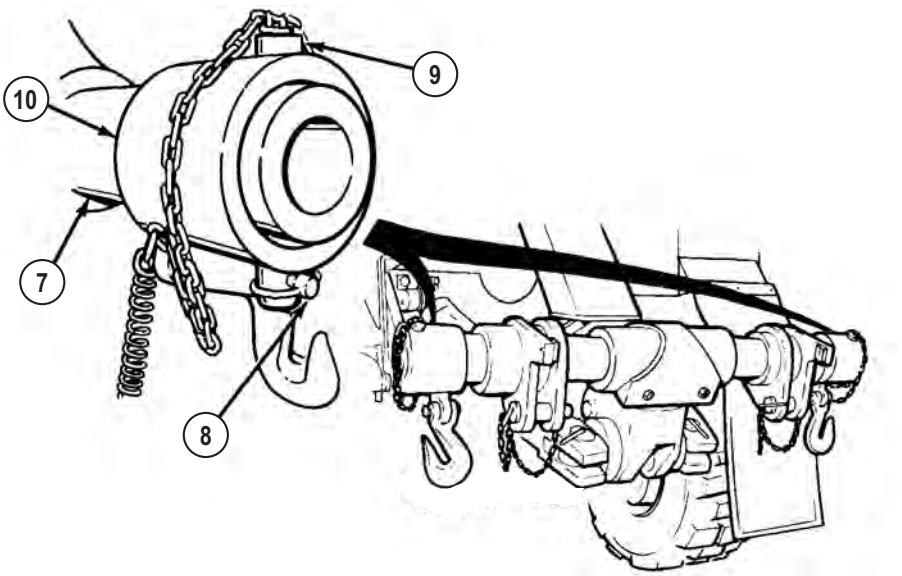


Figure 4.

8. Remove two end caps (10) from cross tube (7).
9. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

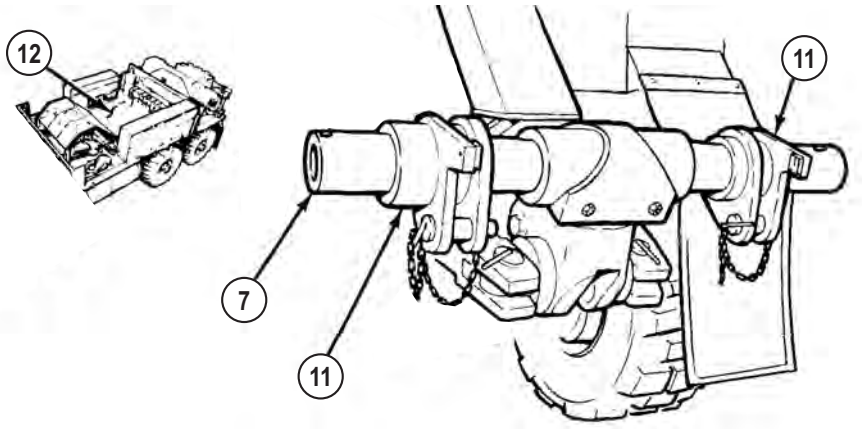


Figure 5.

10. Remove lock handle (13), lock plate (14), and two front tow adapters (1481840W and 1481830W) (15).

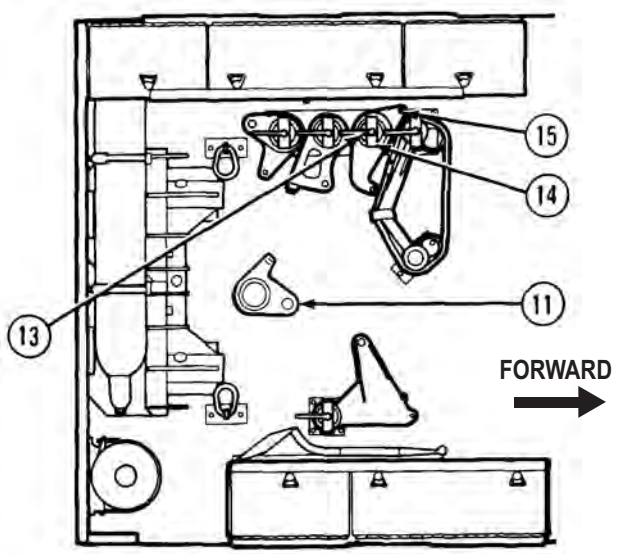


Figure 6.

11. Install two front adapters (11) on equipment body floor (12) with lock plate (14) and lock handle (13).
12. Install two front tow adapters (15) on cross tube (7).

HOOKUP - Continued

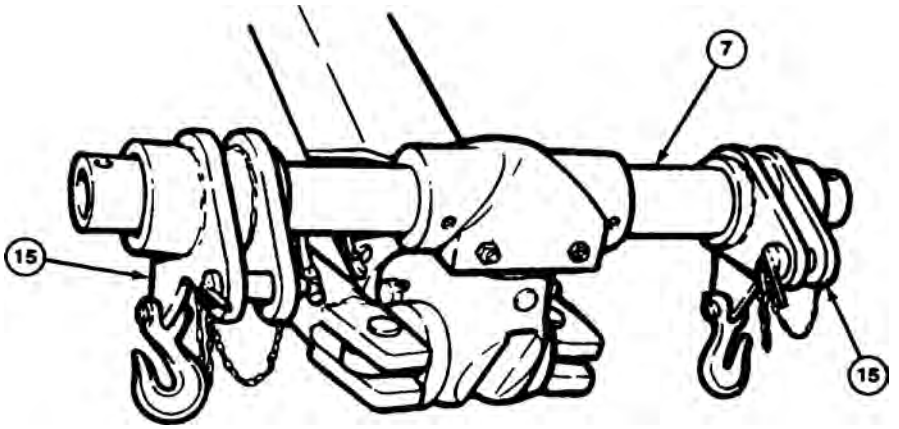


Figure 7.

NOTE

End caps will hang over end of cross tube.

13. Install two end caps (10) on cross tube (7) with two pins (9) and quick pins (8).

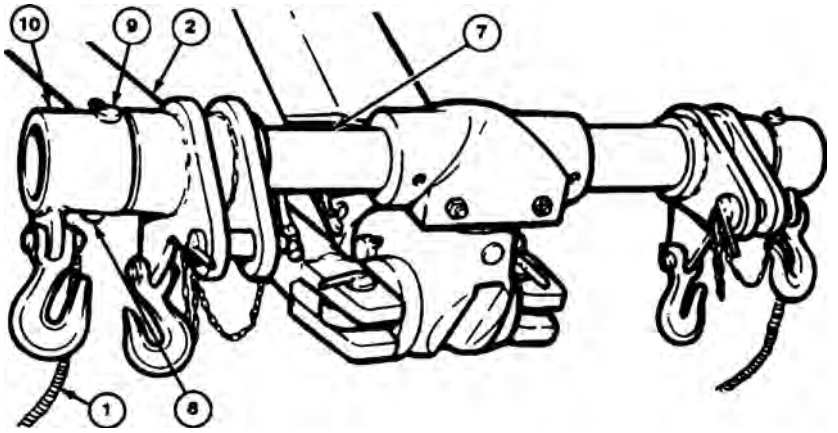


Figure 8.

14. Attach two springs (1) on tow cylinders (2).
15. Remove two quick pins (16) and pins (17) from adapter (15).

HOOKUP - Continued

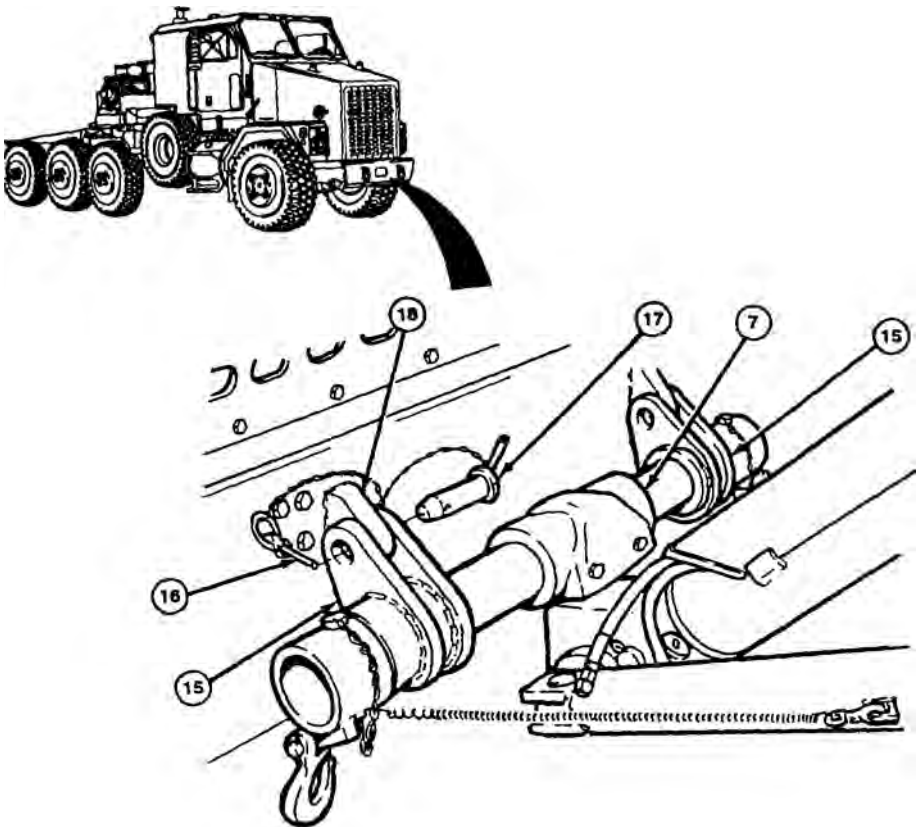


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

HOOKUP - Continued

16. Operate retrieval system and with aid of an assistant, position cross tube (7) so holes in adapters (15) align with holes in front tow eyes (18).
17. Install two pins (17) through adapters (15) and front tow eyes (18), install quick pins (16) in pins (17).
18. Reposition cross tube (7) so that adapter bottom is tight to front bumper (19).

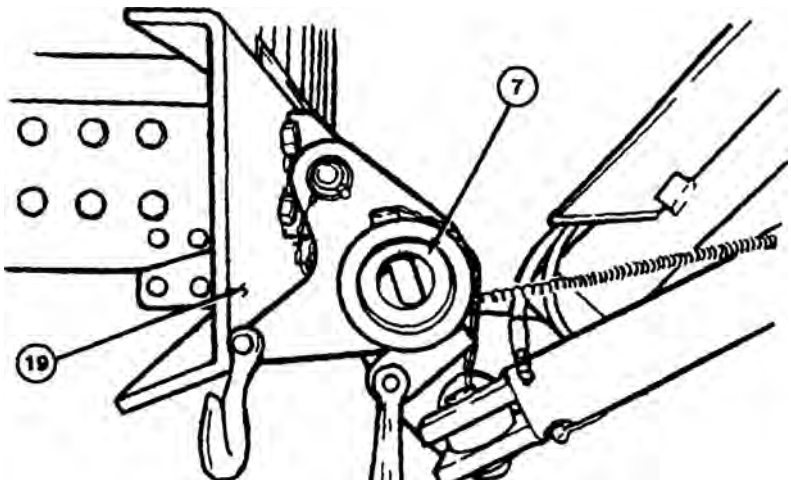


Figure 10.

19. Remove two 16 ft. (5 m) safety chains (20) from stowage.

HOOKUP - Continued

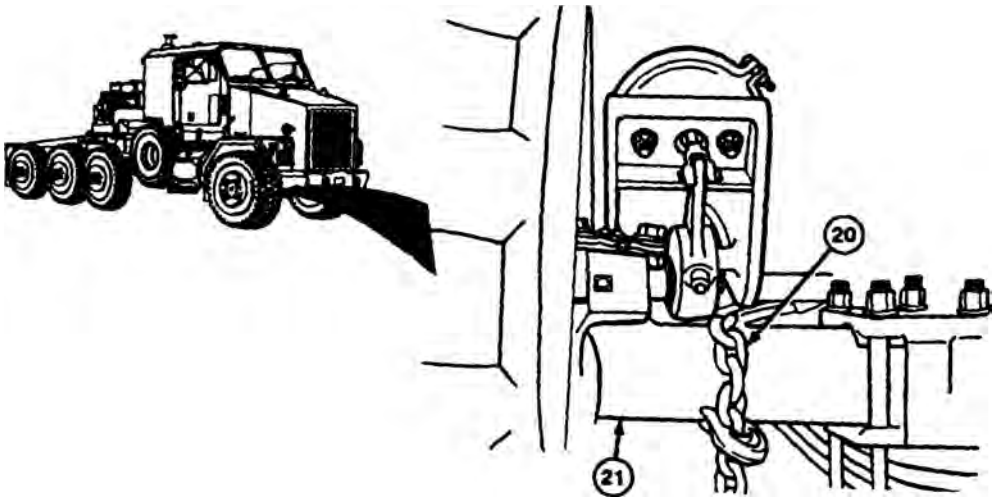


Figure 11.

20. Route end (without safety shackle) of 16 ft. (5 m) safety chain (20) over No. 1 axle (21) of disabled vehicle.
21. Hook 16 ft. (5 m) safety chain (20) together in front of No. 1 axle (21) of disabled vehicle.
22. Repeat Steps (20) and (21) for other side of No. 1 axle (21) of disabled vehicle.
23. Pull 16 ft. (5 m) safety chain (20) tight and install on adapter grab hook (22).

HOOKUP - Continued

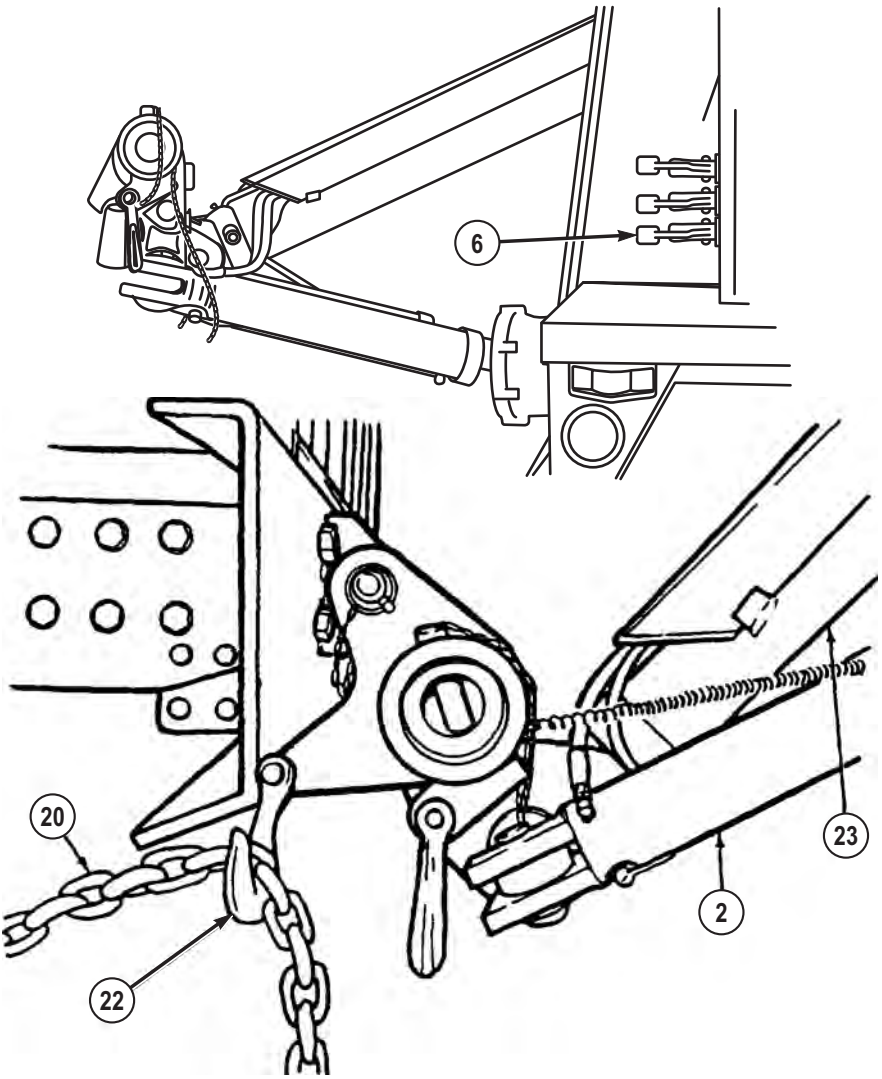


Figure 12.

24. Repeat Step (23) for other 16 ft. (5 m) safety chain (20).
25. Prepare disabled vehicle for towing (Refer to operator's manual).
26. Operate retrieval system until tow cylinders (2) are fully retracted.
27. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (23) until slack is removed from safety chains (20).

HOOKUP - Continued

NOTE

- Safety chains are connected to wrecker safety chain hoop.
- Safety chains should just touch ground when secured.

28. Route two 16 ft. (5 m) safety chains (20) through safety chain hoop (24) on wrecker, hook 16 ft. (5 m) safety chains back into themselves (shown), and secure grab hook (25) with safety shackle (26).

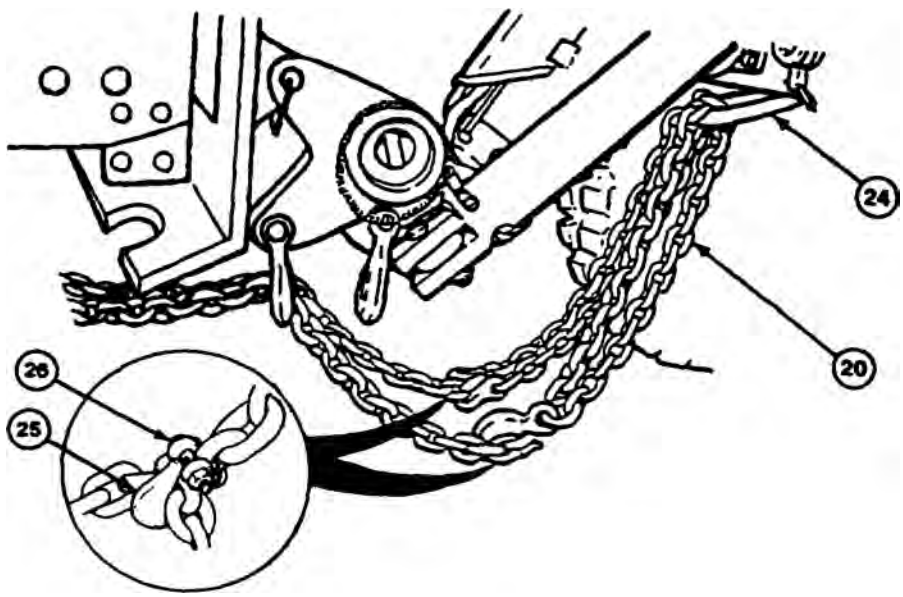


Figure 13.

29. Remove two air lines (27) from stowage and attach to rear gladhands (28) on wrecker.

HOOKUP - Continued

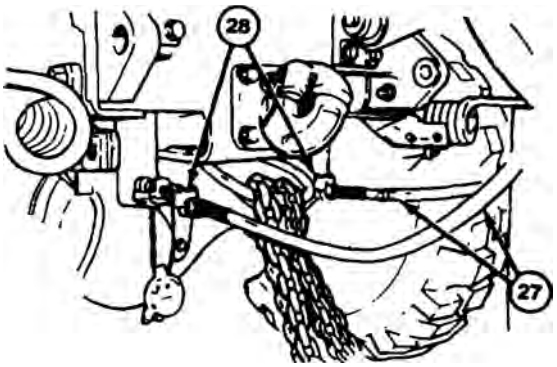


Figure 14.

30. Remove dummy couplings (29) from front gladhands (30) of disabled vehicle.

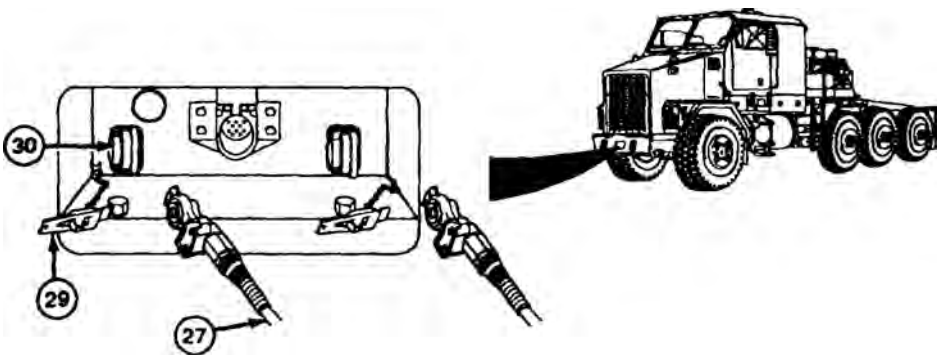


Figure 15.

CAUTION

Air lines should not be routed through retrieval cylinders or damage to air lines may result.

NOTE

Driver side rear air line from wrecker must be connected to driver side front gladhand on disabled vehicle. Passenger side rear air line from wrecker must be connected to passenger side front gladhand on disabled vehicle.

31. Install two air lines (27) on front gladhands (30) of disabled vehicle.
32. Remove emergency tow lights (31) from stowage.

HOOKUP - Continued

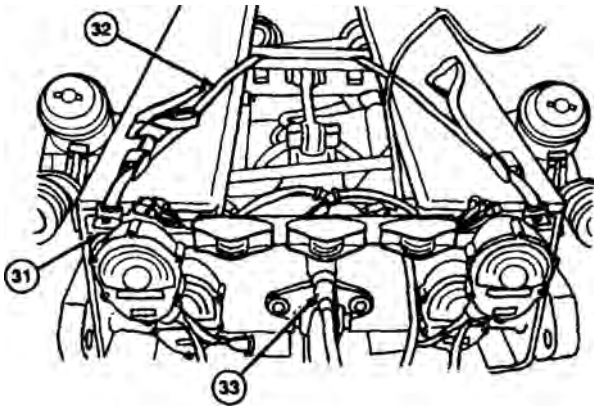


Figure 16.

33. Install tow lights (31) on rear of disabled vehicle and fasten securely with straps (32).
34. Remove tow light cable (33) from stowage and connect to emergency tow lights (31).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

35. Route free end of tow light cable (33) along disabled vehicle and connect to rear electrical connector (34) on wrecker.

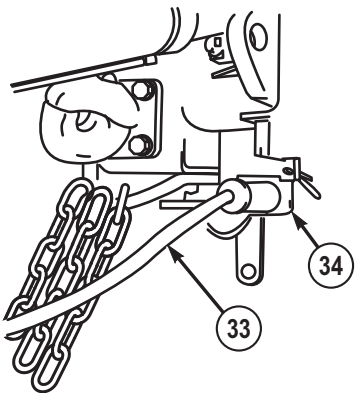


Figure 17.

HOOKUP - Continued

CAUTION

If disabled vehicle is to be towed with all tires in contact with road, this procedure can be accomplished on paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (37).

36. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Skip to Step (43).
37. Refer to operator's manual of disabled vehicle to lock steering.
38. Set POWER switch (35) to ON position.

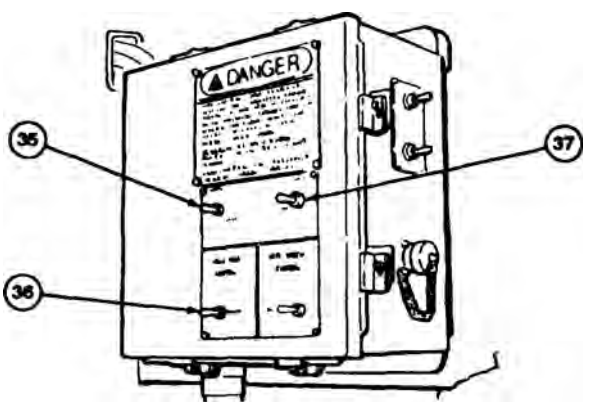


Figure 18.

39. Set HIGH IDLE switch (36) to CONTINUOUS.
40. Push and release LATCH switch (37). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.
- When M1070 is lifted from the front it is approximately 12 ft. 9 in. (3.9 m) high. Do not transport M1070 under anything that does not have this clearance. Use caution when approaching low bridges to avoid contact with structures below 12 ft. 9 in. (3.9 m). Failure to comply will result in damage to equipment.

41. Push LIFT CYLINDER control lever (6) to retract lift cylinder (23) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

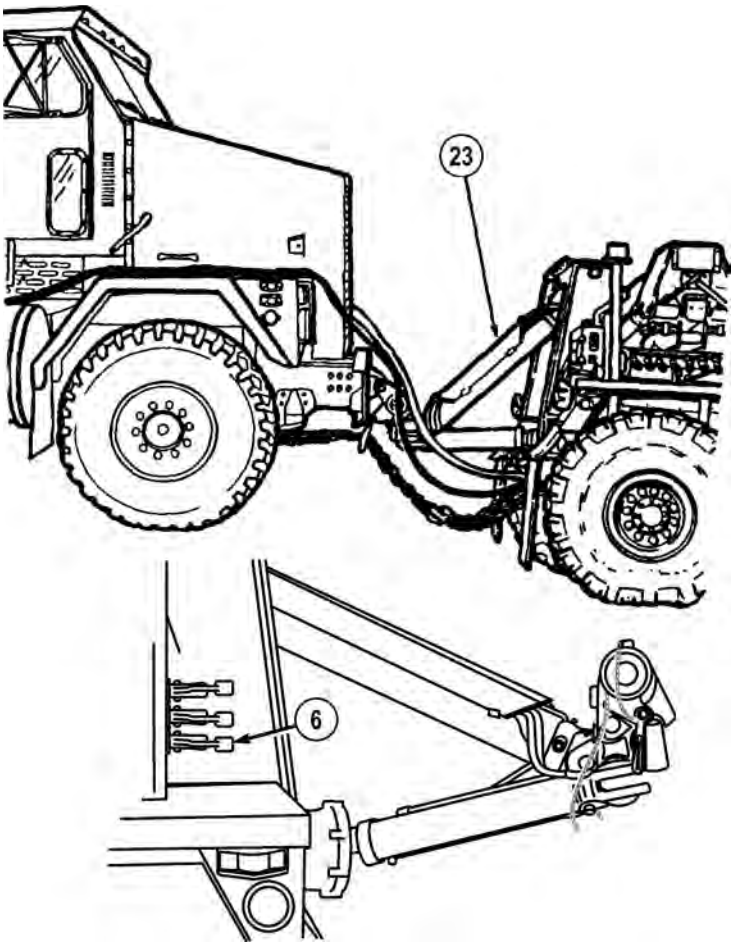


Figure 19.

42. Set POWER switch (35) to OFF position.

HOOKUP - Continued

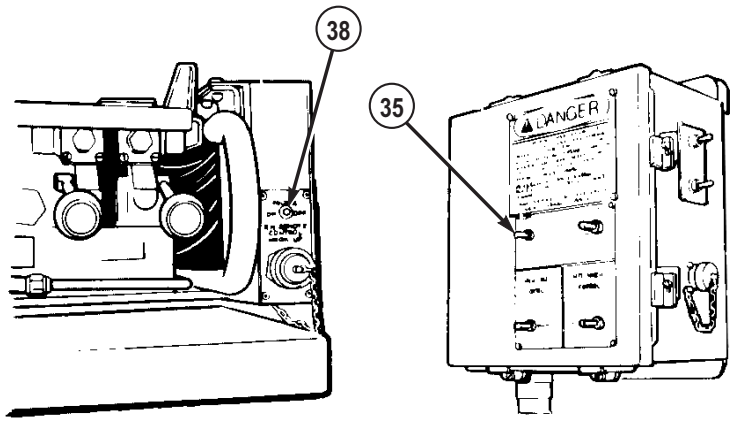


Figure 20.

43. Set POWER switch (38) to OFF position.
44. Set PTO ENGAGE switch (39) to OFF position, indicator light (40) will go out.

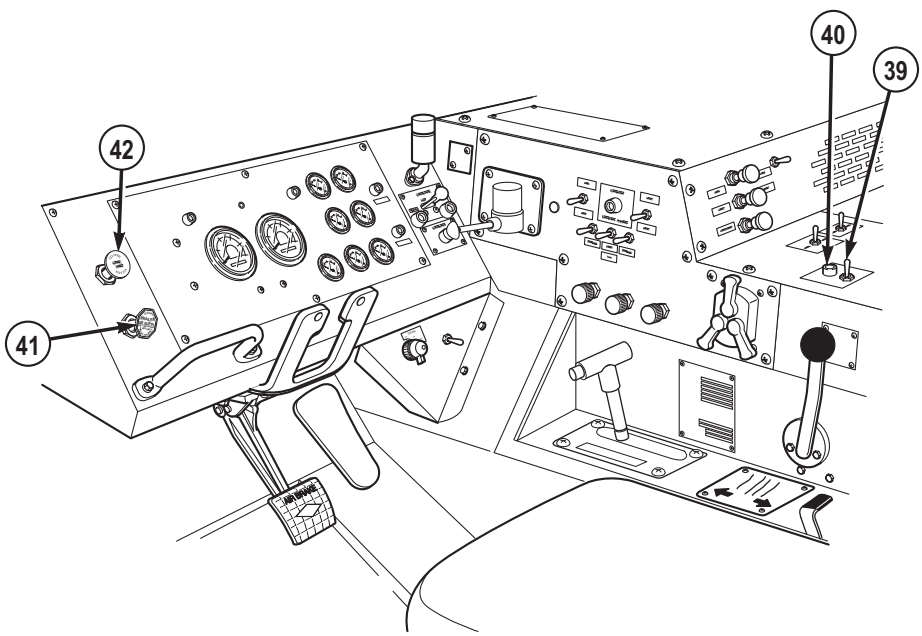


Figure 21.

45. Push in TRAILER AIR SUPPLY control (41).

HOOKUP - Continued

46. Turn on wrecker service drive lights. (WP 0090)
47. Turn on wrecker emergency flashers. (WP 0099)
48. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
49. Push in PARKING BRAKE control (42).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

50. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).
2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

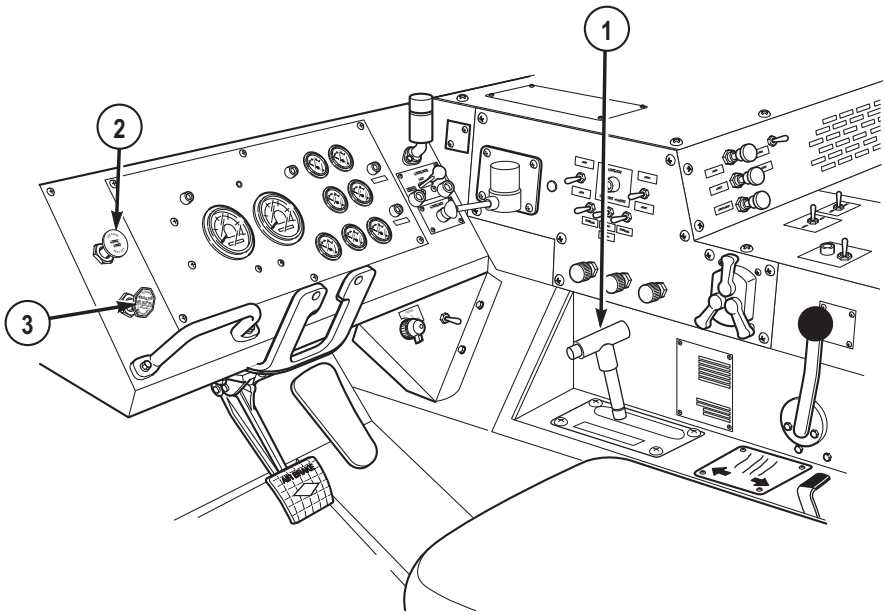


Figure 22.

3. Pull out TRAILER AIR SUPPLY control (3).

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation and lower disabled vehicle to ground (WP 0059) until safety chains at front axle are slack.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

5. Engage PARKING BRAKE on disabled vehicle (refer to operator’s manual).
6. Remove tow light cable (4) from emergency tow lights (5).

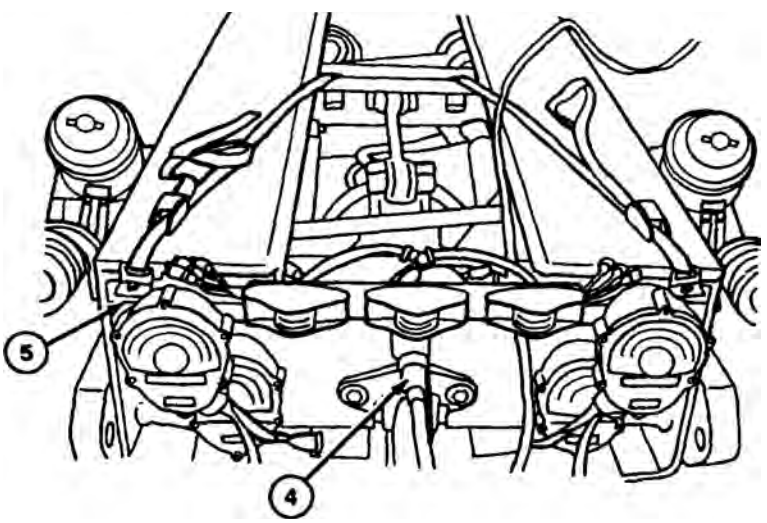


Figure 23.

7. Remove emergency tow lights (5) from disabled vehicle.
8. Remove tow light cable (4) from rear electrical connector of wrecker. Stow emergency tow lights and tow light cable.

DISCONNECT - Continued

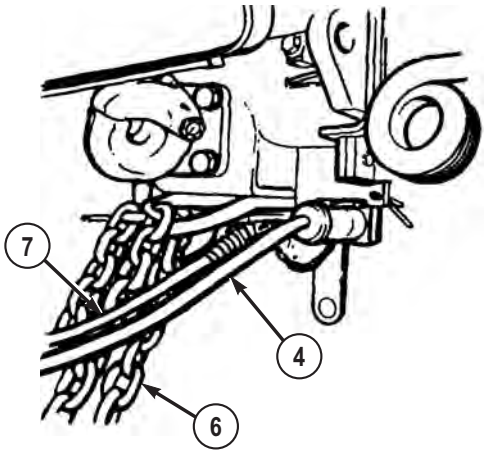


Figure 24.

9. Remove and stow two safety chains (6) and air lines (7).
10. Remove two quick pins (8) and pins (9) from adapters (10).

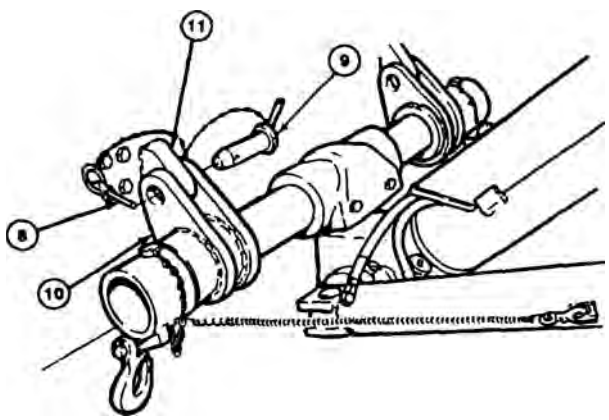


Figure 25.

11. Remove two adapters (10) from tow eyes (11).
12. Install two pins (9) in adapters (10).
13. Install two quick pins (8) in pins (9).
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

DISCONNECT - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (12) from tow cylinders (13).

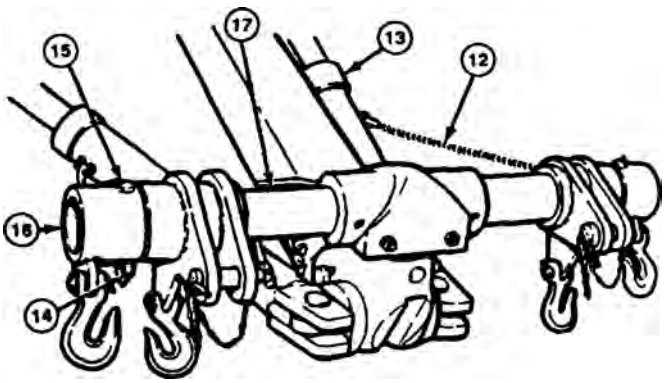


Figure 26.

16. Remove two quick pins (14) and pins (15) from end caps (16).
17. Remove end caps (16) from cross tube (17).
18. Remove two adapters (10) from cross tube (17) and place on equipment body floor (18).

DISCONNECT - Continued

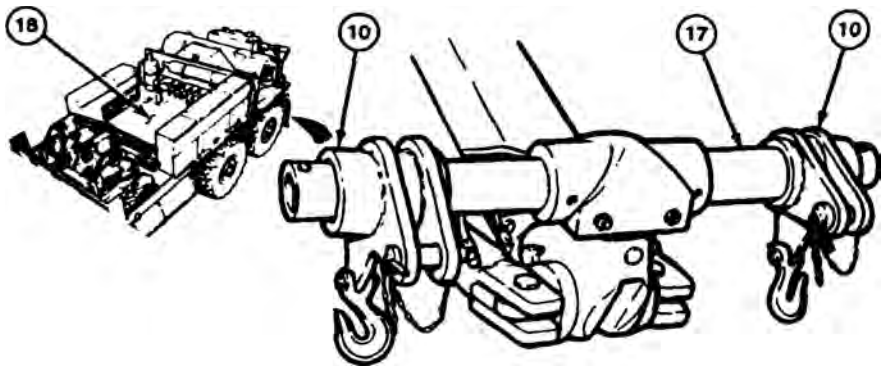


Figure 27.

19. Remove lock handle (19), lock plate (20), and two front tow adapters (21).
20. Install two adapters (10) with lock plate (20) and lock handle (19).

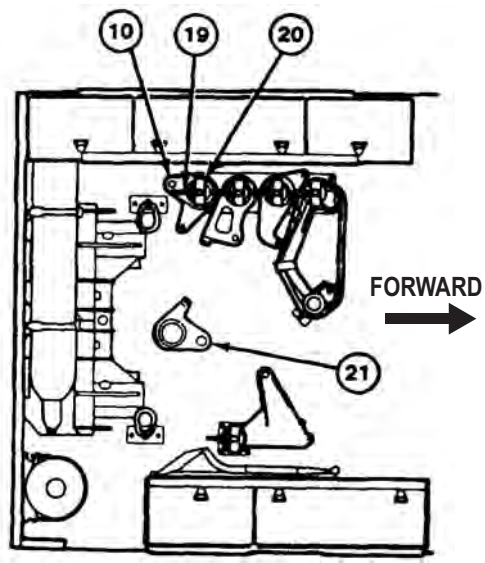


Figure 28.

21. Install two adapters (21) on cross tube (17).

DISCONNECT - Continued

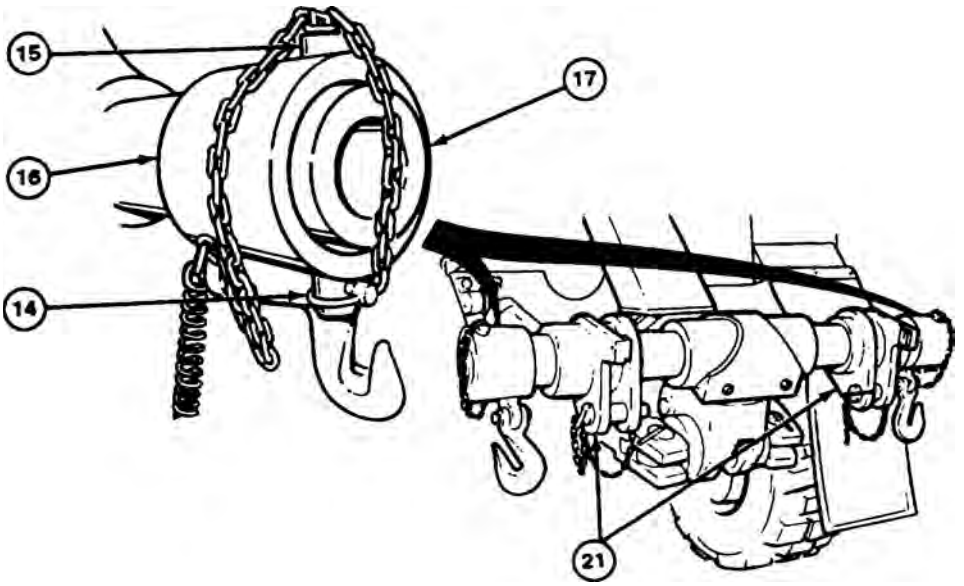


Figure 29.

22. Install two end caps (16) on cross tube (17) with two pins (15) and two quick pins (14).
23. Install two springs (12) on tow cylinders (13).

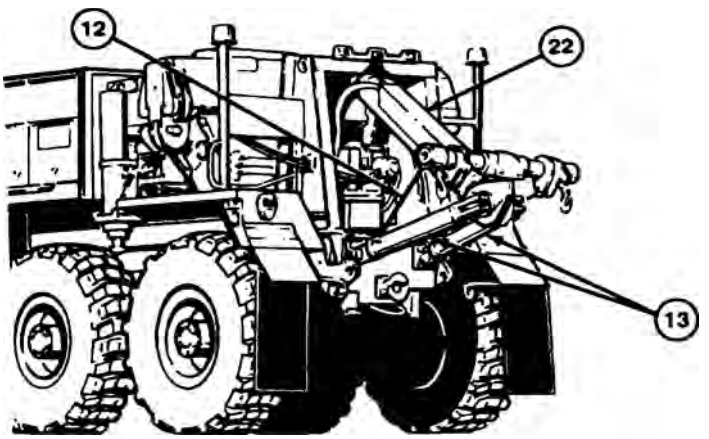


Figure 30.

24. Operate retrieval system and fully retract lift cylinder (22) and tow cylinders (13).

DISCONNECT - Continued

NOTE

Driver side and passenger side towing shackles are installed the same way.

25. Install two rear towing shackles (23), pins (24), and cotter pins (25).

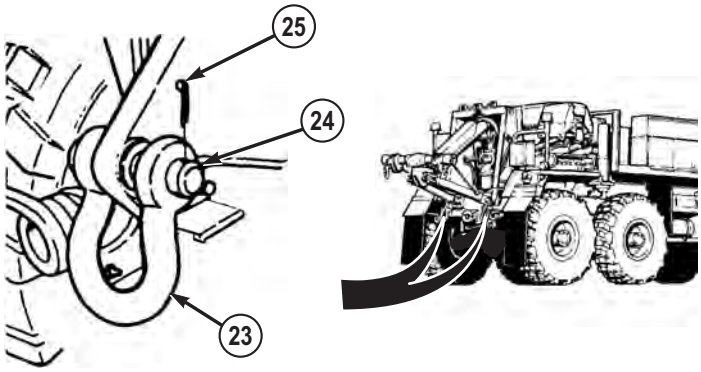


Figure 31.

26. Set POWER switch (26) to OFF position.

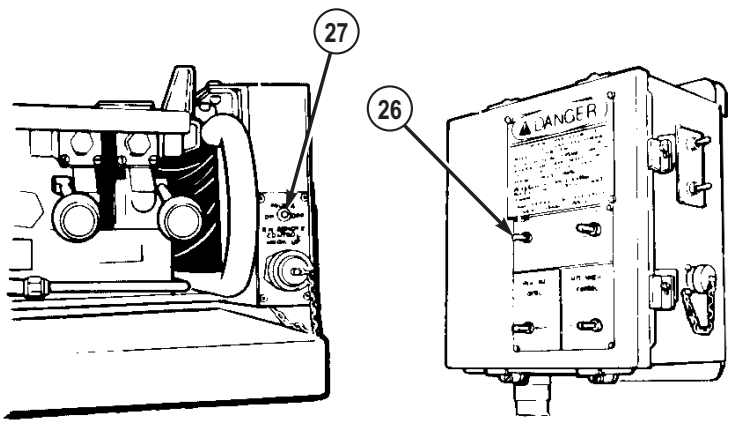


Figure 32.

27. Set POWER switch (27) to OFF position.
28. Turn off wrecker emergency flashers. (WP 0099)
29. Turn off wrecker service drive lights. (WP 0090)

DISCONNECT - Continued

30. Set PTO ENGAGE switch (28) to OFF position. Indicator light (29) will go out.

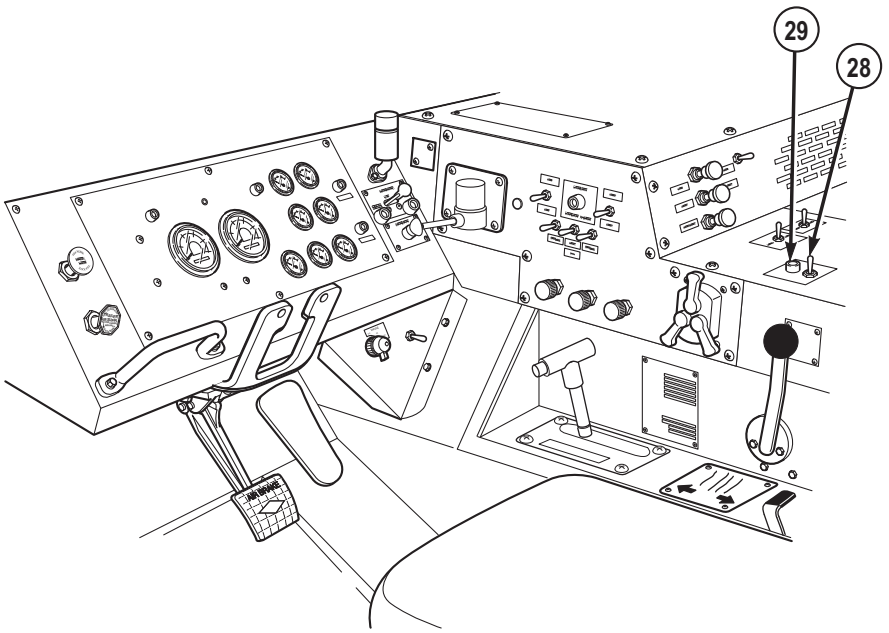


Figure 33.

31. Shut off engine. (WP 0057)
32. Remove and stow portable beacon lights. (WP 0097)
33. Turn off disabled vehicle emergency flashers and unlock steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW HEMTT M984A - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

PREPARE RECOVERY VEHICLE

NOTE

- This procedure is a two soldier task.
- The following rear lift procedures apply to HEMTT M984A wrecker ONLY. For all other models of HEMTT series vehicle, refer to tow HEMTT - rear lift. (WP 0078)

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

PREPARE RECOVERY VEHICLE - Continued

Figure 1.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove towing shackles (5) from rear of disabled vehicle:

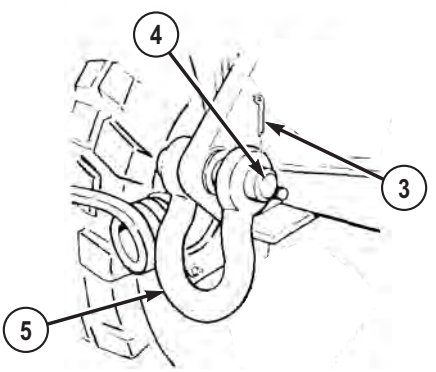


Figure 2.

a. Remove two cotter pins (3), pins (4), and towing shackles (5).

PREPARE RECOVERY VEHICLE - Continued

b. Install two pins (4) in towing shackles (5), install two cotter pins (3) in pins (4).

c. Stow towing shackles on disabled vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

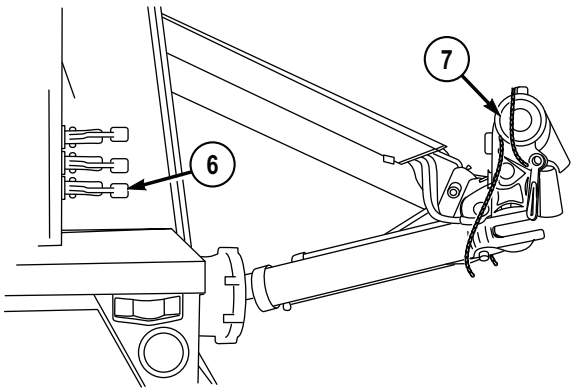


Figure 3.

5. Position recovery vehicle so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

PREPARE DISABLED VEHICLE

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

1. Disconnect two springs (1) from tow cylinders (2) on disabled vehicle.

PREPARE DISABLED VEHICLE - Continued

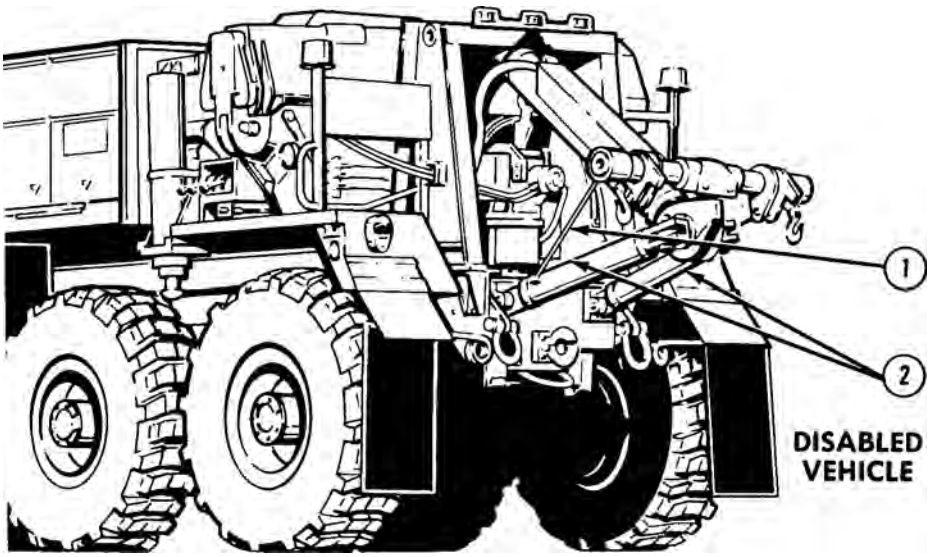


Figure 4.

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Remove two quick pins (3) and pins (4) from end caps (5) on disabled vehicle.

PREPARE DISABLED VEHICLE - Continued

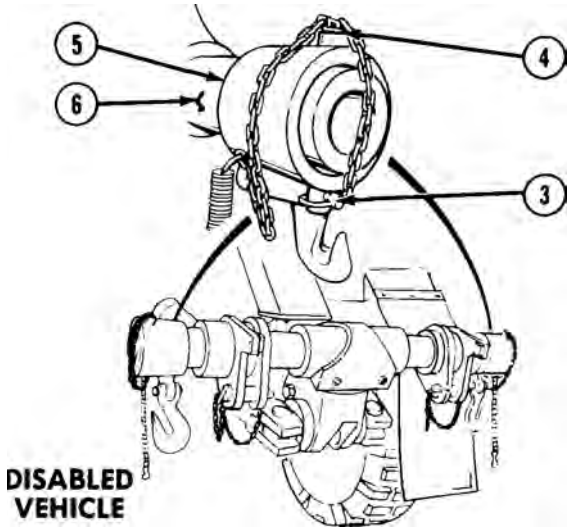


Figure 5.

3. Remove two end caps (5) from cross tube (6).
4. Remove two front adapters (7) from cross tube (6) and place on equipment body floor (8).

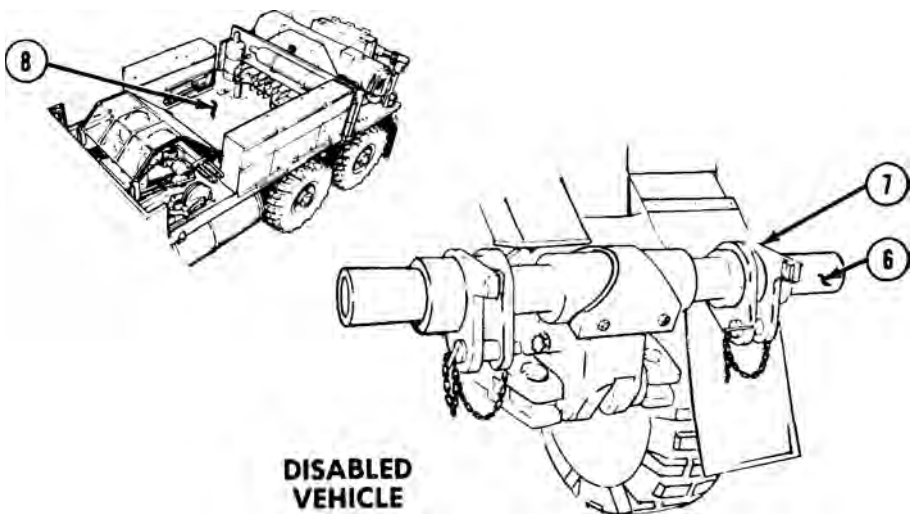


Figure 6.

PREPARE DISABLED VEHICLE - Continued

5. Install two end caps (5) on disabled vehicle cross tube (6).

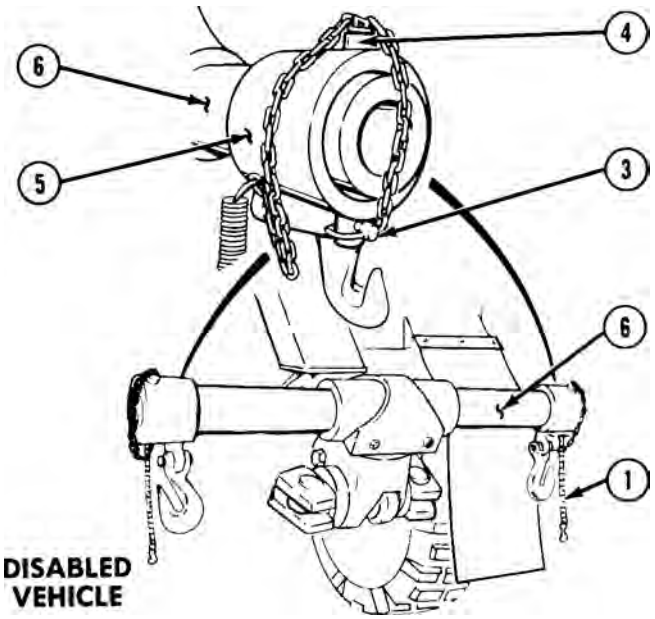


Figure 7.

6. Install two pins (4) and quick pins (3).
7. Wrap two springs (1) around cross tube (6) and secure.
8. Turn fairlead-tensioner (9) on disabled vehicle so hydraulic motor (10) is facing toward crane.

PREPARE DISABLED VEHICLE - Continued

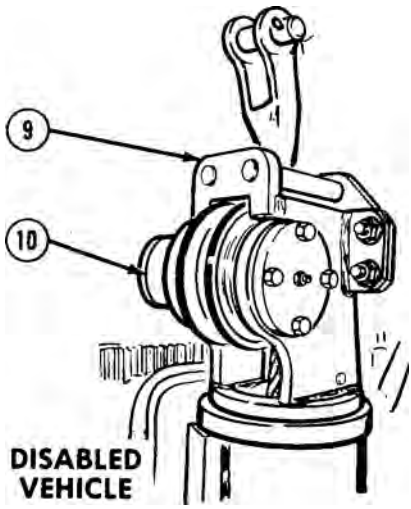


Figure 8.

9. Attach two springs (11) on tow cylinders (12) of recovery vehicle.

PREPARE DISABLED VEHICLE - Continued

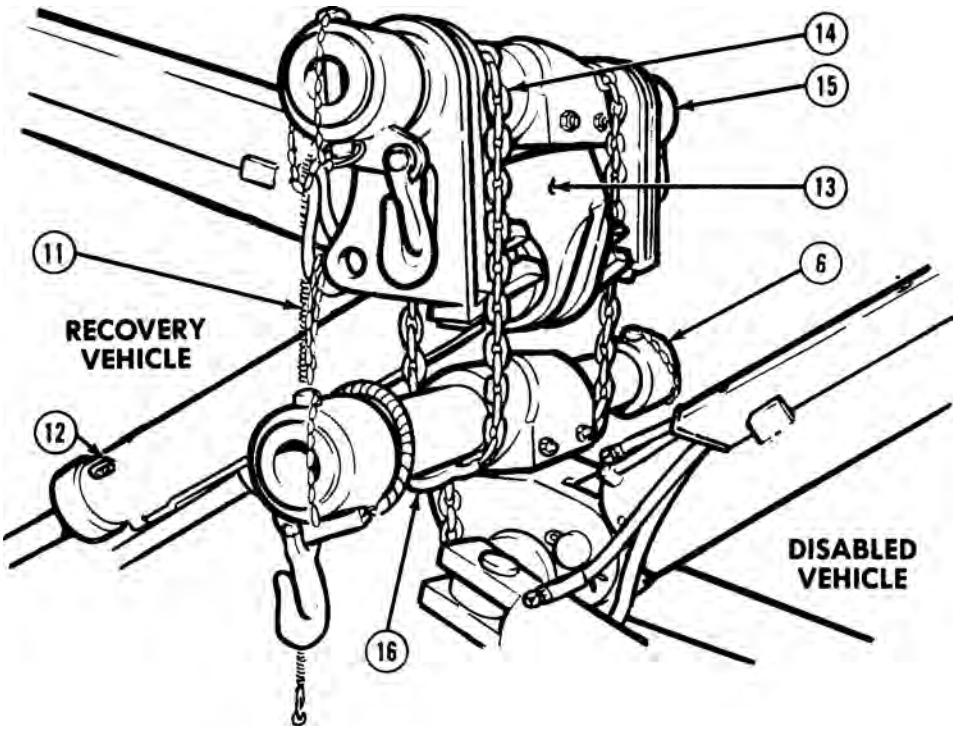


Figure 9.

10. Operate recovery vehicle retrieval system (WP 0059) so center assembly (13) is approximately 1 in. (25 mm) above and centered directly over disabled vehicle cross tube (6).
11. Remove one 12 ft. (3.6 m) chain (14) from recovery vehicle stowage.
12. Route one end of chain around cross tube of recovery vehicle (15) and around cross tube of disabled vehicle (6).
13. Connect grab hook (16) back into 12 ft. (3.6 m) chain (14) as tight as possible to secure that side of recovery vehicle cross tube (15) and disabled vehicle cross tube (6) together.
14. Repeat Steps (12) and (13) with free end of 12 ft. (3.6 m) chain (14) to secure opposite side of side of recovery vehicle cross tube (15) and disabled vehicle cross tube (6) together.
15. Operate retrieval system (WP 0059) and lift recovery vehicle cross tube (15) until 12 ft. (3.6 m) chain (14) is tight.

PREPARE DISABLED VEHICLE - Continued

NOTE

If required, use vehicle access ladder to reach upper screw.

16. Remove two screws (17) (bottom screw shown), lockwashers (18), and lift cylinder hose guard (19) from lift cylinder (20) of disabled vehicle.

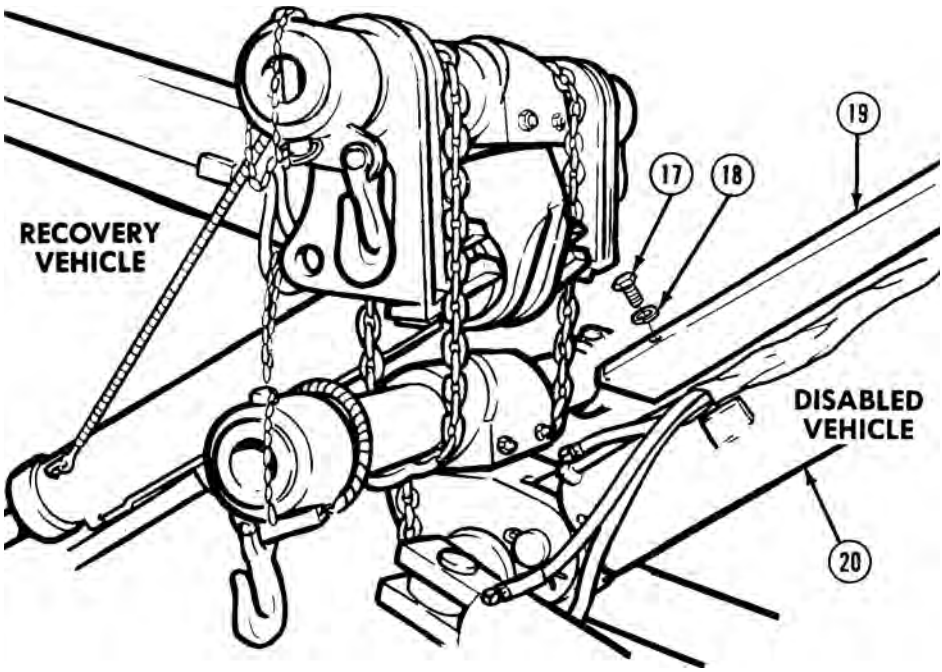


Figure 10.

17. Stow two screws (17), lockwashers (18), and lift cylinder hose guard (19) on disabled vehicle.
18. Prepare recovery vehicle crane for operation. (WP 0106)

CAUTION

Do not route chains over hydraulic hoses. Equipment damage will occur.

19. Remove 8 ft. (2.5 m) utility chain (21) from disabled vehicle stowage.
20. Route 8 ft. (2.5 m) utility chain (21) around lift cylinder (20) below hose guard mounting bracket (22) of disabled vehicle.

PREPARE DISABLED VEHICLE - Continued

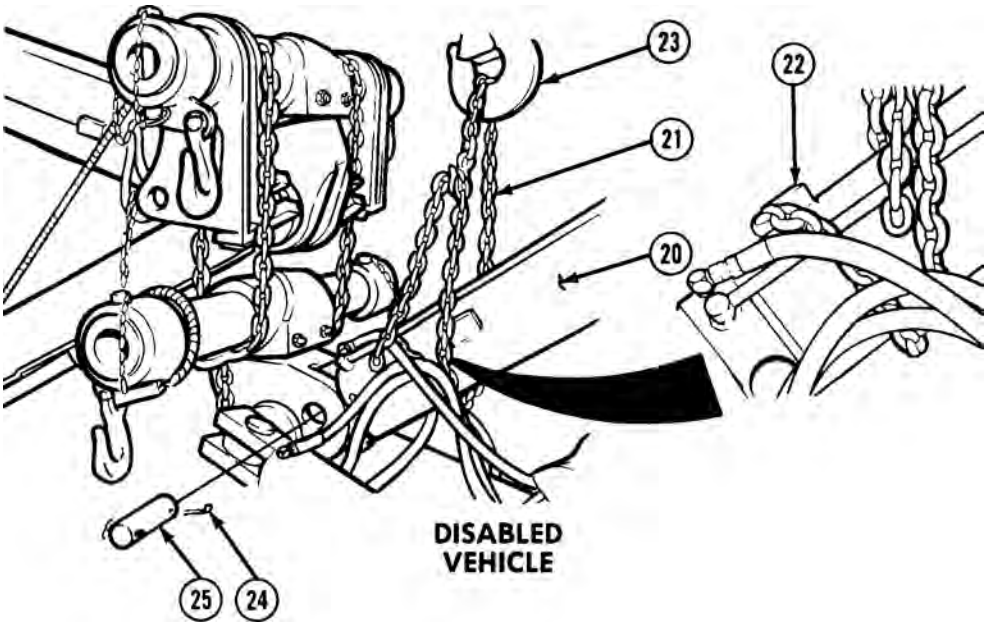
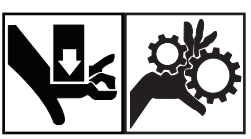


Figure 11.

21. Operate crane controls to lower crane load hook (23) until approximately 1 ft. (30 cm) above 8 ft. (2.5 m) utility chain (21).
22. Attach 8 ft. (2.5 m) utility chain (21) to crane load hook (23).
23. Operate crane controls until slack is removed from 8 ft. (2.5 m) utility chain (21).

WARNING



When cylinder mounting pin is removed, retrieval system may suddenly move up or down. Keep hands away from retrieval system. Failure to comply may result in injury or death to personnel.

24. Remove cotter pin (24) and lift cylinder mounting pin (25) and stow on disabled vehicle.
25. Operate retrieval system (WP 0059) while assistant operates crane controls to lower both cross tubes (6 and 15) and lift cylinder (20) until disabled vehicle lift cylinder (20) separates from center assembly (26).

PREPARE DISABLED VEHICLE - Continued

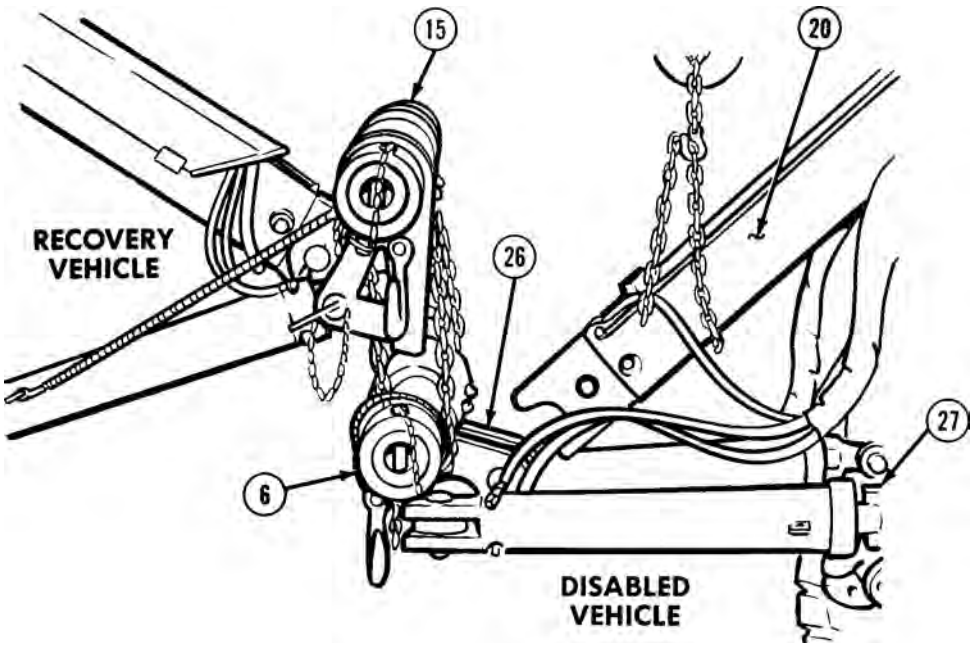
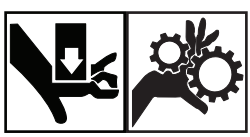


Figure 12.

WARNING



Keep hands away from tow cylinders when lowering lift cylinder and hydraulic lines. Failure to comply may result in injury or death to personnel.

CAUTION

Make sure hydraulic hoses are clear of lift cylinder or equipment may be damaged.

26. Operate crane controls (WP 0106) to lower lift cylinder (20) against rear crossmember (27) while assistant guides lift cylinder and hydraulic hoses.

27. Remove 8 ft. (2.5 m) utility chain (21) from recovery vehicle lift cylinder (20) and crane load hook (23).

PREPARE DISABLED VEHICLE - Continued

28. Route 8 ft. (2.5 m) utility chain around disabled vehicle cross tube (6) and attach to recovery vehicle crane load hook (23).
29. Operate crane controls (WP 0106) to raise load hook (23) until there is slack in the 12 ft. (3.6 m) chain (14).

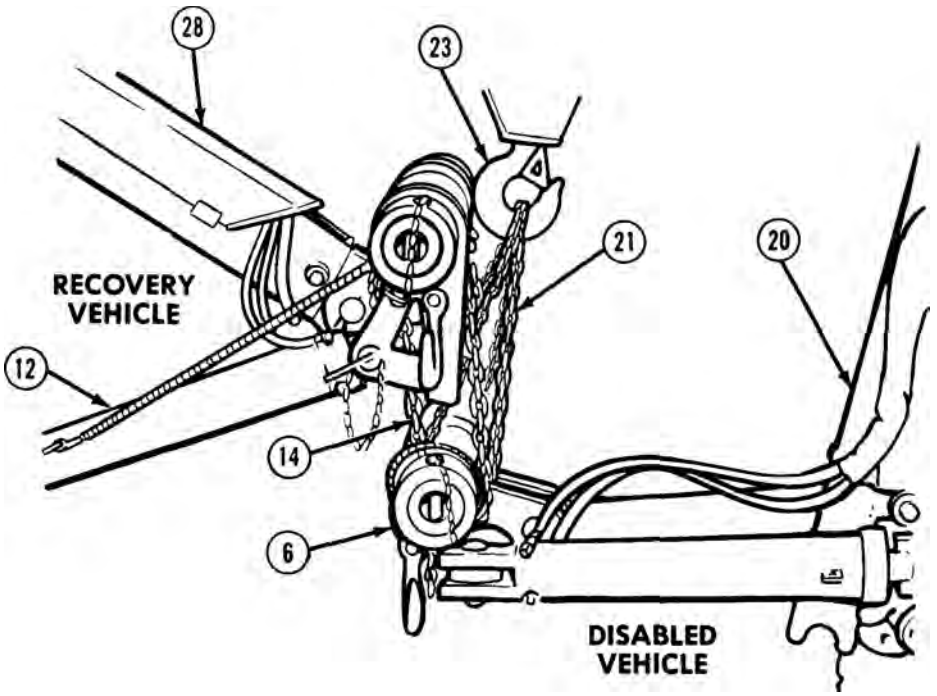


Figure 13.

30. Remove 12 ft. (3.6 m) chain (14) and return to recovery vehicle stowage.
31. Operate retrieval controls (WP 0058) to fully retract lift cylinder (28) and tow cylinders (12) of recovery vehicle.

PREPARE DISABLED VEHICLE - Continued

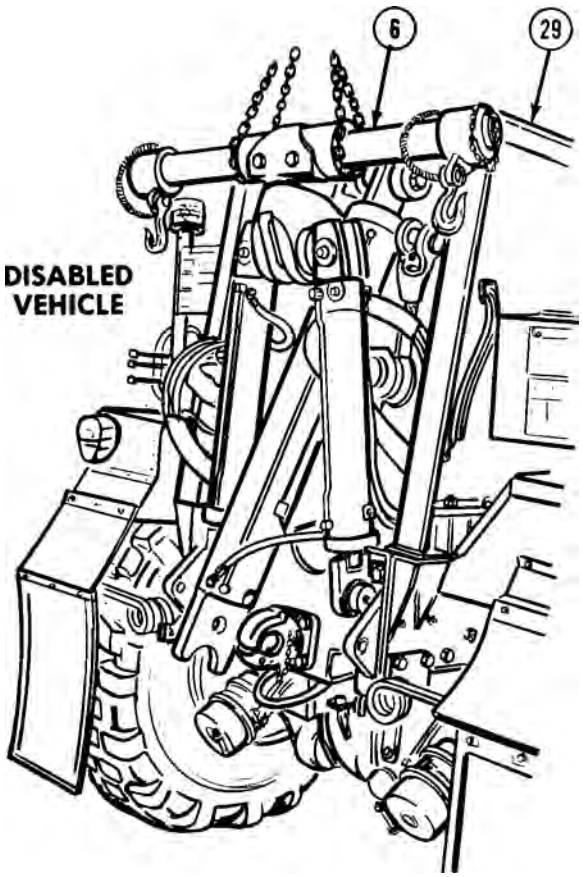


Figure 14.

CAUTION

Make sure hydraulic hoses are clear of tow and lift cylinders. Failure to comply may result in damage to equipment.

32. Operate crane controls (WP 0106) to raise disabled vehicle cross tube (6) to top of tow support assembly (29).

PREPARE DISABLED VEHICLE - Continued

WARNING

Use care when climbing on and off vehicle. Always face vehicle, use steps and grab handles, and maintain three points of contact with vehicle (two feet/one hand or two hands/one foot). Keep steps, grab handles, and walkways clean, and be extra careful in wet, icy, or muddy conditions. Failure to comply may result in injury or death to personnel.

33. Remove two straps (30) from disabled vehicle stowage, and route straps around cross tube (6) and through tow support assembly shackle hole (31).
34. Route one strap around disabled vehicle cross tube (6) and through tow support assembly shackle hole (31) as shown.

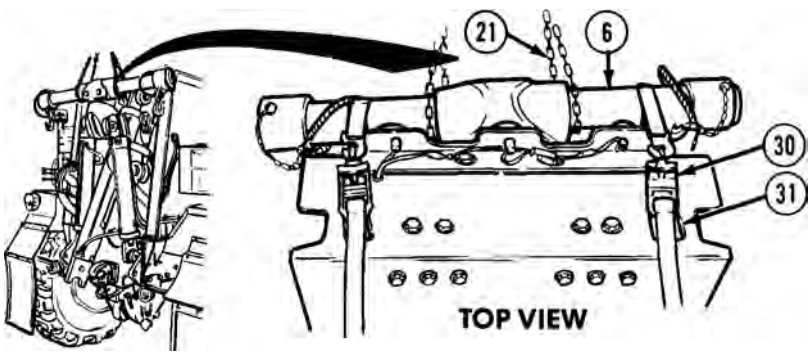


Figure 15.

35. Repeat step (34) for other side of disabled vehicle cross tube (6).
36. Pull two straps (30) tight.
37. Operate crane controls (WP 0106) until 8 ft. (2.5 m) utility chain (21) is slack.

NOTE

Loosen straps as required to remove chain.

38. Remove 8 ft. (2.5 m) utility chain (21), tighten straps (30) if loosened.

PREPARE DISABLED VEHICLE - Continued

NOTE

It is advisable to use chains from disabled vehicle stowage for Step (39). This will enable recovery vehicle to maintain full complement of chains in the event that disabled vehicle retrieval system is not returned to operating condition immediately after disconnect.

39. Install two 8 ft. (2.5 m) utility chains (21) around cross tube (6) and through tow support assembly shackle hole (31) two times, and attach grab hook to chain.

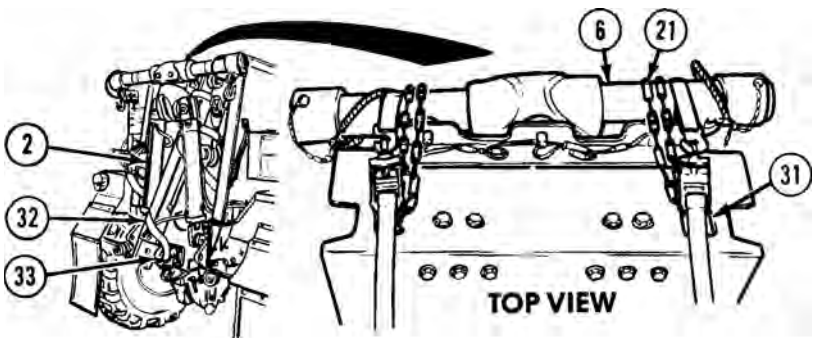


Figure 16.

40. Route strap (32) from towing pintle hook (33), around driver side tow cylinder (2), and tighten.

41. Stow crane (WP 0106) on recovery vehicle.

HOOKUP

1. Position recovery vehicle so that cross tube (1) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Remove two quick pins (2) and pins (3) from end caps (4).

HOOKUP - Continued

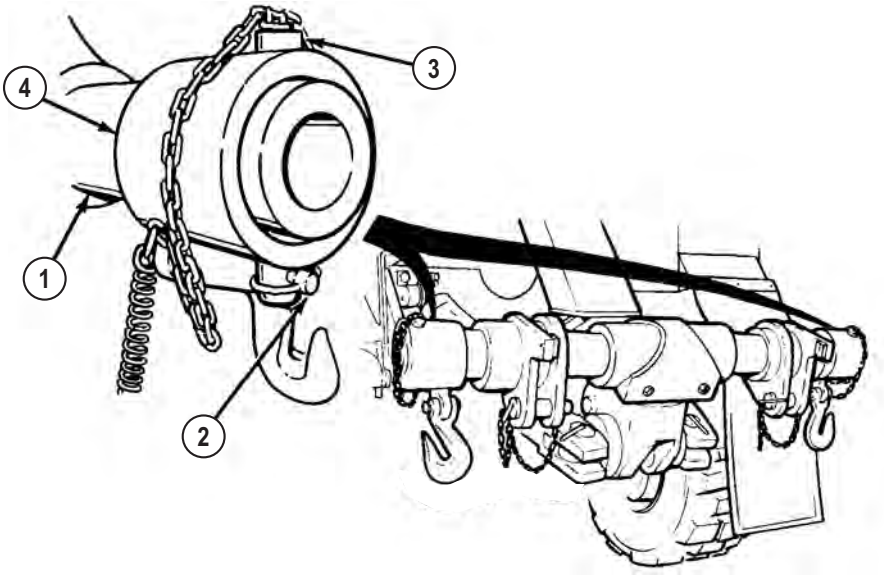


Figure 17.

3. Remove two end caps (4) from cross tube (1).
4. Remove two front adapters (5) from cross tube (1) and place on equipment body floor (6).

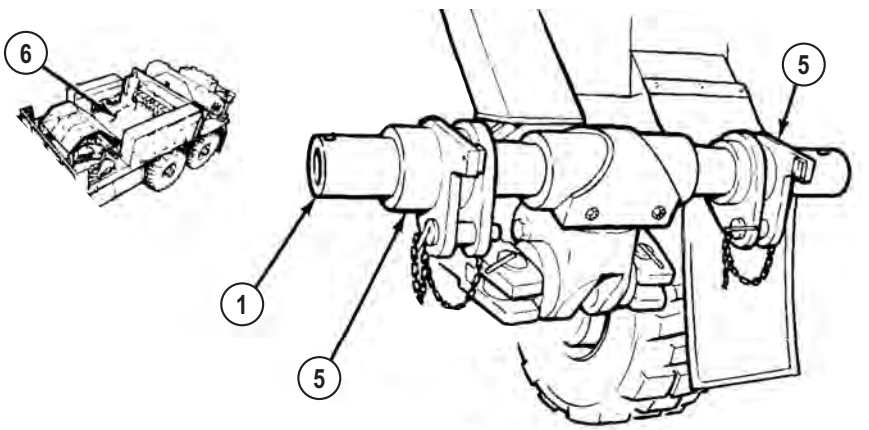


Figure 18.

HOOKUP - Continued

5. Remove lock handle (7), lock plate (8), and two rear tow adapters (9).

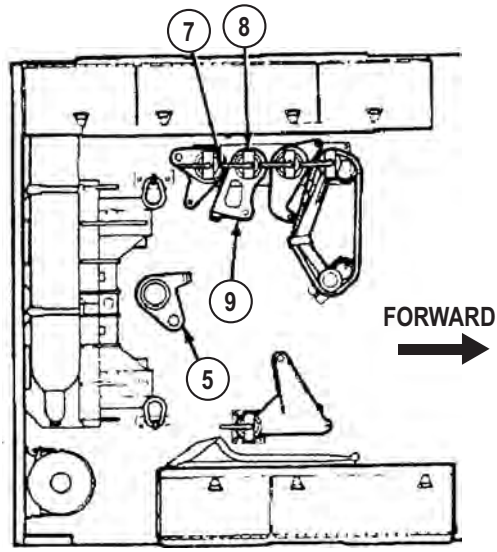
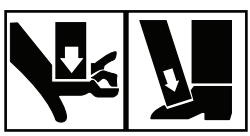


Figure 19.

6. Install two front adapters (5) removed from cross tube with lock plate (8) and lock handle (7).

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

7. Install two rear tow adapters (9) on cross tube (1).

HOOKUP - Continued

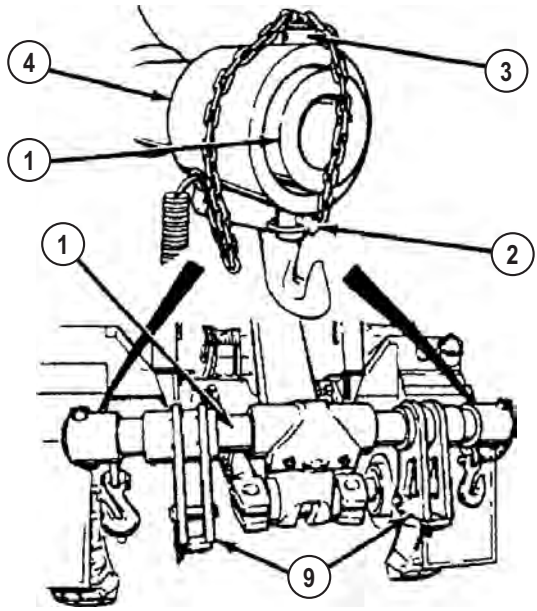


Figure 20.

8. Install two end caps (4) on cross tube (1).
9. Install two pins (3) and quick pins (2).
10. Remove two quick pins (10) and pins (11) from rear tow adapters (9).

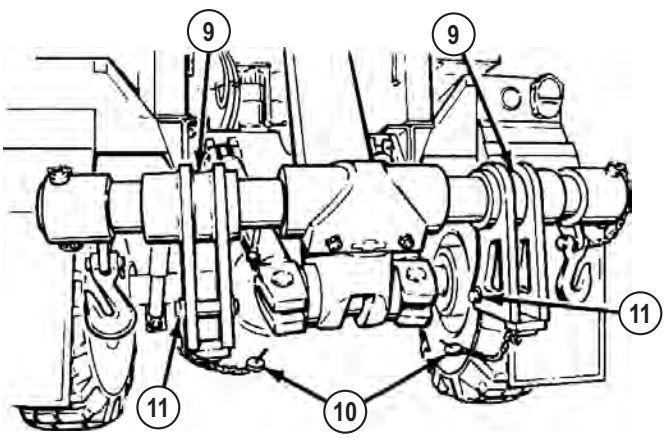


Figure 21.

HOOKUP - Continued

NOTE

If disabled vehicle has rear towing shackles installed, remove towing shackles and stow on disabled vehicle.

11. Attach two springs (12) on tow cylinders (13).

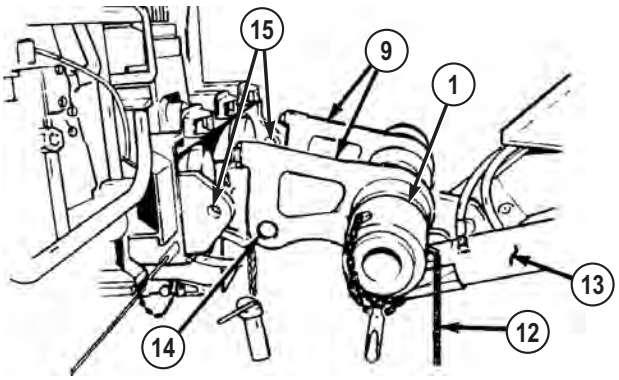


Figure 22.

WARNING

Adapters may need to be held in the upright position while moving cross tube. Failure to comply may result in injury or death to personnel.

12. Rotate two rear tow adapters (9) so mounting holes (14) are on top.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

HOOKUP - Continued

13. Operate retrieval system, and with aid of an assistant position cross tube (1) so two mounting holes (14) in rear tow adapters (9) align with rear tow eyes (15) on disabled vehicle.
14. Insert two pins (11) through rear tow adapters (9) and disabled vehicle rear tow eyes (15). Install two quick pins (10).

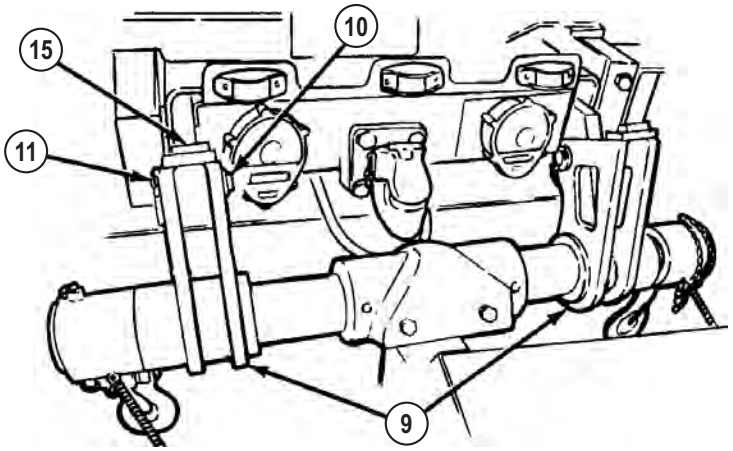


Figure 23.

NOTE

If disabled vehicle air system is inoperative, manually release spring brakes (WP 0129).

15. Push in PARKING BRAKE control (16) on disabled vehicle.

HOOKUP - Continued

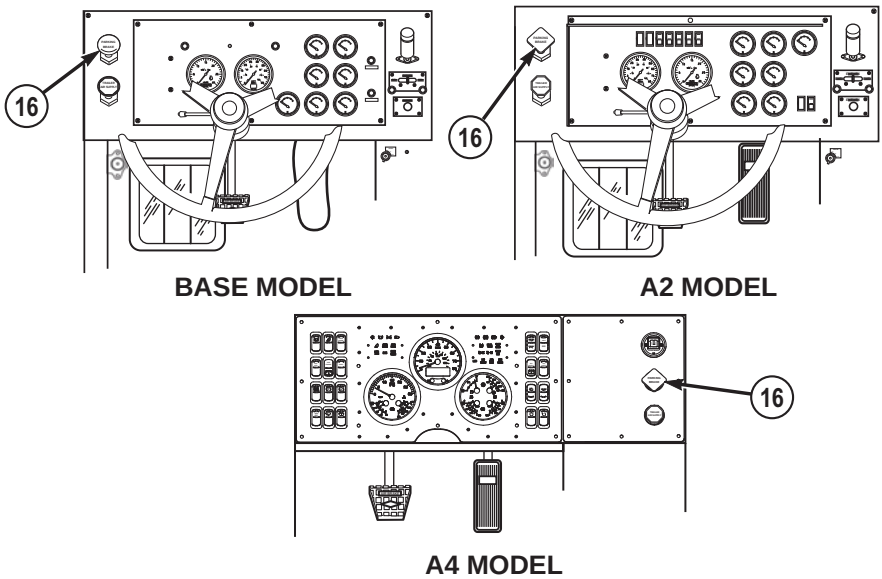


Figure 24.

NOTE

Two rear tow adapters must be resting against frame of disabled vehicle.

16. Operate retrieval system until tow cylinders (13) are fully retracted.

HOOKUP - Continued

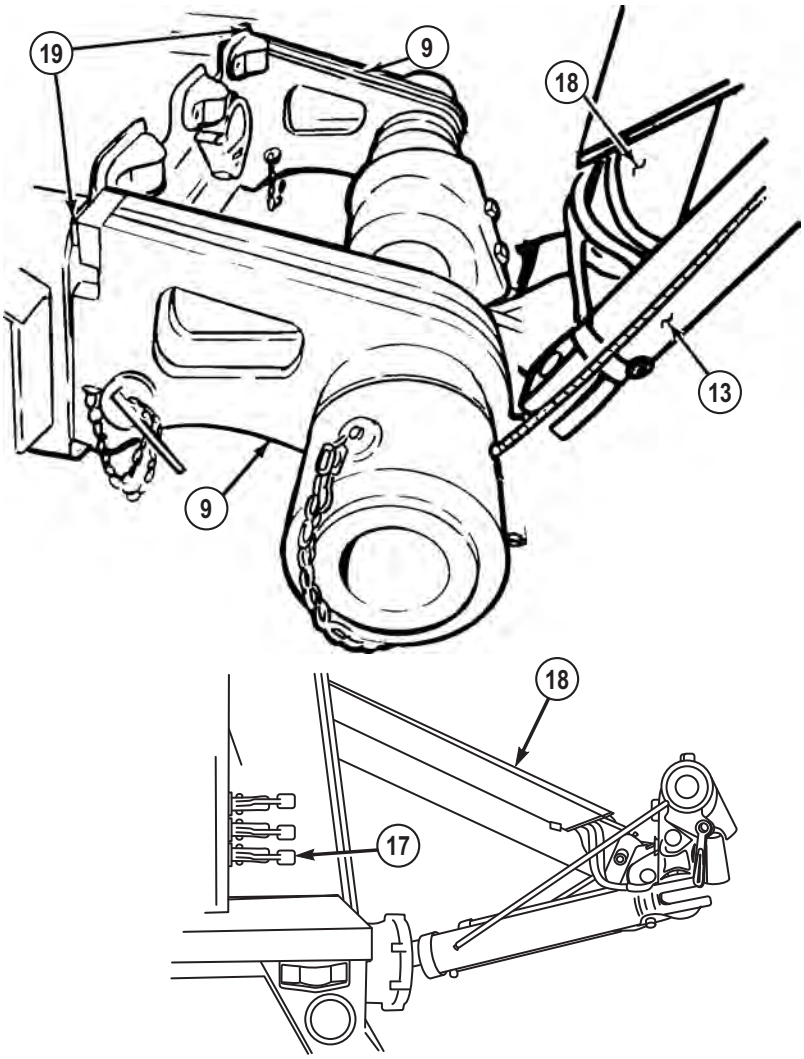


Figure 25.

17. Push in LIFT CYLINDER control lever (17) to retract lift cylinder (18) until two rear tow adapters (9) contact disabled vehicle frame (19).
18. Remove two 16 ft. (5 m) safety chains (20) from wrecker stowage.

HOOKUP - Continued

CAUTION

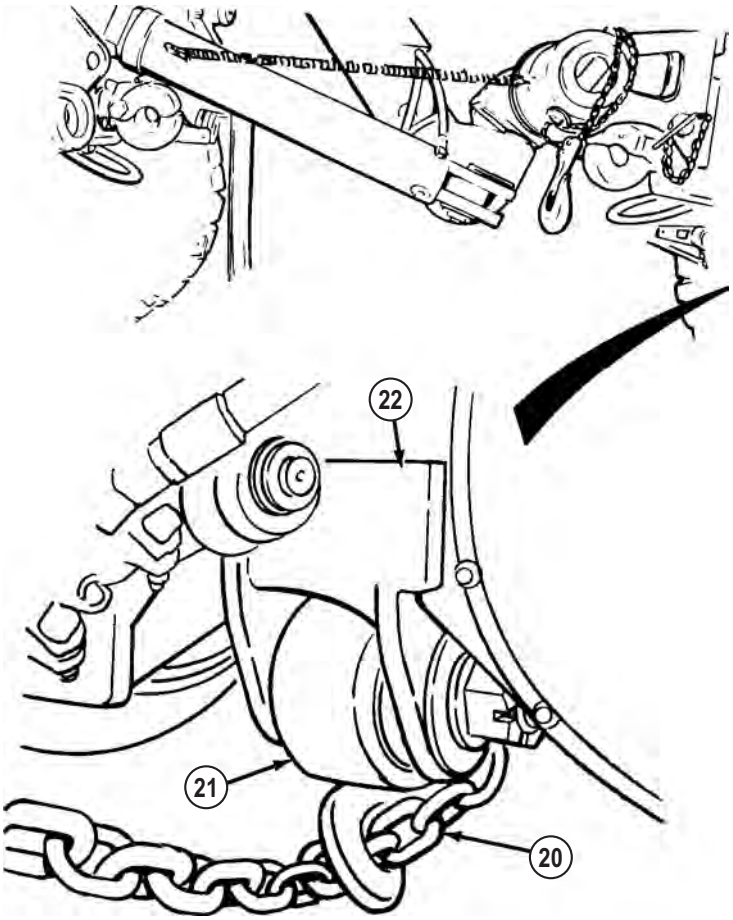
Care must be taken to identify which model of HEMTT series vehicle is being towed (refer to data plate on inside of driver side door). Safety chain attachment points depend on model of HEMTT series vehicle. Failure to comply may result in damage to equipment.

NOTE

- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (19).
- If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (20).

19. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (20) over walking beam (21) in front of No. 4 axle (22) on disabled vehicle, and hook 16 ft. (5 m) safety chain (20) back into itself under walking beam (21) as shown.

HOOKUP - Continued



BASE/A2 DISABLED VEHICLE

Figure 26.

CAUTION

Care must be taken to identify which model of HEMTT series vehicle is being towed (refer to data plate on inside of driver side door). Safety chain attachment points depend on model of vehicle. Failure to comply may result in damage to equipment.

NOTE

Complete Step (20) if disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door).

HOOKUP - Continued

20. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (20) through safety chain hoop (23) on disabled vehicle, and attach grab hook (24) back into 16 ft. (5 m) safety chain (20) as shown.

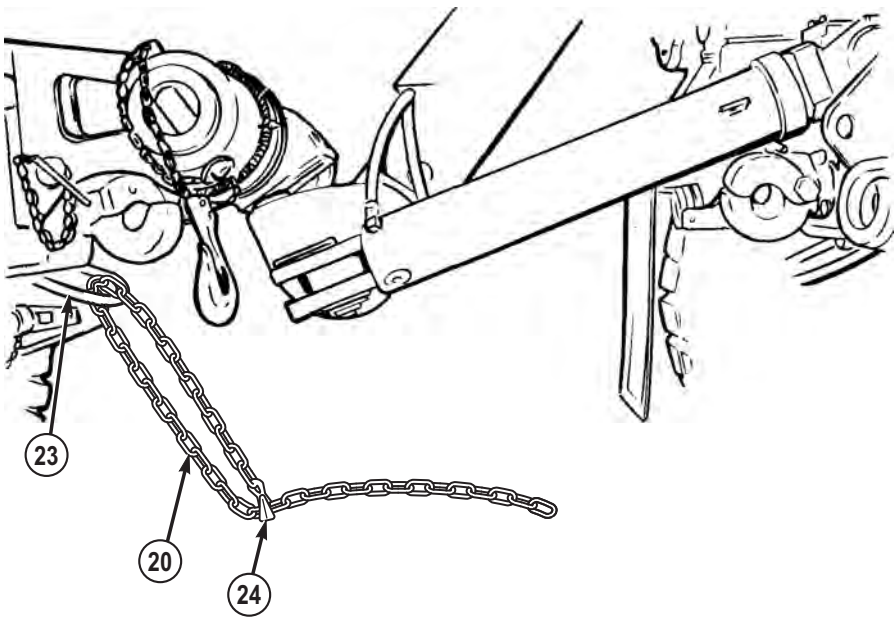


Figure 27.

21. Repeat Step (19) or (20) for other side of disabled vehicle (as applicable).

NOTE

Adjust chain slack so safety chains are approximately 6 in. (15 cm) above the ground.

22. Route two free ends of 16 ft. (5 m) safety chain (20) through safety chain hoop (25) on recovery vehicle, and secure grab hooks (26) back into 16 ft. (5 m) safety chain (20) as shown.

HOOKUP - Continued

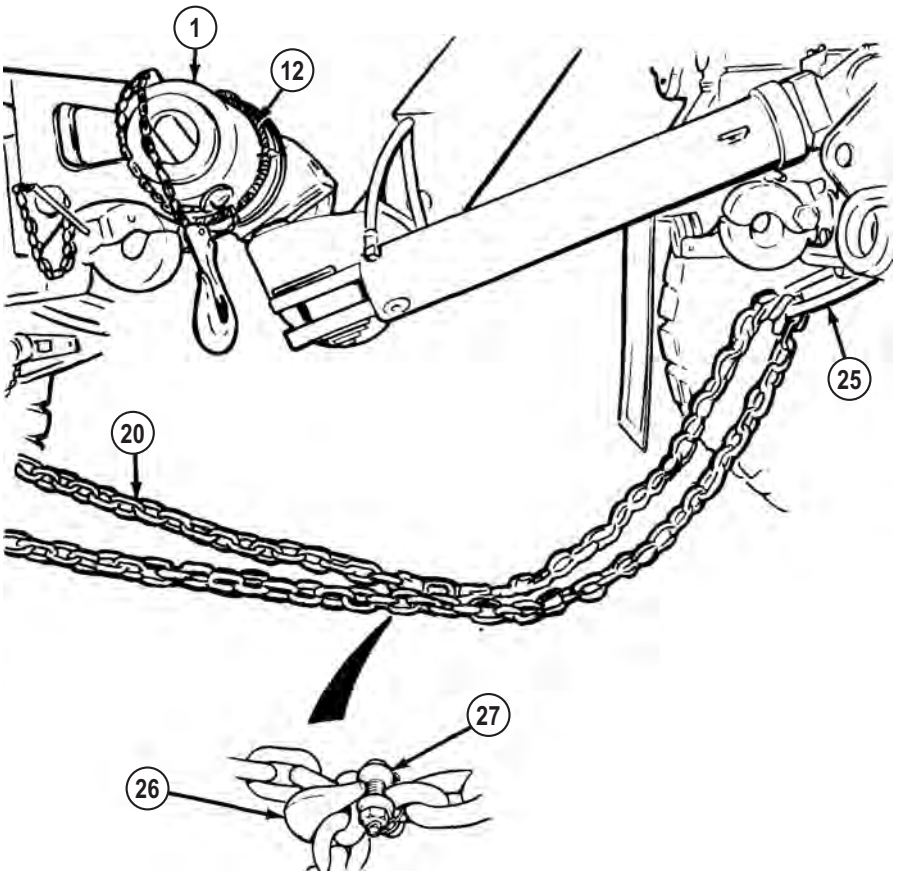


Figure 28.

23. Secure two grab hooks (26) with safety shackles (27).
24. Wrap two springs (12) around cross tube (1) and secure.
25. Prepare disabled vehicle for towing. (WP 0118)
26. Remove emergency tow lights (28) and two brackets (29) from stowage.

HOOKUP - Continued

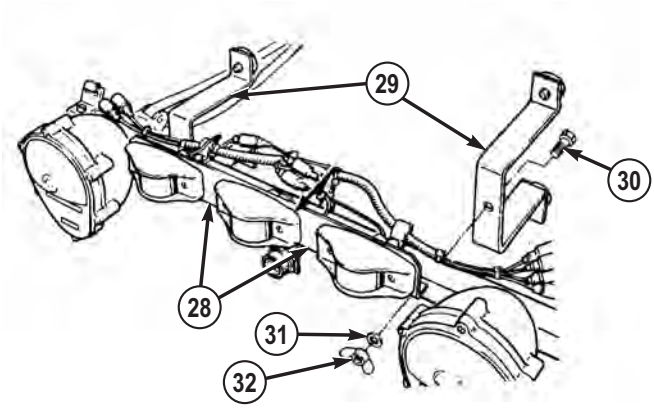


Figure 29.

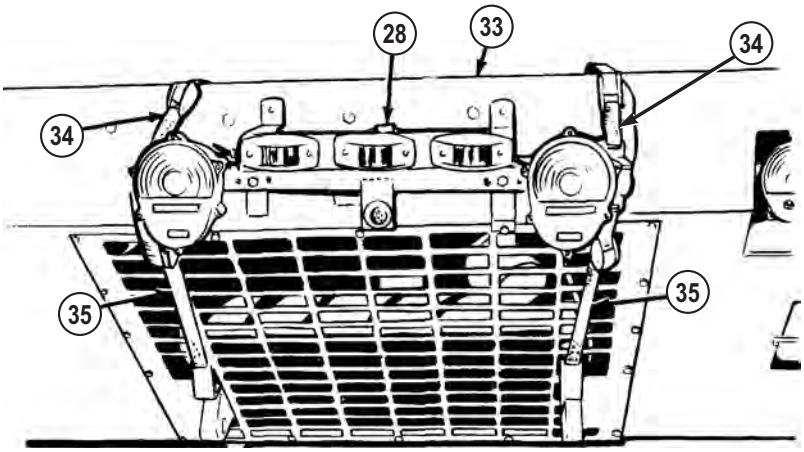
27. Install two brackets (29) in outside holes of emergency tow lights (28) with two screws (30), washers (31), and nuts (32).

NOTE

Emergency tow lights are mounted the same regardless of HEMTT series vehicle model. BASE/A2 model shown.

28. Position emergency tow lights (28) on skid plate (33). Fasten top straps (34) to top of skid plate (33).

HOOKUP - Continued



BASE/A2 SHOWN

Figure 30.

29. Fasten bottom straps (35) to bottom of skid plate (33).
30. Remove tow light cable (36) from wrecker stowage and connect to rear electrical connector (37) on wrecker.

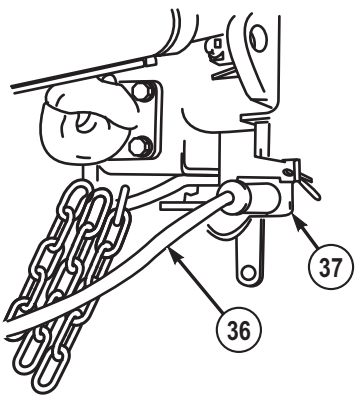


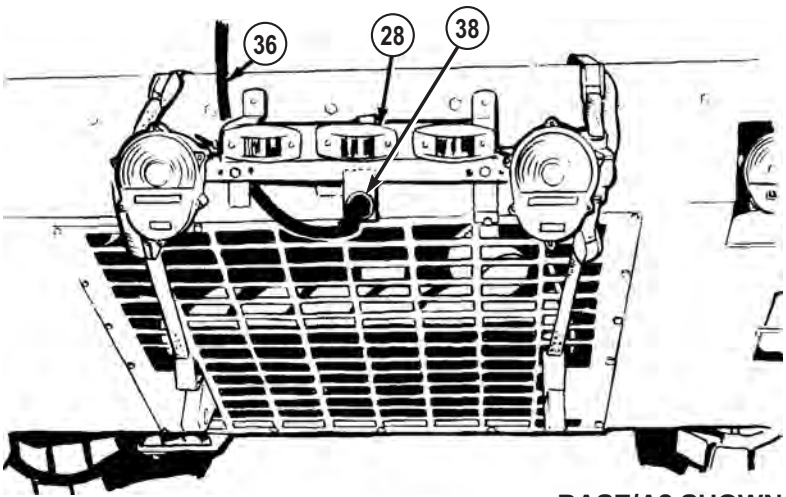
Figure 31.

CAUTION

Route cable so it does not drag on ground or interfere with turning tires or damage to equipment may result.

HOOKUP - Continued

31. Route other end of tow light cable (36) to emergency tow lights (28) on disabled vehicle, and plug in at connector (38).



BASE/A2 SHOWN

Figure 32.

CAUTION

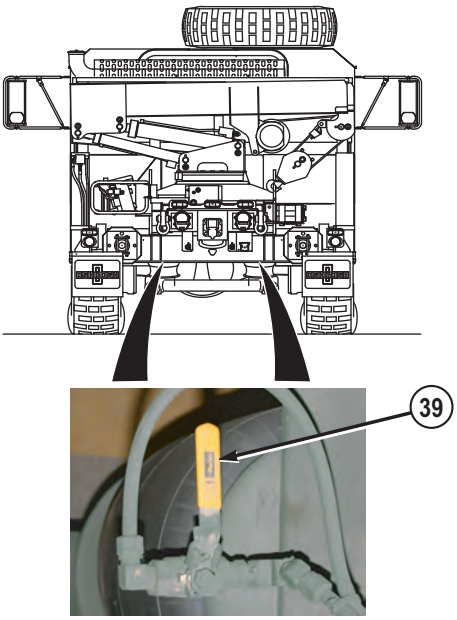
When lifting and towing an A4 HEMTT series vehicle (refer to data plate on inside of driver side door) special care must be taken to avoid causing damage to vehicle air suspension system. Always turn No. 4 axle air suspension ball valves OFF prior to lifting the A4 HEMTT series vehicle (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information). Failure to comply may result in damage to equipment.

NOTE

- If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (32).
- If disabled vehicle is BASE or A2 HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (33).

32. Position disabled vehicle No. 4 axle driver side and passenger side (shown) ball valve handles (39) OFF (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information).

HOOKUP - Continued



BALL VALVE OFF

Figure 33.

33. Set POWER switch (40) to ON position.

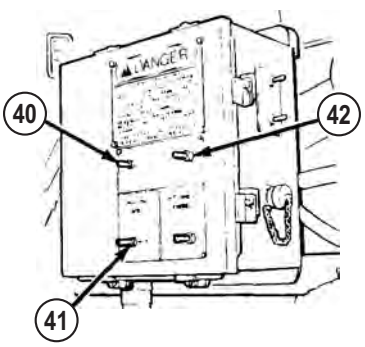


Figure 34.

34. Set HIGH IDLE switch (41) to CONTINUOUS.
35. Push and release LATCH switch (42). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle or damage to equipment may result.
- Make sure all rigging is secure. Loose rigging can become entangled and damage to equipment may result.

36. Push LIFT CYLINDER control lever (17) to retract lift cylinder (18), and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

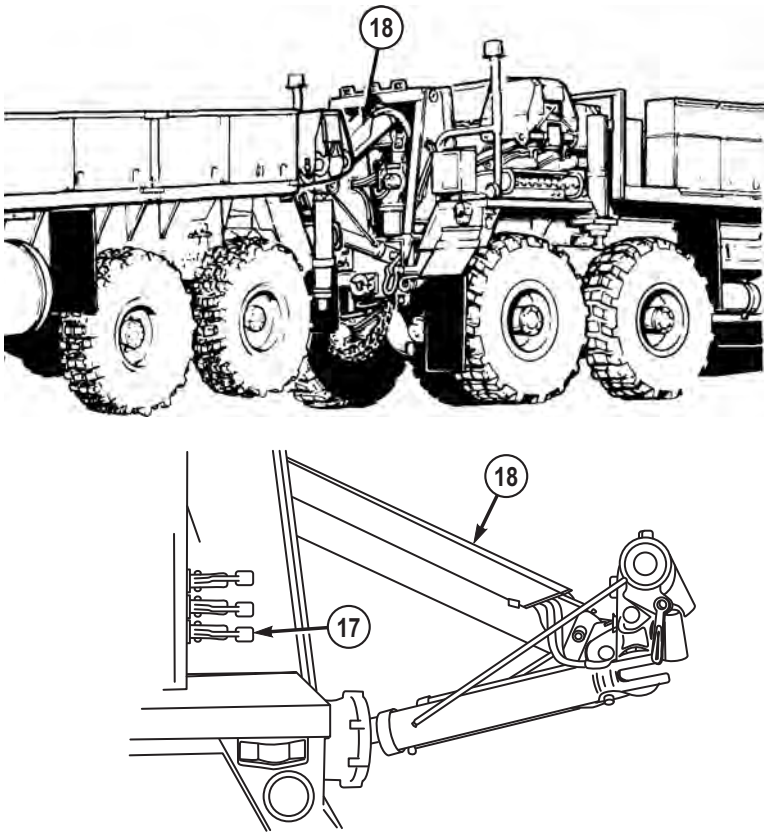


Figure 35.

37. Set POWER switch (40) to OFF position.

HOOKUP - Continued

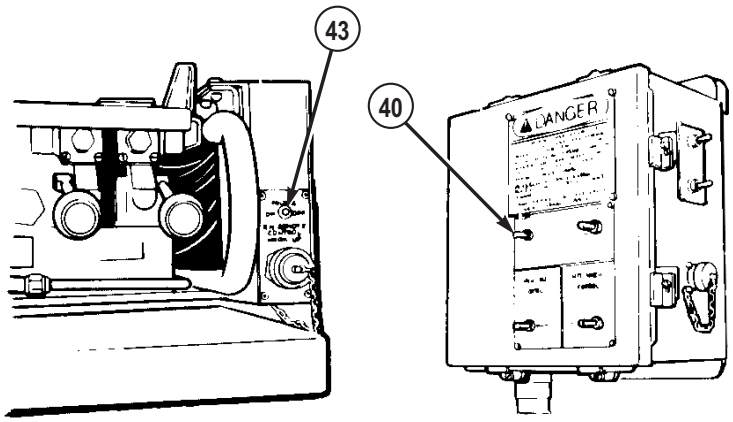


Figure 36.

38. Set POWER switch (43) to OFF position.

NOTE

- If disabled vehicle is BASE/A2 HEMTT series vehicle (refer to data plate on inside of driver side door), continue with Step (40).
- If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (41).

39. Remove steering lock bracket (44) and four screws (45) from disabled vehicle stowage and install on disabled vehicle:

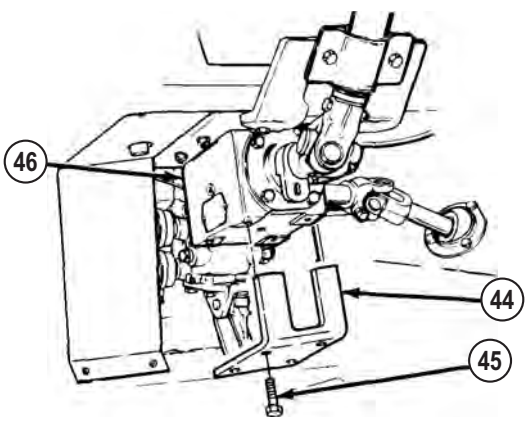


Figure 37.

HOOKUP - Continued

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 9 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lock bracket (44) and four screws (45) from stowage.

c. Install steering lock bracket (44) on 90 degree gearbox (46) with four screws (45).

NOTE

If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), continue with Step (41).

40. Install steering lockpin (47) on disabled vehicle:

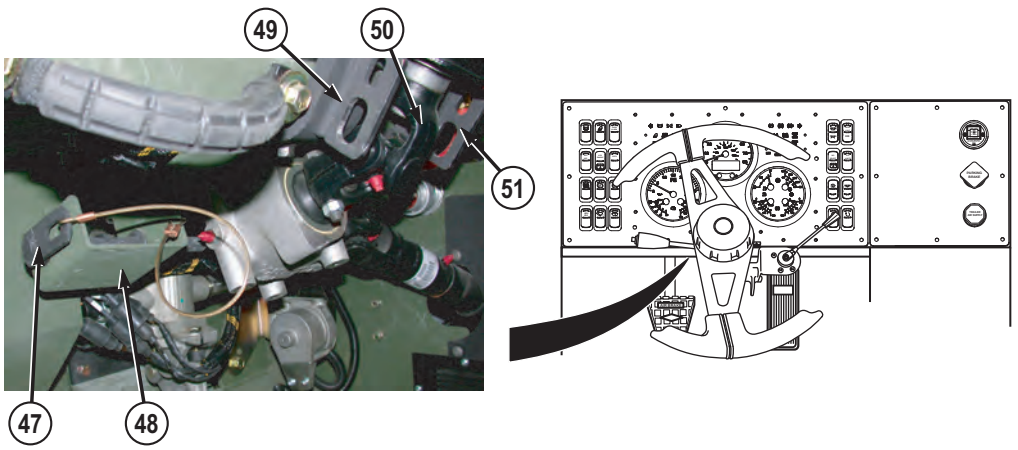


Figure 38.

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 10 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lockpin (47) from stowage bracket (48) under driver side dash panel.

HOOKUP - Continued

NOTE

It may be necessary to turn steering wheel to line up steering column yoke with holes in locking bracket.

c. Install steering lockpin (47) through left hole (49) of lock bracket, steering column yoke (50), and right hole (51) of lock bracket.

d. Rotate steering lockpin (47) to align hole in steering lockpin handle with hole in lock bracket, and install lock (52).

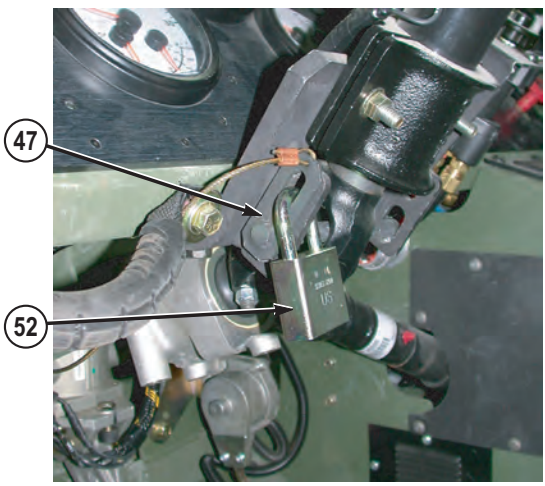


Figure 39.

41. Set PTO ENGAGE switch (53) to OFF position. Indicator light (54) will go out.

HOOKUP - Continued

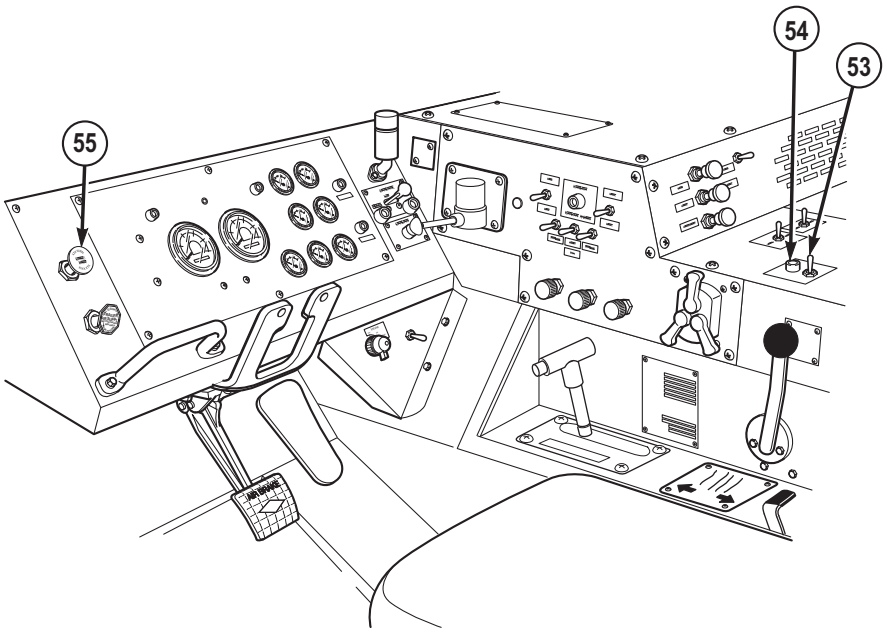


Figure 40.

42. Turn on wrecker service drive lights. (WP 0090)
43. Turn on wrecker emergency flashers. (WP 0099)
44. Turn on disabled vehicle emergency flashers (refer to operator's manual).
45. Push in PARKING BRAKE control (55).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

46. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

The procedures for disconnecting a HEMTT M984A wrecker match those of all other HEMTT series vehicles.

1. Refer to tow HEMTT-rear lift for disconnect procedures.

RETURN RETRIEVAL SYSTEM TO OPERATING CONDITION

1. Remove strap (1) from towing pintle (2) and left tow cylinder (3).

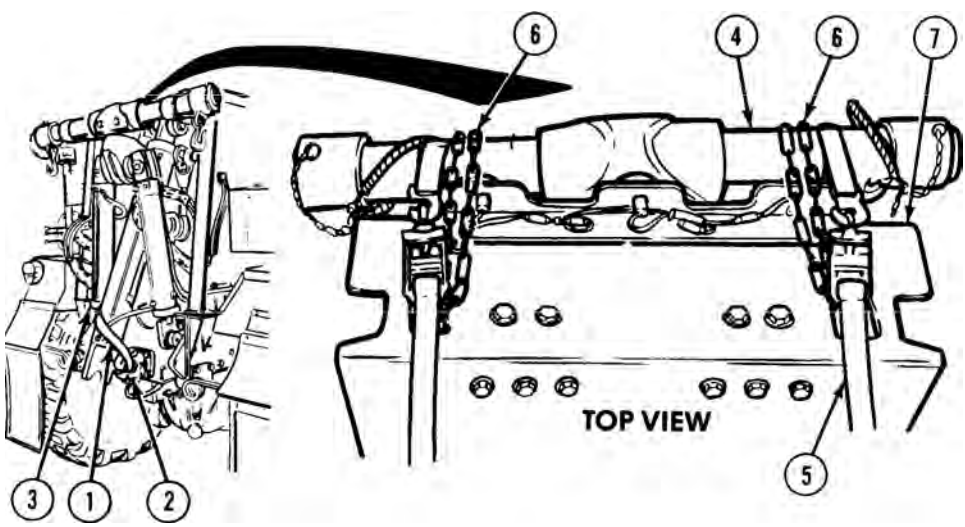


Figure 41.

RETURN RETRIEVAL SYSTEM TO OPERATING CONDITION - Continued

2. Support retrieval cross tube (4) with lifting device.

WARNING

Keep out from under cross tube and tow cylinders after removing strap. Cross tube and cylinders can fall. Failure to comply may result in injury or death to personnel.

3. Remove two straps (5) and 8 ft. (2.5 m) chains (6) that secure cross tube (4) to tow support assembly (7).
4. Lower cross tube (4).
5. Support cross tube (4) with 12 ft. (3.6 m) chain and retrieval system of recovery vehicle.

CAUTION

Make sure chain or sling of lifting device is clear of hydraulic lines. Failure to comply may result in damage to equipment.

6. Attach lifting device to lift cylinder (8).

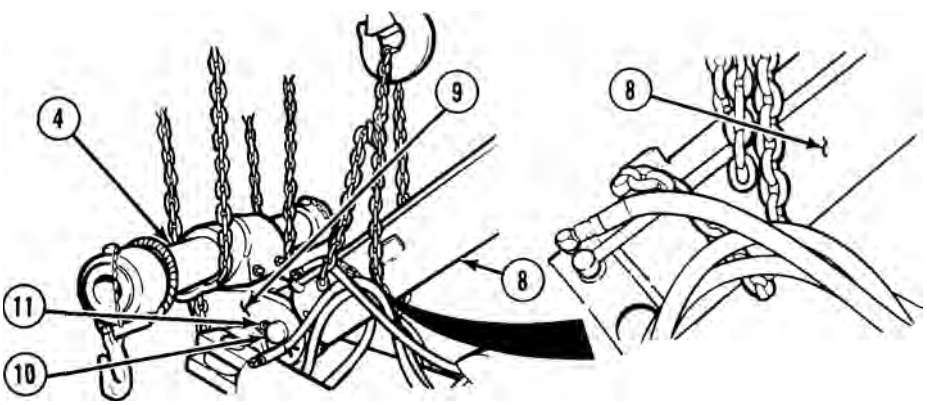


Figure 42.

7. Align lift cylinder (8) with center assembly (9).
8. Install pin (10) with cotter pin (11).

RETURN RETRIEVAL SYSTEM TO OPERATING CONDITION - Continued

9. Remove lifting device from cross tube (4) and lift cylinder (8).

NOTE

If required, use vehicle access ladder to reach upper screw.

10. Install cylinder hose guard (12) with two lockwashers (13) and screws (14).

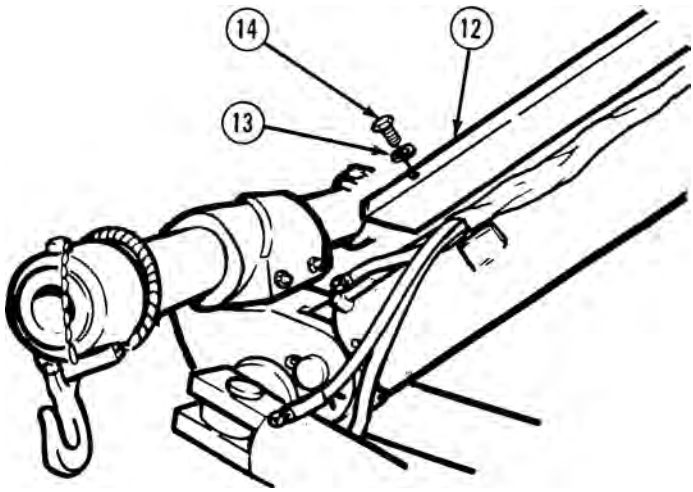


Figure 43.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M35 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

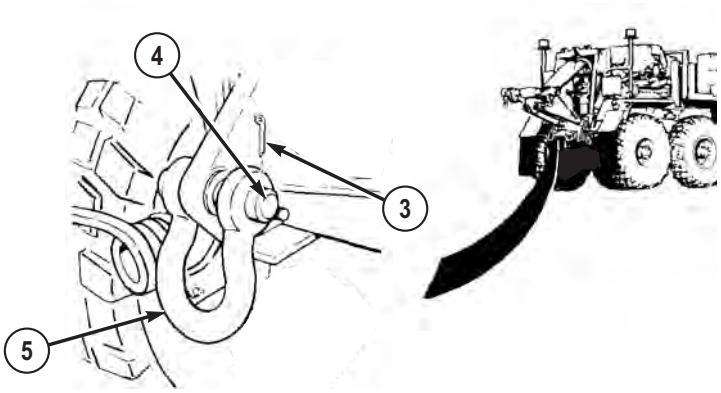


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

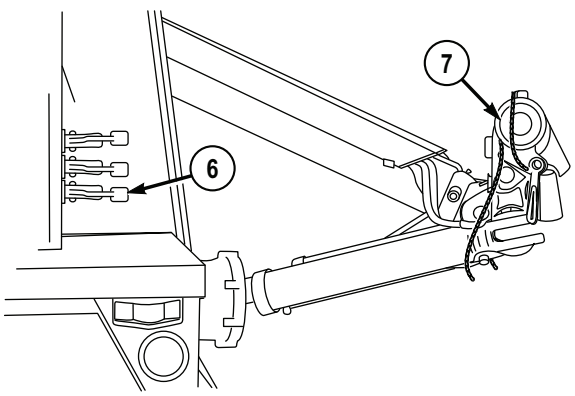


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from, and centered on tow eyes of disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

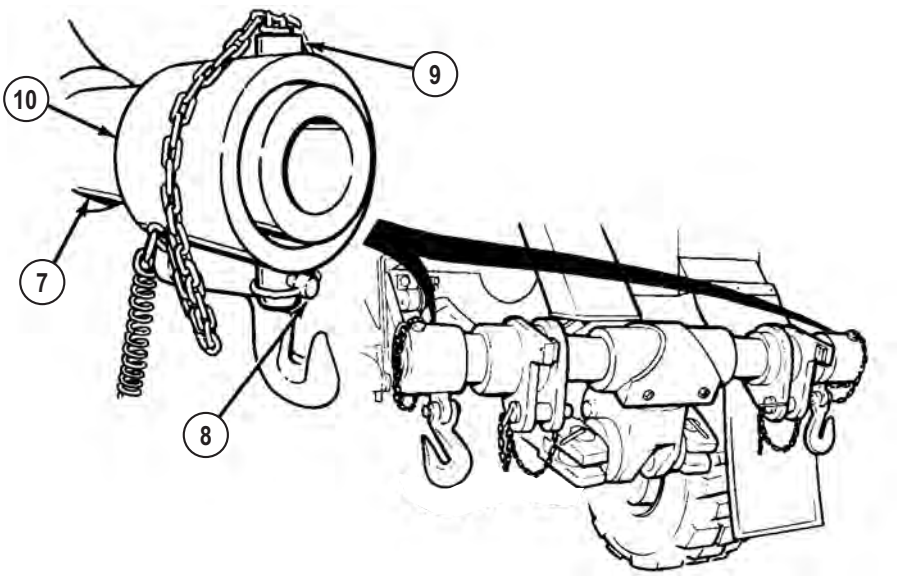


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

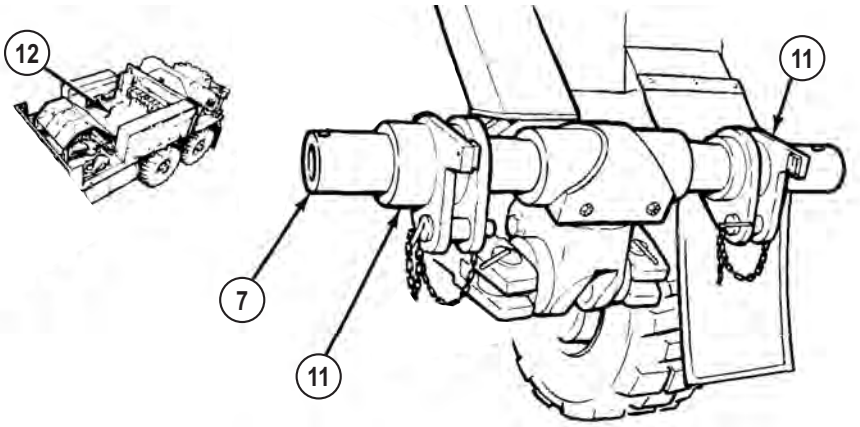


Figure 5.

9. Remove lock handle (13), lock plate (14), and two front tow adapters (15).

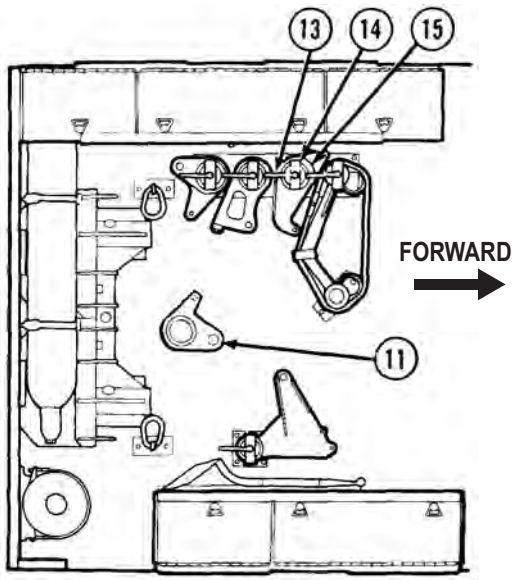


Figure 6.

10. Install two front adapters (11) removed from cross tube (7), lock plate (14), and lock handle (13).

HOOKUP - Continued

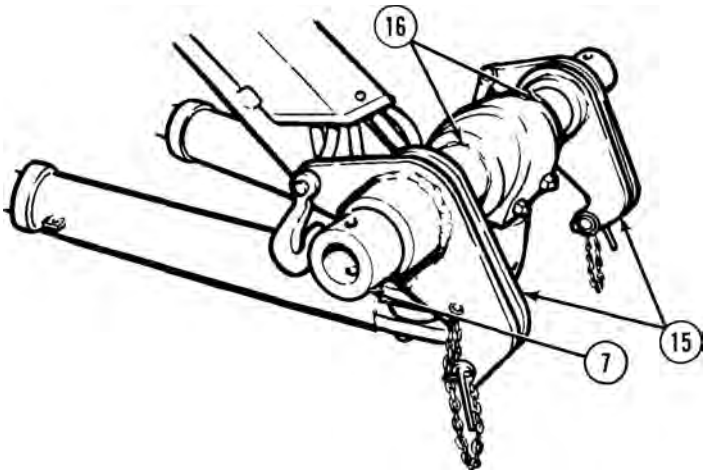
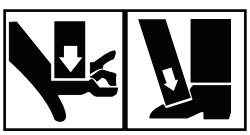


Figure 7.

11. Remove two 5 in. (127 mm) spacers (16) from stowage.
12. Install two 5 in. (127 mm) spacers (16) on cross tube (7).

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

13. Install two front tow adapters (15) on cross tube (7).

HOOKUP - Continued

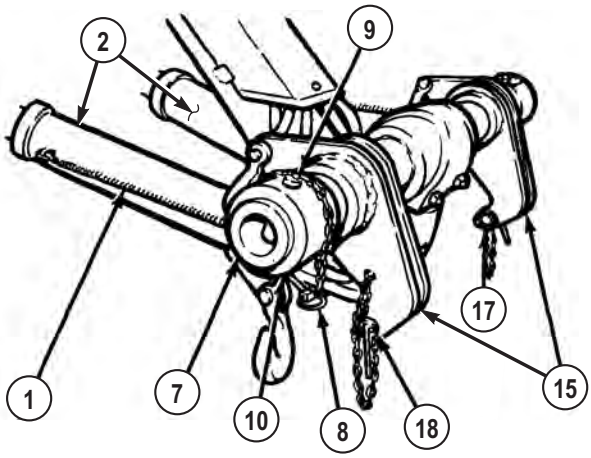
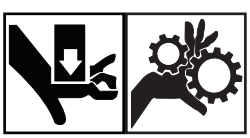


Figure 8.

14. Install two end caps (10) on cross tube (7).
15. Install two pins (9) and quick pins (8).
16. Attach two springs (1) on tow cylinders (2).
17. Remove two quick pins (17) and pins (18) from adapters (15).

WARNING



Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

18. Operate retrieval system, and with aid of an assistant position cross tube (7) so holes in adapters (15) align with front tow eyes (19).

HOOKUP - Continued

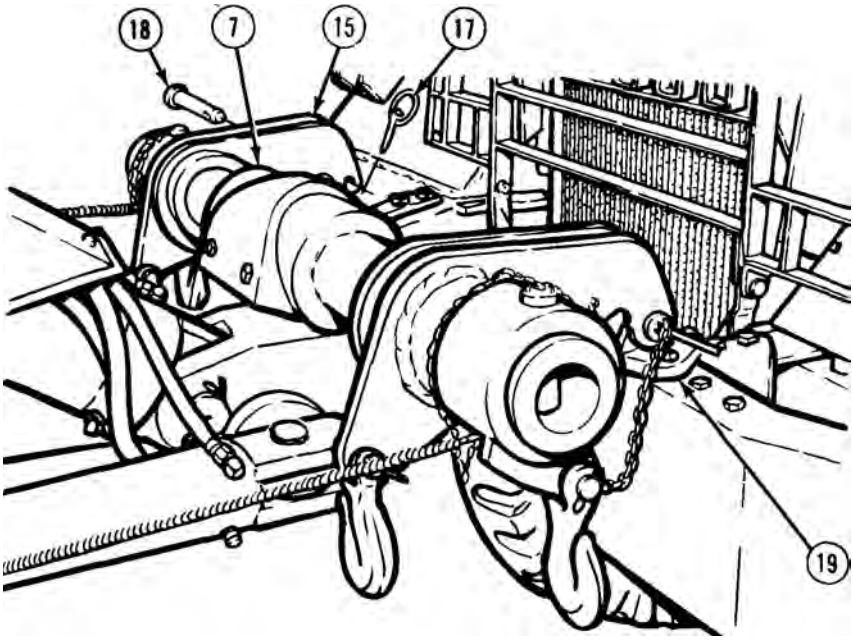


Figure 9.

CAUTION

Do not route pin retention chains between adapters and front bumper or damage to chains may result.

19. Insert two pins (18) through adapters (15) and front tow eyes (19). Install quick pins (17) in pins (18).
20. Operate retrieval system to lower cross tube (7) until adapters (15) contact front bumper (20).

HOOKUP - Continued

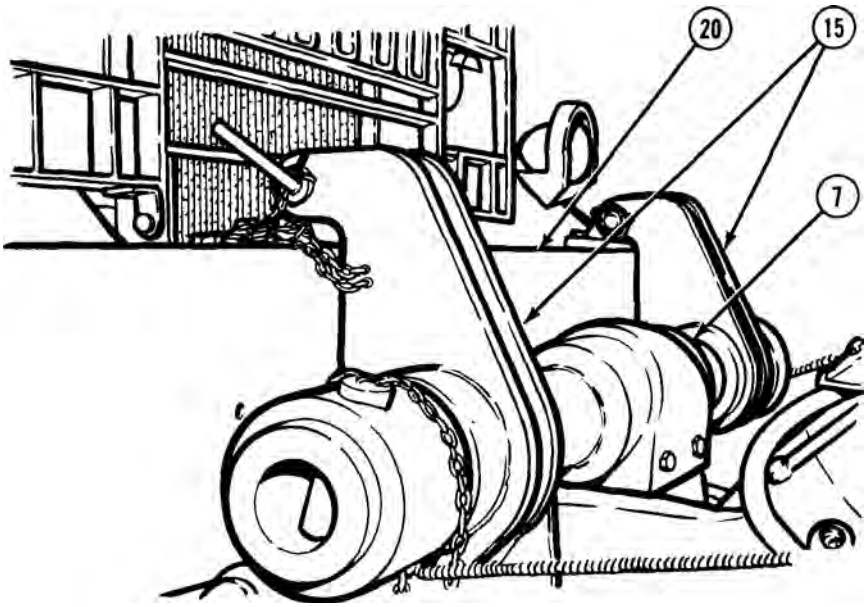


Figure 10.

NOTE

Brake line bracket is located on top rear of axle. Driver side shown.

21. Remove screw (21), move brake line bracket (22) away from axle (23) and replace screw in axle.

HOOKUP - Continued

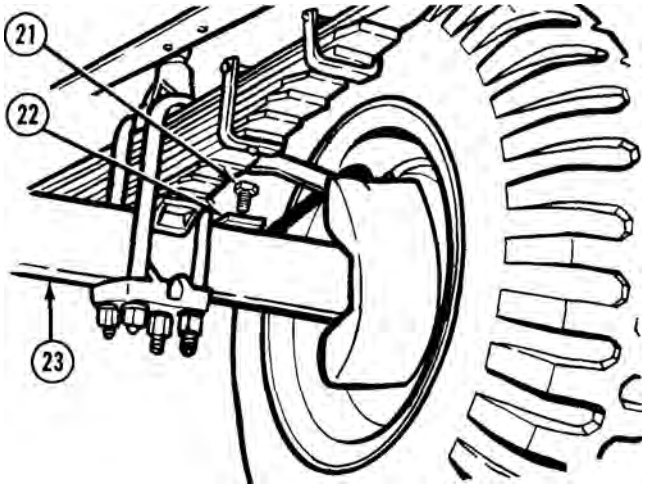


Figure 11.

22. Repeat Step (21) for other side of disabled vehicle.
23. Remove two 16 ft. (5 m) safety chains (24) from stowage.

CAUTION

Route chain between brake line and axle or damage to brake line will result.

24. Route one 16 ft. (5 m) safety chain (24) over front axle (23) on disabled vehicle.

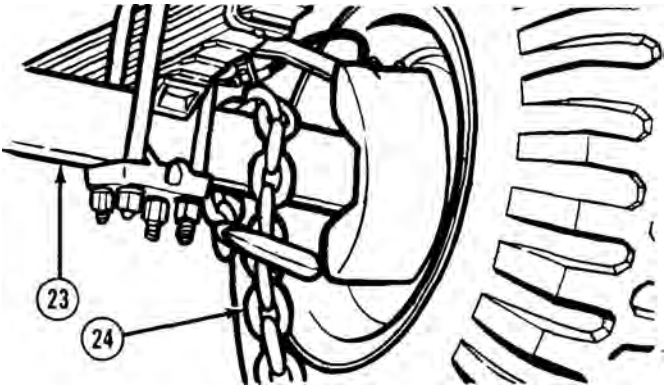


Figure 12.

HOOKUP - Continued

25. Hook 16 ft. (5 m) safety chain (24) together in front of axle (23).
26. Repeat Steps (24) and (25) for other side of disabled vehicle.
27. Pull 16 ft. (5 m) safety chain (24) tight and install chain on adapter grab hook (25).

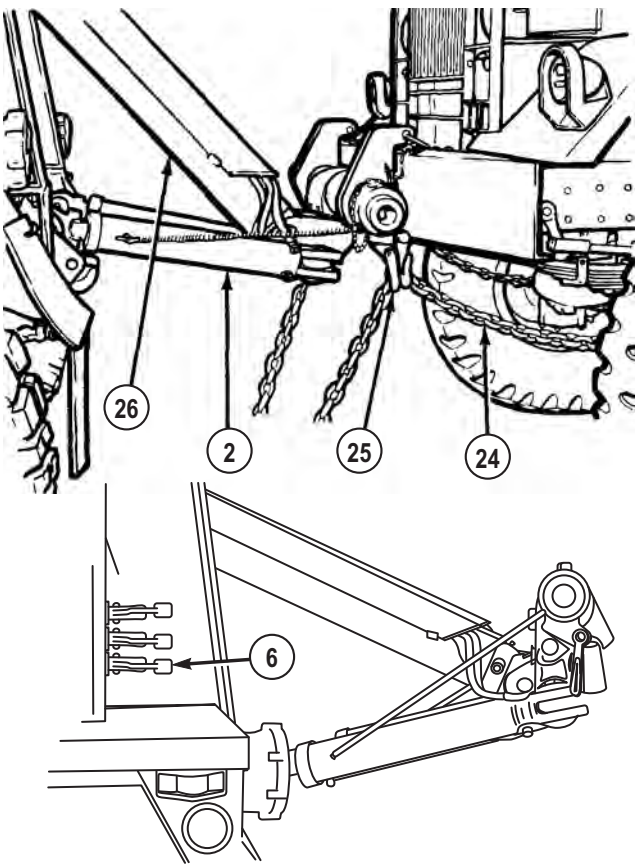


Figure 13.

28. Repeat Step (27) for other side of disabled vehicle.
29. Release PARKING BRAKE on disabled vehicle (refer to operator's manual).
30. Operate retrieval system until tow cylinders (2) are fully retracted.
31. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (26) until slack is removed from 16 ft. (5 m) safety chains (24).

HOOKUP - Continued

NOTE

- Safety chains are connected to wrecker safety chain hoop.
- Adjust chain slack so 16 ft. (5 m) safety chains do not touch the ground.

32. Route two 16 ft. (5 m) safety chains (24) through safety chain hoop (27) on wrecker, and secure grab hook (28) with safety shackle (29).

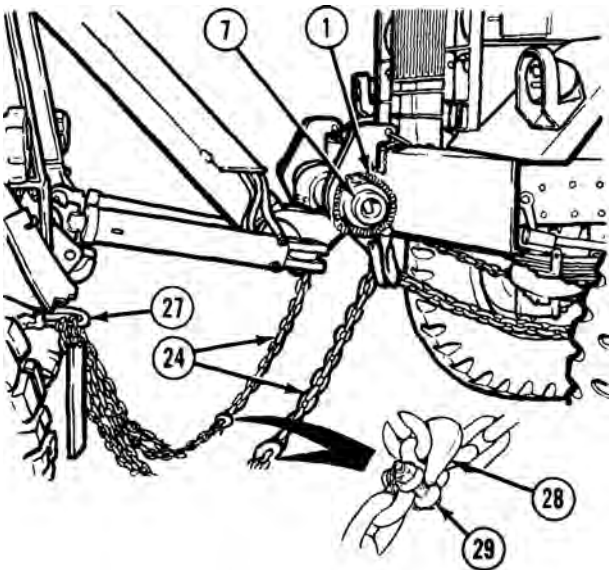


Figure 14.

33. Wrap two springs (1) around cross tube (7) and secure.
34. Prepare disabled vehicle for towing (refer to operator's manual).
35. Remove emergency tow lights (30) and two brackets (31) from stowage.

HOOKUP - Continued

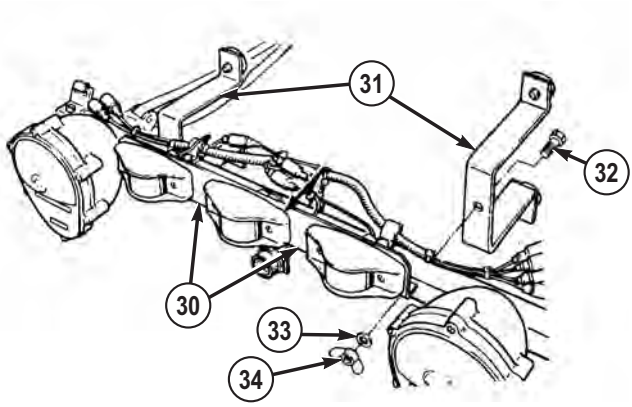


Figure 15.

36. Install two brackets (31) in center holes of emergency tow lights with two screws (32), washers (33), and nuts (34).

37. Install emergency tow lights (30) on rear of M35 and fasten securely with straps (35).

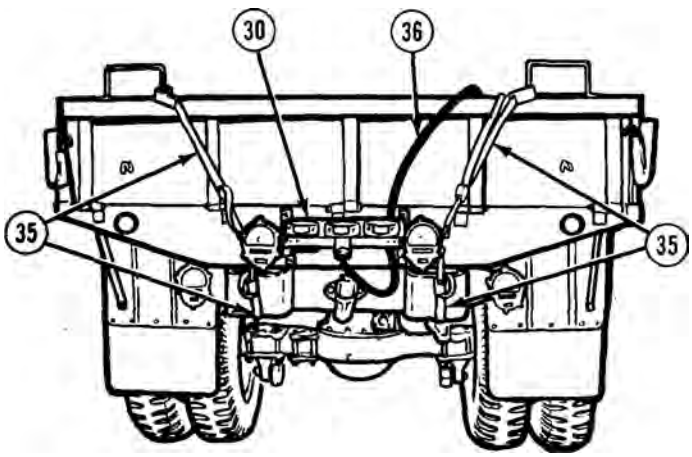


Figure 16.

38. Remove tow light cable (36) from stowage and connect to emergency tow lights (30).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

HOOKUP - Continued

39. Route other end of tow light cable (36) along disabled vehicle and connect to rear electrical connector (37) on wrecker.

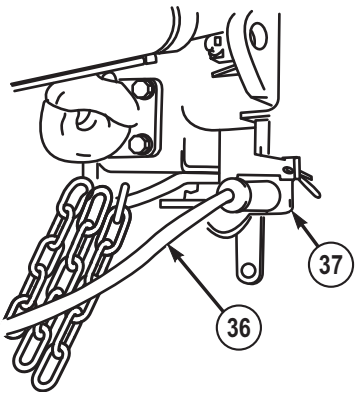


Figure 17.

CAUTION

Vehicle can only be towed with all tires in contact with paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (41).

40. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Skip to Step (46).
41. Lock disabled vehicle’s steering (refer to operator’s manual).
42. Set POWER switch (38) to ON position.

HOOKUP - Continued

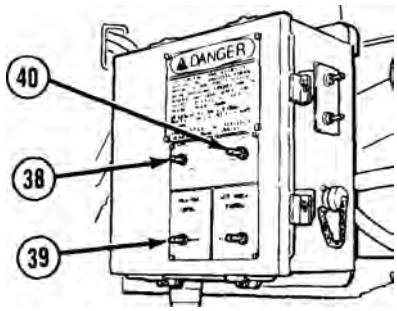


Figure 18.

43. Set HIGH IDLE switch (39) to CONTINUOUS.
44. Push and release LATCH switch (40). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

HOOKUP - Continued

45. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (26) to raise disabled vehicle approximately 1 ft. (30 cm) off ground.

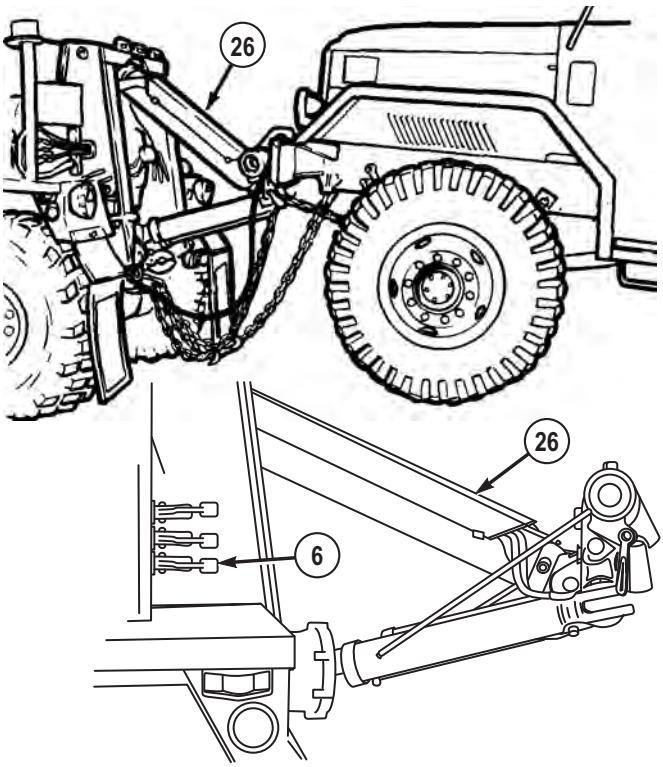


Figure 19.

46. Set POWER switch (38) to OFF position.

HOOKUP - Continued

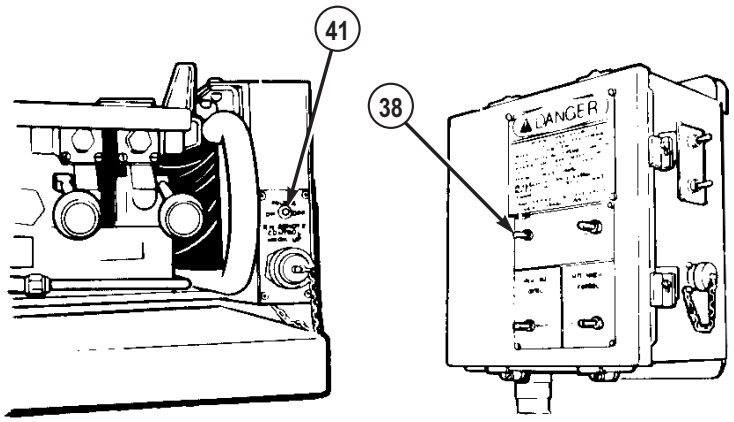


Figure 20.

47. Set POWER switch (41) to OFF position.
48. Set PTO ENGAGE switch (42) to OFF position. Indicator light (43) will go out.

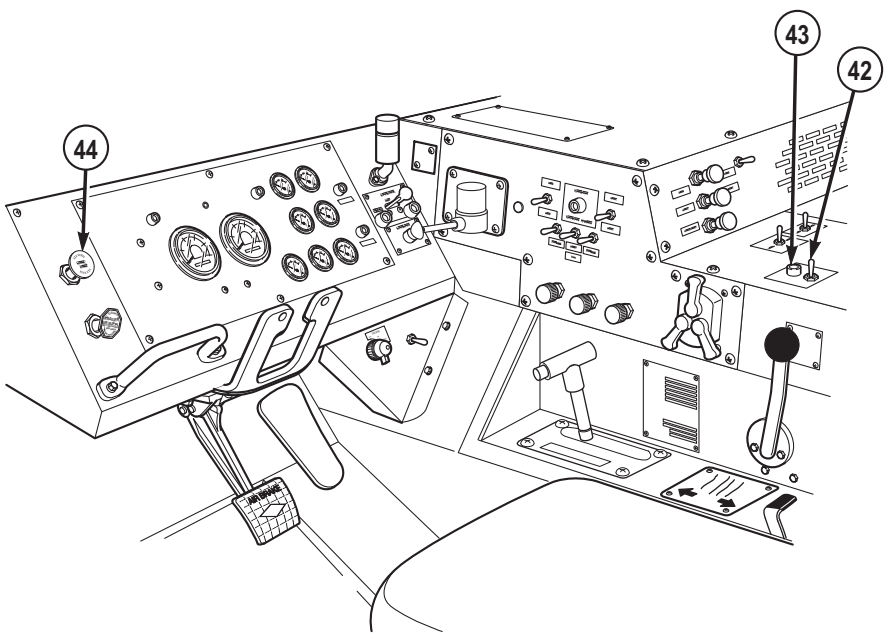


Figure 21.

49. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

50. Turn on wrecker emergency flashers. (WP 0099)
51. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
52. Push in PARKING BRAKE control (44).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

53. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).
2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

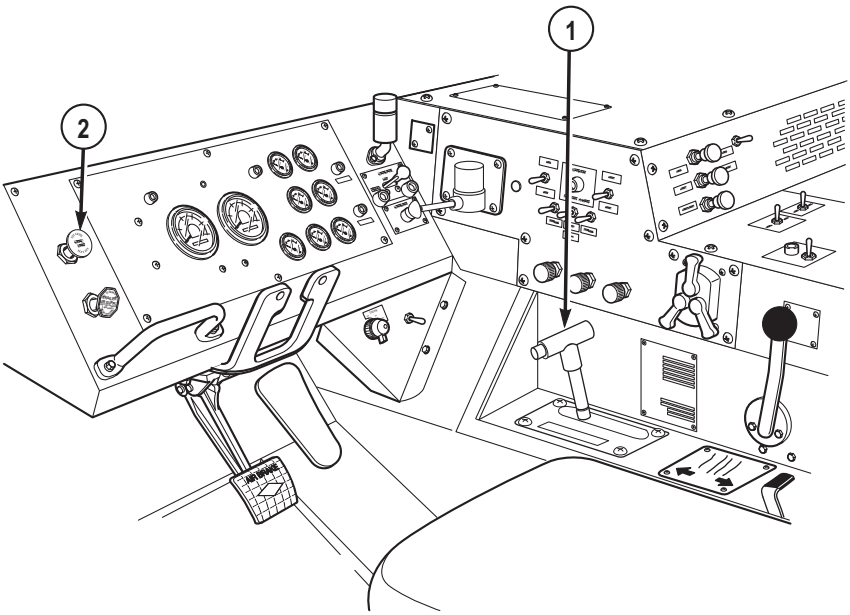


Figure 22.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 in. (50 to 100 mm) to allow for adjustment when removing adapters.

3. Prepare retrieval system for operation, and lower disabled vehicle to ground (WP 0059) until safety chains at front axle are slack.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Engage PARKING BRAKE on disabled vehicle (refer to operator’s manual).
5. Remove tow light cable (3) from wrecker.

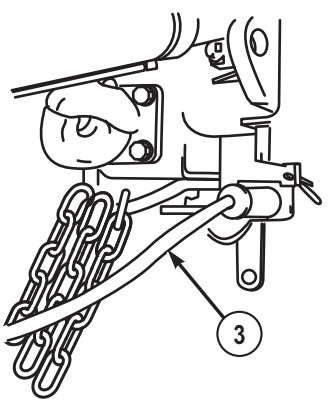


Figure 23.

6. Remove tow light cable (3) from emergency tow lights (4) and stow.

DISCONNECT - Continued

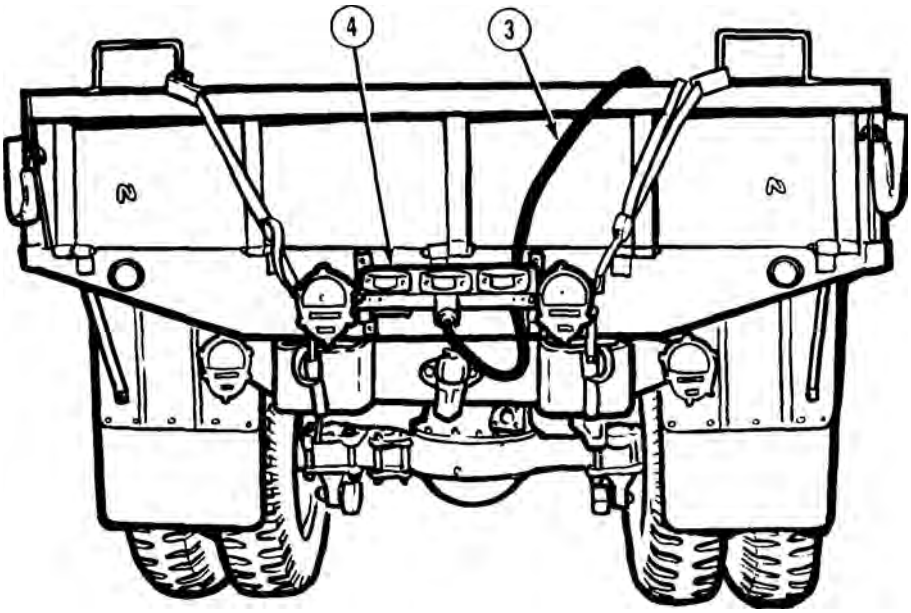


Figure 24.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Stow emergency tow lights and brackets.

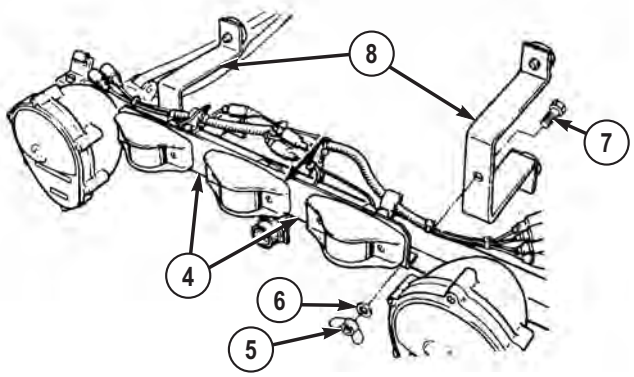


Figure 25.

DISCONNECT - Continued

9. When removing chains, make sure grab hooks do not catch on brake lines. Equipment damage may result.
10. Remove and stow two safety chains (9).

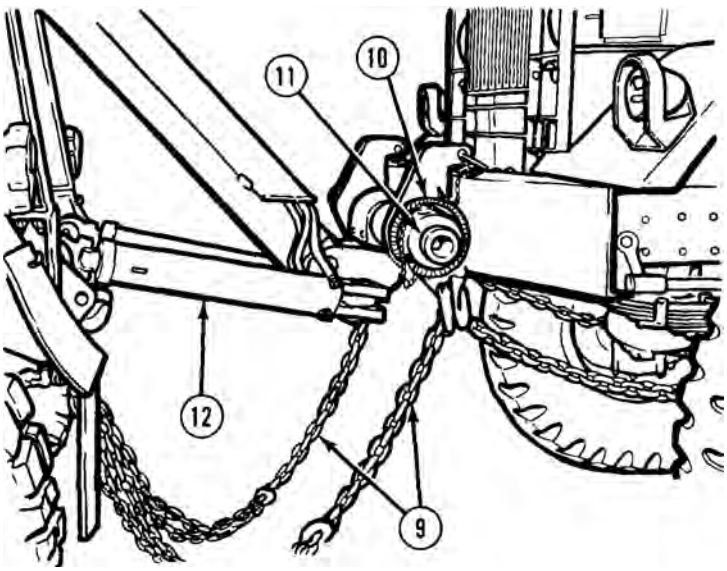


Figure 26.

11. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).
12. Brake line bracket (15) is located on top rear of axle. Driver side shown.

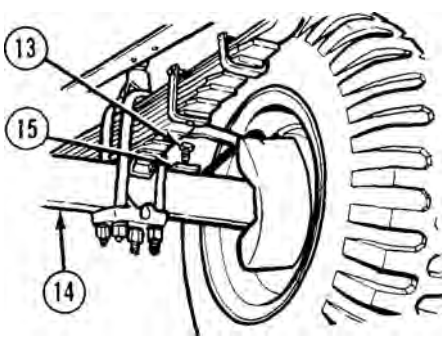


Figure 27.

13. Remove screw (13) from axle (14).

DISCONNECT - Continued

14. Install two pins (17) in adapters (18).

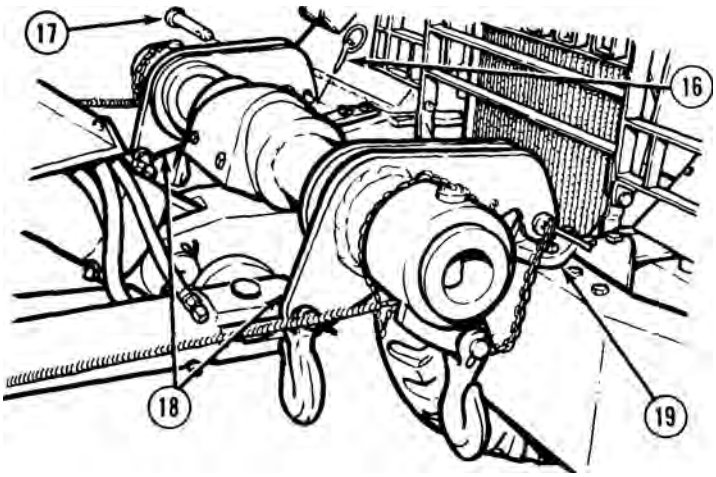


Figure 28.

15. Install two quick pins (16) in pins (17).
16. Drive wrecker forward (WP 0050) several feet and park (WP 0056).

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

17. Remove two springs (10) from tow cylinders (12).

DISCONNECT - Continued

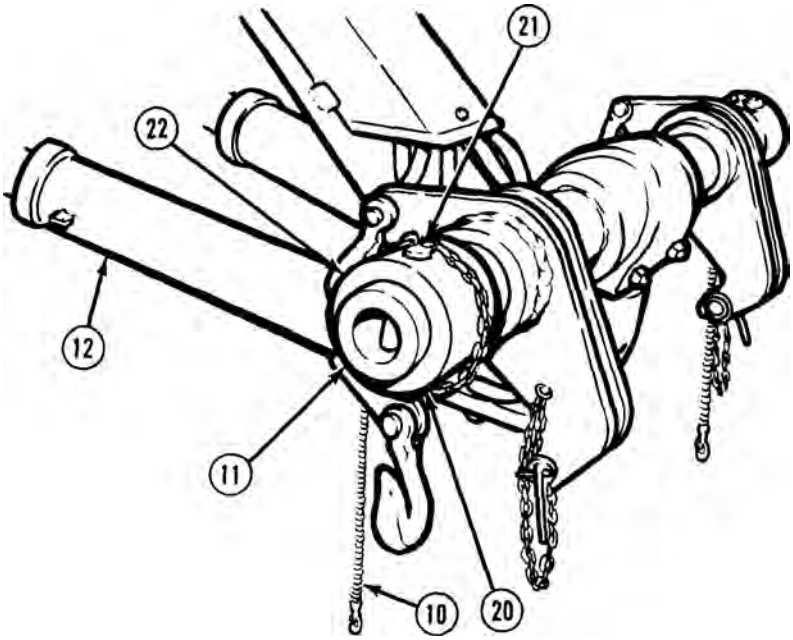


Figure 29.

18. Remove two quick pins (20) and pins (21) from end caps (22).
19. Remove two end caps (22) from cross tube (11).
20. Remove two adapters (18) from cross tube (11) and place on equipment body floor (23).

DISCONNECT - Continued

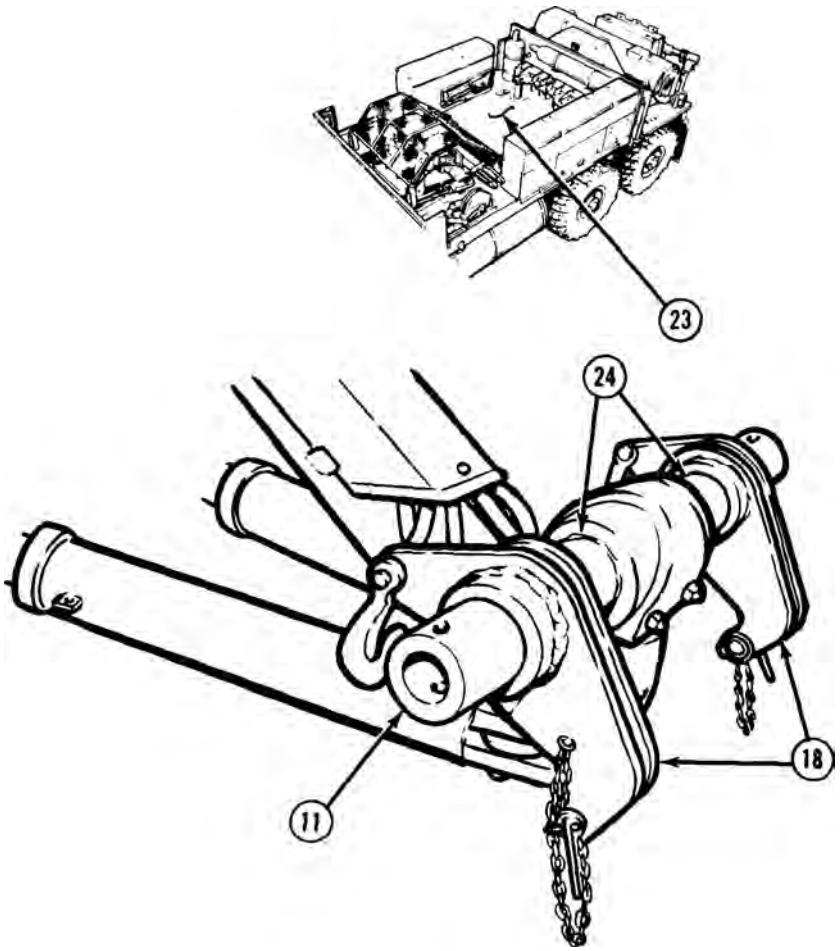


Figure 30.

21. Remove two 5 in. (127 mm) spacers (24) from cross tube (11) and stow.
22. Remove lock handle (25), lock plate (26), and M977 front adapters (27).

DISCONNECT - Continued

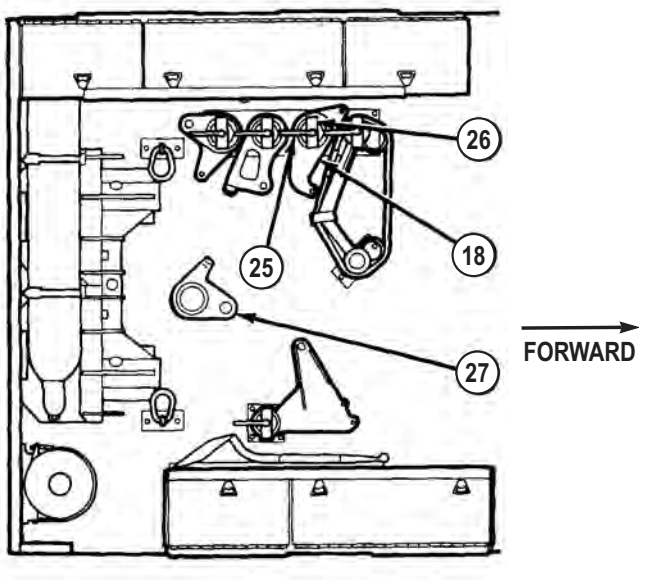


Figure 31.

23. Install two M35 front adapters (18) removed from cross tube, lock plate (26), and lock handle (25).
24. Install two M977 front adapters (27) on cross tube (11).

DISCONNECT - Continued

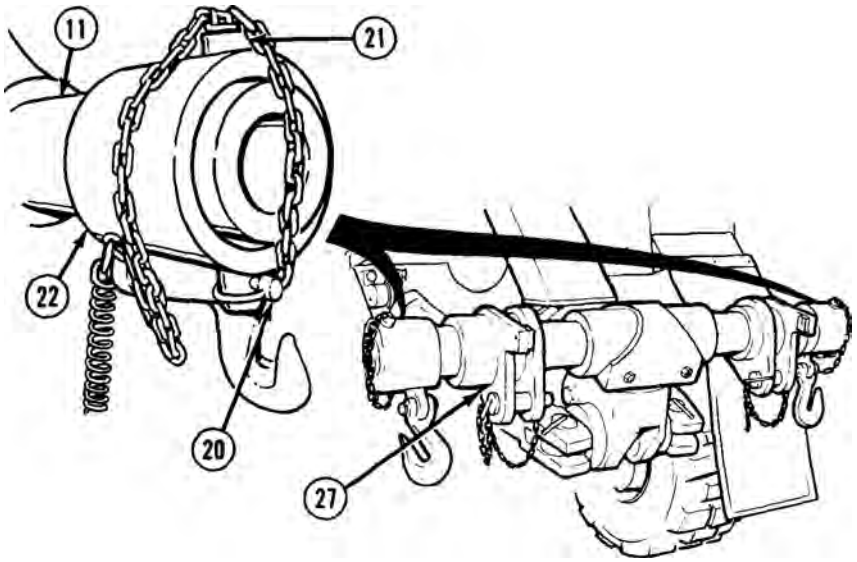


Figure 32.

25. Install two end caps (22) on cross tube (11). Install two pins (21) and quick pins (20).
26. Install two springs (10) on tow cylinders (12).

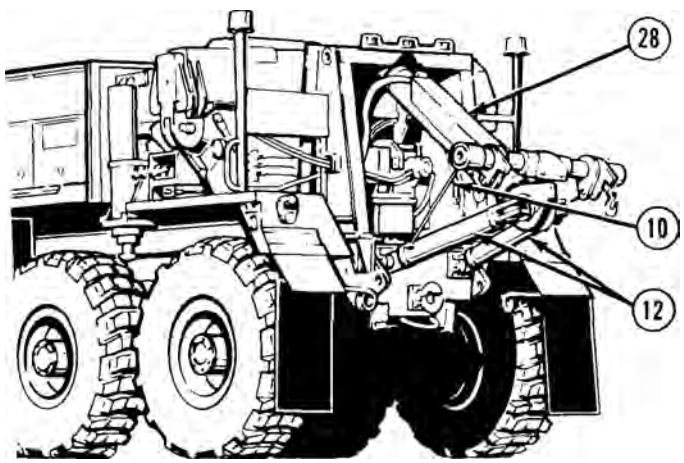


Figure 33.

27. Operate retrieval system to fully retract lift cylinder (28) and tow cylinders (12).

DISCONNECT - Continued

NOTE

Driver side and passenger side towing shackles are installed the same way.

28. Install two rear towing shackles (29), pins (30), and cotter pin (31).

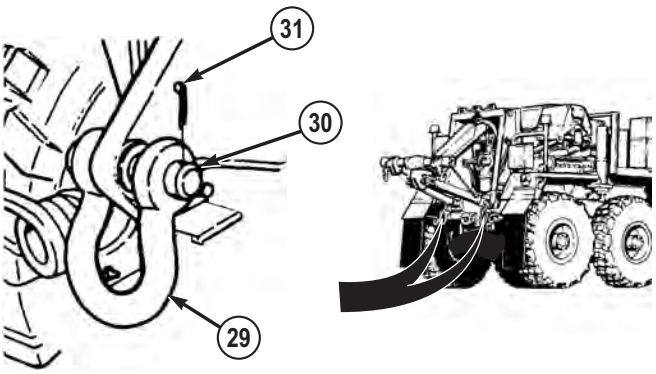


Figure 34.

29. Set POWER switch (32) to OFF position.

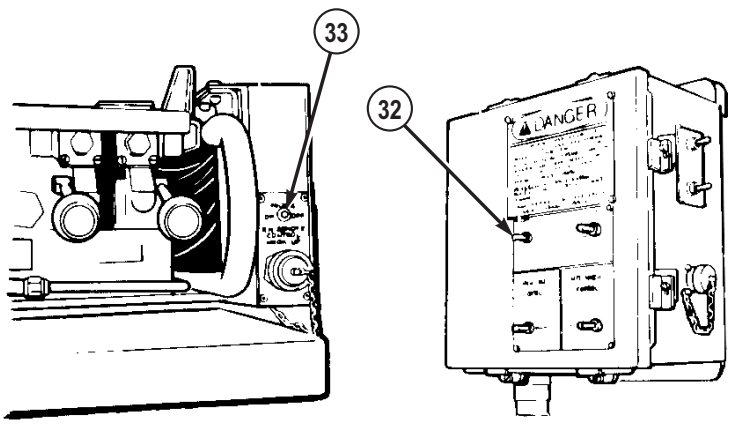


Figure 35.

30. Set POWER switch (33) to OFF position.
31. Turn off wrecker emergency flashers. (WP 0099)
32. Turn off wrecker service drive lights. (WP 0090)

DISCONNECT - Continued

33. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

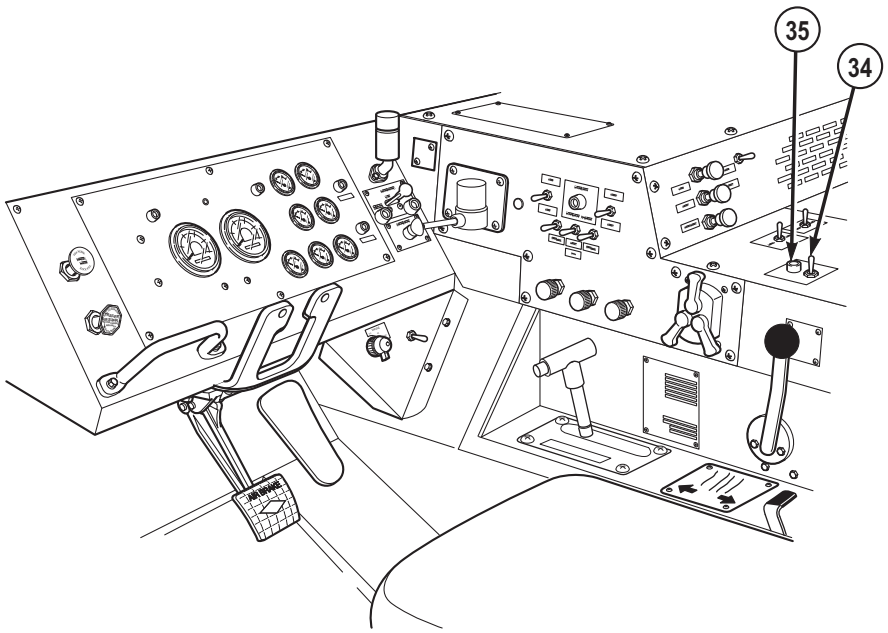


Figure 36.

34. Shut off engine. (WP 0057)
35. Remove and stow portable beacon lights. (WP 0097)
36. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M911 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

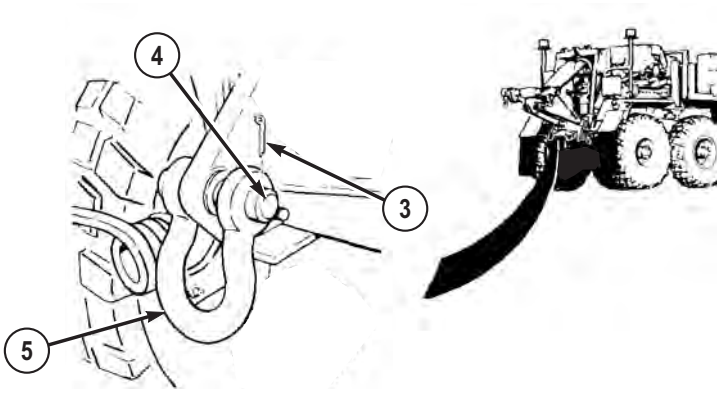


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

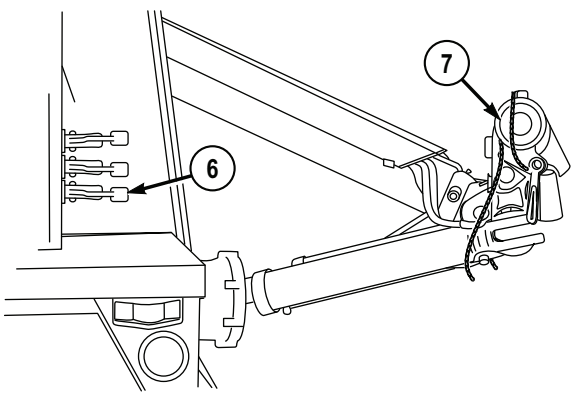


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove quick pins (8) and pins (9) from end caps (10).

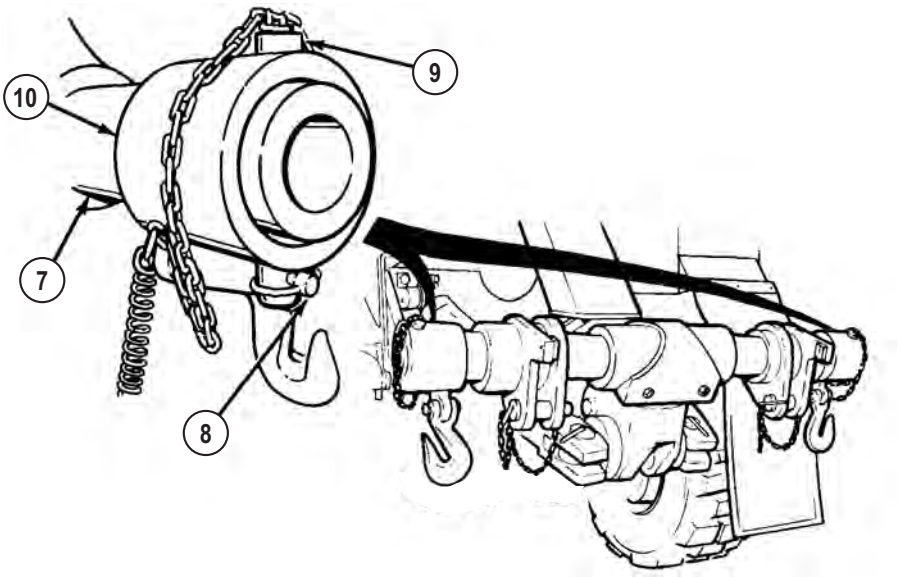


Figure 4.

7. Remove end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

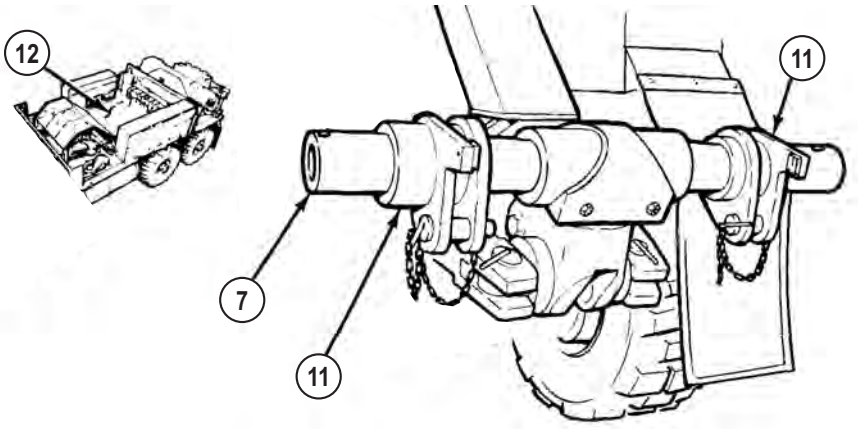


Figure 5.

9. Remove lock handle (13), lock plate (14), and two front tow adapters (15).

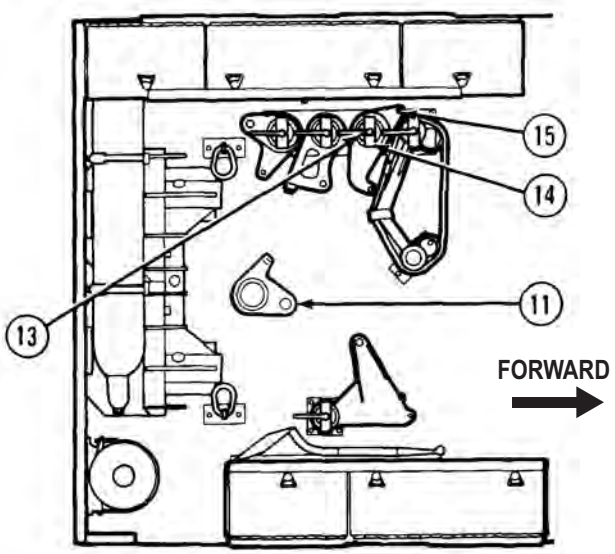


Figure 6.

10. Install two front adapters (11) removed from cross tube (7), lock plate (14), and lock handle (13).
11. Install two front tow adapters (15) on cross tube (7).

HOOKUP - Continued

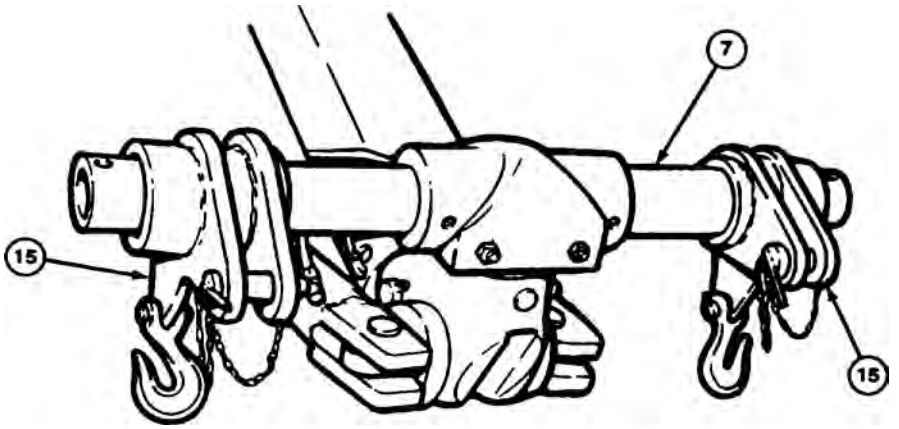


Figure 7.

NOTE

End caps will hang over end of cross tube for M911 adapters.

12. Install two end caps (10) on cross tube (7).

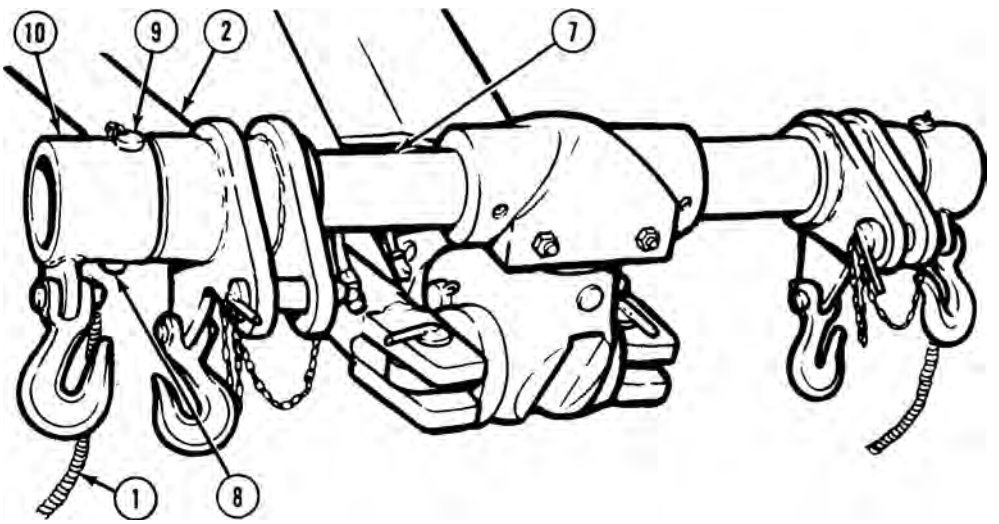


Figure 8.

13. Install two pins (9) and quick pins (8).
14. Attach two springs (1) on tow cylinders (2).

HOOKUP - Continued

15. Remove two quick pins (16) and pins (17) from adapters (15).

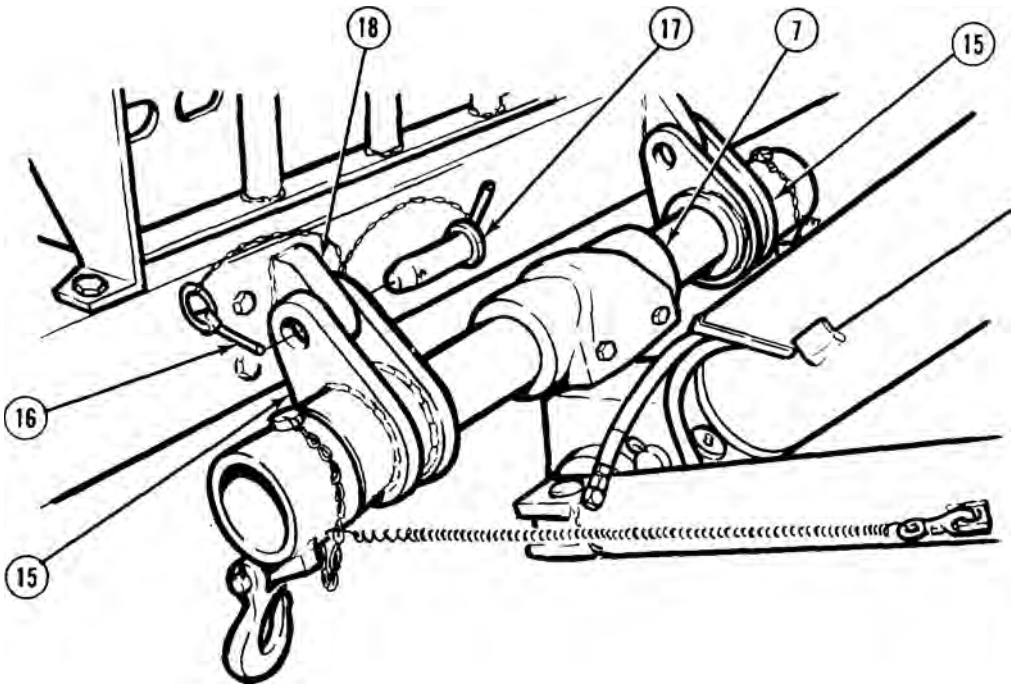


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

16. Operate retrieval system (WP 0059) and with the aid of an assistant, position cross tube (7) so holes in adapters (15) align with front tow eyes (18).

HOOKUP - Continued

17. Insert two pins (17) through adapters (15) and front tow eyes (18). Install quick pins (16) in pins (17).

NOTE

Passenger side grab hook is shown.

18. Alternately operate lift and tow cylinders to lower cross tube (7) until adapter grab hooks (19) are under front bumper (20).

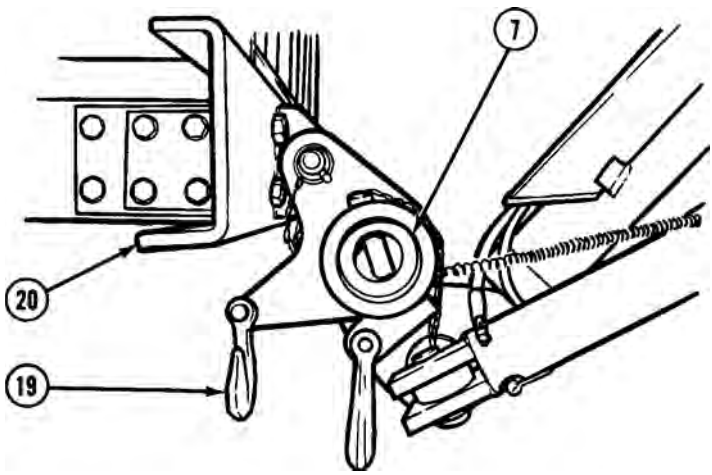


Figure 10.

19. Remove two 16 ft. (5 m) safety chains (21) from stowage.

HOOKUP - Continued

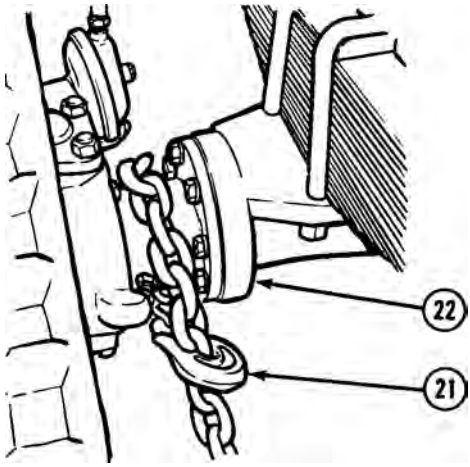


Figure 11.

20. Route one 16 ft. (5 m) safety chain (21) over front axle (22) on disabled vehicle.
21. Hook 16 ft. (5 m) safety chain (21) back into itself (shown) in front of axle (22).
22. Repeat Steps (20) and (21) for other side of disabled vehicle.
23. Pull 16 ft. (5 m) safety chain (21) tight and install chain on adapter grab hook (19).

HOOKUP - Continued

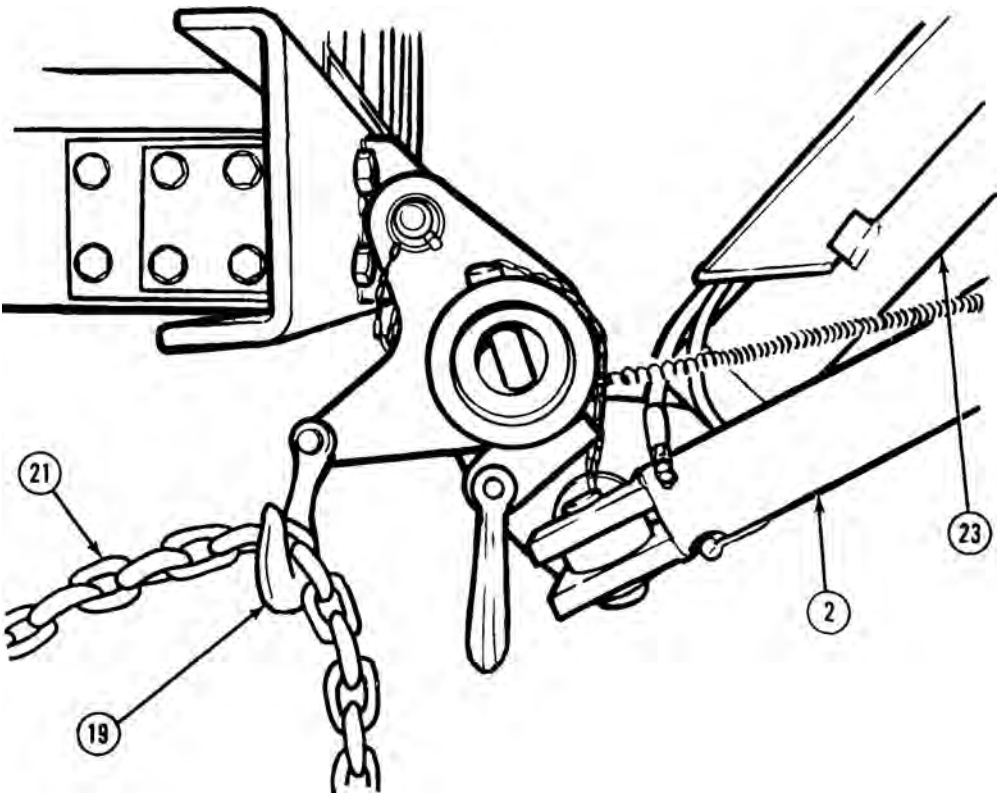


Figure 12.

24. Repeat step (23) for other side of disabled vehicle.
25. Release PARKING BRAKE on disabled vehicle (refer to M911 operator's manual).
26. Alternately, push in TOW and LIFT CYLINDER control levers until tow cylinders (2) are fully retracted.
27. Push in LIFT CYLINDER control lever to retract lift cylinder (23) until slack is removed from 16 ft. (5 m) safety chains (21).

NOTE

Adjust chain slack so safety chains just touch the ground.

28. Route two 16 ft. (5 m) safety chains (21) through safety chain hoop (24) on wrecker and secure grab hook (25) with safety shackle (26).

HOOKUP - Continued

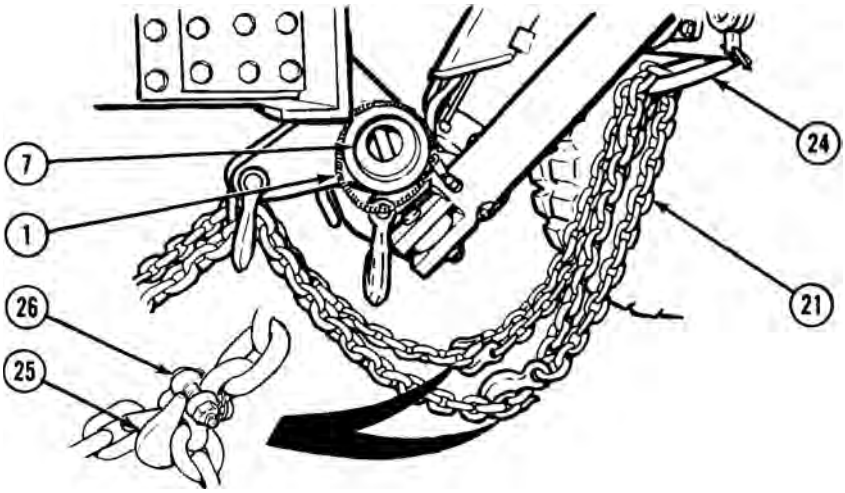


Figure 13.

29. Wrap two springs (1) around cross tube (7) and secure.
30. Remove two air lines (27) from stowage and attach to rear gladhands (28) on wrecker.

CAUTION

Do not route air lines between retrieval cylinders or damage to air lines may result.

NOTE

Rear emergency air line from wrecker must be connected to front emergency gladhand on disabled vehicle. Rear service air line from wrecker must be connected to front service gladhand on disabled vehicle.

31. Route two air lines (27) over cross tube (7) up through M911 grille, and attach to front gladhands (29) on disabled vehicle.

HOOKUP - Continued

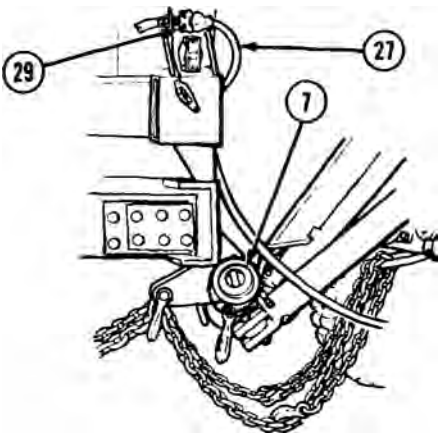


Figure 14.

32. Prepare disabled vehicle for towing (refer to M911 operator's manual).
33. Remove emergency tow lights (30) and tow brackets (31) from stowage.

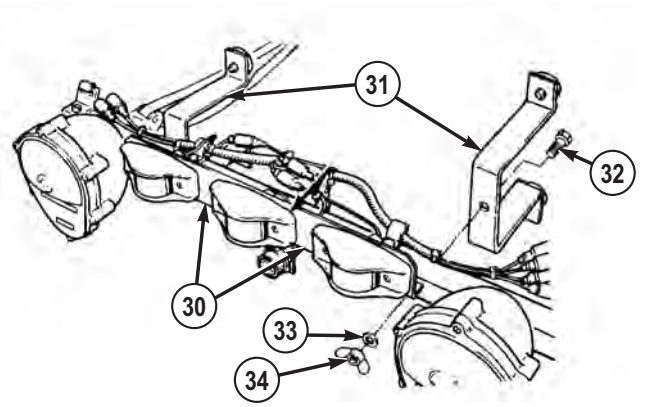


Figure 15.

34. Install two brackets (31) in center holes of emergency tow lights with two screws (32), washers (33), and nuts (34).
35. Install tow lights (30) on rear of disabled vehicle and fasten securely with straps (35).

HOOKUP - Continued

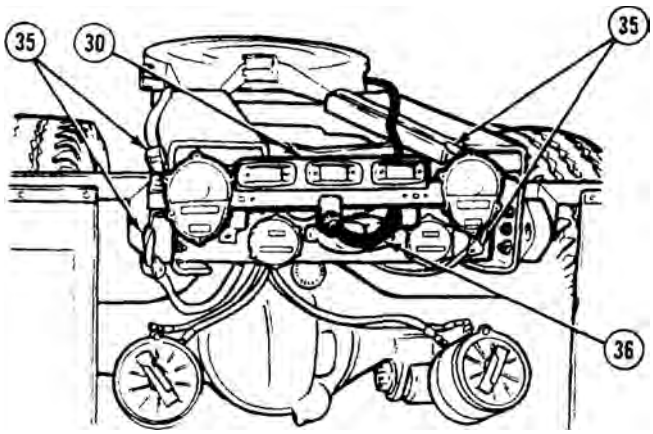


Figure 16.

36. Remove tow light cable (36) from stowage and connect to emergency tow lights (30).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

37. Route other end of tow light cable (36) along disabled vehicle and connect to rear electrical connector (37) on wrecker.

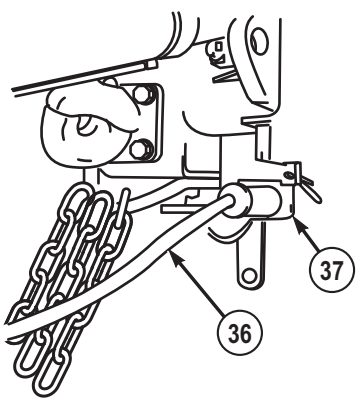


Figure 17.

HOOKUP - Continued

CAUTION

If disabled vehicle is to be towed with all tires in contact with road, this procedure can be accomplished on paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (39).

38. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Proceed to Step (45).
39. Lock disabled vehicles steering (refer to M911 operator's manual).
40. Set POWER switch (38) to ON position.

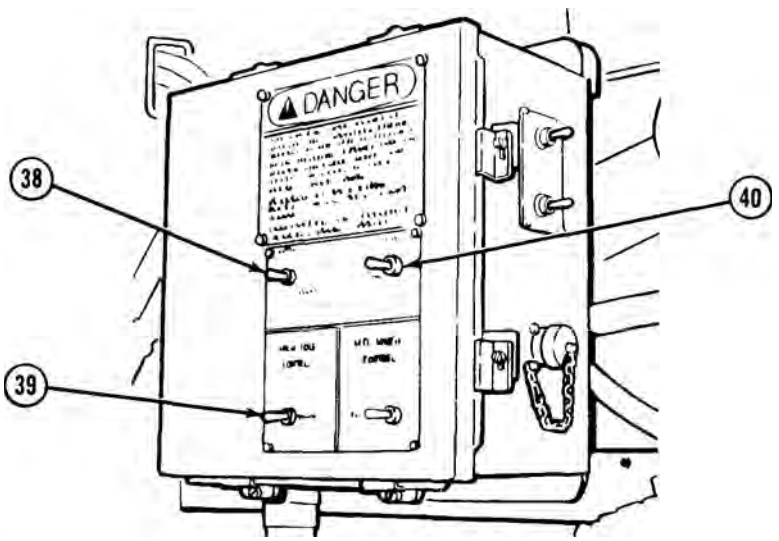


Figure 18.

41. Set HIGH IDLE switch (39) to CONTINUOUS.
42. Push and release LATCH switch (40). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

43. Push LIFT CYLINDER control lever (6) to retract lift cylinder (23) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

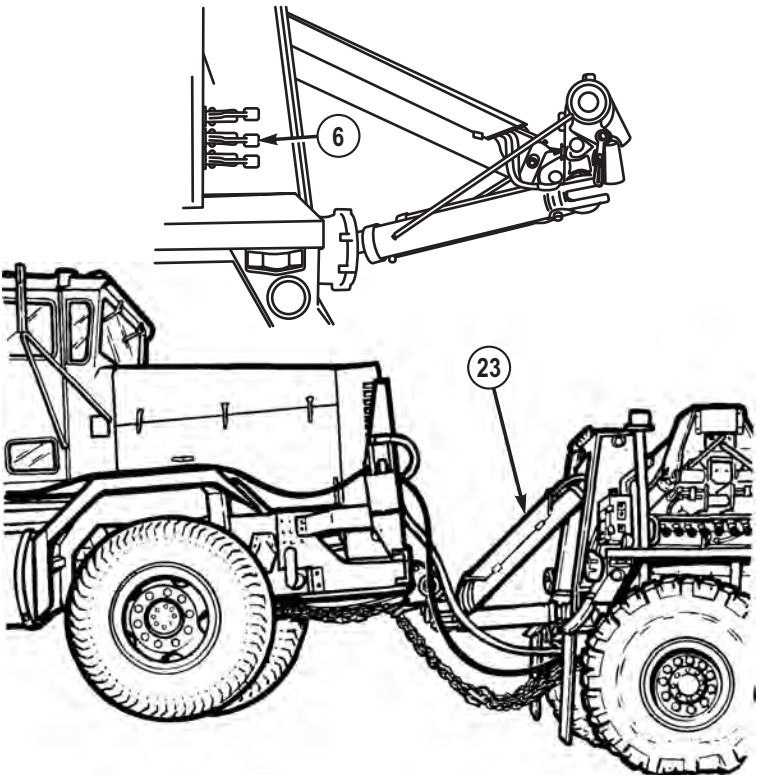


Figure 19.

44. Set POWER switch (38) to OFF position.

HOOKUP - Continued

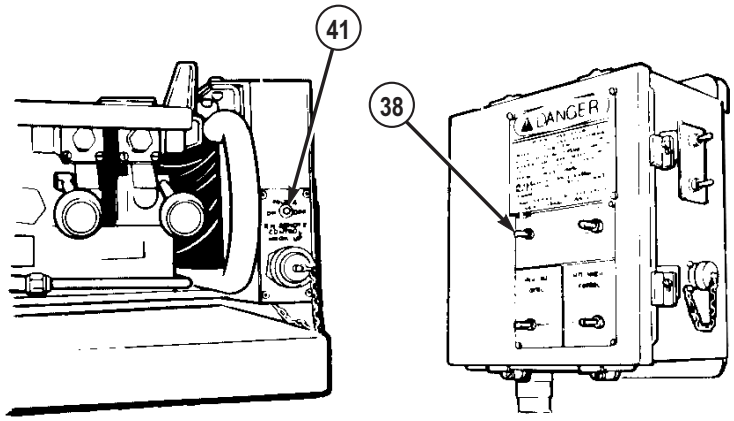


Figure 20.

45. Set POWER switch (41) to OFF position.
46. Set PTO ENGAGE switch (42) to OFF position. Indicator light (43) will go out.

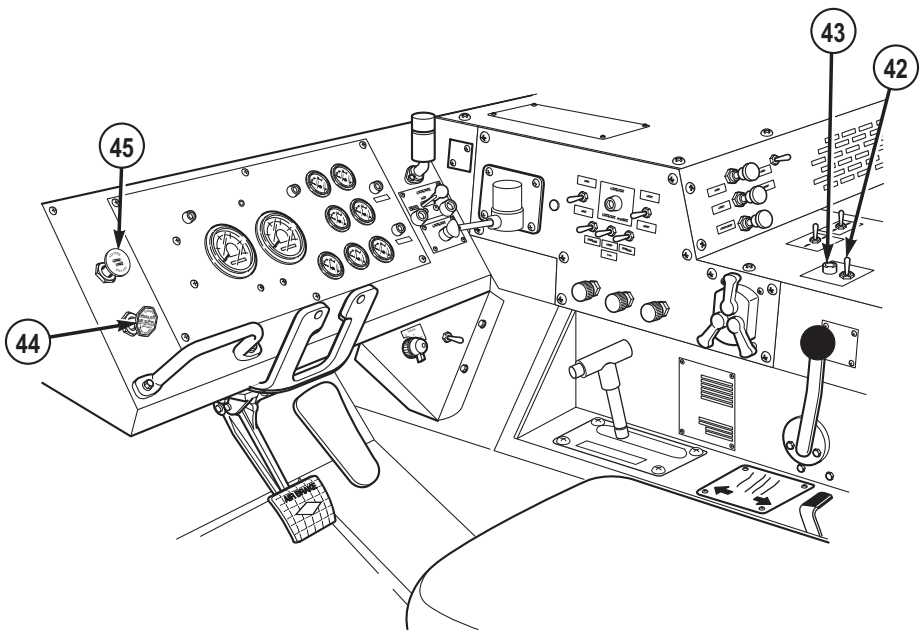


Figure 21.

47. Push in TRAILER AIR SUPPLY control (44).

HOOKUP - Continued

48. Turn on wrecker service drive lights. (WP 0090)
49. Turn on wrecker emergency flashers (WP 0099) and disabled vehicle.
50. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
51. Push in PARKING BRAKE control (45).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

52. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

DISCONNECT - Continued

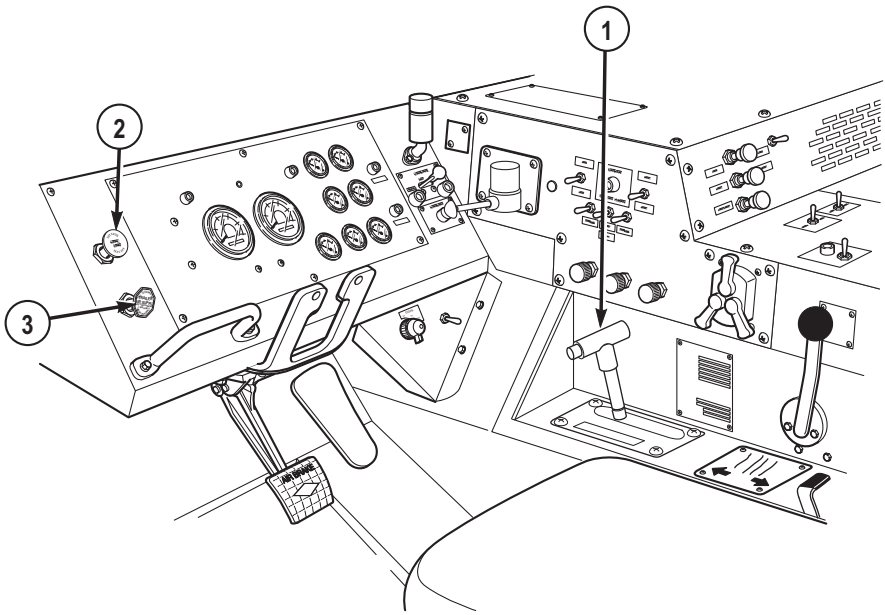


Figure 22.

2. Pull out PARKING BRAKE control (2).
3. Pull out TRAILER AIR SUPPLY control (3)

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation, and lower disabled vehicle to ground. (WP 0059)

DISCONNECT - Continued

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle parking brake is inoperative; chock wheels.

5. Set PARKING BRAKE on disabled vehicle (refer to M911 operator's manual).
6. Remove tow light cable (4) from wrecker.

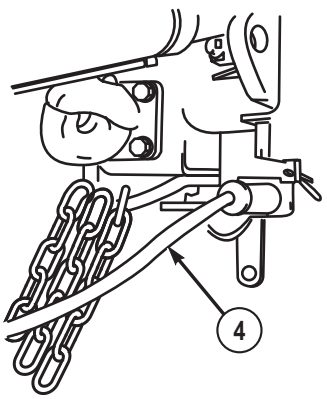


Figure 23.

7. Remove tow light cable (4) from emergency tow lights (5).

DISCONNECT - Continued

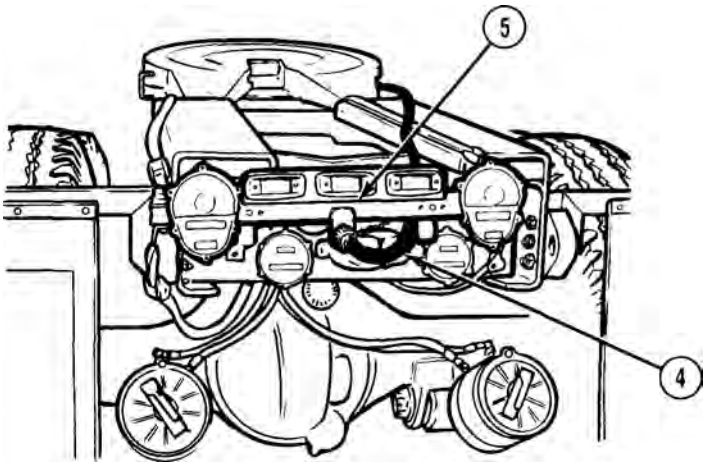


Figure 24.

8. Remove emergency tow lights (5) from disabled vehicle.
9. Remove two nuts (6), washers (7), screws (8), and brackets (9) from emergency tow lights (5). Stow emergency tow lights and brackets.

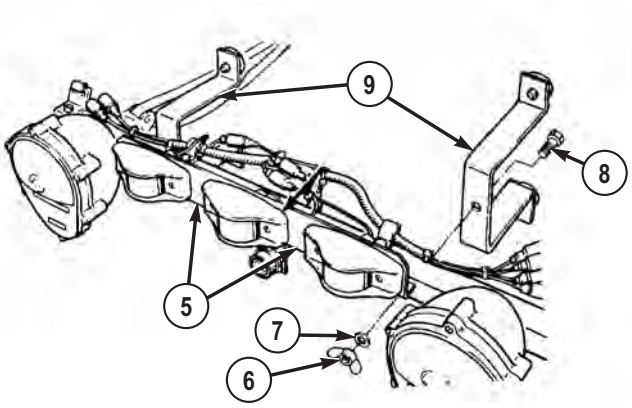


Figure 25.

10. Remove and stow two 16 ft. (5 m) safety chains (10) and air lines (11).

DISCONNECT - Continued

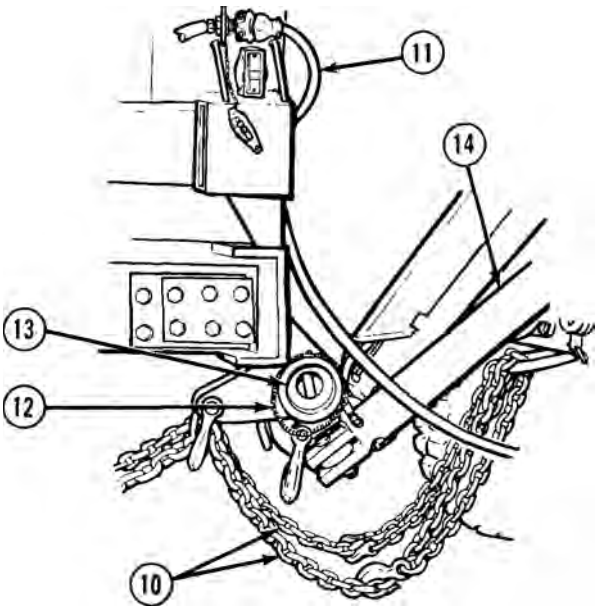


Figure 26.

11. Unwrap two springs (12) from cross tube (13) and connect to tow cylinders (14).
12. Remove two quick pins (15) and pins (16) from adapters (17).

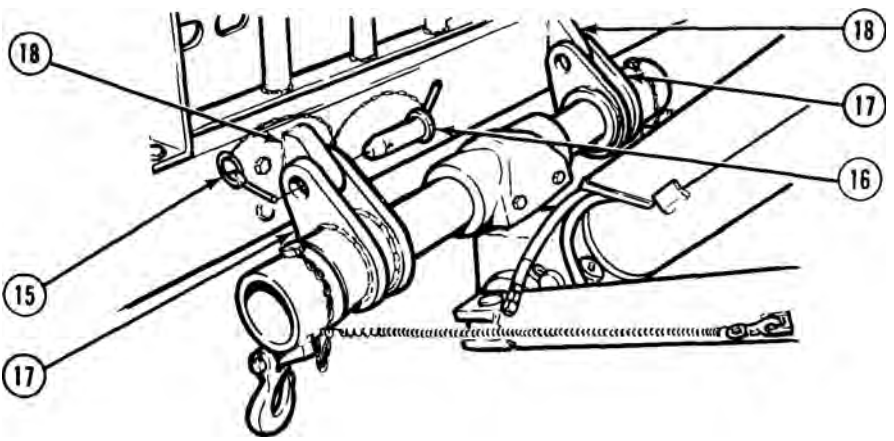


Figure 27.

13. Remove two adapters (17) from tow eyes (18) on disabled vehicle.

DISCONNECT - Continued

14. Install two pins (16) in adapters (17).
15. Install two quick pins (15) in pins (16).
16. Drive wrecker forward several feet (WP 0050) and park. (WP 0056)
17. Remove two springs (12) from tow cylinders (14).

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

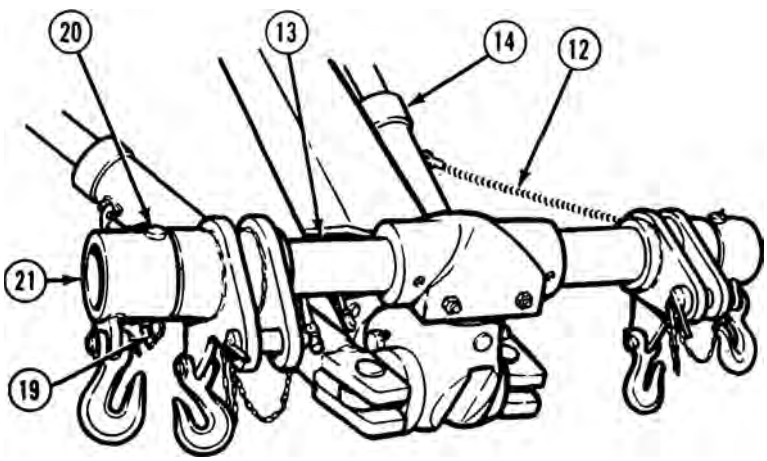


Figure 28.

18. Remove two quick pins (19) and pins (20) from end caps (21).
19. Remove two end caps (21) from cross tube (13).
20. Remove two adapters (17) from cross tube (13) and place on equipment body floor (22).

DISCONNECT - Continued

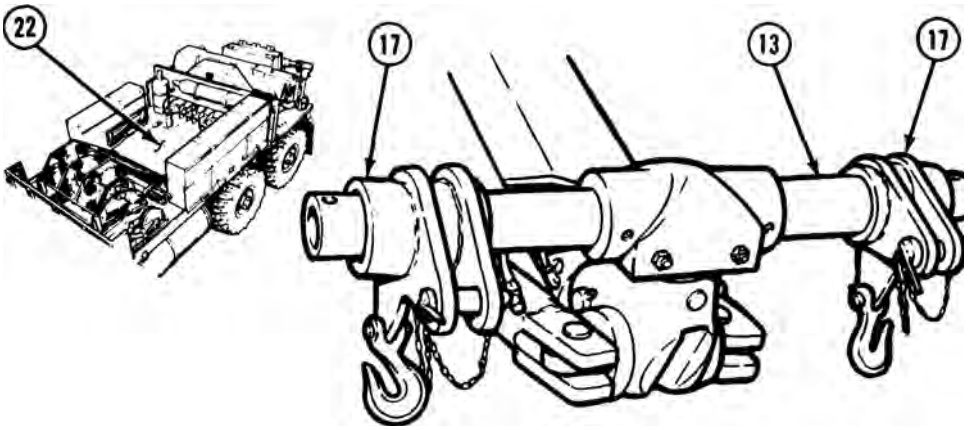


Figure 29.

21. Remove lock handle (23), lock plate (24), and two front tow adapters (25).

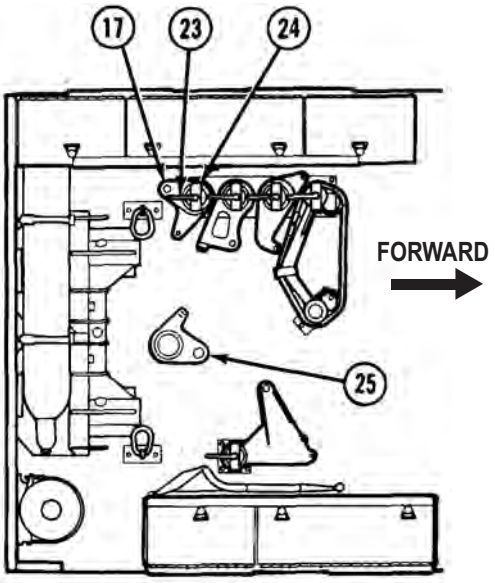


Figure 30.

22. Install two adapters (17) removed from cross tube (13), lock plate (24), and lock handle (23).

23. Install two front adapters (25) on cross tube (13).

DISCONNECT - Continued

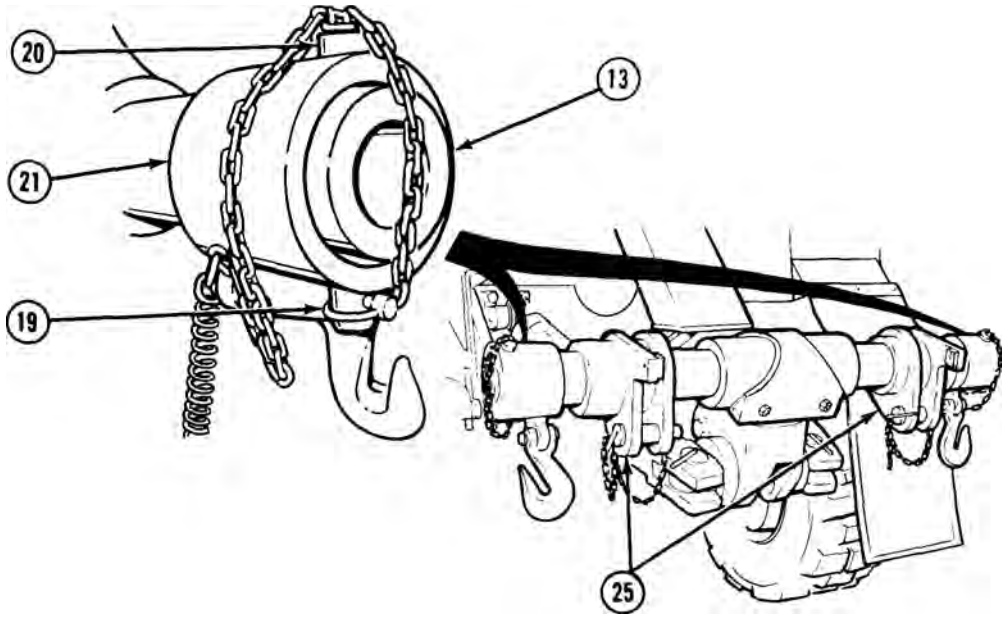


Figure 31.

24. Install two end caps (21) on cross tube (13). Install two pins (20) and quick pins (19).
25. Install two pins (20) and quick pins (19).
26. Install two springs (12) on tow cylinders (14).

DISCONNECT - Continued

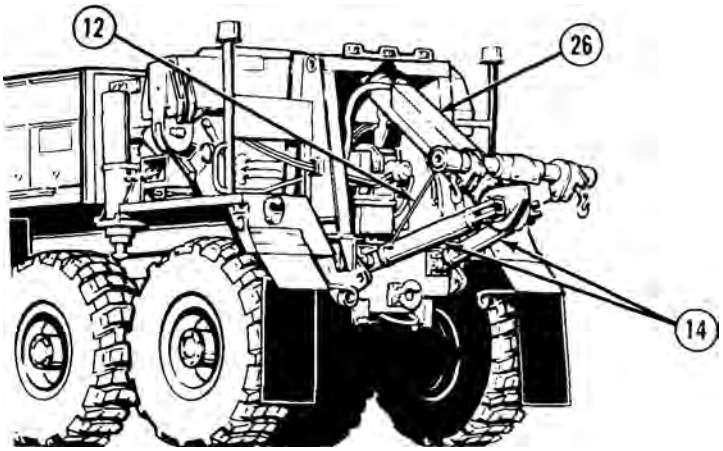


Figure 32.

27. Operate retrieval system (WP 0059) to fully retract lift cylinder (26) and tow cylinders (14).

NOTE

Driver side and passenger side towing shackles are installed the same way.

28. Install two towing shackles (27), pins (28), and cotter pins (29).

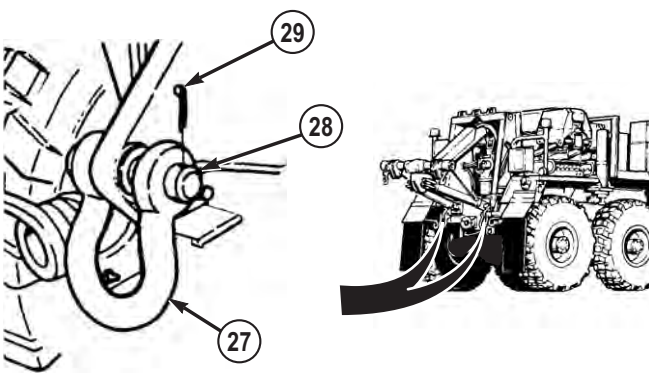


Figure 33.

29. Set POWER switch (30) to OFF position.

DISCONNECT - Continued

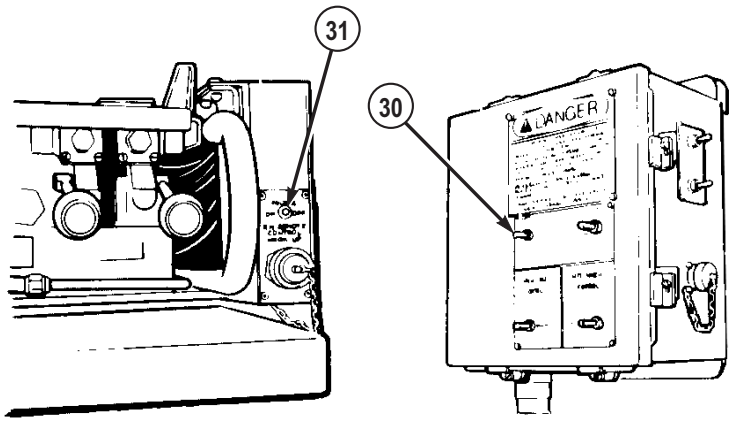


Figure 34.

30. Set POWER switch (31) to OFF position.
31. Turn off wrecker emergency flashers. (WP 0099)
32. Turn off wrecker service drive lights. (WP 0090)
33. Set PTO ENGAGE switch (32) to OFF position. Indicator light (33) will go out.

DISCONNECT - Continued

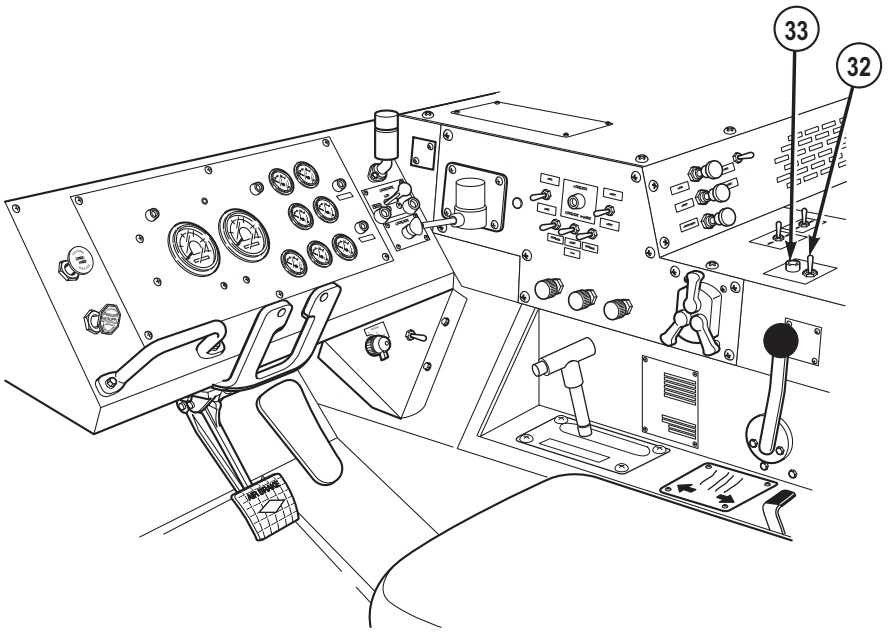


Figure 35.

34. Remove and stow portable beacon lights. (WP 0097)
35. Shut off engine. (WP 0057)
36. Turn off disabled vehicle emergency flashers and remove lock from steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M915 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

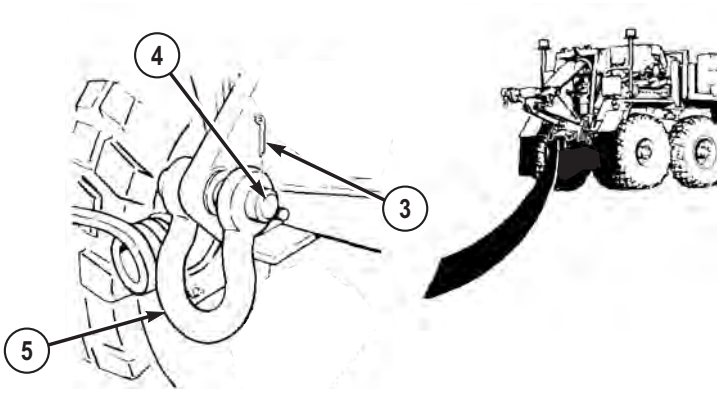


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

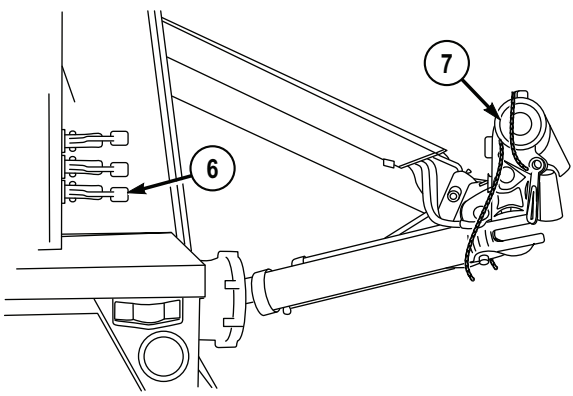


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from two end caps (10).

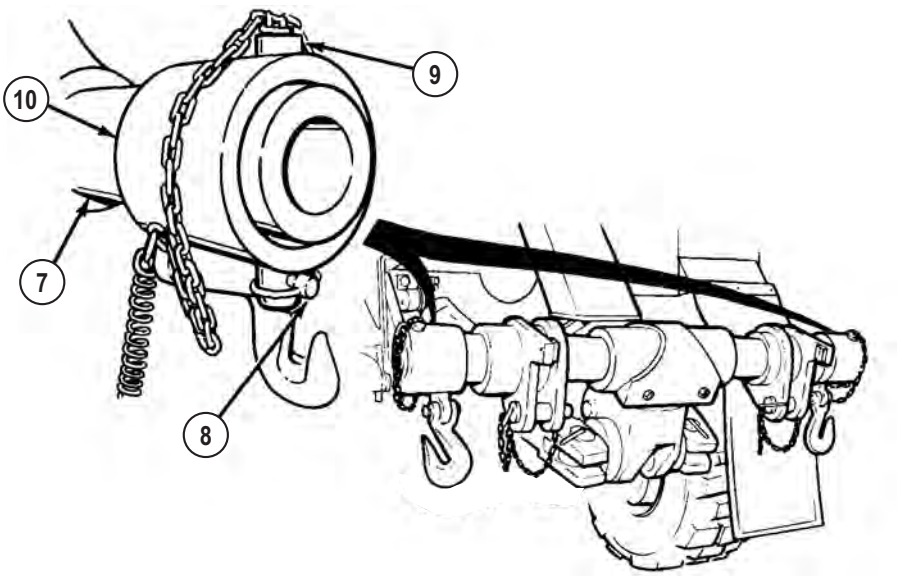


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

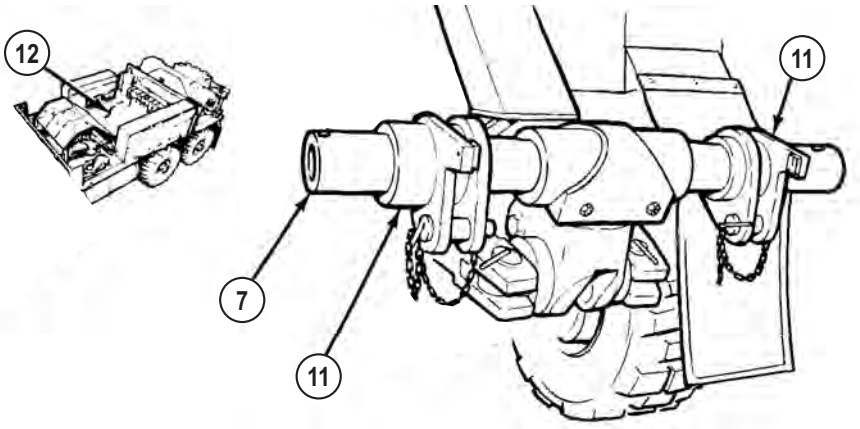


Figure 5.

9. Remove lock handle (13), lock plate (14), and two front tow adapters (15).

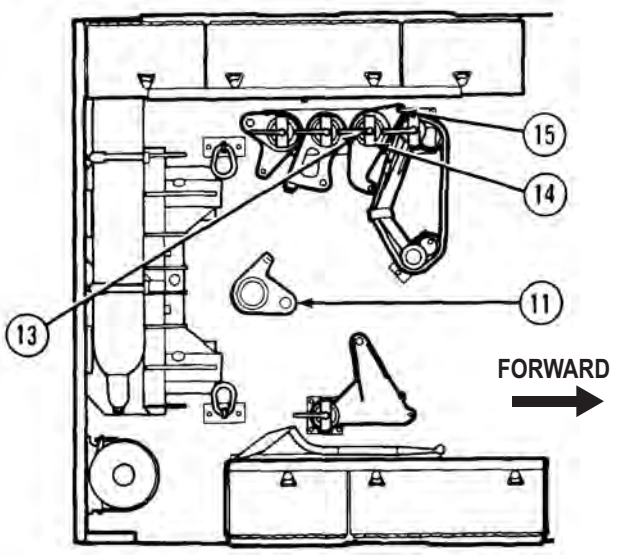


Figure 6.

10. Install two front adapters (11) removed from cross tube, lock plate (14), and lock handle (13).

11. Remove two 5 in. (127 mm) spacers (16) from stowage.

HOOKUP - Continued

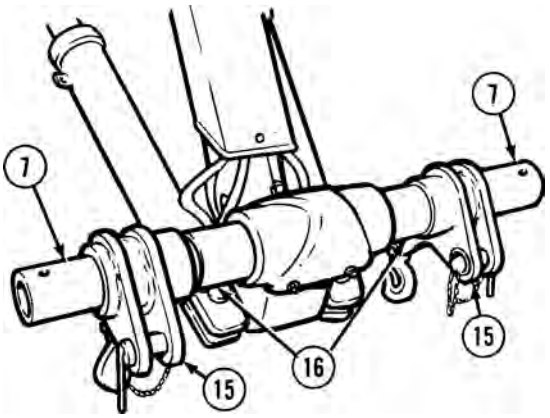
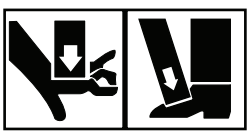


Figure 7.

12. Install two 5 in. (127 mm) spacers (16) on cross tube (7).

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

13. Install two front tow adapters (15) on cross tube (7).

NOTE

End caps will hang over end of cross tube for M915 adapters.

14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

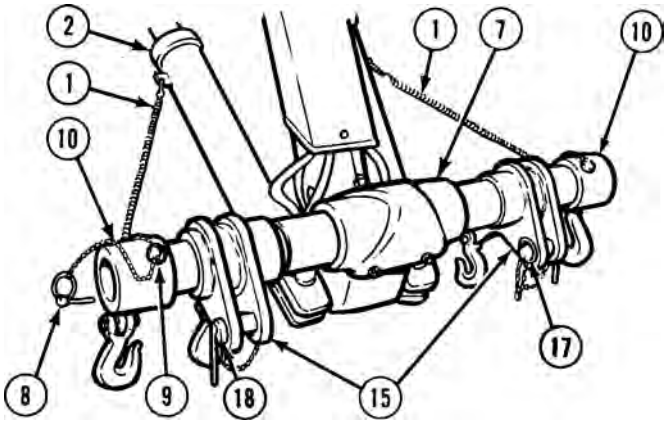


Figure 8.

15. Install pins (9) and quick pins (8).
16. Install two springs (1) on tow cylinders (2).
17. Remove two quick pins (17) and pins (18) from adapters (15).

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle. Keep pins to connect adapters to tow eyes.

18. Operate the retrieval system (WP 0059) and with aid of an assistant, position cross tube (7) so holes in adapters (15) align with front tow eyes (19).

HOOKUP - Continued

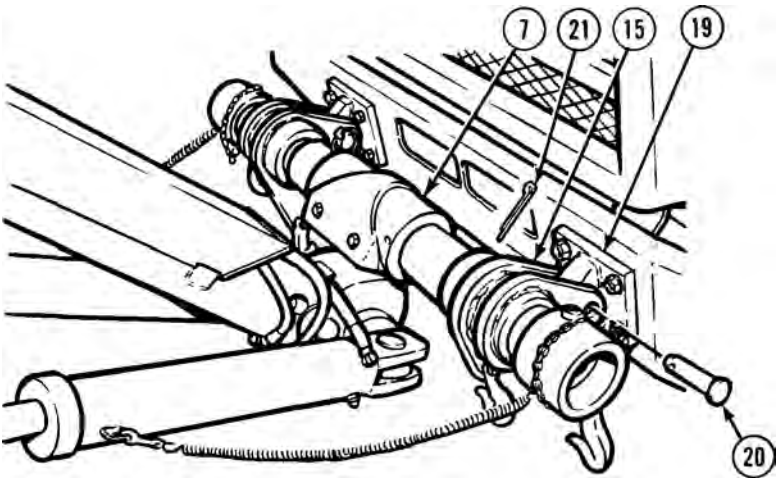


Figure 9.

19. Insert two shackle pins (20) through adapters (15) and front tow eyes (19). Install cotter pins (21) in pins (20).

NOTE

Refer to Figure below for correct angle of adapters.

20. Alternately operate lift and tow cylinder controls to lower cross tube (7) until top edge of adapters (15) are even with top edge of front tow eyes (19).

HOOKUP - Continued

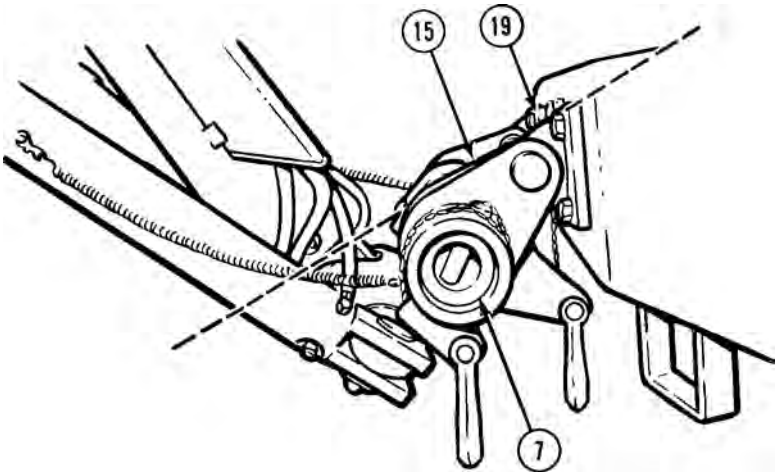


Figure 10.

21. Remove two 16 ft. (5 m) safety chains (22) from stowage.

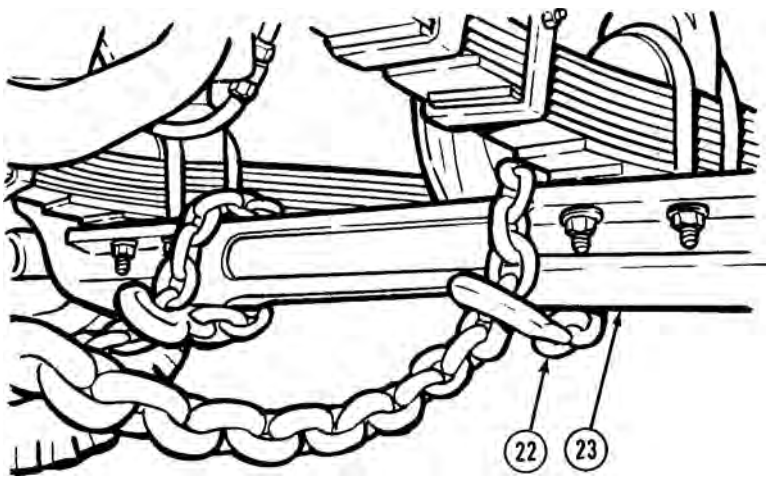


Figure 11.

22. Route one 16 ft. (5 m) safety chain (22) over front axle (23) on disabled vehicle.
23. Hook 16 ft. (5 m) safety chain (22) back into itself (as shown) in front of axle (23).
24. Repeat Steps (22) and (23) for other side of disabled vehicle.
25. Pull 16 ft. (5 m) safety chain (22) tight, and install on adapter grab hook (24).

HOOKUP - Continued

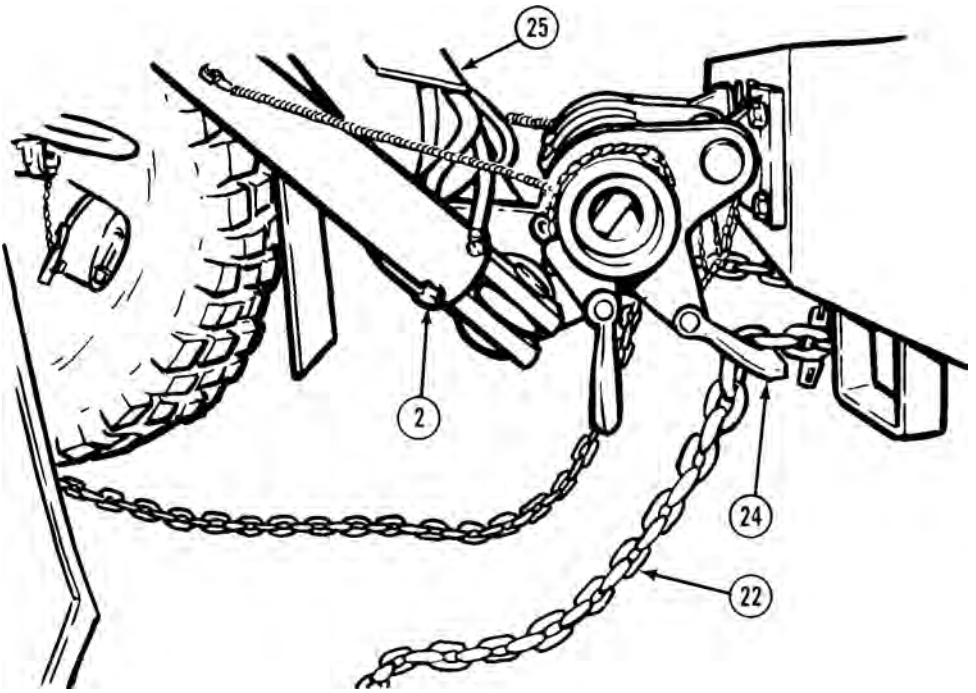


Figure 12.

26. Repeat Step (25) for other side of disabled vehicle.
27. Release PARKING BRAKE on disabled vehicle (refer to M915 operator's manual).

CAUTION

Do not let lift cylinder contact pintle hook, or damage to cylinder may result.

28. Operate retrieval system (WP 0059) until tow cylinders (2) are fully retracted.
29. Push in LIFT CYLINDER control lever to retract lift cylinder (25) until slack is removed from safety chains (22).

NOTE

Adjust chain slack so safety chains do not touch ground.

30. Route two 16 ft. (5 m) safety chains (22) through safety chain hoop (26) on wrecker and secure grab hook (27) with safety shackle (28).

HOOKUP - Continued

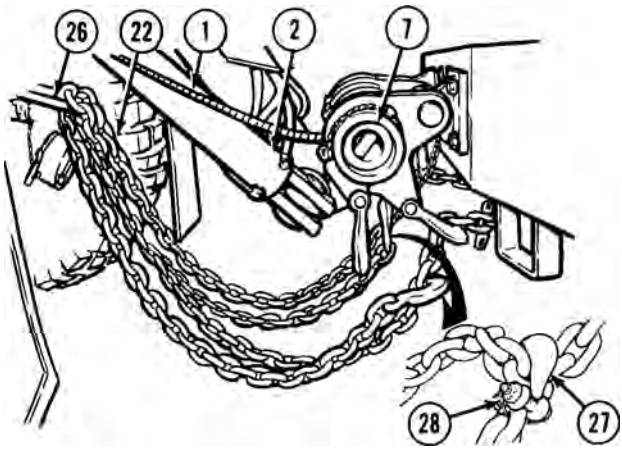


Figure 13.

31. Disconnect two springs (1) from tow cylinders (2) and wrap around cross tube (7).
32. Remove two air lines (29) from stowage and attach to rear gladhands (30) on wrecker.

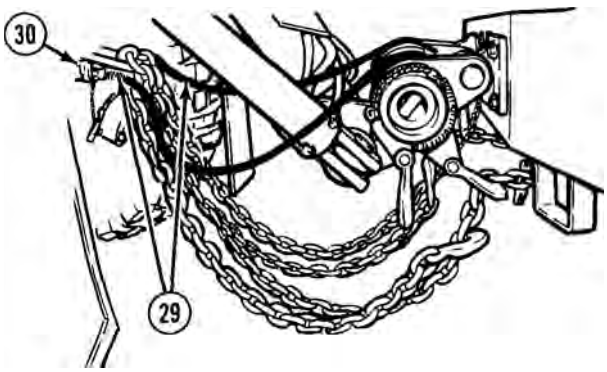


Figure 14.

CAUTION

Do not route air lines between retrieval cylinders or damage to air lines may result.

HOOKUP - Continued

NOTE

Rear emergency air lines from wrecker must be connected to front emergency gladhand on disabled vehicle. Rear service air lines from wrecker must be connected to front service gladhand on disabled vehicle.

33. Remove two air lines (29) over cross tube (7) and attach to front gladhands (31) on disabled vehicle.

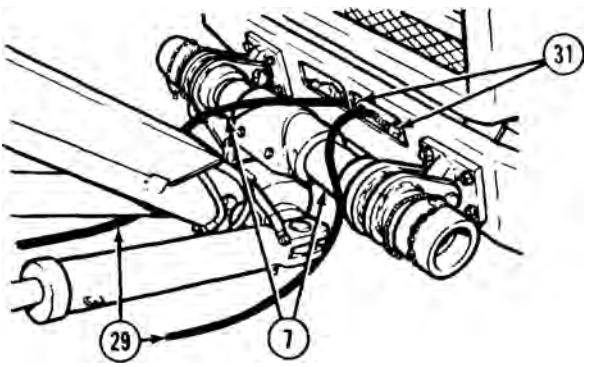


Figure 15.

34. Prepare disabled vehicle for towing (refer to M915 operator's manual).
35. Remove emergency tow lights (32) and two brackets (33) from stowage.

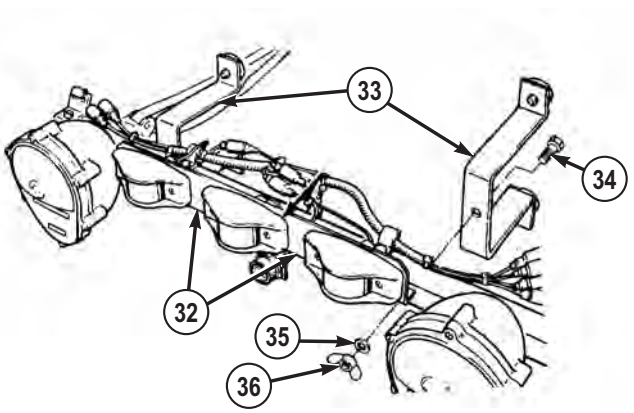


Figure 16.

HOOKUP - Continued

36. Install two brackets (33) in outer holes of emergency tow lights with two screws (34), washers (35), and nuts (36).
37. Install emergency tow lights (32) on rear of M915 and fasten securely with straps (37).

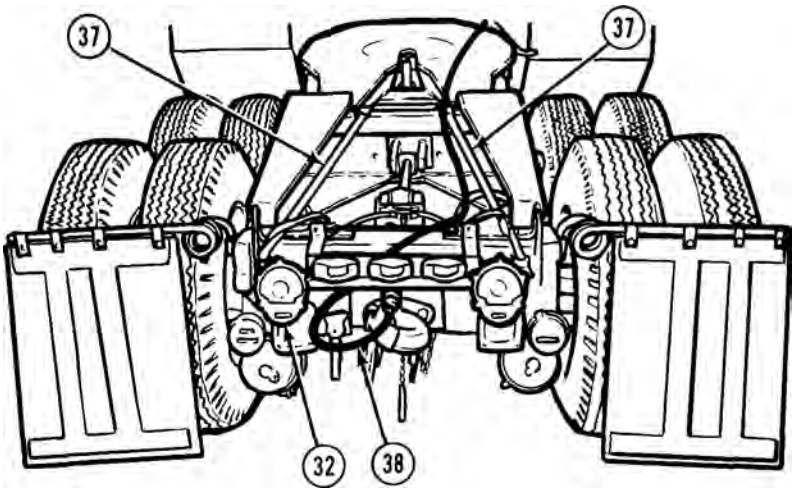


Figure 17.

38. Remove tow light cable (38) from stowage and connect to emergency tow lights (32).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

39. Route other end of tow light cable (38) along disabled vehicle and connect to rear electrical connector (39) on wrecker.

HOOKUP - Continued

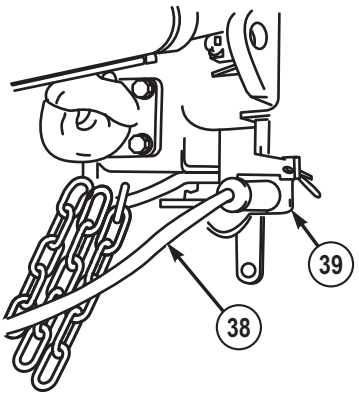


Figure 18.

CAUTION

Vehicle can only be towed with all tires in contact with paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (41).

40. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Proceed to Step (47).
41. Lock disabled vehicle's steering (refer to M915 operator's manual).
42. Set POWER switch (40) to ON position.

HOOKUP - Continued

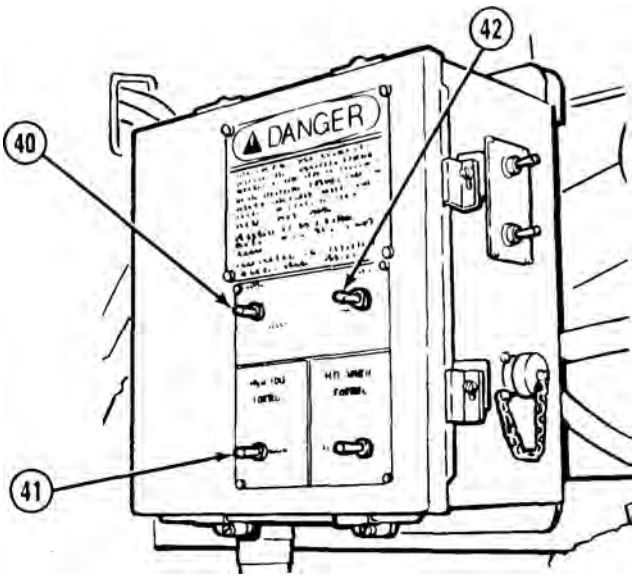


Figure 19.

43. Set HIGH IDLE switch (41) to CONTINUOUS.
44. Push and release LATCH switch (42). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

HOOKUP - Continued

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

45. Push LIFT CYLINDER control lever (6) to retract lift cylinder (25) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

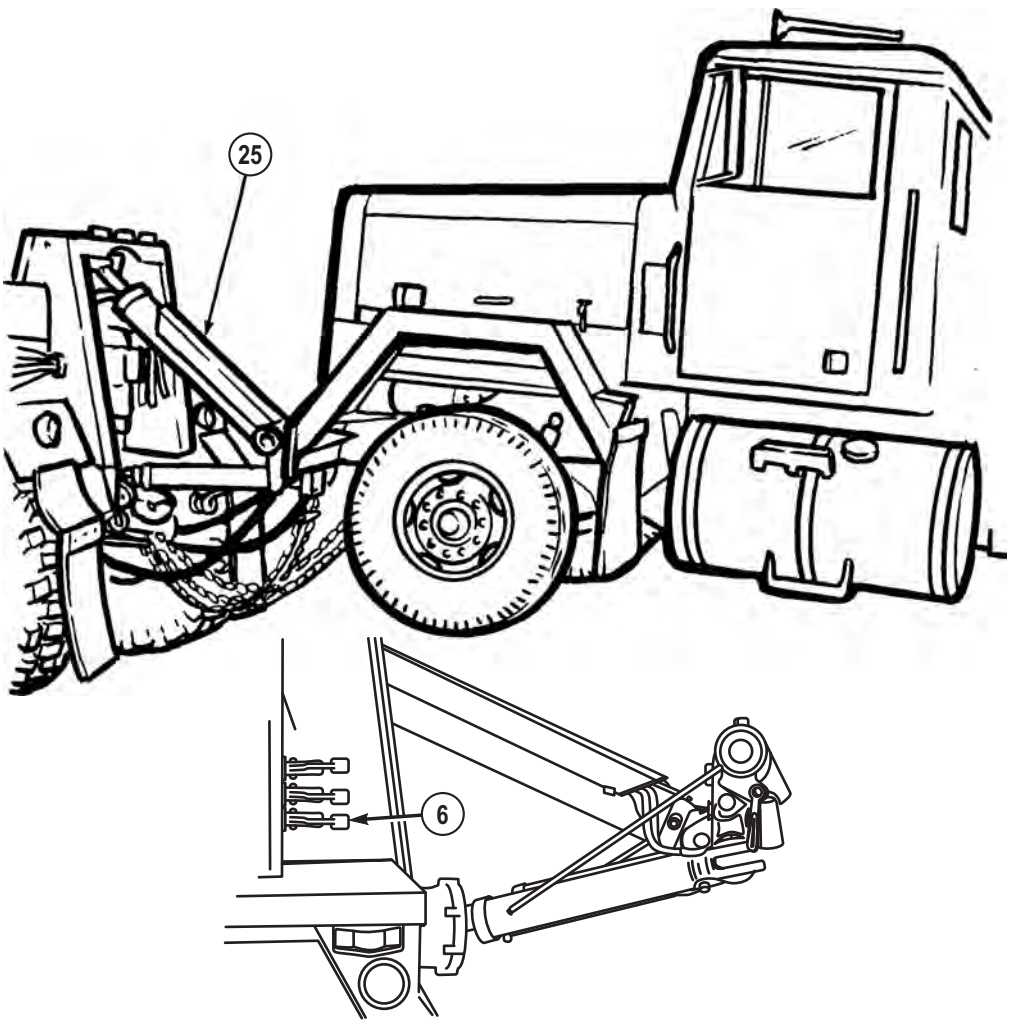


Figure 20.

HOOKUP - Continued

46. Set POWER switch (40) to OFF position.

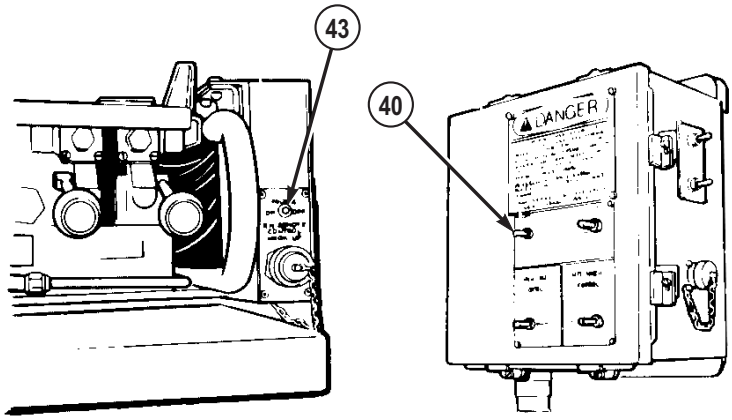


Figure 21.

47. Set POWER switch (43) to OFF position.
48. Set PTO ENGAGE switch (44) to OFF position. Indicator light (45) will go out.

HOOKUP - Continued

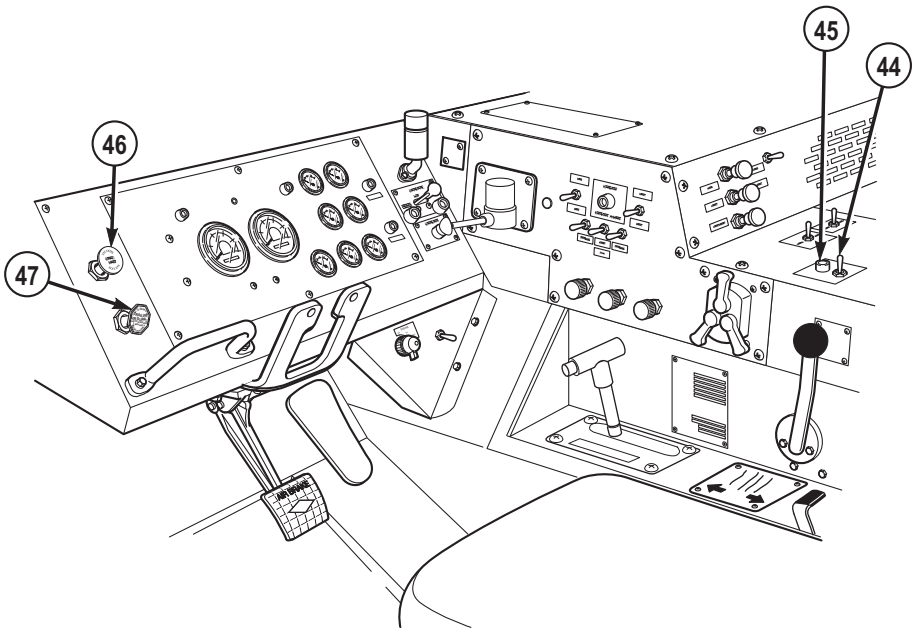


Figure 22.

49. Push in TRAILER AIR SUPPLY control (47).
50. Turn on wrecker service drive lights. (WP 0090)
51. Turn on wrecker emergency flashers. (WP 0099)
52. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
53. Push in PARKING BRAKE control (46).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

HOOKUP - Continued

54. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

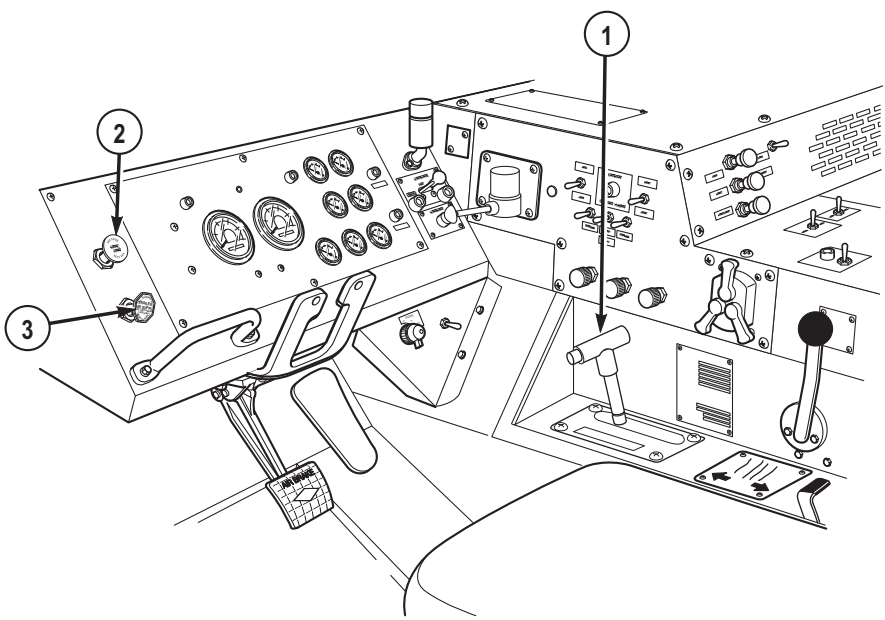


Figure 23.

DISCONNECT - Continued

2. Pull out PARKING BRAKE control (2).
3. Pull TRAILER AIR SUPPLY control (3).

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation, and lower disabled vehicle to ground (WP 0059) until safety chain at front axle is slack.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle parking brake is inoperative; install wheel chocks.

5. Set PARKING BRAKE on disabled vehicle (refer to M915 operator's manual).
6. Remove tow light cable (4) from wrecker.

DISCONNECT - Continued

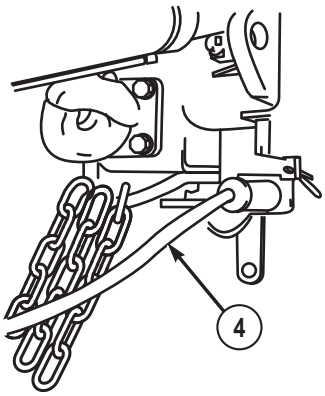


Figure 24.

7. Remove tow light cable (4) from emergency tow lights (5) and stow.

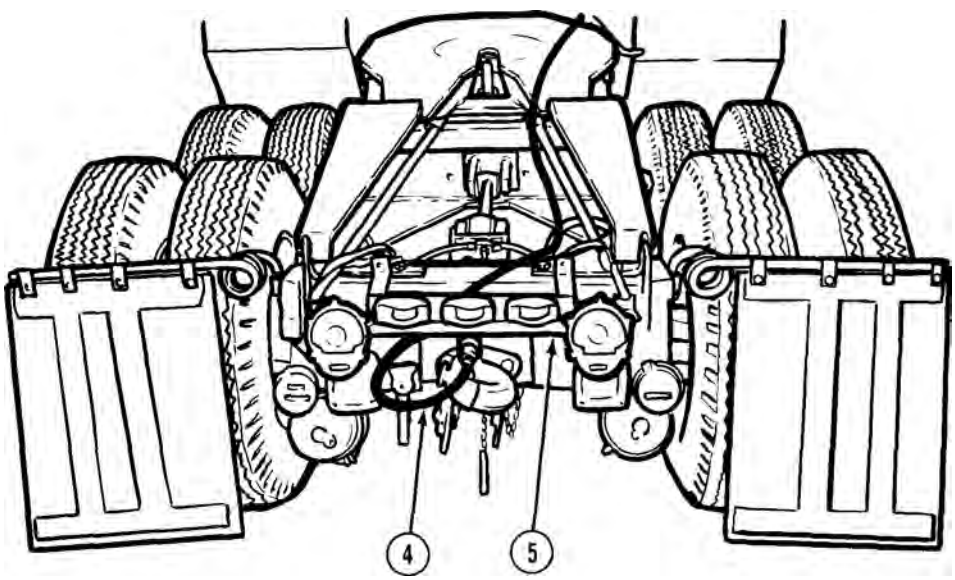


Figure 25.

8. Remove emergency tow lights (5) from disabled vehicle.
9. Remove two nuts (6), washers (7), screws (8), and brackets (9) from emergency tow lights (5). Stow emergency tow lights and brackets.

DISCONNECT - Continued

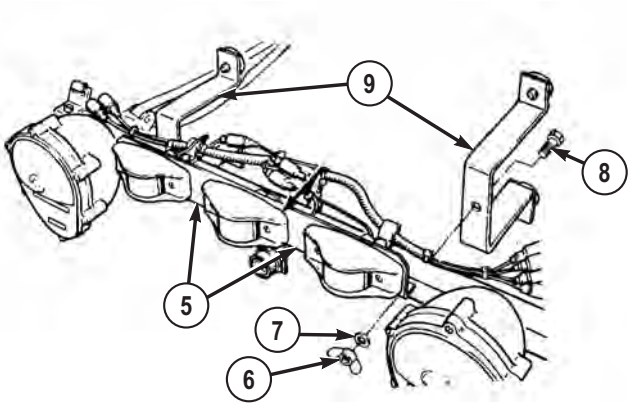


Figure 26.

10. Remove and stow safety chains (10) and air hoses (11).

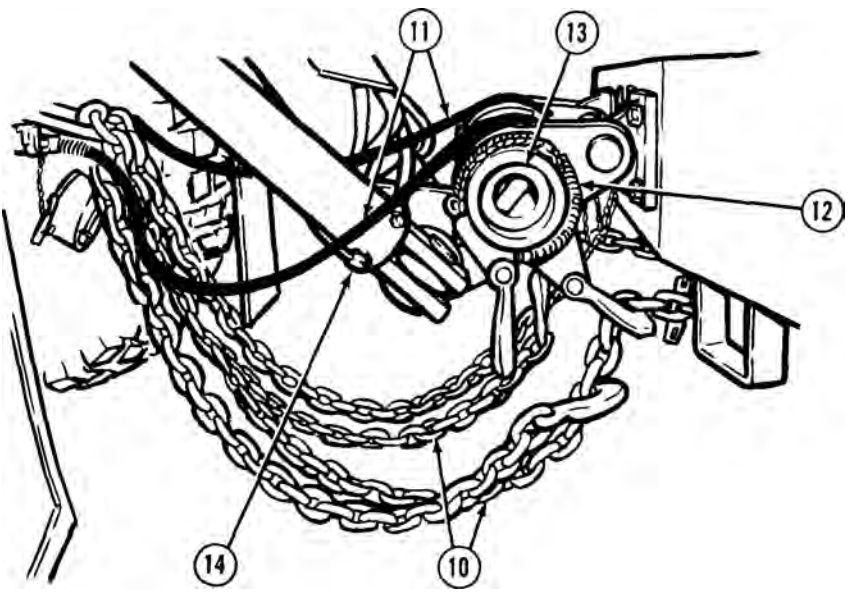


Figure 27.

11. Unwrap two springs (12) from cross tube (13) and connect to tow cylinders (4).

DISCONNECT - Continued

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

12. Remove two cotter pins (15) and shackle pins (16) from M915 front adapters (17), and stow with shackles removed from disabled vehicle tow eyes.

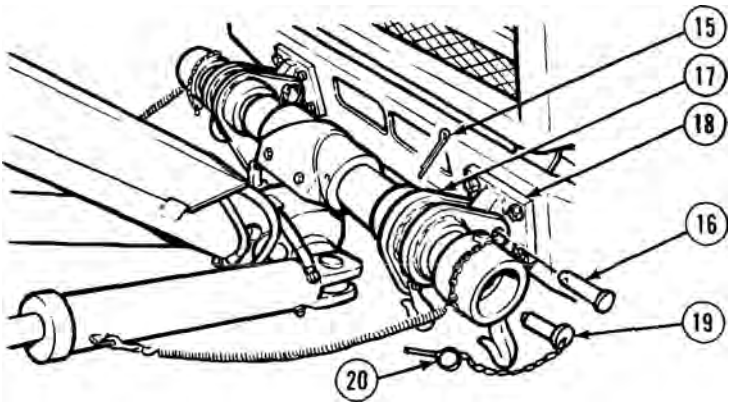


Figure 28.

13. Remove two M915 front adapters (17) from tow eyes (18) on disabled vehicle.
14. Install two pins (19) in M915 front adapters (17).
15. Install two quick pins (20) in adapter pins (19).
16. Drive wrecker forward several feet (WP 0050) and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

17. Remove two springs (12) from tow cylinders (14).

DISCONNECT - Continued

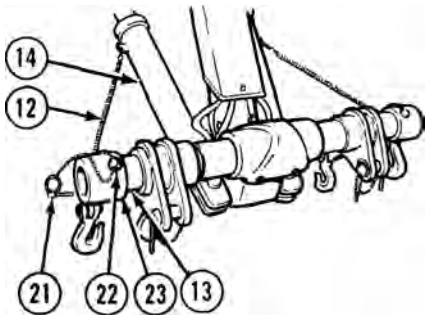


Figure 29.

18. Remove two quick pins (21) and pins (22) from end caps (23).
19. Remove two end caps (23) from cross tube (13).
20. Remove two front adapters (17) from cross tube (13) and place on equipment body floor (24).

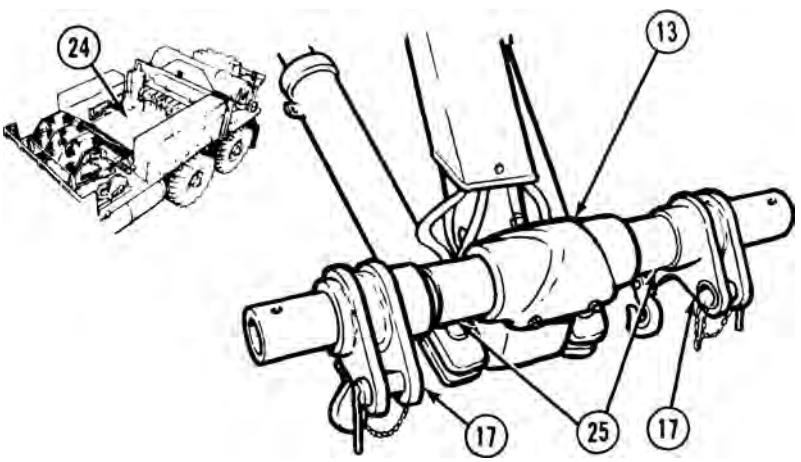


Figure 30.

21. Remove and stow two 5 in. (127 mm) spacers (25).
22. Remove lock handle (26), lock plate (27), and two front adapters (28).
23. Install two front adapters (17), lock plate (27), and lock handle (26).

DISCONNECT - Continued

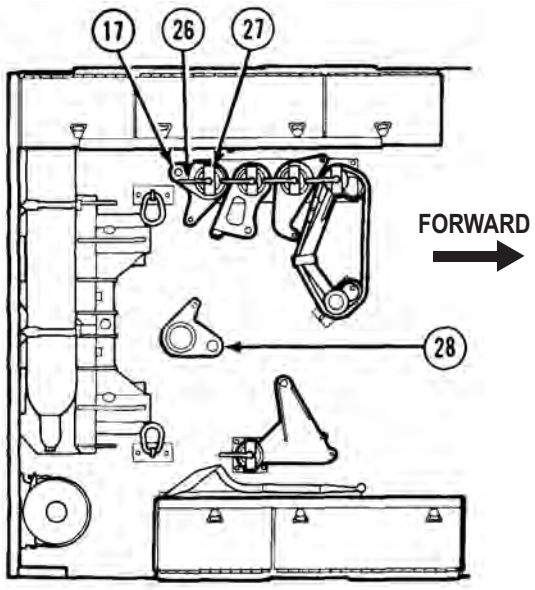


Figure 31.

24. Install two front adapters (28) on cross tube (13).

DISCONNECT - Continued

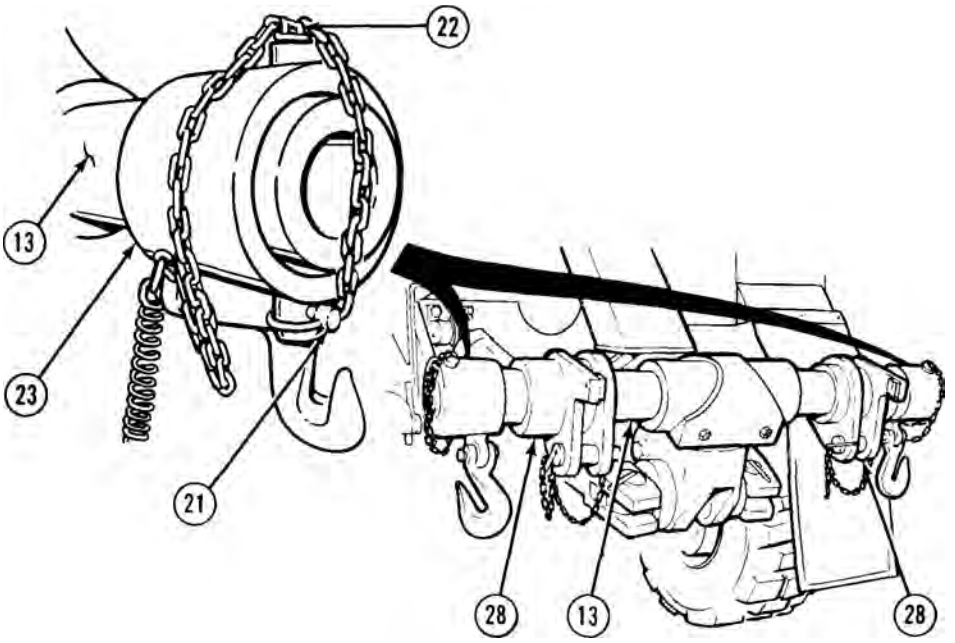


Figure 32.

25. Install two end caps (23) on cross tube (13). Install two pins (22) and quick pins (21).
26. Install two springs (12) on tow cylinders (14).

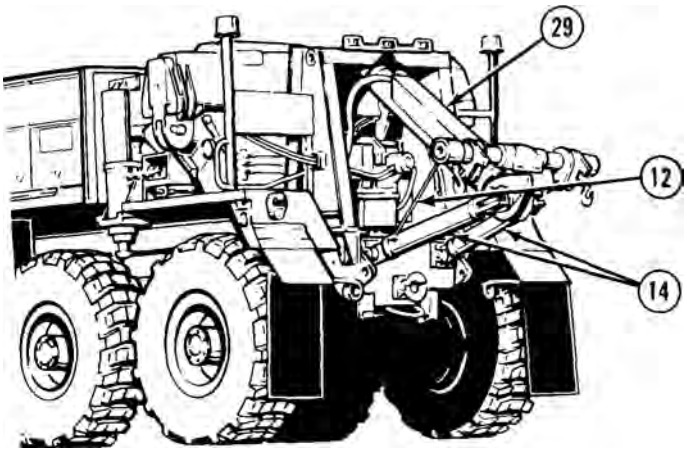


Figure 33.

DISCONNECT - Continued

27. Operate retrieval system (WP 0059) to fully retract lift cylinder (29) and tow cylinders (14).

NOTE

Driver side and passenger side towing shackles are installed the same way.

28. Install towing shackle (30), pin (31), and cotter pin (32).

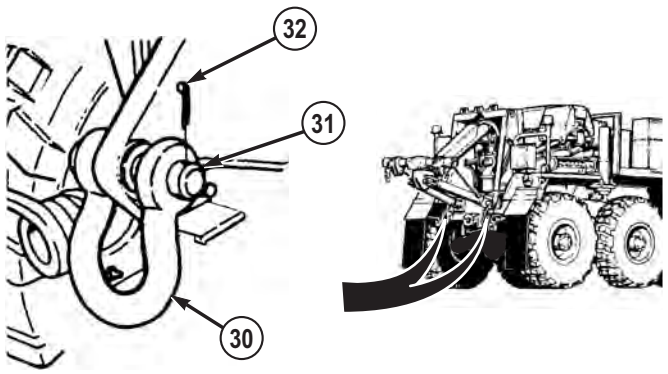


Figure 34.

29. Set POWER switch (33) to OFF position.

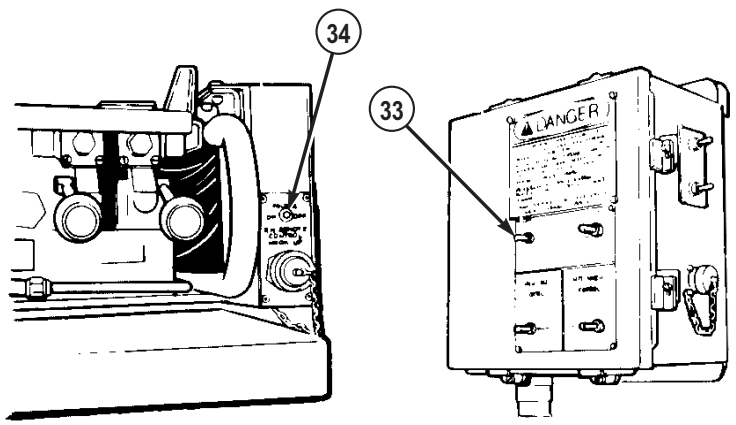


Figure 35.

30. Set POWER switch (34) to OFF position.

DISCONNECT - Continued

31. Turn off wrecker emergency flashers. (WP 0099)
32. Turn off wrecker service drive lights. (WP 0090)
33. Set PTO ENGAGE switch (35) to OFF position. Indicator light (36) will go out.

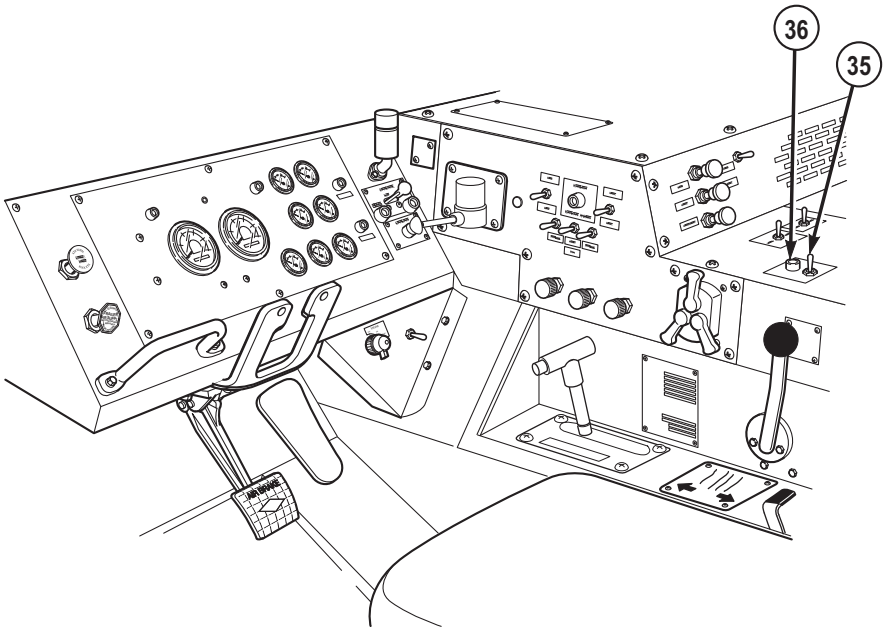


Figure 36.

34. Remove and stow portable beacon lights. (WP 0097)
35. Shut off engine. (WP 0057)
36. Turn off disabled vehicle emergency flashers, and remove lock from steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M939 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

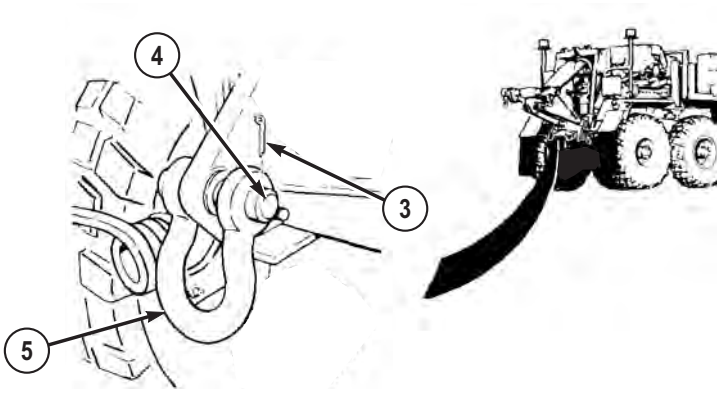


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 4 ft. (1.2 m) above ground.

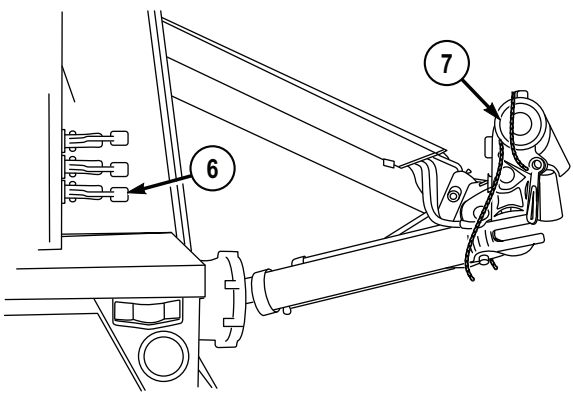


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

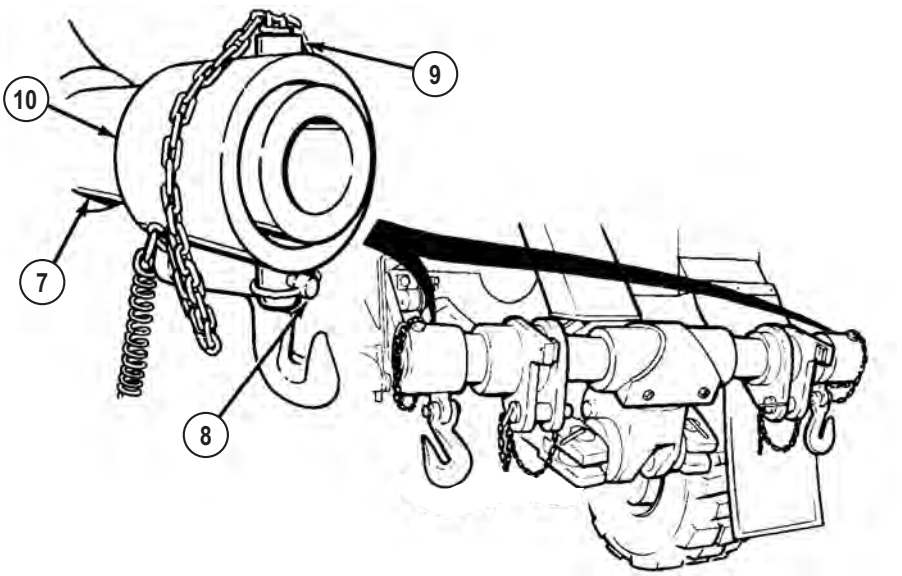


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

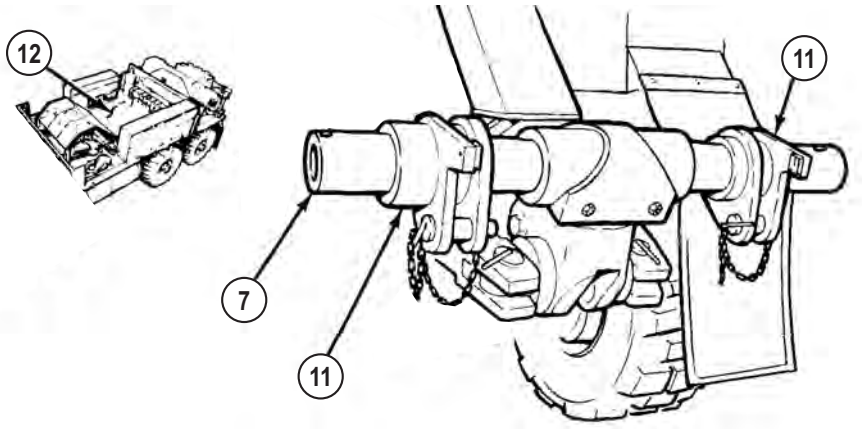


Figure 5.

9. Remove lock handle (13), lock plate (14), and two M939 front tow adapters (15).

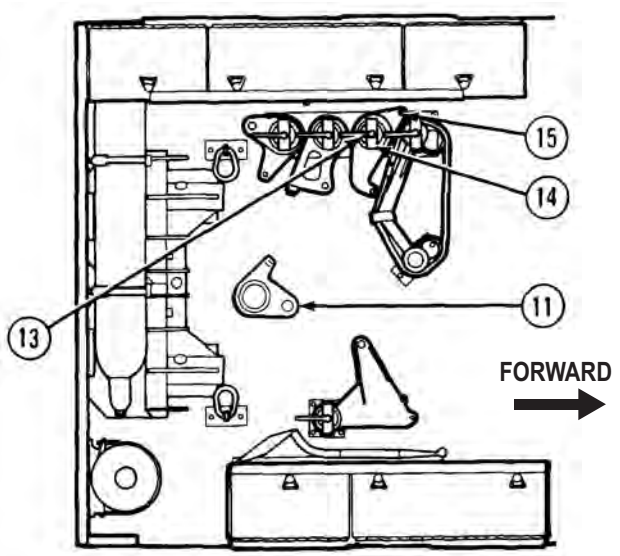


Figure 6.

10. Remove two 5 in. (127 mm) spacers from stowage.
11. Install two front adapters (11) removed from cross tube (7), lock plate (14), and lock handle (13).

HOOKUP - Continued

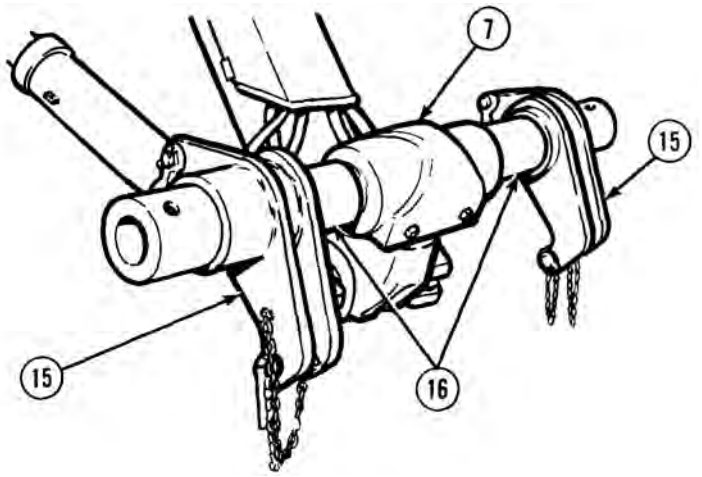
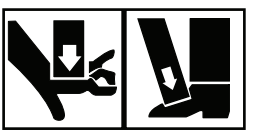


Figure 7.

12. Install two 5 in. (127 mm) spacers (16) on cross tube (7).

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

13. Install two front tow adapters (15) on cross tube (7).
14. Install two end caps (10) on cross tube (7).
15. Install two pins (9) and quick pins (8).

HOOKUP - Continued

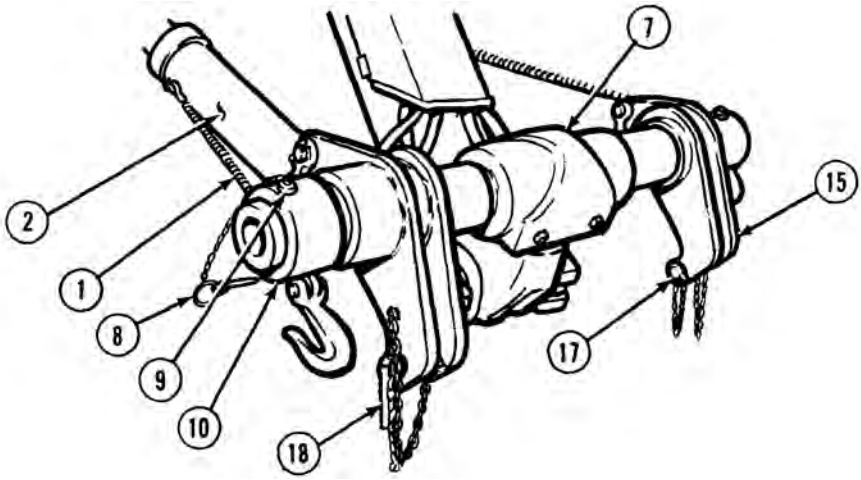


Figure 8.

16. Attach two springs (1) on tow cylinders (2).
17. Remove two quick pins (17) and pins (18) from adapters (15).

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

18. Operate retrieval system, (WP 0059) and with aid of an assistant position cross tube (7) so holes in adapters (15) align with front tow eyes (19).

HOOKUP - Continued

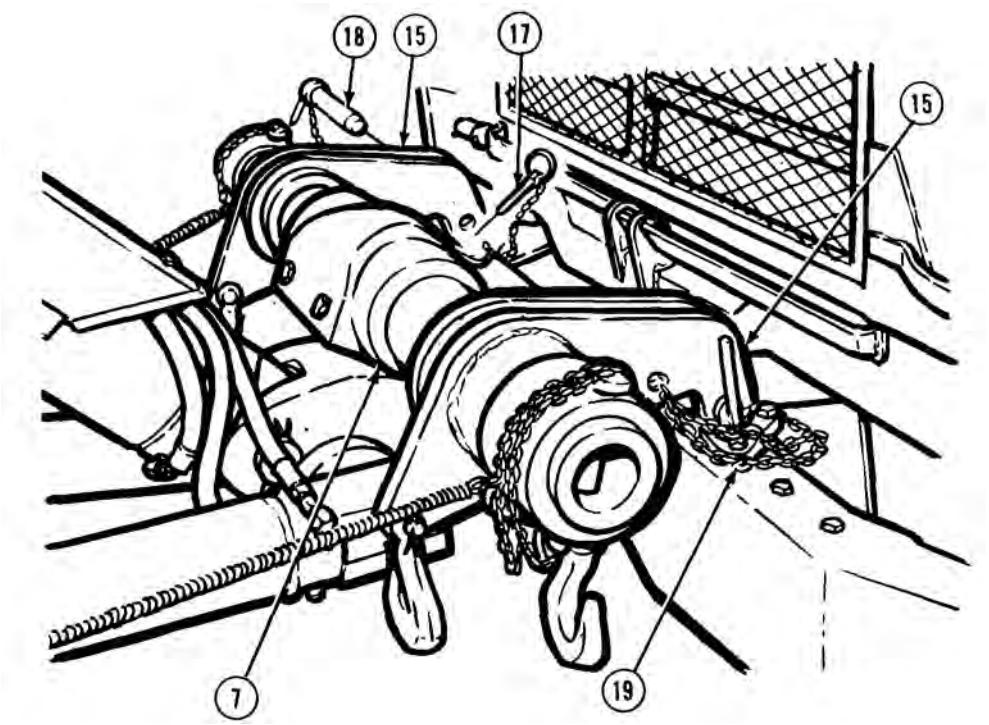


Figure 9.

CAUTION

Do not route pin retention chains between adapters and front bumper, or damage to chains may result.

19. Insert two pins (18) through adapters (15) and front tow eyes (19). Install quick pins (17) in pins (18).
20. Lower cross tube (7) until adapters (15) contact front bumper (20).

HOOKUP - Continued

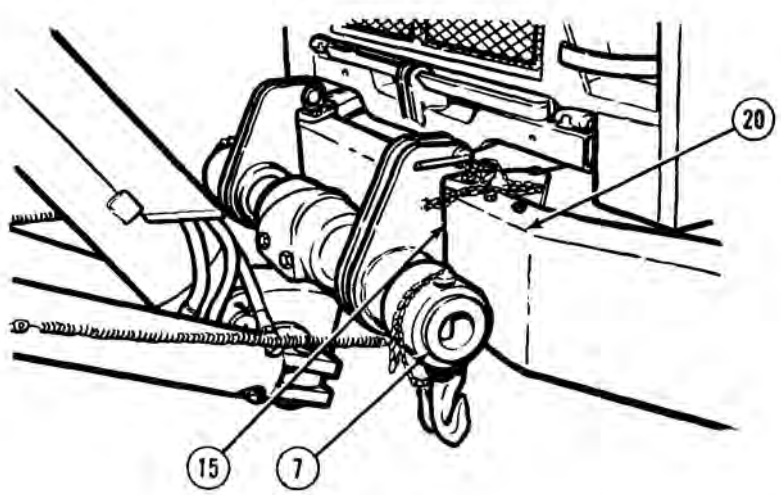


Figure 10.

21. Remove two 16 ft. (5 m) safety chains (21) from stowage.

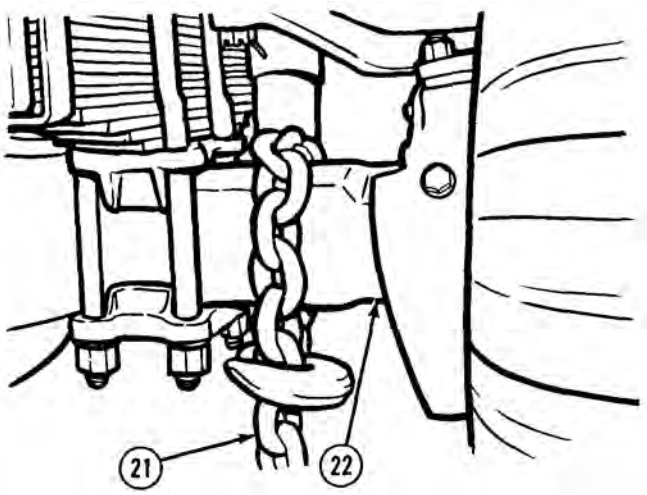


Figure 11.

22. Route one 16 ft. (5 m) safety chain (21) over front axle (22) on disabled vehicle.
23. Hook 16 ft. (5 m) safety chain (21) back into itself in front of axle (22).

HOOKUP - Continued

24. Repeat Steps (22) and (23) for other side of disabled vehicle.
25. Pull 16 ft. (5 m) safety chain (21) tight, and install chain on adapter grab hook (23).

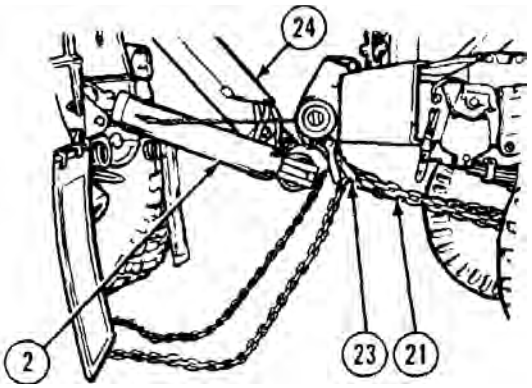


Figure 12.

26. Repeat Step (25) for other side of disabled vehicle.
27. Release parking brake on disabled vehicle (refer to M939 operator's manual).
28. Operate retrieval system (WP 0059) until tow cylinders (2) are fully retracted.

HOOKUP - Continued

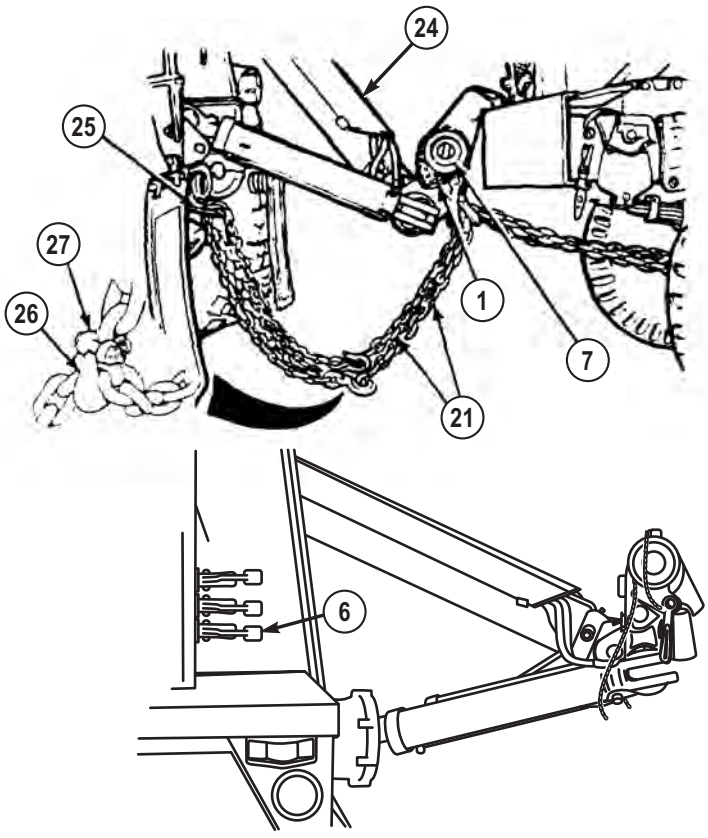


Figure 13.

29. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (24) until slack is removed from safety chains (21).

NOTE

- 16 ft. (5 m) safety chains can he routed to towing shackles or safety chain hoop. Towing shackles can be used only after tow cylinders are extended.
- Adjust chain slack so 16 ft. (5 m) safety chains just touch the ground.

30. Route two 16 ft. (5 m) safety chains (11) through safety chain hoop (25) on wrecker and secure grab hook (26) with safety shackle (27).

31. Wrap two springs (1) around cross tube (7) and secure.

HOOKUP - Continued

32. Remove two air lines (28) from stowage and attach to rear gladhands (29) on wrecker.

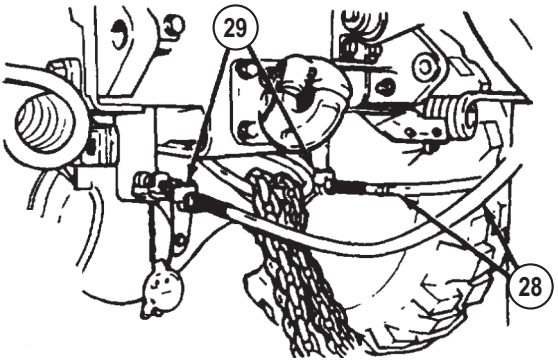


Figure 14.

CAUTION

Do not route air lines between retrieval cylinders, or damage to air lines may result.

NOTE

Rear emergency air line from wrecker must be connected to front emergency gladhand on disabled vehicle. Rear service air line from wrecker must be connected to front service gladhand on disabled vehicle.

33. Route two air lines (28) over cross tube (7) and front bumper (20). Attach to front gladhands (30) on disabled vehicle.

HOOKUP - Continued

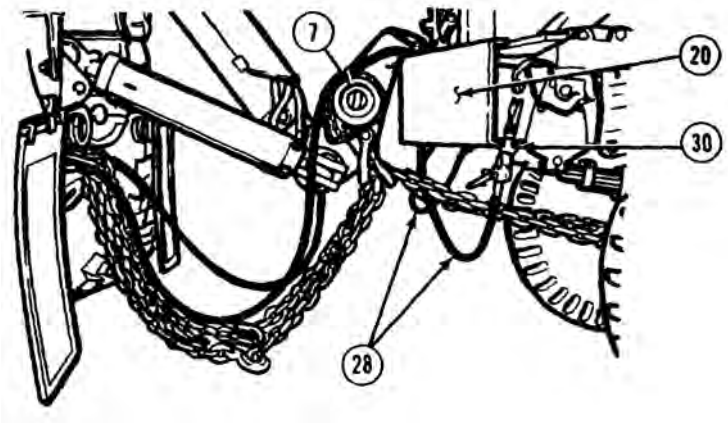


Figure 15.

34. Prepare disabled vehicle for towing (refer to M939 operator's manual).
35. Remove emergency tow lights (31) and two brackets (32) from stowage.

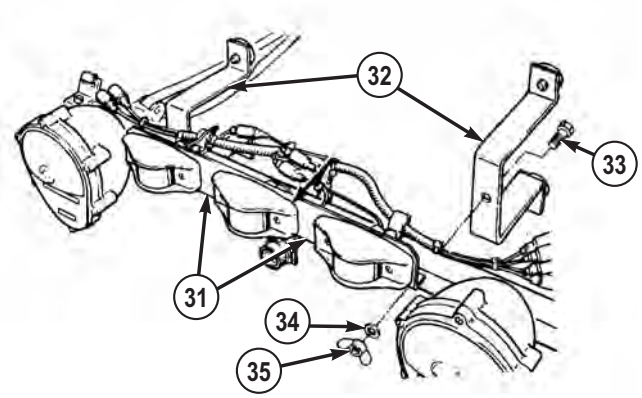


Figure 16.

36. Install two brackets (32) in center holes of emergency tow lights with two screws (33), washers (34), and nuts (35).
37. Install emergency tow lights (31) on rear of M939 and fasten securely with straps (36).

HOOKUP - Continued

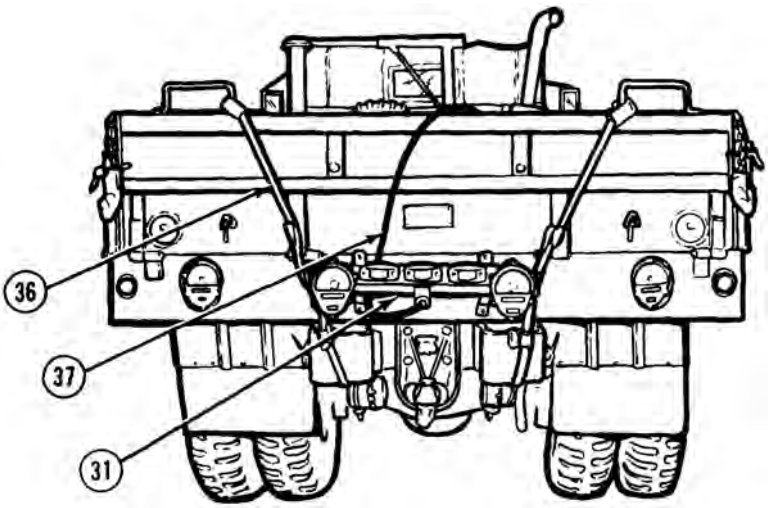


Figure 17.

38. Remove tow light cable (37) from stowage and connect to emergency tow lights (31).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

39. Route other end of tow light cable (37) along disabled vehicle and connect to rear electrical connector (38) on wrecker.

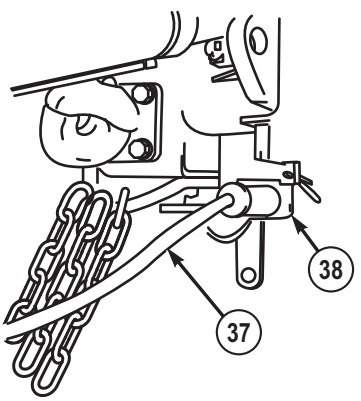


Figure 18.

HOOKUP - Continued

CAUTION

If disabled vehicle is to be towed with all tires in contact with road, this procedure can be accomplished on paved roads only. Failure to comply may result in damage to equipment.

NOTE

If disabled vehicle is to be lifted and towed, skip to Step (41).

40. If disabled vehicle will be towed with all tires in contact with road:
    a. Raise cross tube enough to partially unload disabled vehicle's front suspension.
    b. Keep front tires in firm contact with ground.
    c. Skip to Step (46).
41. Lock disabled vehicle's steering (refer to M939 operator's manual).
42. Set POWER switch (39) to ON position.

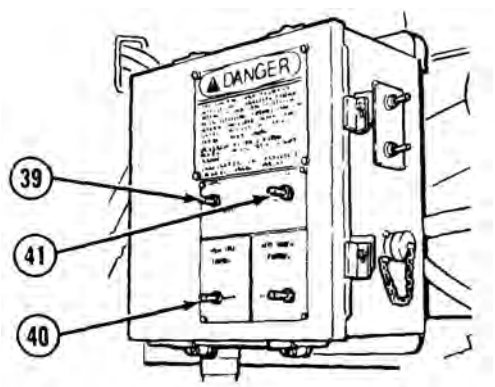


Figure 19.

43. Set HIGH IDLE switch (40) to CONTINUOUS.
44. Push and release LATCH switch (41). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

45. Retract lift cylinder (24) to raise disabled vehicle approximately 1 ft. (30 cm) off ground.

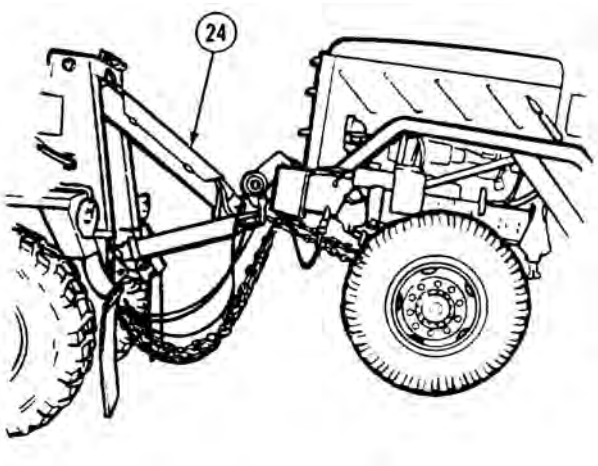


Figure 20.

HOOKUP - Continued

46. Set POWER switch (39) to OFF position.

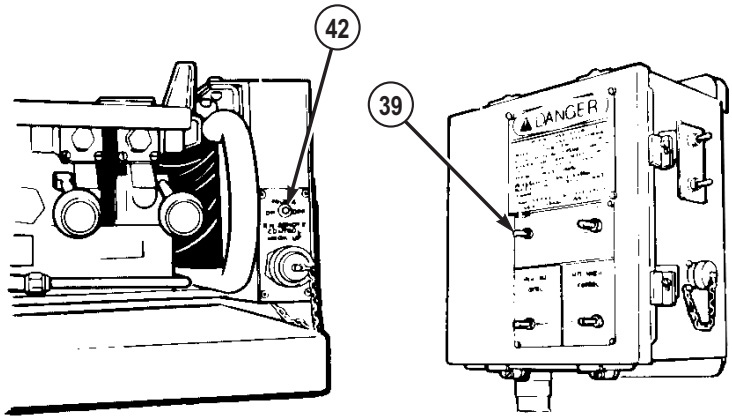


Figure 21.

47. Set POWER switch (42) to OFF position.
48. Set PTO ENGAGE switch (43) to OFF position. Indicator light (44) will go out.

HOOKUP - Continued

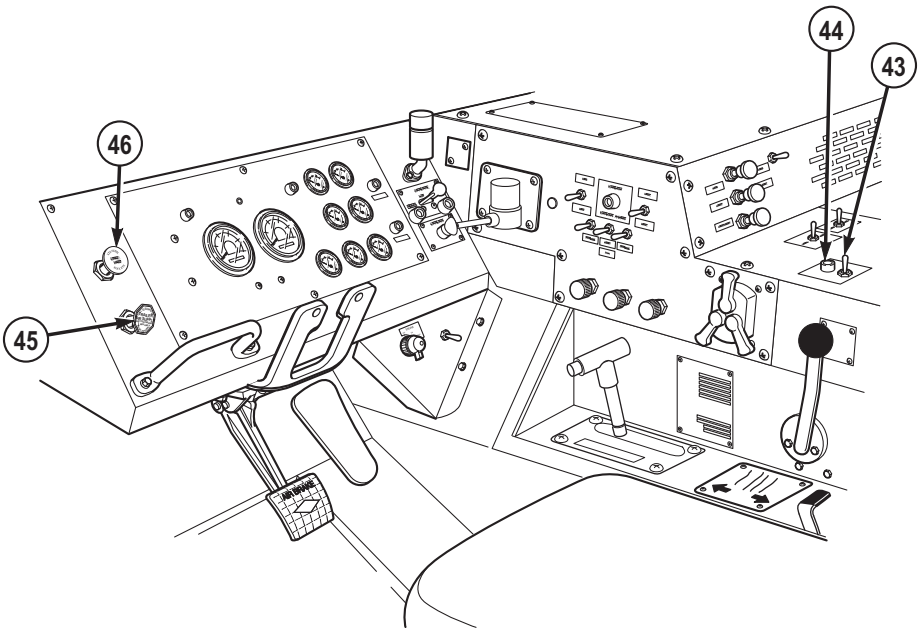


Figure 22.

49. Push in TRAILER AIR SUPPLY control (45).
50. Turn on wrecker service drive lights. (WP 0090)
51. Turn on wrecker emergency flashers. (WP 0099)
52. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
53. Push in PARKING BRAKE control (46).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

HOOKUP - Continued

54. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).
2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

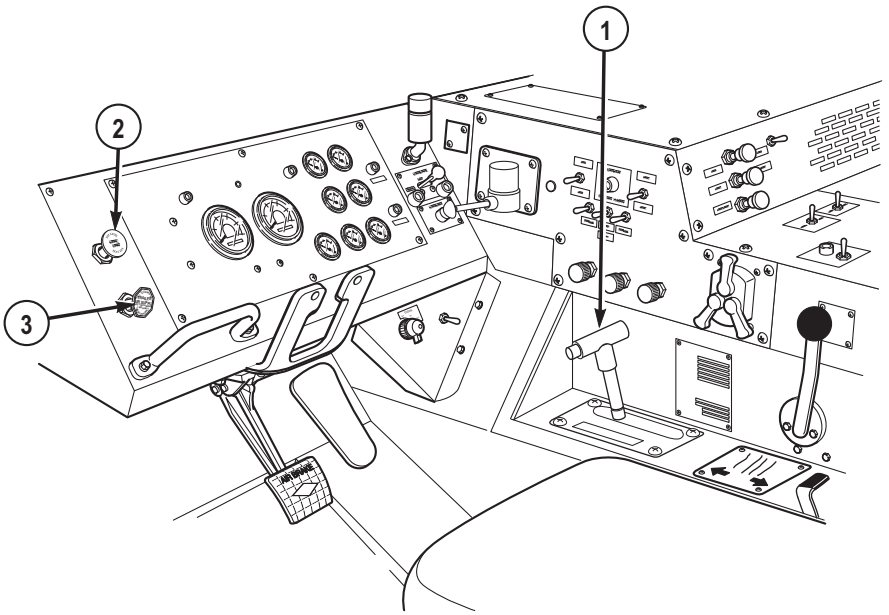


Figure 23.

3. Pull out TRAILER AIR SUPPLY control (3).

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 in. (50 to 100 mm) to allow for adjustment when removing adapters.

4. Prepare retrieval system for operation (WP 0059) and pull LIFT CYLINDER control lever (4) and lower disabled vehicle to ground until safety chains at front axle are slack.

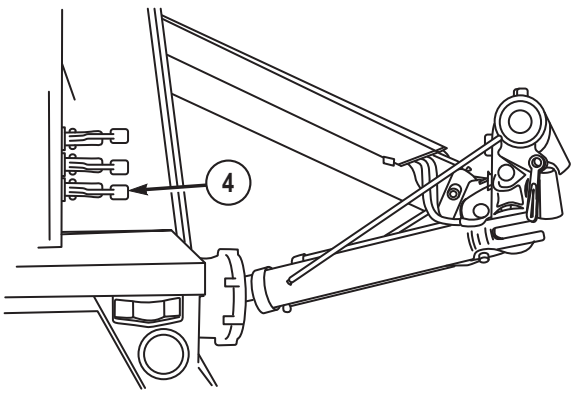


Figure 24.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

5. Engage PARKING BRAKE on disabled vehicle (refer to operator’s manual).
6. Remove tow light cable (5) from wrecker.

DISCONNECT - Continued

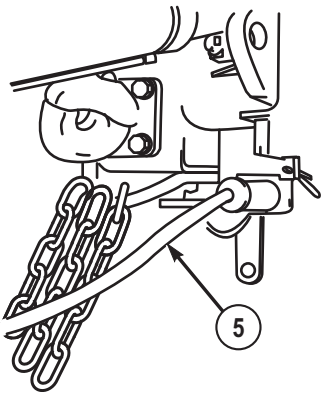


Figure 25.

7. Remove tow light cable (5) from emergency tow lights (6) and stow.

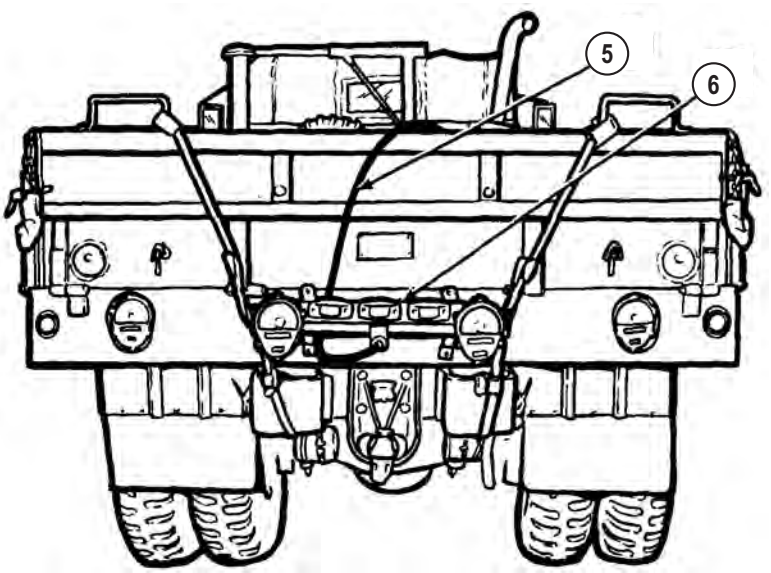


Figure 26.

8. Remove emergency tow lights (6) from disabled vehicle.
9. Remove and stow two nuts (7), washers (8), screws (9), and brackets (10) from emergency tow lights (6) and return all to stowage.

DISCONNECT - Continued

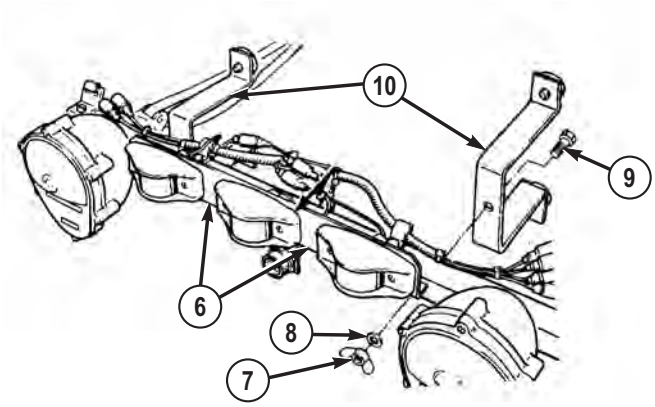


Figure 27.

10. Remove and stow two 16 ft. (5 m) safety chains (11) and air lines (12).

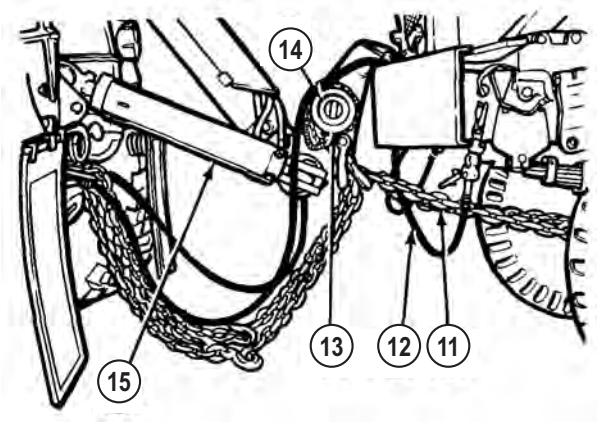


Figure 28.

11. Unwrap two springs (13) from cross tube (14) and connect to tow cylinders (15).
12. Remove two quick pins (16) and pins (17) from adapters (18).

DISCONNECT - Continued

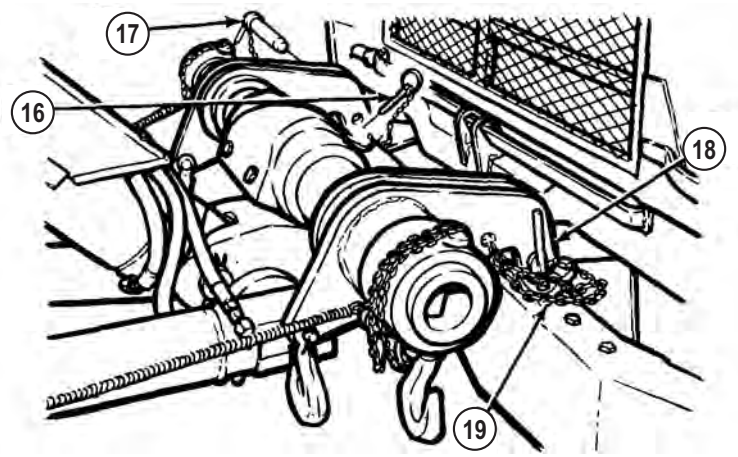


Figure 29.

13. Remove two adapters (18) from tow eyes (19) on disabled vehicle.
14. Install two pins (17) in adapters (18).
15. Install two quick pins (16) in pins (17).
16. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

17. Remove two springs (13) from tow cylinders (15).

DISCONNECT - Continued

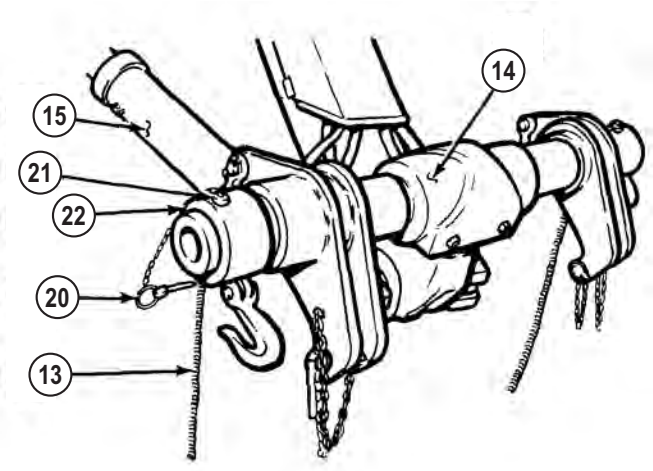


Figure 30.

18. Remove two quick pins (20) and pins (21) from end caps (22).
19. Remove two end caps (22) from cross tube (14).
20. Remove two adapters (18) from cross tube (14) and place on equipment body floor (23).

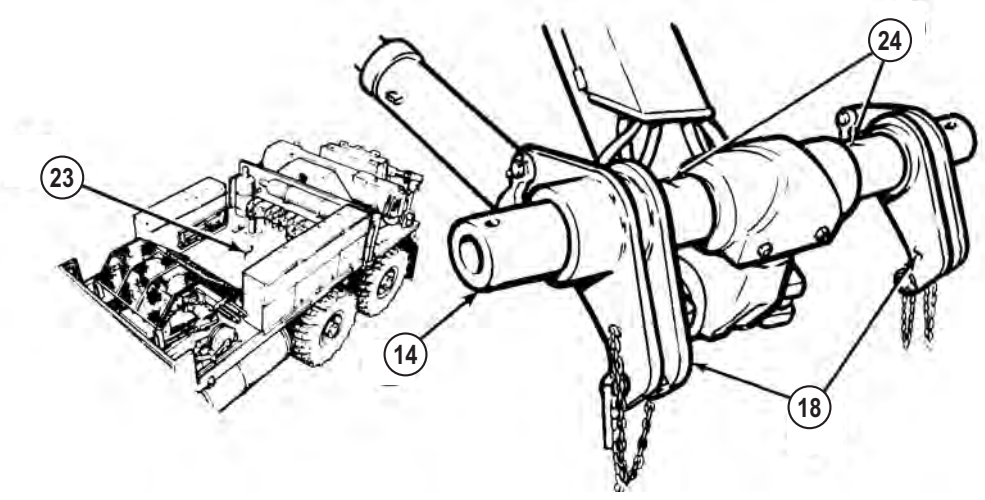


Figure 31.

DISCONNECT - Continued

21. Remove and stow two 5 in. (127 mm) spacers (24).
22. Remove lock handle (25), lock plate (26), and two front adapters (27).

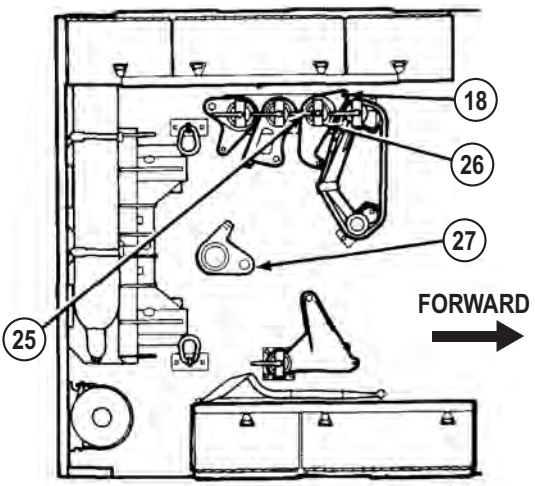


Figure 32.

23. Install two front adapters (18) removed from cross tube, lock plate (26), and lock handle (25).
24. Install two front adapters (27) on cross tube (14).

DISCONNECT - Continued

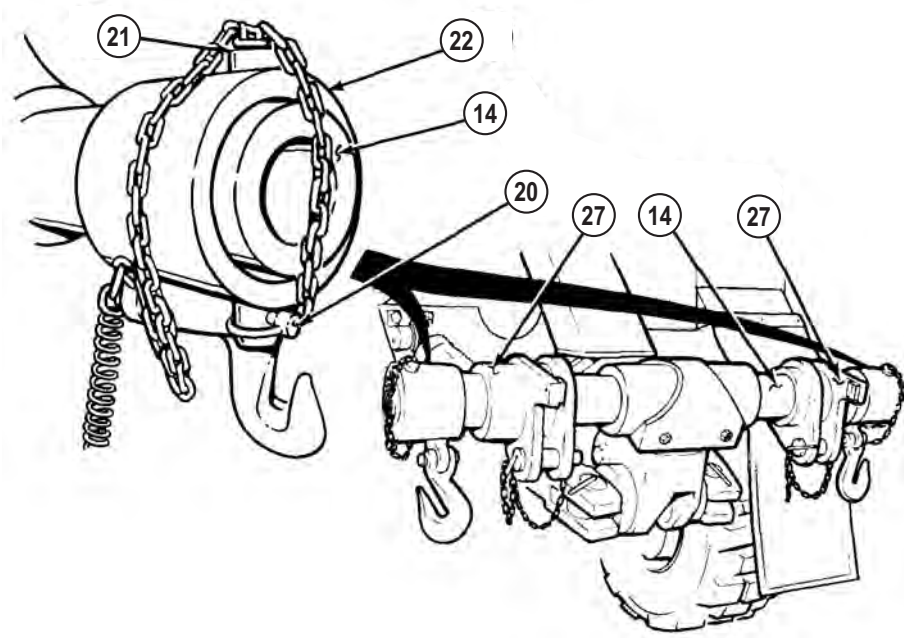


Figure 33.

25. Install two end caps (22) on cross tube (14).
26. Install two pins (21) and quick pins (20).
27. Install two springs (13) on tow cylinders (15).

DISCONNECT - Continued

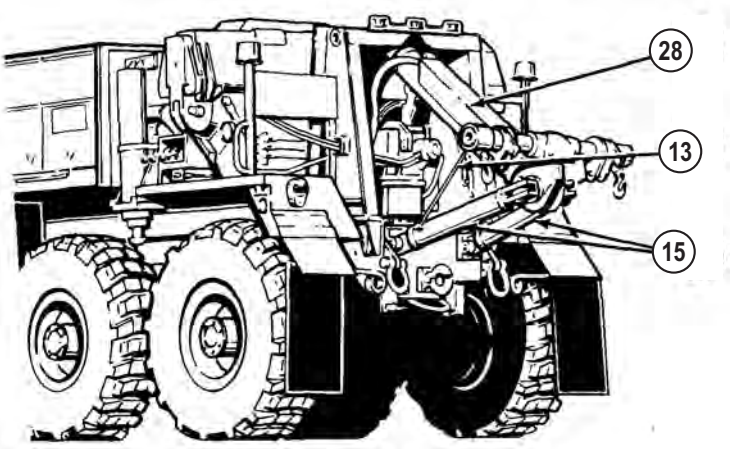


Figure 34.

28. Operate retrieval system (WP 0059) to fully retract lift cylinder (28) and tow cylinders (15).

NOTE

Driver side and passenger side towing shackles are installed the same way.

29. Install two rear towing shackles (29), pins (30), and cotter pins (31).

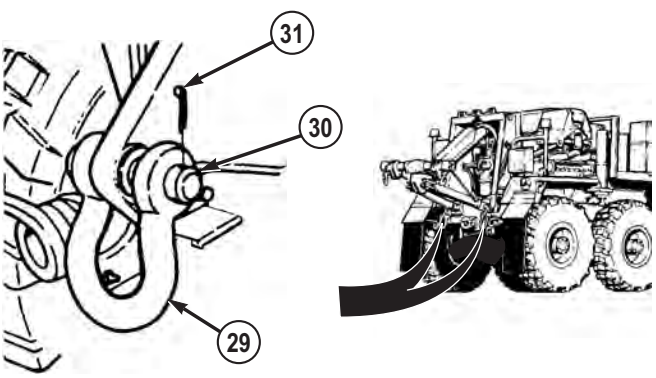


Figure 35.

30. Set POWER switch (32) to OFF position.

DISCONNECT - Continued

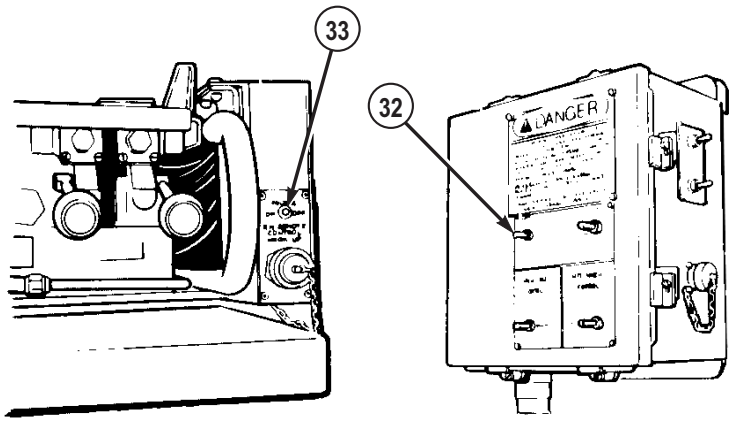


Figure 36.

31. Set POWER switch (33) to OFF position.
32. Turn off wrecker emergency flashers. (WP 0099)
33. Turn off wrecker service drive lights. (WP 0090)
34. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

DISCONNECT - Continued

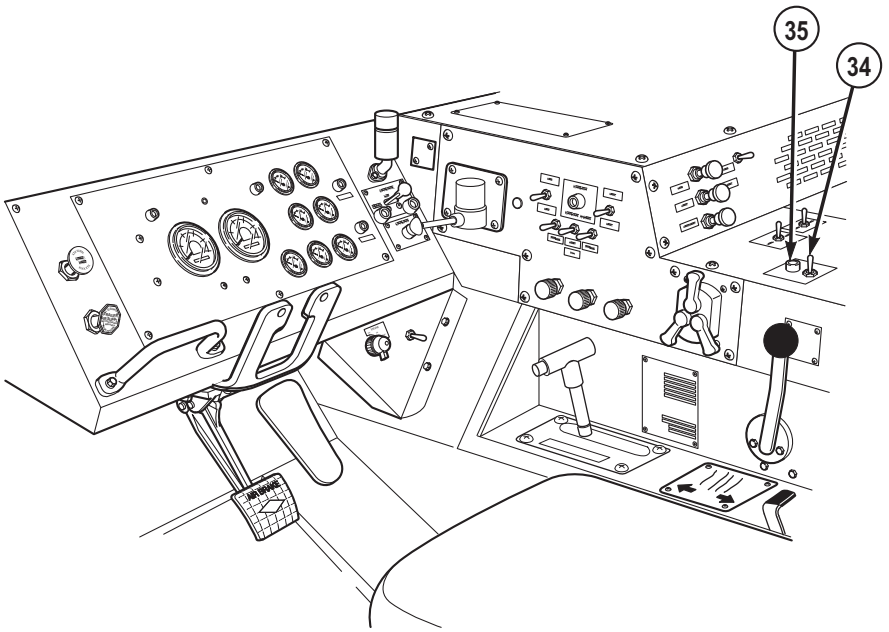


Figure 37.

35. Shut off engine. (WP 0057)
36. Remove and stow portable beacon lights. (WP 0097)
37. Turn off disabled vehicle emergency flashers and unlock steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M966 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

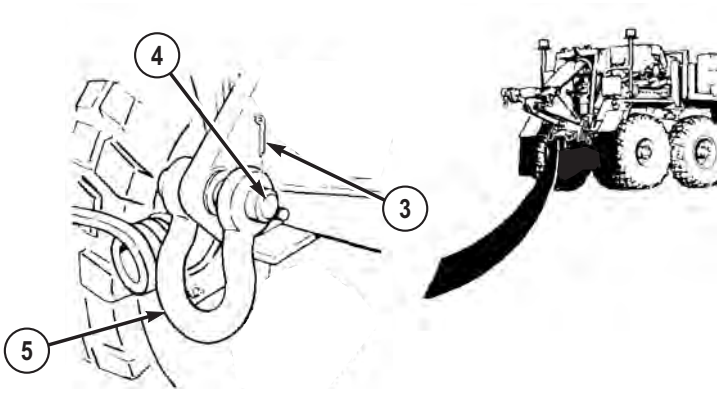


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower crosstube (7) to approximately 3 ft. (91 cm) above ground.

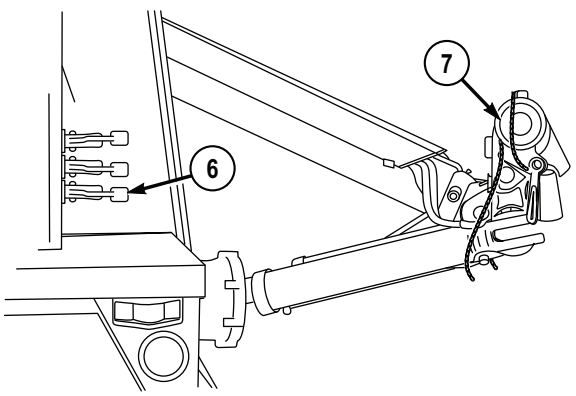


Figure 3.

5. Position wrecker so that crosstube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

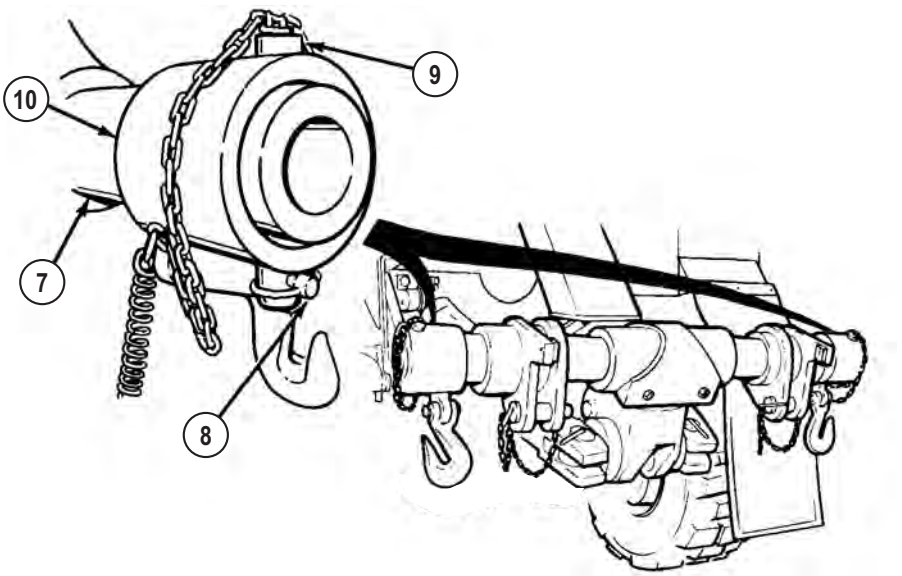


Figure 4.

7. Remove two end caps (10) from crosstube (7).
8. Remove two front adapters (11) from crosstube (7) and place on equipment body floor (12).

HOOKUP - Continued

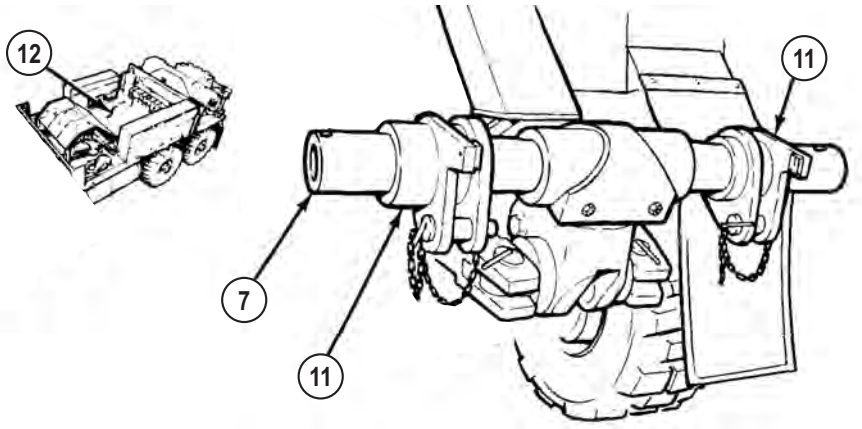


Figure 5.

9. Remove lock handle (13), lock plate (14), and two front tow adapters (15).

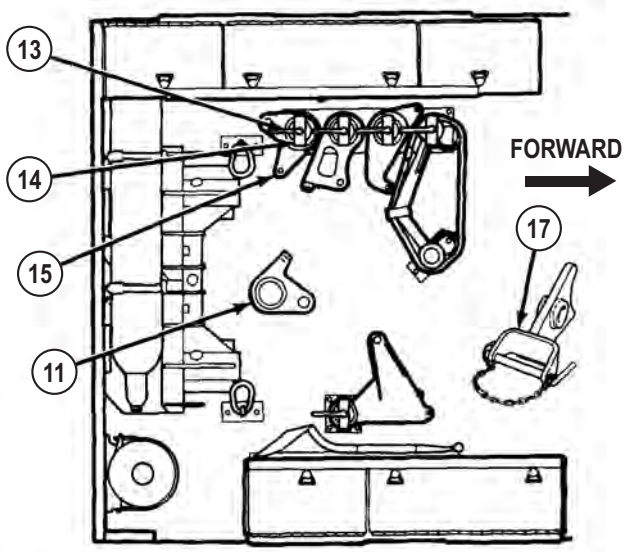


Figure 6.

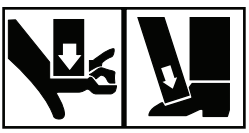
10. Install two adapters (11) removed from crosstube (7), lock plate (14), and lock handle (13).

11. Remove two extensions (17) from stowage.

HOOKUP - Continued

12. Remove two 12 ft. (3.6 m) chains from stowage.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

13. Install two 5 in. (127 mm) spacers (16) on crosstube (7).

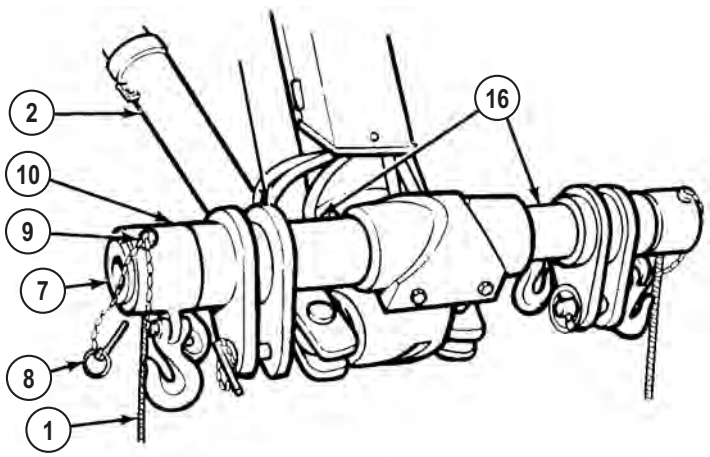


Figure 7.

14. Install two front tow adapters (15) on crosstube (7).
15. Install two end caps (10) on crosstube (7).
16. Install two pins (9) and quick pins (8).
17. Install two springs (1) on tow cylinders (2).
18. Remove two quick pins (18) and pins (19) from adapters (15).

HOOKUP - Continued

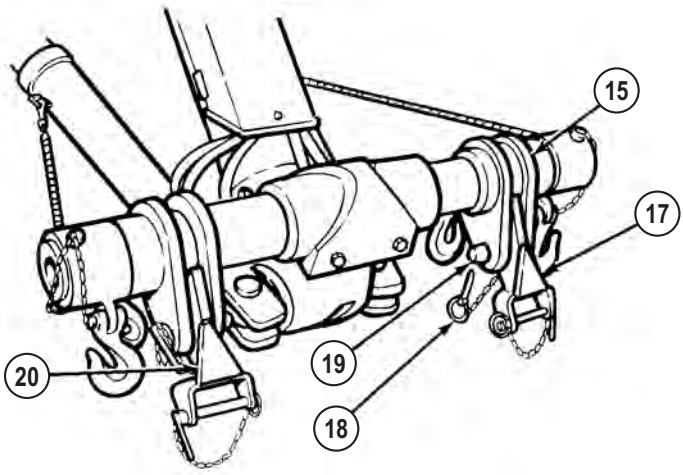


Figure 8.

19. Install two extensions (17) so holes in adapter (15) align with holes in extension and triangular brace (20) is on top.
20. Insert two pins (19) through adapters (15) and extensions (17). Install two quick pins (18) in pins (19).
21. Remove two quick pins (21) and pins (22) from extensions (17).

HOOKUP - Continued

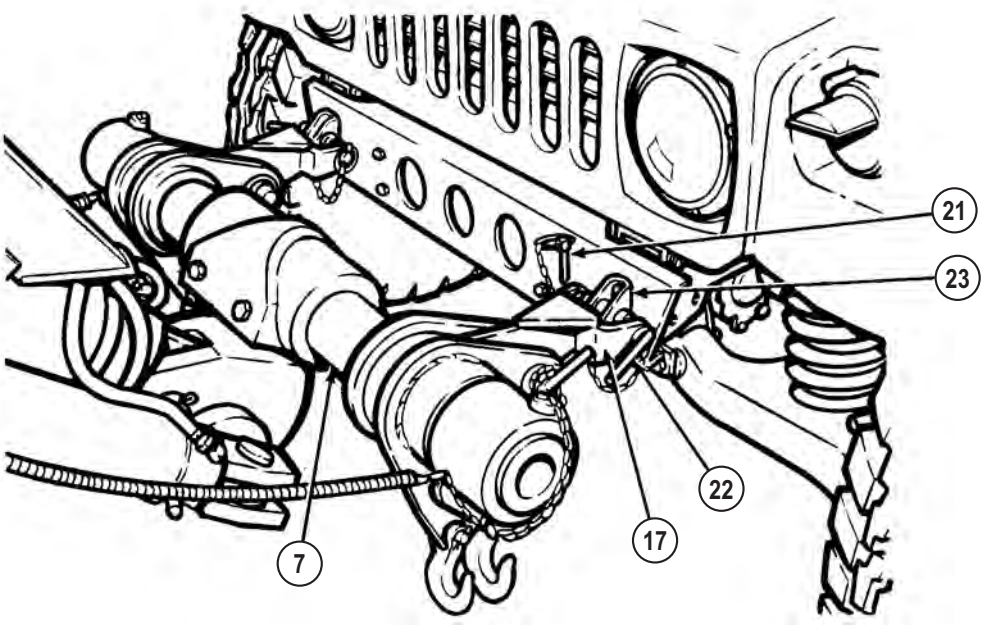


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

22. Operate retrieval system and with the aid of an assistant, position crosstube (7) so holes in extensions (17) align with front tow eyes (23).

23. Insert two pins (22) through extensions (17) and front tow eyes (23). Install two quick pins (21) in pins (22).

HOOKUP - Continued

CAUTION

Do not contact pintle hook with lift cylinder. Equipment damage could occur.

NOTE

Passenger side extension is shown.

24. Lower crosstube (7) until extensions (17) contact bottom edge of front tow eye (23).

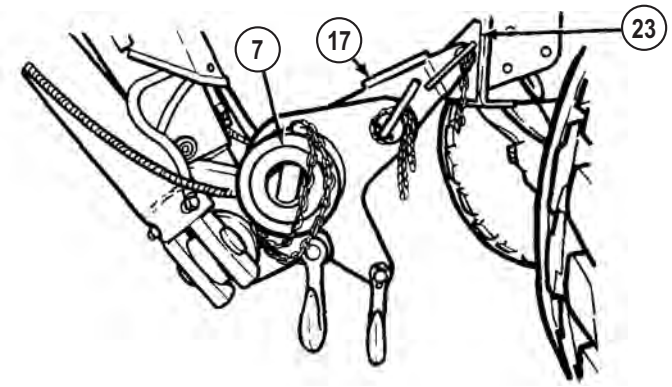


Figure 10.

25. Route one 12 ft. (3.6 m) chain (24) over front arm of A-frame (25) on disabled vehicle.

HOOKUP - Continued

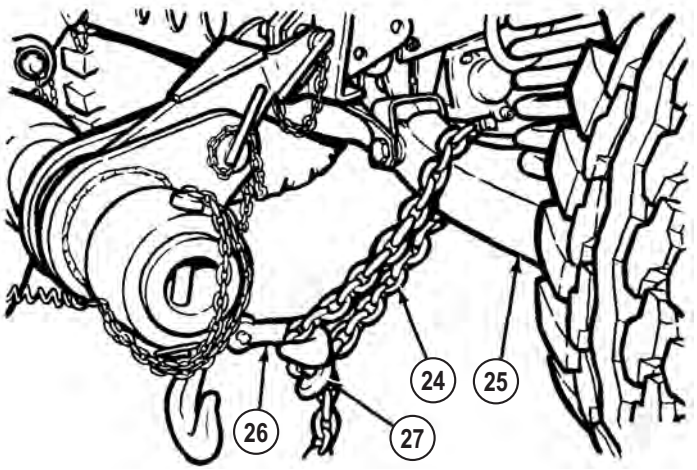


Figure 11.

26. Route 12 ft. (3.6 m) chain (24) through adapter grab hook (26). Pull chain tight and attach grab hook (27) to chain.
27. Repeat Steps (25) and (26) for other side of disabled vehicle.
28. Release PARKING BRAKE on disabled vehicle (refer to M966 operator's manual).
29. Operate retrieval system until tow cylinders (2) are fully retracted.

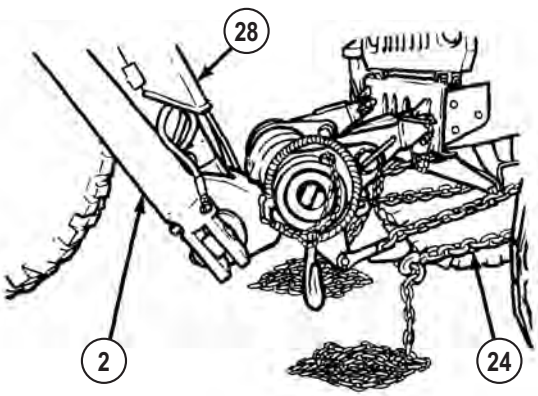


Figure 12.

30. Push in LIFT CYLINDER control lever to retract lift cylinder (28) until slack is removed from 12 ft. (3.6 m) chains (24).

HOOKUP - Continued

NOTE

Adjust chain slack so 12 ft. (3.6 m) chains just touch the ground.

31. Route two 12 ft. (3.6 m) chains (24) through safety chain hoop (29) on wrecker and secure grab hooks (30) with safety shackles (31).

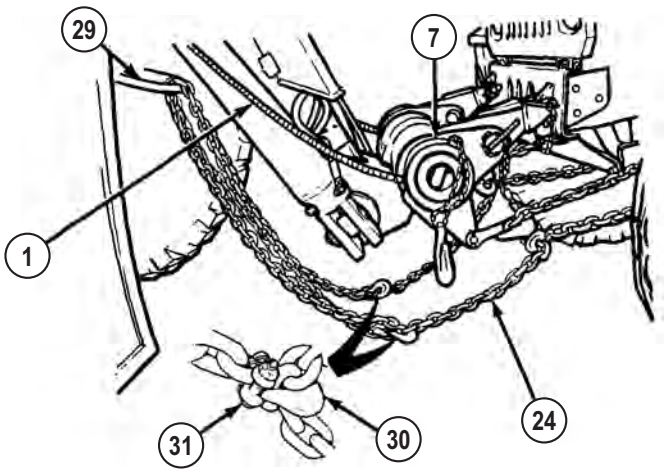


Figure 13.

32. Wrap two springs (1) around crosstube (7) and secure.
33. Prepare disabled vehicle for towing (refer to M966 operator's manual).
34. Remove emergency tow lights (32) and two brackets (33) from stowage.

HOOKUP - Continued

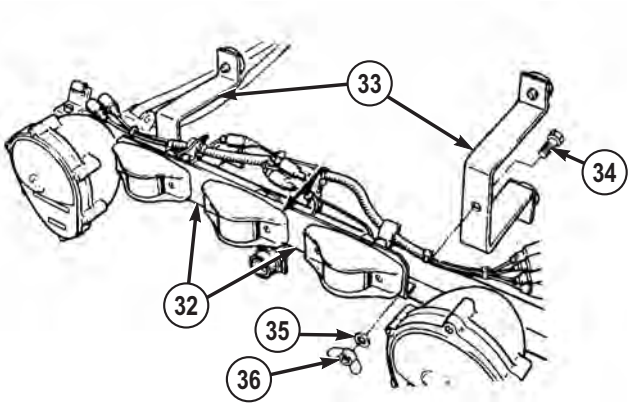


Figure 14.

35. Install two brackets (33) in center holes of emergency tow lights with two screws (34), washers (35), and nuts (36).

36. Install emergency tow lights (32) on rear of M966 and fasten securely with straps (37).

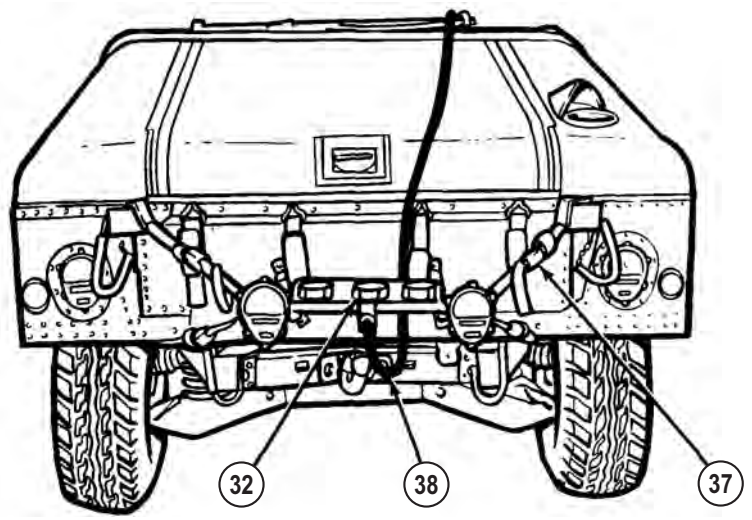


Figure 15.

37. Remove tow light cable (38) from stowage and connect to emergency tow lights (32).

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

38. Route other end of tow light cable (38) along disabled vehicle and connect to rear electrical connector (39) on wrecker.

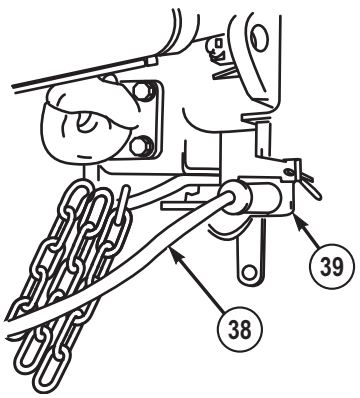


Figure 16.

39. Set POWER switch (40) to ON position.

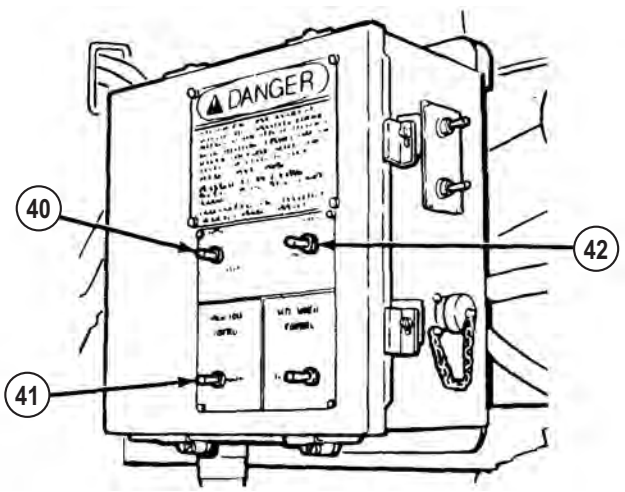


Figure 17.

HOOKUP - Continued

40. Set HIGH IDLE switch (41) to CONTINUOUS.
41. Push and release LATCH switch (42). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

42. Push LIFT CYLINDER control lever (6) to retract lift cylinder (28) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

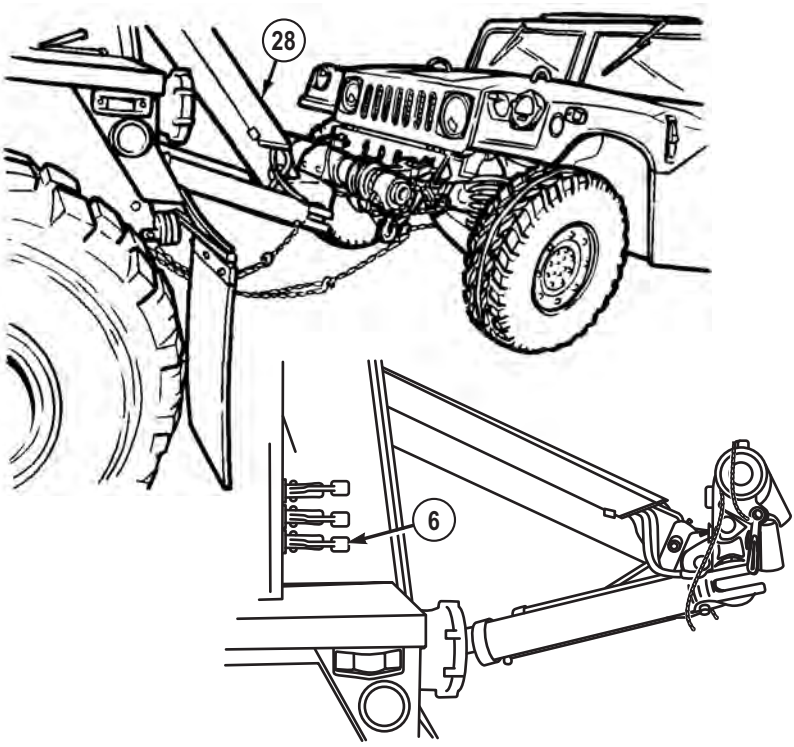


Figure 18.

43. Set POWER switch (40) to OFF position.

HOOKUP - Continued

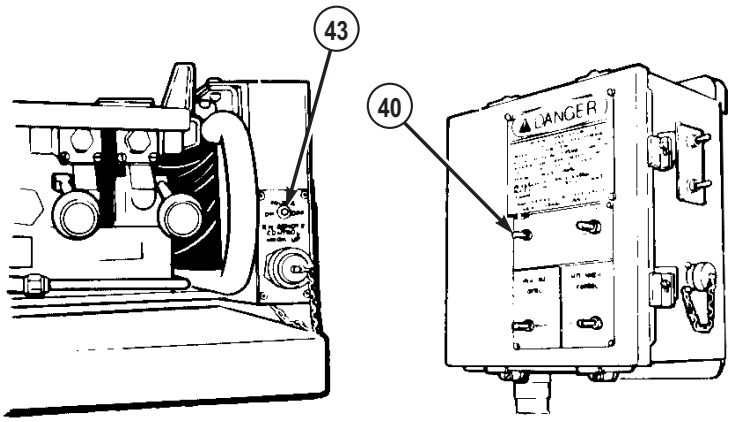


Figure 19.

44. Set POWER switch (43) to OFF position.
45. Set PTO ENGAGE switch (44) to OFF position. Indicator light (45) will go out.

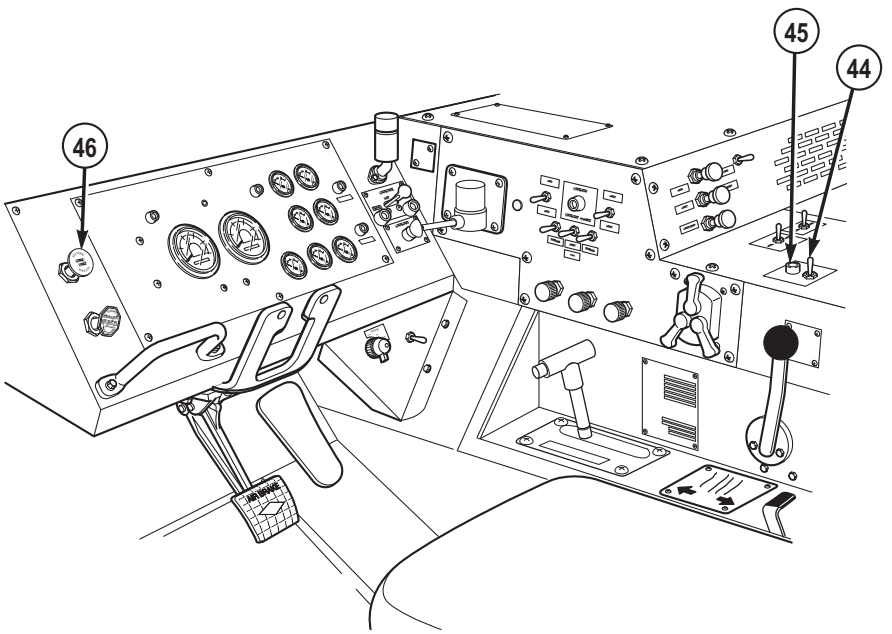


Figure 20.

46. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

47. Turn on wrecker emergency flashers. (WP 0099)
48. Ensure disabled vehicle emergency flashers are turned on (refer to operator's manual).
49. Push in PARKING BRAKE control (46).

NOTE

Dashboard parking brake indicator will go out when PARKING BRAKE control is released.

50. Push in PARKING BRAKE control (46).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

51. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

DISCONNECT - Continued

1. Set transmission range selector (1) to N (neutral).
2. Pull PARKING BRAKE control (2).

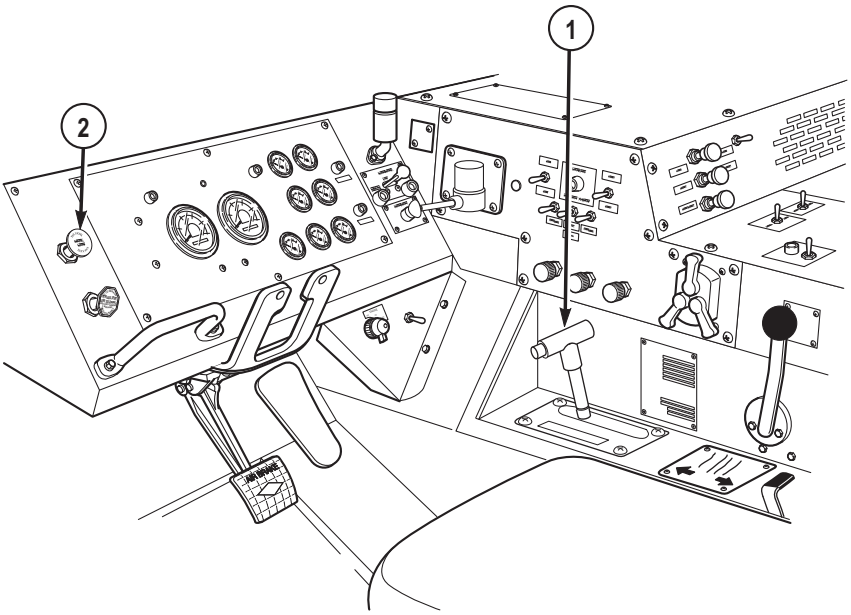


Figure 21.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058)prepare retrieval system for operation, (WP 0059) and lower disabled vehicle to the ground.

DISCONNECT - Continued

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle parking brake is inoperative; install wheel chocks.

4. Set PARKING BRAKE on disabled vehicle (refer to M966 operator's manual).
5. Remove tow light cable (3) from wrecker.

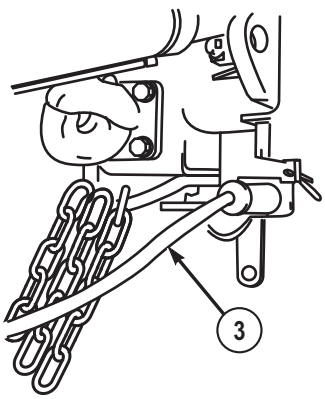


Figure 22.

6. Remove tow light cable (3) from emergency tow lights (4).

DISCONNECT - Continued

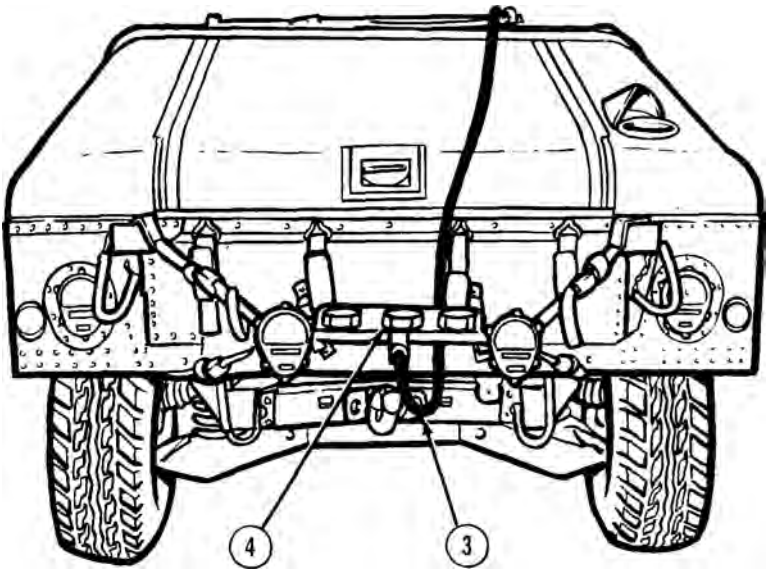


Figure 23.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Stow emergency tow lights and brackets.

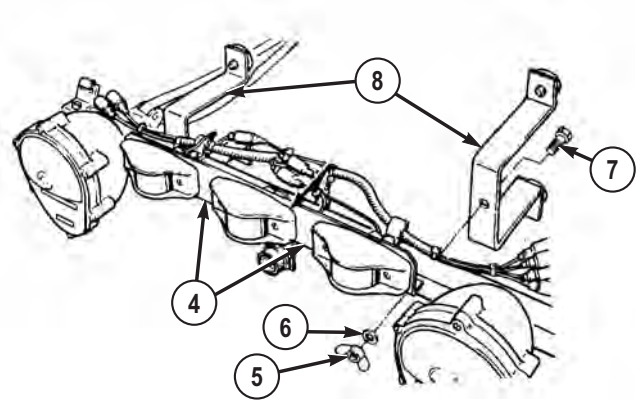


Figure 24.

9. Remove and stow two 12 ft. (3.6 m) chains (9).

DISCONNECT - Continued

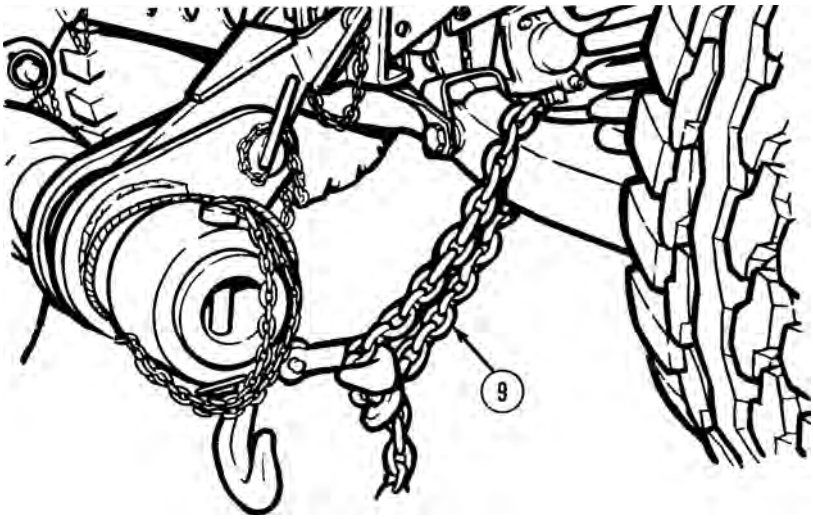


Figure 25.

10. Unwrap two springs (10) from crosstube (11) and connect to tow cylinders (12).

DISCONNECT - Continued

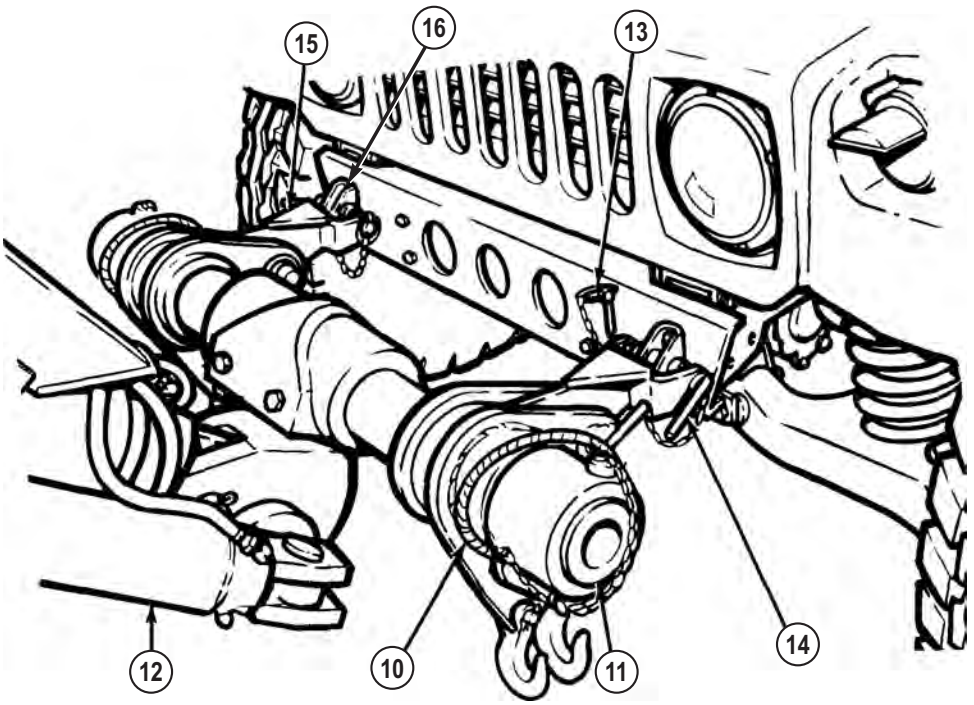
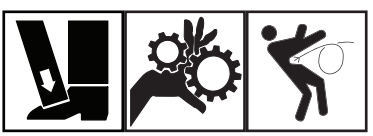


Figure 26.

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position crosstube to relieve tension from adapters.

11. Remove two quick pins (13) and pins (14) from extensions (15).

DISCONNECT - Continued

12. Remove two extensions (15) from tow eyes (16) on disabled vehicle.
13. Install two pins (14) in extensions (15).
14. Install two quick pins (13) in pins (14).
15. Drive wrecker forward several feet (WP 0050) and park. (WP 0056)
16. Remove two quick pins (17) and pin (18) from adapter (19).

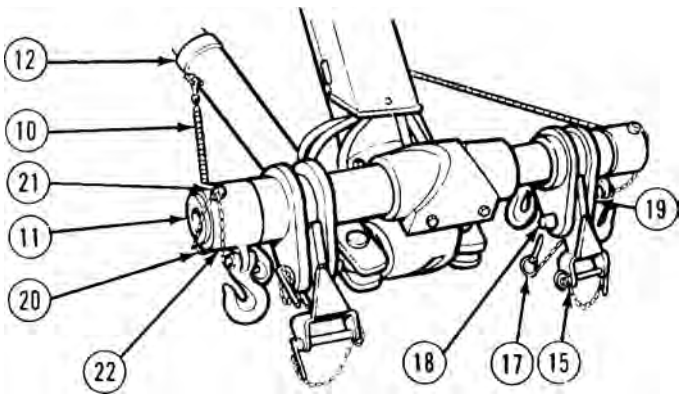


Figure 27.

17. Remove extensions (15) from adapters (19) and stow.
18. Install two pins (18) in adapters (19).
19. Install two quick pins (17) in pins (18).

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

20. Remove two springs (10) from tow cylinders (12).
21. Remove two quick pins (20) and pins (21) from end caps (22).
22. Remove two end caps (22) from crosstube (11).

DISCONNECT - Continued

23. Remove two adapters (19) from crosstube (11) and place on equipment body floor (23).

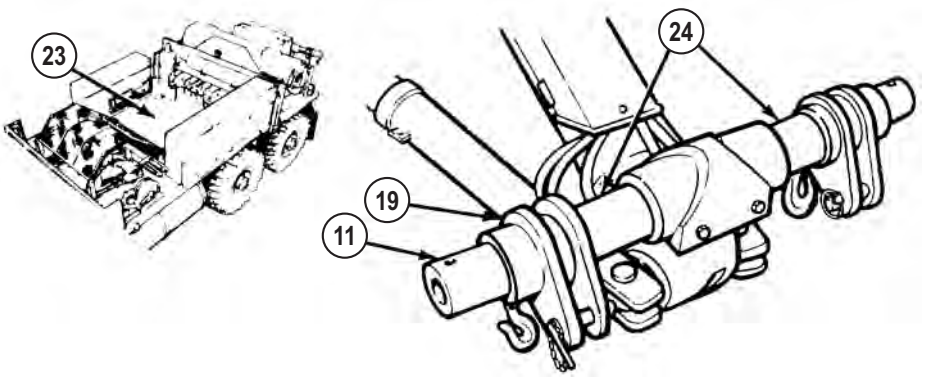


Figure 28.

24. Remove and stow two 5 in. (127 mm) spacers (24) from crosstube (11).
25. Remove lock handle (25), lock plate (26), and front adapters (27).

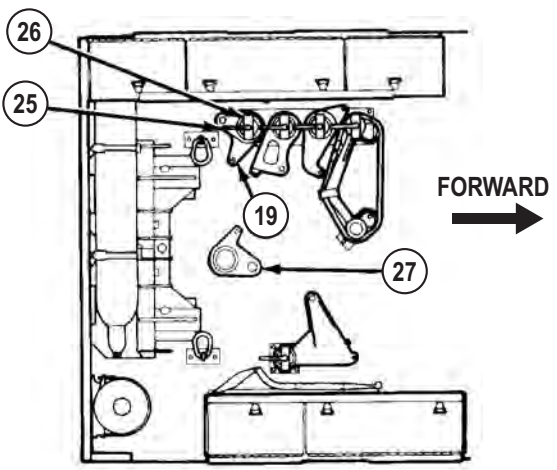


Figure 29.

26. Install two adapters (19) removed from crosstube, lock plate (26), and lock handles (25).

DISCONNECT - Continued

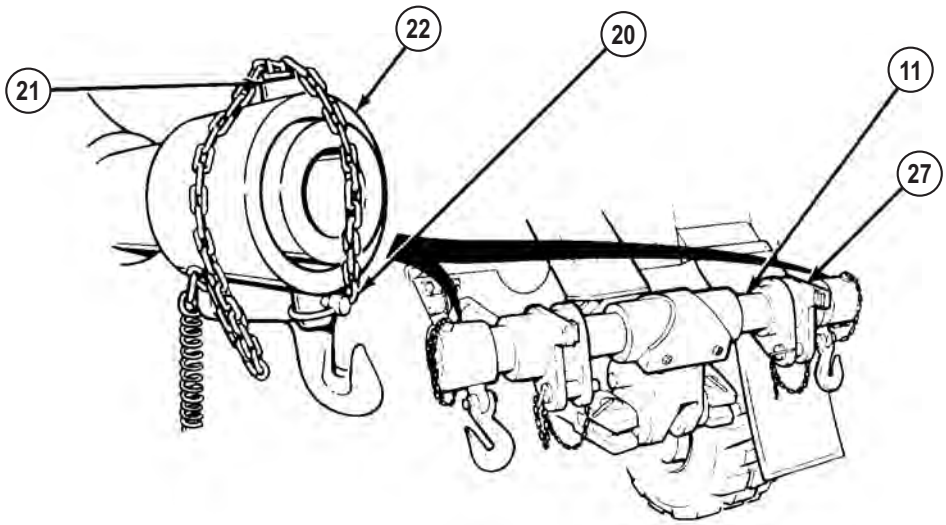


Figure 30.

27. Install two front adapters (27) on crosstube (11).
28. Install two end caps (22) on crosstube (11). Install two pins (21) and quick pins (20).
29. Install two springs (10) on tow cylinders (12).

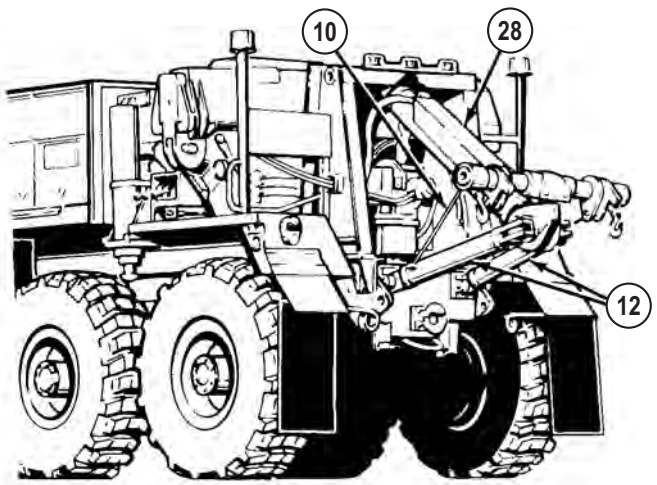


Figure 31.

DISCONNECT - Continued

30. Operate retrieval system (WP 0059) and fully retract lift cylinder (28) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

31. Install two towing shackles (29), pins (30), and cotter pins (31).

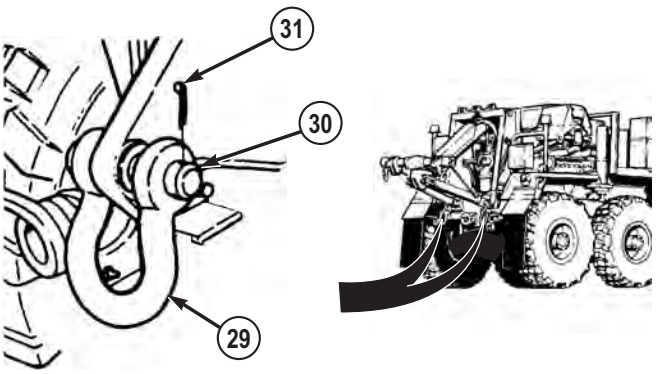


Figure 32.

32. Set POWER switch (32) to OFF position.

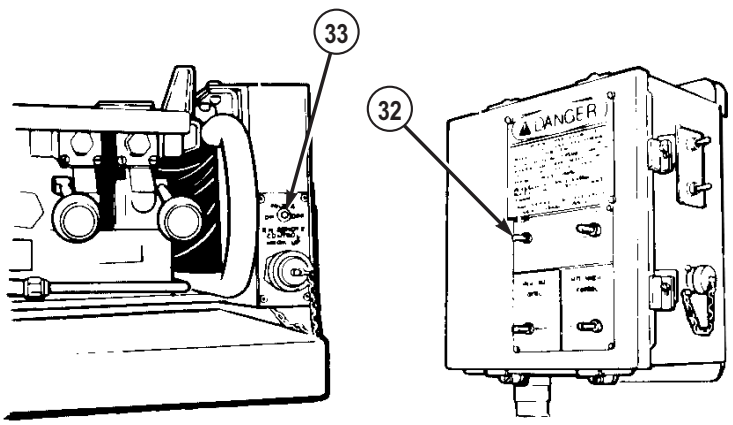


Figure 33.

33. Set POWER switch (33) to OFF position.

DISCONNECT - Continued

34. Turn off wrecker emergency flashers. (WP 0099)
35. Turn off wrecker service drive lights. (WP 0090)
36. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

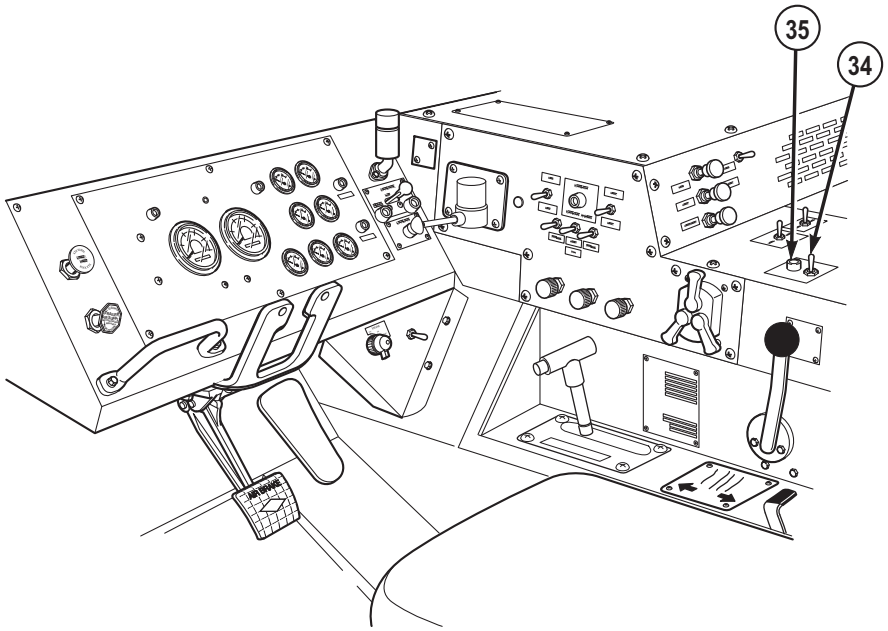


Figure 34.

37. Remove and stow portable beacon light. (WP 0097)
38. Shut off engine. (WP 0057)
39. Turn off disabled vehicle emergency flashers (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1008 - FRONT LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

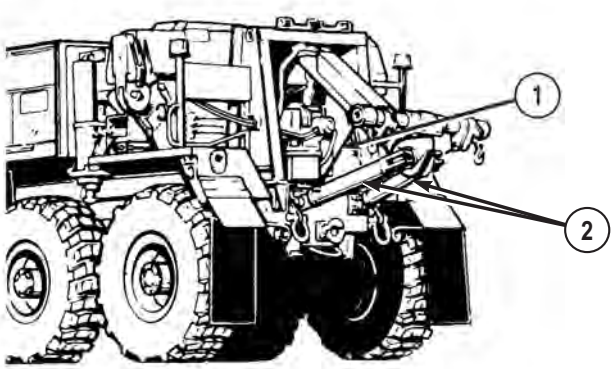


Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

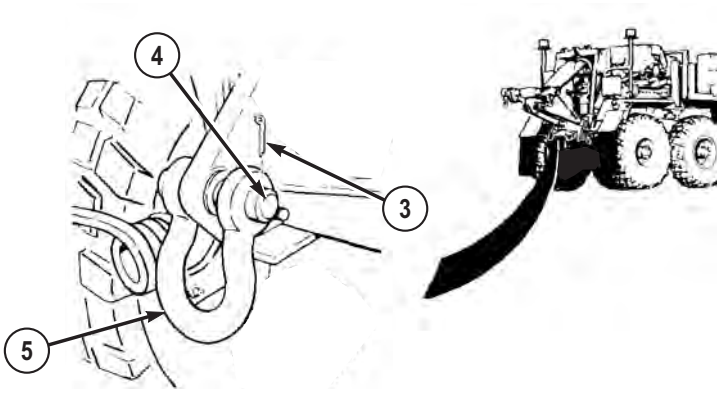


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

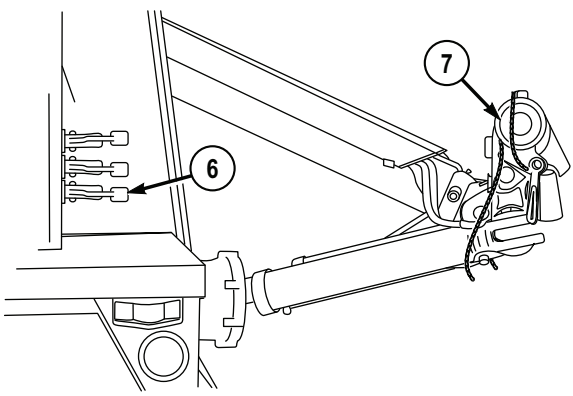


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

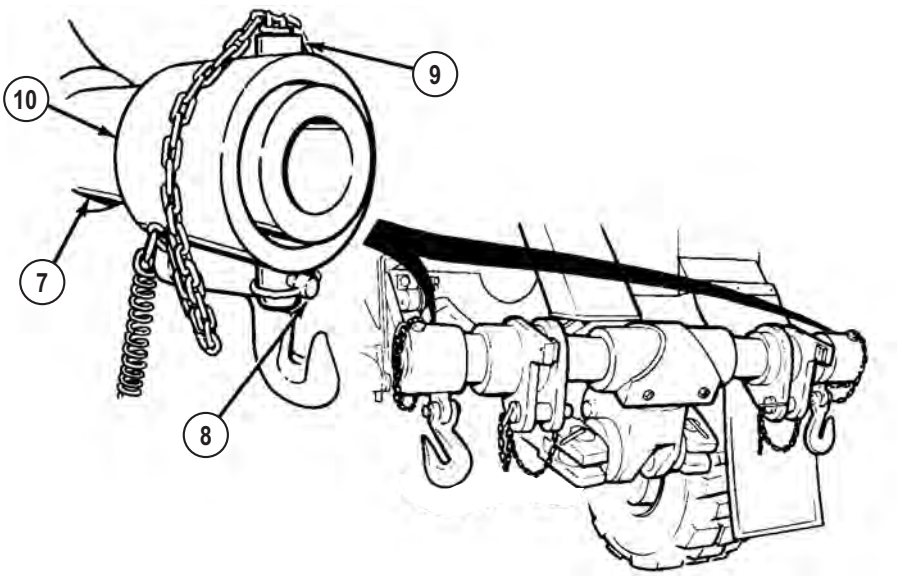


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two adapters (11) from cross tube (7) and body floor (12).

HOOKUP - Continued

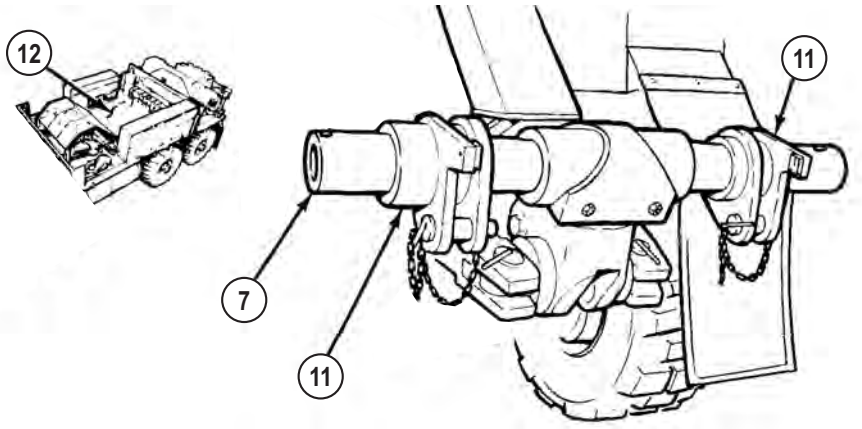


Figure 5.

9. Remove lock handle (13), lock plate (14), and two front tow adapters (15).

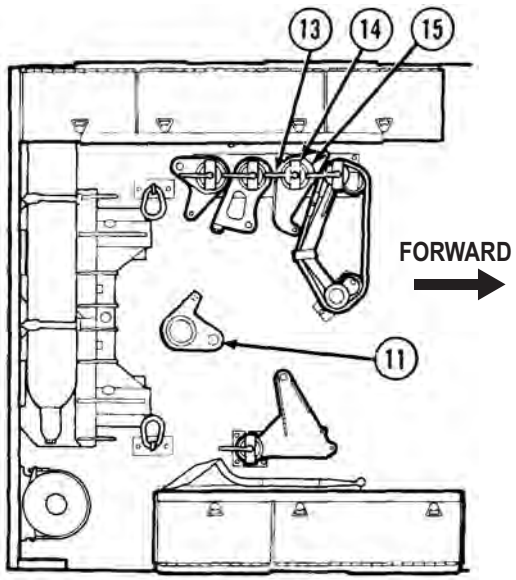


Figure 6.

10. Install two front adapters (11) removed from cross tube, lock plate (14), and lock handle (13).

HOOKUP - Continued

11. Remove two 5 in. (127 mm) spacers and two 12 ft. (3.6 m) tow chains from stowage.
12. Install two 5 in. (127 mm) spacers (16) on cross tube (7).

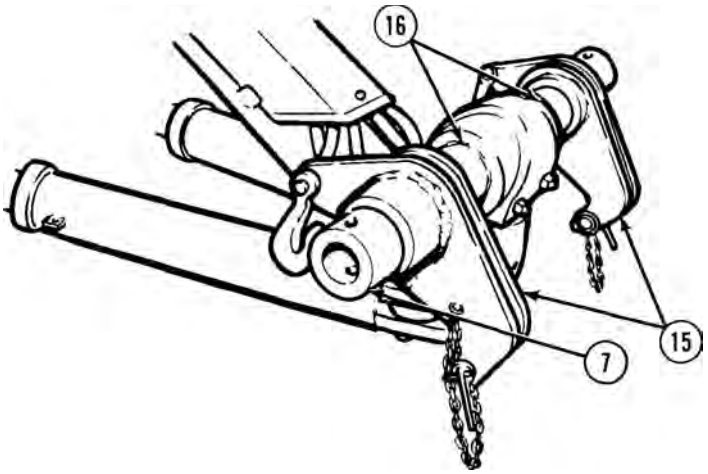
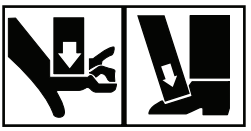


Figure 7.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

13. Install two front tow adapters (15) on cross tube (7).
14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

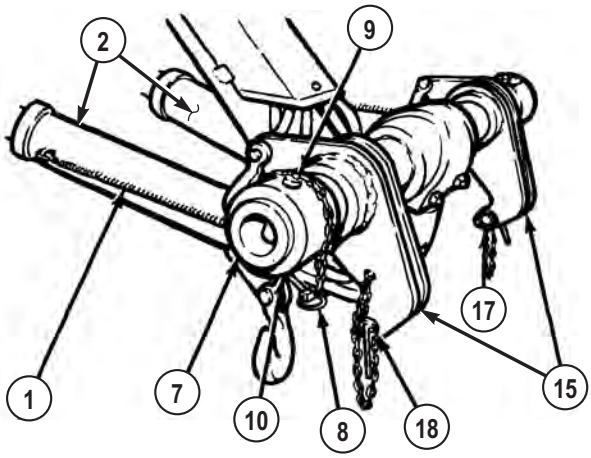


Figure 8.

15. Install two pins (9) and quick pins (8).
16. Attach two springs (1) on tow cylinders (2).
17. Remove two quick pins (17) and pin (18) from adapters (15).

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

CAUTION

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle. Failure to comply may result in damage to equipment.

18. Operate retrieval system, (WP 0059) and with aid of an assistant, position cross tube (7) so holes in adapters (15) align with front tow eyes (19).

HOOKUP - Continued

CAUTION

Do not route pin chains between adapters and front bumper or damage to chains may result.

19. Insert two pins (13) through adapters (15) and front tow eyes (19). Install two quick pins (17) in pins (18).
20. Release PARKING BRAKE, and place transmission in neutral on disabled vehicle (refer to M1008 operator's manual).

CAUTION

Do not contact pintle hook with lift cylinder. Failure to comply may result in damage to equipment.

21. Operate retrieval system (WP 0059) to lower adapters (15) under front bumper (20) and up against front springs (21).

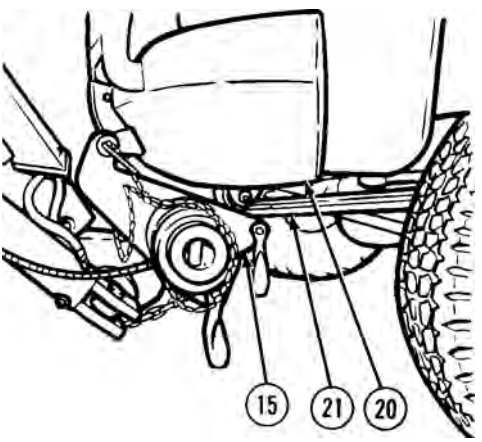


Figure 9.

22. Set PARKING BRAKE, and place transmission in PARK on disabled vehicle (refer to M1008 operator's manual).
23. Remove two 12 ft. (3.6 m) tow chains (22) from stowage.

HOOKUP - Continued

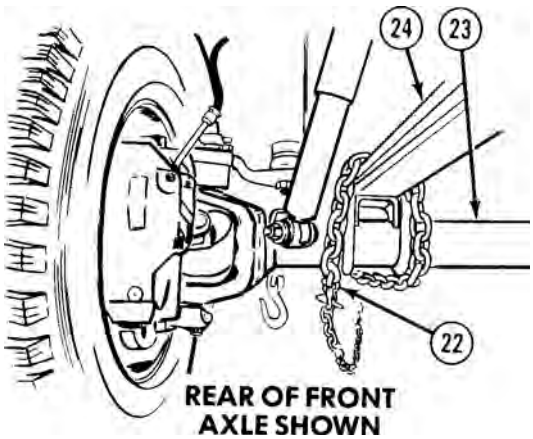


Figure 10.

24. Route one 12 ft. (3.6 m) tow chain (22) behind front axle (23) and loop over leaf spring (24) on disabled vehicle.
25. Route 12 ft. (3.6 m) tow chain (22) through adapter grab hook (25).

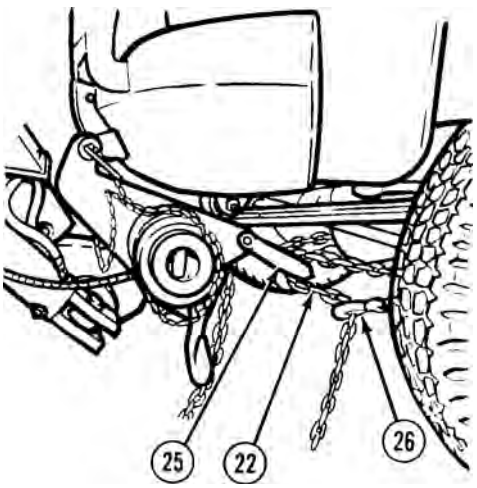


Figure 11.

26. Pull 12 ft. (3.6 m) tow chain (22) tight, and attach grab hook (26) to 12 ft. (3.6 m) tow chain (22) near adapter grab hook (25).
27. Repeat Steps (23) through (26) for other side of disabled vehicle.

HOOKUP - Continued

28. Release PARKING BRAKE and place transmission in neutral on disabled vehicle (refer to M1008 operator's manual).

CAUTION

Do not contact pintle hook with lift cylinder. Failure to comply may result in damage to equipment.

29. Operate retrieval system (WP 0059) until lift cylinder (27) is approximately 1 in. (25 mm) from pintle hook (28).

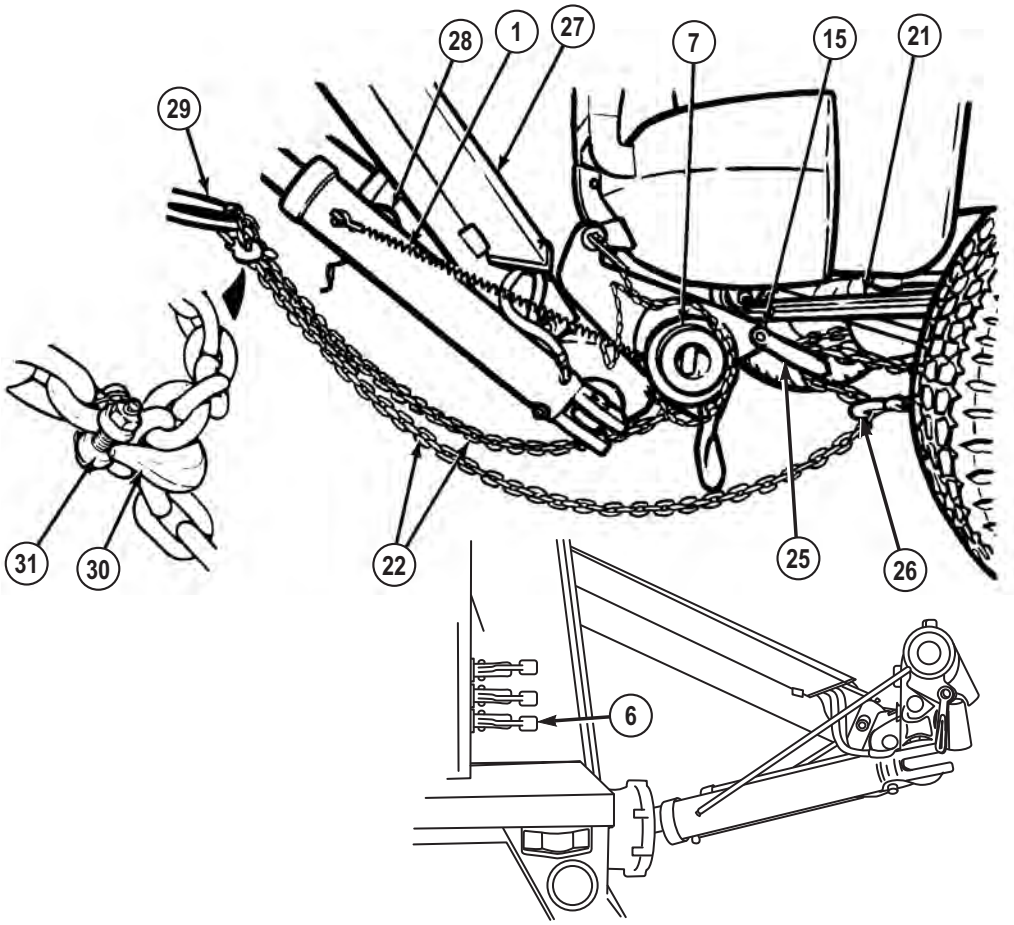


Figure 12.

HOOKUP - Continued

30. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (27) until adapters (15) are against front springs (21).

NOTE

- Safety chains can be routed to towing shackles or safety chain hoop. Towing shackles can be used only after tow cylinders are extended.
- Adjust chain slack so safety chains just touch the ground.
- Tow chains will act as safety chains when connected to wrecker.

31. Route 12 ft. (3.6 m) tow chains (22) through safety chain hoop (29) and secure grab hooks (30) with safety shackle (31).
32. Wrap two springs (1) around cross tube (7) and secure.
33. Prepare disabled vehicle for towing (refer to M1008 operator's manual).
34. Remove emergency tow lights (32) and two brackets (33) from stowage.

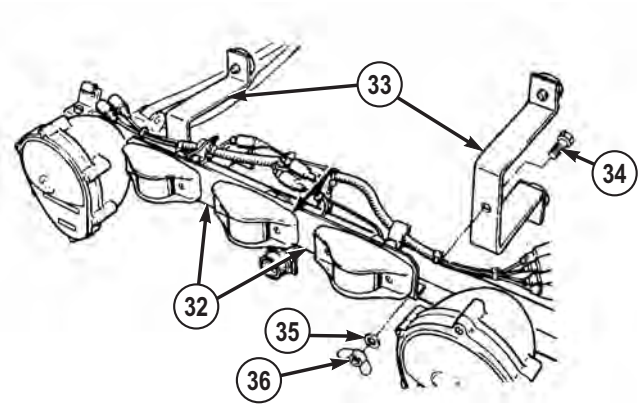


Figure 13.

35. Install two brackets (33) in center holes of emergency tow lights with two screws (34), washers (35), and nuts (36).
36. Install emergency tow lights (32) on rear of M1008 and fasten securely with straps (37).

HOOKUP - Continued

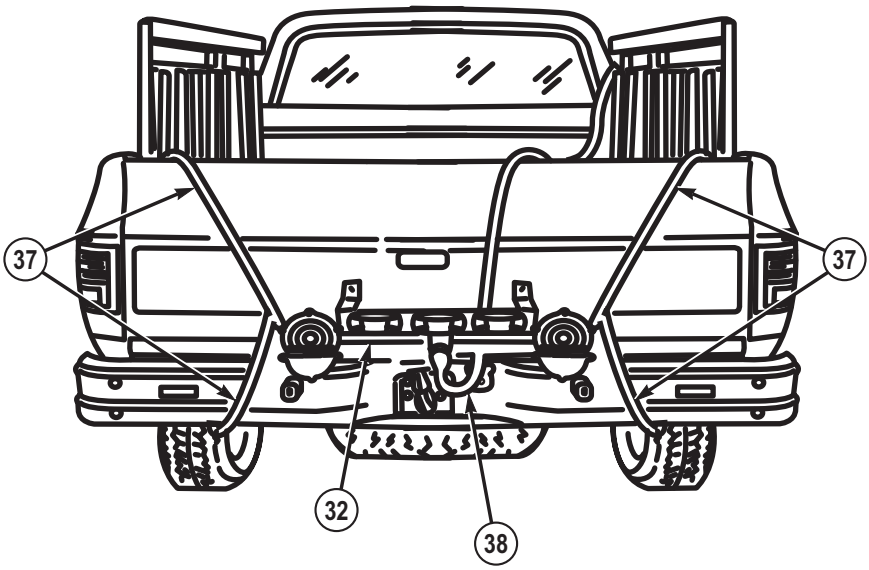


Figure 14.

37. Remove tow light cable (38) from stowage and connect to emergency tow lights (32).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

38. Route other end of tow light cable (38) along disabled vehicle and connect to rear electrical connector (39) on wrecker.

HOOKUP - Continued

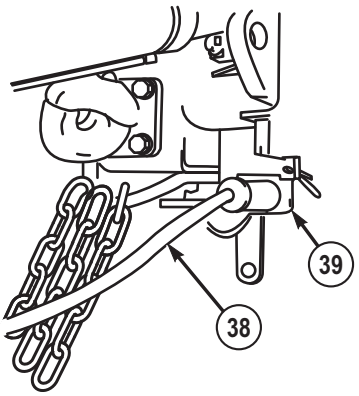


Figure 15.

39. Lock disabled vehicle's steering (refer to M1008 operator's manual).
40. Set POWER switch (40) to ON position.

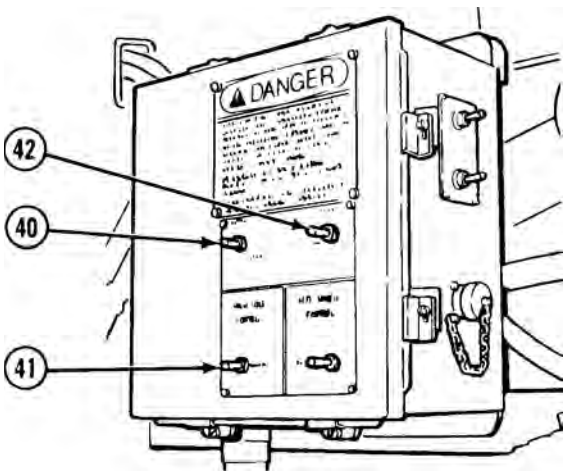


Figure 16.

41. Set HIGH IDLE switch (41) to CONTINUOUS.
42. Push and release LATCH switch (42). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

43. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (27) until disabled vehicle is approximately 1 ft. (30 cm) above ground.

HOOKUP - Continued

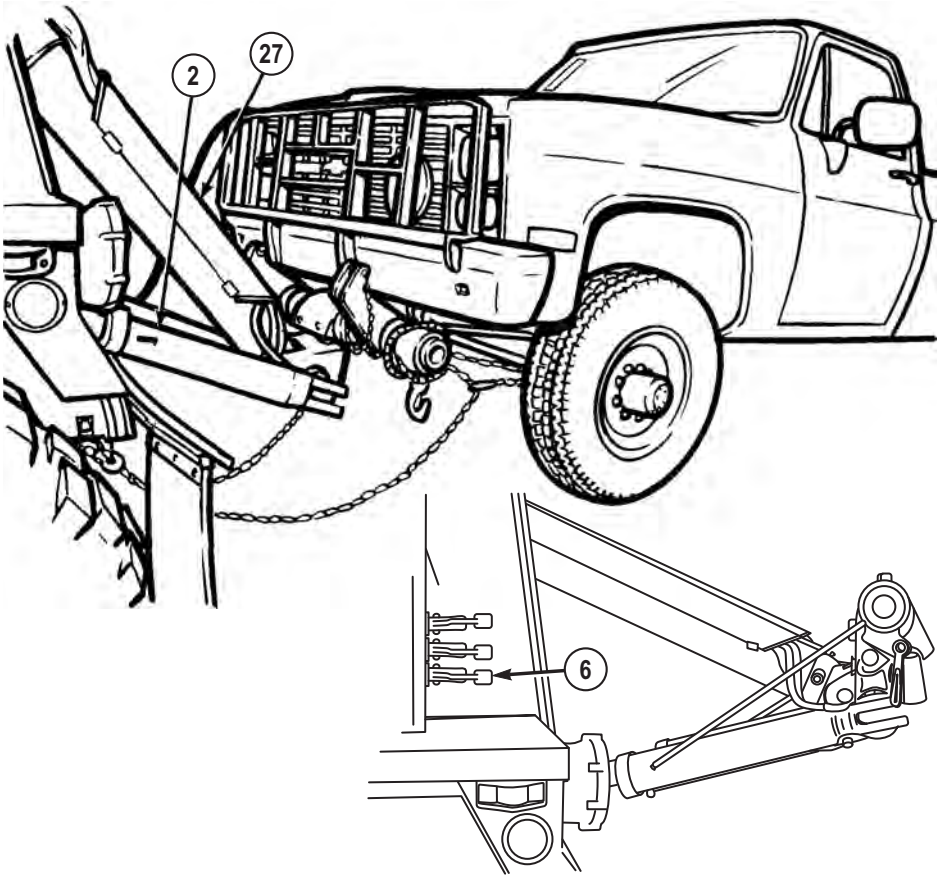


Figure 17.

44. Operate retrieval system (WP 0059) to retract lift cylinder (27) until tow cylinders (2) are fully retracted and vehicle is approximately 1 ft. (30 cm) above ground.

45. Set POWER switch (40) to OFF position.

HOOKUP - Continued

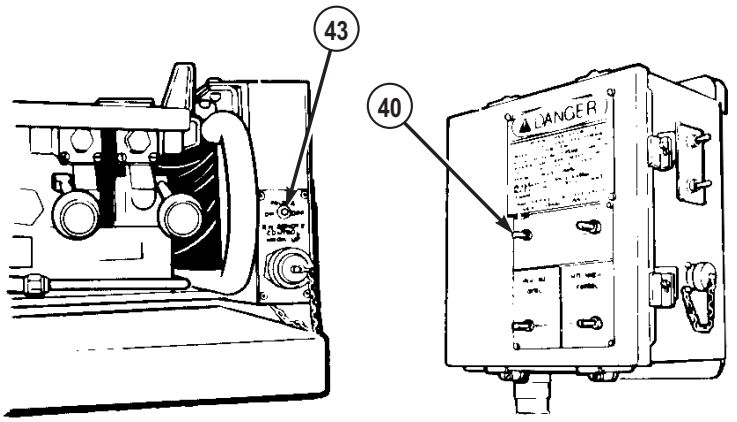


Figure 18.

46. Set POWER switch (43) to OFF position.
47. Set PTO ENGAGE switch (44) to OFF position. Indicator light (45) will go out.

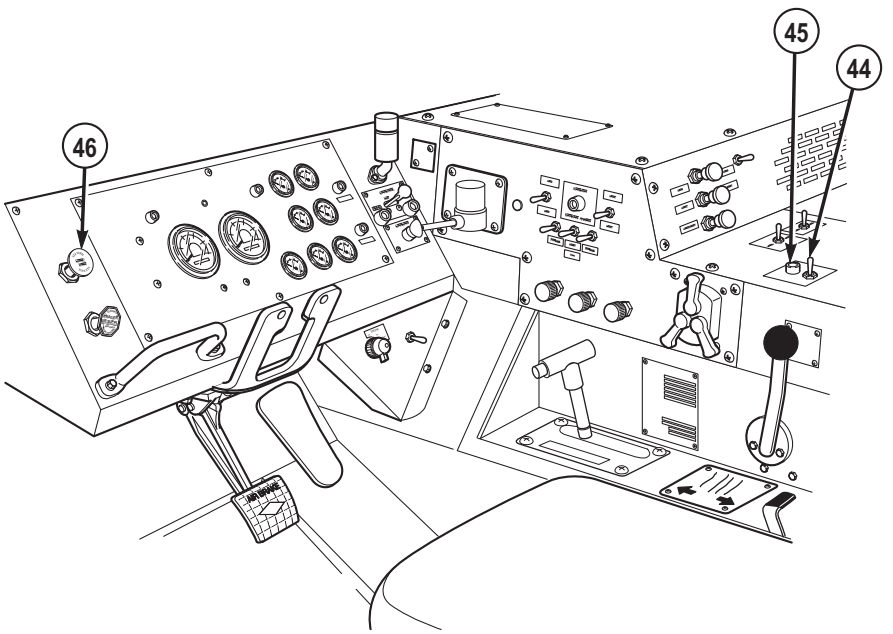


Figure 19.

48. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

49. Turn on wrecker emergency flashers. (WP 0099)
50. Make sure disabled vehicle emergency flashers are turned on (refer to operator's manual).
51. Push in PARKING BRAKE control (44).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

52. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).
2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

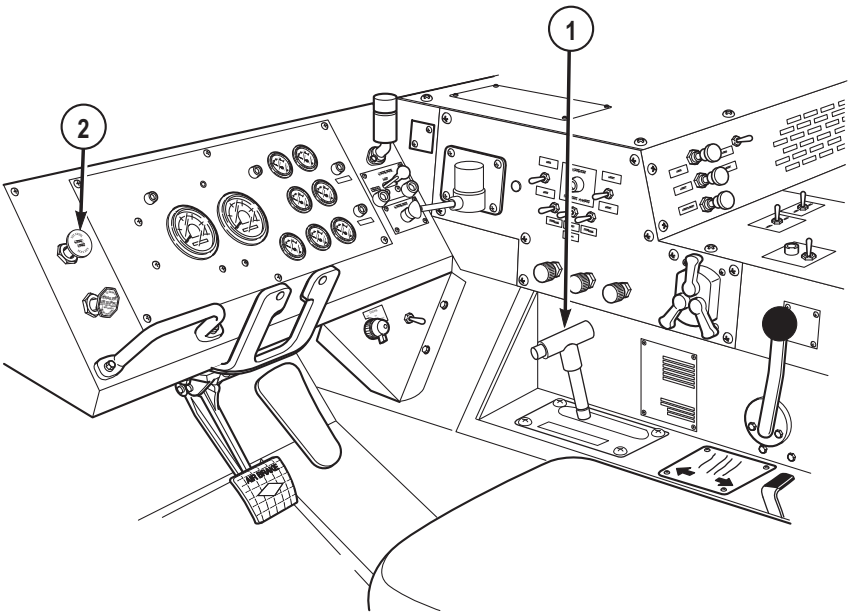


Figure 20.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

3. Remove safety chains (3) from safety chain hoop (4) or towing shackles.

DISCONNECT - Continued

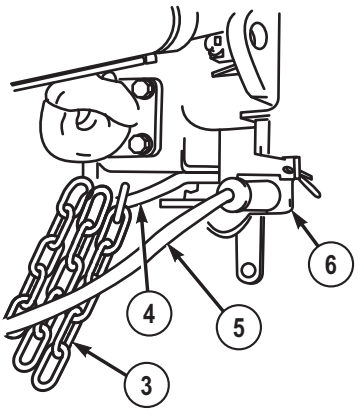


Figure 21.

4. Remove tow light cable (5) from electrical connector (6).

CAUTION

Any cargo in cargo bed must be tied down before doing Steps (5) through (7), or cargo may be damaged.

NOTE

High idle must be engaged when lowering disabled vehicle.

5. Prepare retrieval system for operation (WP 0059) and retract lift cylinder until tow cylinders are even with ground.

NOTE

Tow cylinders should remain parallel with ground during Step (6).

6. Operate retrieval system (WP 0059) until tow cylinders are extended approximately 10 in. (25 cm).

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

Do not contact pintle hook with lift cylinder. Failure to comply may result in damage to equipment.

7. Prepare retrieval system for operation, and lower disabled vehicle to ground (WP 0059) until safety chains at front axle are slack.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle parking brake is inoperative, chock wheels.

8. Apply PARKING BRAKE, and place transmission in PARK on disabled vehicle (refer to M1008 operator’s manual).
9. Remove tow light cable (5) from emergency tow lights (7) and return to wrecker stowage.

DISCONNECT - Continued

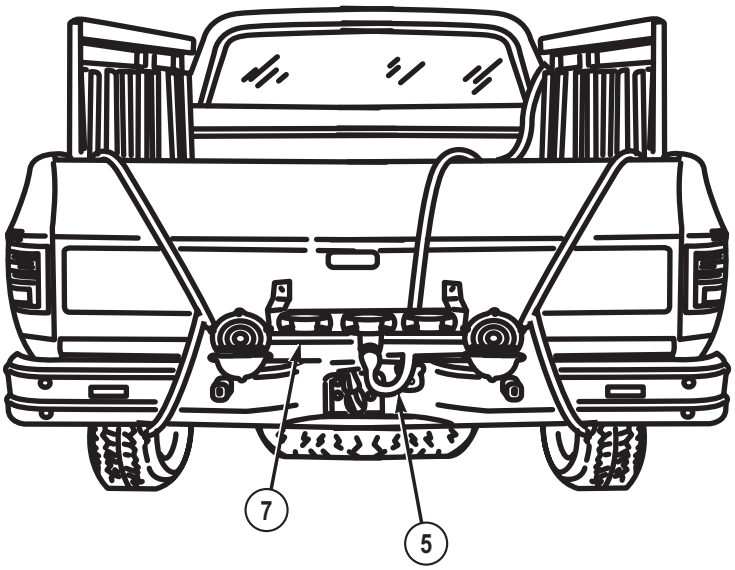


Figure 22.

10. Remove emergency tow lights (7) from disabled vehicle
11. Remove two nuts (8), washers (9), screws (10), and brackets (11) from emergency tow lights (7).

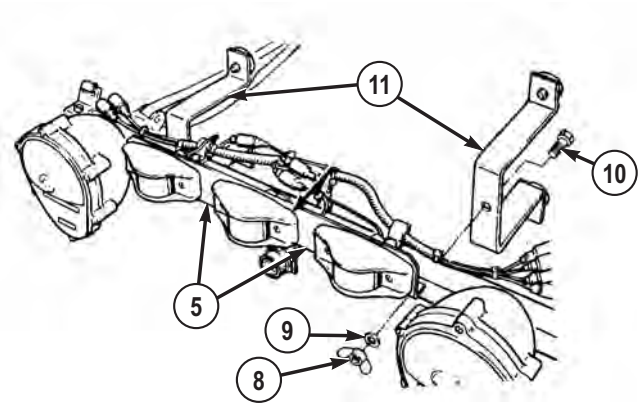


Figure 23.

12. Stow emergency tow lights and brackets.

DISCONNECT - Continued

13. Remove and stow two 12 ft. (3.6 m) tow chains (12).

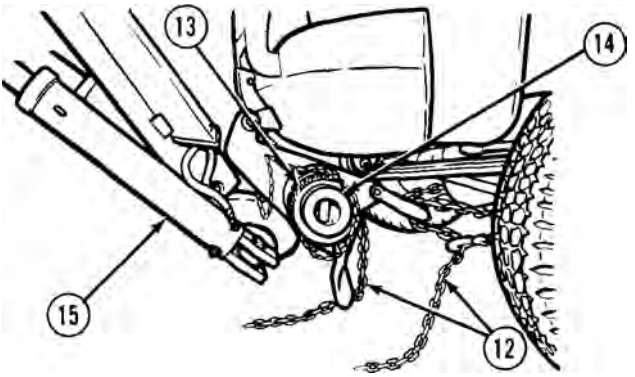
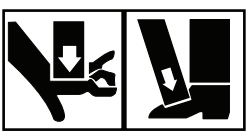


Figure 24.

14. Unwrap two springs (13) from cross tube (14) and connect to tow cylinders (15).

WARNING



Do not allow adapters to swing around. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

15. Remove two quick pins (16) and pins (17) from adapters (18).

DISCONNECT - Continued

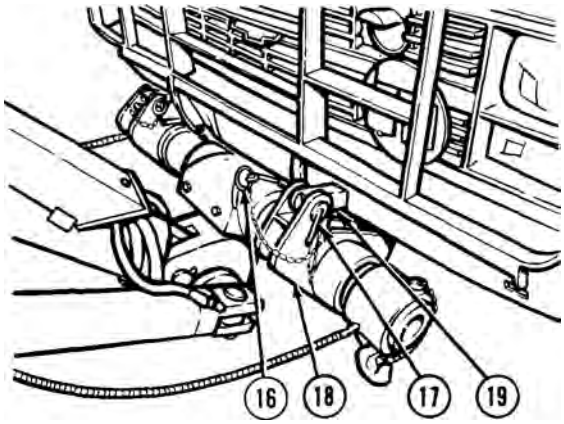


Figure 25.

16. Remove two adapters (18) from tow eyes (19) on disabled vehicle.
17. Install two pins (17) in adapters (18).
18. Install two quick pins (16) in pins (17).
19. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

20. Remove two springs (13) from tow cylinders (15).

DISCONNECT - Continued

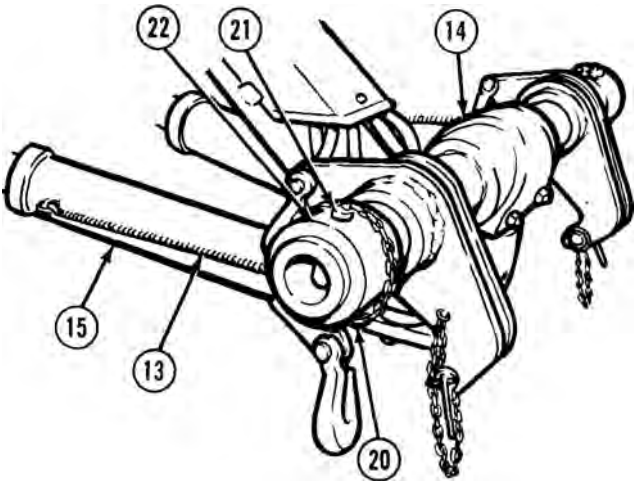


Figure 26.

21. Remove two quick pins (20) and pin (21) from end caps (22).
22. Remove two end caps (22) from cross tube (14).
23. Remove two adapters (18) from cross tube (14) and place on equipment body floor (23).

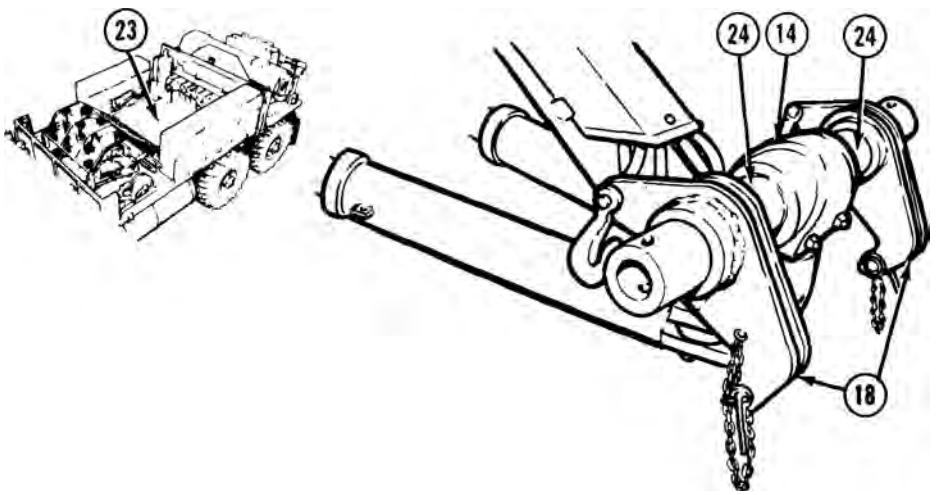


Figure 27.

DISCONNECT - Continued

24. Remove two 5 in. (127 mm) spacers (24) from cross tube (14) and stow.
25. Remove lock handle (25), lock plate (26), and two front adapters (27).

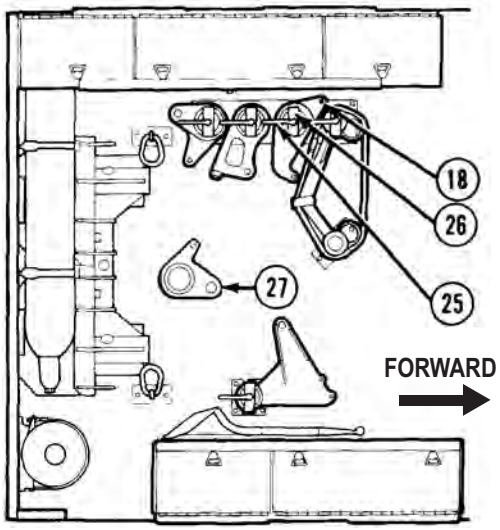


Figure 28.

26. Install two adapters (18), lock plate (26), and lock handles (25).
27. Install two front adapters (27) on cross tube (14).

DISCONNECT - Continued

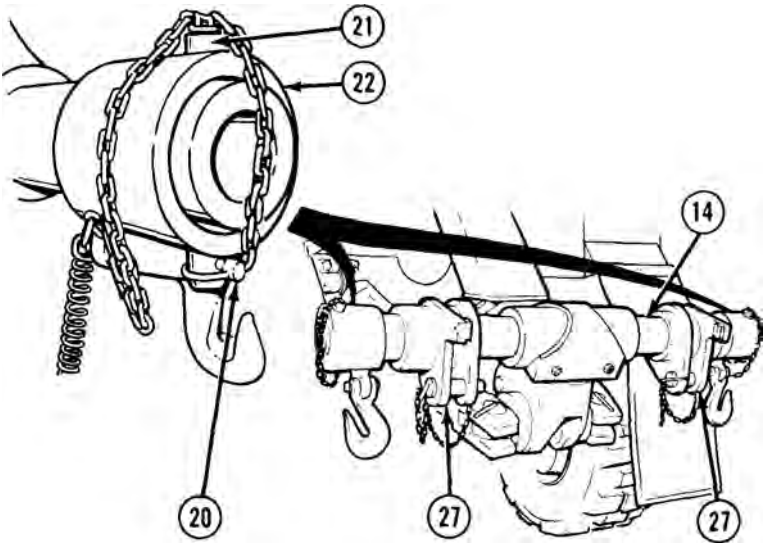


Figure 29.

28. Install two end caps (22) on cross tube (14). Install two pins (21) and quick pins (20).
29. Install two springs (13) on tow cylinders (15).

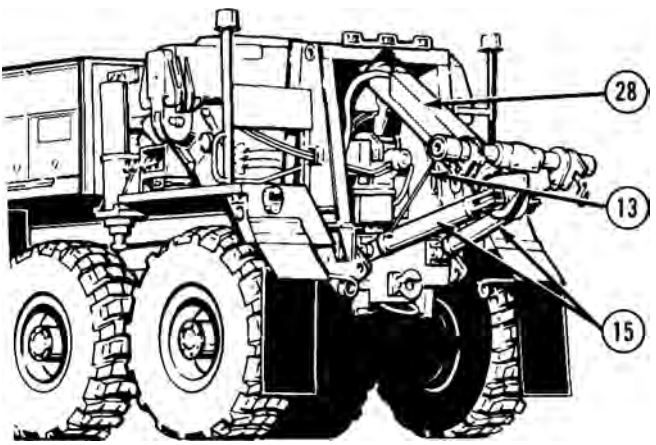


Figure 30.

30. Operate retrieval system (WP 0059) and fully retract lift cylinder (28) and tow cylinders (15).

DISCONNECT - Continued

NOTE

Driver side and passenger side towing shackles are installed the same way.

31. Install two rear towing shackles (29), pins (30), and cotter pins (31).

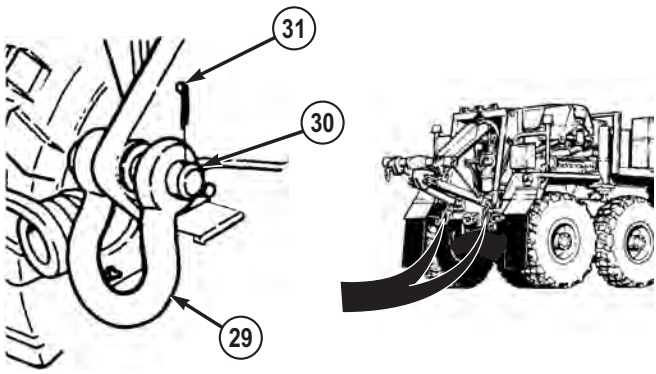


Figure 31.

32. Set POWER switch (32) to OFF position.

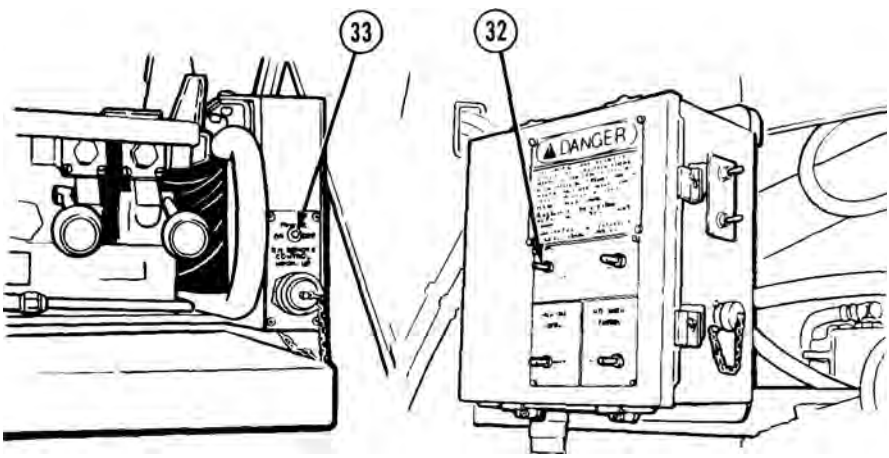


Figure 32.

33. Set POWER switch (33) to OFF position.
34. Turn off wrecker emergency flashers. (WP 0099)

DISCONNECT - Continued

35. Turn off wrecker service drive lights. (WP 0090)
36. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

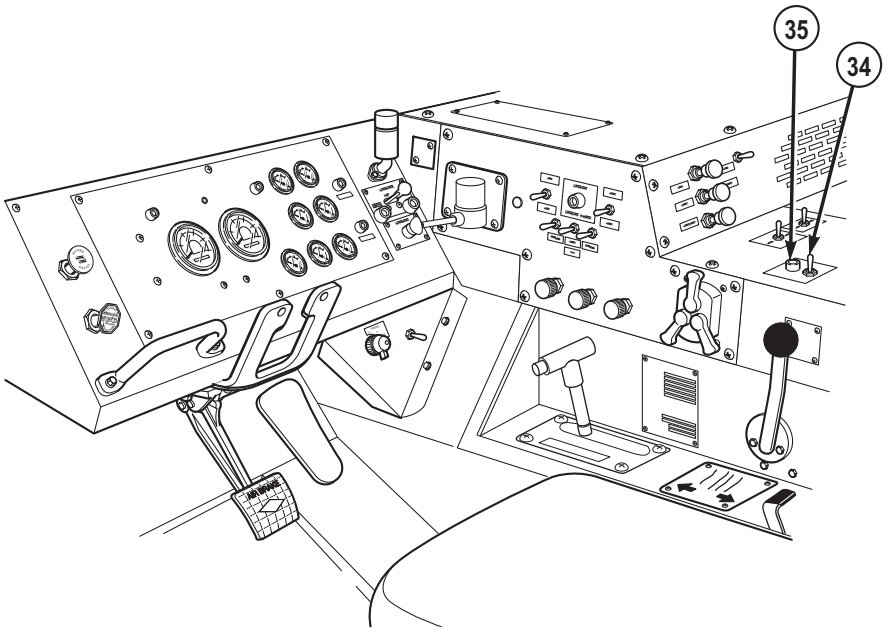


Figure 33.

37. Shut off engine. (WP 0057)
38. Remove and stow portable beacon lights. (WP 0097)
39. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1074/M1075 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

CAUTION

When lifting and towing a PLS (Palletized Load System) with an M1077 flatrack, the flatrack must be empty, or if stacked, no more than three high or damage to equipment may result.
When lifting and towing a PLS with an M1 flatrack, the flatrack must be empty with both end walls folded, or if stacked, no more than three high or damage to equipment may result.

HOOKUP - Continued

2. Disconnect two springs (1) from tow cylinders (2).

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

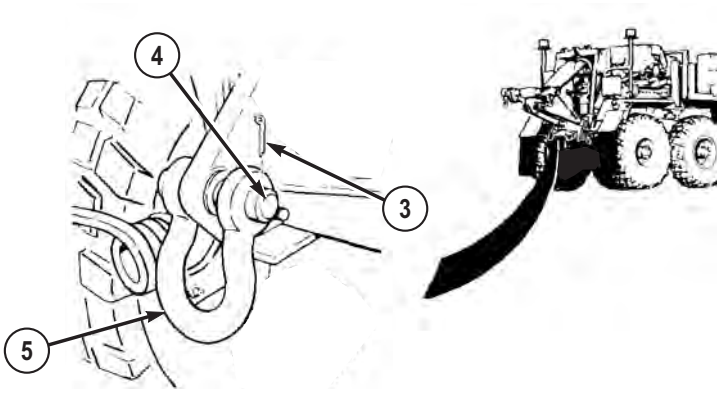


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

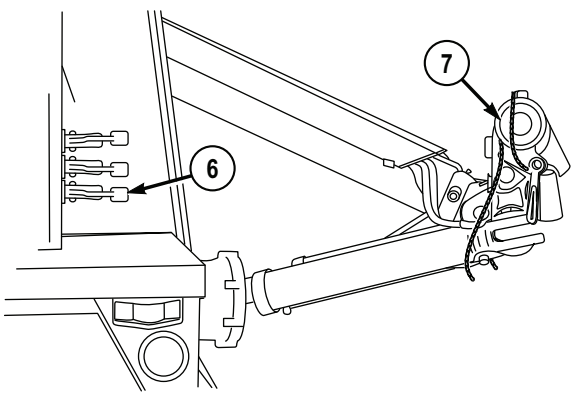


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

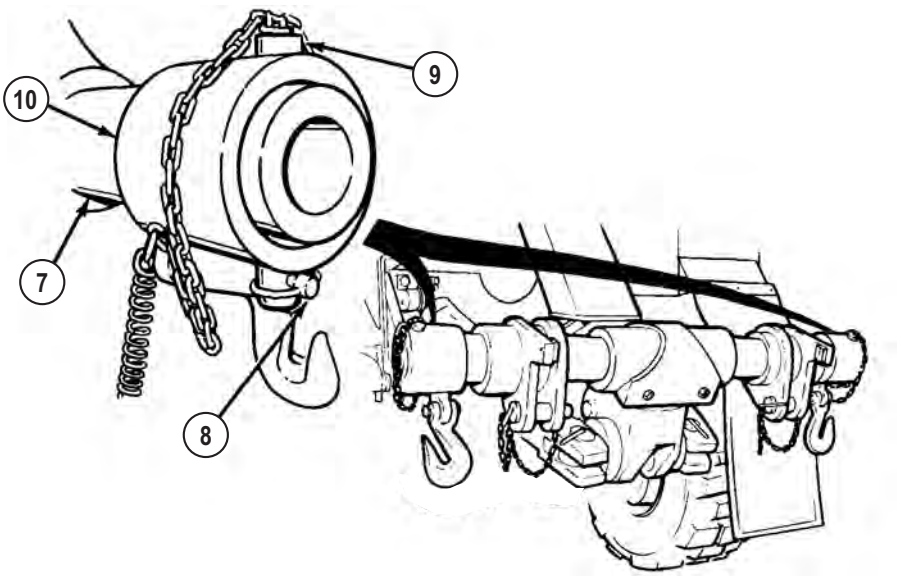


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

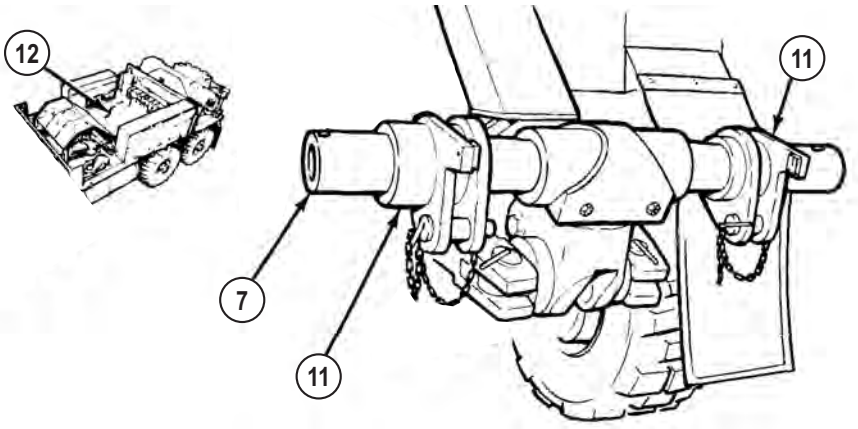


Figure 5.

9. Remove lock handle (13), lock plate (14), and two rear tow adapters (15).

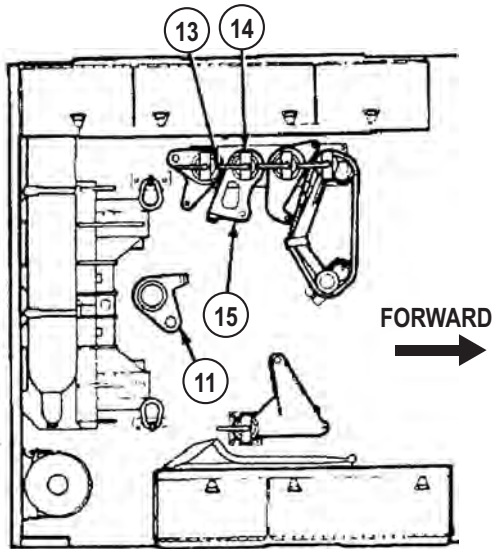


Figure 6.

10. Install two front adapters (11) removed from cross tube (7)with lock plate (14), and lock handle (13).

HOOKUP - Continued

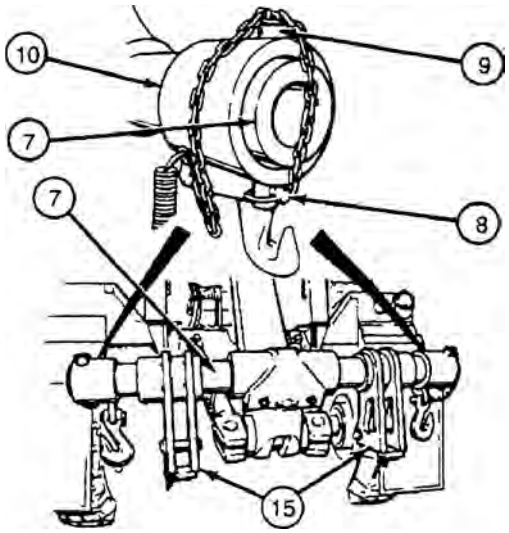
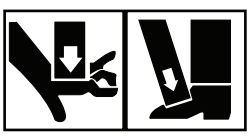


Figure 7.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

11. Install two rear tow adapters (15) on cross tube (7).
12. Install end caps (10) on cross tube (7).
13. Install pins (9) and quick pins (8).

NOTE

Driver side and passenger side towing shackles are removed the same way.

14. Remove two cotter pins (16), pins (17), and two rear towing shackles (18) from disabled vehicle. Stow shackles (18) on disabled vehicle.

HOOKUP - Continued

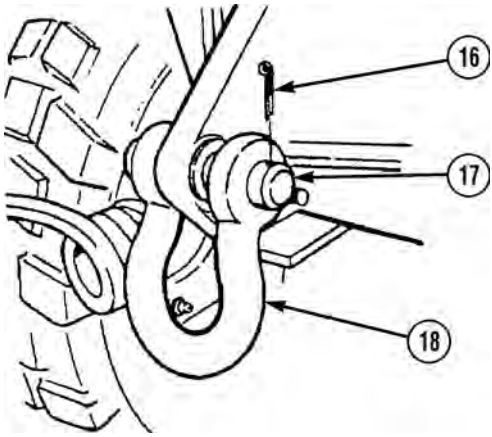


Figure 8.

15. Remove two quick pins (19) and pins (20) from adapters (15).

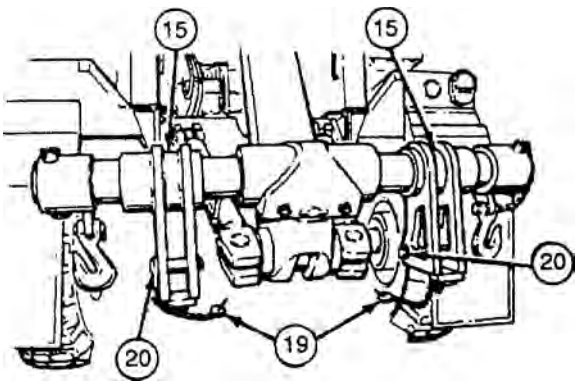


Figure 9.

16. Attach two springs (1) on tow cylinders (2).

HOOKUP - Continued

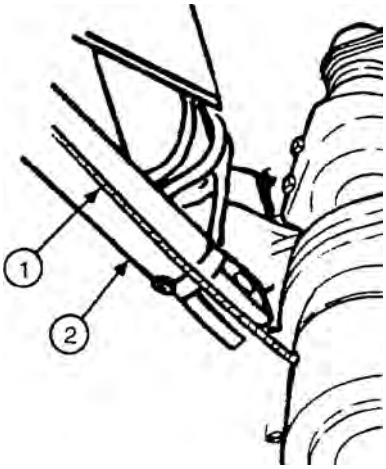
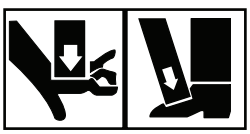


Figure 10.

WARNING



- Adapters may need to be held in the upright position while moving the cross tube. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.
- Adapters must be connected to lower holes of rear tow eyes or disabled vehicle may contact M984 Wrecker during towing operations. Failure to comply may result in injury or death to personnel and damage to equipment.

17. Operate retrieval system, and with aid of an assistant position cross tube (7) so holes in adapters (15) align with lower holes of rear tow eyes (21).

HOOKUP - Continued

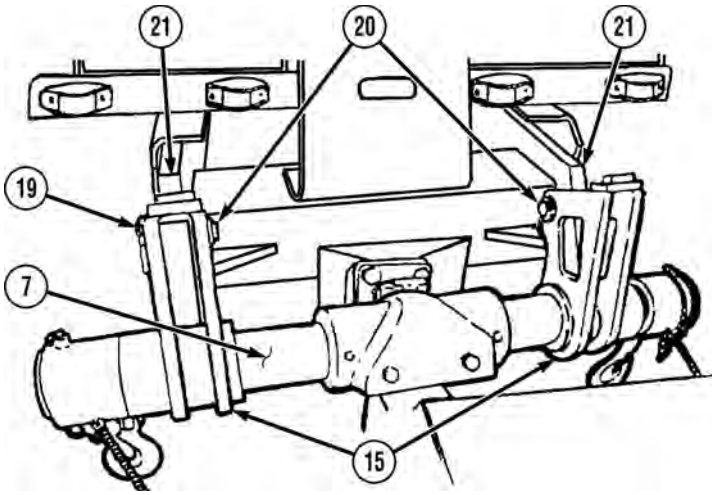


Figure 11.

18. Insert pins (20) through adapters (15), and lower holes of rear tow eyes (21). Install quick pins (19).

NOTE

If air system is inoperative, manually release spring brakes (refer to disabled vehicle operator's manual).

19. Push in PARKING BRAKE control (22) on disabled vehicle (refer to disabled vehicle operator's manual).

HOOKUP - Continued

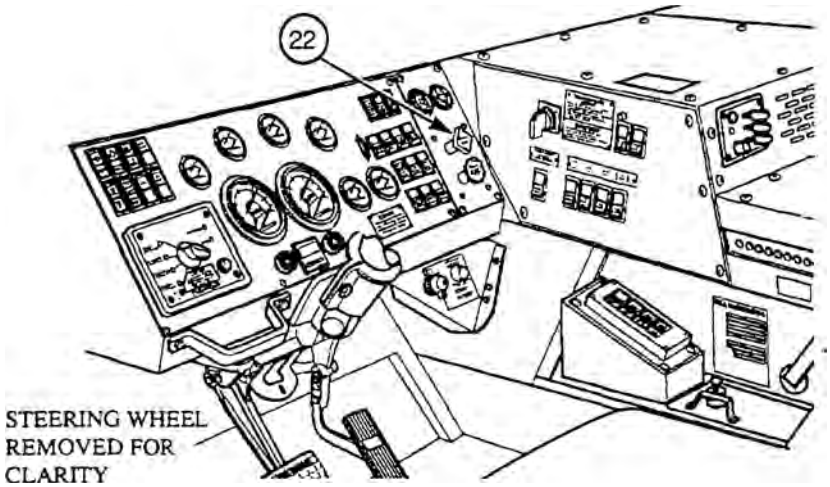


Figure 12.

NOTE

Two rear tow adapters must be resting against frame of disabled vehicle.

20. Operate retrieval system until tow cylinders (2) are fully retracted.

HOOKUP - Continued

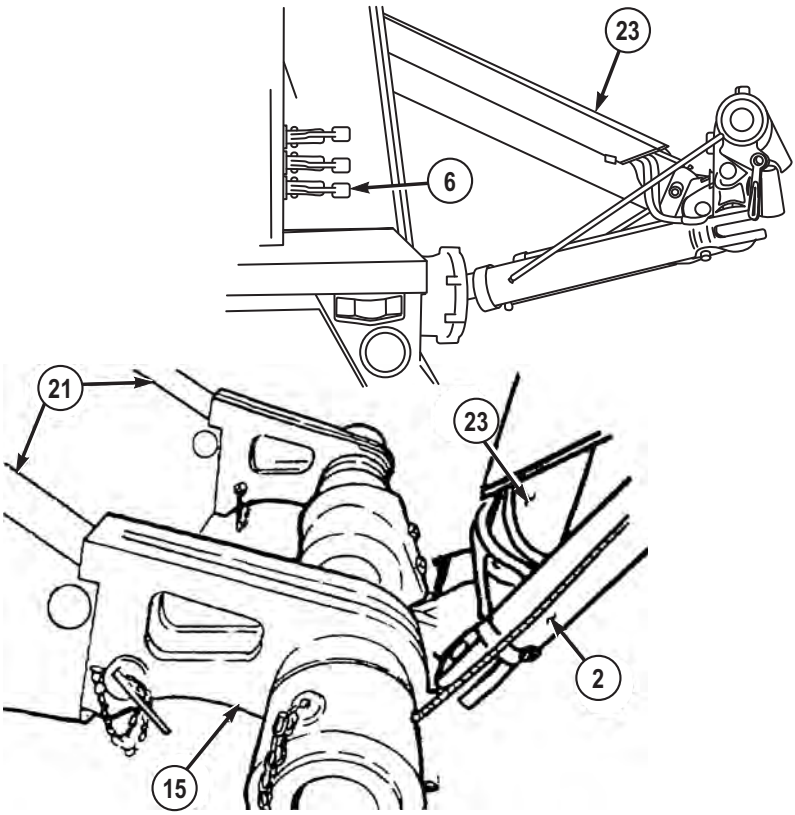


Figure 13.

21. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (23) until adapters (15) contact tow eyes (21).
22. Remove two 16 ft. (5 m) safety chains (24) from wrecker stowage.

HOOKUP - Continued

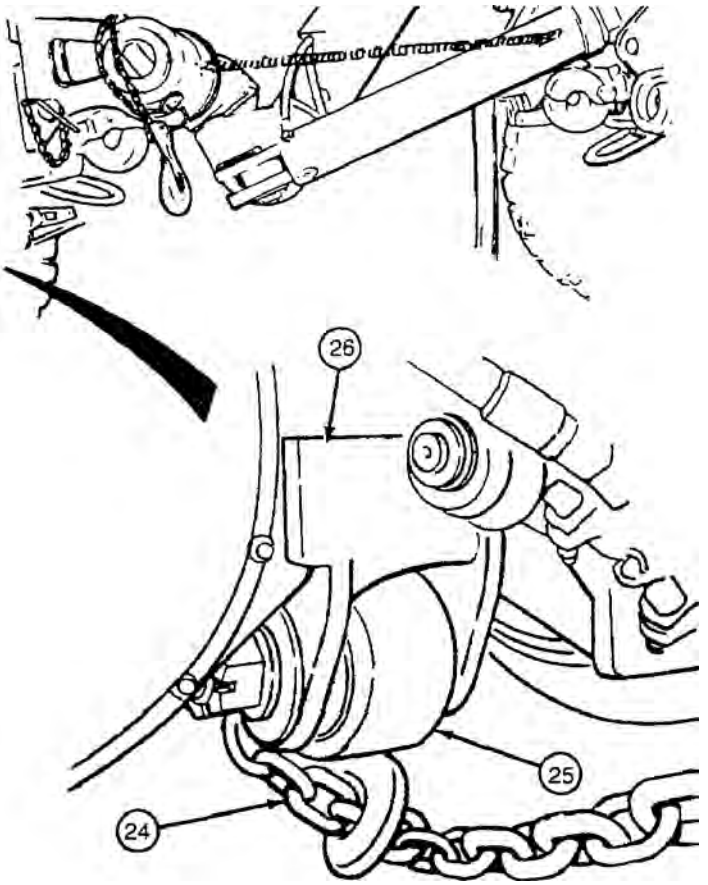


Figure 14.

23. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (24) over walking beam (25) in front of No. 5 axle (26) on disabled vehicle.
24. Hook 16 ft. (5 m) safety chain (24) back into itself (shown) under walking beam (25).
25. Repeat Steps (23) and (24) for other side of disabled vehicle.

NOTE

Adjust chain slack so chains are approximately 6 in. (150 mm) above ground.

HOOKUP - Continued

26. Route two free ends of 16 ft. (5 m) safety chains (24) through safety chain hoop (26) on wrecker. Hook two 16 ft. (5 m) safety chains (24) back into themselves and secure grab hook (27) with safety shackles (28).

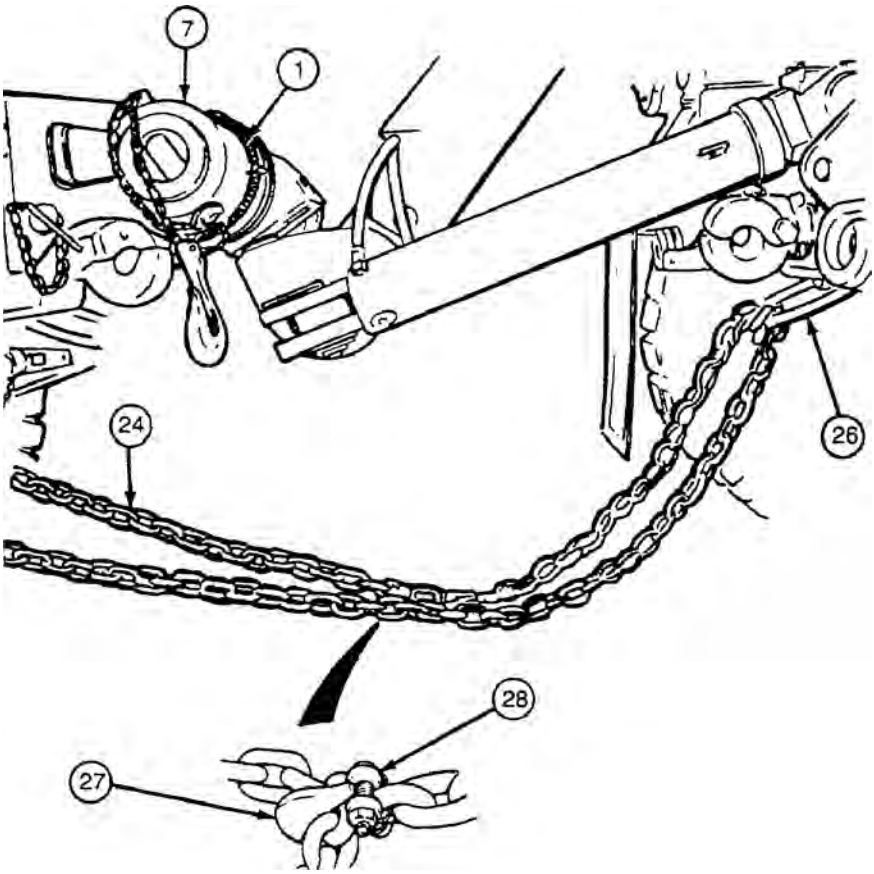


Figure 15.

27. Wrap two springs (1) around cross tube (7) and secure.

CAUTION

ensure all disabled vehicle cargo is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

28. Prepare disabled vehicle for towing (refer to disabled vehicle operator's manual).

29. Remove emergency tow lights (29) and two brackets (30) from wrecker stowage.

HOOKUP - Continued

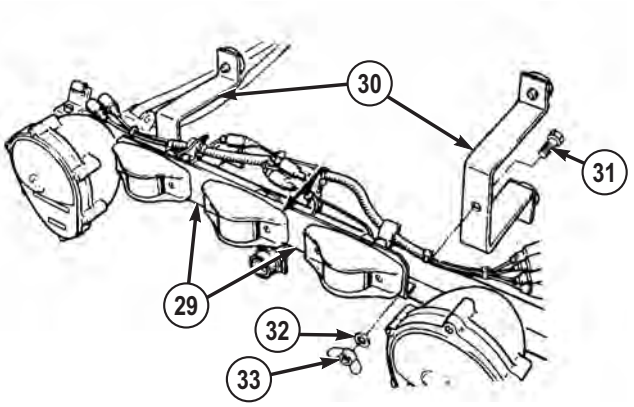


Figure 16.

30. Install two brackets (30) in outside holes of emergency tow lights (29) with two screws (31), washers (32), and nuts (33).

31. Position emergency tow lights (29) on skid plate (34). Fasten top straps (35) to top of skid plate (34).

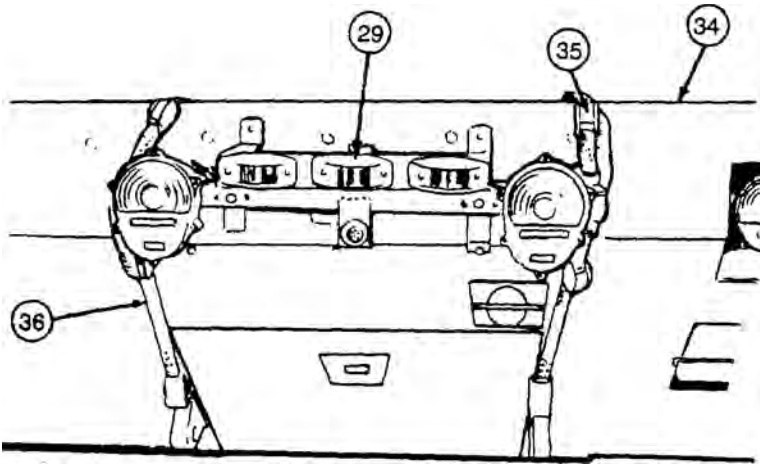


Figure 17.

32. Fasten bottom straps (36) to bottom of skid plate (34).

HOOKUP - Continued

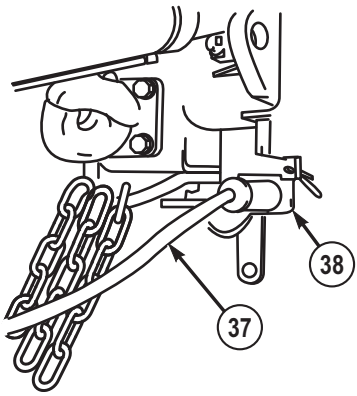


Figure 18.

33. Remove tow light cable (37) from wrecker stowage and connect to rear electrical connector (38) on wrecker.

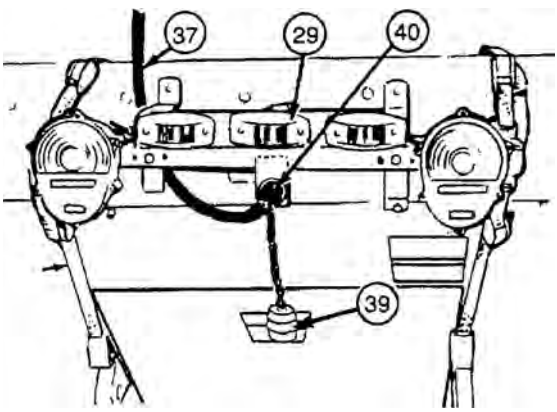


Figure 19.

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

34. Route other end of tow light cable (37) to emergency tow lights (29) on disabled vehicle, remove dust cover (39), and plug in at connector (40).

HOOKUP - Continued

WARNING

Driveshafts can weigh up to 100 lbs (45 kg). Properly support driveshafts when removing screws. After screws and brackets are removed, driveshaft can fall. Failure to comply may result in injury or death to personnel.

NOTE

- To remove driveshaft screws, use wrench located in PLS BII stowage box.
- Driveshaft ends at No. 2 axle and transfer case are removed the same way.

35. Support No. 2 axle driveshaft (41) while assistant removes four screws (42) and two brackets (43).

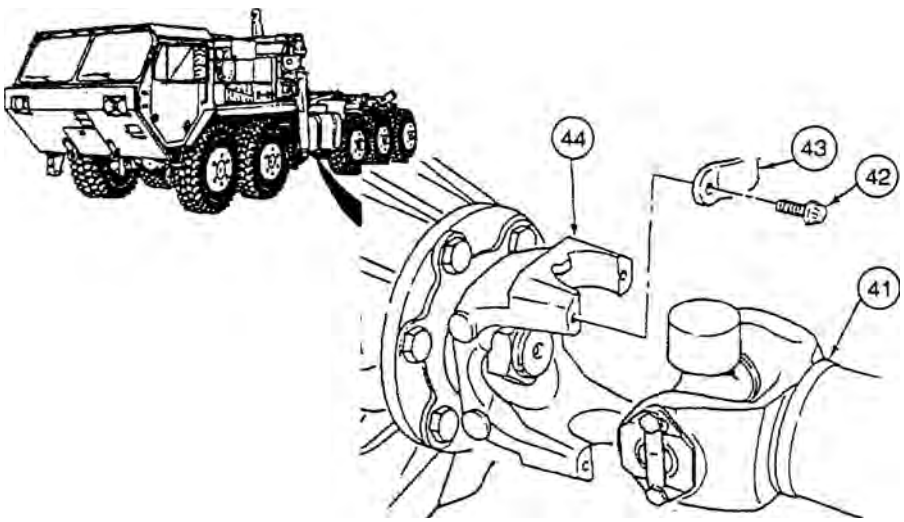


Figure 20.

36. Remove No. 2 axle driveshaft (41) from flange (44).
37. Turn steering axles straight forward, and install lock on steering column (refer to M1074/M1075 operator's manual).

HOOKUP - Continued

38. Set POWER switch (45) to ON position.

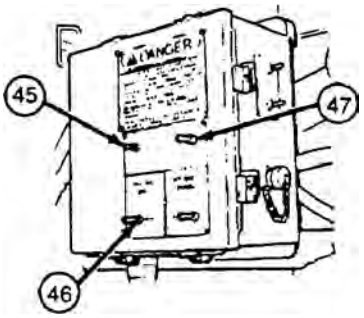


Figure 21.

39. Set HIGH IDLE switch (46) to CONTINUOUS.
40. Push and release LATCH switch (47). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

HOOKUP - Continued

41. Push LIFT CYLINDER control lever (6) to retract lift cylinder (23) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

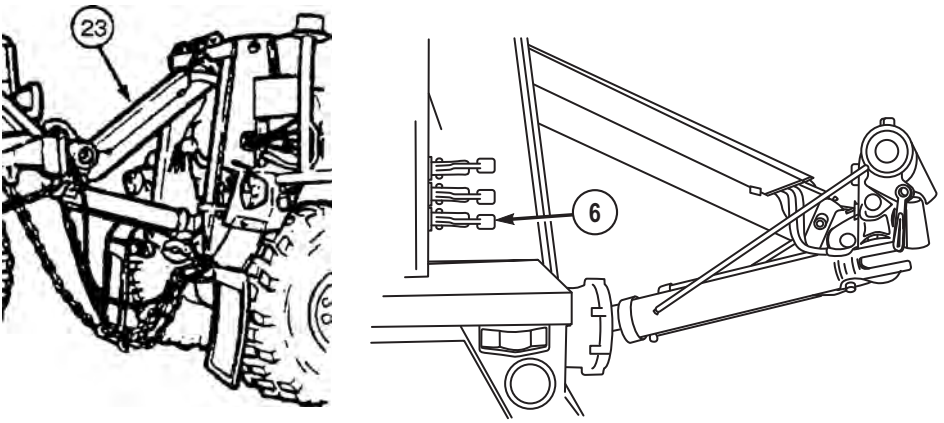


Figure 22.

42. Set POWER switch (45) to OFF position.

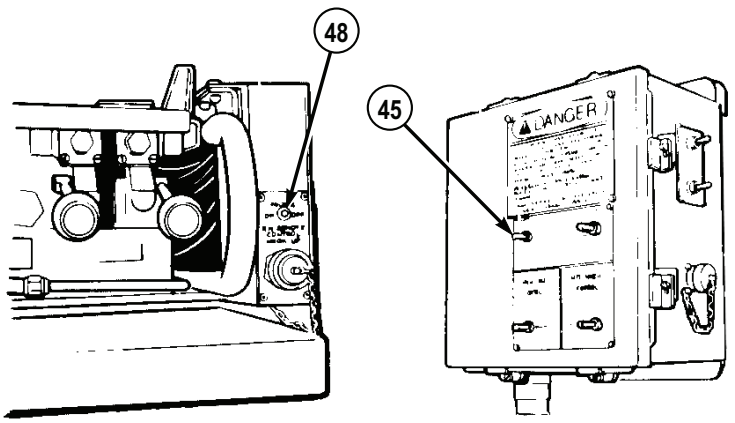


Figure 23.

43. Set POWER switch (48) to OFF position.
44. Set PTO ENGAGE switch (49) to OFF position. Indicator light (50) will go out.

HOOKUP - Continued

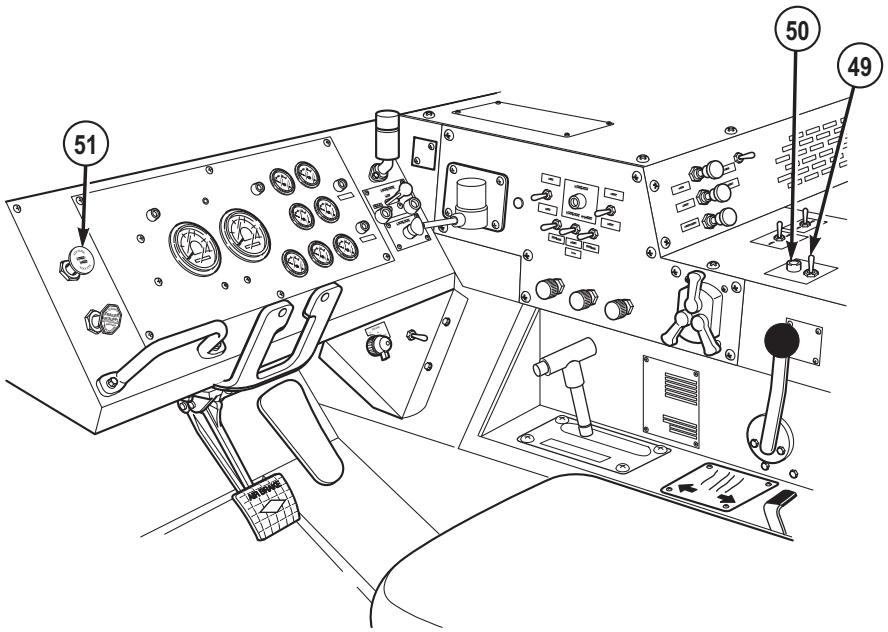


Figure 24.

45. Turn on wrecker service drive lights. (WP 0090)
46. Turn on wrecker emergency flashers. (WP 0099)
47. Turn on disabled vehicle emergency flashers (refer to operator's manual).
48. Push in PARKING BRAKE control (51).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

49. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

REAR DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).Pull out PARKING BRAKE control (2).

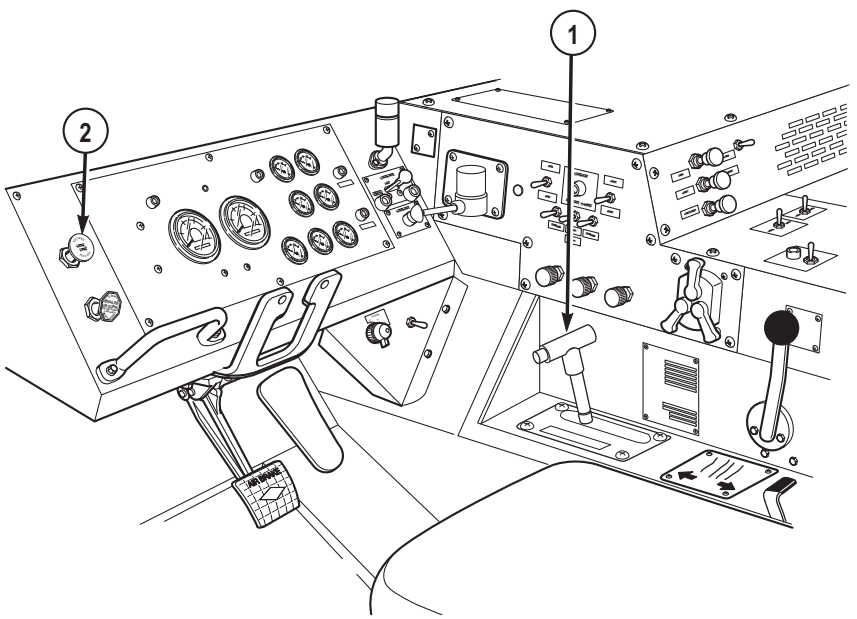


Figure 25.

2. Pull out PARKING BRAKE control (2).

REAR DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation, (WP 0059)and lower disabled vehicle to the ground.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Pull out PARKING BRAKE control (3) on disabled vehicle.

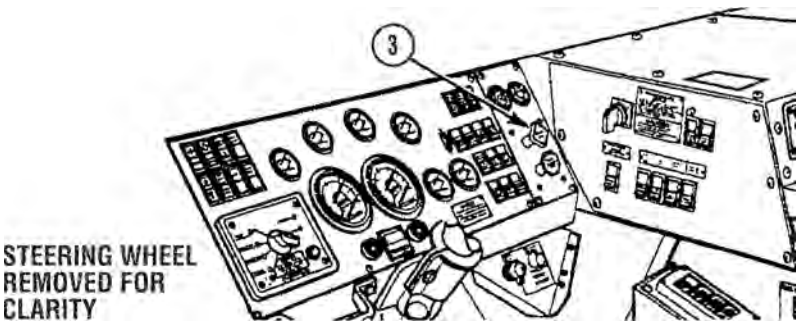


Figure 26.

5. Remove tow light cable (4) from wrecker.

REAR DISCONNECT - Continued

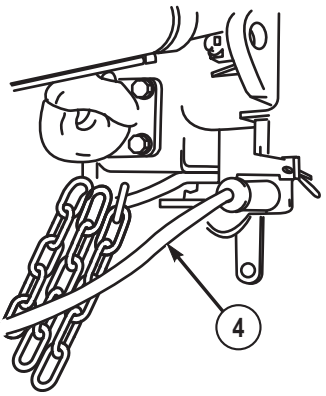


Figure 27.

6. Remove tow light cable (4) from emergency tow lights (5).

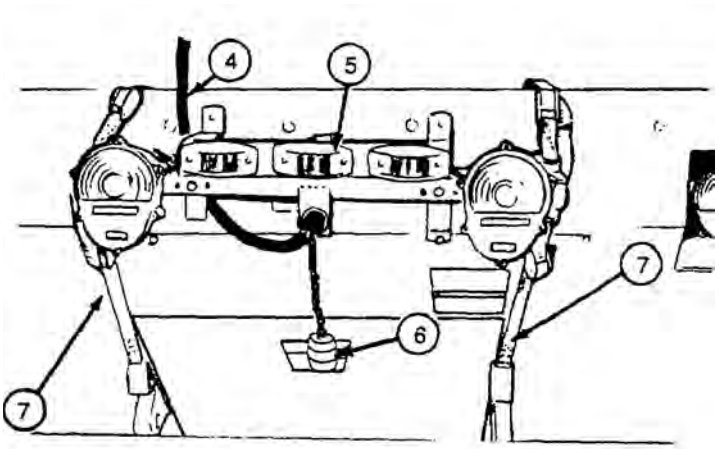


Figure 28.

7. Install dust cap (6) on tow light cable (4) and return to wrecker stowage.
8. Loosen straps (7), and remove emergency tow lights (5) from disabled vehicle.
9. Remove two nuts (8), washers (9), screws (10), and brackets (11) from emergency tow lights (5).
10. Return emergency tow lights (5) and two brackets (11) to wrecker stowage.

REAR DISCONNECT - Continued

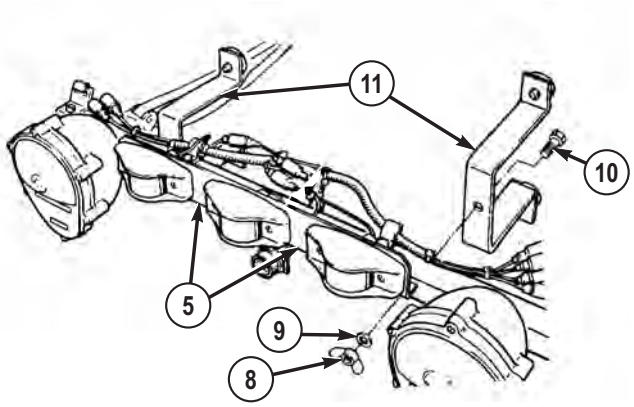


Figure 29.

11. Remove and stow two 16 ft. (5 m) safety chains (12).

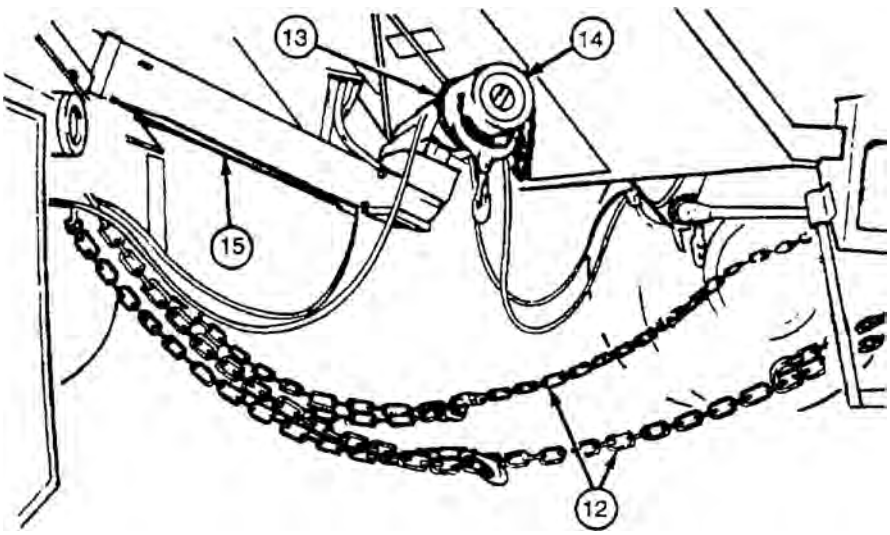
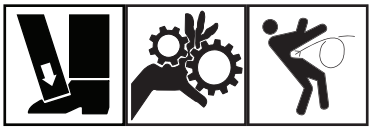


Figure 30.

12. Unwrap two springs (13) from cross tube (14) and connect two springs to tow cylinders (15).

REAR DISCONNECT - Continued

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

13. Remove two quick pins (16) and pins (17) from adapters (18).

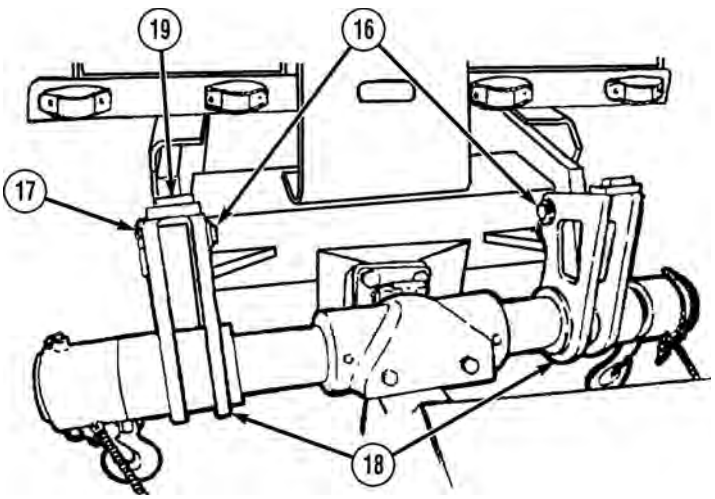


Figure 31.

14. Remove two adapters (18) from tow eyes (19) on disabled vehicle.
15. Install two pins (17) through adapters (18). Install two quick pins (16) in pins (17).
16. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)
17. Remove two springs (13) from tow cylinders (15).

REAR DISCONNECT - Continued

Figure 32.

18. Remove quick pins (20) and pins (21) from end caps (22).

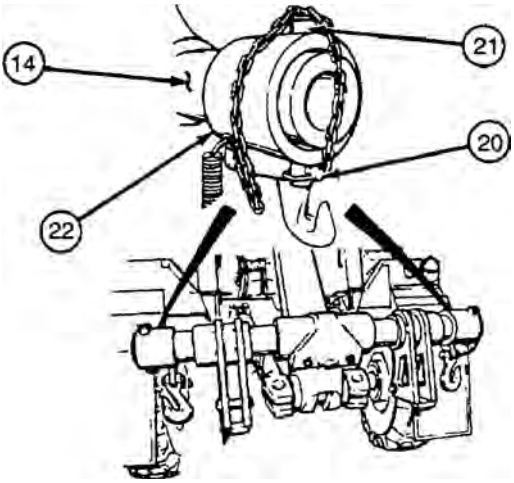


Figure 33.

19. Remove end caps (22) from cross tube (14).
20. Remove adapters (18) from cross tube (14) and place on equipment body floor (23).

REAR DISCONNECT - Continued

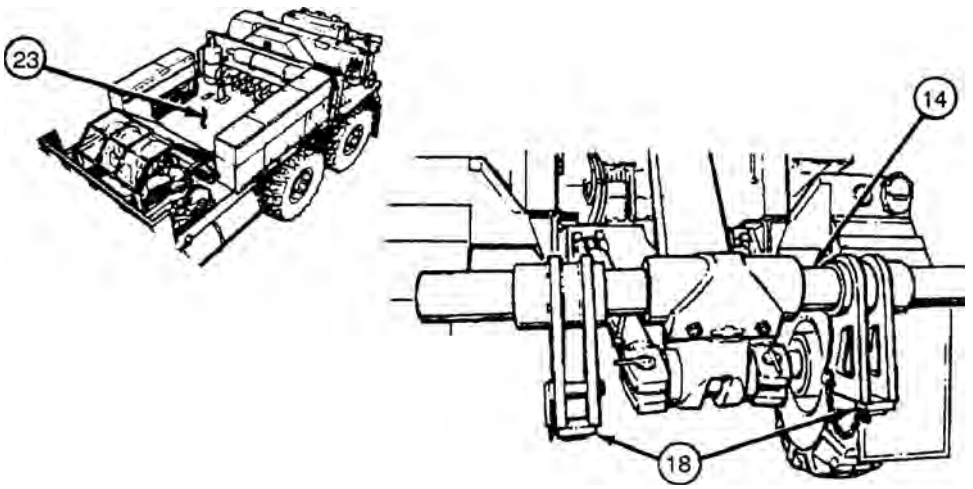


Figure 34.

21. Remove lock handle (24), lock plate (25), and two front adapters (26).
22. Install two rear adapters (18) with lock plate (25) and lock handle (24).

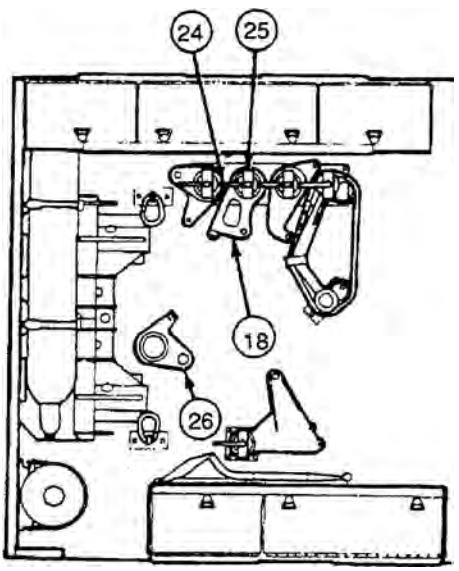


Figure 35.

23. Install two front adapters (26) on cross tube (14).

REAR DISCONNECT - Continued

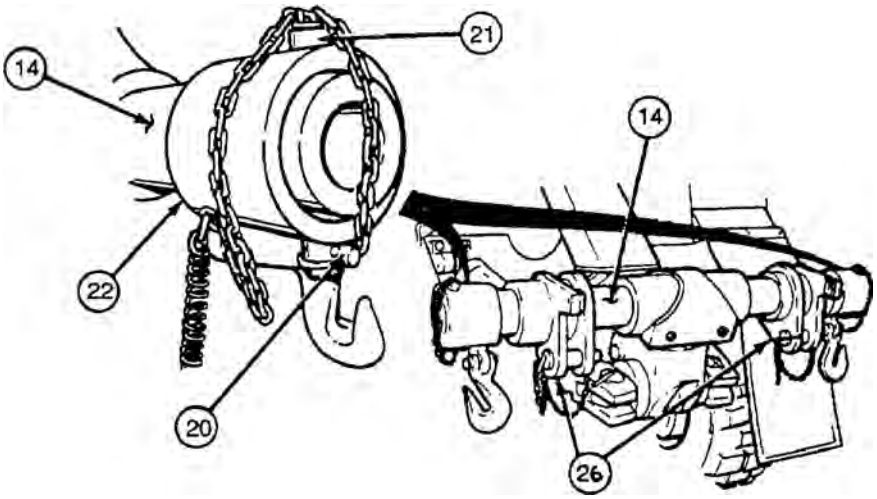


Figure 36.

24. Install two end caps (22) on cross tube (14). Install two pins (21) and quick pins (20).
25. Install two springs (13) on tow cylinders (15).

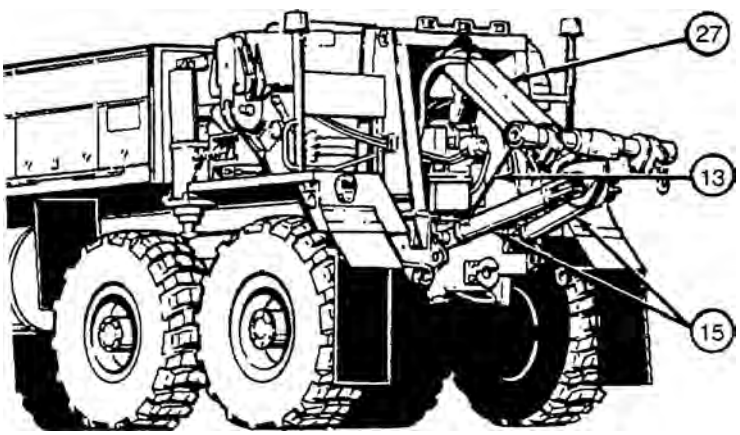


Figure 37.

26. Operate retrieval system, and fully retract lift cylinder (27) and tow cylinders (15).

REAR DISCONNECT - Continued

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two towing shackles (28), pins (29), and cotter pins (30).

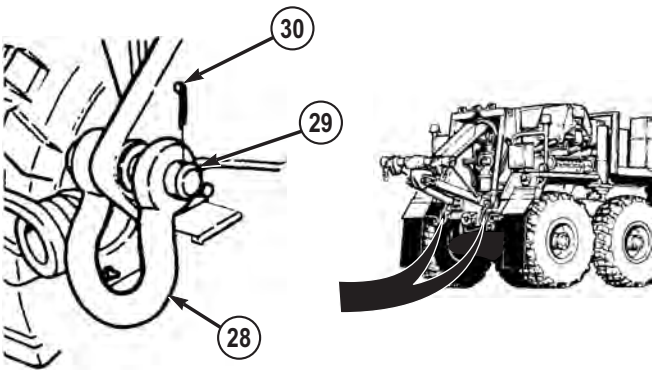


Figure 38.

28. Set POWER switch (31) to OFF position.

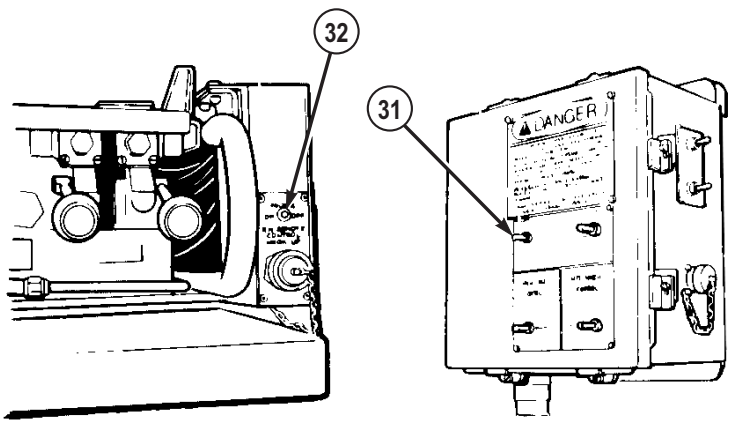


Figure 39.

29. Set POWER switch (32) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)

REAR DISCONNECT - Continued

32. Set PTO ENGAGE switch (33) to OFF position. Indicator light (34) will go out.

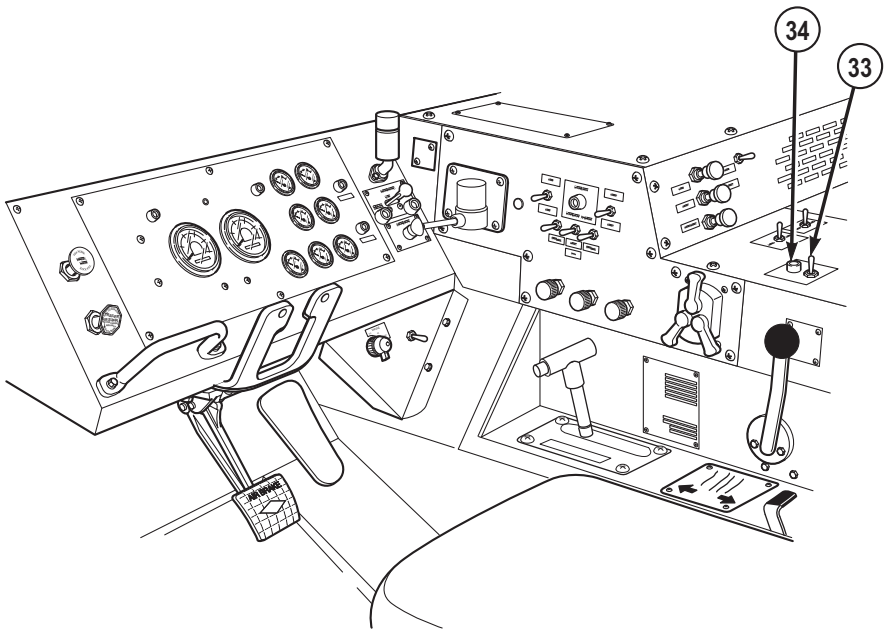


Figure 40.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M35 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

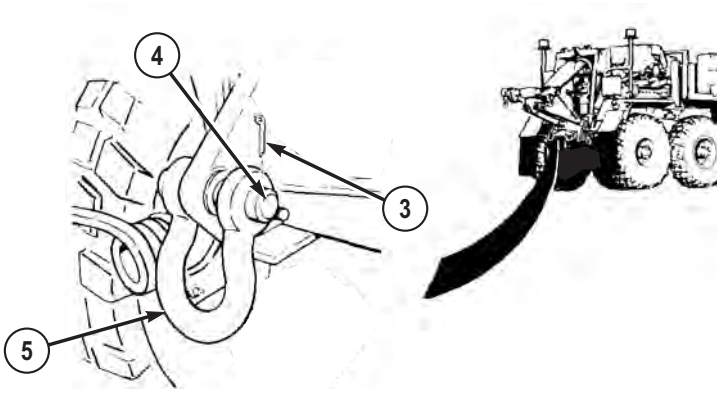


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

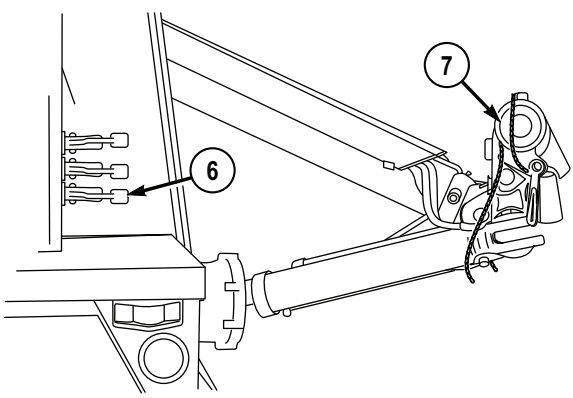


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from, and centered on tow eyes of disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

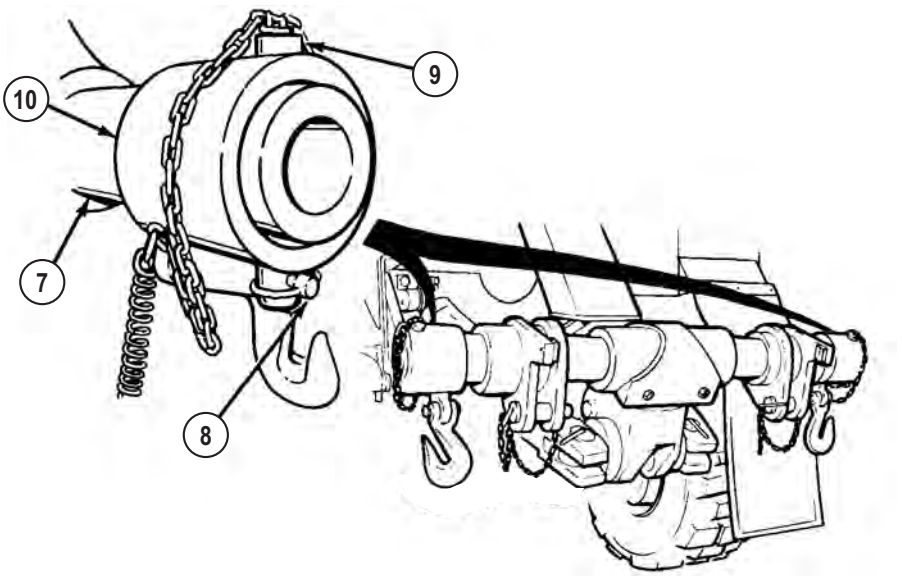


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

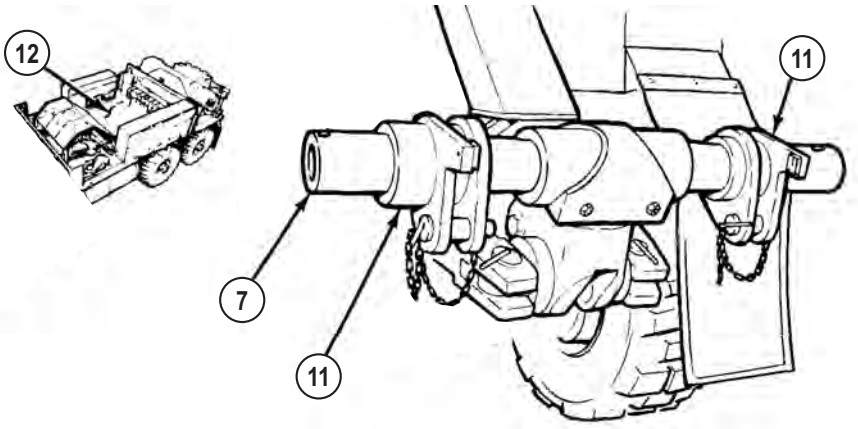


Figure 5.

9. Remove lock handle (13), lock plate (14), quick pin (15), pin (16), and two rear tow adapters (17).

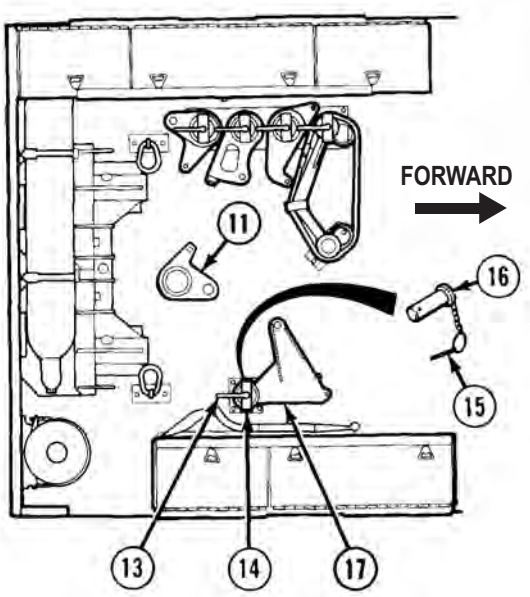


Figure 6.

HOOKUP - Continued

10. Install two front adapters (11) removed from cross tube (7), lock plate (14), lock handle (13), pin (16), and quick pin (15).

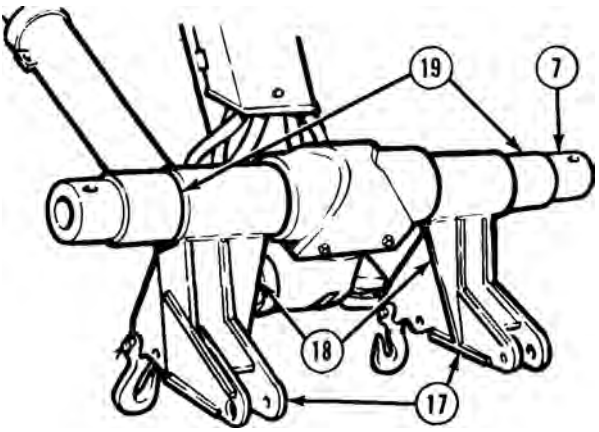
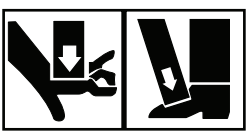


Figure 7.

11. Remove two 7/8 in. (22 mm) pins and two 5 in. (127 mm) spacers (19) from wrecker stowage.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

12. Install two rear tow adapters (17) on cross tube (7) with support brace (18) to inside.
13. Install two 5 in. (127 mm) spacers (19) on cross tube (7).
14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

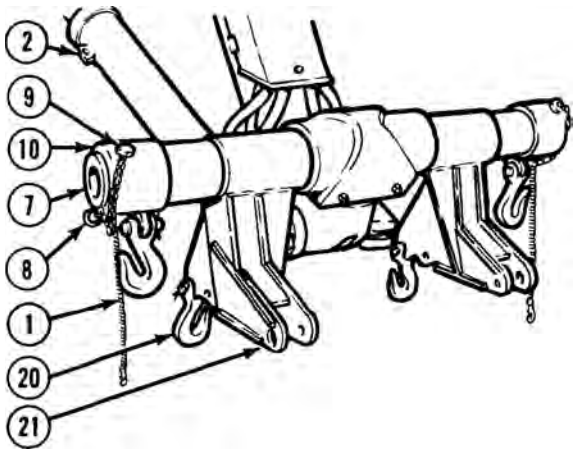


Figure 8.

15. Install two pins (9) and quick pins (8).

NOTE

Adapter grab hook may be installed in either hole. For M35, install grab hooks in hole farthest from towing pin holes.

16. Position adapter grab hooks (20) in hole farthest from pin holes (21).
17. Attach two springs (1) on tow cylinders (2).

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

18. Operate retrieval system, and with aid of an assistant position cross tube (7) so holes in adapters (17) align with rear tow eyes (22).

HOOKUP - Continued

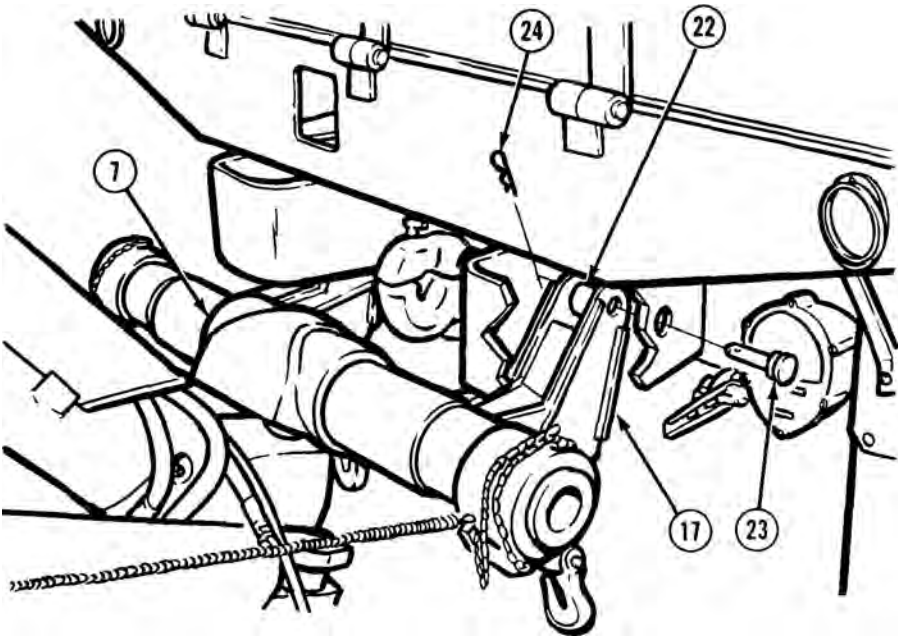


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

When installing pins, turn pin hole vertical to allow for easier cotter hairpin installation.

19. Insert two 7/8 in. (22 mm) pins (23) through adapters (17) and rear tow eyes (22). Install two cotter hairpins (24) in pins.
20. Lower cross tube (7) until adapter grab hooks (20) are under rear tow eyes (22).

HOOKUP - Continued

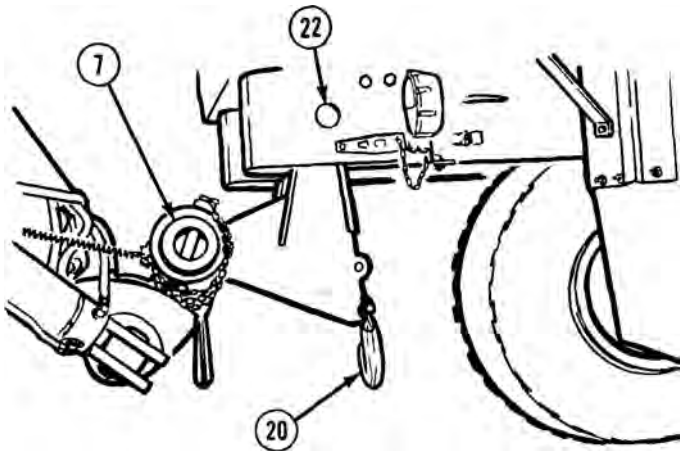


Figure 10.

21. Remove two 16 ft. (5 m) safety chains (25) from wrecker stowage.

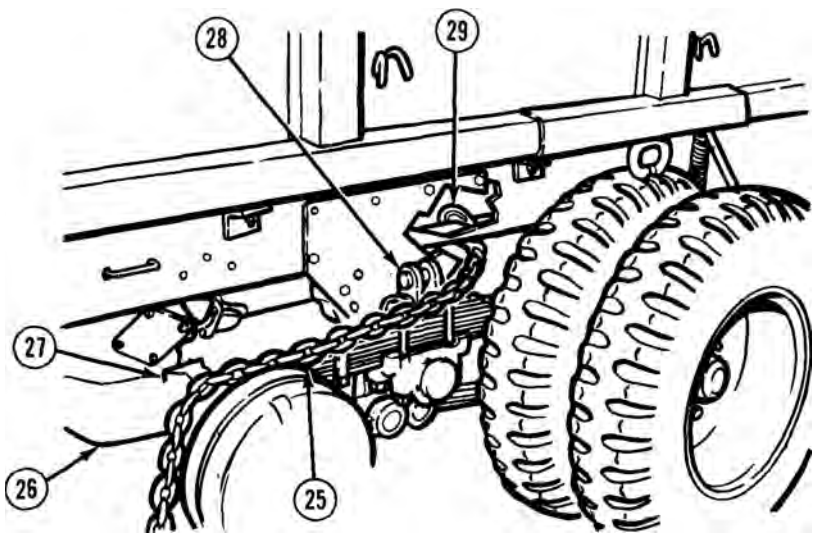


Figure 11.

22. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (25) over rear axle (26) and outside axle stop (27).

23. Route 16 ft. (5 m) safety chain (25) around sling point (28), and attach grab hook (29) to bottom flange of frame rail.

HOOKUP - Continued

24. Repeat Steps (22) and (23) for other side of disabled vehicle.
25. Pull 16 ft. (5 m) safety chain (25) tight, and install on adapter grab hook (20).
26. Repeat Step (25) for other side of disabled vehicle.
27. Release PARKING BRAKE on disabled vehicle (refer to M35 operator's manual).
28. Operate retrieval system until tow cylinders (2) are fully retracted.

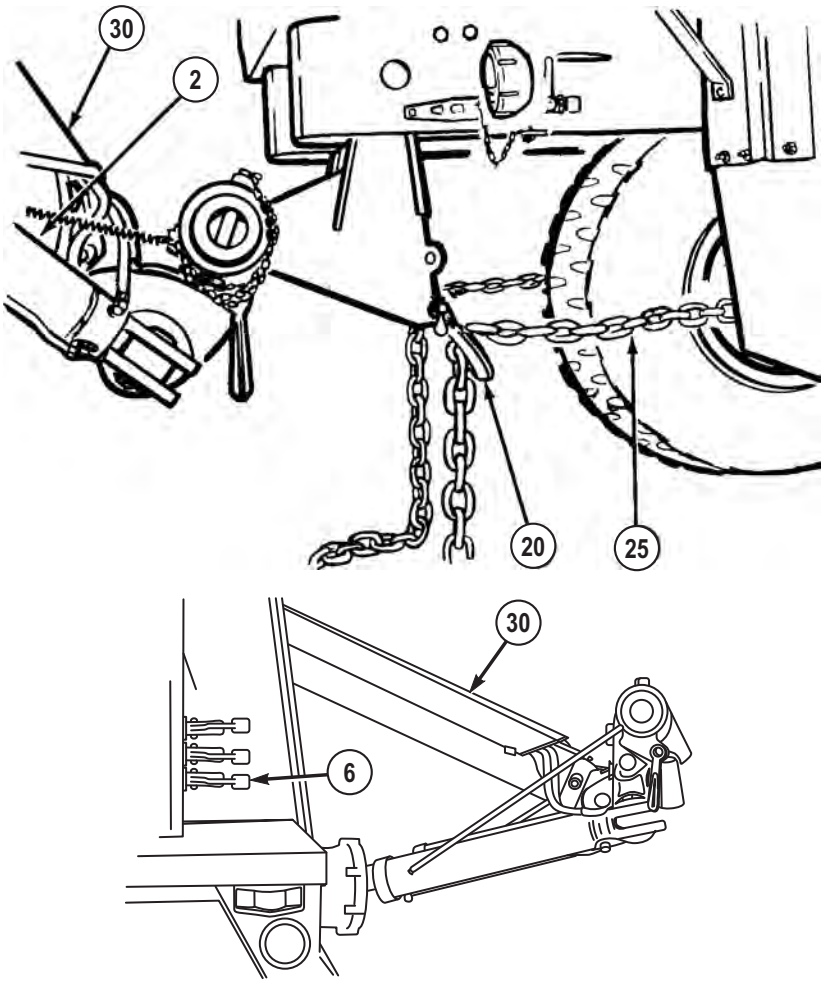


Figure 12.

HOOKUP - Continued

29. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (30) until slack is removed from 16 ft. (5 m) safety chains (25).

NOTE

Adjust chain slack so 16 ft. (5 m) safety chains do not touch ground.

30. Route two 16 ft. (5 m) safety chains (25) through safety chain hoop (31) on wrecker, hook back into themselves, and secure grab hooks (32) with safety shackles (33).

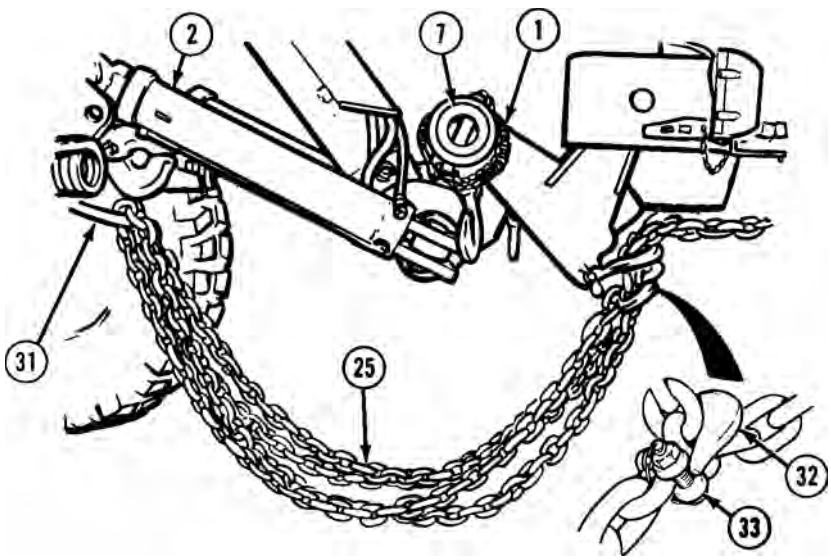


Figure 13.

31. Disconnect two springs (1) from tow cylinders (2), wrap around cross tube (7) and secure.

CAUTION

Make sure all cargo in bed of disabled vehicle is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

32. Prepare disabled vehicle for towing (refer to M35 operator's manual).

33. Remove emergency tow lights (34) and two brackets (35) from wrecker stowage.

34. Install two brackets (35) in outside holes of emergency tow lights (34) with two screws (36), washers (37), and nuts (38).

HOOKUP - Continued

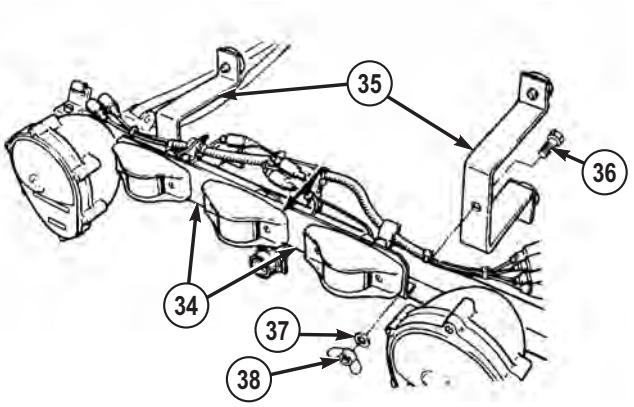


Figure 14.

35. Install emergency tow lights (34) on front of M35 and fasten securely with straps (39).

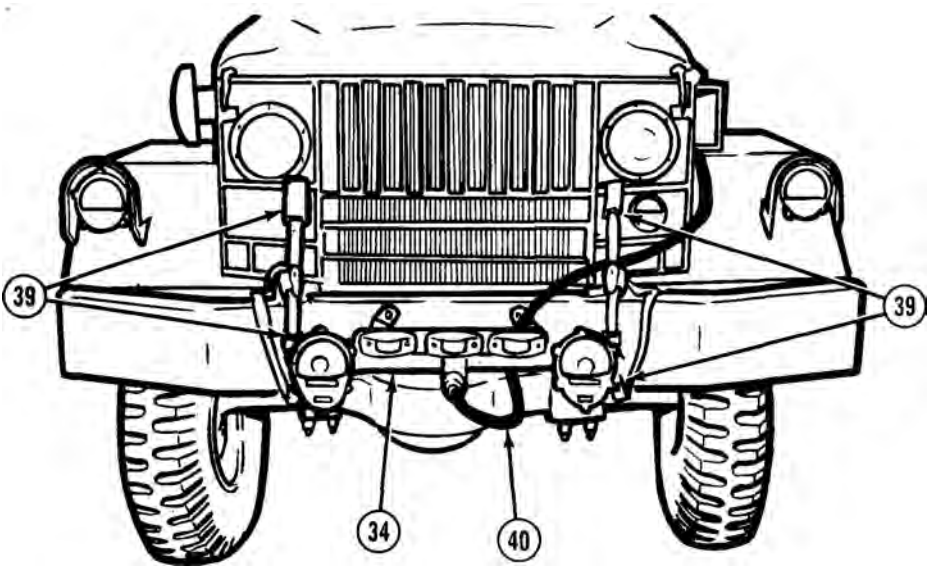


Figure 15.

36. Remove tow light cable (40) from wrecker stowage and connect to emergency tow light (34).

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

37. Route other end of tow light cable (40) along disabled vehicle, and connect to rear electrical connector (41) on wrecker.

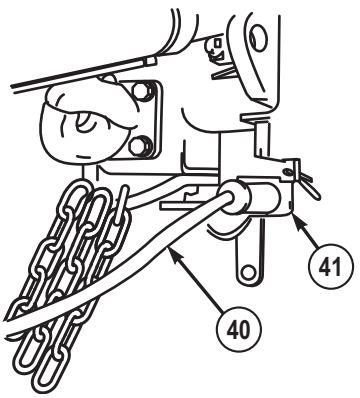


Figure 16.

38. Lock disabled vehicle's steering (refer to M35 operator's manual).
39. Set POWER switch (42) to ON position.

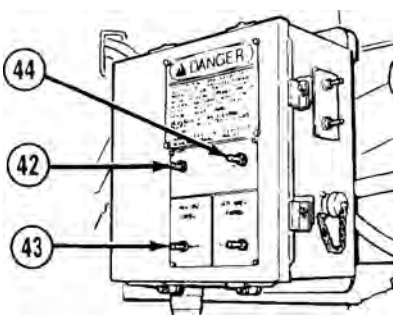


Figure 17.

40. Set HIGH IDLE switch (43) to CONTINUOUS.
41. Push and release LATCH switch (44). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

42. Push LIFT CYLINDER control lever (6) to retract lift cylinder (30) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

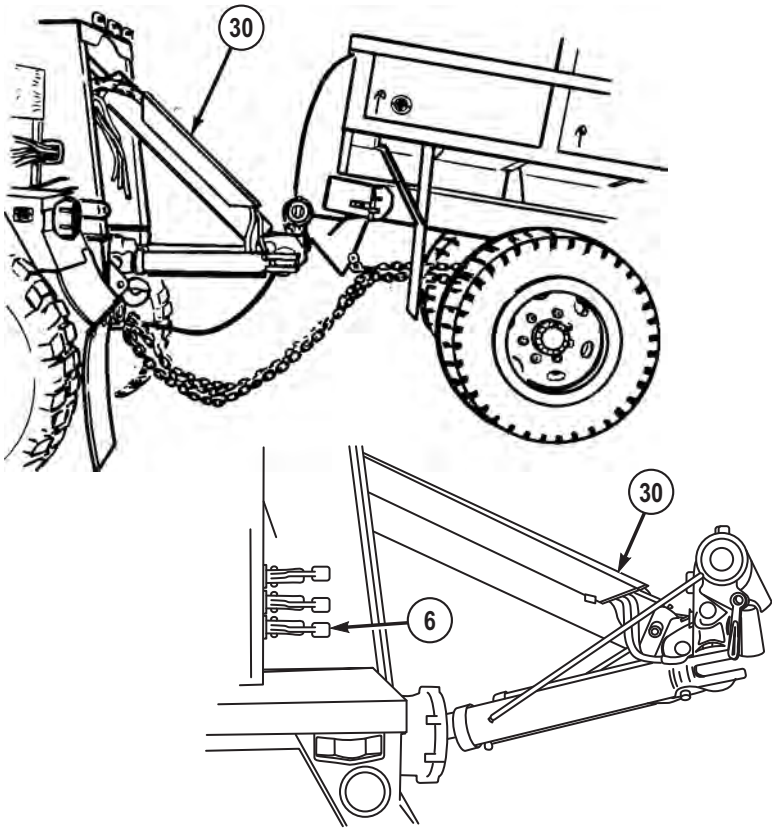


Figure 18.

43. Set POWER switch (42) to OFF position.

HOOKUP - Continued

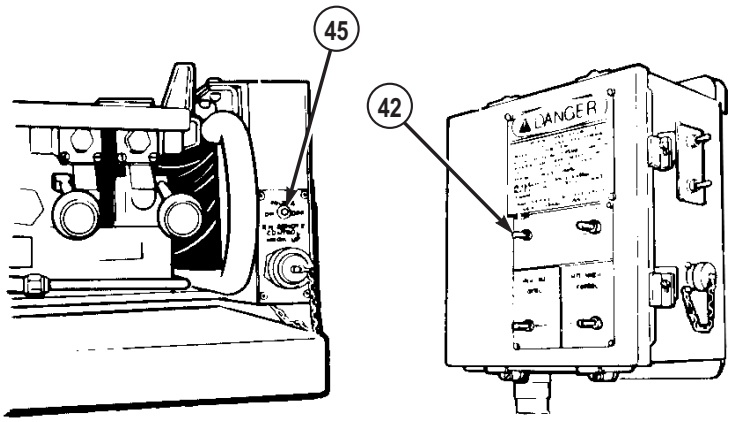


Figure 19.

44. Set POWER switch (45) to OFF position.
45. Set PTO ENGAGE switch (46) to OFF position. Indicator light (47) will go out.

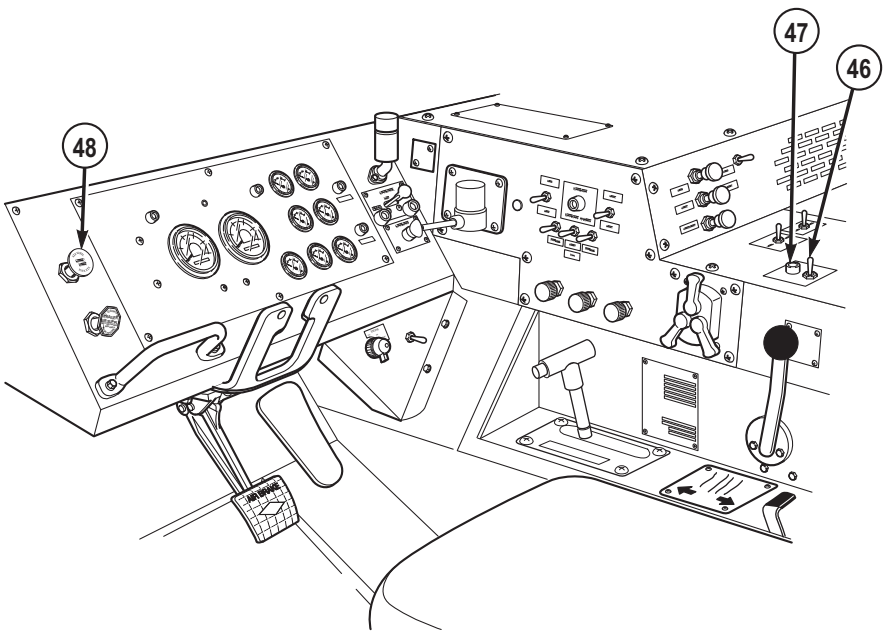


Figure 20.

46. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

47. Turn on wrecker emergency flashers. (WP 0099)
48. Turn on disabled vehicle emergency flashers (refer to operator's manual).
49. Push in PARKING BRAKE control (48).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

50. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

REAR DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

REAR DISCONNECT - Continued

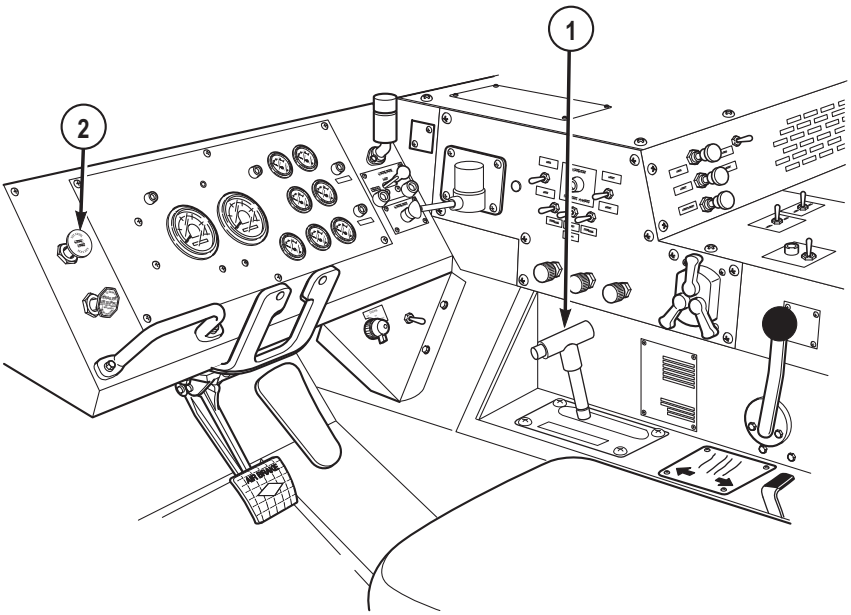


Figure 21.

2. Pull out PARKING BRAKE control (2).

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058) prepare retrieval system for operation, (WP 0059) and lower disabled vehicle until 16 ft. (5 m) safety chains are slack at rear axle.

REAR DISCONNECT - Continued

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

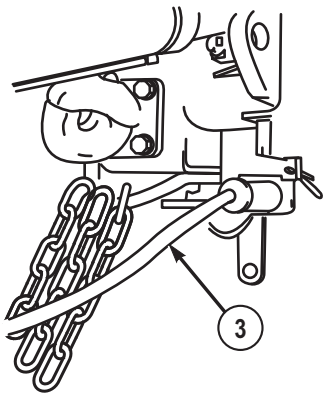


Figure 22.

6. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

REAR DISCONNECT - Continued

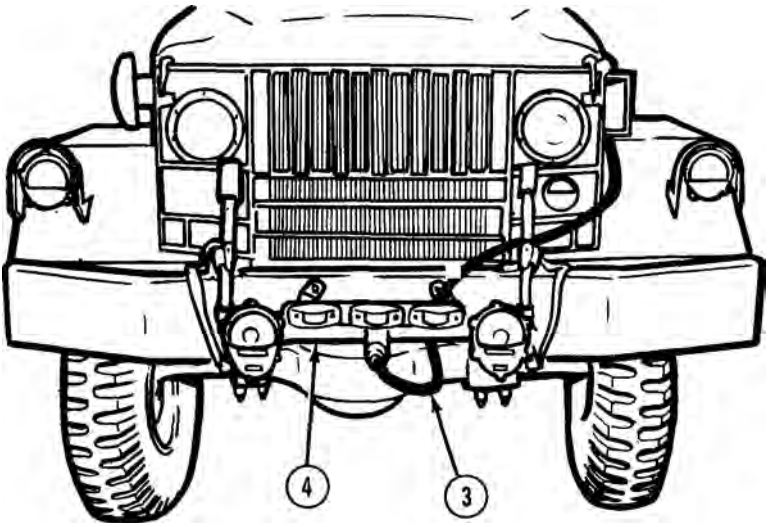


Figure 23.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and two brackets to wrecker stowage.

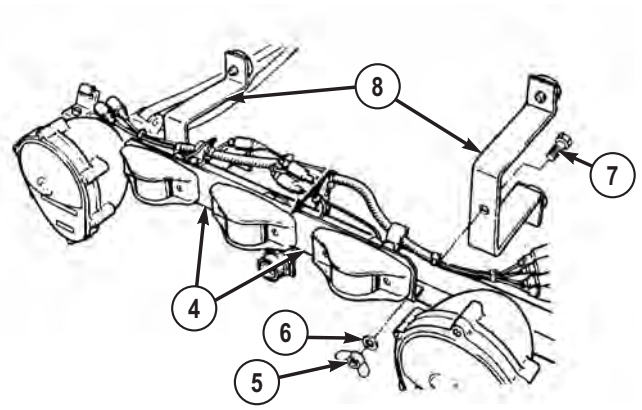


Figure 24.

9. Remove and stow two 16 ft. (5 m) safety chains (9).

REAR DISCONNECT - Continued

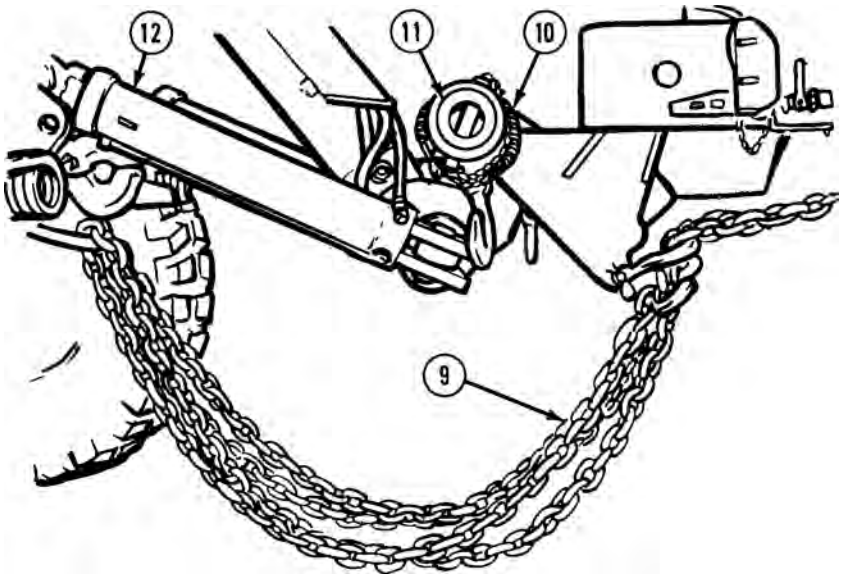
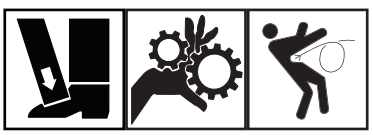


Figure 25.

10. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

11. Remove two hairpins (13) and 7/8 in. (22 mm) pins (14) from adapters (15).

REAR DISCONNECT - Continued

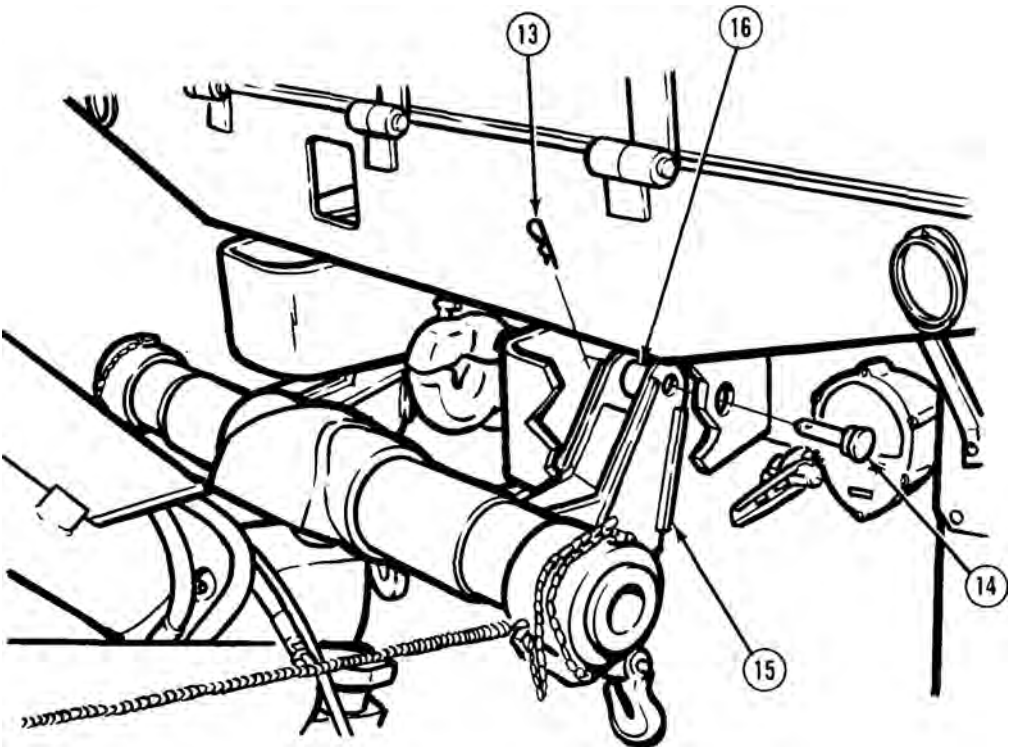


Figure 26.

12. Remove two adapters (15) from tow eyes (16) on disabled vehicle.
13. Install two hairpins (13) in 7/8 in. (22 mm) pins (14) and return to wrecker stowage.
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (10) from tow cylinders (12).

REAR DISCONNECT - Continued

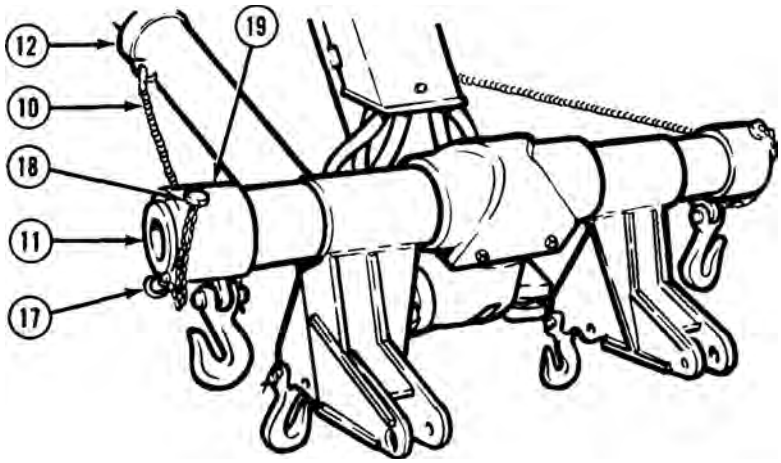


Figure 27.

16. Remove two quick pins (17) and pins (18) from end caps (19).
17. Remove two end caps (19) from cross tube (11).
18. Remove two 5 in. (127 mm) spacers (20) from cross tube (11) and return to wrecker stowage.
19. Remove two adapters (15) from cross tube (11) and place on equipment body floor (21).

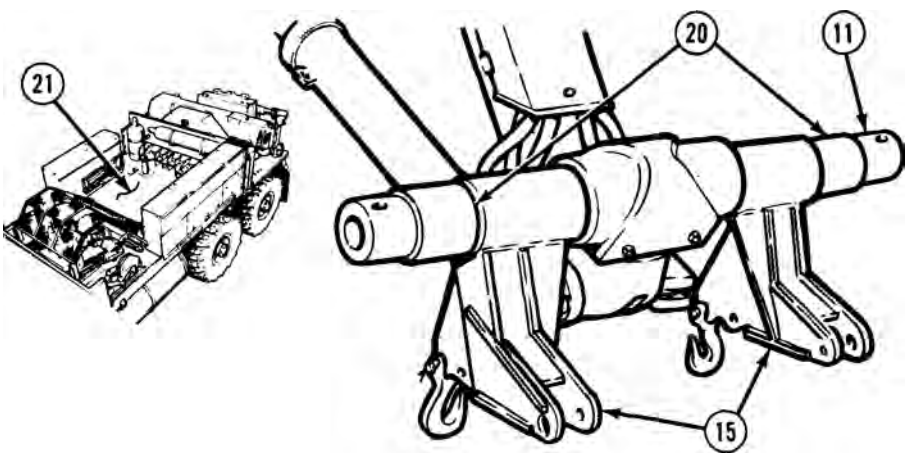


Figure 28.

REAR DISCONNECT - Continued

20. Remove lock handle (22), lock plate (23), quick pin (24), pin (25), and two front adapters (26).

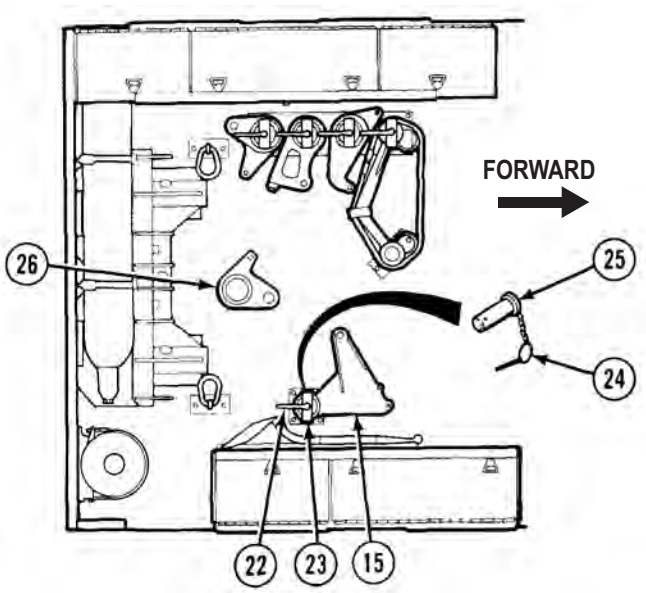


Figure 29.

21. Install two adapters (15) on body floor with pin (25), quick pin (24), lock plate (23), and lock handle (22).

22. Install two front adapters (26) on cross tube (11).

REAR DISCONNECT - Continued

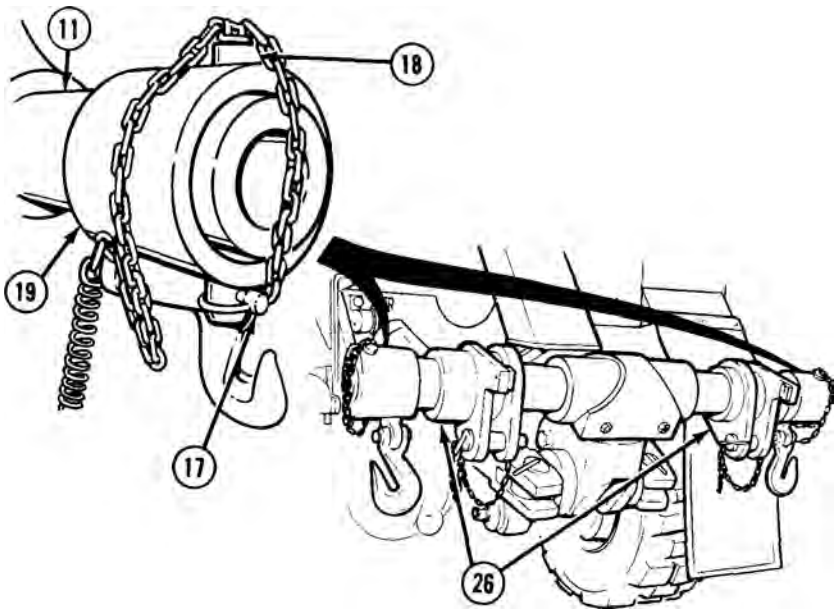


Figure 30.

23. Install two end caps (19) on cross tube (11).
24. Install two pins (18) and quick pins (17).
25. Install two springs (10) on tow cylinders (12).

REAR DISCONNECT - Continued

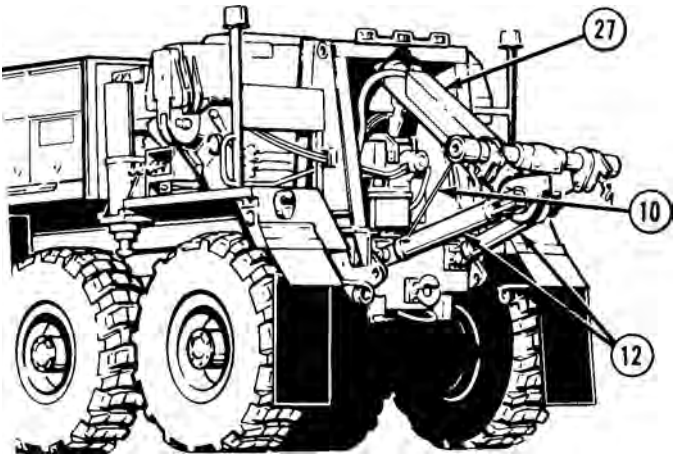


Figure 31.

26. Operate retrieval system, and fully retract lift cylinder (27) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two rear towing shackles (28), pins (29), and cotter pins (30).

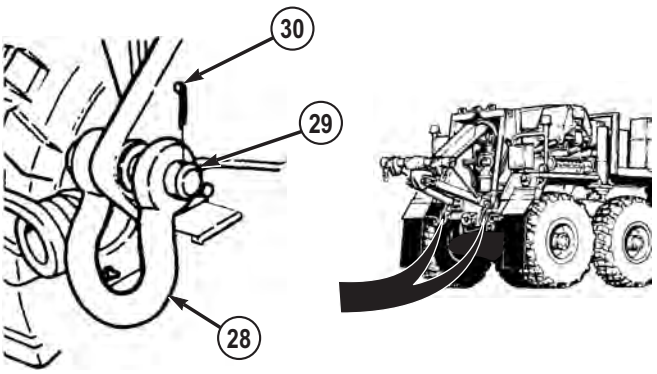


Figure 32.

28. Set POWER switch (31) to OFF position.

REAR DISCONNECT - Continued

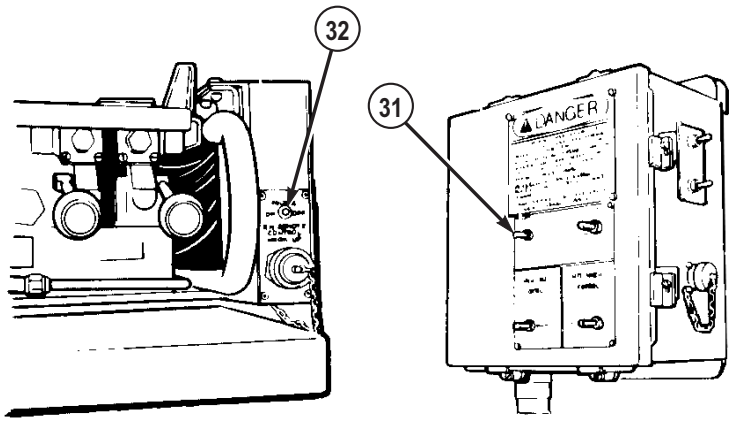


Figure 33.

29. Set POWER switch (32) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)
32. Set PTO ENGAGE switch (33) to OFF position. Indicator light (34) will go out.

REAR DISCONNECT - Continued

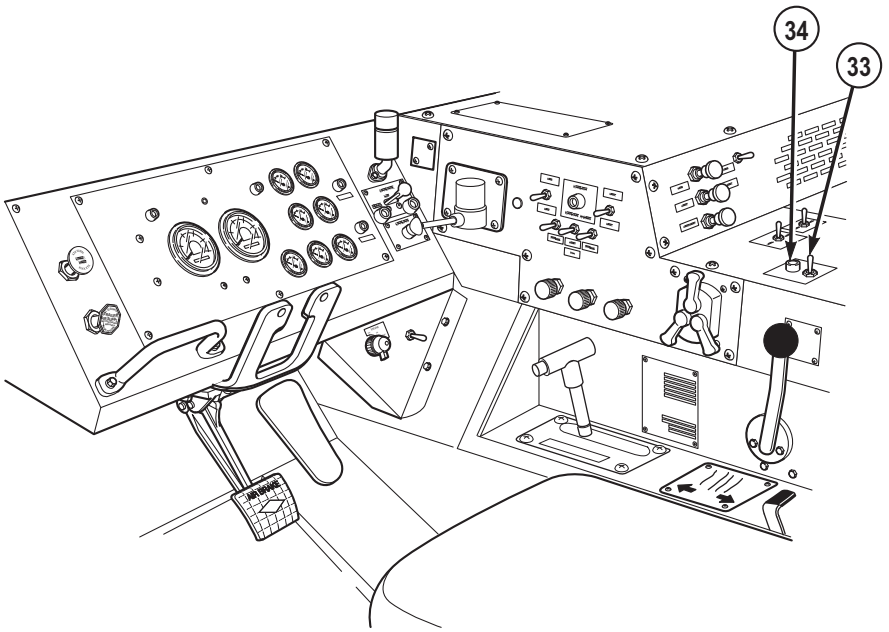


Figure 34.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M939 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

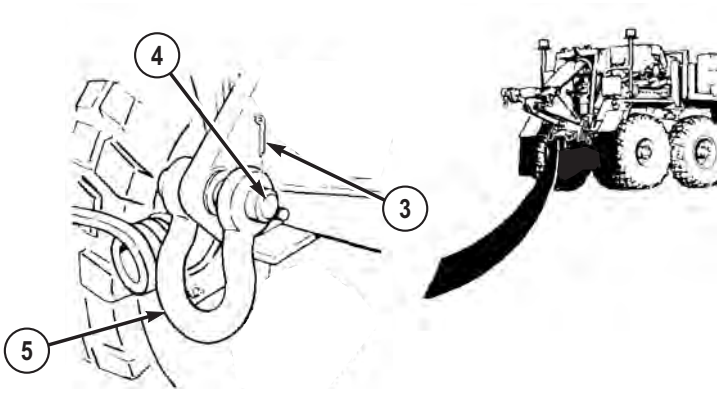


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

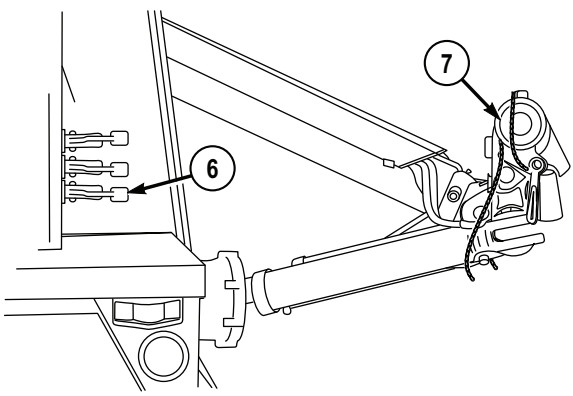


Figure 3.

5. Position wrecker so that cross tube (7) is centered and approximately 1 ft. (30 cm) from tow eyes of disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

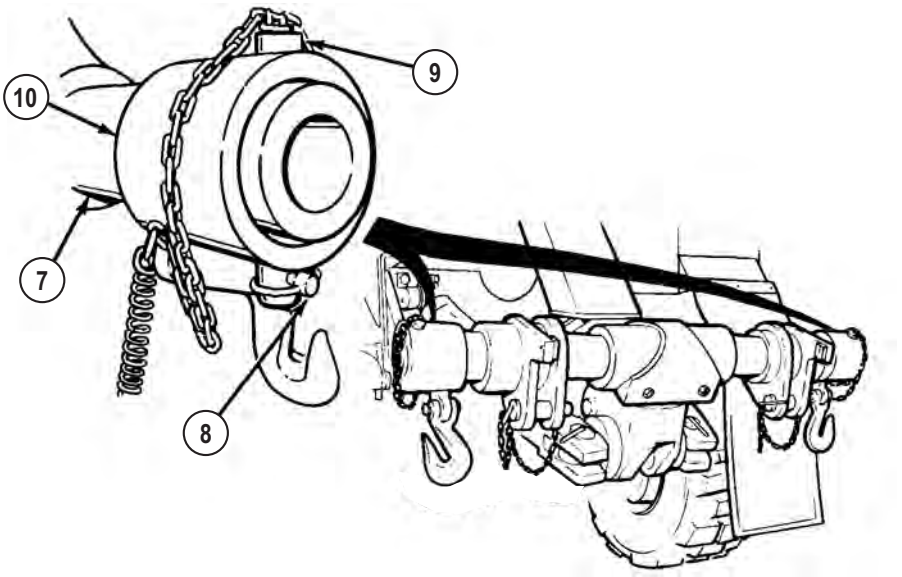


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

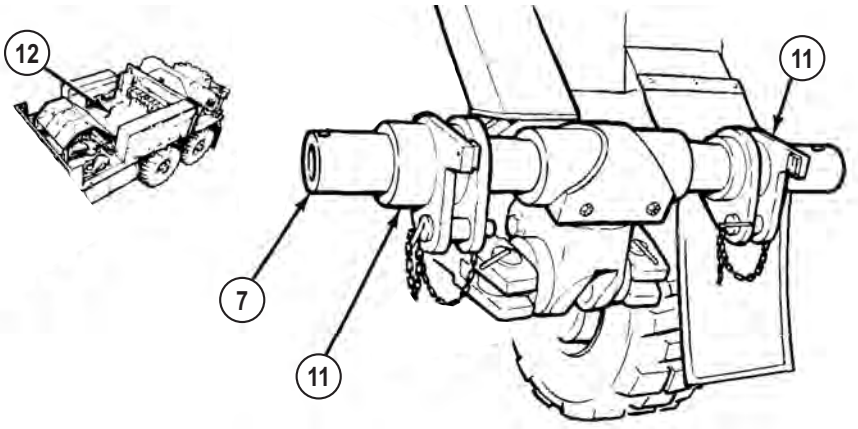


Figure 5.

9. Remove lock handle (13), lock plate (14), quick pin (15), pin (16), and two rear tow adapters (17).

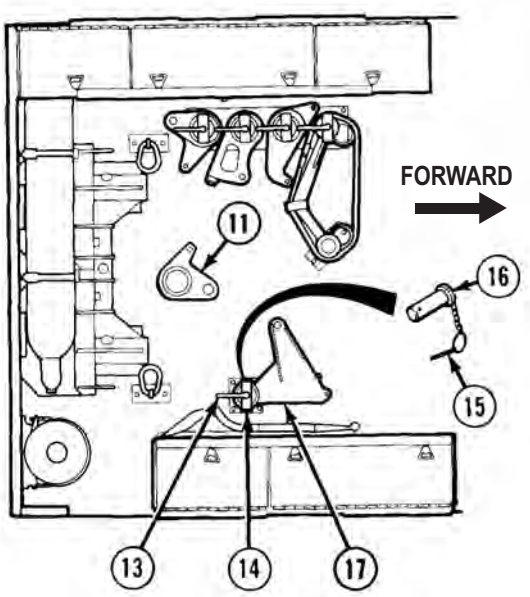
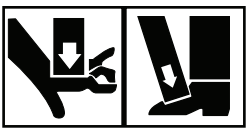


Figure 6.

HOOKUP - Continued

10. Install two front adapters (11) removed from cross tube, lock plate (14), lock handle (13), pin (16), and quick pin (15).
11. Remove two 7/8 in. (22 mm) pins and two 5 in. (127 mm) spacer tubes from wrecker stowage.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

12. Install two rear tow adapters (17) on cross tube (7) with support brace (18) to inside.

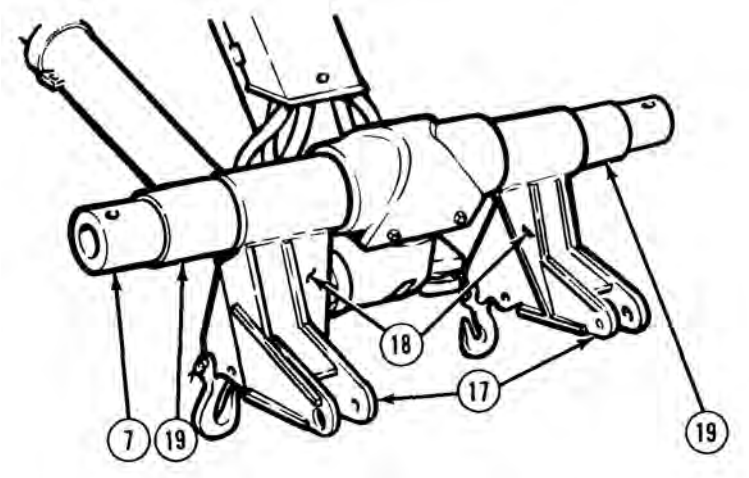


Figure 7.

13. Install two 5 in. (127 mm) spacers (19) on cross tube (7).
14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

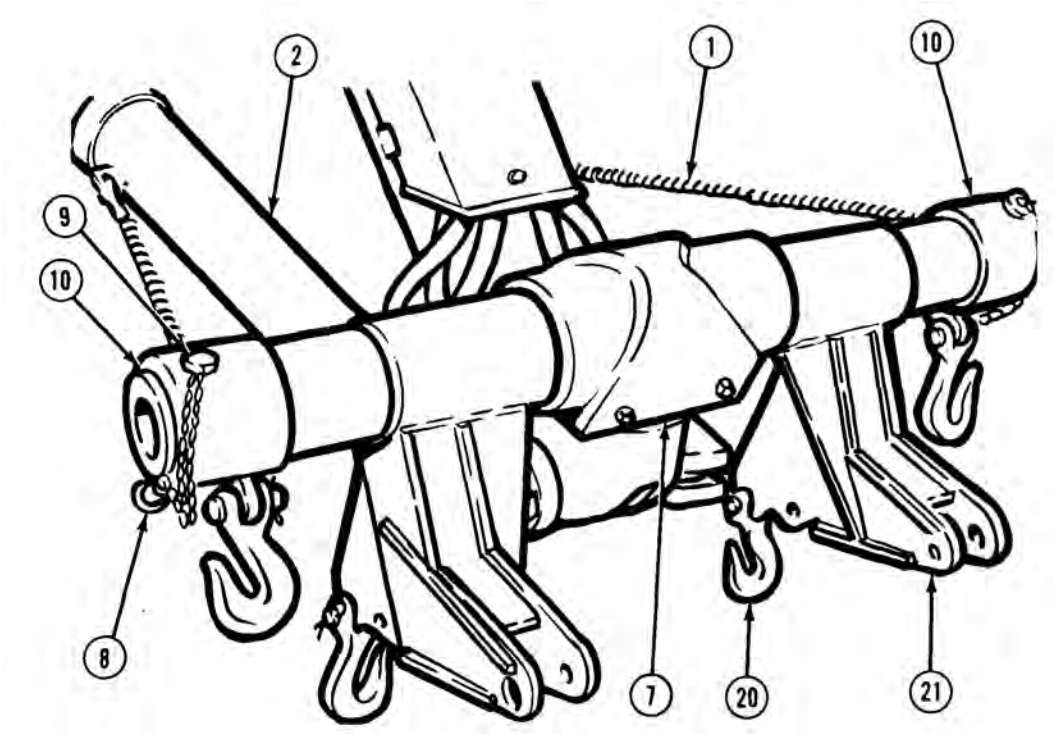


Figure 8.

15. Install two pins (9) and quick pins (8).

NOTE

Adapter grab hook may be installed in either hole. For M939, install grab hooks in hole farthest from towing pin holes.

16. Position adapter grab hooks (20) in hole farthest from pin holes (21).
17. Attach two springs (1) on tow cylinders (2).

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

18. Operate retrieval system (WP 0059) and with aid of an assistant position cross tube (7) so holes in adapters (17) align with rear tow eyes (22).

HOOKUP - Continued

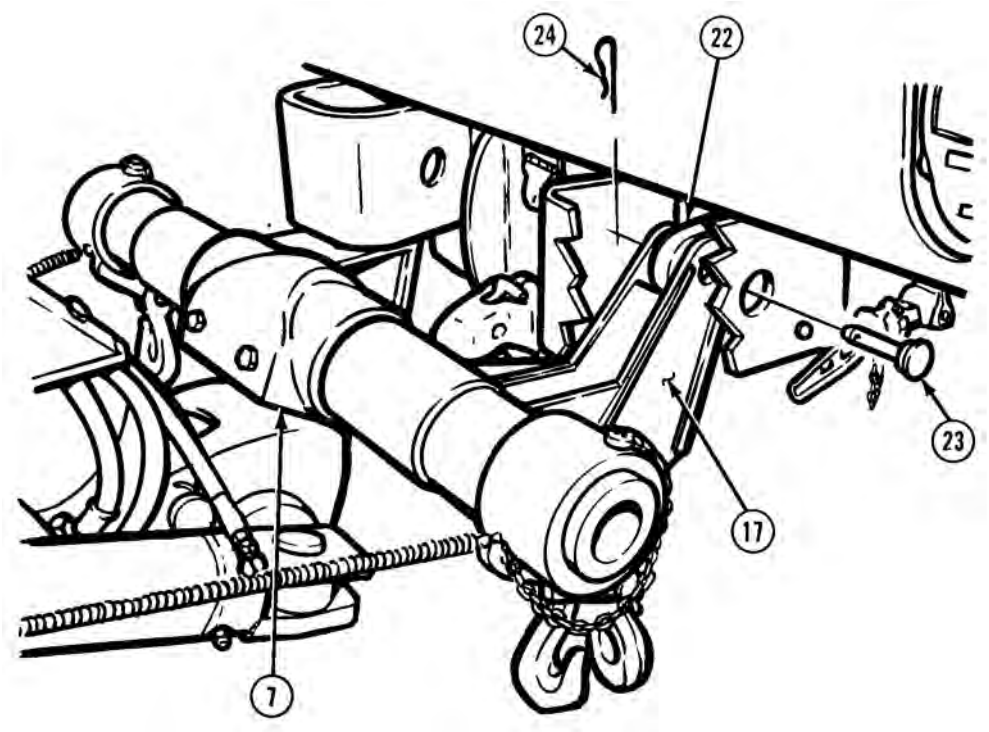


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

19. Insert two 7/8 in. (22 mm) pins (23) through adapters (17) and rear tow eyes (22).
20. Install two cotter pins (24) in 7/8 in. (22 mm) pins (23).
21. Lower cross tube (7) until adapters (17) contact rear crossmember (25) of disabled vehicle.

HOOKUP - Continued

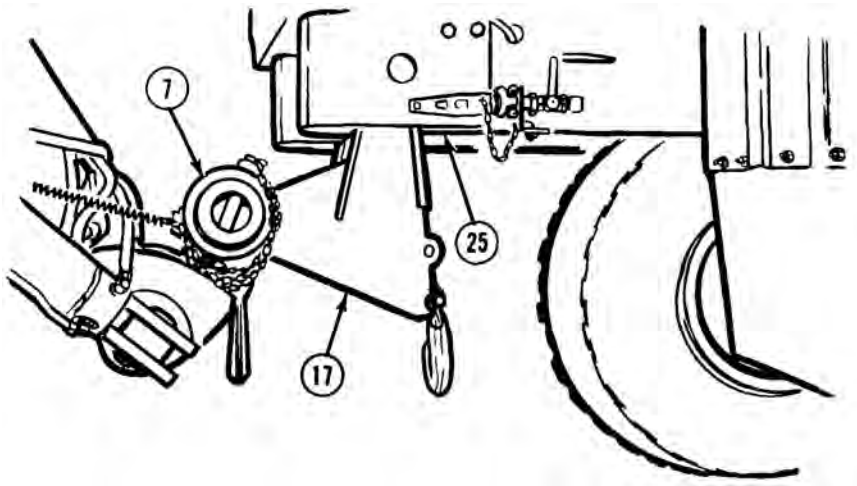


Figure 10.

22. Remove two 16 ft. (5 m) safety chains (26) from wrecker stowage.

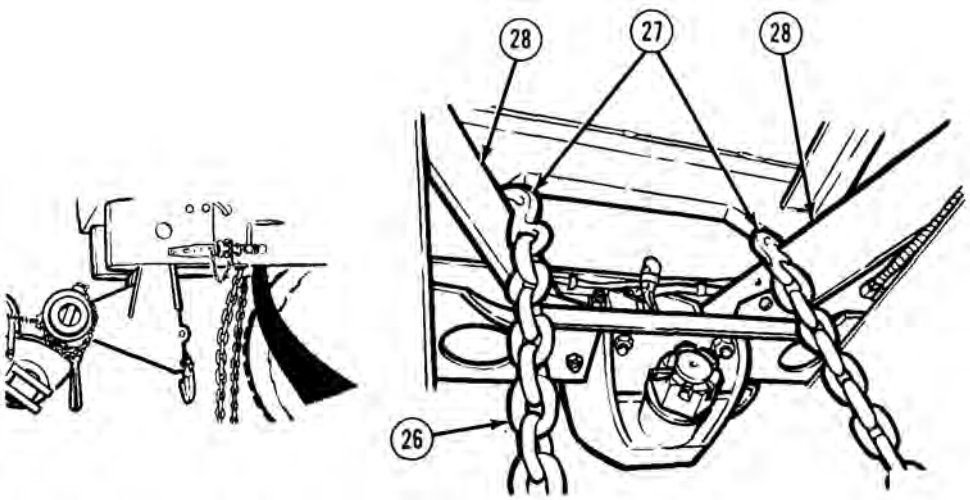


Figure 11.

23. Attach end (without safety shackle) of 16 ft. (5 m) safety chain grab hook (27) to support brace (28).

24. Repeat Step (23) for other side of disabled vehicle.

HOOKUP - Continued

25. Pull 16 ft. (5 m) safety chain (26) tight, and install 16 ft. (5 m) safety chain (26) on adapter grab hook (20).

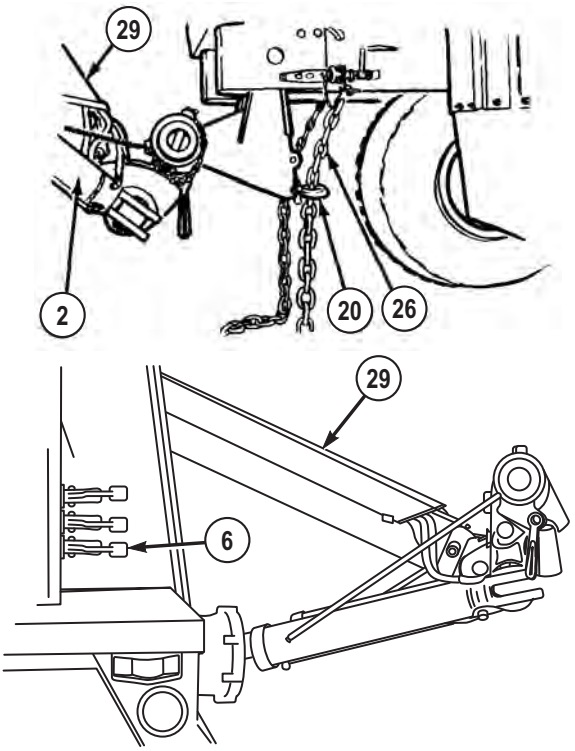


Figure 12.

26. Repeat Step (25) for other side of disabled vehicle.
27. Release PARKING BRAKE on disabled vehicle (refer to M939 operator's manual).
28. Operate retrieval system until tow cylinders (2) are fully retracted.
29. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (29) until slack is removed from safety chains (26).

NOTE

Adjust chain slack so 16 ft. (5 m) safety chains do not touch ground.

30. Route two 16 ft. (5 m) safety chains (26) through safety chain hoop (30) on wrecker, hook back into themselves, and secure grab hooks (31) with safety shackles (32).

HOOKUP - Continued

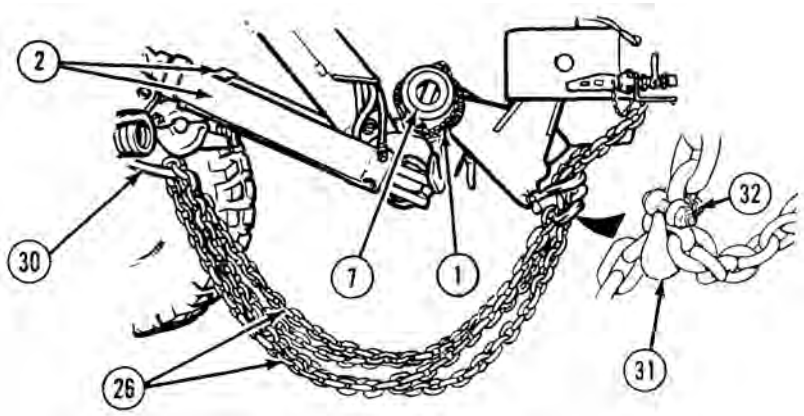


Figure 13.

31. Disconnect two springs (1) from tow cylinders (2), wrap around cross tube (7) and secure.

CAUTION

Ensure all cargo in bed of disabled vehicle is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

32. Prepare disabled vehicle for towing (refer to M939 operator's manual).
33. Remove emergency tow lights (33) and two brackets (34) from wrecker stowage.

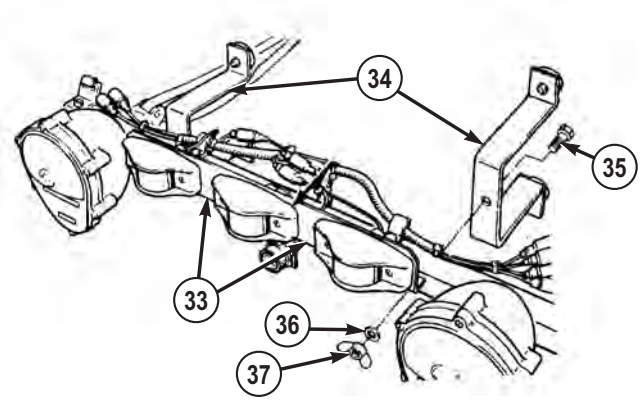


Figure 14.

HOOKUP - Continued

34. Install two brackets (34) in center holes of emergency tow lights (33) with two screws (35), washers (36), and nuts (37).
35. Install emergency tow lights (33) on front of M939 and fasten securely with straps (38).

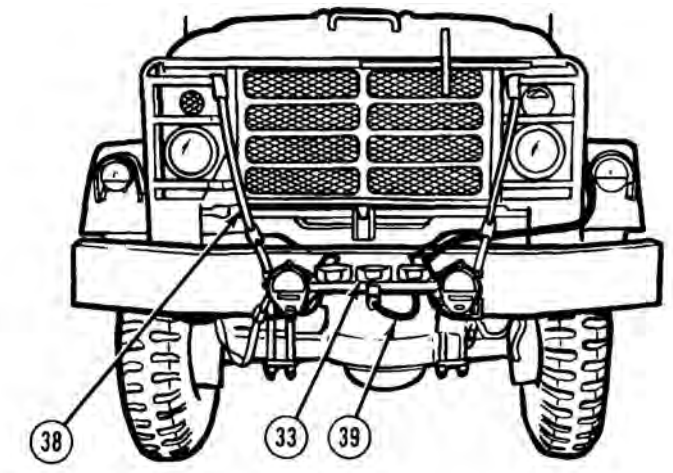


Figure 15.

36. Remove tow light cable (39) from wrecker stowage and connect to emergency tow lights (33).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

37. Route free end of tow light cable (39) along disabled vehicle and connect to rear electrical connector (40) on wrecker.

HOOKUP - Continued

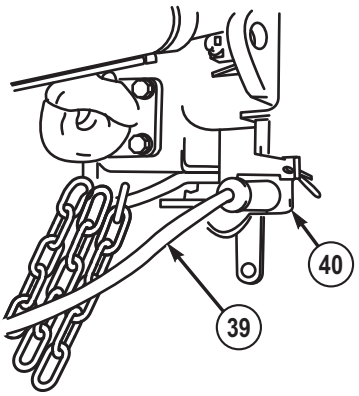


Figure 16.

38. Lock disabled vehicle's steering (refer to M939 operator's manual).
39. Set POWER switch (41) to ON position.

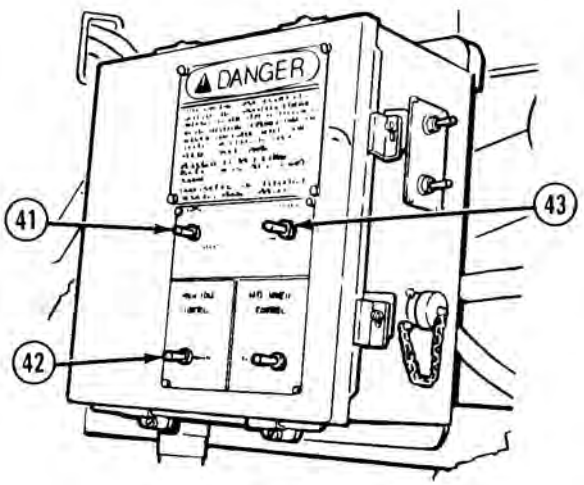


Figure 17.

40. Set HIGH IDLE switch (42) to CONTINUOUS.
41. Push and release LATCH switch (43). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

42. Operate retrieval system to retract lift cylinder (29) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

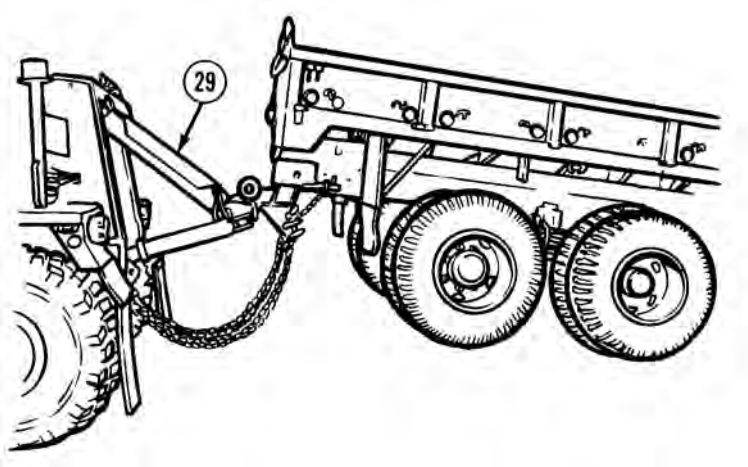


Figure 18.

43. Set POWER switch (41) to OFF position.

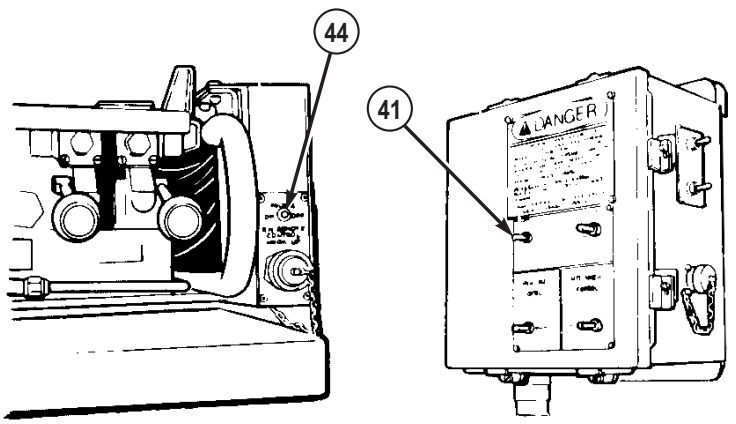


Figure 19.

44. Set POWER switch (44) to OFF position.
45. Set PTO ENGAGE switch (45) to OFF position. Indicator light (46) will go out.

HOOKUP - Continued

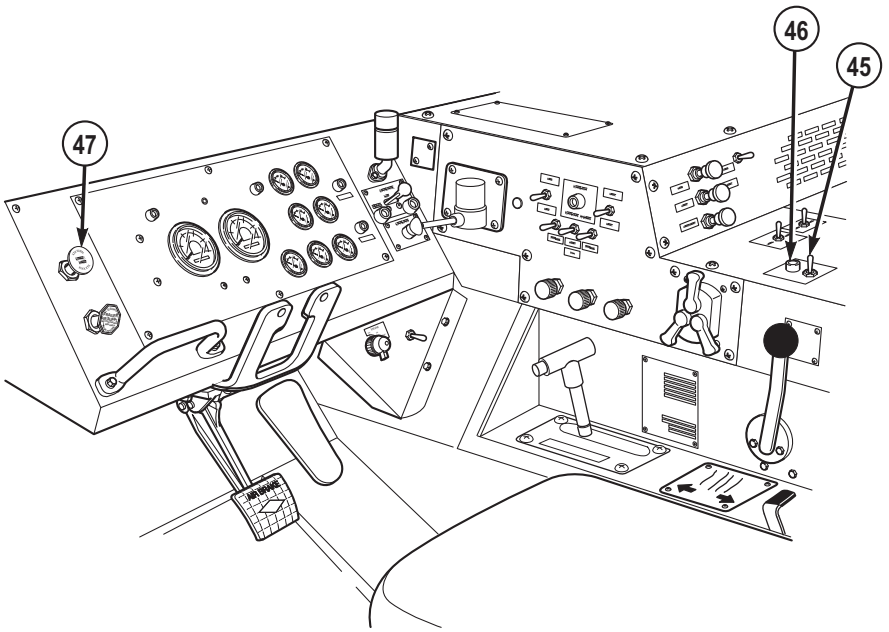


Figure 20.

46. Turn on wrecker service drive lights. (WP 0090)
47. Turn on wrecker emergency flashers. (WP 0099)
48. Turn on disabled vehicle emergency flashers (refer to operator's manual).
49. Push in PARKING BRAKE control (47).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

50. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

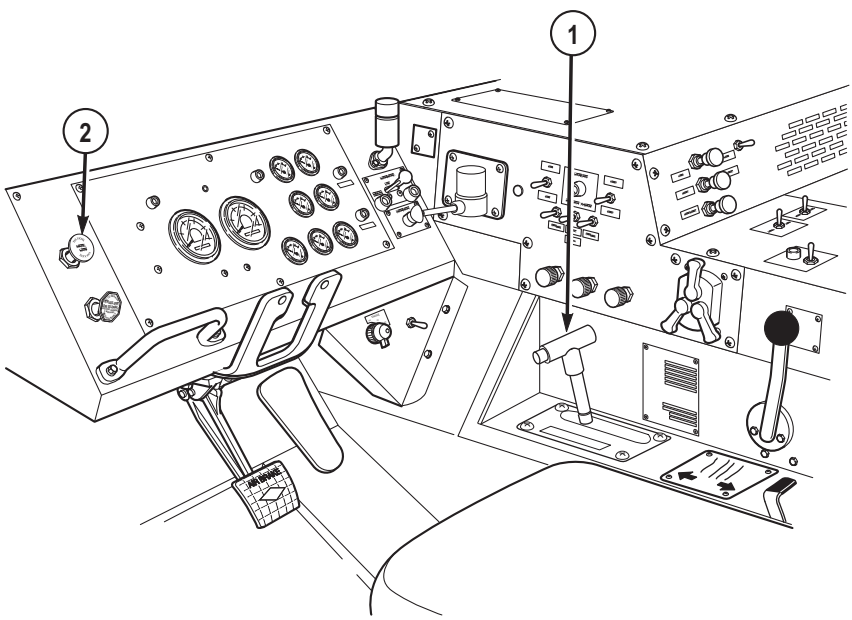


Figure 21.

2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058)prepare retrieval system for operation, (WP 0059) and lower disabled vehicle until 16 ft. (5 m) safety chains are slack at rear of disabled vehicle.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

DISCONNECT - Continued

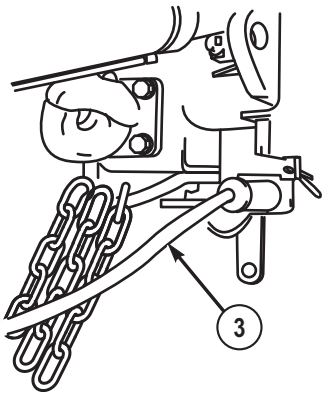


Figure 22.

6. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

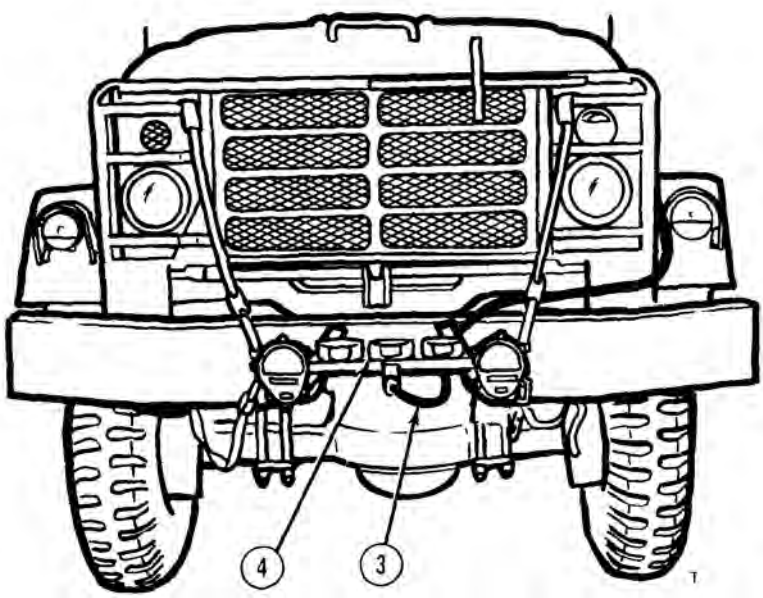


Figure 23.

7. Remove emergency tow lights (4) from disabled vehicle.

DISCONNECT - Continued

8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and two brackets to wrecker stowage.

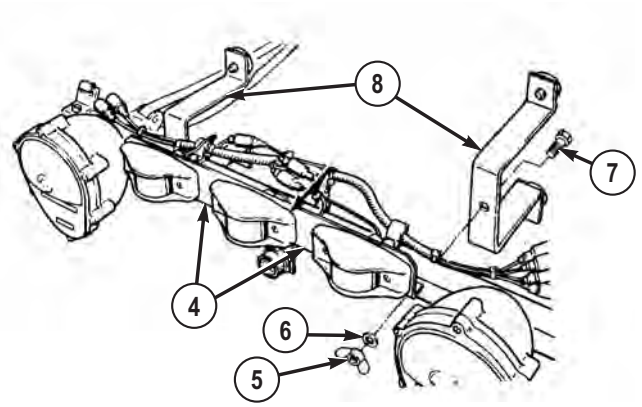


Figure 24.

9. Remove and stow two 16 ft. (5 m) safety chains (9).

DISCONNECT - Continued

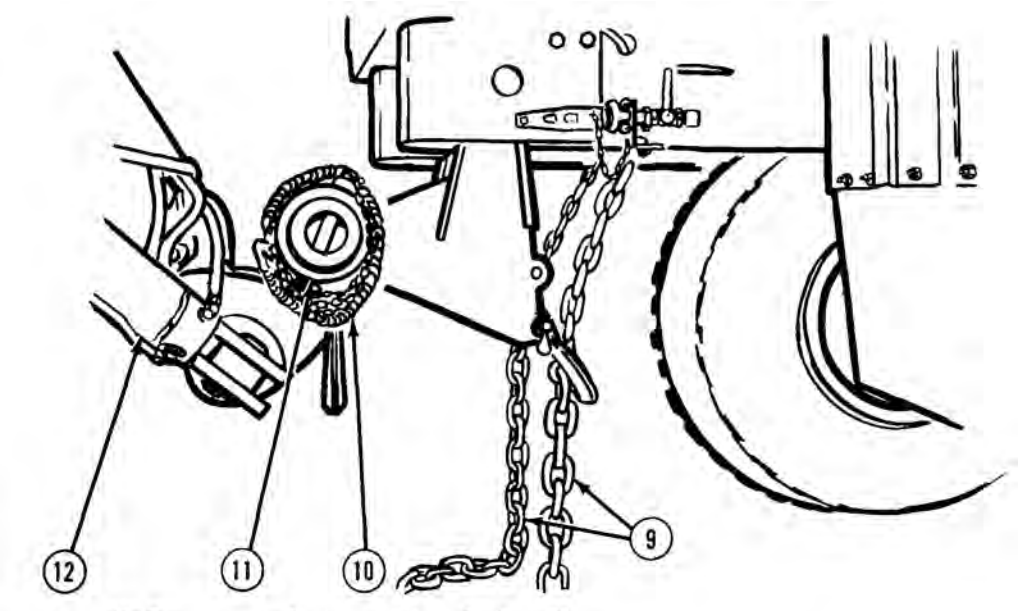
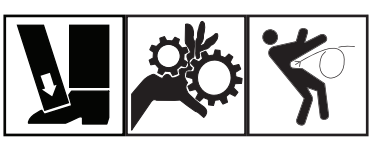


Figure 25.

10. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

11. Remove two cotter pins (13) and 7/8 in. (22 mm) pins (14) from adapters (15).

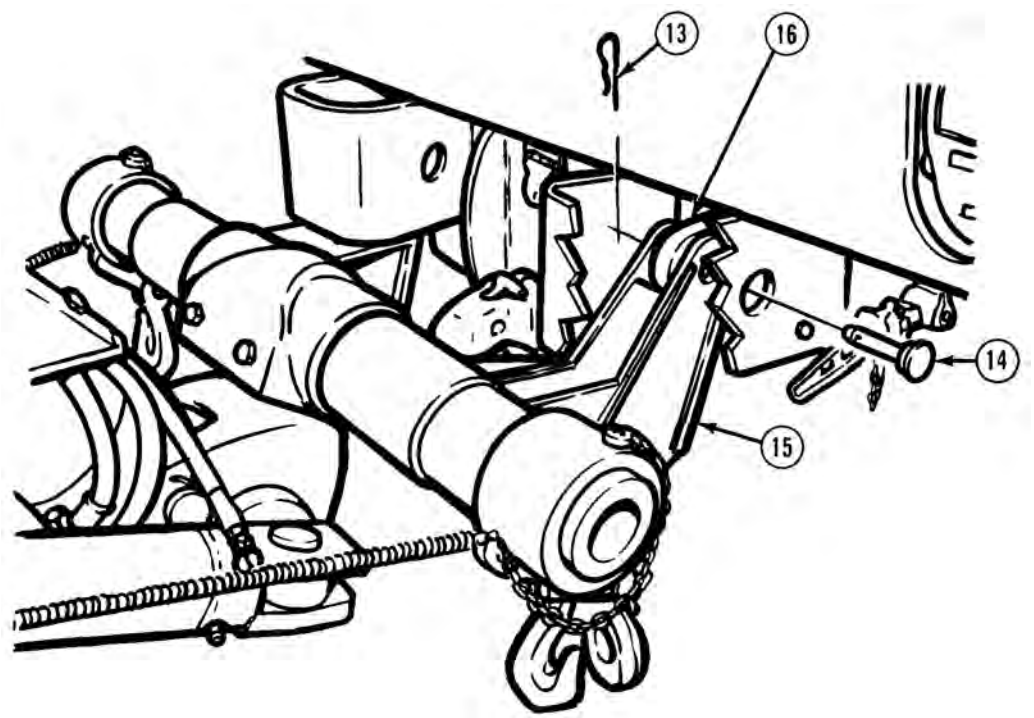


Figure 26.

12. Remove two adapters (15) from tow eyes (16) on disabled vehicle.
13. Install two cotter pins (13) in 7/8 in. (22 mm) pins (14) and return to wrecker stowage.
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

DISCONNECT - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (10) from tow cylinders (12).

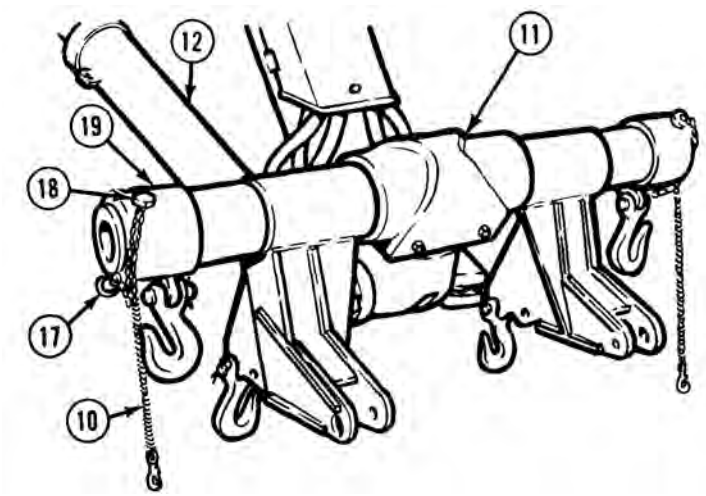


Figure 27.

16. Remove two quick pins (17) and pins (18) from end caps (19).
17. Remove two end caps (19) from cross tube (11).

DISCONNECT - Continued

18. Remove two 5 in. (127 mm) spacers (20) from cross tube (11) and return to wrecker stowage.

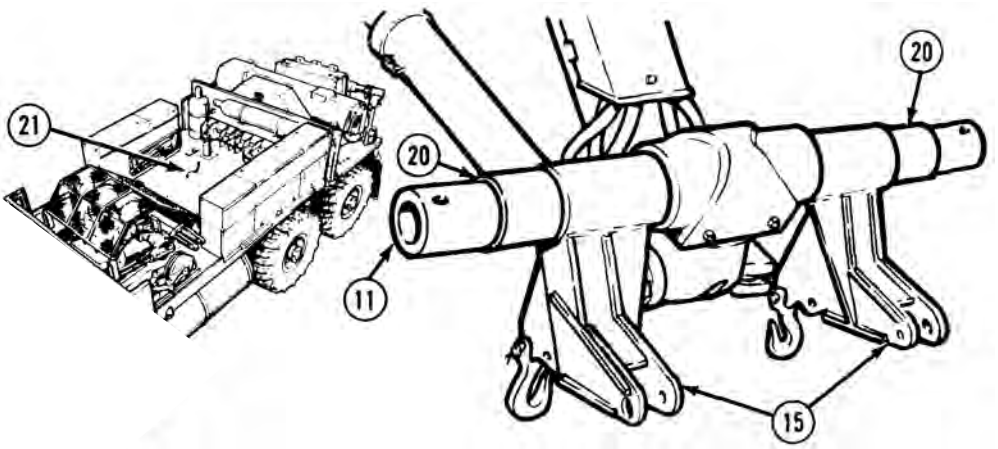


Figure 28.

19. Remove two adapters (15) from cross tube (11) and place on equipment body floor (21).
20. Remove lock handle (22), lock plate (23), quick pin (24), pin (25), and two front adapters (26).

DISCONNECT - Continued

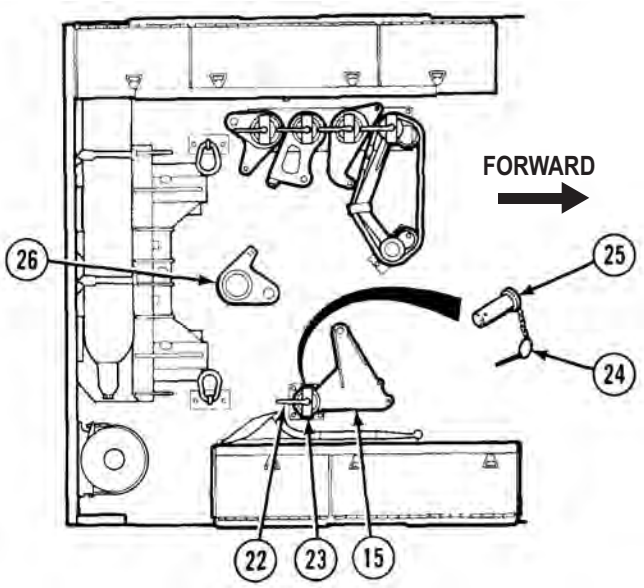


Figure 29.

21. Install two adapters (15) on body floor with pin (25), quick pin (24), lock plate (23), and lock handle (22).

22. Install two front adapters (26) on cross tube (11).

DISCONNECT - Continued

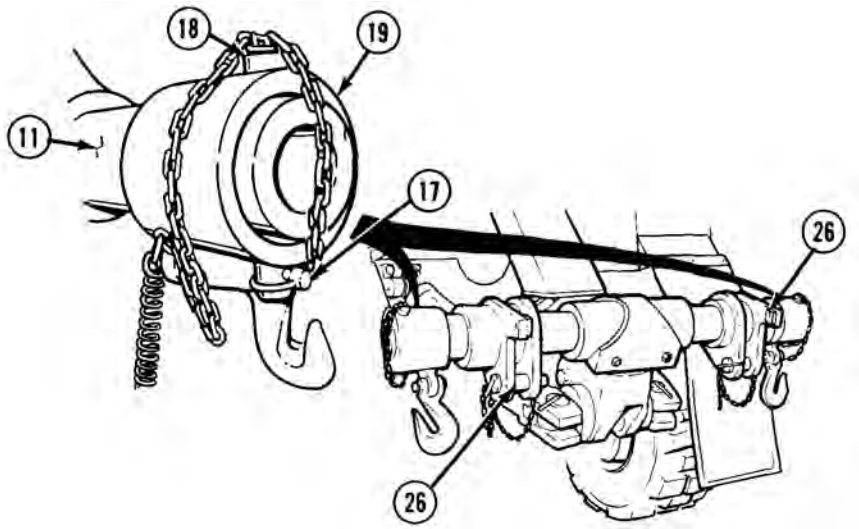


Figure 30.

23. Install two end caps (19) on cross tube (11).
24. Install two pins (18) and quick pins (17).
25. Install two springs (10) on tow cylinders (12).

DISCONNECT - Continued

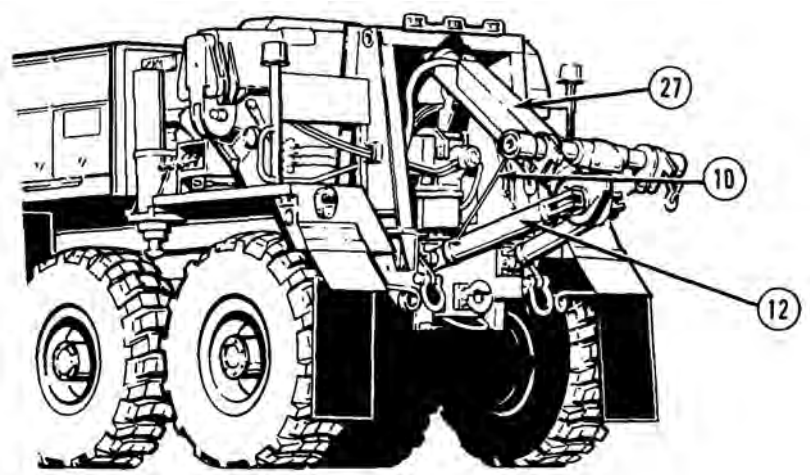


Figure 31.

26. Operate retrieval system, and fully retract lift cylinder (27) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two rear towing shackles (28), pins (29), and cotter pins (30).

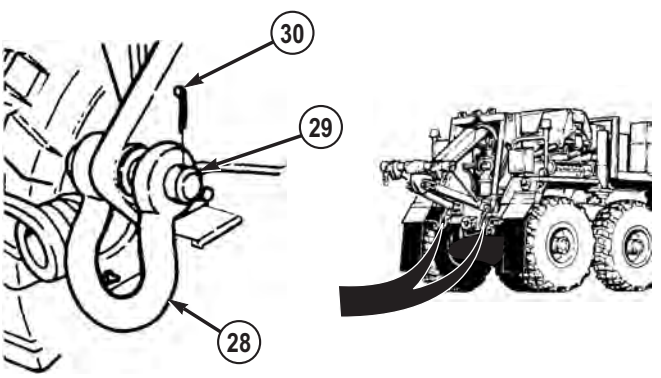


Figure 32.

28. Set POWER switch (31) to OFF position.

DISCONNECT - Continued

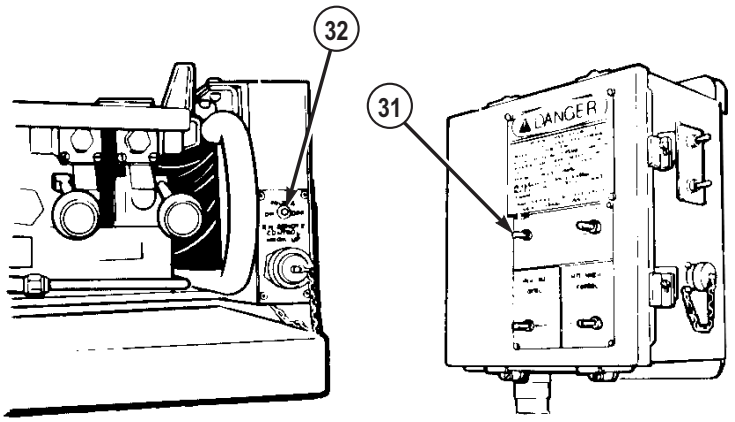


Figure 33.

29. Set POWER switch (32) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)
32. Set PTO ENGAGE switch (33) to OFF position. Indicator light (34) will go out.

DISCONNECT - Continued

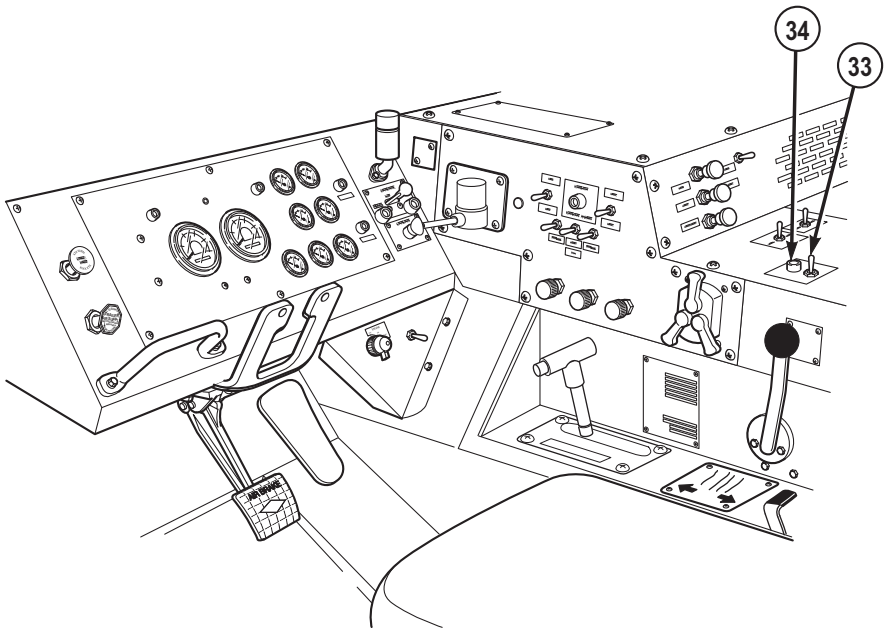


Figure 34.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1008 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

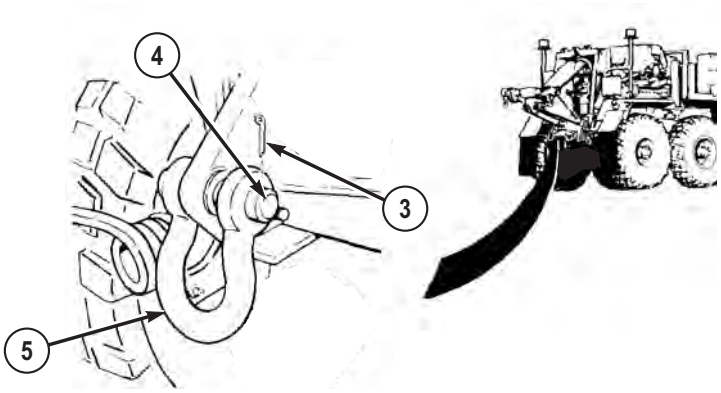


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

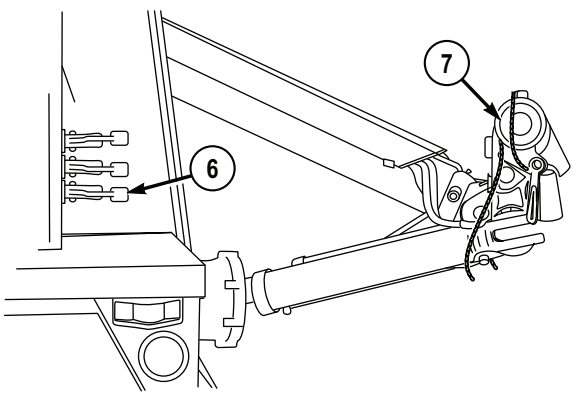


Figure 3.

5. Position wrecker so that cross tube (7) is centered and approximately 1 ft. (30 cm) from tow eyes of disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

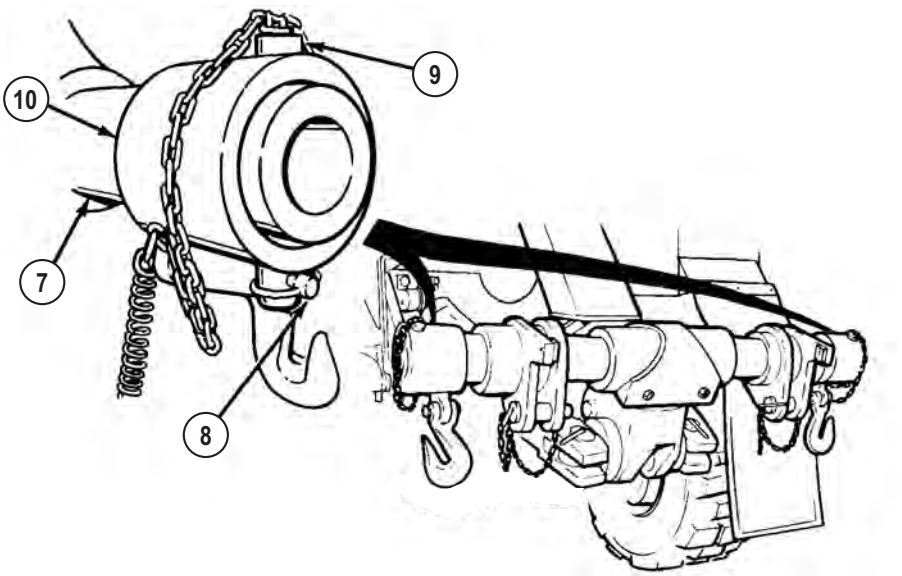


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

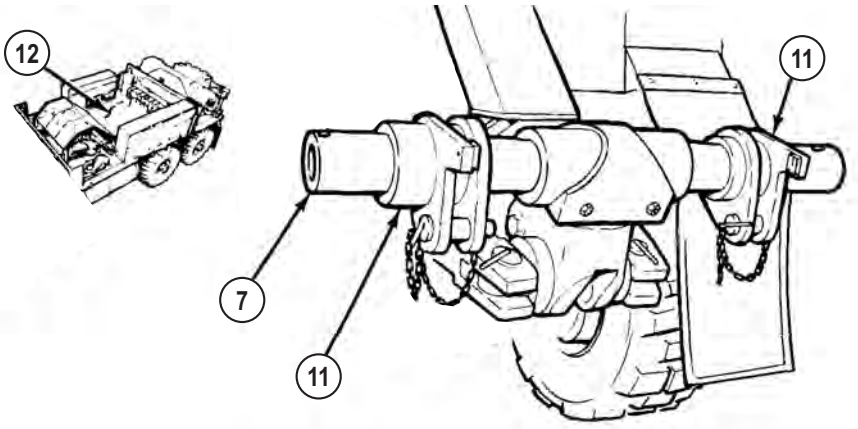


Figure 5.

9. Remove lock handle (13), lock plate (14), and two adapters (15).

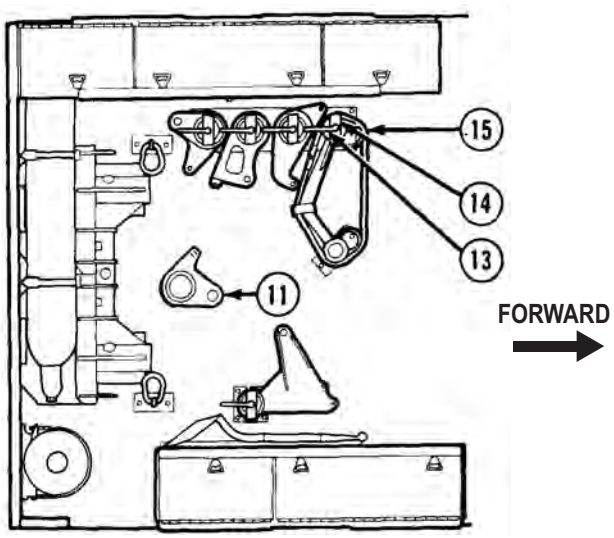


Figure 6.

10. Install two front adapters (11) removed from cross tube (7), with lock plate (14), and lock handle (13).

HOOKUP - Continued

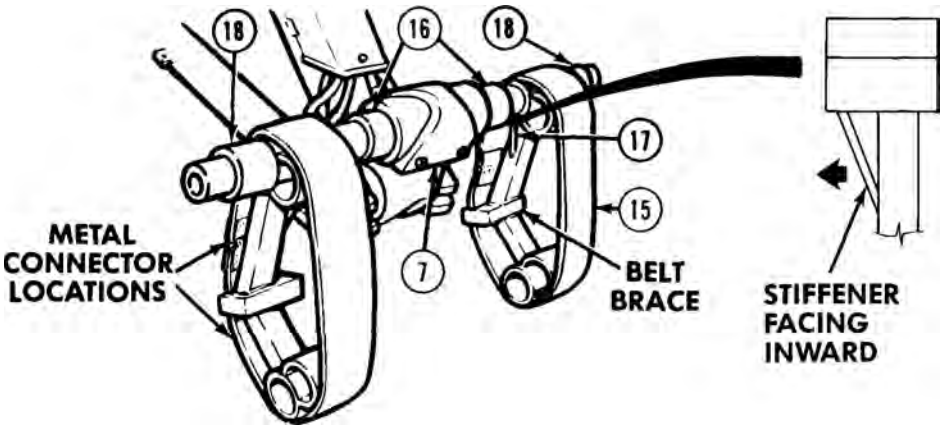


Figure 7.

11. Remove two 4 in. (102 mm) spacers (16) and two 5 in. (127 mm) spacers (18) from wrecker stowage.
12. Install two 4 in. (102 mm) spacers (16) on cross tube (7).

NOTE

Ensure metal connection is located on either side of belt brace and does not touch metal parts of adapters.

13. Install two adapters (15) on cross tube (7) with stiffener (17) facing inward.
14. Install two 5 in. (127 mm) spacers (18) on cross tube (7).

NOTE

End caps will hang over end of cross tube.

15. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

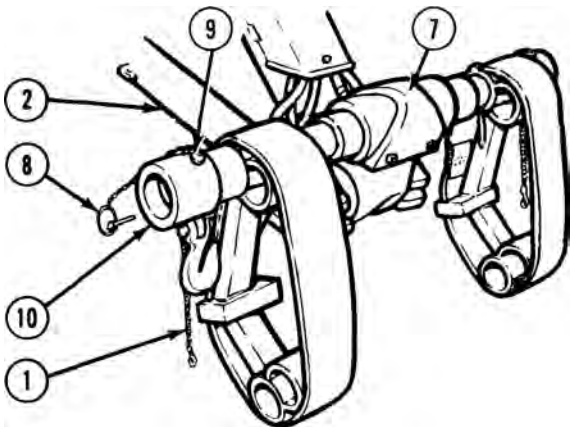


Figure 8.

16. Install two pins (9) and quick pins (8).
17. Attach two springs (1) on tow cylinders (2).
18. Operate retrieval system (WP 0059) to extend both tow cylinders (2) 2 in. (50 mm) and lower lift cylinder (19) until adapters (15) are approximately 6 in. (150 mm) from ground.

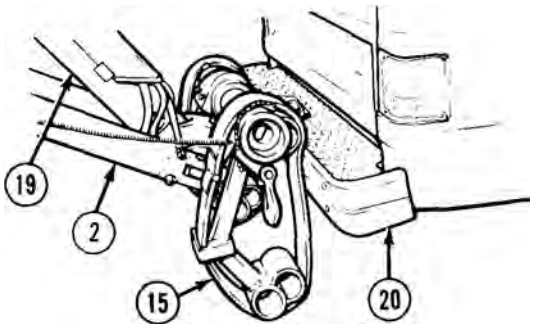


Figure 9.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

19. Position wrecker so adapters (15) contact rear bumper (20) of disabled vehicle and are centered.

HOOKUP - Continued

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

CAUTION

Do not contact pintle hook with lift cylinders. Failure to comply may result in damage to equipment.

20. Operate retrieval system, (WP 0059) and with aid of an assistant guide adapters (15) down and under disabled vehicle's rear bumper (20) until belt brace (21) aligns with rear edge of bumper (shown).

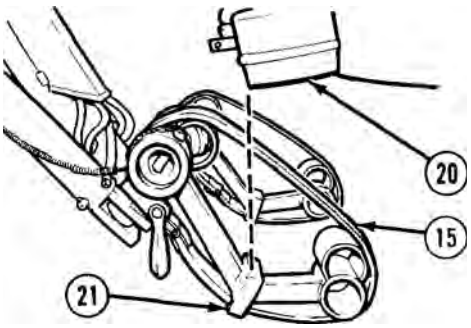


Figure 10.

NOTE

All four 12 ft. (3.6 m) chains are the same.

21. Remove four 12 ft. (3.6 m) chains (22) from wrecker stowage

HOOKUP - Continued

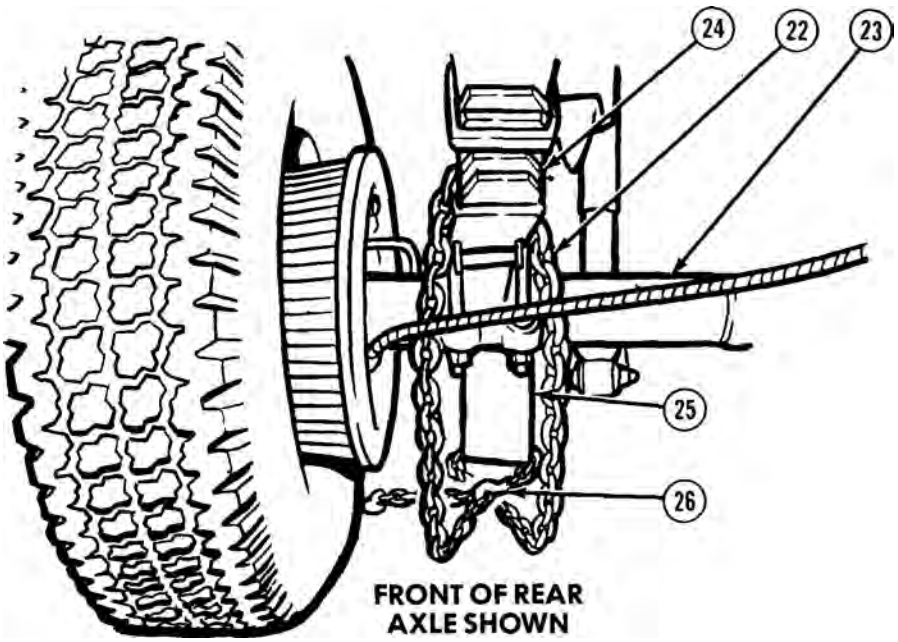


Figure 11.

CAUTION

Do not allow brake cable to become pinched by 12 ft. (3.6 m) tow chains. Failure to comply may result in damage to equipment.

NOTE

12 ft. (3.6 m) tow chains should be crossed and looped around rear leaf spring shackle bolts.

22. Route 12 ft. (3.6 m) tow chain (22) in front of rear axle (23) and loop over leaf spring (24) on disabled vehicle.
23. Route 12 ft. (3.6 m) tow chain (22) through lower adapter tube (25). Attach grab hook (26) to 12 ft. (3.6 m) tow chain (22) approximately 9 links from grab hook on other end of 12 ft. (3.6 m) tow chain (22).
24. Repeat Steps (22) and (23) for other side of disabled vehicle.
25. Release disabled vehicle's parking brake and place transmission in neutral (refer to M1008 operator's manual).

HOOKUP - Continued

26. Operate retrieval system (WP 0059) and retract tow cylinders (2) and lift cylinder (19) until adapters (15) are positioned tight against rear bumper (20) with tow eyes (27) between adapters and fully retracted tow cylinders (2).

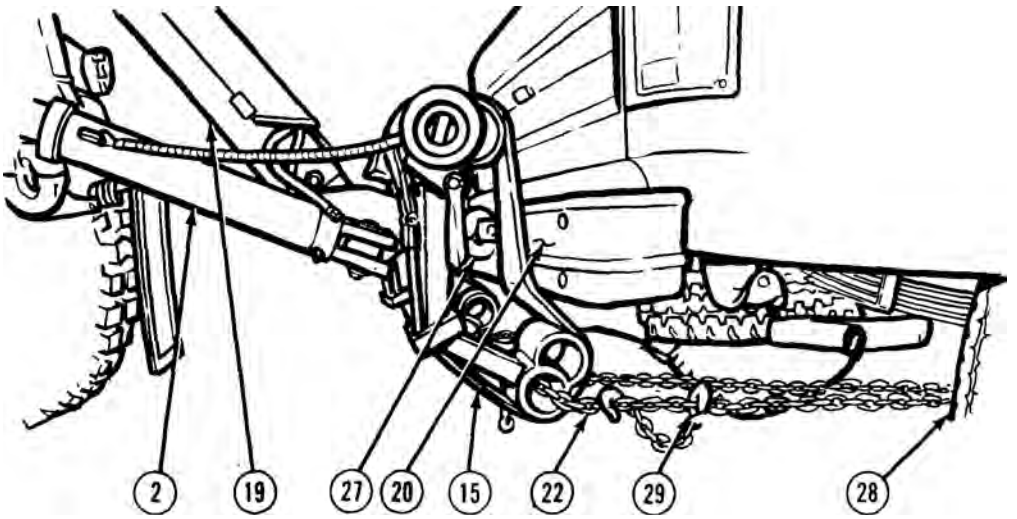


Figure 12.

CAUTION

Ensure tow chain does not contact rear leaf spring shackle bolts. Failure to comply may result in damage to equipment.

NOTE

12 ft. (3.6 m) tow chain should be adjusted to allow strap adapters to lift evenly.

27. Raise disabled vehicle until rear tires (28) are approximately 6 in. (150 mm) above ground.
28. Lower disabled vehicle until rear tires (28) contact ground, but 12 ft. (3.6 m) tow chains (22) remain tight.
29. Attach grab hooks (29) to 12 ft. (3.6 m) tow chains (22).

NOTE

Passenger side of disabled vehicle is opposite from passenger side of wrecker.

HOOKUP - Continued

30. Route 12 ft. (3.6 m) tow chain (30) through right adapter brace (18) and through right chain hole (31) on disabled vehicle.

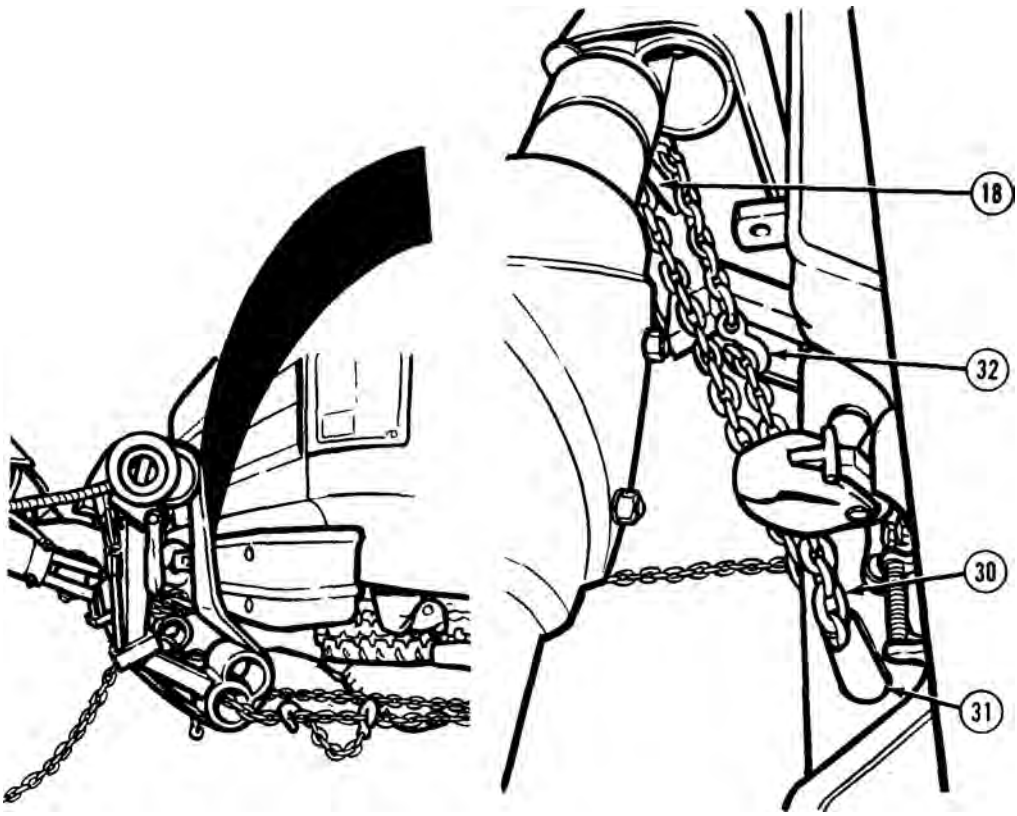


Figure 13.

31. Pull 12 ft. (3.6 m) tow chain (30) tight, and attach grab hook (32) to 12 ft. (3.6 m) tow chain (30).

32. Repeat Steps (30) and (31) for other side of disabled vehicle.

NOTE

- Adjust chain slack so cross chains just touch the ground.
- Cross chains will act as safety chains when connected to wrecker.

33. Route two 12 ft. (3.6 m) cross chains (30) through safety chain hoop (33) on wrecker and secure grab hooks (34) with safety shackle (35).

HOOKUP - Continued

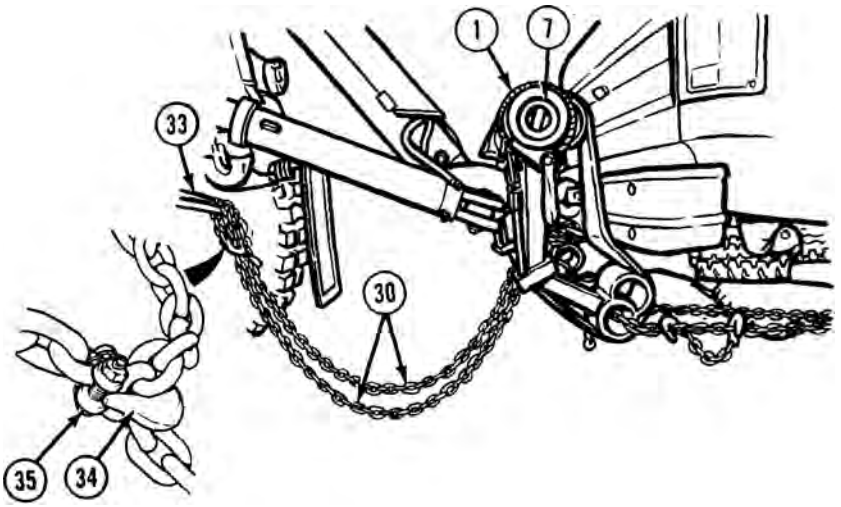


Figure 14.

34. Wrap two springs (1) around cross tube (7) and secure.
35. Prepare disabled vehicle for towing (refer to M1008 operator's manual).
36. Remove emergency tow lights (36) and two brackets (37) from wrecker stowage.

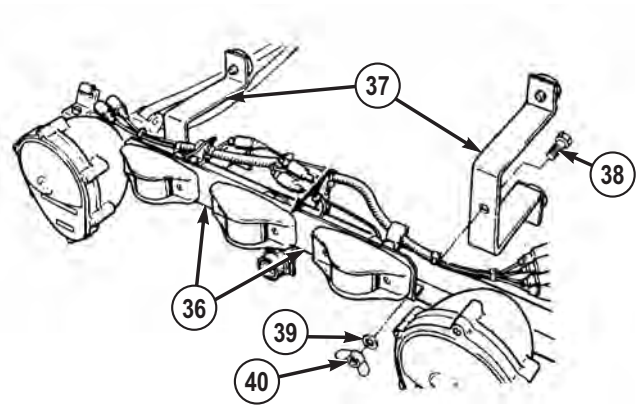


Figure 15.

37. Install two brackets (37) in center holes of emergency tow lights with two screws (38), washers (39), and nuts (40).

HOOKUP - Continued

38. Install emergency tow lights (36) on front of disabled vehicle and fasten securely with straps (41).

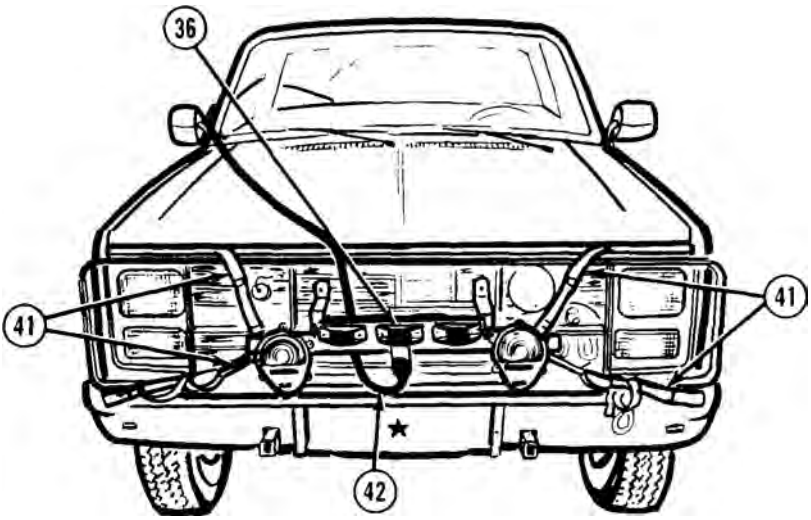


Figure 16.

39. Remove tow light cable (42) from wrecker stowage and connect to emergency tow lights (36).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

40. Route free end of tow light cable (42) along disabled vehicle and connect to rear electrical connector (43) on wrecker.

HOOKUP - Continued

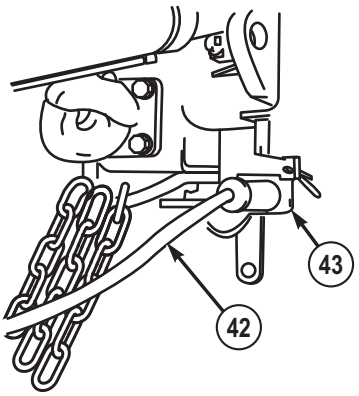


Figure 17.

41. Set POWER switch (44) to ON position.

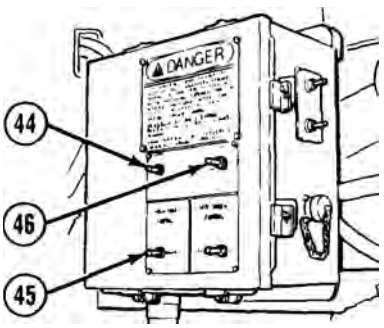


Figure 18.

42. Set HIGH IDLE switch (45) to CONTINUOUS.
43. Push and release LATCH switch (46). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

HOOKUP - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

44. Operate retrieval system (WP 0059) to retract lift cylinder (19) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

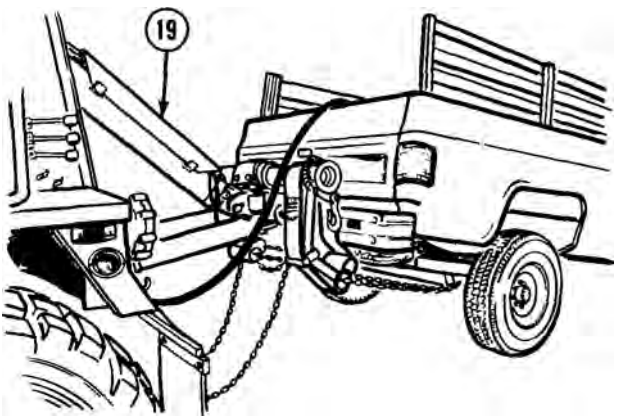


Figure 19.

45. Set POWER switch (44) to OFF position.

HOOKUP - Continued

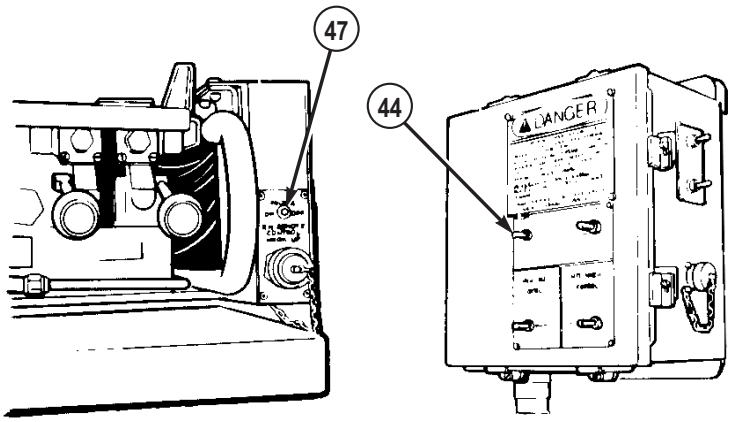


Figure 20.

46. Set POWER switch (47) to OFF position.
47. Set PTO ENGAGE switch (48) to OFF position. Indicator light (49) will go out.

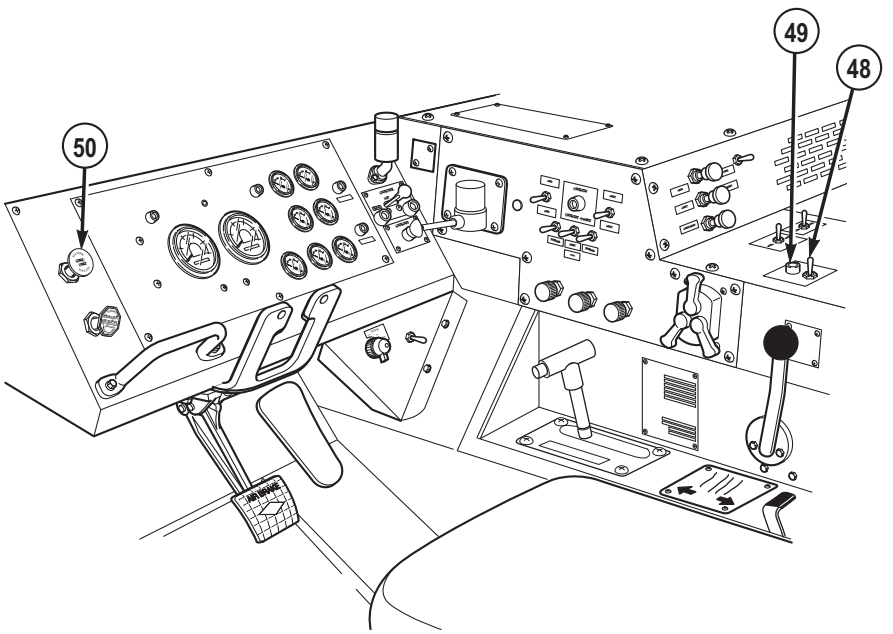


Figure 21.

48. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

49. Turn on wrecker emergency flashers. (WP 0099)
50. Turn on disabled vehicle emergency flashers (refer to operator's manual).
51. Push in PARKING BRAKE control (50).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

52. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

DISCONNECT - Continued

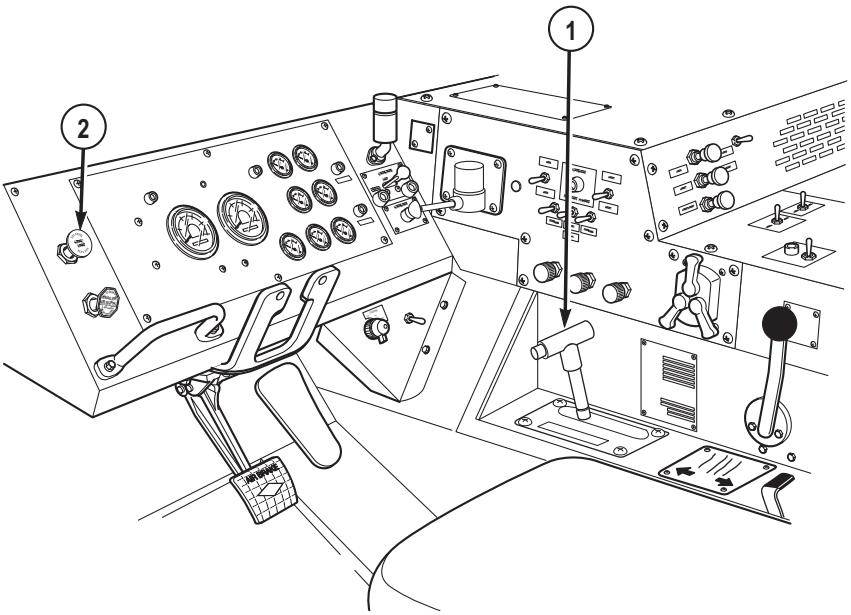


Figure 22.

2. Pull out PARKING BRAKE control (2).

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058)prepare retrieval system for operation, (WP 0059) and lower disabled vehicle to ground, but allowing 12 ft. (3.6 m) tow chains to remain tight.

DISCONNECT - Continued

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

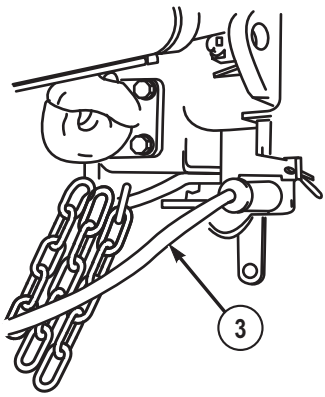


Figure 23.

6. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

DISCONNECT - Continued

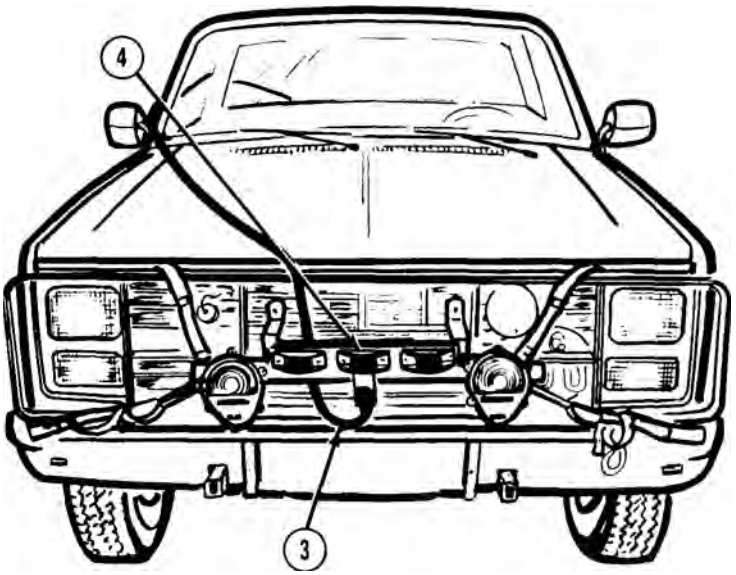


Figure 24.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and two brackets to wrecker stowage.

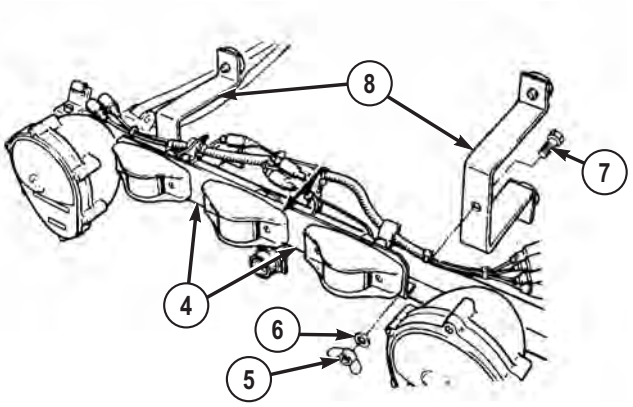


Figure 25.

9. Remove and stow two 12 ft. (3.6 m) tow chains (9).

DISCONNECT - Continued

10. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

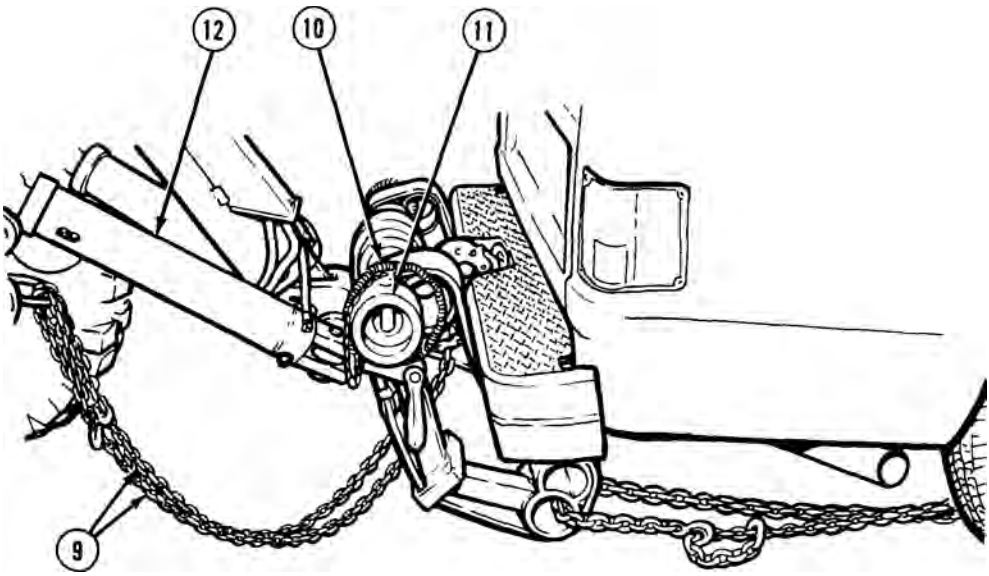


Figure 26.

CAUTION

Do not contact pintle hook with lift cylinder or damage to equipment could result.

11. Operate retrieval system to extend tow cylinders (12) and lift cylinder (13) until 12 ft. (3.6 m) tow chains (14) are slack and adapters (15) rest on ground.

DISCONNECT - Continued

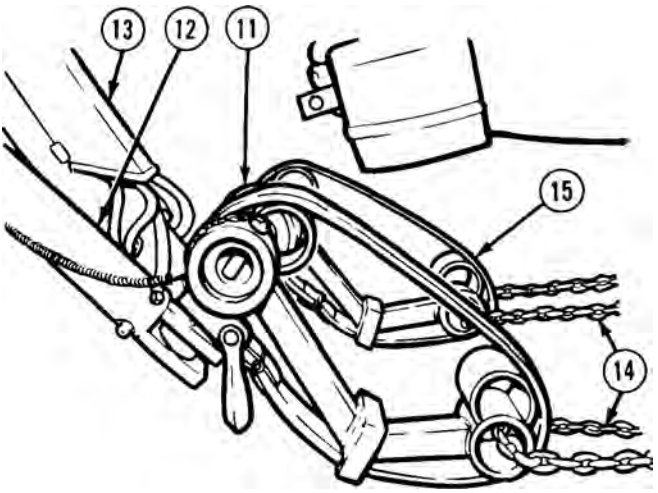


Figure 27.

12. Remove and stow two 12 ft. (3.6 m) tow chains (14).

CAUTION

Do not contact pintle hook with lift cylinder or damage to equipment could occur.

13. Operate retrieval system to fully retract tow cylinders (12) and retract lift cylinder (13) to raise cross tube (11) approximately 3 ft. (1 m) from ground.
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (10) from tow cylinders (12).

DISCONNECT - Continued

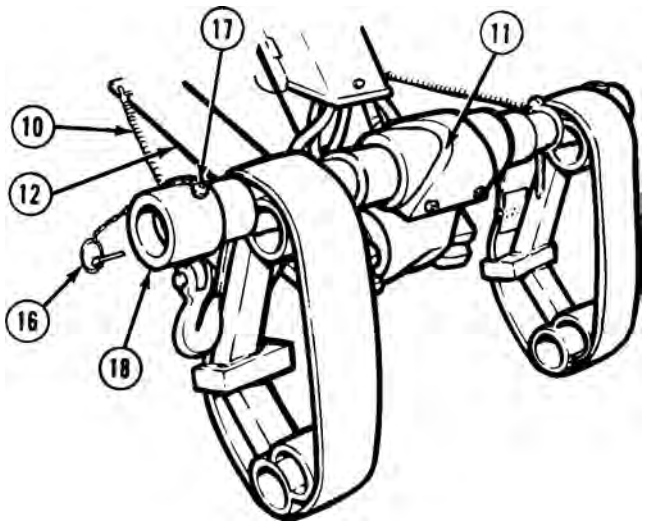


Figure 28.

16. Remove two quick pins (16) and pins (17) from end caps (18).
17. Remove two end caps (18) from cross tube (11).
18. Remove two 5 in. (127 mm) spacers (19) from cross tube (11) and return to wrecker stowage.

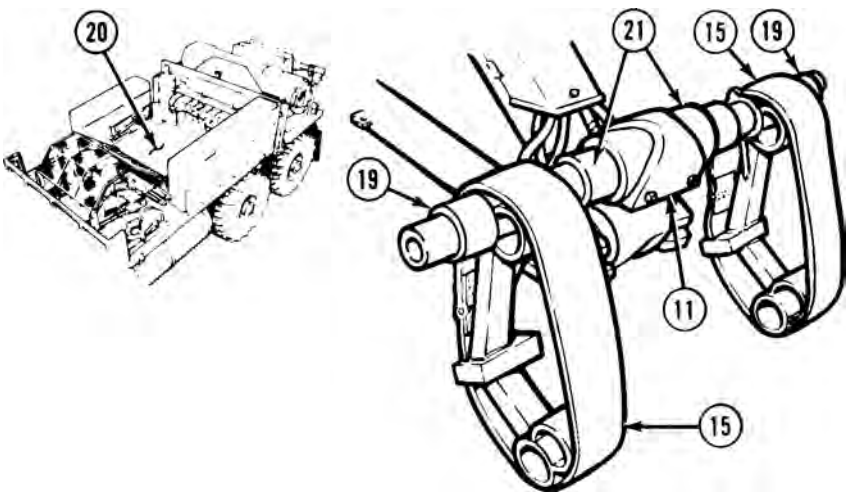


Figure 29.

DISCONNECT - Continued

19. Remove two adapters (15) from cross tube (11) and place on equipment body floor (20).
20. Remove two 4 in. (102 mm) spacers (21) from cross tube (11) and return to wrecker stowage.
21. Remove lock handle (22), lock plate (23), and two front adapters (24).

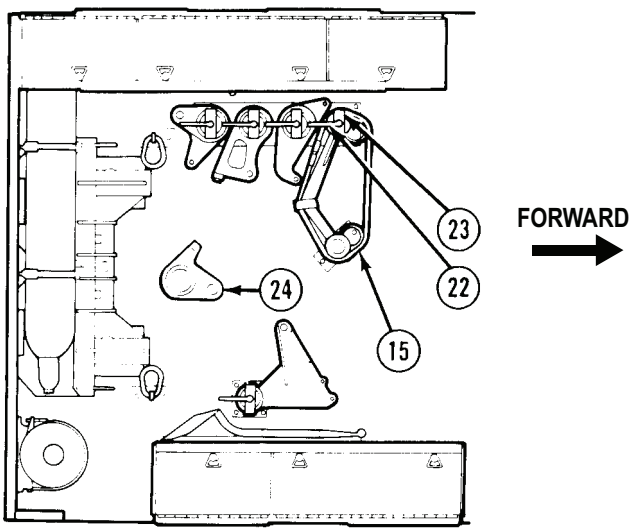


Figure 30.

22. Install two adapters (15) removed from cross tube (11), lock plate (23), and lock handle (22).

DISCONNECT - Continued

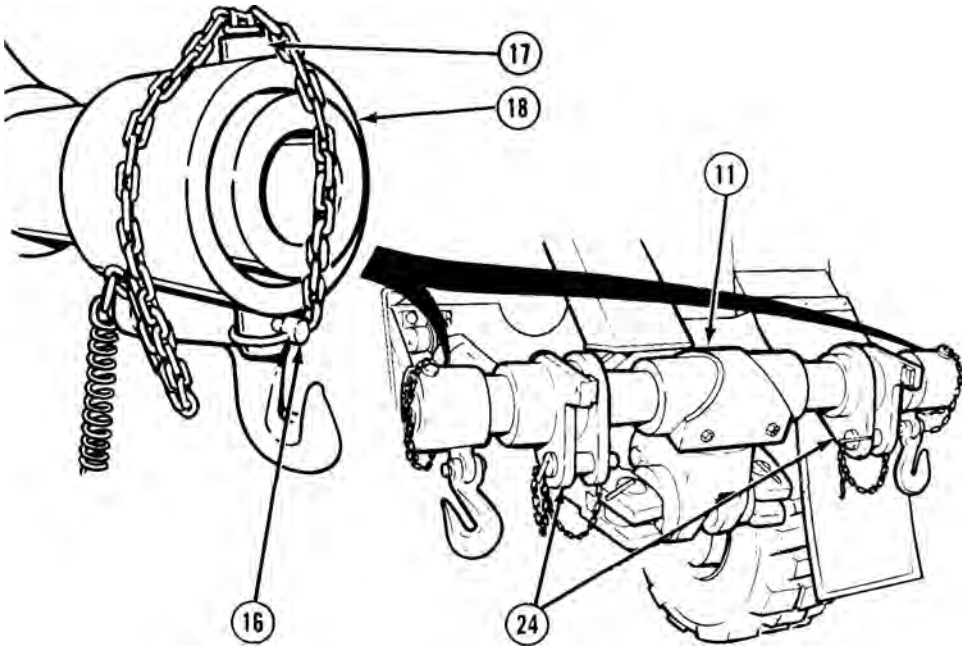


Figure 31.

23. Install two front adapters (24) on cross tube (11).
24. Install two end caps (18) on cross tube (11). Install two pins (17) and quick pins (16).
25. Install two springs (10) on tow cylinders (12).

DISCONNECT - Continued

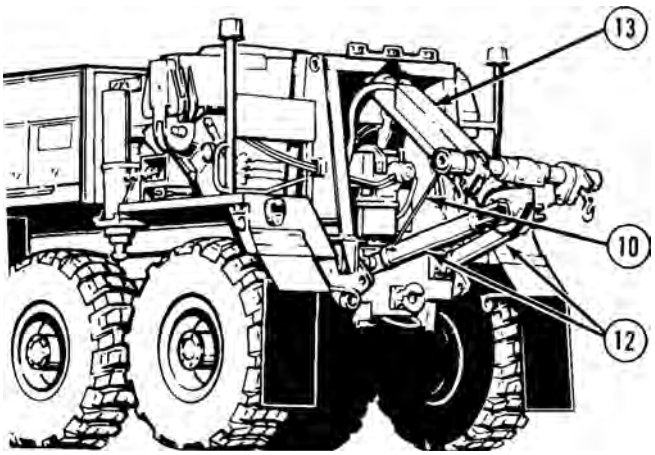


Figure 32.

26. Operate retrieval system and fully retract lift cylinder (13).

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two rear towing shackles (25), pins (26), and cotter pins (27).

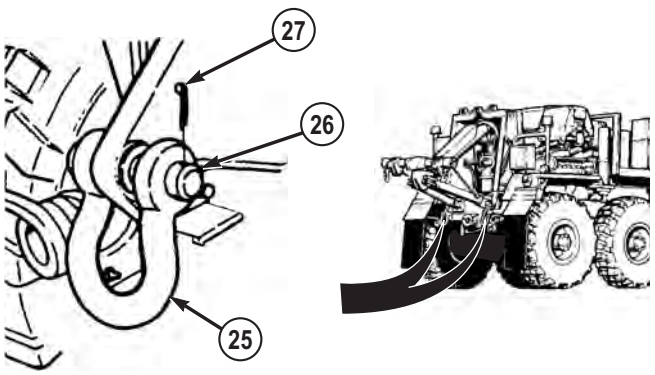


Figure 33.

28. Set POWER switch (28) to OFF position.

DISCONNECT - Continued

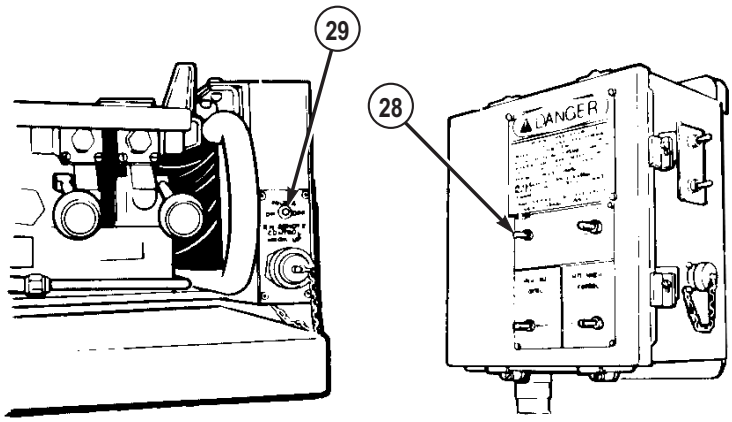


Figure 34.

29. Set POWER switch (29) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)
32. PTO ENGAGE switch (30) to OFF position. Indicator light (31) will go out.

DISCONNECT - Continued

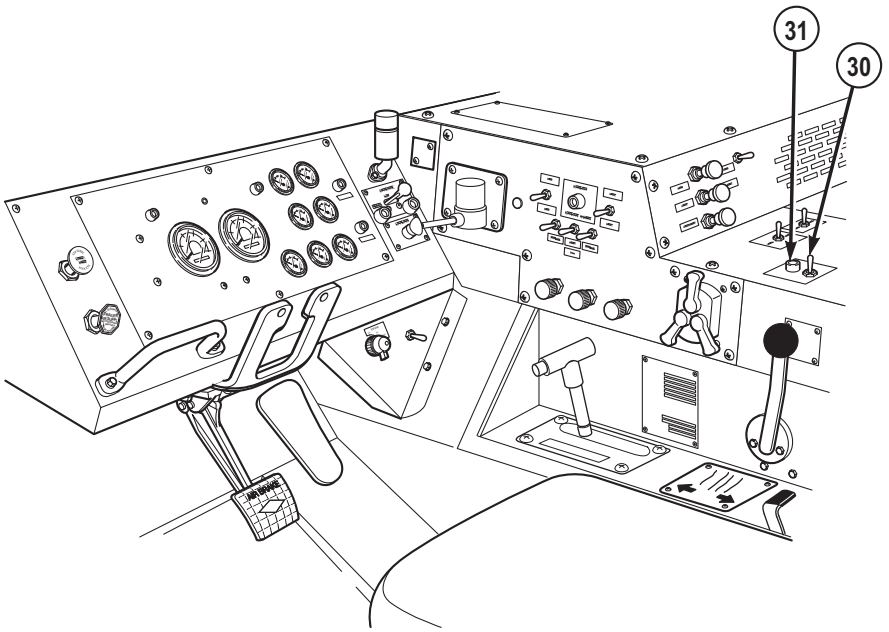


Figure 35.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M966 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

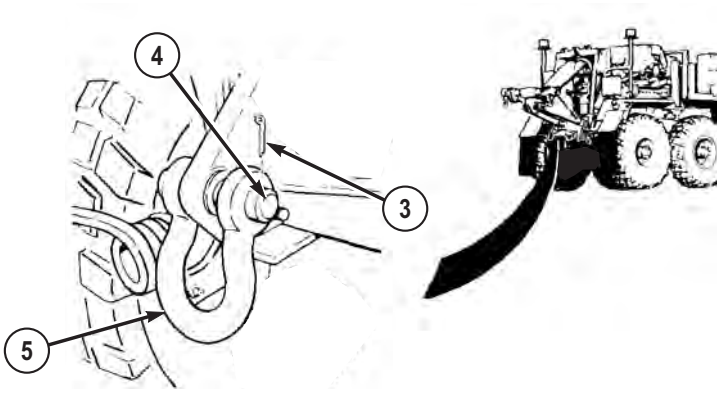


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

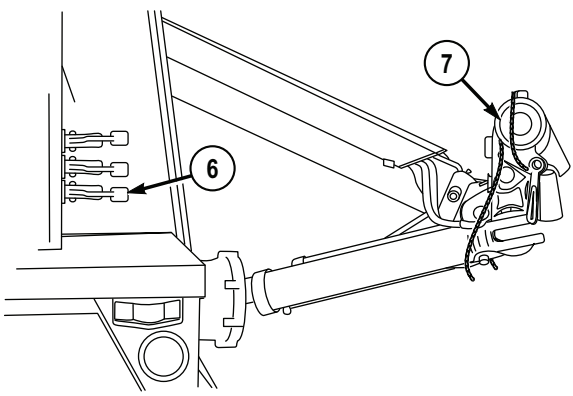


Figure 3.

5. Position wrecker so that cross tube (7) is centered and approximately 1 ft. (30 cm) from tow eyes of disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

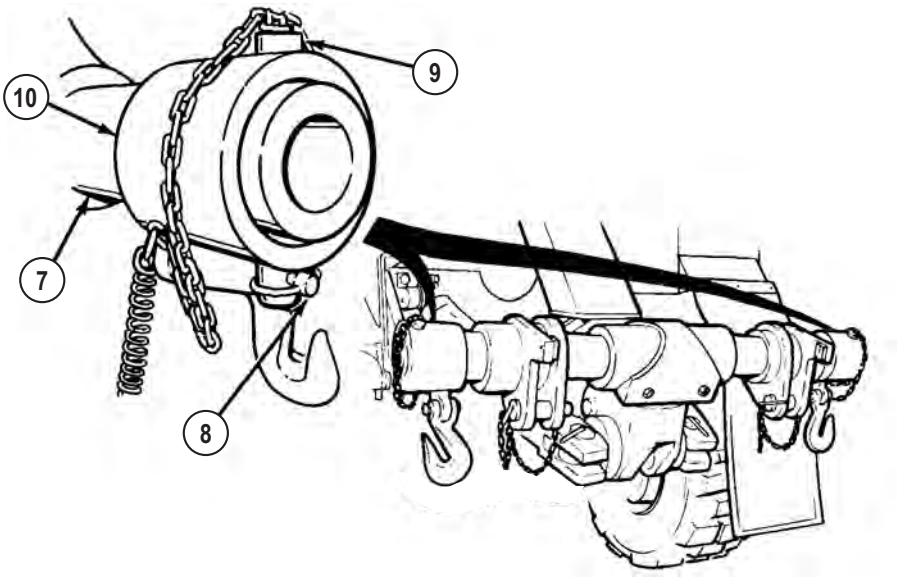


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

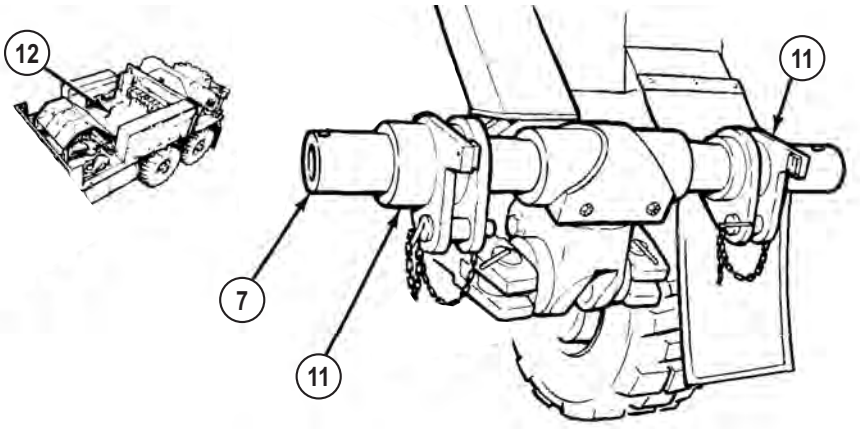


Figure 5.

9. Remove lock handle (13), lock plate (14), and two M966 rear tow adapters (15).

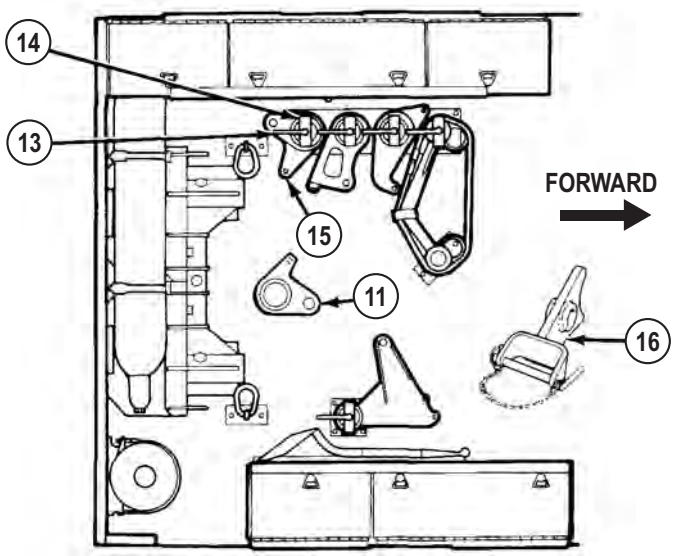
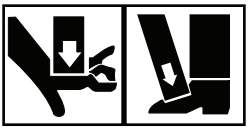


Figure 6.

10. Install two front adapters (11), lock plate (14), and lock handle (13).
11. Remove two extensions (16) from wrecker stowage.

HOOKUP - Continued

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

12. Install two 5 in. (127 mm) spacers (17) on cross tube (7).

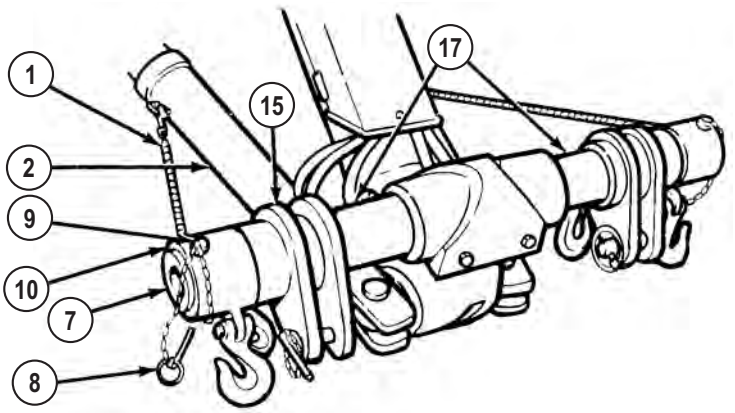


Figure 7.

13. Install two rear tow adapters (15) on cross tube (7).
14. Install two end caps (10) on cross tube (7).
15. Install two pins (9) and quick pins (8).
16. Attach two springs (1) on tow cylinders (2).
17. Remove two quick pins (18) and pins (19) from adapters (15).

HOOKUP - Continued

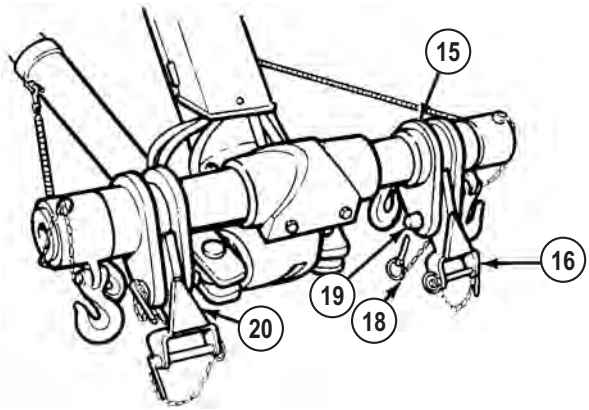


Figure 8.

18. Install extensions (16) so holes in adapter (15) align with holes in extension and triangular brace (20) is on top.
19. Insert two pins (19) through adapters (15) and extensions (16).
20. Install two quick pins (18) in pins (19).
21. Remove two quick pins (21) and pins (22) from extensions (16).

HOOKUP - Continued

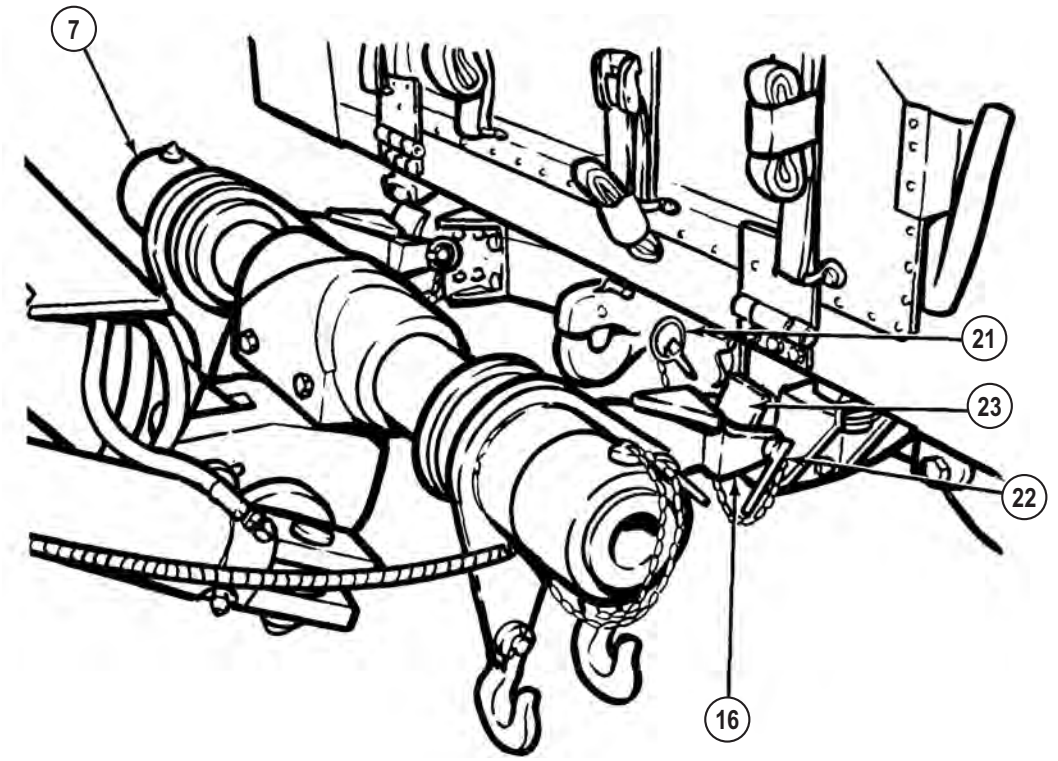


Figure 9.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow in disabled vehicle.

22. Operate retrieval system, and with aid of an assistant, position cross tube (7) so holes in extensions (16) align with rear tow eyes (23).

HOOKUP - Continued

23. Insert two pins (22) through extensions (16) and rear tow eyes (23). Install two quick pins (21) in pins (22).
24. Lower cross tube (7) until adapter grab hooks (24) are directly underneath adapter pins (19).

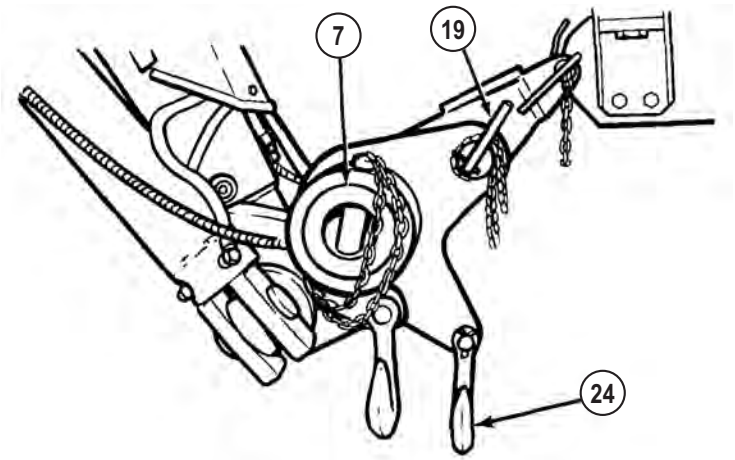


Figure 10.

25. Remove two 12 ft. (3.6 m) safety chains (25) from wrecker stowage.

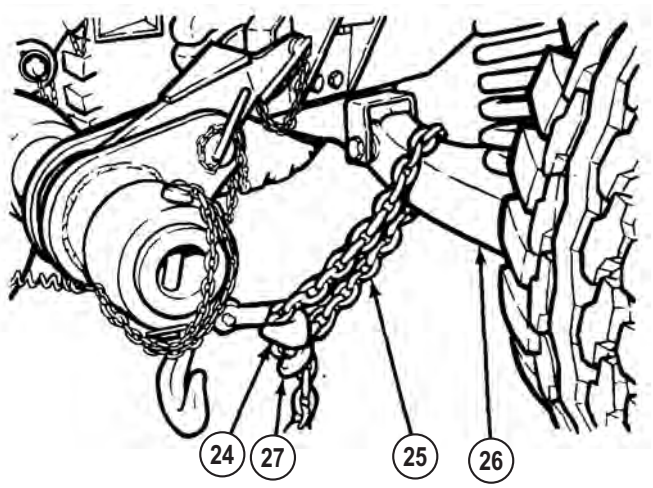


Figure 11.

HOOKUP - Continued

26. Route end of 12 ft. (3.6 m) safety chain (25) over rear arm of A-frame (26) on disabled vehicle.
27. Route 12 ft. (3.6 m) safety chain (25) through adapter grab hook (24). Pull safety chain (25) tight and attach grab hook (27) to 12 ft. (3.6 m) safety chain (25).
28. Repeat Steps (26) and (27) for other side of disabled vehicle.
29. Release PARKING BRAKE on disabled vehicle (refer to M966 operator's manual).

CAUTION

Do not allow lift cylinder to touch pintle hook. Equipment may be damaged.

30. Operate retrieval system until tow cylinders (2) are fully retracted.

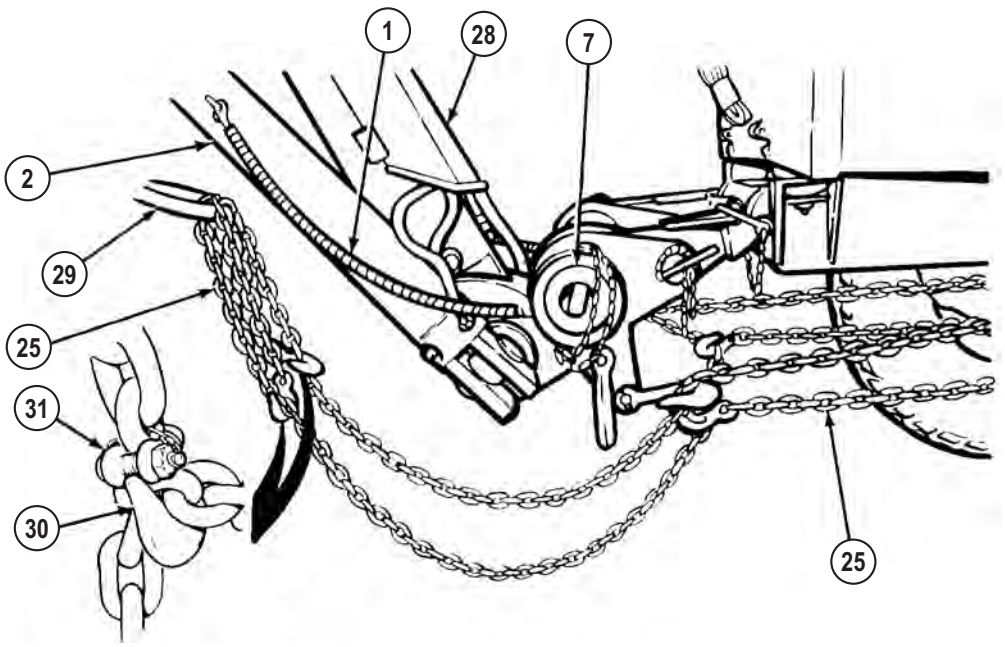


Figure 12.

31. Operate retrieval system to retract lift cylinder (28) until slack is removed from 12 ft. (3.6 m) safety chains (25).

HOOKUP - Continued

NOTE

Adjust 12 ft. (3.6 m) safety chain slack so 12 ft. (3.6 m) safety chains just touch the ground.

32. Route two free ends of 12 ft. (3.6 m) safety chains (25) through safety chain hoop (29) on wrecker and secure grab hooks (30) with safety shackles (31).

33. Wrap two springs (1) around cross tube (7) and secure.

CAUTION

Ensure all disabled vehicle cargo is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

34. Prepare disabled vehicle for towing (refer to M966 operators manual).

35. Remove emergency tow lights (33) and two brackets (34) from wrecker stowage.

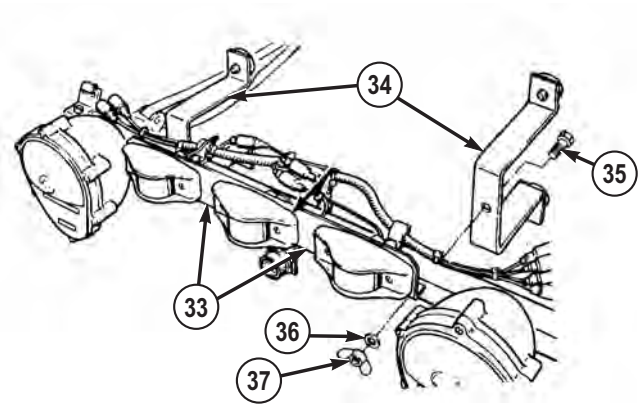


Figure 13.

36. Install two brackets (34) in center holes of emergency tow lights (33) with two screws (35), washers (36), and nuts (37).

37. Install emergency tow lights (33) on front of M966 and fasten securely with straps (38).

HOOKUP - Continued

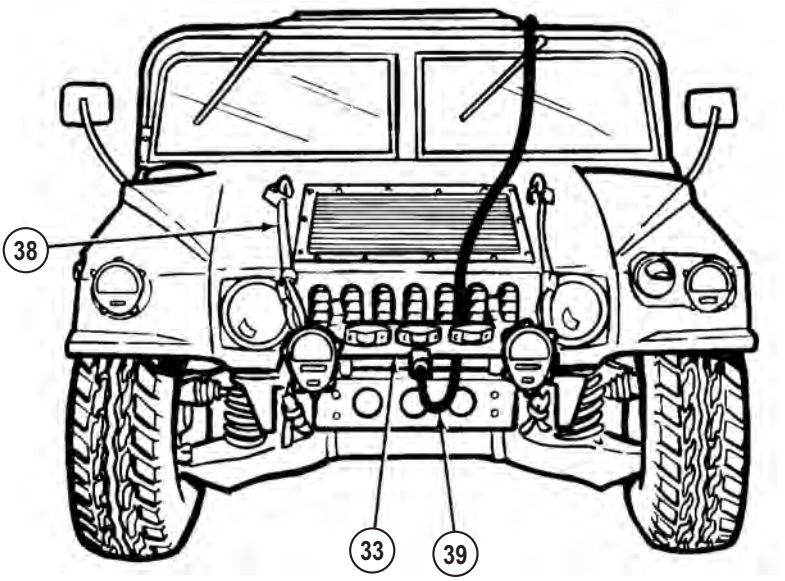


Figure 14.

38. Remove tow light cable (39) from wrecker stowage and connect to emergency tow lights (33).

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

39. Route other end of tow light cable (39) along disabled vehicle and connect to rear electrical connector (40) on wrecker.

HOOKUP - Continued

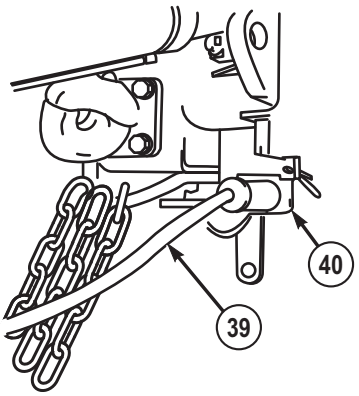


Figure 15.

NOTE

If disabled vehicle is equipped with built-in steering lock assembly, lock disabled vehicles steering (refer to M966 operator's manual).

40. Set POWER switch (41) to ON position.

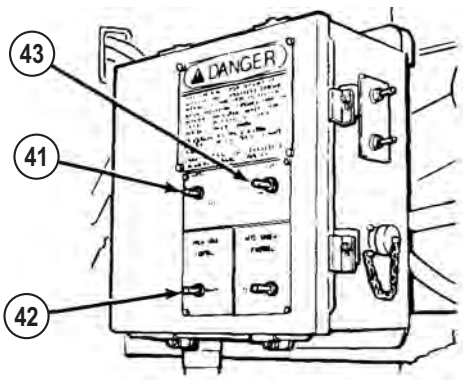


Figure 16.

41. Set HIGH IDLE switch (42) to CONTINUOUS.
42. Push and release LATCH switch (43). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

43. Operate retrieval system to retract lift cylinder (28) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

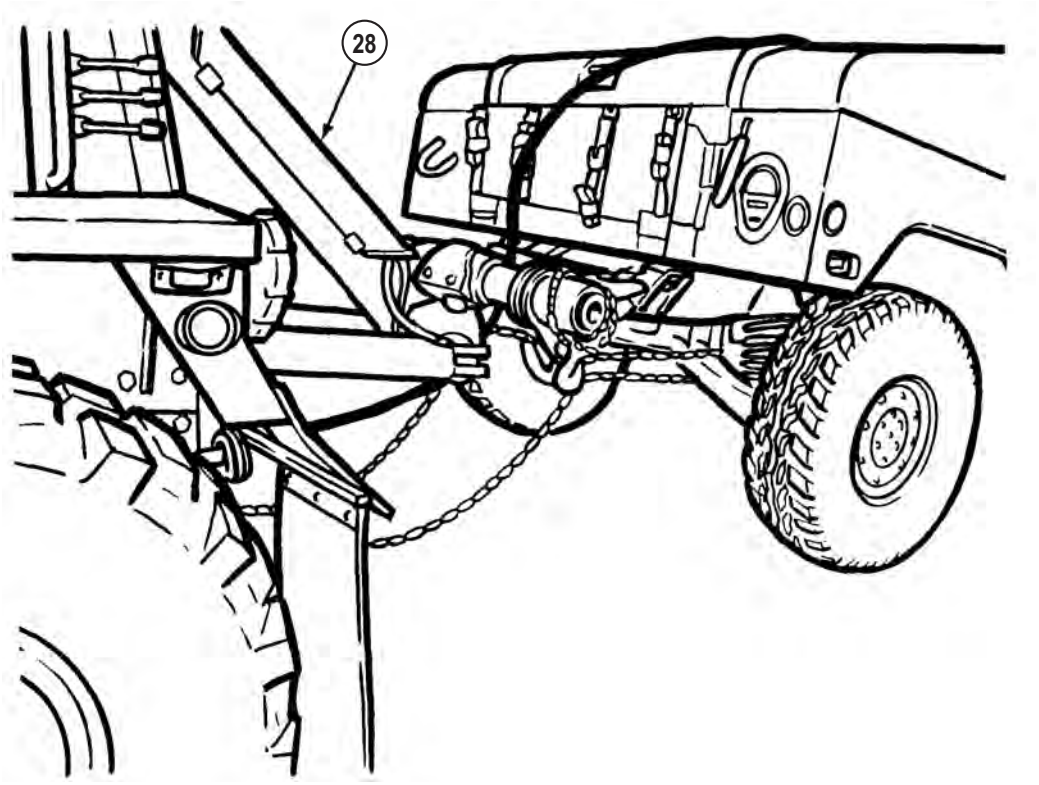


Figure 17.

44. Set POWER switch (41) to OFF position.

HOOKUP - Continued

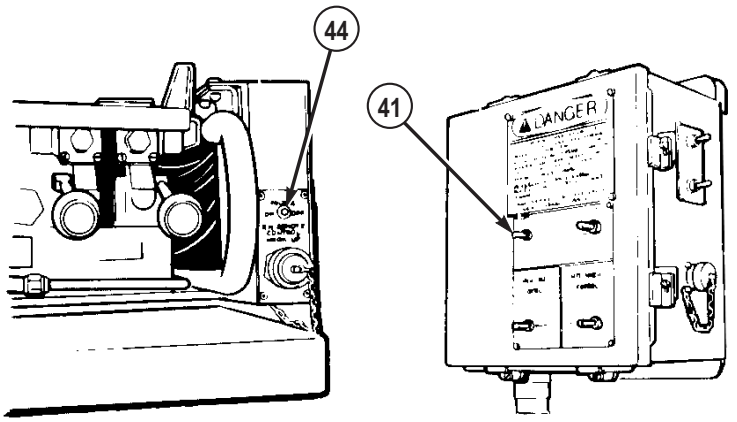


Figure 18.

45. Set POWER switch (44) to OFF position.
46. Set PTO ENGAGE switch (45) to OFF position. Indicator light (46) will go out.

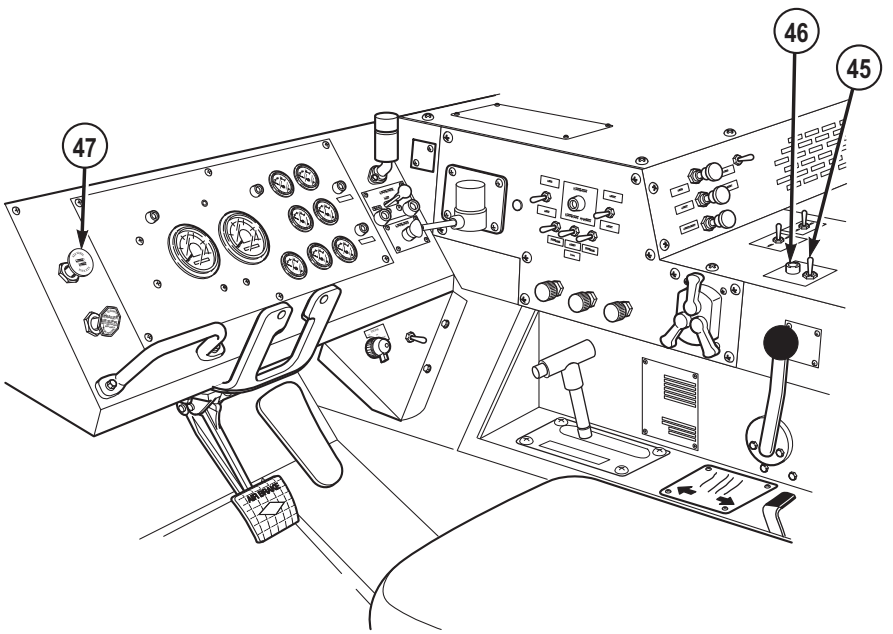


Figure 19.

47. Turn on wrecker service drive lights. (WP 0090)

HOOKUP - Continued

48. Turn on wrecker emergency flashers. (WP 0099)
49. Turn on disabled vehicle emergency flashers (refer to operator's manual).
50. Push in PARKING BRAKE control (47).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

51. Select desired gear (WP 0048) and transport disabled vehicle.

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

DISCONNECT - Continued

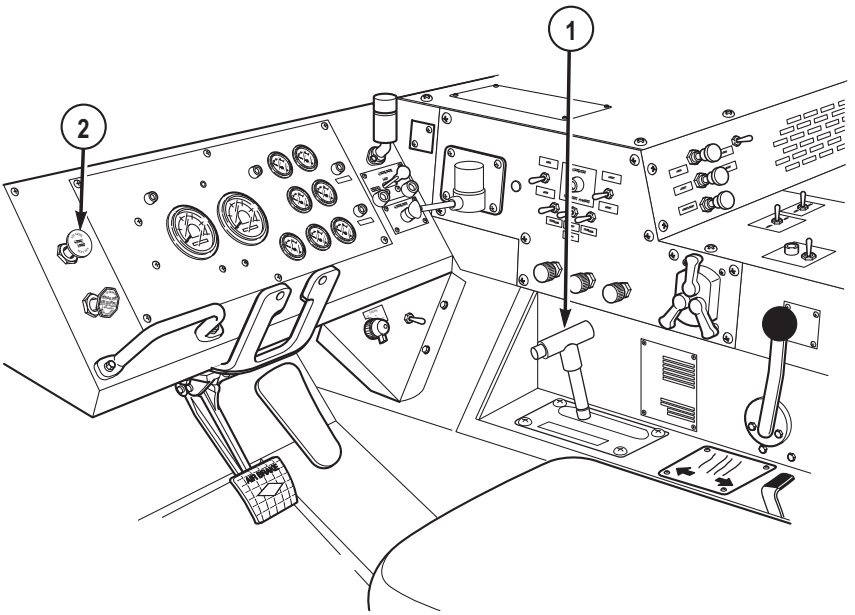


Figure 20.

2. Pull out PARKING BRAKE control (2).
3. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

Do not contact pintle hook with lift cylinder. Equipment damage could result.

DISCONNECT - Continued

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 in. (50 to 100 mm) to allow for adjustment when removing adapters.

4. Operate retrieval system, and lower disabled vehicle to ground until 12 ft. (3.6 m) safety chains at front A-frames are slack.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

5. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
6. Remove tow light cable (3) from wrecker.

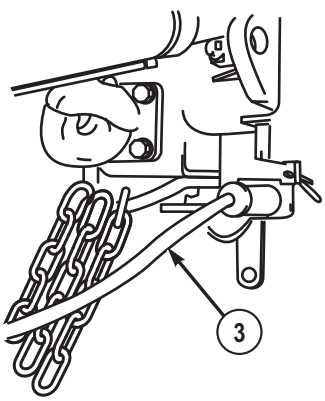


Figure 21.

7. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

DISCONNECT - Continued

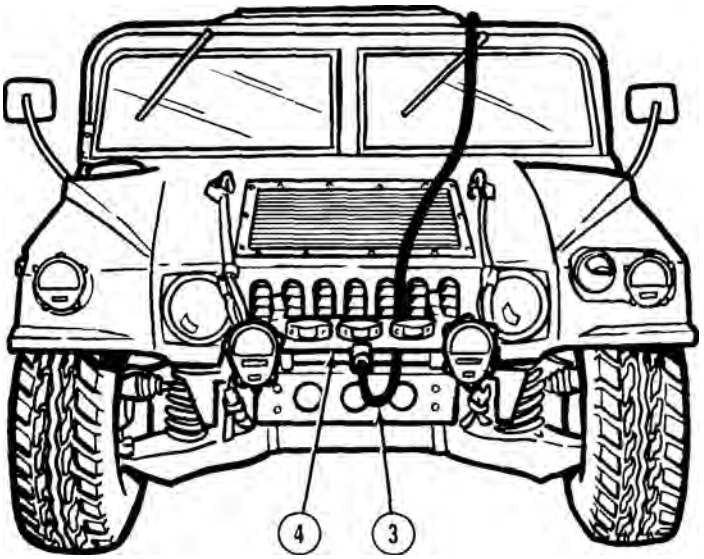


Figure 22.

8. Remove emergency tow lights (4) from disabled vehicle.
9. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and brackets to wrecker stowage.

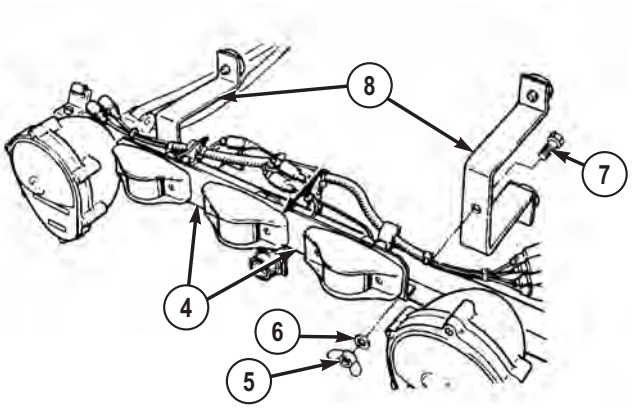


Figure 23.

10. Remove and stow two 12 ft. (3.6 m) safety chains (9).

DISCONNECT - Continued

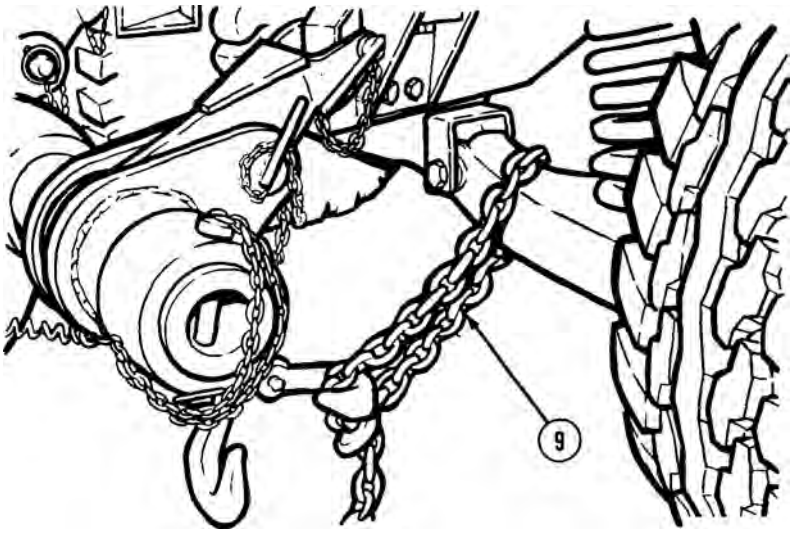


Figure 24.

11. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

DISCONNECT - Continued

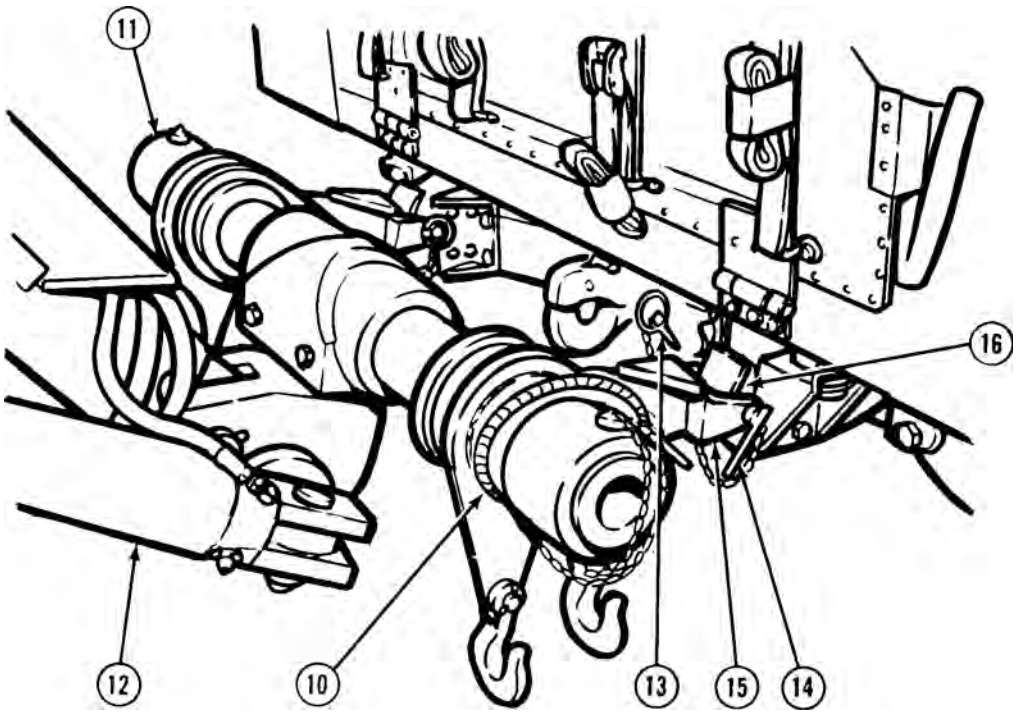
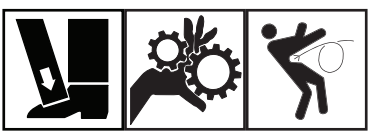


Figure 25.

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

12. Remove two quick pins (13) and pins (14) from extensions (15).

DISCONNECT - Continued

13. Remove two extensions (15) from tow eyes (16) on disabled vehicle.
14. Install two pins (14) in extensions (15).
15. Install two quick pins (13) in pins (14).
16. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)
17. Remove two quick pins (17) and pins (18) from adapters (19).

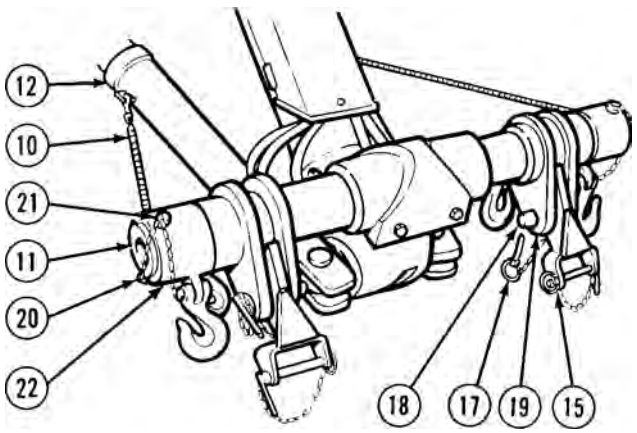


Figure 26.

18. Remove two extensions (15) from adapters (19) and return to wrecker stowage.
19. Install two pins (18) in adapters (19).
20. Install two quick pins (17) in pins (18).

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

21. Remove two springs (10) from tow cylinders (12).
22. Remove two quick pins (20) and pins (21) from end caps (22).
23. Remove two end caps (22) from cross tube (11).

DISCONNECT - Continued

24. Remove two adapters (19) from cross tube (11) and place on equipment body floor (23).

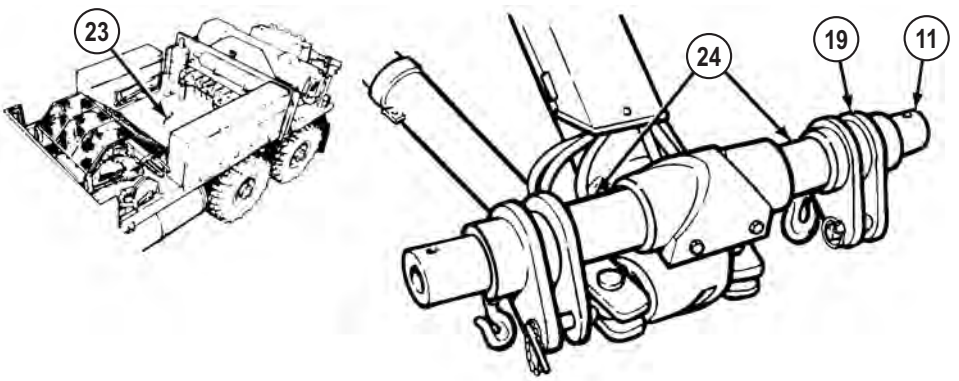


Figure 27.

25. Remove and stow two 5 in. (127 mm) spacers (24) from cross tube (11).
26. Remove lock handle (25), lock plate (26), and two front adapters (27).

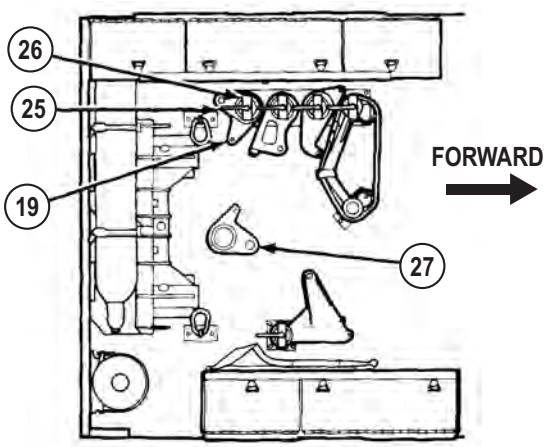


Figure 28.

27. Install two adapters (19) removed from cross tube (11), lock plate (26), and lock handle (25).

DISCONNECT - Continued

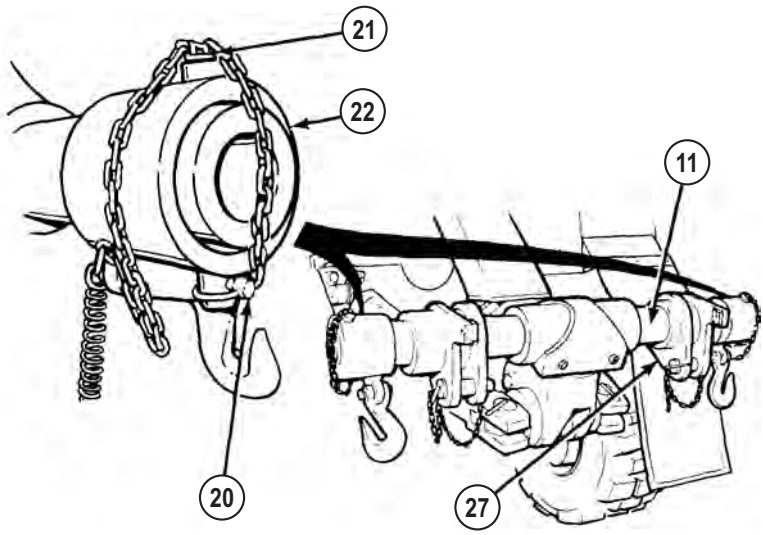


Figure 29.

28. Install two front adapters (27) on cross tube (11).
29. Install two end caps (22) on cross tube (11).
30. Install two pins (21) and quick pins (20).
31. Install two springs (10) on tow cylinders (12).

DISCONNECT - Continued

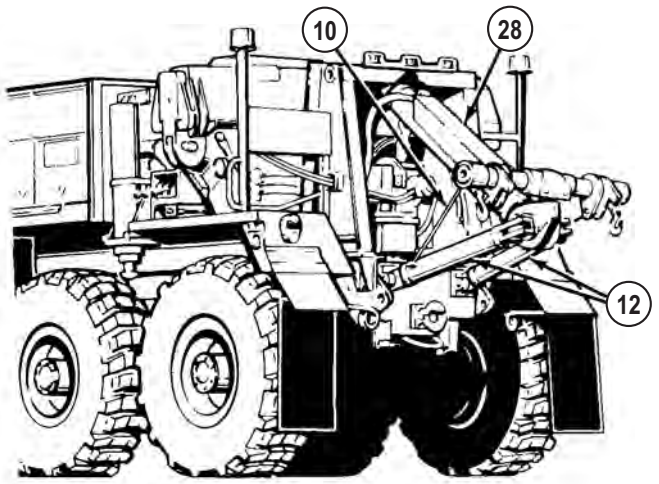


Figure 30.

32. Operate retrieval system and fully retract lift cylinder (28) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

33. Install two rear towing shackles (29), pins (30), and cotter pins (31).

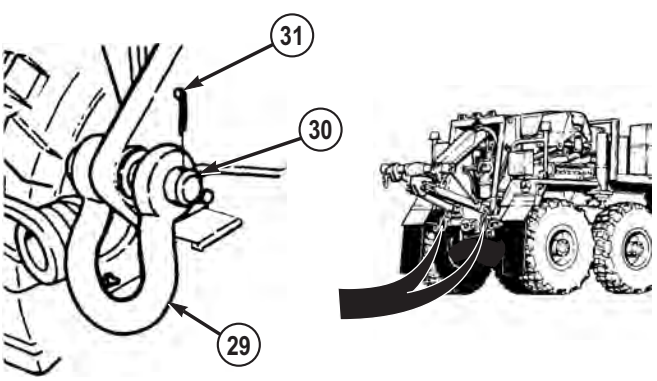


Figure 31.

34. Set POWER switch (32) to OFF position.

DISCONNECT - Continued

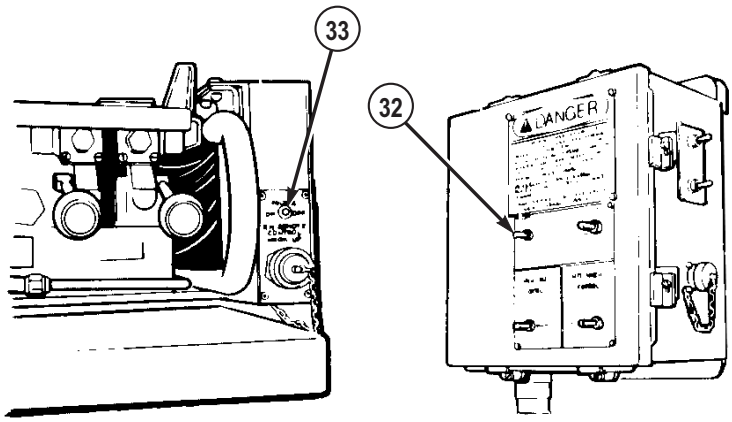


Figure 32.

35. Set POWER switch (33) to OFF position.
36. Turn off wrecker service drive lights. (WP 0090)
37. Turn off wrecker emergency flashers. (WP 0099)
38. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

DISCONNECT - Continued

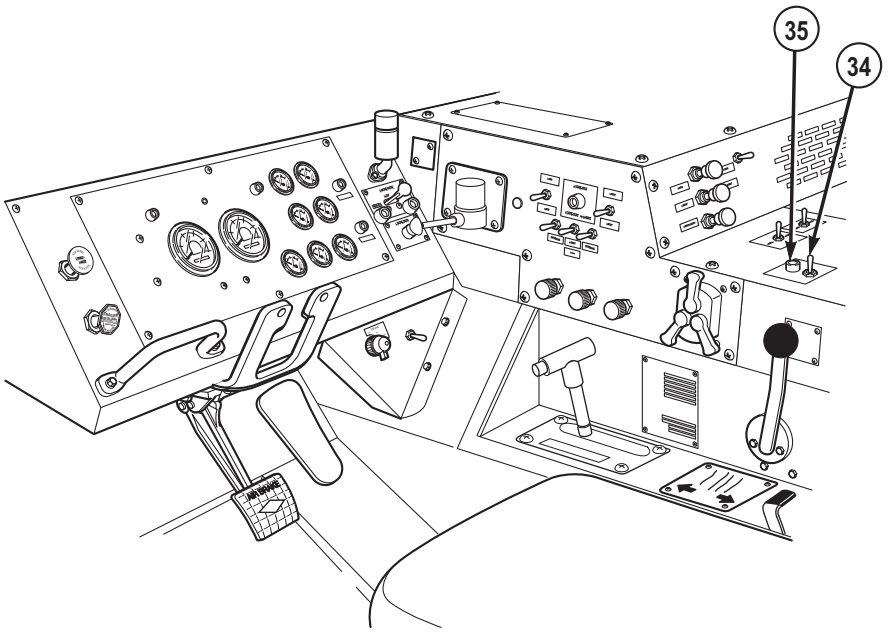


Figure 33.

39. Shut off engine. (WP 0057)
40. Remove and stow portable beacon lights. (WP 0097)
41. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M915 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

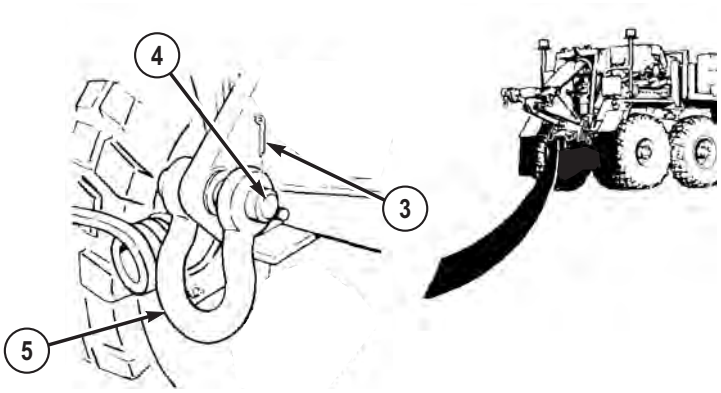


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

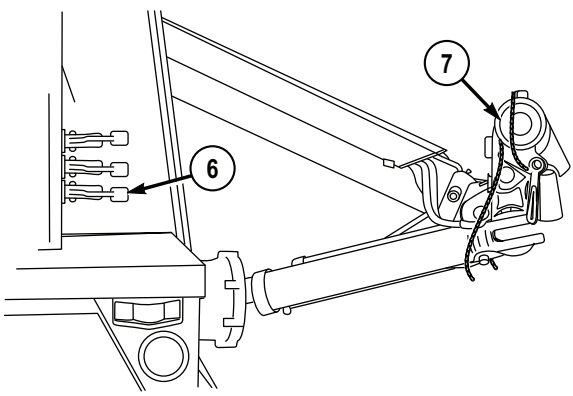


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove quick pins (8) and pins (9) from end caps (10).

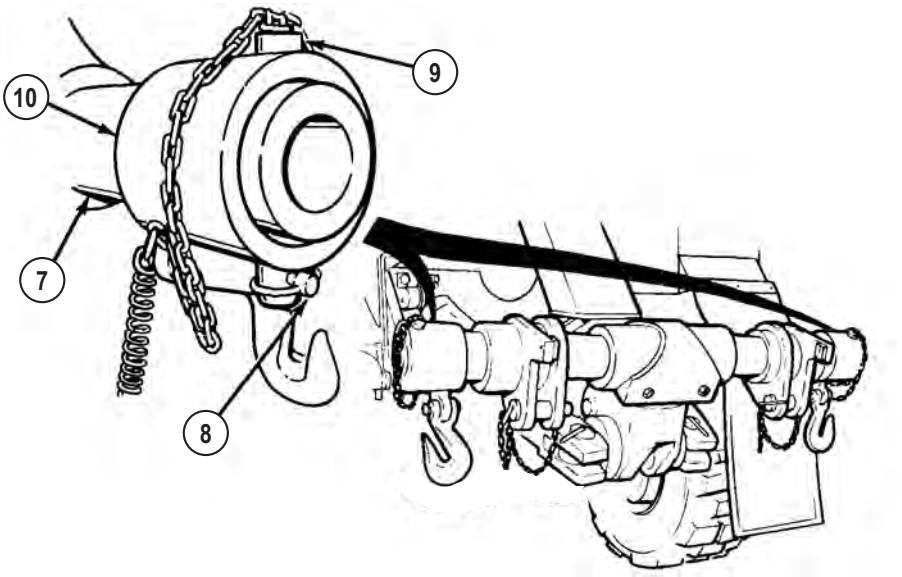


Figure 4.

7. Remove end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

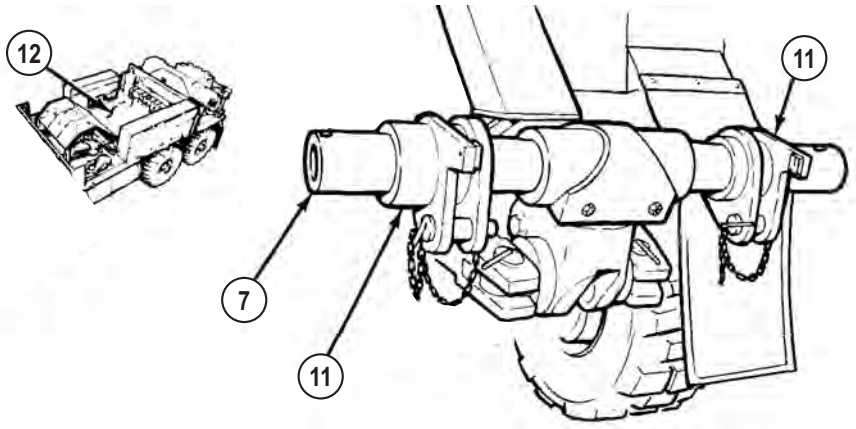


Figure 5.

9. Remove lock handle (13), lock plate (14), quick pin (15), pin (16), and two rear tow adapters (17).

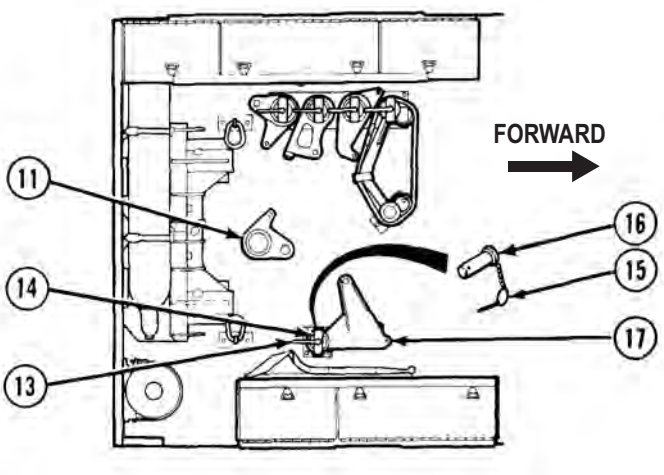


Figure 6.

10. Install two front adapters (11) removed from cross tube (7), pin (16), and quick pin (15), lock plate (14), and lock handle (13).

HOOKUP - Continued

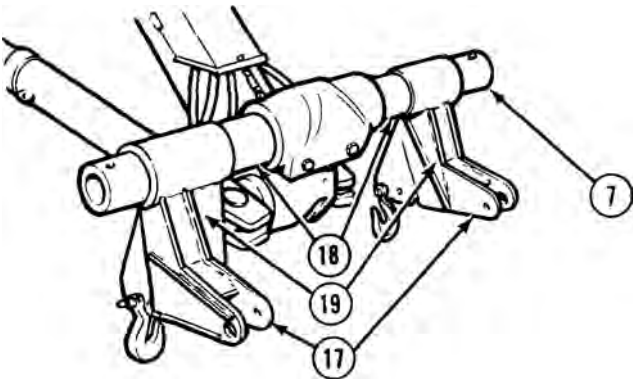
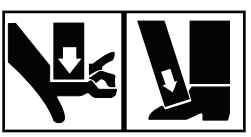


Figure 7.

11. Remove two 1 7/16 in. (38 mm) pins and two 5 in. (127 mm) spacers (18) from stowage.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

12. Install two 5 in. (127 mm) spacers (18) on cross tube (7).
13. Install two rear tow adapters (17) on cross tube (7) with support brace (19) to inside.
14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

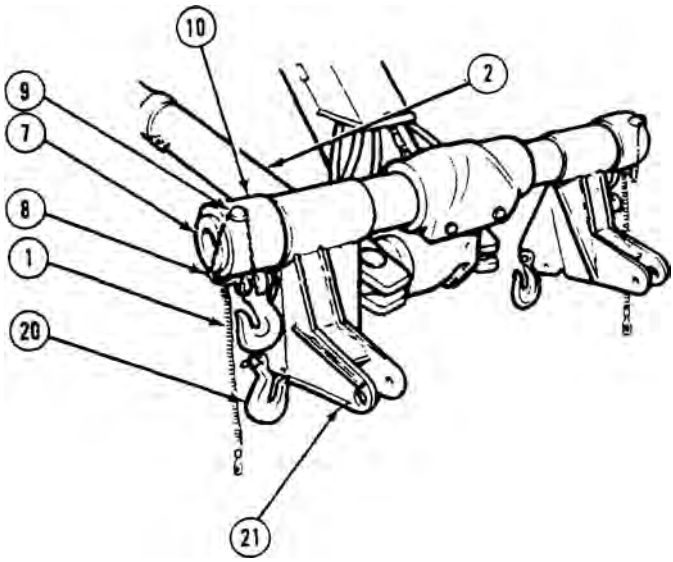


Figure 8.

15. Install two pins (9) and quick pins (8).

NOTE

Complete Step (16) if two rear adapter grab hooks are located in holes other than those farthest from towing pin holes, otherwise skip to Step (17).

16. Position adapter grab hooks (20) in hole farthest away from towing eye pin holes (21).
17. Attach two springs (1) on tow cylinders (2).

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

HOOKUP - Continued

NOTE

If disabled vehicle has towing shackles installed, remove shackles and stow on disabled vehicle.

18. Operate retrieval system, and with aid of an assistant position cross tube (7) so holes in adapters (17) align with rear tow eyes (22).

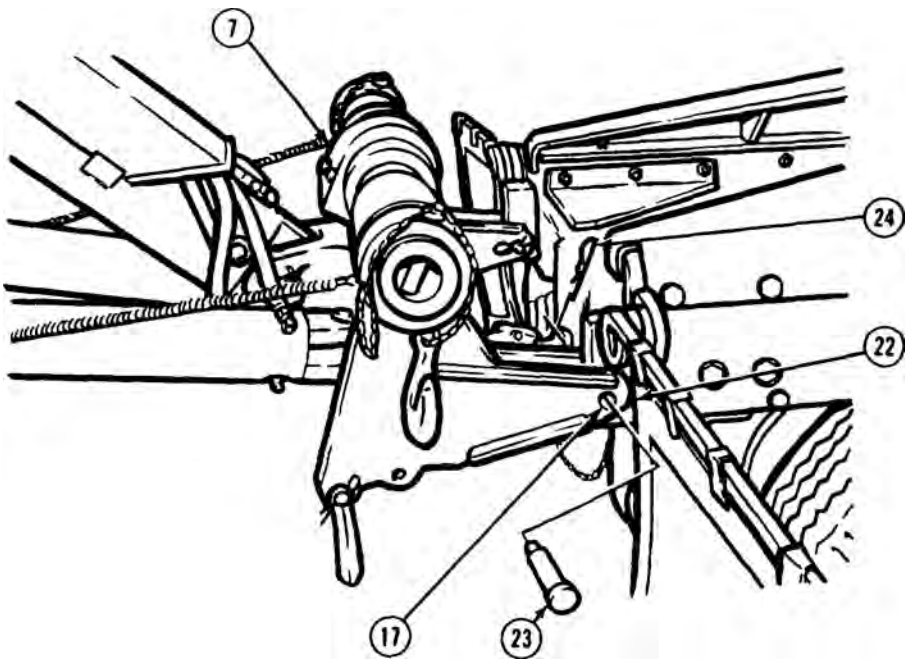


Figure 9.

19. Insert two 1 7/16 in. (38 mm) pins (23) through adapters (17) and rear tow eyes (22).
20. Install two cotter pins (24) in pins.

CAUTION

Do not allow adapters to come in contact with blackout lights. Failure to comply may result in damage to equipment.

21. Lower cross tube (7) until adapter grab hooks (20) are under rear tow eyes (22) and adapter (17) is approximately 1 in. (25 mm) from blackout lights (25).

HOOKUP - Continued

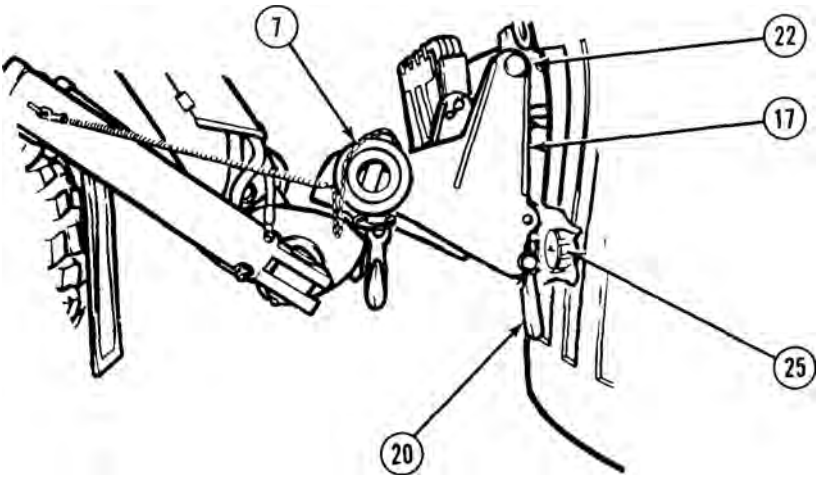


Figure 10.

22. Remove two 16 ft. (5 m) safety chains (26) from wrecker stowage.

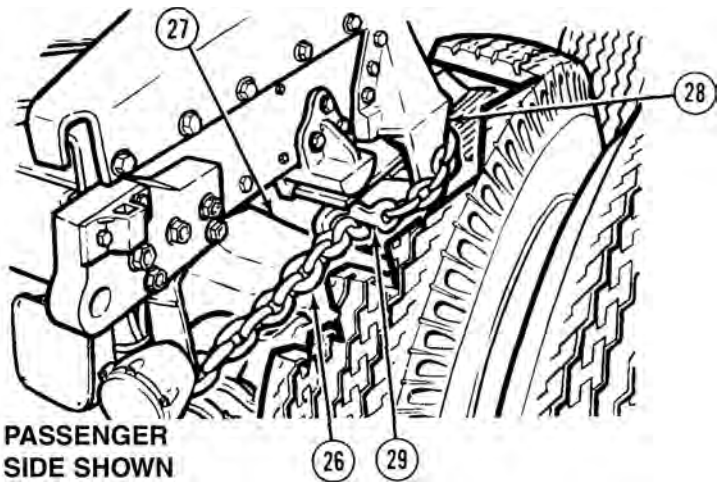


Figure 11.

23. Route end (without safety shackle) of 16 ft. (5 m) safety chain (26) over rear axle (27) and around rear leaf spring shackle (28) of disabled vehicle.

24. Hook 16 ft. (5 m) safety chain (26) back into itself so grab hook (29) is just touching rear axle (27).

HOOKUP - Continued

25. Repeat Steps (23) and (24) for other side of disabled vehicle.

CAUTION

After attaching 16 ft. (5 m) safety chain to grab hook, remove 16 ft. (5 m) safety chain from grab hook and increase chain slack between grab hook and rear leaf spring shackle by two links. This will prevent damage to air brake chambers of disabled vehicle.

26. Pull 16 ft. (5 m) safety chain (26) tight and install on adapter grab hook (20).

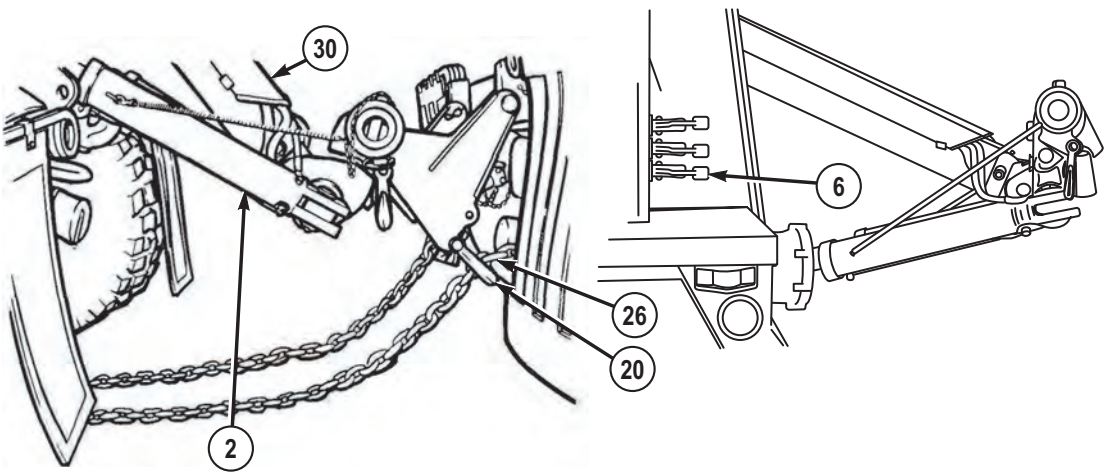


Figure 12.

27. Repeat Step (26) for other side of disabled vehicle.
28. Release PARKING BRAKE on disabled vehicle (refer to M915 operator's manual).

CAUTION

Do not allow adapters to come in contact with blackout lights. Lights may be damaged.

29. Operate retrieval system until tow cylinders (2) are fully retracted.

CAUTION

16 ft. (5 m) safety chains must not hit rear brake chambers or blackout lights. Adjust position of adapters if needed to center safety chains between blackout lights and rear brake chambers. Failure to provide clearance may result in damage to equipment.

HOOKUP - Continued

30. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (30) until slack is removed from 16 ft. (5 m) safety chains (26).

NOTE

Adjust 16 ft. (5 m) safety chain slack so 16 ft. (5 m) safety chains just touch the ground.

31. Route two free ends of 16 ft. (5 m) safety chains (26) through safety chain hoop (31) on wrecker, hook 16 ft. (5 m) safety chains (26) back into themselves (as shown), and secure grab hooks (32) with safety shackles (33).

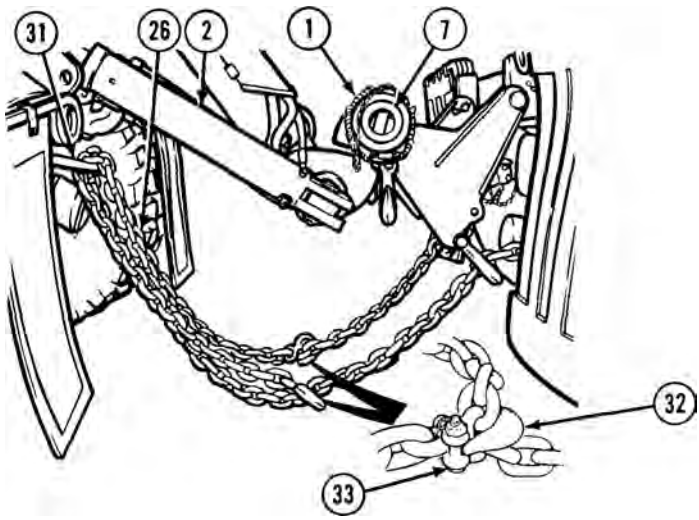


Figure 13.

32. Disconnect two springs (1) from tow cylinders (2), wrap springs around cross tube (7) and secure.

CAUTION

Ensure all disabled vehicle cargo is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

33. Prepare disabled vehicle for towing (refer to M915 operator's manual).

34. Remove emergency tow lights (34) and two brackets (35) from wrecker stowage.

HOOKUP - Continued

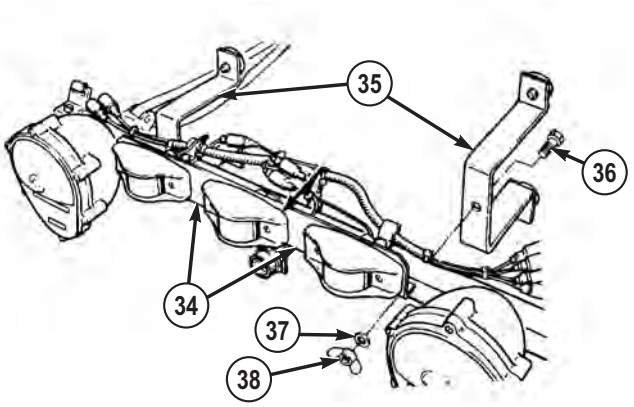


Figure 14.

35. Install two brackets (35) in center holes of emergency tow lights (34) with two screws (36), washers (37), and nuts (38).

36. Install emergency tow lights (34) on front of M915 and fasten securely with straps (39).

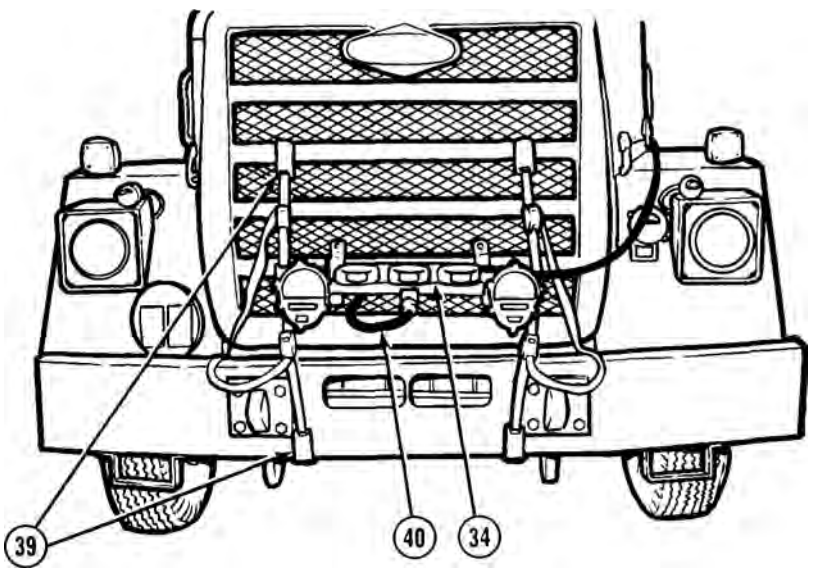


Figure 15.

37. Remove tow light cable (40) from stowage and connect to emergency tow lights (34).

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

38. Route free end of tow light cable (40) along disabled vehicle and connect to rear electrical connector (41) on wrecker.

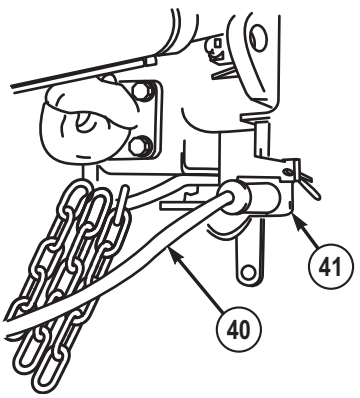


Figure 16.

39. Lock disabled vehicle steering (refer to M915 operator's manual).
40. Set POWER switch (42) to ON position.

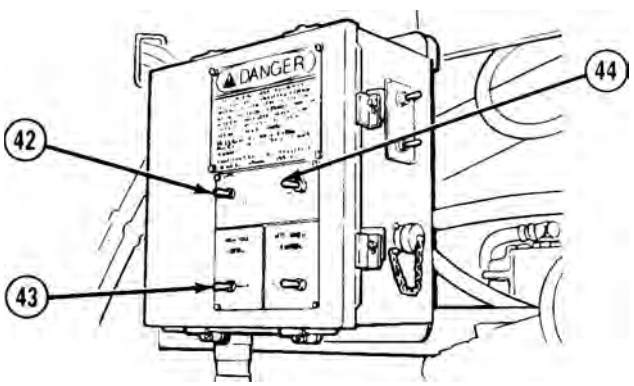


Figure 17.

41. Set HIGH IDLE switch (43) to CONTINUOUS.

HOOKUP - Continued

42. Push and release LATCH switch (44). Engine speed will increase to approximately 1500 rpm.

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

43. Operate retrieval system (WP 0059) to retract lift cylinder (30), and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

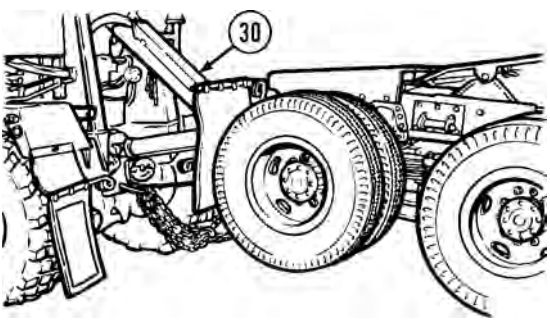


Figure 18.

HOOKUP - Continued

44. Set POWER switch (42) to OFF position.

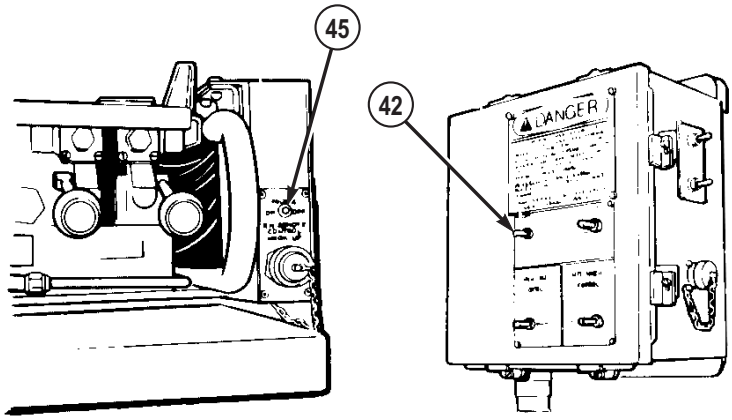


Figure 19.

45. Set POWER switch (45) to OFF position.
46. Set PTO ENGAGE switch (46) to OFF position. Indicator light (47) will go out.

HOOKUP - Continued

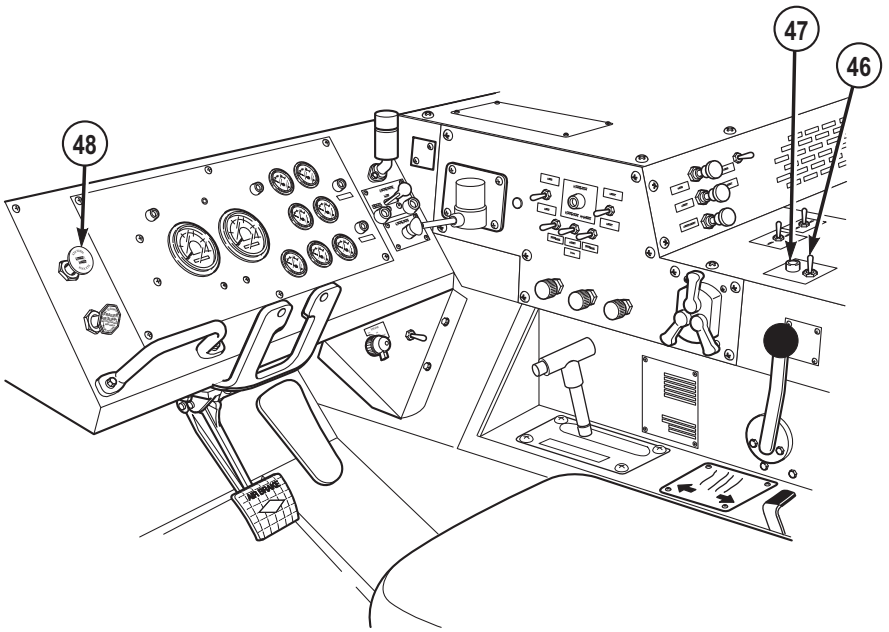


Figure 20.

47. Turn on wrecker service drive lights. (WP 0090)
48. Turn on wrecker emergency flashers. (WP 0099)
49. Turn on disabled vehicle emergency flashers (refer to operator's manual).
50. Push in PARKING BRAKE control (48).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

51. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

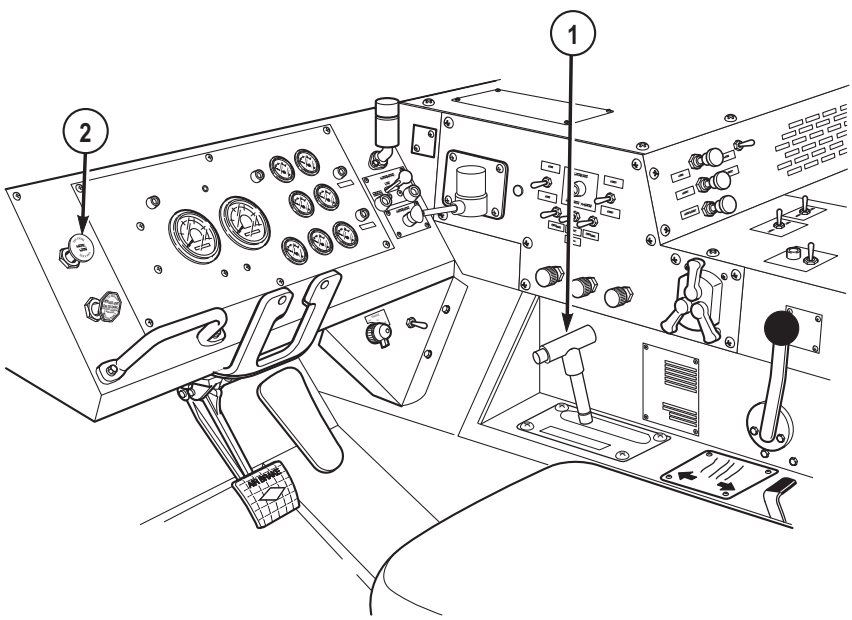


Figure 21.

2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 inches (50 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058) prepare retrieval system for operation, (WP 0059) and lower disabled vehicle to the ground.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

DISCONNECT - Continued

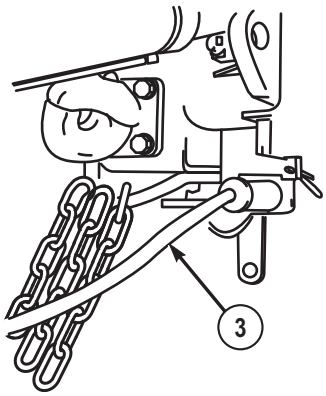


Figure 22.

6. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

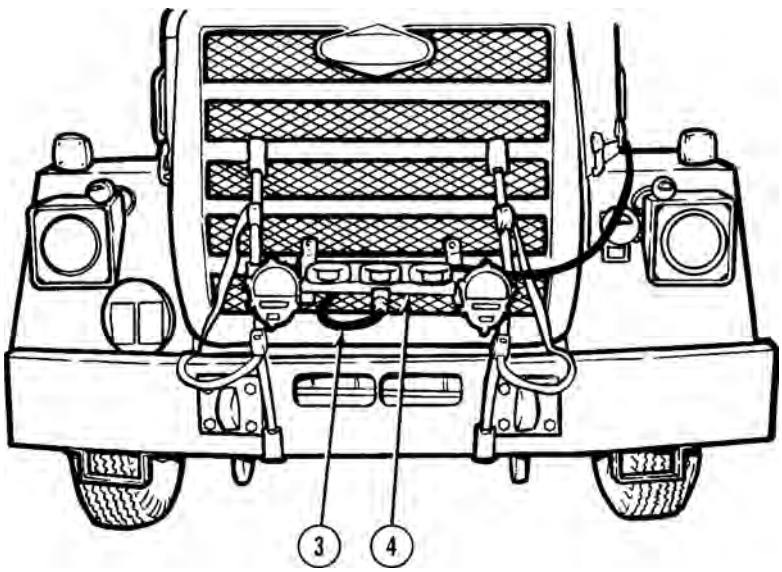


Figure 23.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and brackets to wrecker stowage.

DISCONNECT - Continued

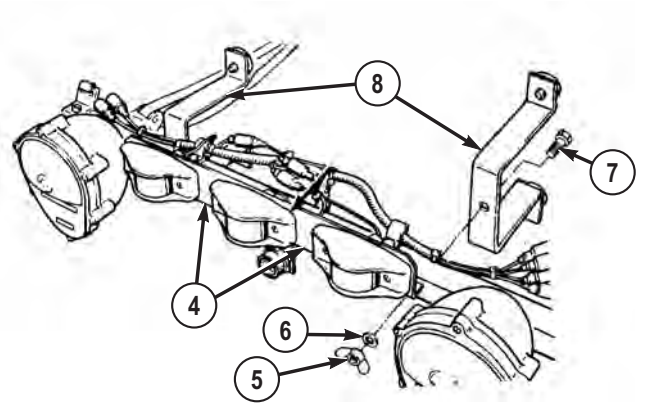


Figure 24.

9. Remove and stow two 16 ft. (5 m) safety chains (9).

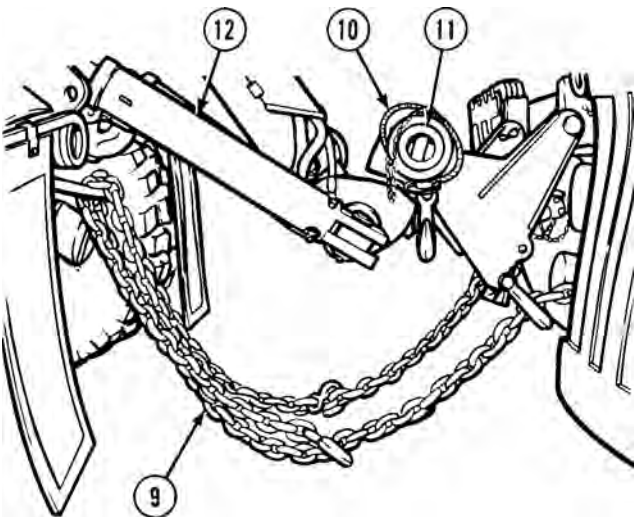


Figure 25.

10. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

DISCONNECT - Continued

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

CAUTION

Adapters will swing down and can hit blackout lights causing equipment damage.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

11. Remove two cotter pins (13) and 1 7/16 in. (38 mm) pins (14) from adapters (15).

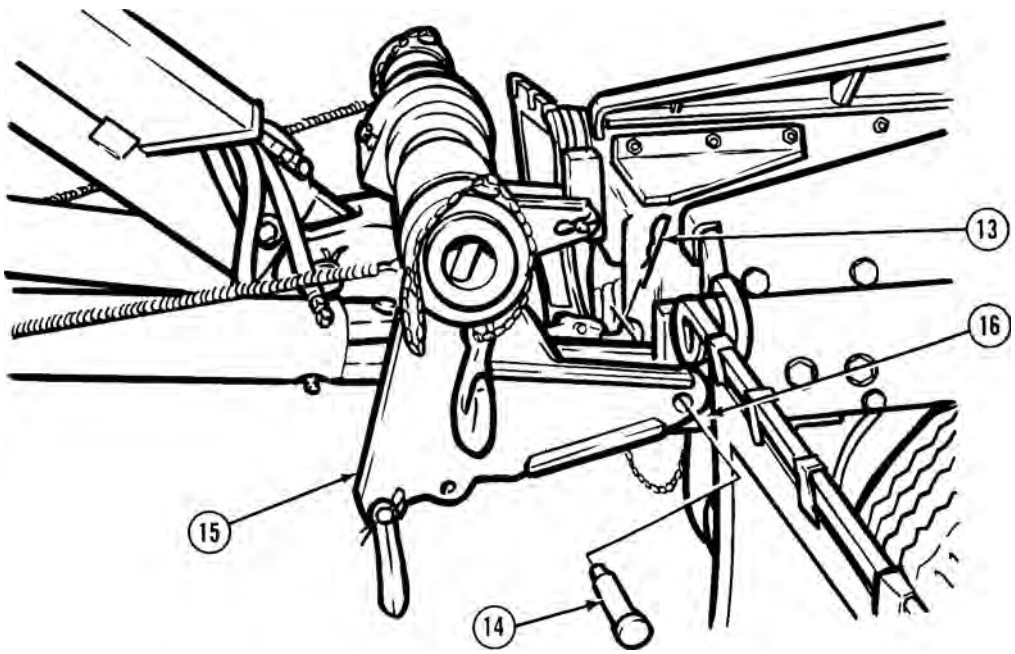


Figure 26.

DISCONNECT - Continued

12. Remove two adapters (15) from tow eyes (16) on disabled vehicle.
13. Install two cotter pins (13) in 1 7/16 in. (38 mm) pins (14), and return to wrecker stowage.
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (10) from tow cylinders (12).

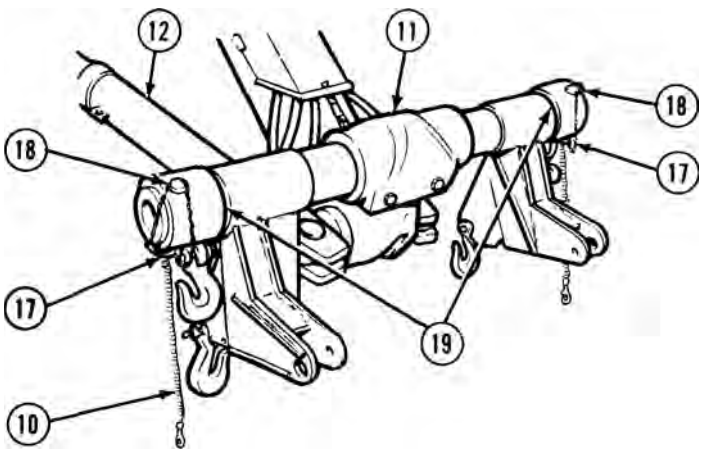


Figure 27.

16. Remove two quick pins (17) and pins (18) from end caps (19).
17. Remove two end caps (19) from cross tube (11).
18. Remove two adapters (15) from cross tube (11) and place on equipment body floor (20).

DISCONNECT - Continued

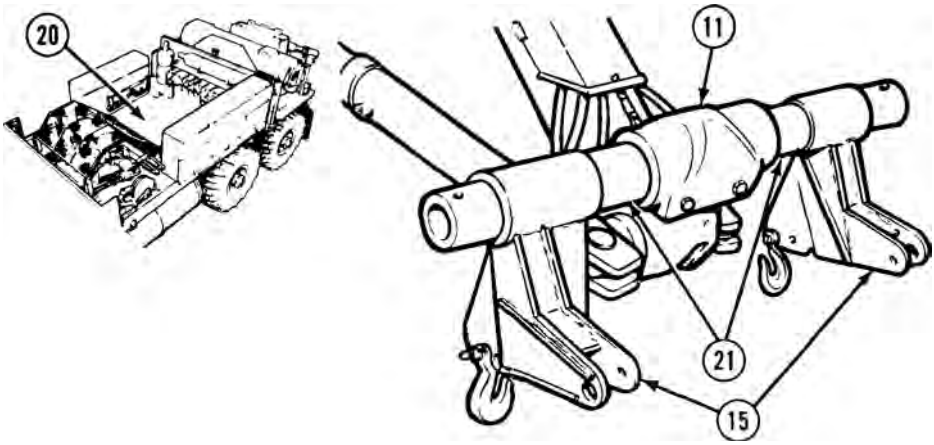


Figure 28.

19. Remove two 5 in. (127 mm) spacers (21) from cross tube (11) and return to wrecker stowage.
20. Remove lock handle (22), lock plate (23), quick pin (24), pin (25), and two front adapters (26).

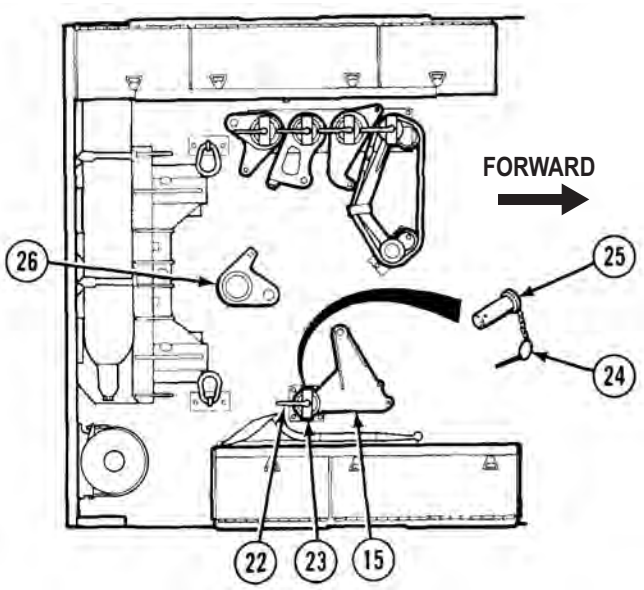


Figure 29.

DISCONNECT - Continued

21. Install two adapters (15) removed from cross tube (11), pin (25), quick pin (24), lock plate (23), and lock handle (22).

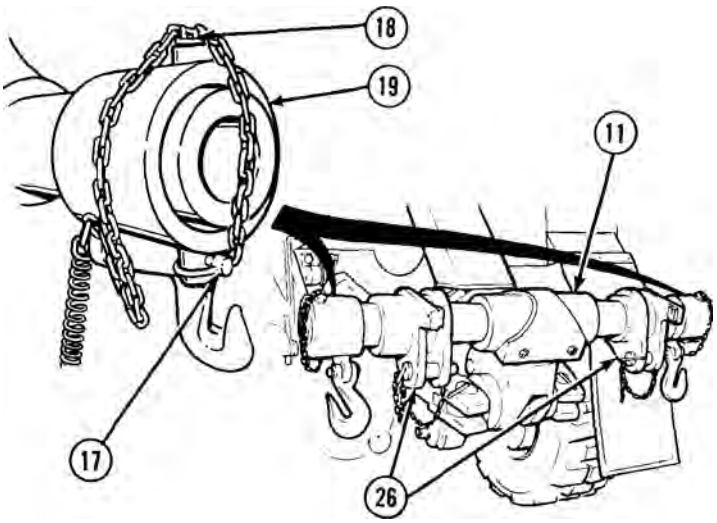


Figure 30.

22. Install front adapters (26) on cross tube (11).
23. Install two end caps (19) on cross tube (11).
24. Install two pins (18) and quick pins (17).
25. Install two springs (10) on tow cylinders (12).

DISCONNECT - Continued

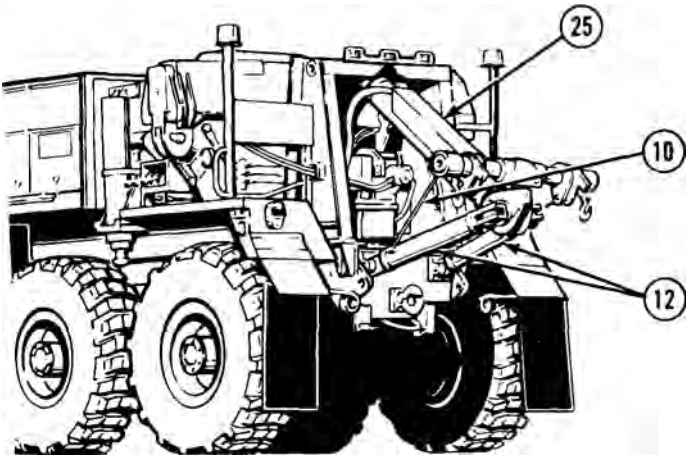


Figure 31.

26. Operate retrieval system and fully retract lift cylinder (25) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two rear towing shackles (27), pins (28), and cotter pins (29).

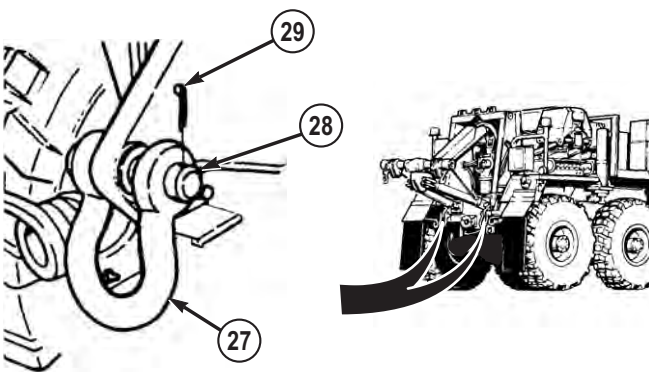


Figure 32.

28. Set POWER switch (30) to OFF position.

DISCONNECT - Continued

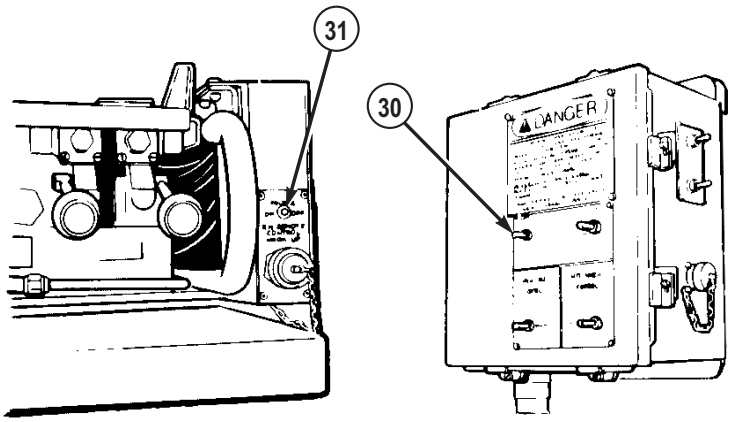


Figure 33.

29. Set POWER switch (31) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)
32. Set PTO ENGAGE switch (32) to OFF position. Indicator light (33) will go out.

DISCONNECT - Continued

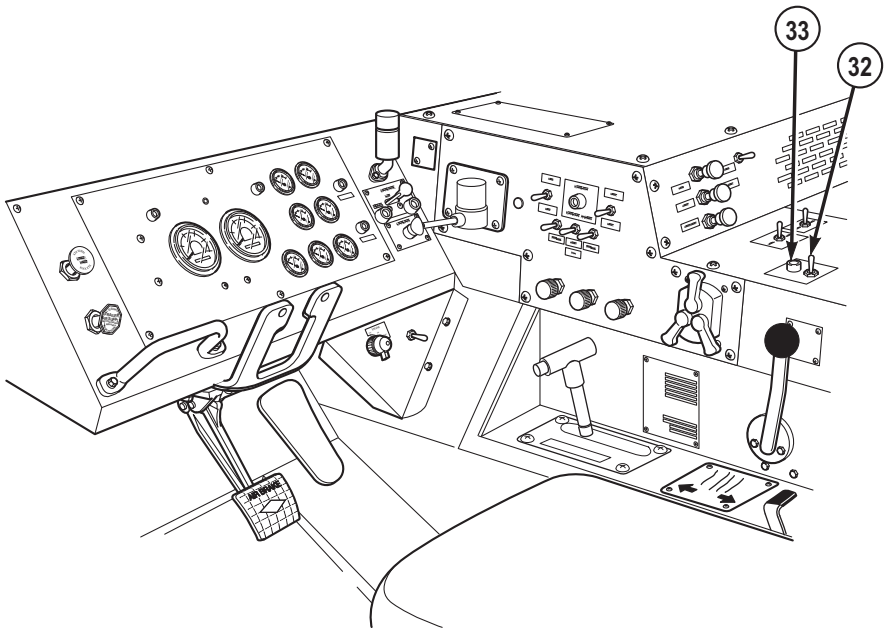


Figure 34.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M1070 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

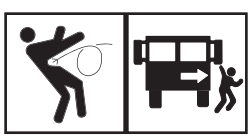
HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING



- Do not conduct lift and tow operations on side slopes in excess of 25%. Vehicle may roll over. Failure to comply may result in vehicle rollover and or death to personnel and damage to equipment.
- Air suspension system may still be pressurized even though air gauge reads 0 psi (0 kPa). Air suspension will drop when air line is removed. Remove air line slowly to allow air to escape. Stay clear of suspension. Failure to comply may result in injury or death to personnel.

2. Set PARKING BRAKE and chock wheels on disabled vehicle (refer to disabled vehicle's operator's manual).

NOTE

- Disabled vehicle air suspension is drained and lowered to gain extra axle to ground clearance when rear of vehicle is lifted.

HOOKUP - Continued

- Any one of the six rear air bag air lines may be removed to drain air system.

3. Remove air line (1) from fitting (2) on air spring (3).

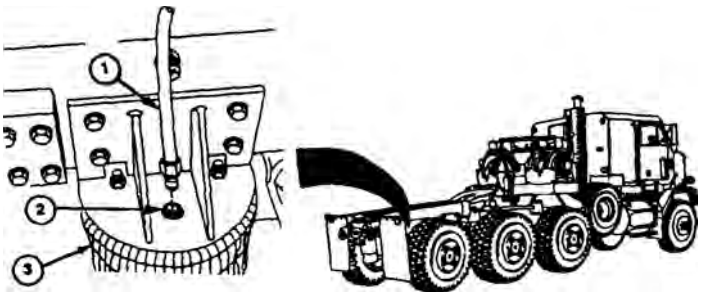


Figure 1.

4. Install air line (1) on fitting (2) after air suspension has settled.

CAUTION

- All three rear axles must be secured with chains to prevent distortion of suspension air springs. Failure to comply may result in damage to equipment.
- Use caution when routing chains near air lines, wiring, steering components, etc. Failure to comply may result in damage to equipment.

NOTE

- Two 12 ft. (3.6 m) chains are used to secure No. 2 axle.
- For maximum ground clearance, chains should be installed as tight as possible.

5. Route and secure 12 ft. (3.6 m) chain (4) over driver side frame rail (5) behind winch platform (6), in front of No. 2 axle (7), and under suspension arm (8).

HOOKUP - Continued

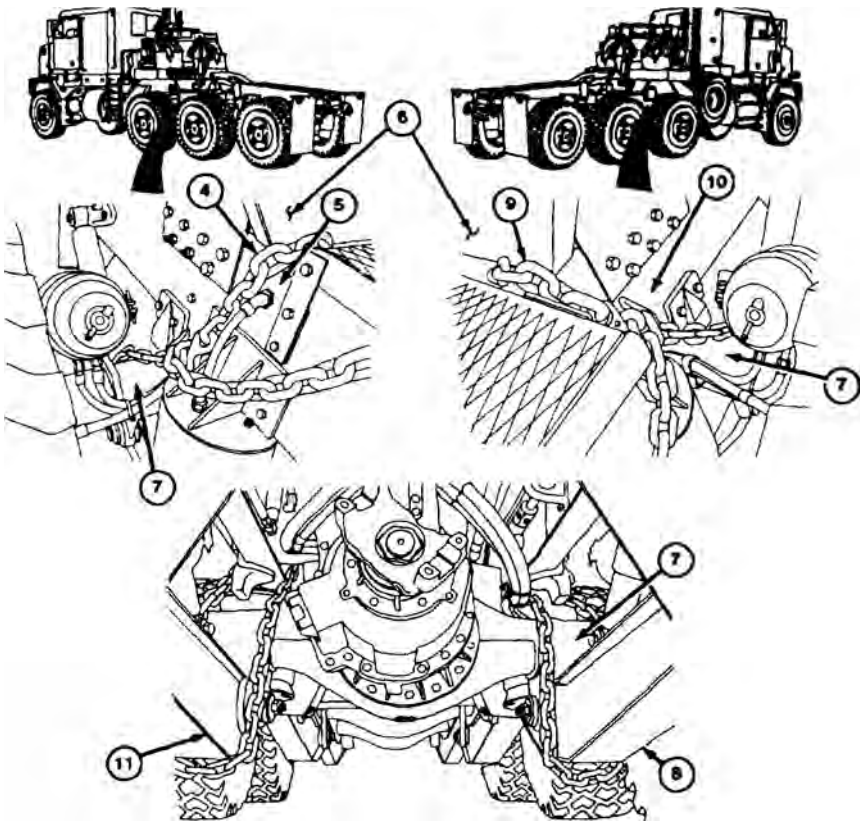


Figure 2.

6. Route and secure 12 ft. (3.6 m) chain (9) over passenger side frame rail (10) behind winch platform (6), in front of No. 2 axle (7), and under suspension arm (11).

NOTE

- One 16 ft. (5 m) safety chain is used to secure No. 3 axle.
- One 16 ft. (5 m) safety chain is used to secure No. 4 axle.
- For maximum ground clearance, chains should be installed as tight as possible.
- Both No. 3 and No. 4 axles are secured in similar manner, No. 3 axle is shown.

7. Route and secure 16 ft. (5 m) safety chain (12) over both frame rails (5 and 10), in front of No. 3 axle (13) and under suspension arms (14).

HOOKUP - Continued

8. Repeat step (7) for No. 4 axle.
9. Prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

10. Disconnect two springs (15) from tow cylinders (16).

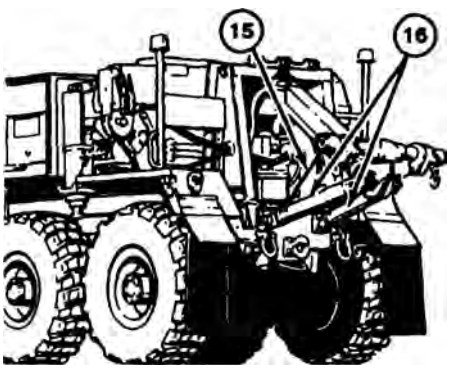


Figure 3.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

HOOKUP - Continued

11. Remove two rear towing shackles from wrecker vehicle:

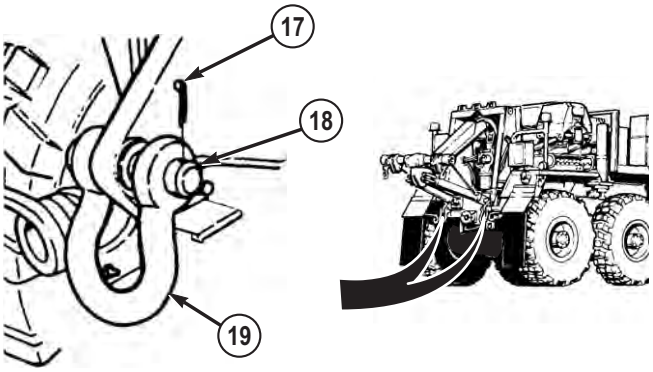


Figure 4.

a. Remove cotter pin (17), pin (18), and towing shackle (19).

b. Replace pin (17) in shackle (19), and cotter pin (17) in pin (18).

c. Repeat Steps (a) and (b) for opposite side towing shackle (19).

d. Stow two rear towing shackles on wrecker vehicle.

12. Pull LIFT CYLINDER control lever (20) to lower cross tube (21) to approximately 3 ft. (1 m) above the ground.

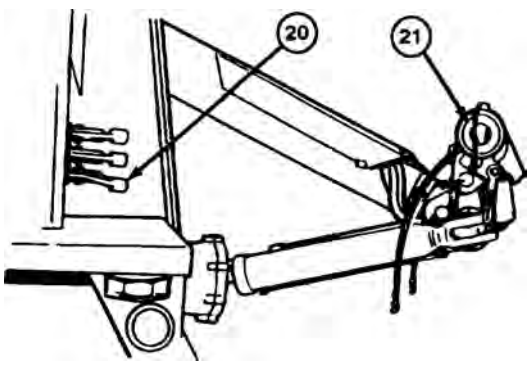


Figure 5.

13. Position wrecker so that cross tube (21) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

14. Remove two quick pins (22) and pins (23) from end caps (24).

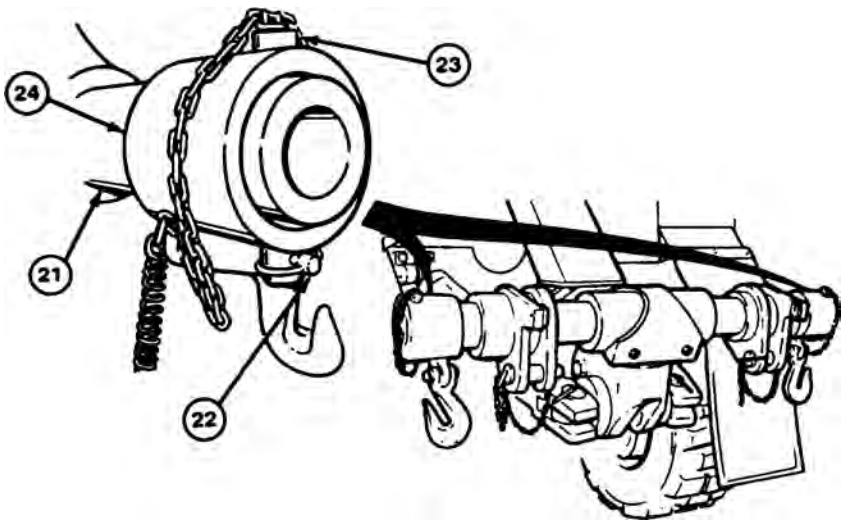


Figure 6.

15. Remove two end caps (24) from cross tube (21).
16. Remove two front adapters (25) from cross tube (21) and place on equipment body floor (26).

HOOKUP - Continued

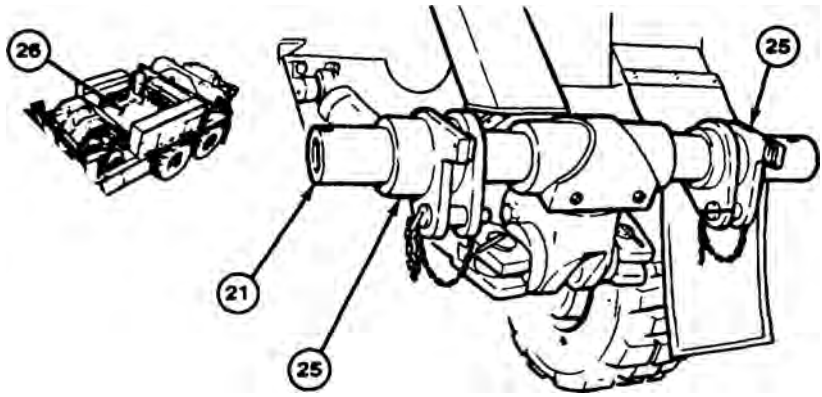


Figure 7.

17. Remove lock handle (27), lock plate (28), and two rear tow adapters (1497260W and 1497250W) (29) from equipment body floor (26).

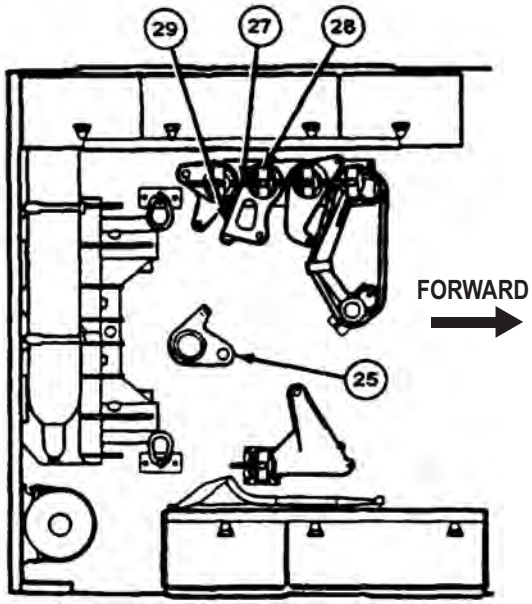


Figure 8.

18. Install two front adapters (25) on equipment body floor (26) with lockplate (28) and lock handle (27).

HOOKUP - Continued

19. Install two rear tow adapters (29) on cross tube (21).

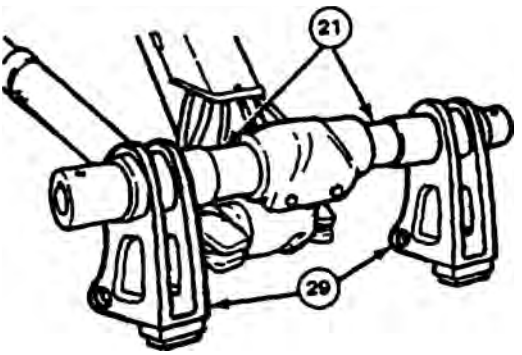


Figure 9.

20. Install two end caps (24) on cross tube (21) with two pins (23) and quick pins (22).

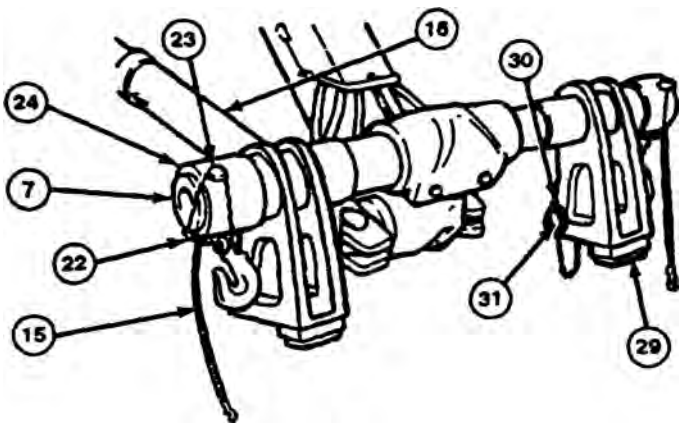


Figure 10.

21. Attach two springs (15) on tow cylinders (16).
22. Remove two quick pins (30) and pins (31) from adapters (29).

HOOKUP - Continued

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

23. Operate retrieval system (WP 0059) and with aid of an assistant, position cross tube (21) so holes in adapters (29) align with holes in rear tow eyes (32).

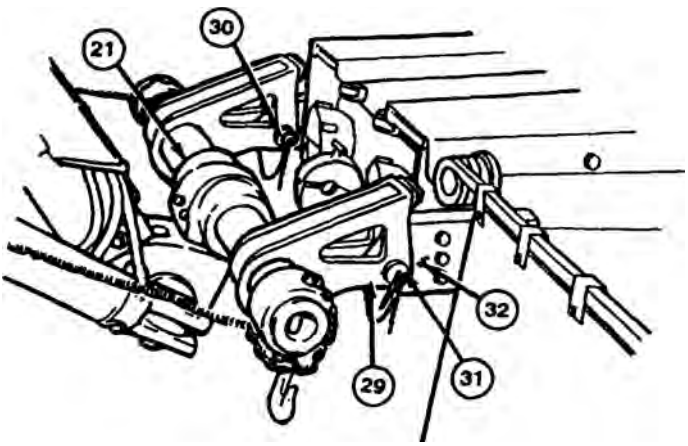


Figure 11.

24. Install two pins (31) through adapters (29) and rear tow eyes (32) with two quick pins (30).

25. Remove two 16 ft. (5 m) safety chains (33) from wrecker stowage.

HOOKUP - Continued

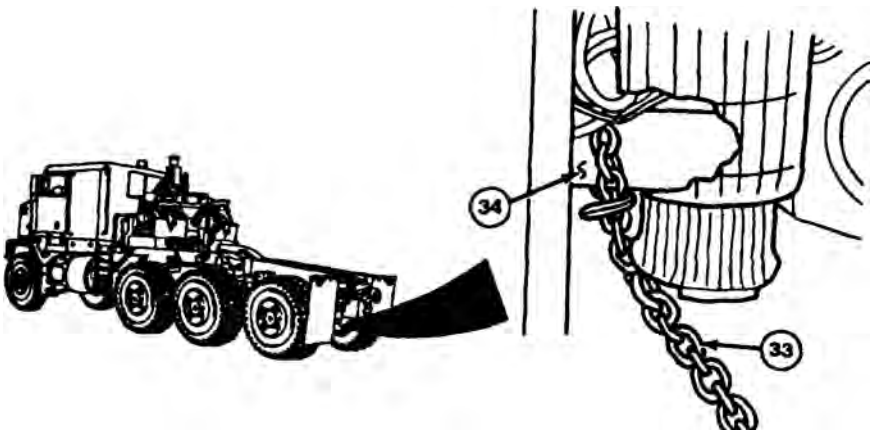


Figure 12.

26. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (33) over No. 4 axle (34) of disabled vehicle.
27. Hook 16 ft. (5 m) safety chain (33) together toward rear on disabled vehicle.
28. Repeat Steps (26) and (27) for other side of disabled vehicle No. 4 axle (34).
29. Route two free ends of 16 ft. (5 m) safety chains (33) through safety chain hoop (35) on wrecker and secure grab hooks (36) with safety shackles (37).

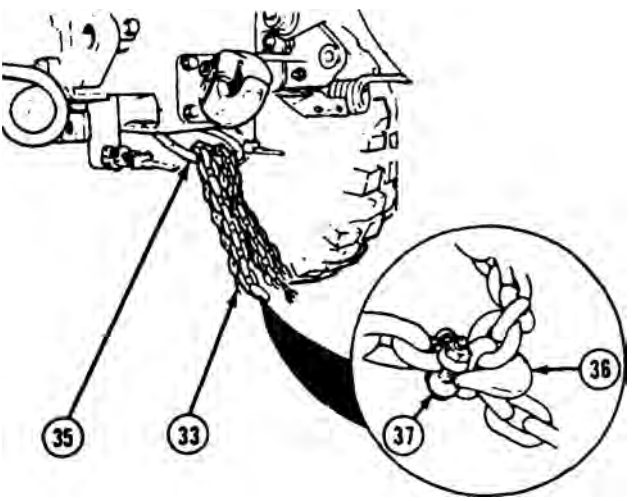


Figure 13.

HOOKUP - Continued

30. Position 16 ft. (5 m) safety chains (33) on grab hooks of end caps (24).

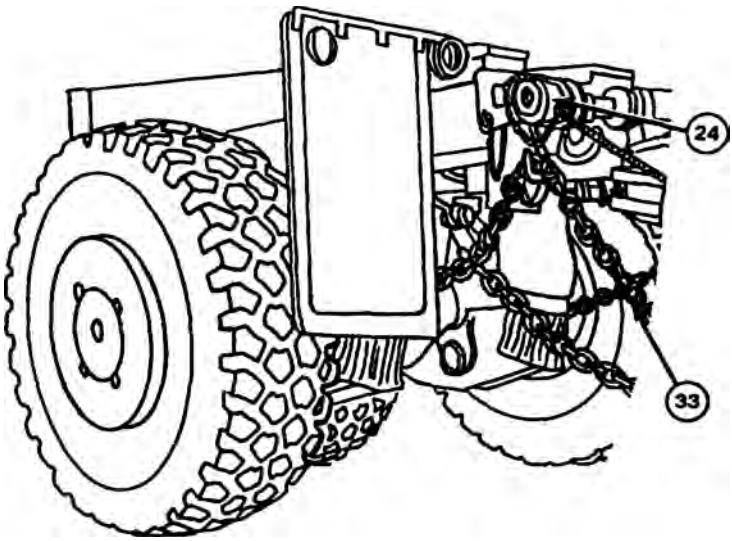


Figure 14.

CAUTION

Ensure all disabled vehicle cargo is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

31. Prepare disabled vehicle for towing (refer to disabled vehicle operator's manual).
32. Remove emergency tow lights (38) and two brackets (39) from wrecker stowage.

HOOKUP - Continued

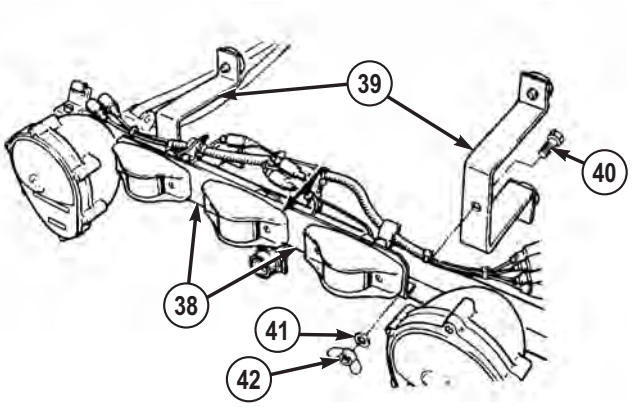


Figure 15.

33. Install two brackets (39) on emergency tow lights (38) with two screws (40), washers (41), and nuts (42).
34. Install emergency tow lights (38) on front of disabled vehicle and fasten securely with straps (43).

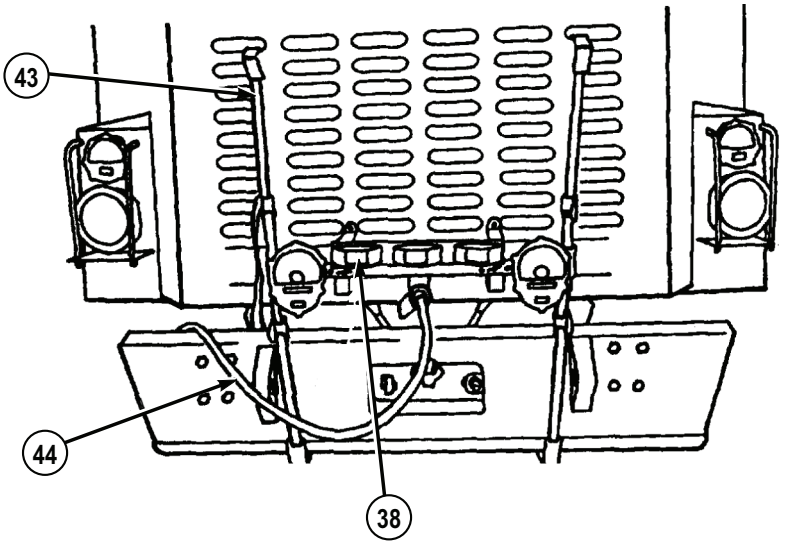


Figure 16.

35. Remove tow light cable (44) from wrecker stowage and connect to emergency tow lights (38).

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

36. Route free end of tow light cable (44) along disabled vehicle and connect to rear electrical connector (45) on wrecker.

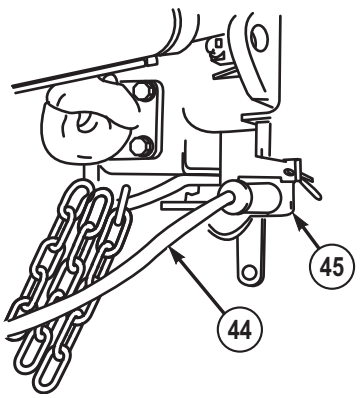


Figure 17.

37. Lock disabled vehicle's steering (refer to disabled vehicle operator's manual).
38. Set POWER switch (46) to ON position.

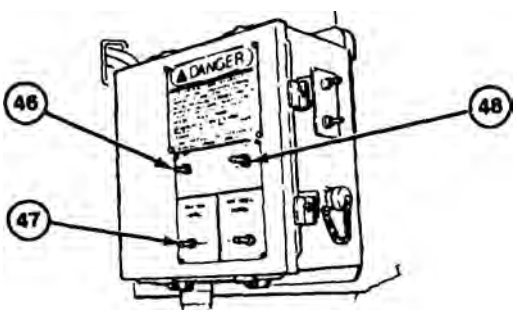


Figure 18.

39. Set HIGH IDLE switch (47) to CONTINUOUS.
40. Push and release LATCH switch (48). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

41. Push LIFT CYLINDER control lever (20) to retract lift cylinder (49) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

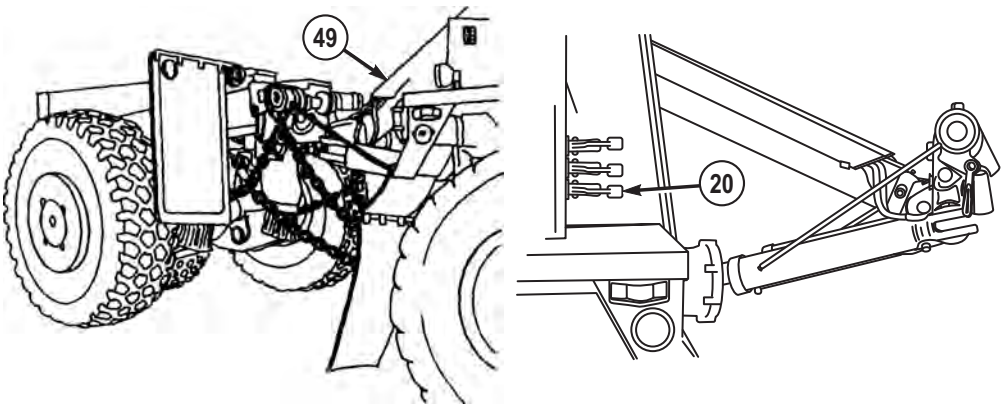


Figure 19.

HOOKUP - Continued

42. Set POWER switch (46) to OFF position.

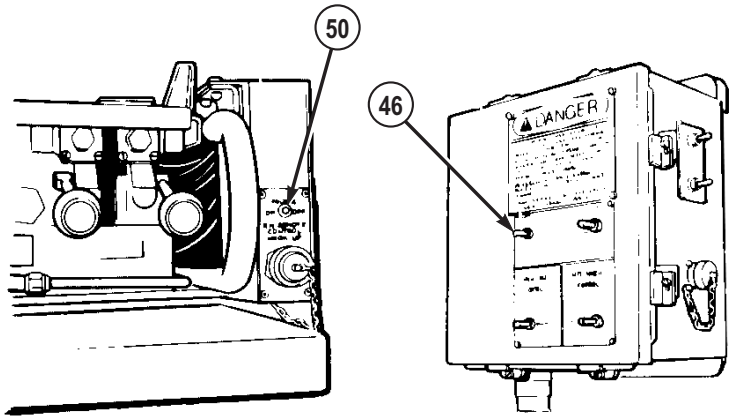


Figure 20.

43. Set POWER switch (50) to OFF position.
44. Set PTO ENGAGE switch (52) to OFF position. Indicator light (53) will go out.

HOOKUP - Continued

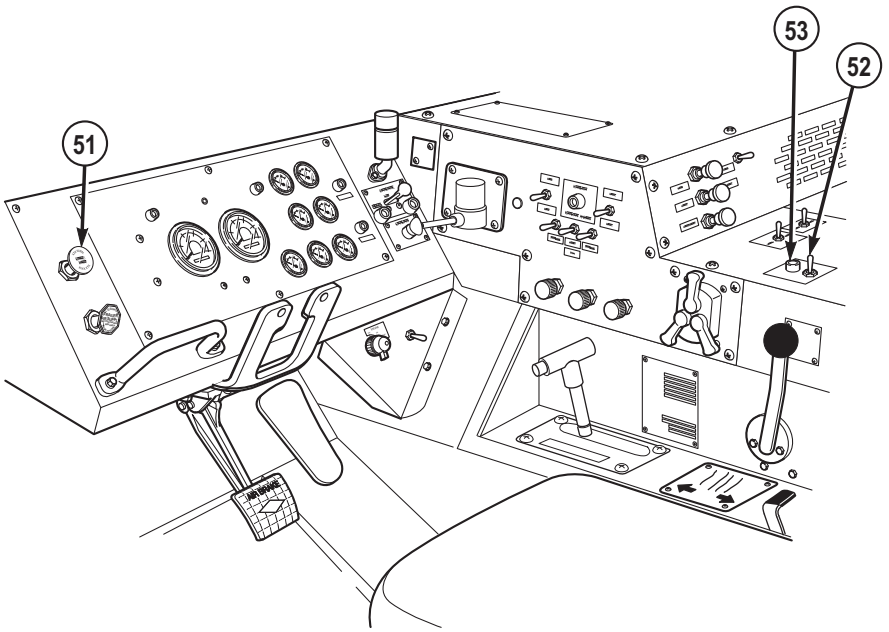


Figure 21.

45. Turn on wrecker service drive lights. (WP 0090)
46. Turn on wrecker emergency flashers. (WP 0099)
47. Turn on disabled vehicle emergency flashers (refer to operator's manual).
48. Push in PARKING BRAKE control (51).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

49. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

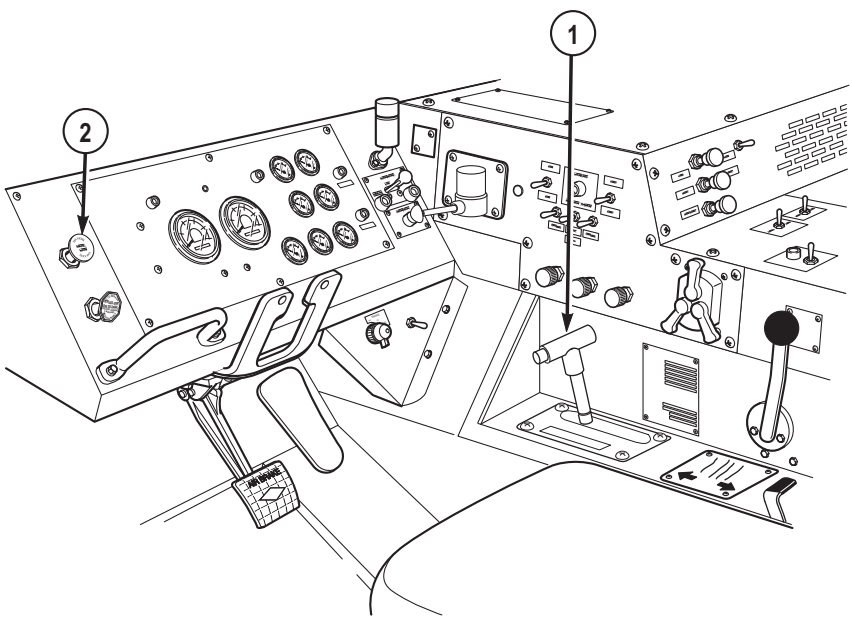


Figure 22.

2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058) prepare retrieval system for operation, (WP 0059) and lower disabled vehicle to the ground.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

DISCONNECT - Continued

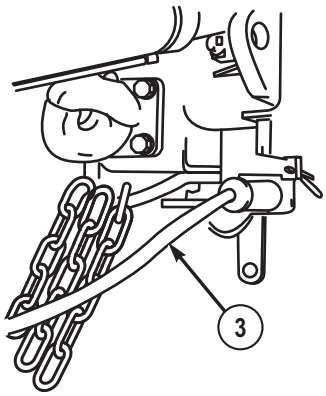


Figure 23.

6. Remove tow light cable (3) from emergency tow lights (4) and return to wrecker stowage.

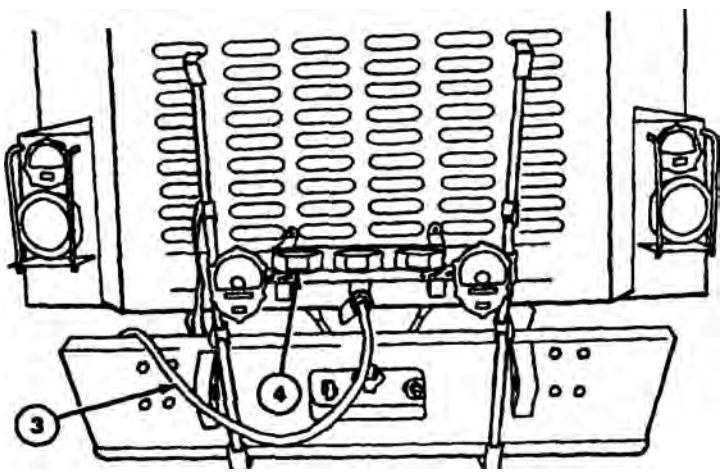


Figure 24.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and brackets to wrecker stowage.

DISCONNECT - Continued

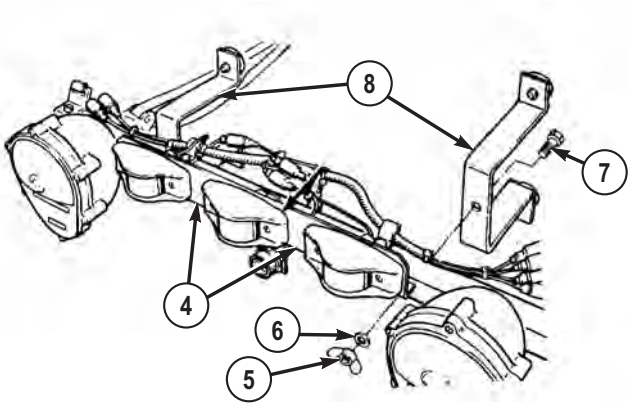


Figure 25.

9. Remove and stow two 16 ft. (5 m) safety chains (9).

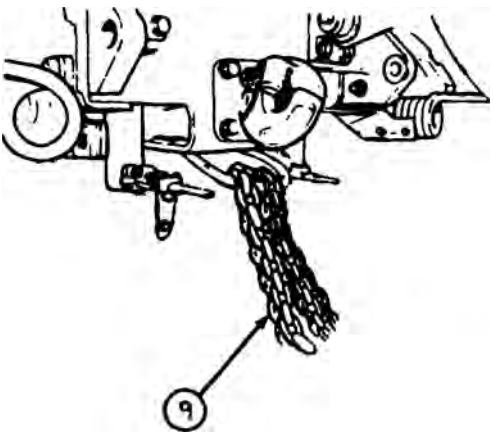


Figure 26.

10. Remove two quick pins (10) and pins (11) from adapters (12).

DISCONNECT - Continued

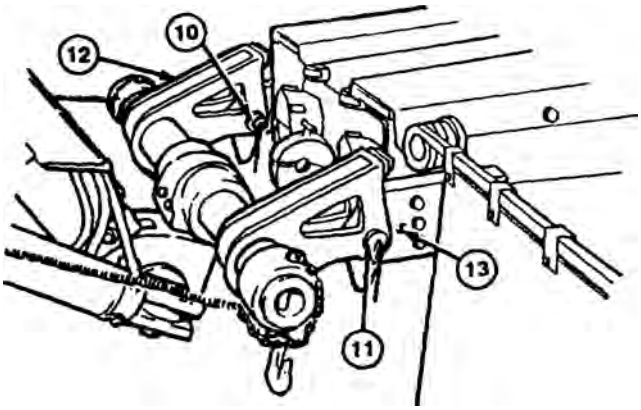


Figure 27.

11. Remove two adapters (12) from tow eyes (13).
12. Install two pins (11) in adapters (12).
13. Install two quick pins (10) in pins (11).
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (14) from tow cylinders (15).

DISCONNECT - Continued

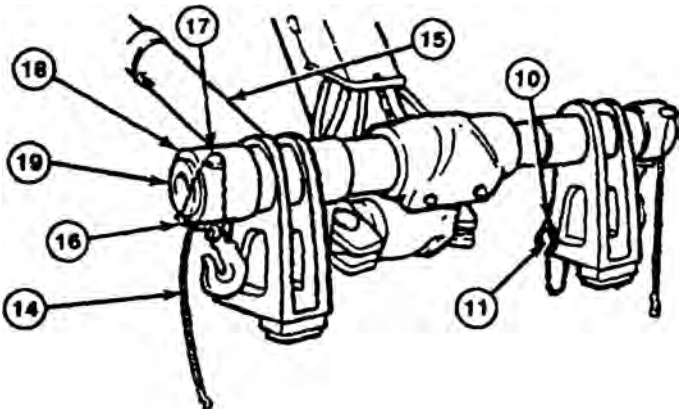


Figure 28.

16. Remove two quick pins (16) and pins (17) from end caps (18).
17. Remove two end caps (18) from cross tube (19).
18. Remove two adapters (12) from cross tube (19) and place on equipment body floor (20).

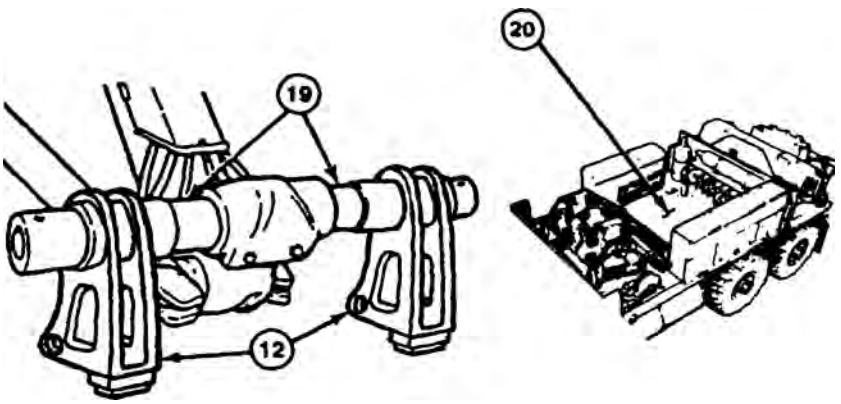


Figure 29.

19. Remove lock handle (21), lock plate (22), and two front tow adapters (23).

DISCONNECT - Continued

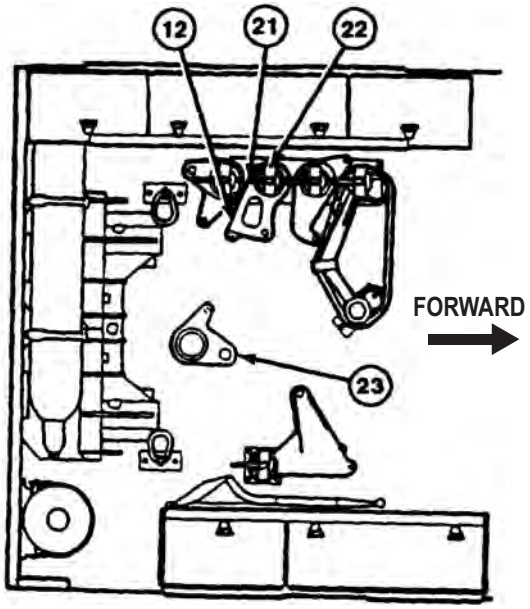


Figure 30.

20. Install two adapters (12) on body floor with lock plate (22) and lock handle (21).
21. Install two adapters (23) on cross tube (19).

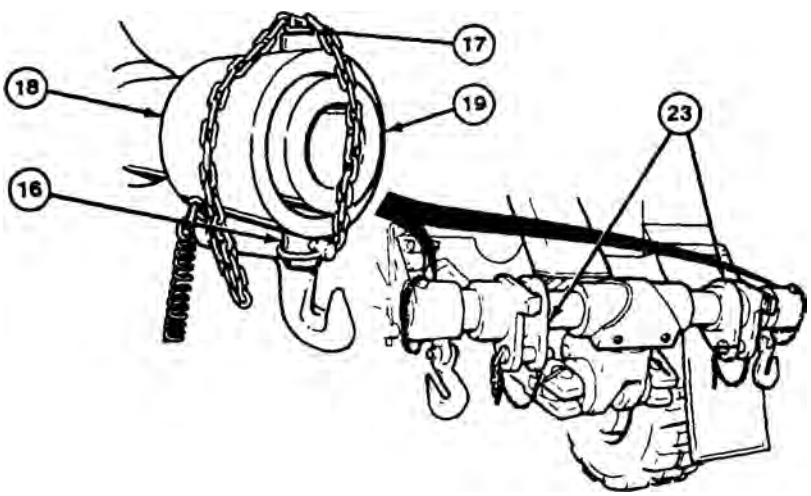


Figure 31.

DISCONNECT - Continued

22. Install two end caps (18) on cross tube (19) with two pins (17) and two quick pins (16).
23. Install two springs (14) on tow cylinders (15).

Figure 32.

24. Operate retrieval system to fully retract lift cylinder (24) and tow cylinders (15).

NOTE

Driver side and passenger side towing shackles are installed the same way.

25. Install two rear towing shackles (25), pins (26), and cotter pins (27).

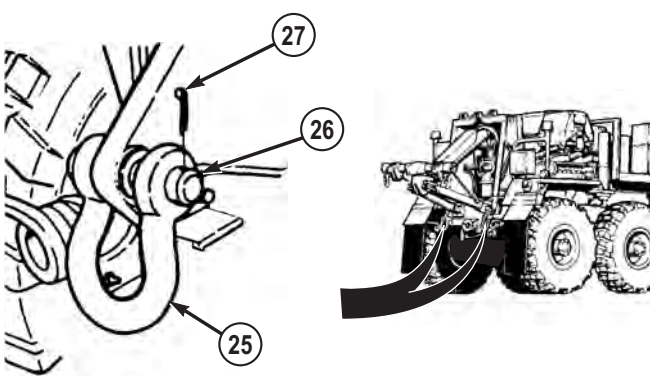


Figure 33.

DISCONNECT - Continued

26. Set POWER switch (28) to OFF position.

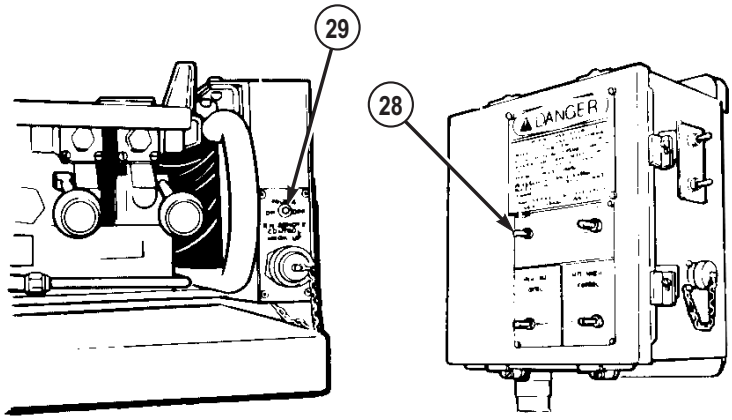


Figure 34.

27. Set POWER switch (29) to OFF position.
28. Turn off wrecker service drive lights. (WP 0090)
29. Turn off wrecker emergency flashers. (WP 0099)
30. Set PTO ENGAGE switch (30) to OFF position. Indicator light (31) will go out.

DISCONNECT - Continued

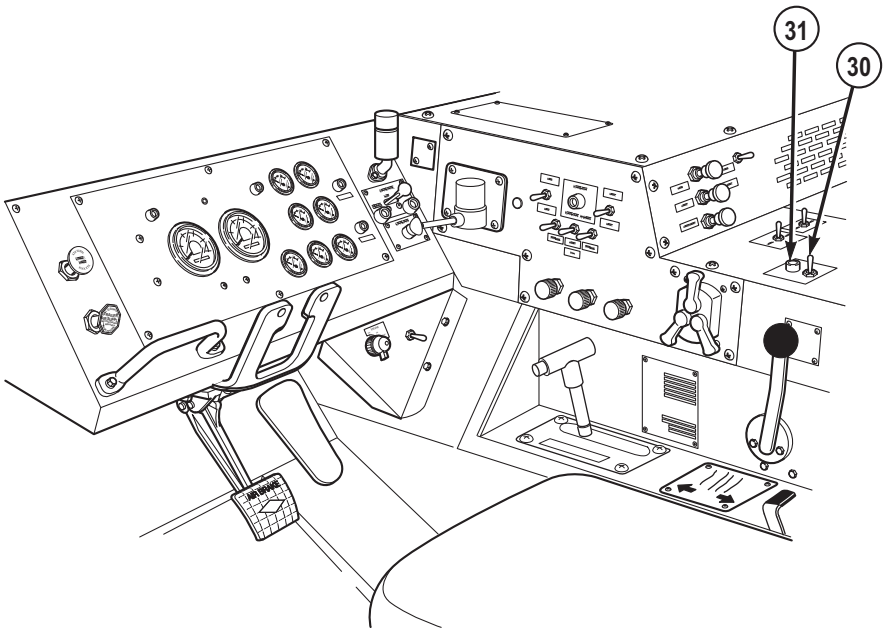


Figure 35.

31. Shut off engine. (WP 0057)
32. Remove and stow portable beacon lights. (WP 0097)
33. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW M911 - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- Each recovery situation is unique and requires assessment to determine if the driveline is suitable for transport. When in doubt, consult with field level maintenance.
- This procedure is a two soldier task.

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

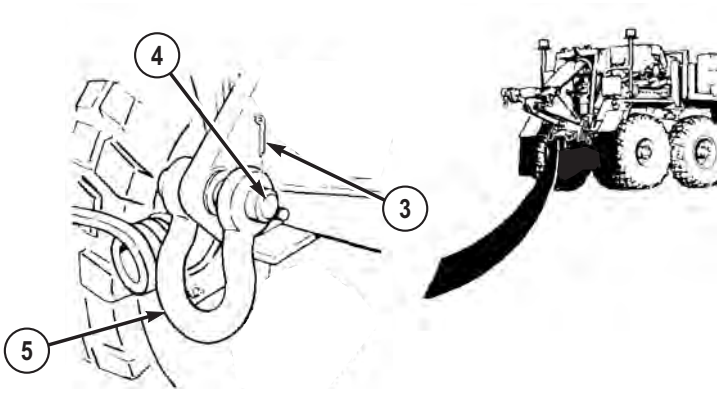


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

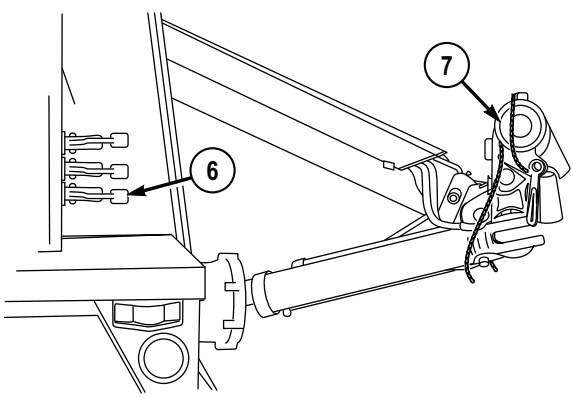


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove quick pins (8) and pins (9) from end caps (10).

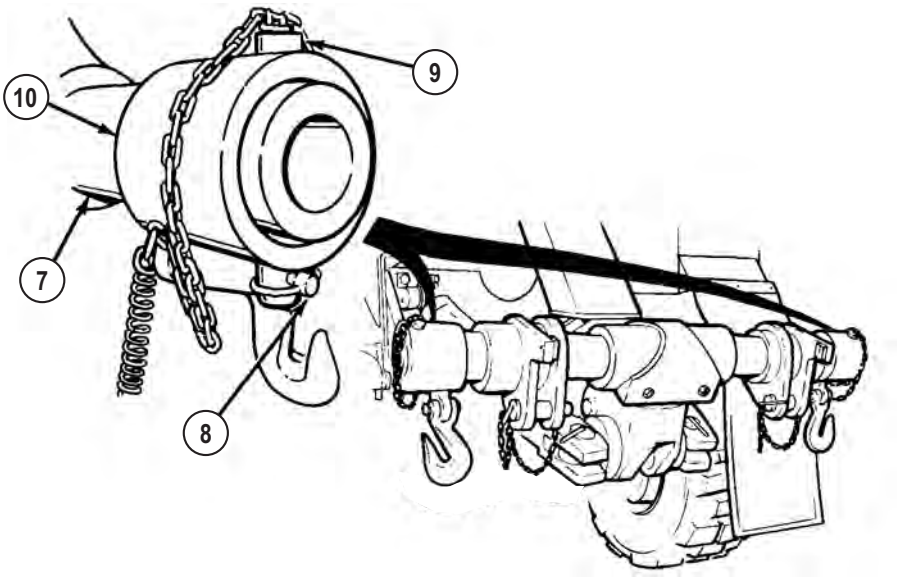


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

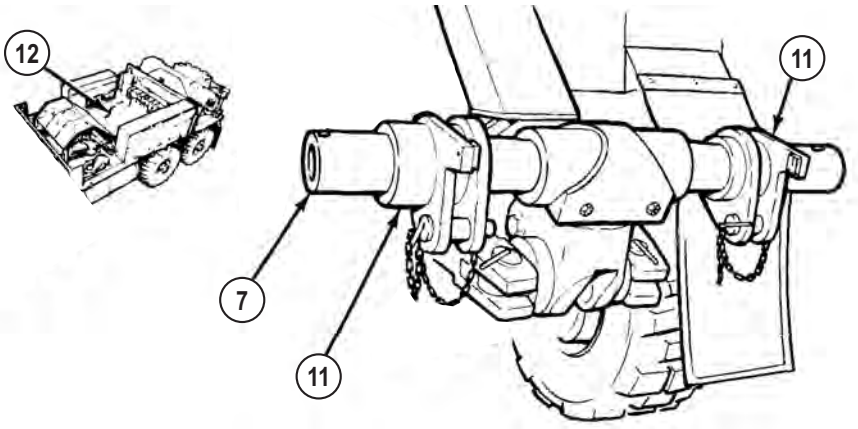


Figure 5.

9. Remove lock handle (13), lock plate (14), quick pin (15), pin (16), and two rear tow adapters (17).

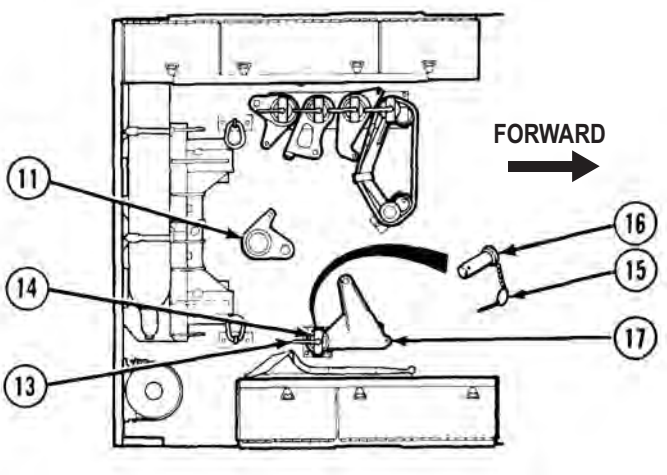


Figure 6.

10. Install two front adapters (11) removed from cross tube (7), pin (16), quick pin (15), lock plate (14), and lock handle (13).

HOOKUP - Continued

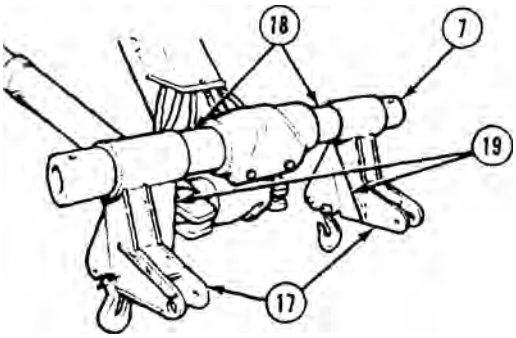
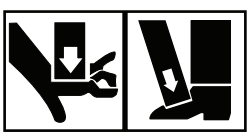


Figure 7.

11. Remove two 1 7/16 in. (37 mm) pins and two 5 in. (127 mm) spacers (18) from wrecker stowage.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

12. Install two 5 in. (127 mm) spacers (18) on cross tube (7).
13. Install two rear tow adapters (17) on cross tube (7) with support brace (19) to inside.
14. Install two end caps (10) on cross tube (7).

HOOKUP - Continued

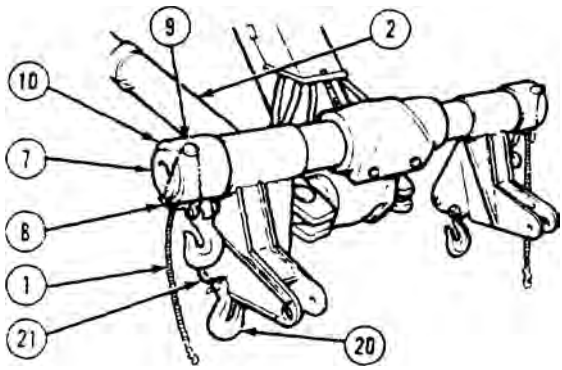


Figure 8.

15. Install two pins (9) and quick pins (8).

NOTE

Complete Step (16) if two rear adapter grab hooks are located in holes other than those closest to towing pin holes, otherwise skip to Step (17).

16. Install adapter grab hooks (20) in hole closest to pin holes (21).
17. Attach two springs (1) on tow cylinders (2).
18. Operate retrieval system, and with aid of an assistant, position cross tube (7) so holes in adapters (17) align with rear tow eyes (22).

HOOKUP - Continued

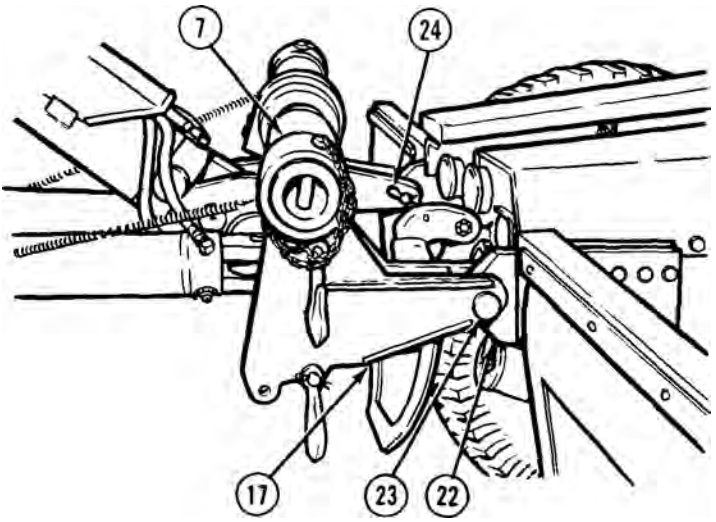


Figure 9.

19. Insert two 1 7/16 in. (37 mm) pins (23) through adapters (17) and rear tow eyes (22). Install two cotter pins (24) in pins (23).
20. Install two cotter pins (24) in pins (23).
21. Operate retrieval system (7) until adapter grab hooks (20) are under rear tow eyes (22).

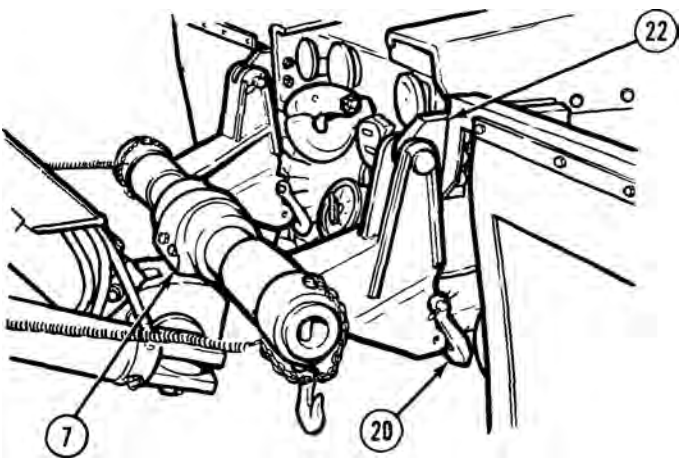


Figure 10.

HOOKUP - Continued

22. Remove two 16 ft. (5 m) safety chains (25) from wrecker stowage.

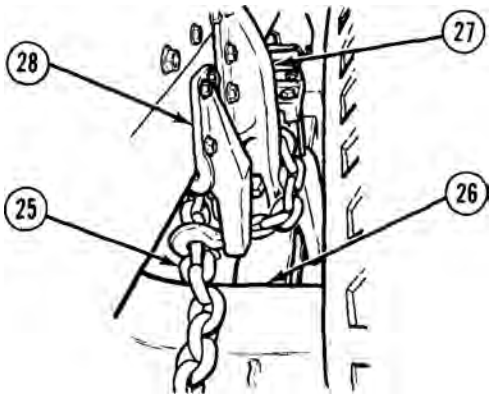


Figure 11.

23. Route end (without safety shackle) of 16 ft. (5 m) safety chain (25) over rear axle (26) on disabled vehicle.
24. Route 16 ft. (5 m) safety chains (25) around rear leaf spring shackle (27).
25. Hook 16 ft. (5 m) safety chain (25) back into itself between rear leaf spring shackle (27) and axle stop (28).
26. Repeat Steps (23) through (25) for other side of disabled vehicle.
27. Pull 16 ft. (5 m) safety chain (25) tight, and install chain on adapter grab hook (20).

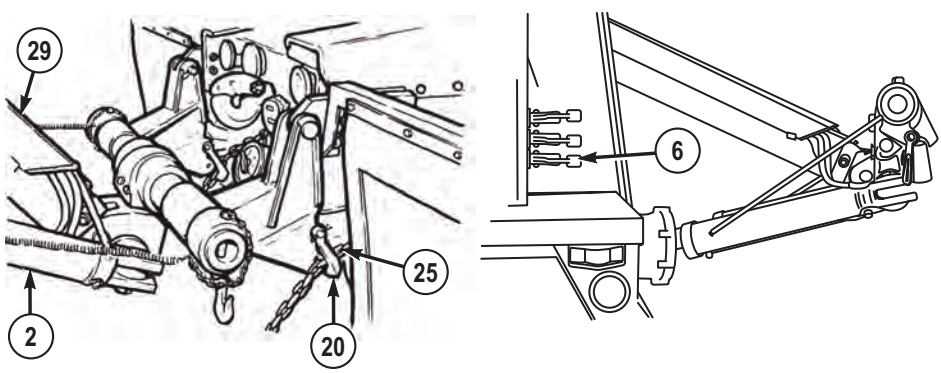


Figure 12.

28. Repeat step (27) for other side of disabled vehicle.

HOOKUP - Continued

29. Release PARKING BRAKE on disabled vehicle (refer to M911 operator's manual).
30. Operate retrieval system until tow cylinders (2) are fully retracted.
31. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (29) until slack is removed from 16 ft. (5 m) safety chains (25).

NOTE

Adjust chain slack so safety chains do not touch the ground.

32. Route two free ends of 16 ft. (5 m) safety chains (25) through safety chain hoop (30) on wrecker, and secure grab hooks (31) with safety shackles (32).

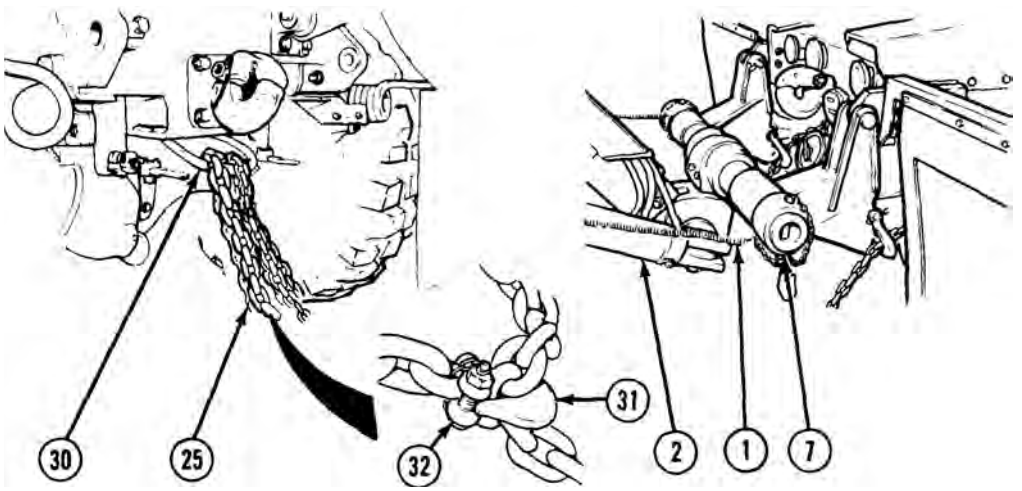


Figure 13.

33. Disconnect two springs (1) from tow cylinders (2), wrap around cross tube (7) and secure.

CAUTION

Ensure all disabled vehicle cargo is secured prior to lifting and towing. Failure to comply may result in damage to cargo and equipment.

34. Prepare disabled vehicle for towing (refer to M911 operator's manual).
35. Remove emergency tow lights (33) and two brackets (34) from wrecker stowage.

HOOKUP - Continued

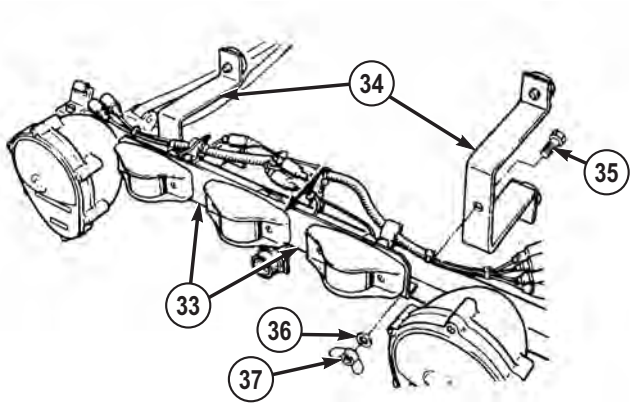


Figure 14.

36. Install two brackets (34) on emergency tow lights (33) with two screws (35), washers (36), and nuts (37).

37. Install emergency tow lights (33) on front of M911 and fasten securely with straps (38).

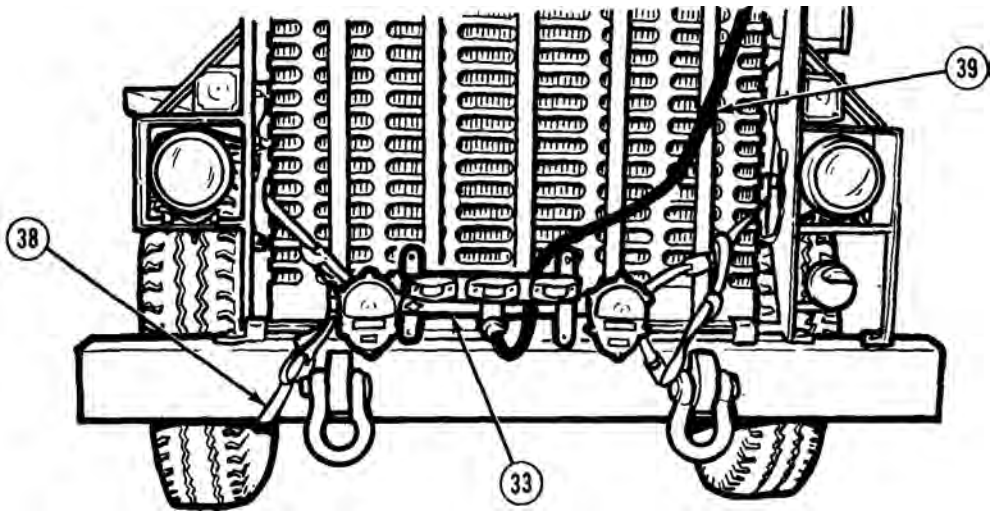


Figure 15.

38. Remove tow light cable (39) from wrecker stowage and connect to emergency tow lights (33).

HOOKUP - Continued

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

39. Route free end of tow light cable (39) along disabled vehicle and connect to rear electrical connector (40) on wrecker.

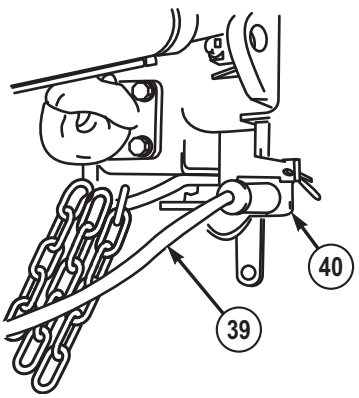


Figure 16.

40. Lock disabled vehicles steering (refer to M911 operator's manual).
41. Set POWER switch (41) to ON position.

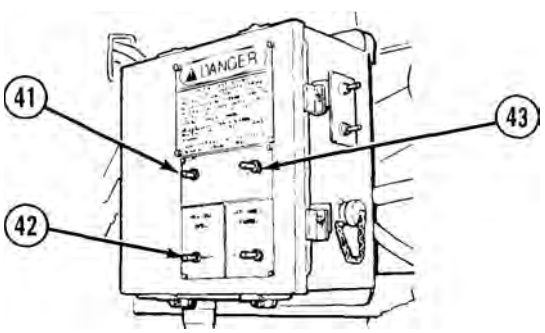


Figure 17.

42. Set HIGH IDLE switch (42) to CONTINUOUS.
43. Push and release LATCH switch (43). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

44. Operate retrieval system to retract lift cylinder (29) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

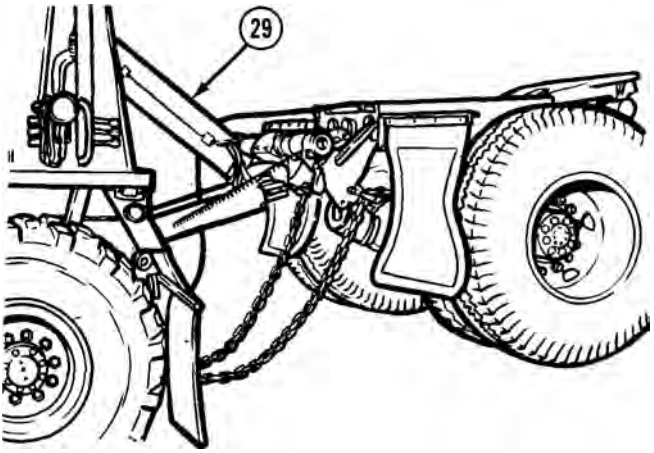


Figure 18.

NOTE

Ensure there is sufficient clearance between tires of pusher axle and ground (refer to M911 operator's manual).

45. Set POWER switch (41) to OFF position.

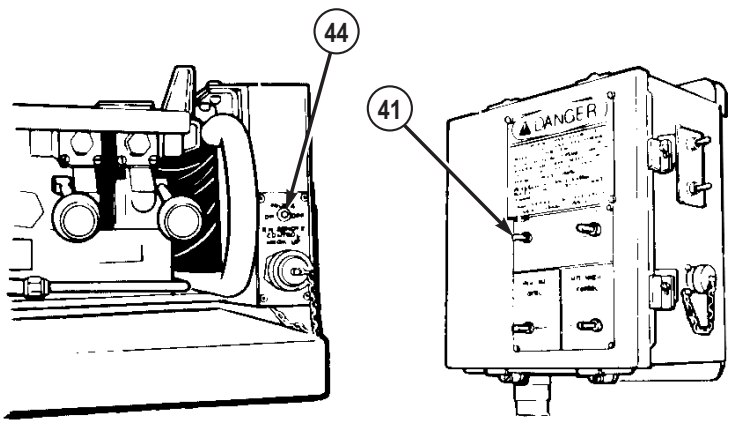


Figure 19.

46. Set POWER switch (44) to OFF position.
47. Set PTO ENGAGE switch (45) to OFF position. Indicator light (46) will go out.

HOOKUP - Continued

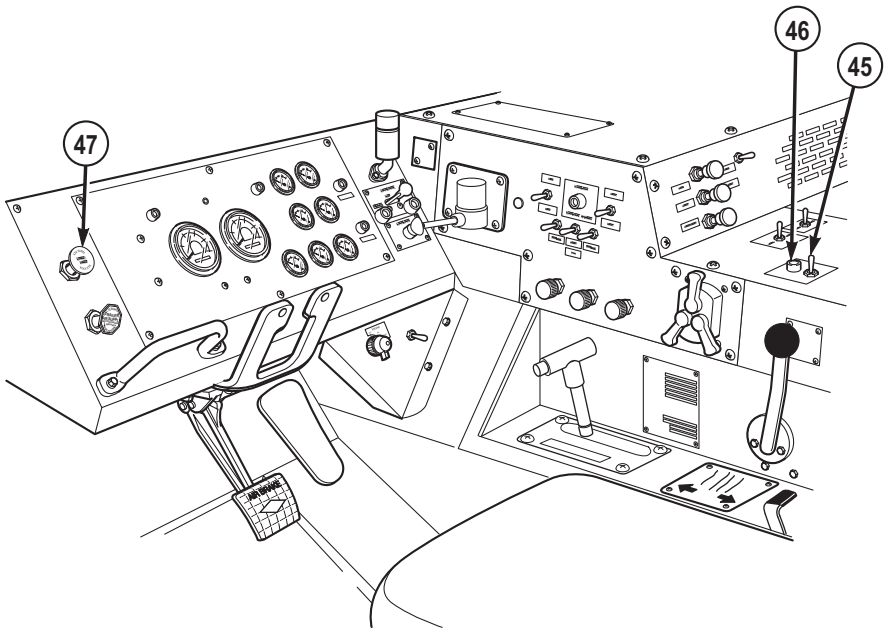


Figure 20.

48. Turn on wrecker service drive lights. (WP 0090)
49. Turn on wrecker emergency flashers. (WP 0099)
50. Turn on disabled vehicle emergency flashers (refer to operator's manual).
51. Push in PARKING BRAKE control (47).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

52. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

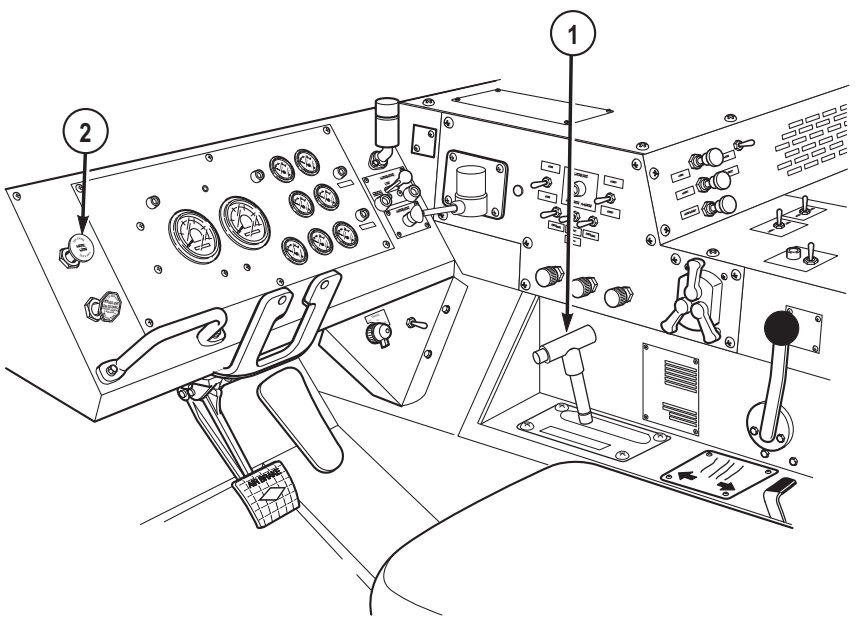


Figure 21.

2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 inches (50 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058)prepare retrieval system for operation, (WP 0059) and lower disabled vehicle to the ground.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

4. Set parking brake on disabled vehicle (refer to disabled vehicle operator's manual).
5. Remove tow light cable (3) from wrecker.

DISCONNECT - Continued

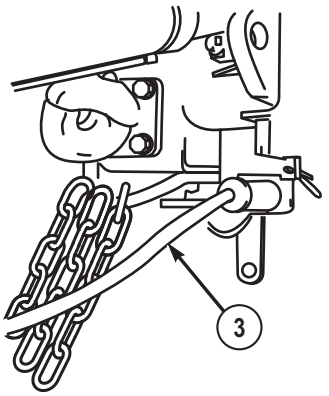


Figure 22.

6. Remove tow light cable (3) from emergency tow lights (4) and stow.

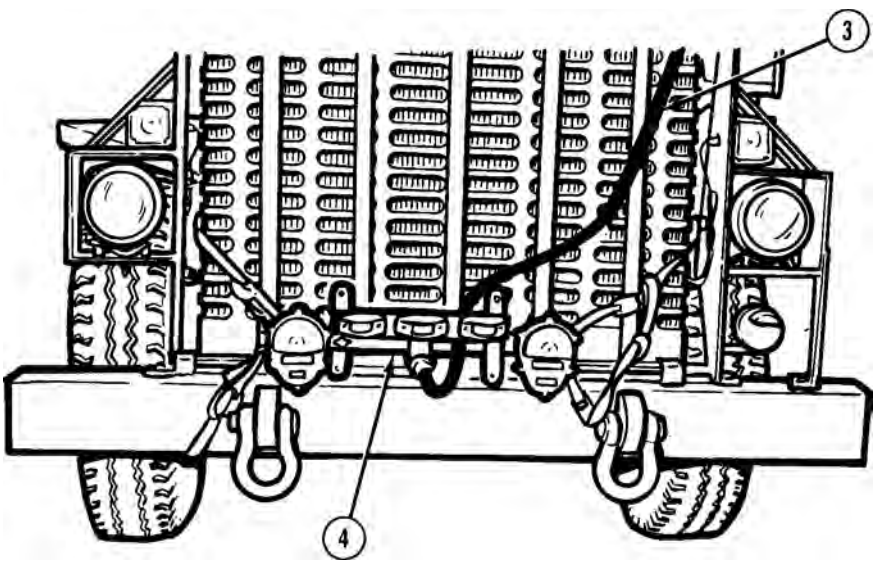


Figure 23.

7. Remove emergency tow lights (4) from disabled vehicle.
8. Remove two nuts (5), washers (6), screws (7), and brackets (8) from emergency tow lights (4). Return emergency tow lights and brackets to wrecker stowage.

DISCONNECT - Continued

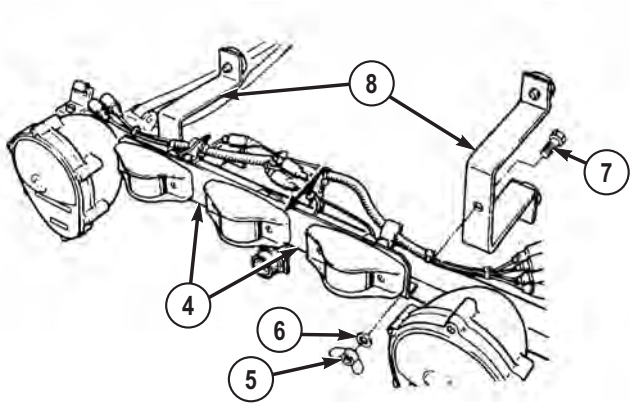


Figure 24.

9. Remove and stow two 16 ft. (5 m) safety chains (9).

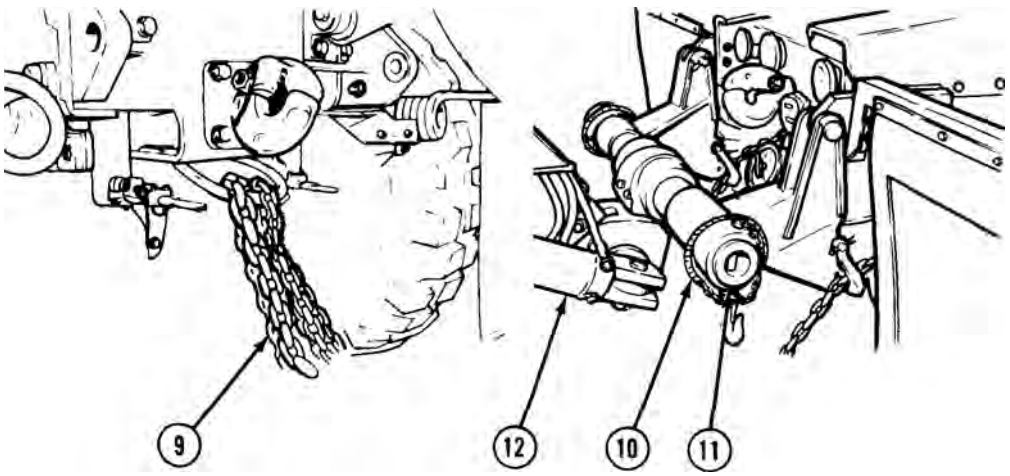
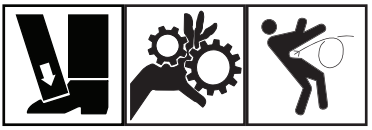


Figure 25.

10. Unwrap two springs (10) from cross tube (11) and connect to tow cylinders (12).

DISCONNECT - Continued

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

11. Remove two cotter pins (13) and 1 7/16 in. (37 mm) pins (14) from adapters (15).

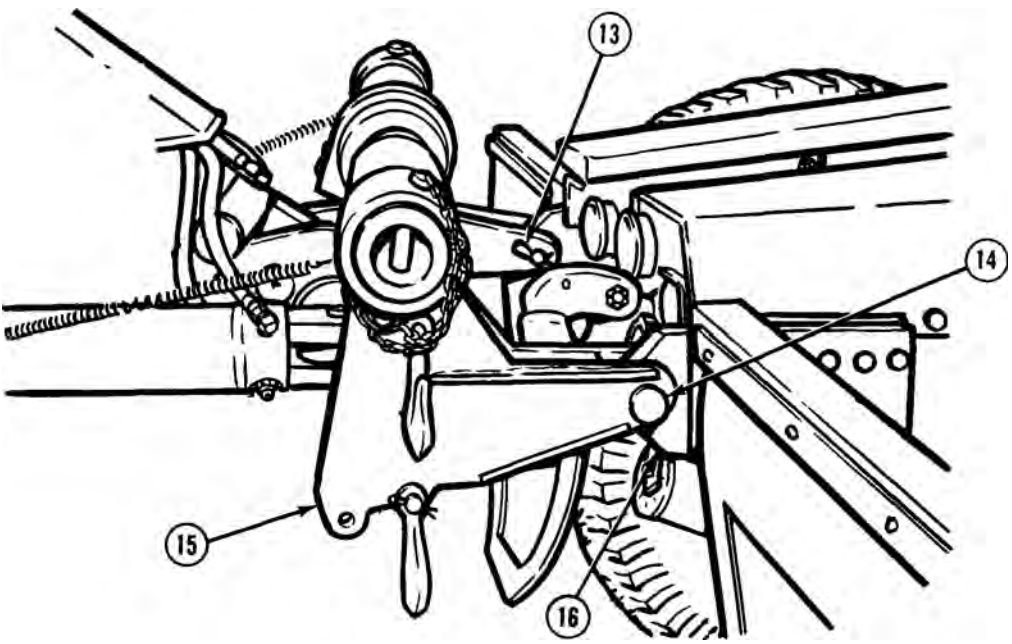


Figure 26.

12. Remove two adapters (15) from tow eyes (16) on disabled vehicle.

DISCONNECT - Continued

13. Install two cotter pins (13) in 1 7/16 in. (37 mm) pins (14) and return to wrecker stowage.
14. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

15. Remove two springs (10) from tow cylinders (12).

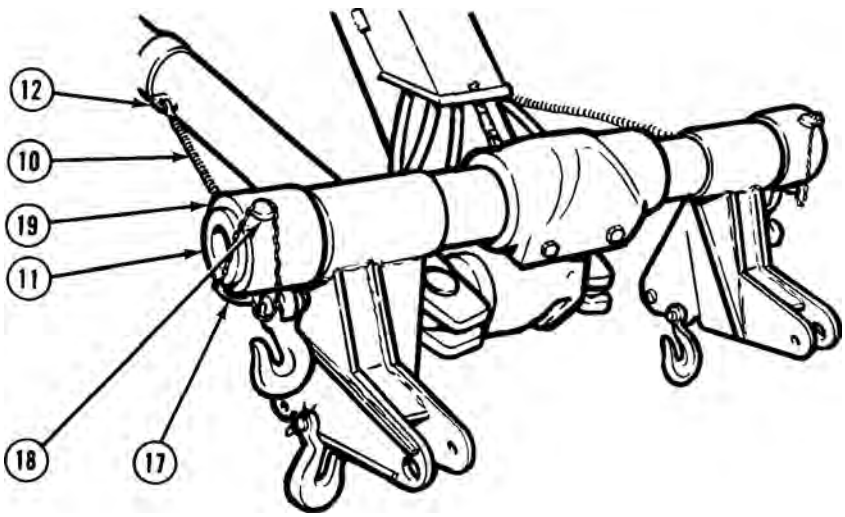


Figure 27.

16. Remove two quick pins (17) and pins (18) from end caps (19).
17. Remove two end caps (19) from cross tube (11).
18. Remove two rear adapters (15) from cross tube (11) and place on equipment body floor (20).

DISCONNECT - Continued

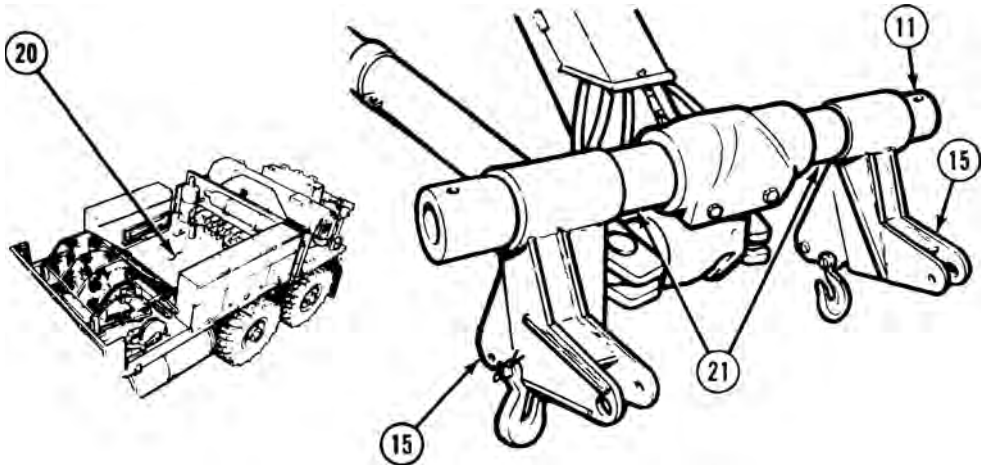


Figure 28.

19. Remove two 5 in. (127 mm) spacer tubes (21) from cross tube (11) and return to wrecker stowage.
20. Remove lock handle (22), lock plate (23), quick pin (24), pin (25), and two front adapters (26).

DISCONNECT - Continued

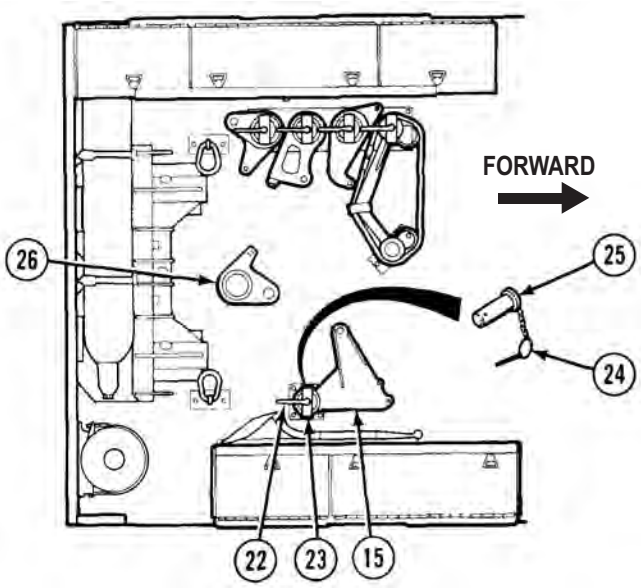


Figure 29.

21. Install two rear adapters (15) removed from cross tube (11), pin (25), quick pin (24), lock plate (23), and lock handle (22).

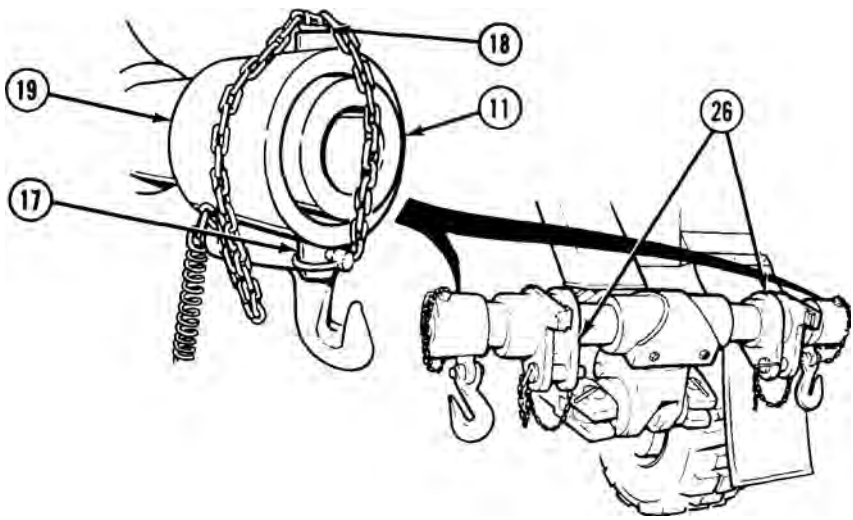


Figure 30.

DISCONNECT - Continued

22. Install two front adapters (26) on cross tube (11).
23. Install two end caps (19) on cross tube (11).
24. Install two pins (18) and quick pins (17).
25. Install two springs (10) on tow cylinders (12).

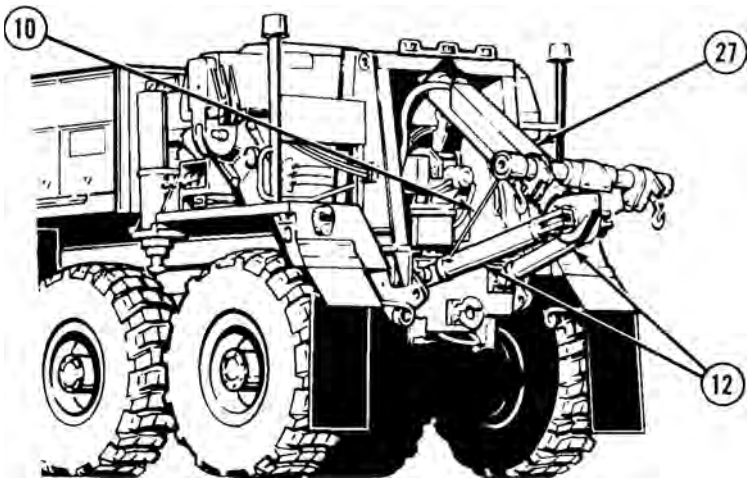


Figure 31.

26. Operate retrieval system to fully retract lift cylinder (27) and tow cylinders (12).

NOTE

Driver side and passenger side towing shackles are installed the same way.

27. Install two rear towing shackles (28), pins (29), and cotter pins (30).

DISCONNECT - Continued

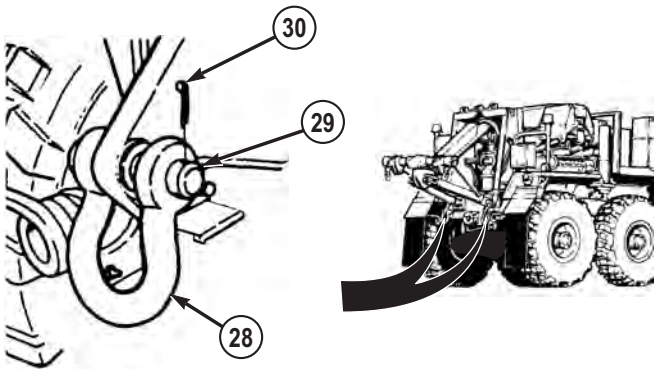


Figure 32.

28. Set POWER switch (31) to OFF position.

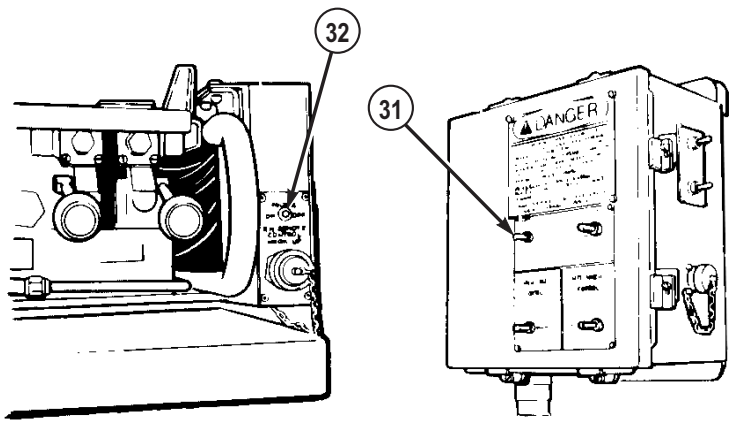


Figure 33.

29. Set POWER switch (32) to OFF position.
30. Turn off wrecker service drive lights. (WP 0090)
31. Turn off wrecker emergency flashers. (WP 0099)
32. Set PTO ENGAGE switch (33) to OFF position. Indicator light (34) will go out.

DISCONNECT - Continued

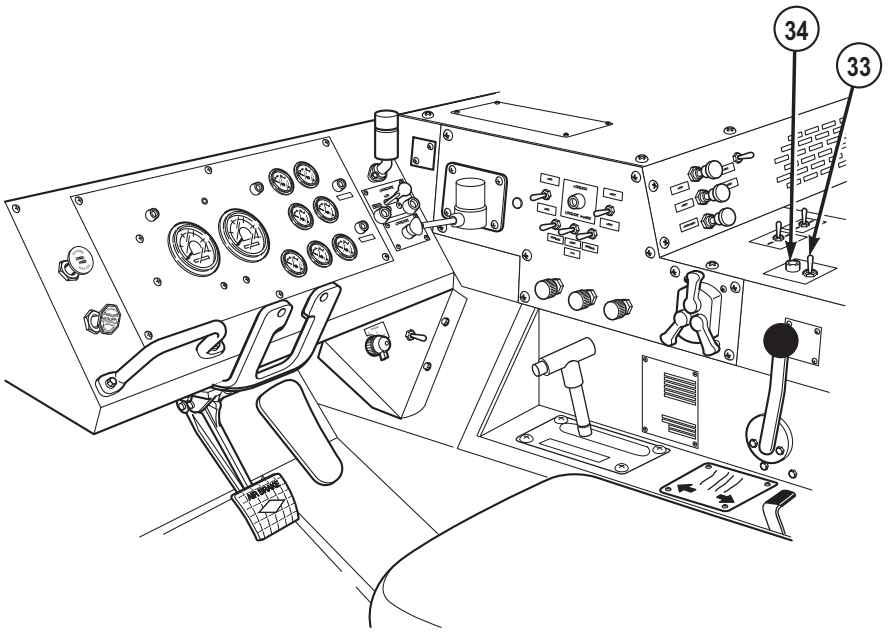


Figure 34.

33. Shut off engine. (WP 0057)
34. Remove and stow portable beacon lights. (WP 0097)
35. Turn off disabled vehicle emergency flashers, and unlock steering column (refer to disabled vehicle operator's manual).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW HEMTT - REAR LIFT

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

HOOKUP

NOTE

- This procedure is a two soldier task.
- The following rear lift procedures apply to all models HEMTT series vehicle EXCEPT M984A wrecker. If performing a rear-lift procedure to another HEMTT M984A wrecker, refer to Tow HEMTT M984 - Rear Lift. (WP 0063)

1. Review procedures for operating retrieval towing system (WP 0058) and prepare retrieval system for operation. (WP 0059)

WARNING

- Hold cross tube when removing springs, cross tube can swing in all directions and adapters may slide off. Failure to comply may result in injury or death to personnel.
- Intervehicular air lines are not connected when towing from rear. Disabled vehicle will not have braking. Use extreme care when transporting disabled vehicle using rear hookup. Failure to comply may result in injury or death to personnel.

2. Disconnect two springs (1) from tow cylinders (2).

HOOKUP - Continued

Figure 1.

CAUTION

Both rear towing shackles must be removed from rear tow eyes on wrecker before performing retrieval operations, or damage to tow cylinder may result.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove two rear towing shackles from wrecker vehicle:

HOOKUP - Continued

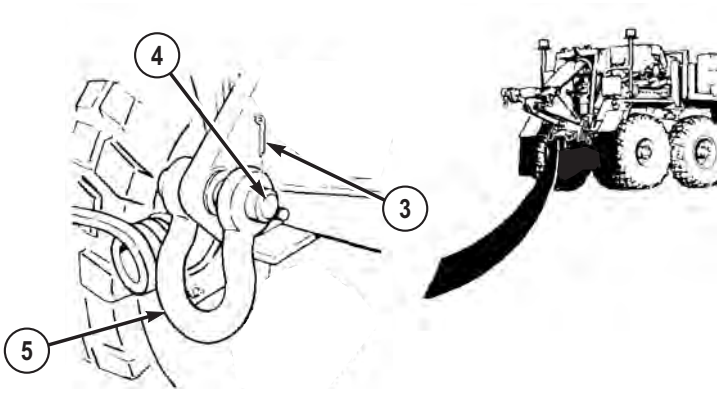


Figure 2.

a. Remove cotter pin (3), pin (4), and towing shackle (5).

b. Replace pin (4) in shackle (5), and cotter pin (3) in pin (4).

c. Repeat Steps (a) and (b) for opposite side towing shackle (5).

d. Stow two rear towing shackles on wrecker vehicle.

4. Pull LIFT CYLINDER control lever (6) to lower cross tube (7) to approximately 3 ft. (1 m) above ground.

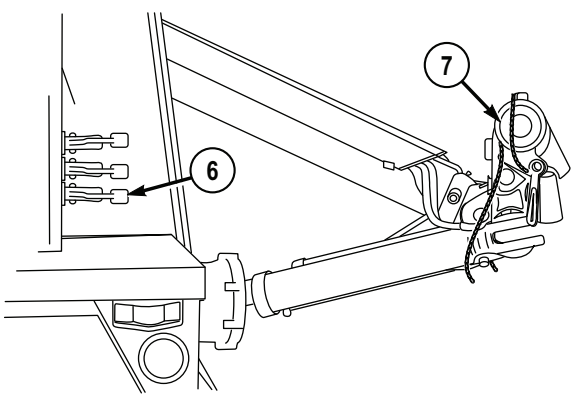


Figure 3.

5. Position wrecker so that cross tube (7) is approximately 1 ft. (30 cm) from tow eyes of disabled vehicle and centered on disabled vehicle.

HOOKUP - Continued

WARNING

When springs and end caps are removed, cross tube can swing in all directions and adapters may slide off and cause injury or death to personnel.

6. Remove two quick pins (8) and pins (9) from end caps (10).

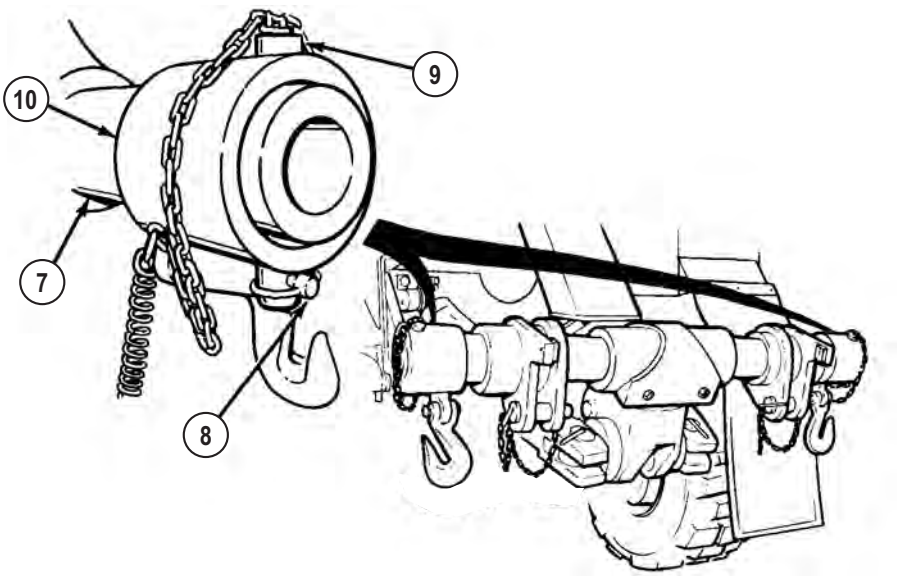


Figure 4.

7. Remove two end caps (10) from cross tube (7).
8. Remove two front adapters (11) from cross tube (7) and place on equipment body floor (12).

HOOKUP - Continued

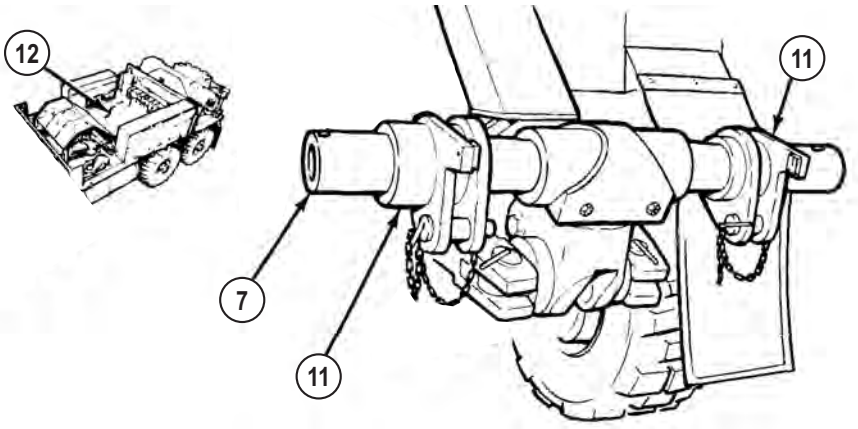


Figure 5.

9. Remove lock handle (13), lock plate (14), and two rear tow adapters (15).

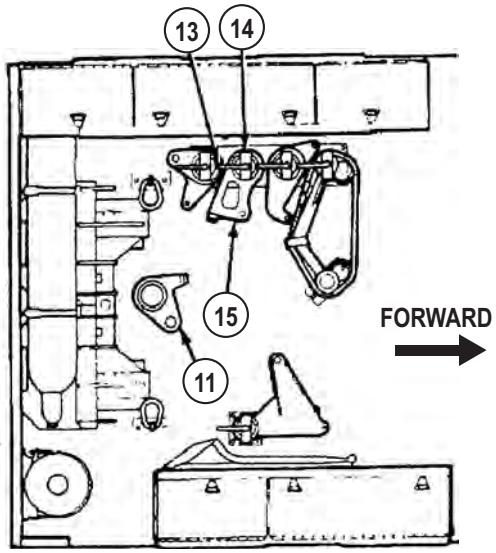


Figure 6.

10. Install two front adapters (11) removed from cross tube (7) with lock plate (14) and lock handle (13).

HOOKUP - Continued

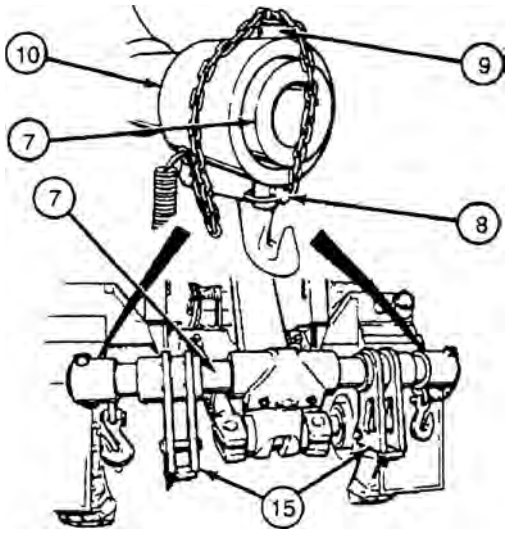
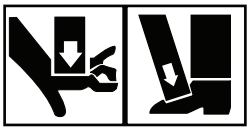


Figure 7.

WARNING



Adapters and end caps may slide off when installing and cause injury or death to personnel.

11. Install two rear tow adapters (15) on cross tube (7).
12. Install two end caps (10) on cross tube (7).
13. Install two pins (9) and quick pins (8).
14. Remove two quick pins (16) and pins (17) from rear tow adapters (15).

HOOKUP - Continued

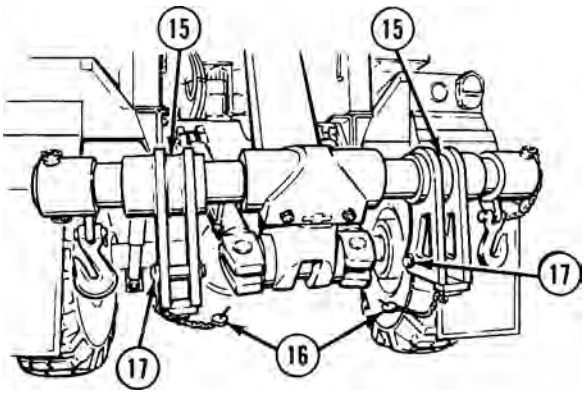


Figure 8.

NOTE

If disabled vehicle has rear towing shackles installed, remove towing shackles and stow on disabled vehicle.

15. Attach two springs (1) on tow cylinders (2).

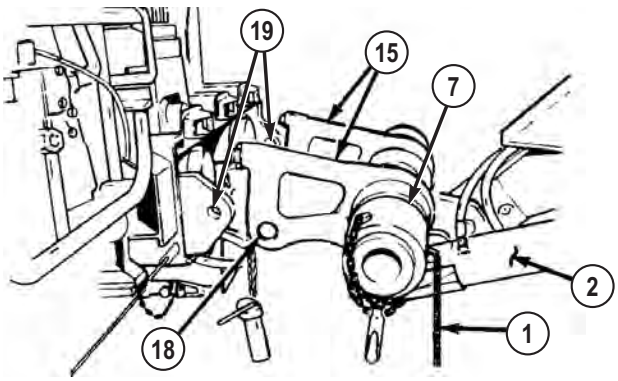


Figure 9.

HOOKUP - Continued

WARNING

Adapters may need to be held in the upright position while moving cross tube. Failure to comply may result in injury or death to personnel.

16. Rotate two rear tow adapters (15) so mounting holes (18) are on top.

WARNING

Keep hands and fingers away from adapters and tow eyes when operating retriever controls. Failure to comply may result in injury or death to personnel.

17. Operate retrieval system, and with aid of an assistant position cross tube (7) so two mounting holes (18) in rear tow adapters (15) align with rear tow eyes (19) on disabled vehicle.

18. Insert two pins (17) through rear tow adapters (15) and disabled vehicle rear tow eyes (19). Install two quick pins (16).

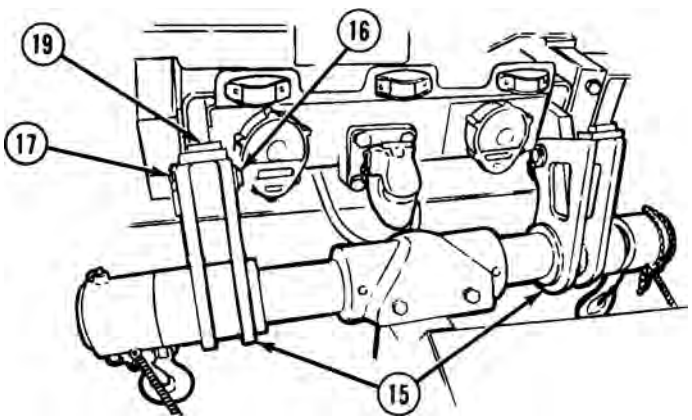


Figure 10.

HOOKUP - Continued

NOTE

If disabled vehicle air system is inoperative, manually release spring brakes (WP 0129).

19. Push in PARKING BRAKE control (20) on disabled vehicle.

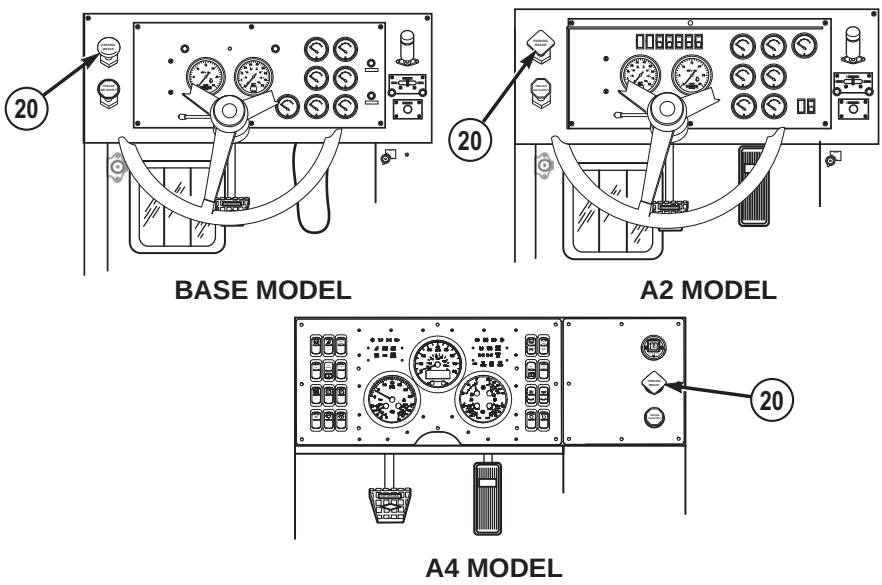


Figure 11.

NOTE

Two rear tow adapters must be resting against frame of disabled vehicle.

20. Operate retrieval system until tow cylinders (2) are fully retracted.

HOOKUP - Continued

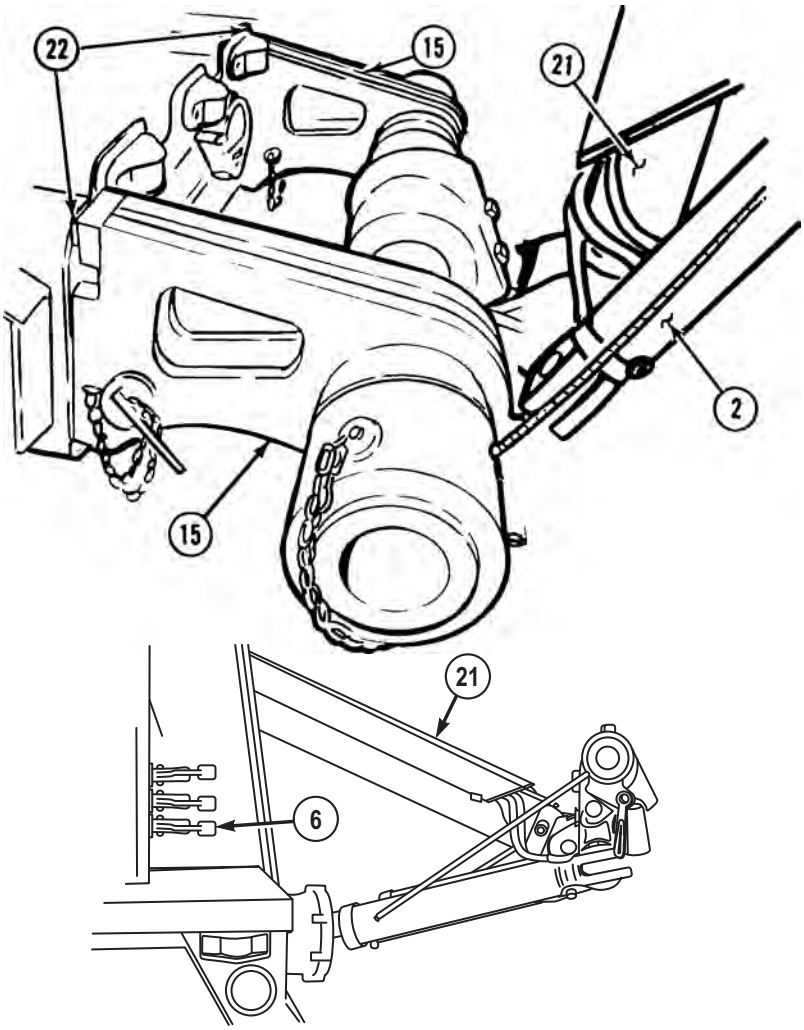


Figure 12.

21. Push in LIFT CYLINDER control lever (6) to retract lift cylinder (21) until two rear tow adapters (15) contact disabled vehicle frame (22).

22. Remove two 16 ft. (5 m) safety chains (23) from wrecker stowage.

CAUTION

Care must be taken to identify which model of HEMTT series vehicle is being towed (refer to data plate on inside of driver side door). Safety chain

HOOKUP - Continued

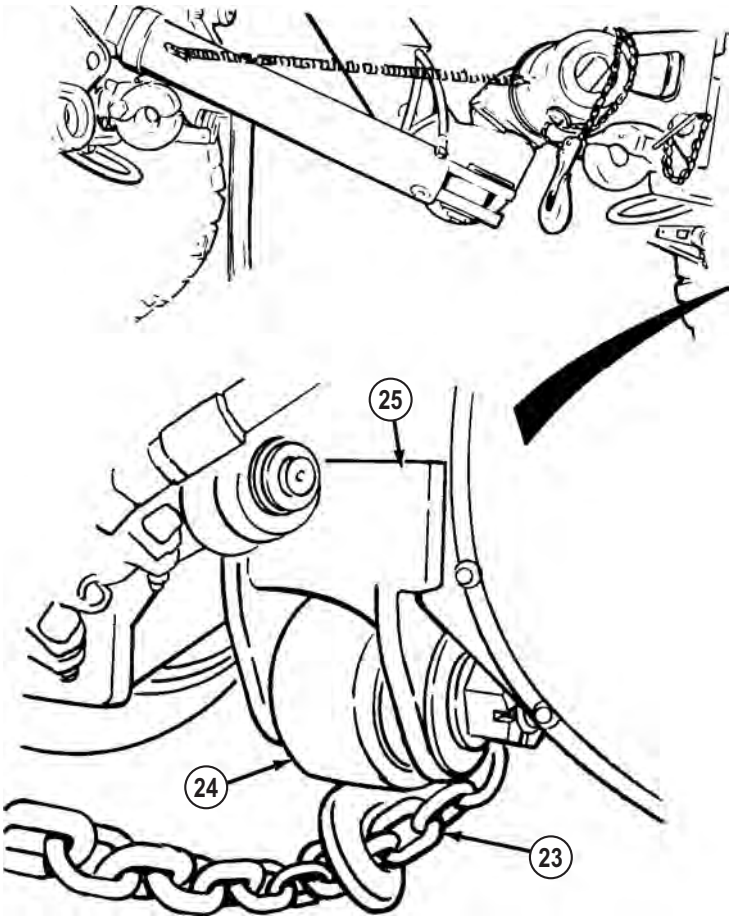
attachment points depend on model of HEMTT series vehicle. Failure to comply may result in damage to equipment.

NOTE

- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (23).
- If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (24).

23. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (23) over walking beam (24) in front of No. 4 axle (25) on disabled vehicle, and hook 16 ft. (5 m) safety chain (23) back into itself under walking beam (24) as shown.

HOOKUP - Continued



BASE/A2 DISABLED VEHICLE

Figure 13.

CAUTION

Care must be taken to identify which model of HEMTT series vehicle is being towed (refer to data plate on inside of driver side door). Safety chain attachment points depend on model of vehicle. Failure to comply may result in damage to equipment.

NOTE

Complete Step (24) if disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door).

HOOKUP - Continued

24. Route one end (without safety shackle) of 16 ft. (5 m) safety chain (23) through safety chain hoop (26) on disabled vehicle, and attach grab hook (27) back into 16 ft. (5 m) safety chain (23) as shown.

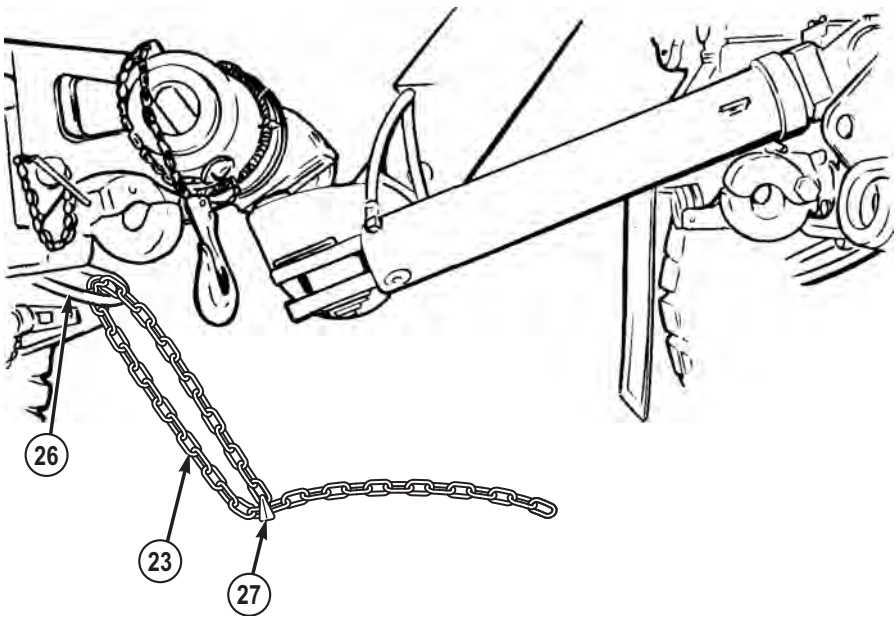


Figure 14.

25. Repeat Step (23) or (24) for other side of disabled vehicle (as applicable).

NOTE

- Safety chains can be routed to towing shackles or safety chain hoop. Towing shackles can be used only after tow cylinders are extended.
- Adjust chain slack so safety chains are approximately 6 in. (15 cm) above the ground.

26. Route two free ends of 16 ft. (5 m) safety chain (23) through safety chain hoop (28) on wrecker and secure grab hooks (29) back into 16 ft. (5 m) safety chain (23) as shown.

HOOKUP - Continued

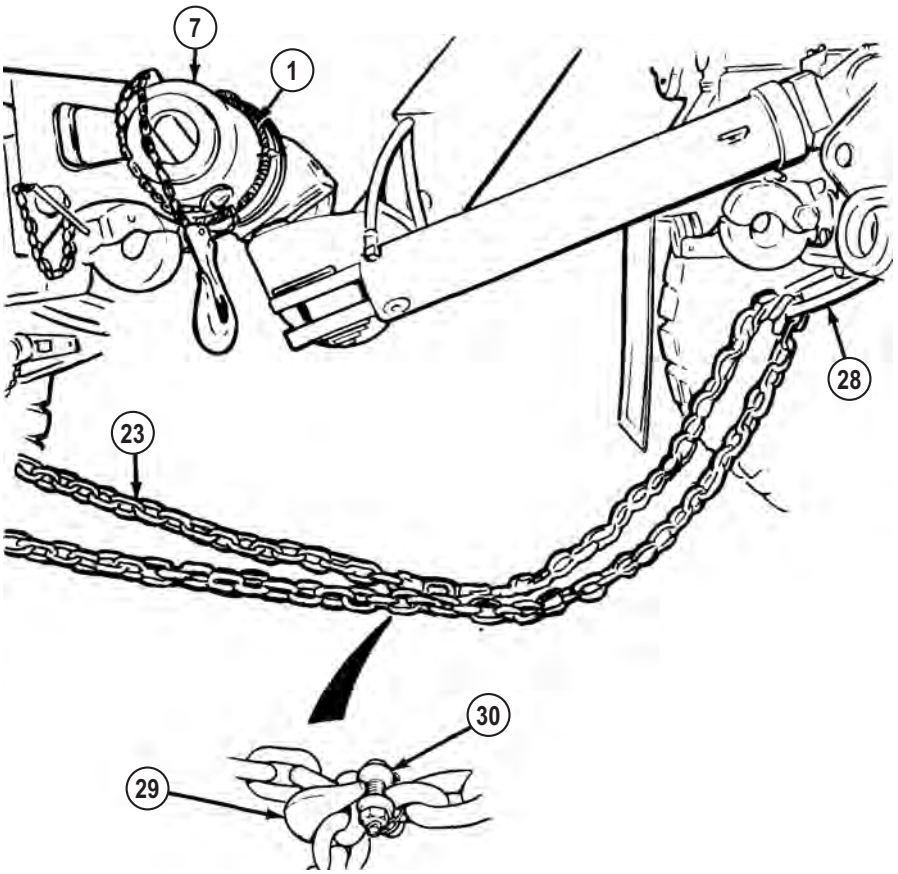


Figure 15.

27. Secure two grab hooks (29) with safety shackles (30).
28. Wrap two springs (1) around cross tube (7) and secure.
29. Prepare disabled vehicle for towing. (WP 0118)
30. Remove emergency tow lights (31) and two brackets (32) from stowage.

HOOKUP - Continued

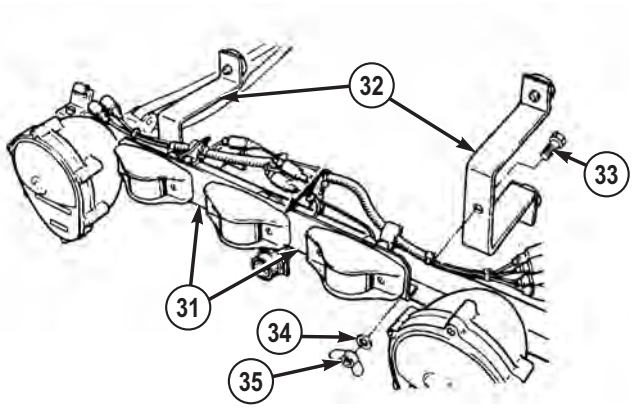


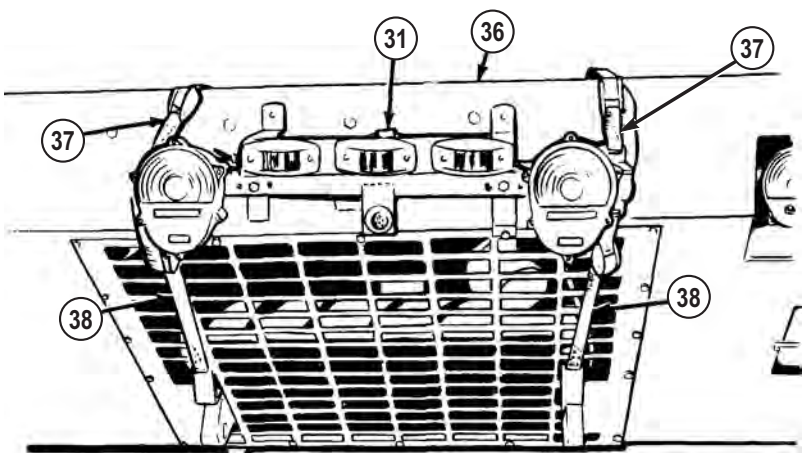
Figure 16.

31. Install two brackets (32) in outside holes of emergency tow lights (31) with two screws (33), washers (34), and nuts (35).

NOTE

Emergency tow lights are mounted the same regardless of HEMTT series vehicle model. BASE/A2 model shown.

32. Position emergency tow lights (31) on skid plate (36). Fasten top straps (37) to top of skid plate (36).



BASE/A2 SHOWN

Figure 17.

HOOKUP - Continued

33. Fasten bottom straps (38) to bottom of skid plate (36).
34. Remove tow light cable (39) from wrecker stowage and connect to rear electrical connector (40) on wrecker.

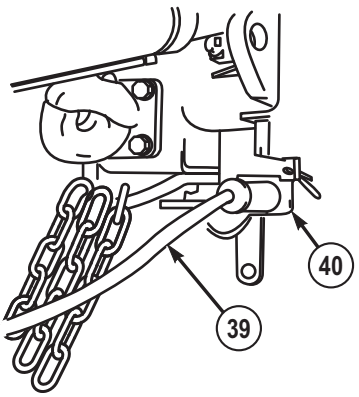


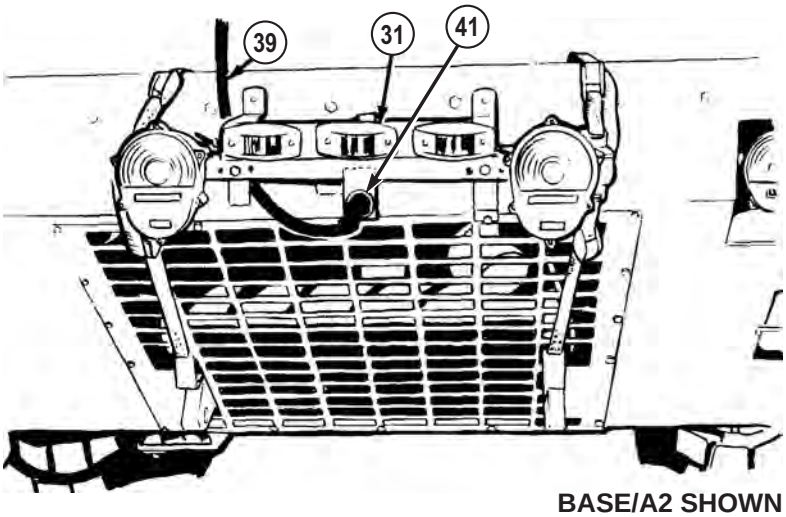
Figure 18.

CAUTION

Route cable so it does not drag on ground or interfere with turning tires. Failure to comply may result in damage to equipment.

35. Route other end of tow light cable (39) to emergency tow lights (31) on disabled vehicle, and plug in at connector (41).

HOOKUP - Continued



BASE/A2 SHOWN

Figure 19.

CAUTION

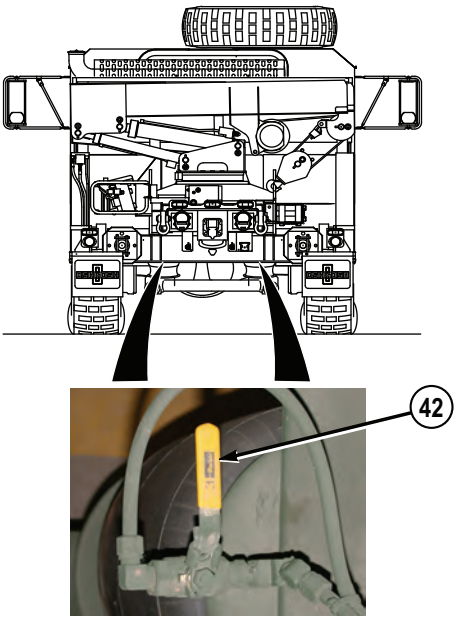
When lifting and towing an A4 HEMTT series vehicle (refer to data plate on inside of driver side door), special care must be taken to avoid causing damage to vehicle air suspension system. Always turn No. 4 axle air suspension ball valves OFF prior to lifting the A4 HEMTT series vehicle (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information). Failure to comply may result in damage to equipment.

NOTE

- If disabled vehicle is an A4 HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (36).
- If disabled vehicle is an BASE or A2 HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (37).

36. Position disabled vehicle No. 4 axle driver side and passenger side (shown) ball valve handle (42) OFF (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information).

HOOKUP - Continued



BALL VALVE OFF

Figure 20.

37. Set POWER switch (43) to ON position.

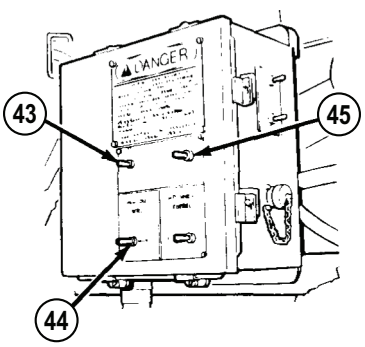


Figure 21.

38. Set HIGH IDLE switch (44) to CONTINUOUS.
39. Push and release LATCH switch (45). Engine speed will increase to approximately 1500 rpm.

HOOKUP - Continued

WARNING

Keep out from under retrieval system and disabled vehicle when raised off ground. Failure to comply may result in injury or death to personnel.

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

CAUTION

- Fully retract both tow cylinders before lifting disabled vehicle. Failure to comply may result in damage to equipment.
- Ensure all rigging is secure. Loose rigging can become entangled. Failure to comply may result in damage to equipment.

40. Push LIFT CYLINDER control lever (6) to retract lift cylinder (21) and raise disabled vehicle approximately 1 ft. (30 cm) off ground.

HOOKUP - Continued

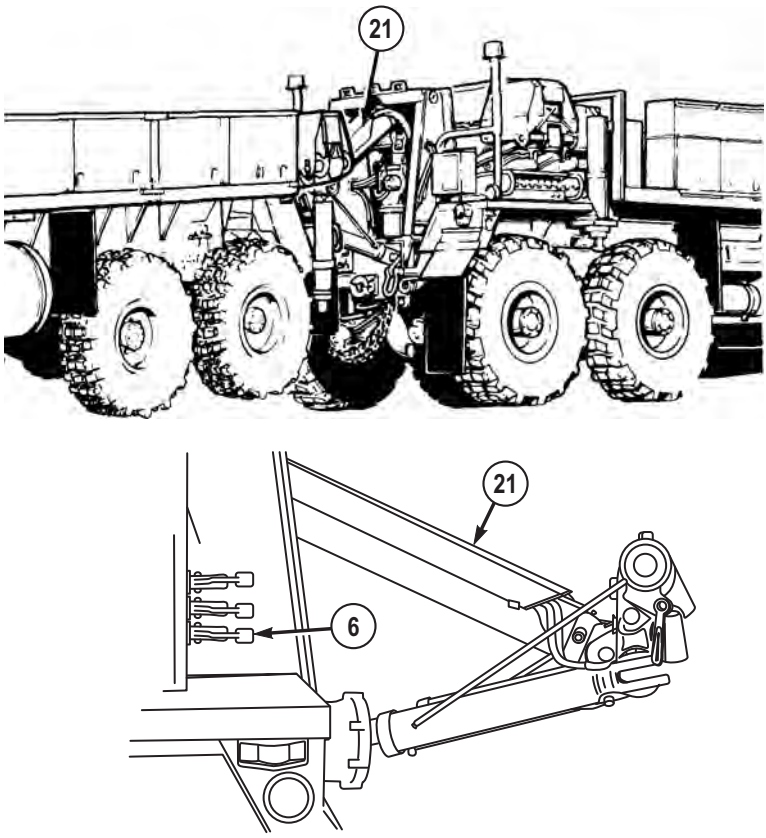


Figure 22.

41. Set POWER switch (43) to OFF position.

HOOKUP - Continued

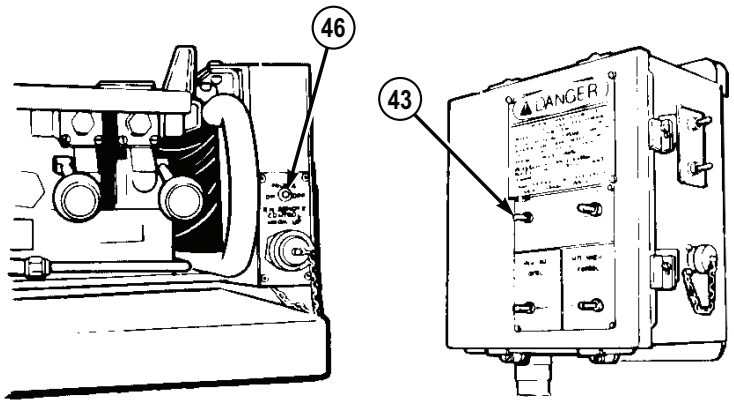


Figure 23.

42. Set POWER switch (46) to OFF position.
43. Remove steering lock bracket (47) and four screws (48) from stowage.

NOTE

- If disabled vehicle is BASE/A2 HEMTT series vehicle (refer to data plate on inside of driver side door), continue with Step (44).
- If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (45).

44. Install steering lock bracket (47) on disabled vehicle:

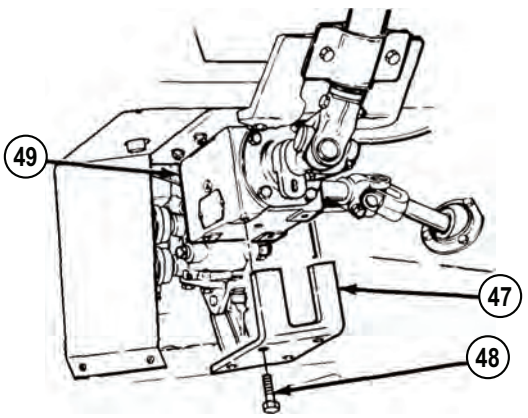


Figure 24.

HOOKUP - Continued

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 10 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lock bracket (47) and four screws (48) from stowage.

c. Install steering lock bracket (47) on 90 degree gearbox (49) with four screws (48).

NOTE

If disabled vehicle is A4 HEMTT series vehicle (refer to data plate on inside of driver side door), continue with Step (45).

45. Install steering lockpin (50) on disabled vehicle:

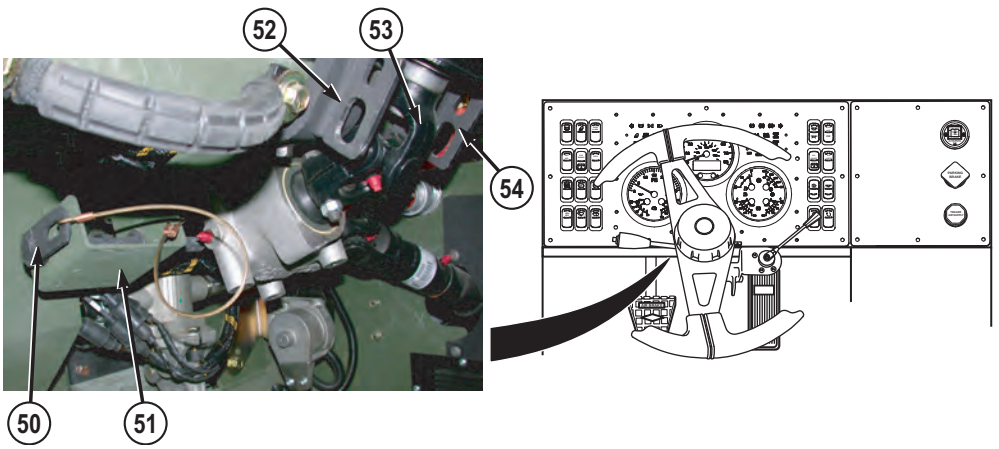


Figure 25.

NOTE

If tires of disabled vehicle have to be straightened manually, drive wrecker forward (WP 0050) 20 to 30 ft. (6 to 10 m) while assistant straightens tires on disabled vehicle.

a. Straighten front wheels on disabled vehicle.

b. Remove steering lockpin (50) from stowage bracket (51) under driver side dash panel.

HOOKUP - Continued

NOTE

It may be necessary to turn steering wheel to line up steering column yoke with holes in locking bracket.

c. Install steering lockpin (50) through left hole (52) of lock bracket, steering column yoke (53), and right hole (54) of lock bracket.

d. Rotate steering lockpin (50) to align hole in steering lockpin handle with hole in lock bracket, and install lock (55).

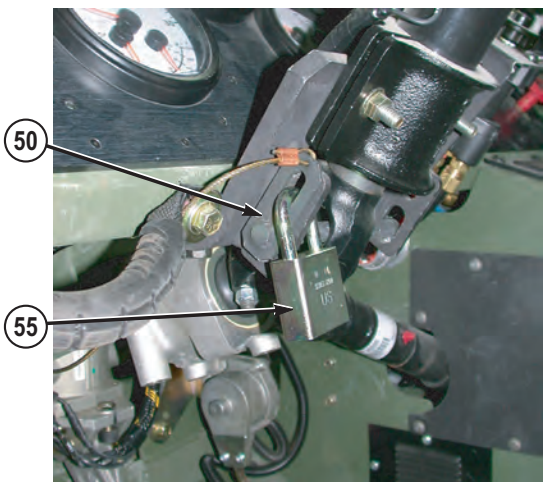


Figure 26.

46. Set PTO ENGAGE switch (56) to OFF position. Indicator light (57) will go out.

HOOKUP - Continued

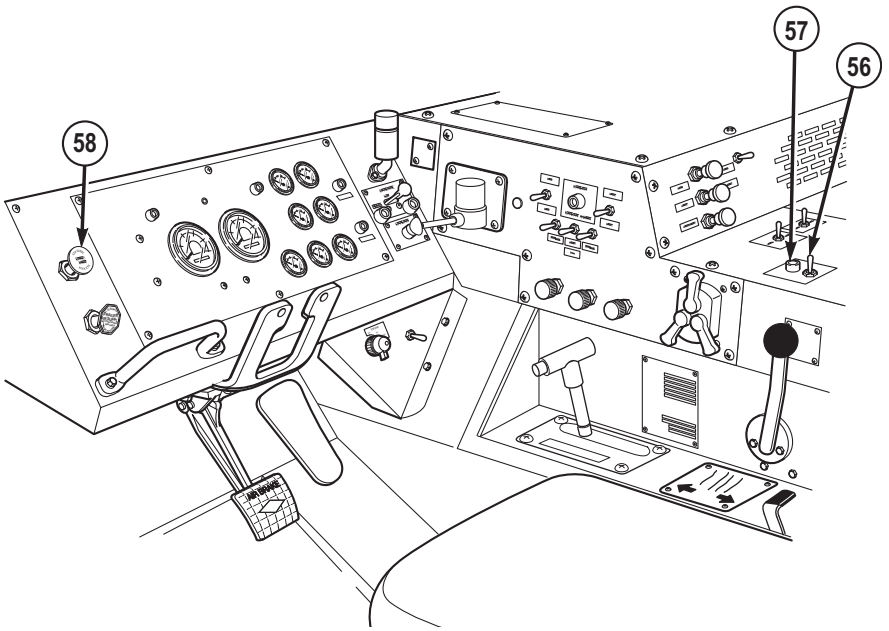


Figure 27.

47. Turn on wrecker service drive lights. (WP 0090)
48. Turn on wrecker emergency flashers. (WP 0099)
49. Turn on disabled vehicle emergency flashers (refer to operator's manual).
50. Push in PARKING BRAKE control (58).

WARNING

The M984 Wrecker should not be operated at speeds over 15 MPH (24 km/hr) except on paved roads when the operator determines that the vehicle being towed and the terrain allow safe operation. Engine brake switch must ON for all towing operations. Speed in excess of the below table may result in loss of control, serious injury, or death to personnel.

51. Select desired gear (WP 0048) and transport disabled vehicle.

HOOKUP - Continued

Table 1. Maximum Towing Speed.

Terrain Condition	Maximum Speed Towed Load Up To 50,000 lbs (22 700 kg)	Maximum Speed Towed Load Above 50,000 lbs (22 700 kg)
On Road-Level	35 mph (56 km/hr)	30 mph (48 km/hr)
On Road-Hilly	30 mph (48 km/hr)	20 mph (32 km/hr)
Off-Road	15 mph (24 km/hr)	15 mph (24 km/hr)

DISCONNECT

NOTE

This procedure is a two soldier task.

1. Set transmission range selector (1) to N (neutral).

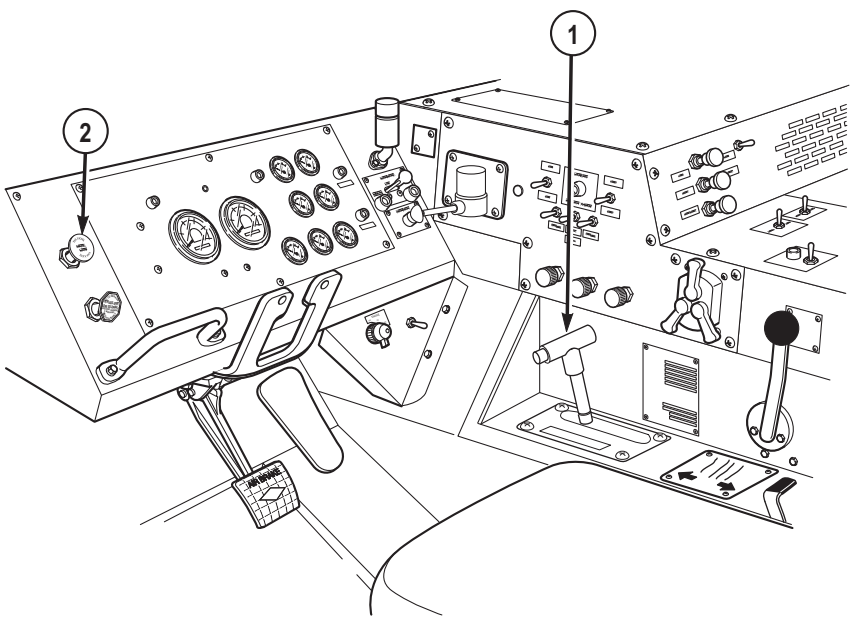


Figure 28.

2. Pull out PARKING BRAKE control (2).

DISCONNECT - Continued

WARNING

Do not stand between vehicles while disabled vehicle is raised off ground. Failure to comply may result in injury or death to personnel.

NOTE

After lowering disabled vehicle, extend lift and tow cylinders approximately 2 to 4 inches (50 to 100 mm) to allow for adjustment when removing adapters.

3. Review procedures for operating retrieval towing system, (WP 0058) prepare retrieval system for operation, (WP 0059) and pull LIFT CYLINDER control lever (3) to extend lift cylinder (4) and lower disabled vehicle to ground.

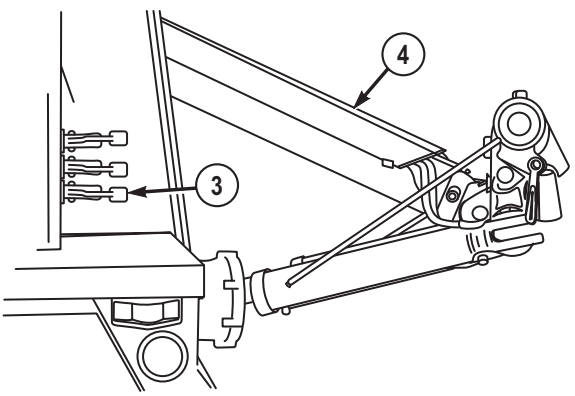


Figure 29.

WARNING

If disabled vehicle's parking brake is inoperative, chock wheels of disabled vehicle (refer to operator's manual). Failure to comply may result in injury or death to personnel.

DISCONNECT - Continued

4. Pull out PARKING BRAKE control (5) on disabled vehicle.

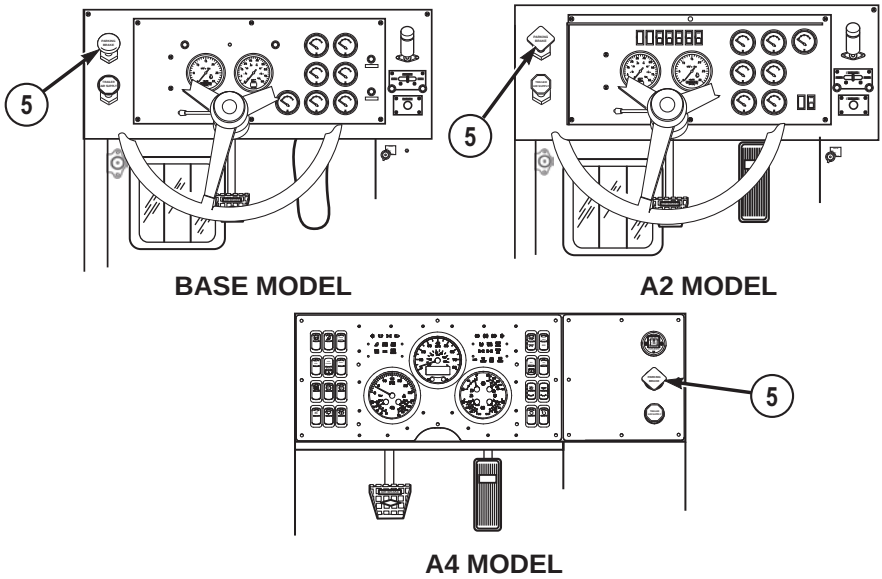


Figure 30.

5. Remove tow light cable (6) from rear electrical connector (7) on wrecker.

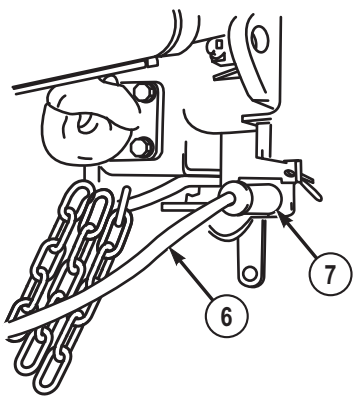
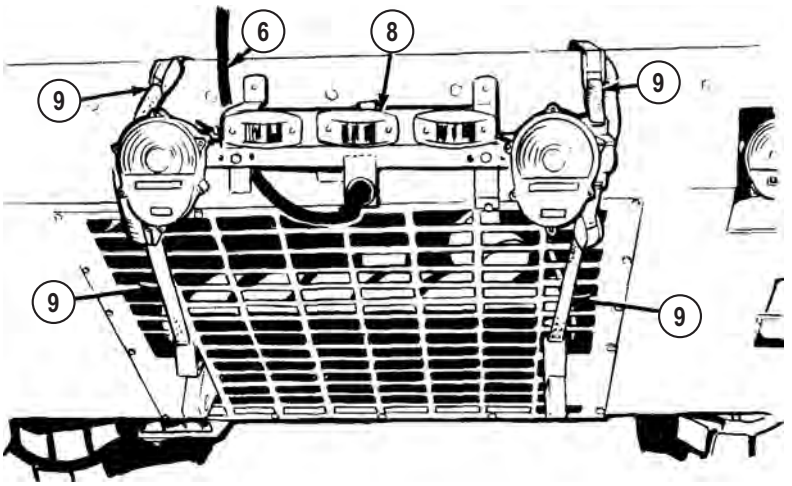


Figure 31.

6. Remove tow light cable (6) from emergency tow lights (8) and return to wrecker stowage.

DISCONNECT - Continued



BASE/A2 SHOWN

Figure 32.

7. Loosen straps (9) and remove emergency tow lights (8) from disabled vehicle.
8. Remove two nuts (10), washers (11), screws (12), and brackets (13) from emergency tow lights (8).

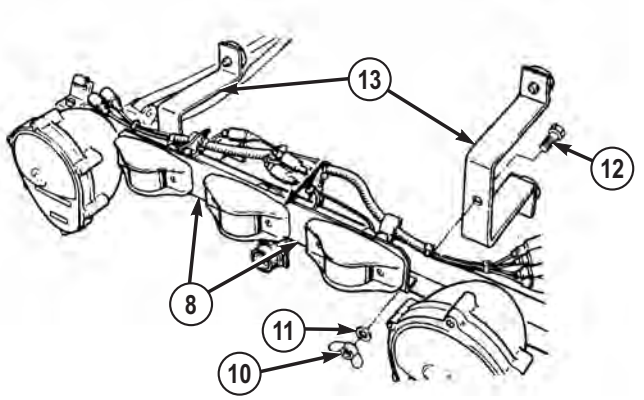


Figure 33.

9. Return emergency tow lights (8) and brackets (13) to wrecker stowage.
10. Remove two 16 ft. (5 m) safety chains (14) from wrecker and disabled vehicle. Return two 16 ft. (5 m) safety chains to wrecker stowage.

DISCONNECT - Continued

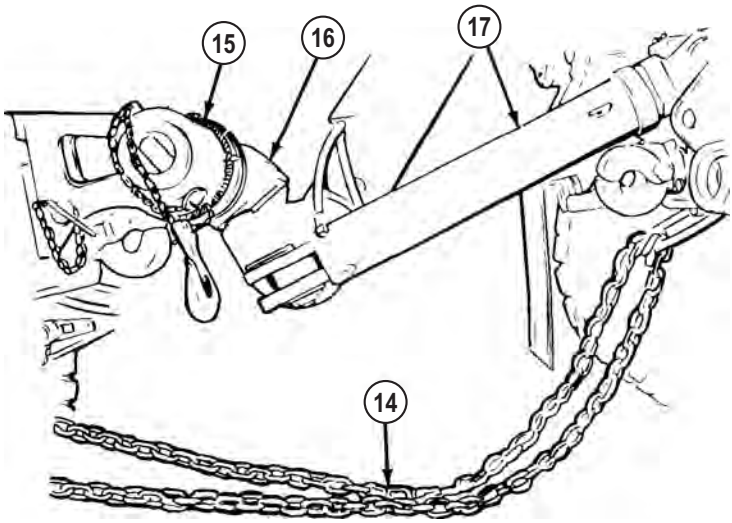
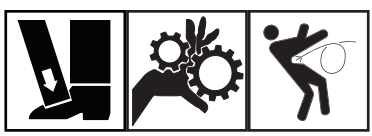


Figure 34.

11. Unwrap two springs (15) from cross tube (16) and connect two springs to tow cylinders (17).

WARNING



- Do not stand behind adapters when pins are being removed. Failure to comply may result in injury or death to personnel.
- Keep hands and fingers away from adapters and tow eyes when operating retrieval controls. Failure to comply may result in injury or death to personnel.

NOTE

Use retrieval controls to position cross tube to relieve tension from adapters.

12. Remove two quick pins (18) and pins (19) from rear tow adapters (20).

DISCONNECT - Continued

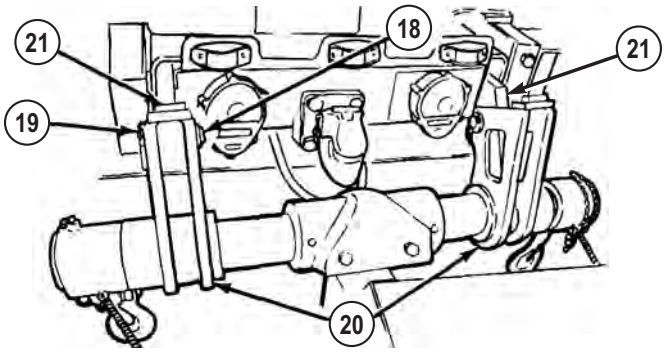


Figure 35.

13. Remove two rear tow adapters (20) from tow eyes (21) on disabled vehicle.
14. Install two pins (19) and quick pins (18) through rear tow adapters (20).
15. Drive wrecker forward (WP 0050) several feet and park. (WP 0056)
16. Remove two springs (15) from tow cylinders (17).

Figure 36.

17. Remove two quick pins (22) and pins (23) from end caps (24).

DISCONNECT - Continued

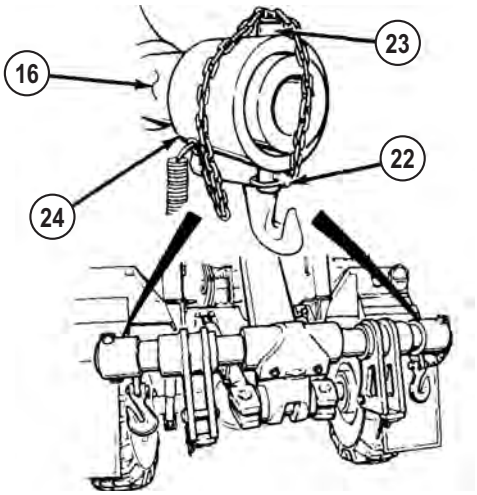


Figure 37.

18. Remove two end caps (24) from cross tube (16).
19. Remove two rear tow adapters (20) from cross tube (16) and place on equipment body floor (25).

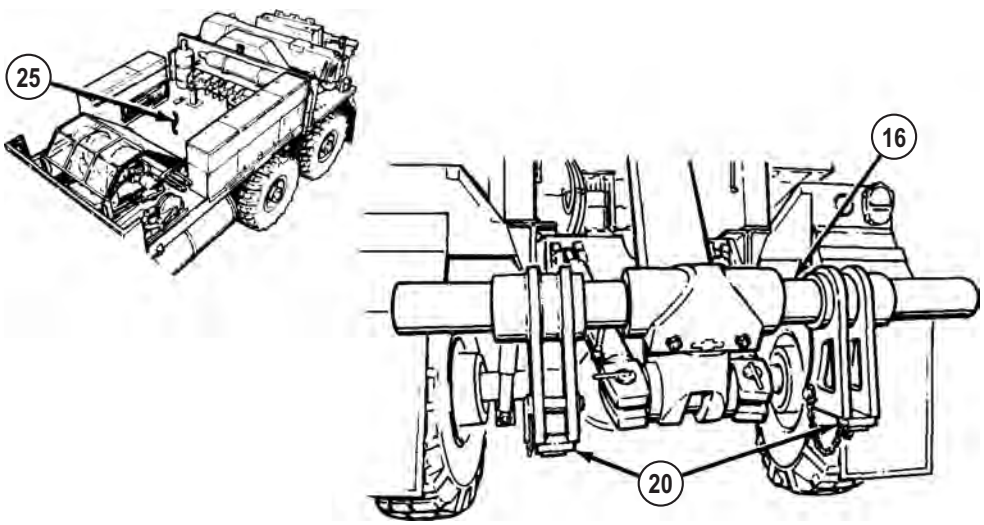


Figure 38.

20. Remove lock handle (26), lock plate (27), and two front adapters (28).

DISCONNECT - Continued

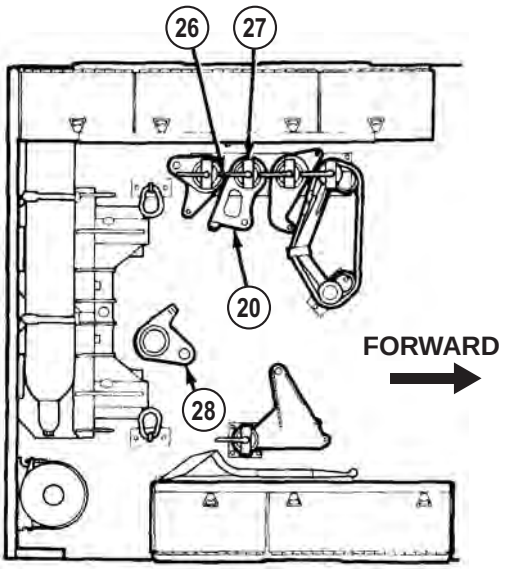


Figure 39.

21. Install two rear two adapters (20) with lock plate (27) and lock handle (26).
22. Install two front adapters (28) on cross tube (16).

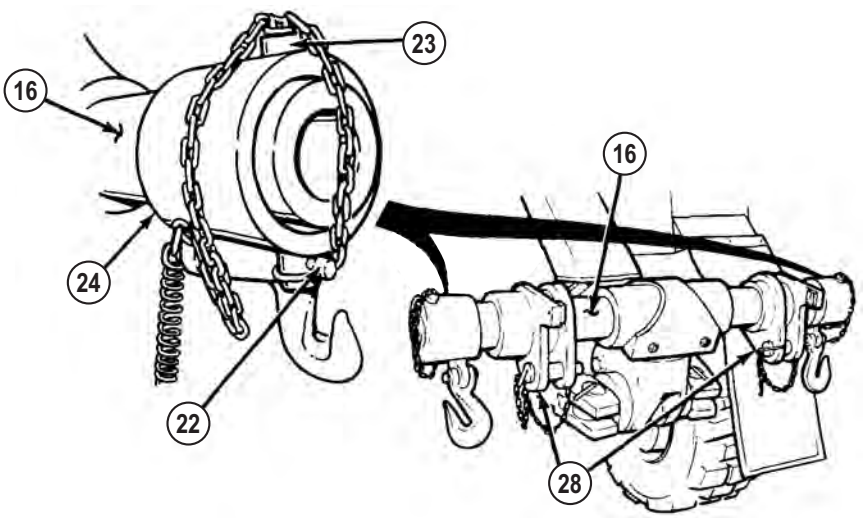


Figure 40.

DISCONNECT - Continued

23. Install two end caps (24), pins (23), and quick pins (22) on cross tube (16).
24. Install two springs (15) on tow cylinders (17).

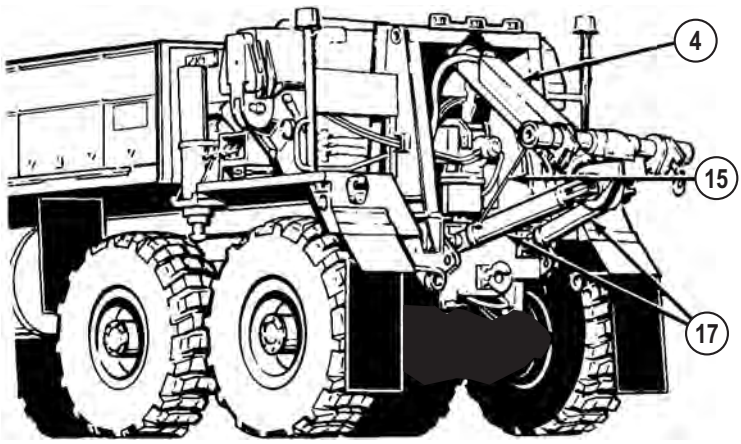


Figure 41.

25. Operate retrieval system to fully retract lift cylinder (4) and tow cylinders (17).

NOTE

Driver side and passenger side towing shackles are installed the same way.

26. Install two rear towing shackles (29), pins (30), and cotter pins (31).

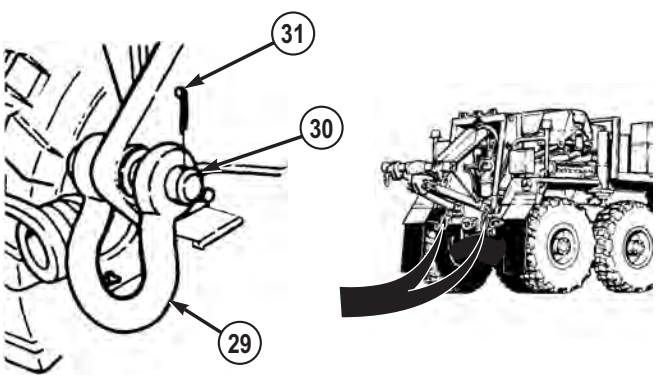


Figure 42.

DISCONNECT - Continued

27. Set POWER switch (32) to OFF position.

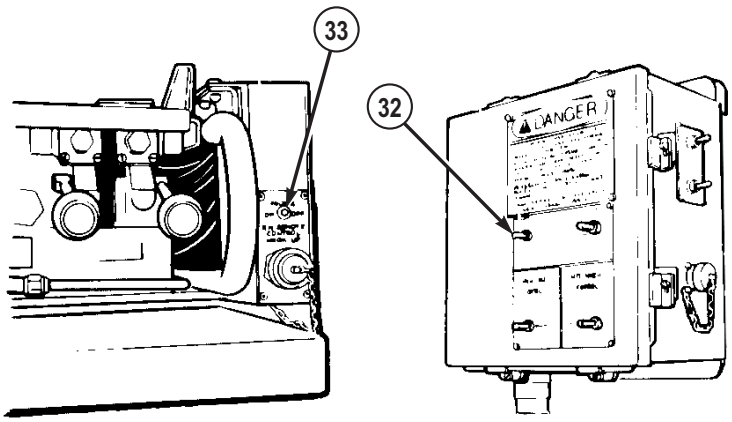


Figure 43.

28. Set POWER switch (33) to OFF position.
29. Turn off wrecker service drive lights. (WP 0090)
30. Turn off wrecker emergency flashers. (WP 0099)
31. Set PTO ENGAGE switch (34) to OFF position. Indicator light (35) will go out.

DISCONNECT - Continued

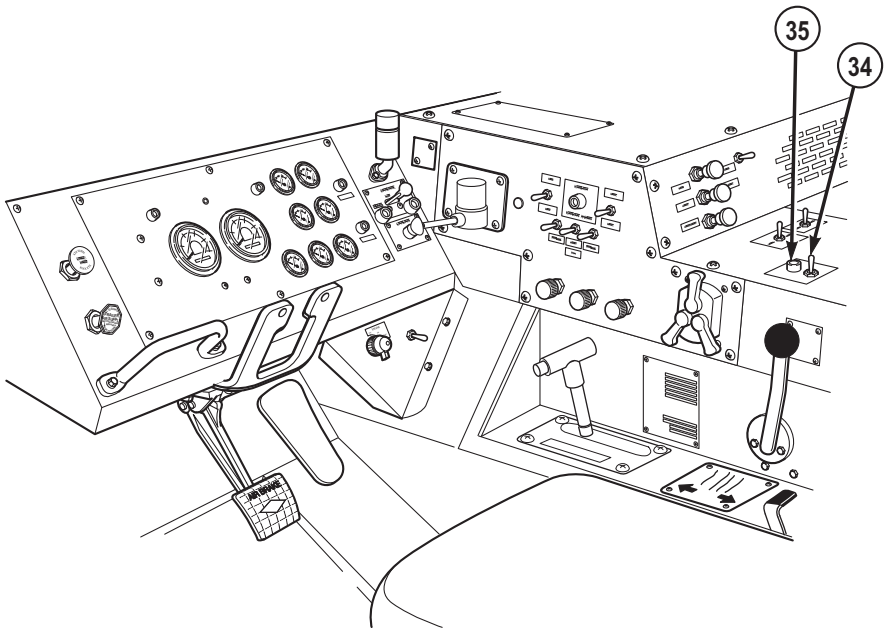


Figure 44.

32. Remove and stow portable beacon lights. (WP 0097)

33. Shut off wrecker engine. (WP 0057)

NOTE

- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (34).
- If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (35).

34. Perform the following on BASE or A2 model HEMTT series disabled vehicle:

    a. Turn off disabled vehicle emergency flashers (refer to operator's manual). (WP 0099)

    b. Remove four screws (36) and steering lock bracket (37) from 90 degree gearbox (38) and return to wrecker stowage.

DISCONNECT - Continued

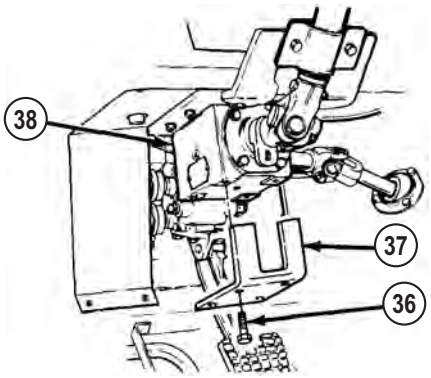


Figure 45.

NOTE

If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (35).

35. Perform the following on A4 model HEMTT series disabled vehicle:

    a. Turn off disabled vehicle emergency flashers (refer to operator's manual). (WP 0099)

    b. Remove lock (39) and steering lockpin (40).

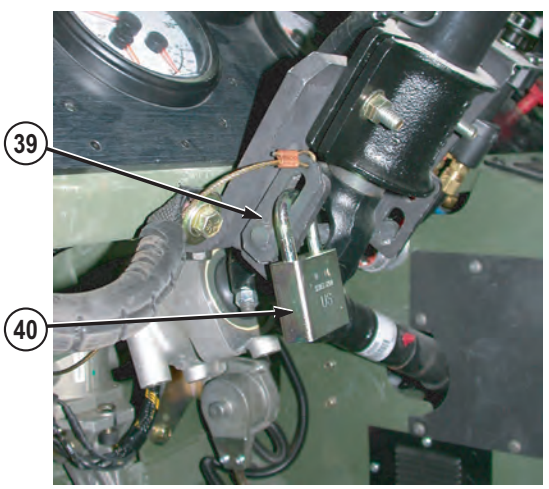


Figure 46.

DISCONNECT - Continued

c. Install steering lockpin (40) in stowage bracket (41) located under driver side dash panel.

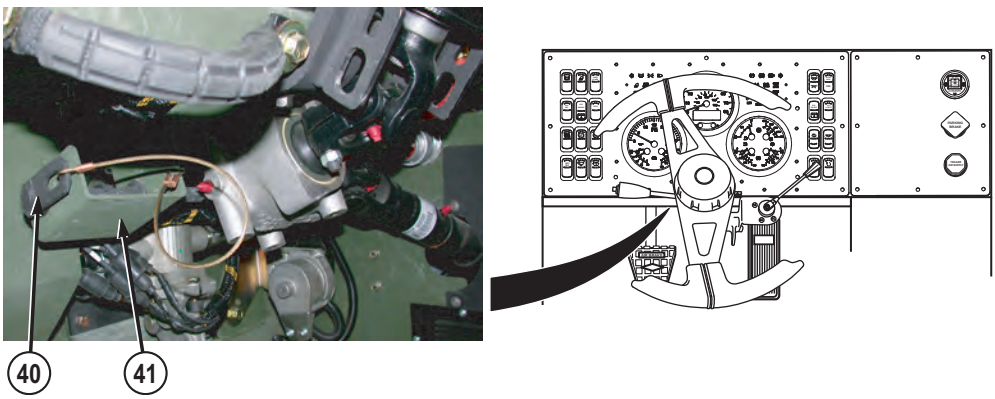


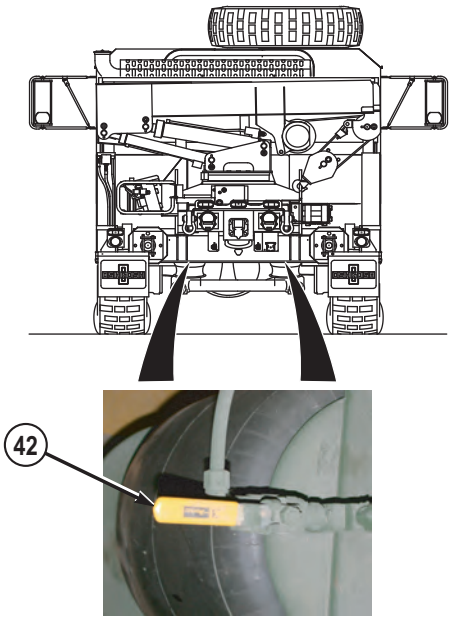
Figure 47.

CAUTION

When lifting and towing an A4 HEMTT series vehicle (refer to data plate on inside of driver side door), special care must be taken to avoid causing damage to the vehicle air suspension system. Always turn No. 1 axle air suspension ball valves ON before abandoning disabled A4 HEMTT series vehicle (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information). Failure to comply may result in damage to equipment.

d. Position disabled vehicle No. 4 axle driver side (shown) and passenger side ball valve handles (42) ON (refer to "operate air suspension ball valves" in HEMTT A4 operator's manual for more information).

DISCONNECT - Continued



BALL VALVE ON

Figure 48.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE ARCTIC ENGINE HEATER

INITIAL SETUP:

Not Applicable

WARNING

CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH.

- Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas that, when breathed, deprives body or 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 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 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

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 anti-freeze (refer to lubrication table) is maintained at all times. Failure to comply may result in damage to engine and/or injury to personnel.

WARNING

- The arctic engine heater must be off when filling any fuel tanks on vehicle. Failure to comply may result in injury or death to personnel.
- Do not operate arctic engine heater in garages or enclosed areas without proper ventilation. Failure to comply may result in injury or death 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 operations. Arctic engine heater indicator light flashing indicates an arctic engine heater system fault. Failure to comply may cause system lockout.

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 flame out occurs during operation, arctic engine heater will attempt one restart. If unsuccessful, arctic engine heater will shutdown.
- During operation, arctic engine heater continually monitors input voltage. If the arctic engine heater input voltage decreases below (20 V) or increases above (30 V), arctic engine heater will automatically shutdown.

1. Set arctic engine heater switch (1) to ON position. Observe arctic engine heater indicator light (2) for steady illumination.

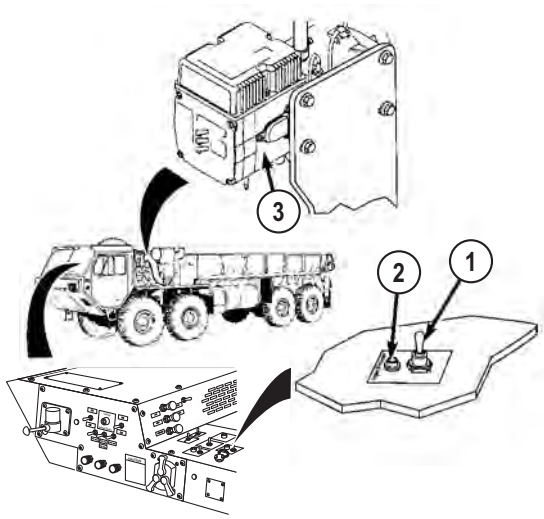


Figure 1.

2. Observe arctic engine heater (3) for proper operation.
3. Operate arctic engine heater (3) for 35 minutes to warm engine.
4. After 35 minutes, start engine. (WP 0044)
5. After engine is started, set arctic engine heater switch (1) in OFF position. Indicator light (2) will go out.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE GAS PARTICULATE FILTER UNIT (GPFU)

INITIAL SETUP:

Not Applicable

OPERATE GPFU

WARNING

- BE AWARE that the gas particulate filter unit or the field protective mask for nuclear-biological-chemical protection WILL NOT offer safety from carbon monoxide poisoning.
- 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 procedures.
- 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. Failure to comply may result in injury or death to personnel.

NOTE

- Do Steps (1) through (8) only when under Nuclear, Biological, or Chemical (NBC) attack and/or when ordered to do so.
- For detailed information concerning protective mask, refer to TM 3-4240-280-10.
- Both crew stations have M-3 heater, hose, and air duct sockets.

1. Remove two protective masks (1) and canisters (2) from pouches (3).

OPERATE GPFU - Continued

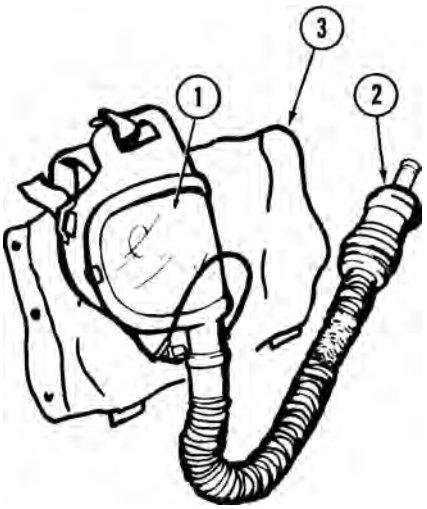


Figure 1.

2. Put on protective masks (1).
3. Clear and seal protective masks (1).

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.

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

OPERATE GPFU - Continued

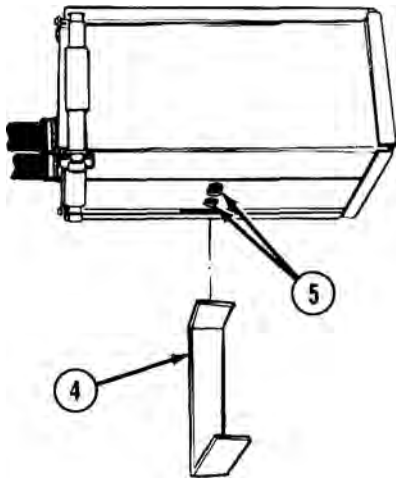


Figure 2.

5. Set GAS PARTICULATE FILTER switch (6) to ON.

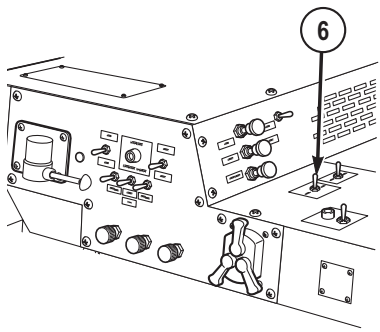


Figure 3.

OPERATE GPFU - Continued

NOTE

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

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

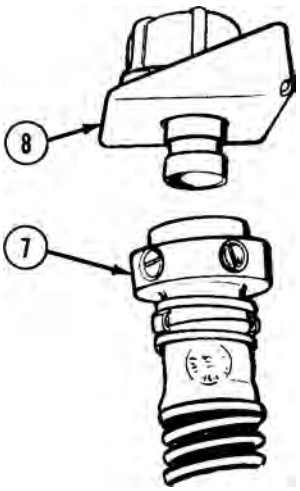


Figure 4.

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.

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

OPERATE GPFU - Continued

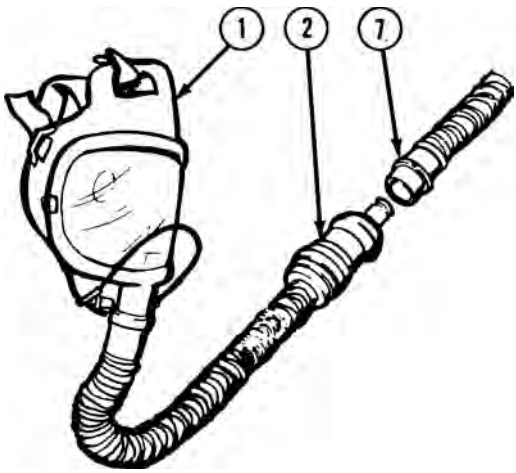


Figure 5.

NOTE

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

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

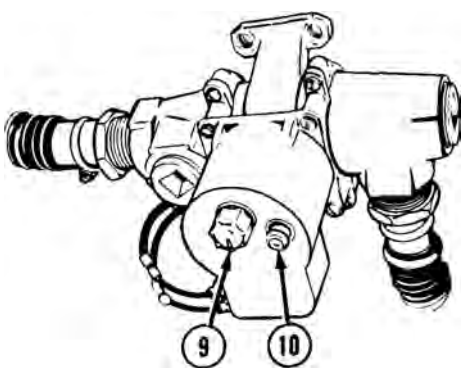


Figure 6.

a. Turn knob (9) clockwise for warmer air.

b. Turn knob (9) counterclockwise for cooler air.

OPERATE GPFU - Continued

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

NOTE

Do Steps (1) through (5) only when Nuclear, Biological, or Chemical (NBC) attack is over and/or when ordered to do so.

1. When protective masks (1) are no longer needed, disconnect air duct hose breakaway sockets (2) from canisters (3).

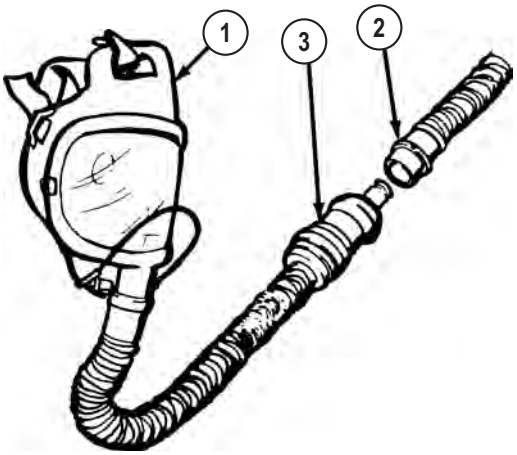


Figure 7.

2. Connect two air duct hose breakaway sockets (2) to mounts (4).

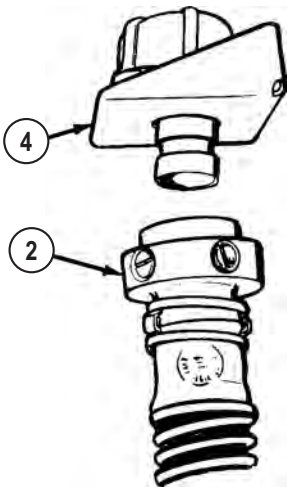


Figure 8.

3. Set GAS PARTICULATE FILTER switch (5) to OFF.

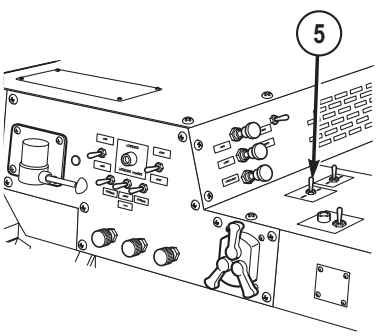


Figure 9.

4. Push up on spring clip (6) to cover intake holes (7).

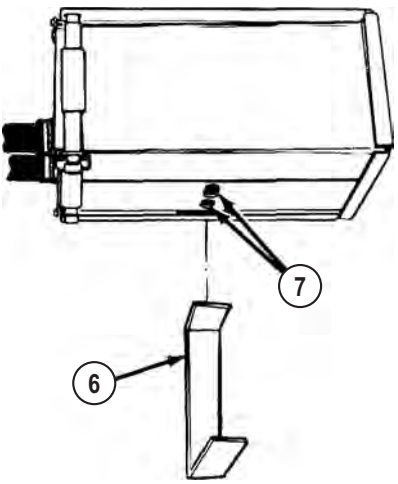


Figure 10.

5. Remove and stow two protective masks (1).

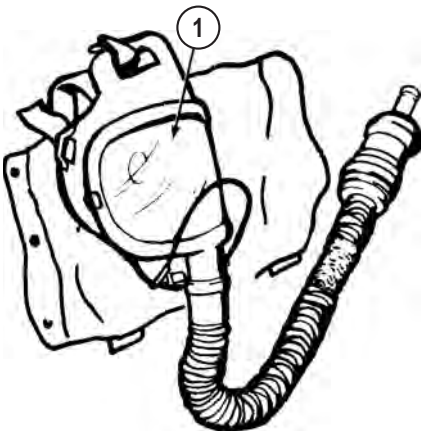


Figure 11.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE RIFLE STOWAGE MOUNT

INITIAL SETUP:

Not Applicable

STOW RIFLE IN STOWAGE MOUNT

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

STOW RIFLE IN STOWAGE MOUNT - Continued

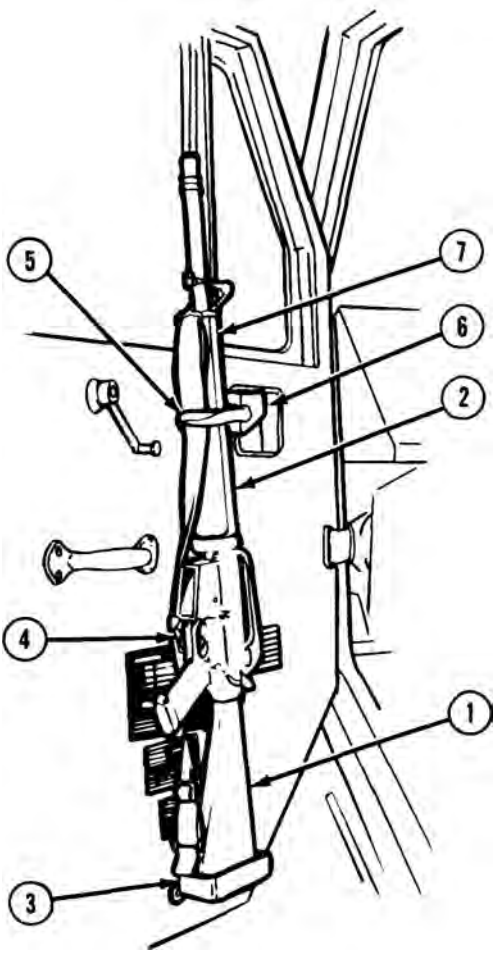


Figure 1.

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

REMOVE RIFLE FROM STOWAGE MOUNT

1. Pull handle (1) of top mount (2) down and toward middle of cab.

REMOVE RIFLE FROM STOWAGE MOUNT - Continued

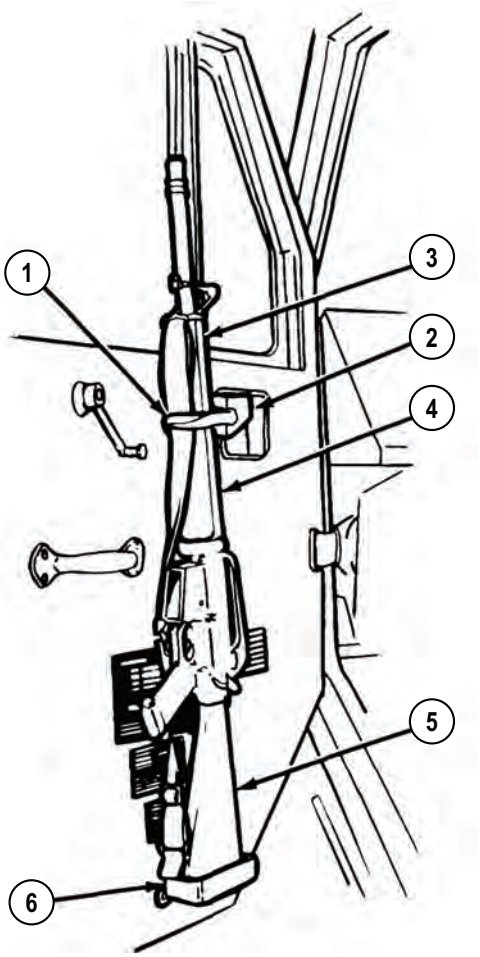


Figure 2.

2. Remove heat guard (3) of M-16 rifle (4) from top mount (2).
3. Remove butt (5) of M-16 rifle (4) from lower mount (6).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE MACHINE GUN MOUNT

INITIAL SETUP:

Not Applicable

REFERENCE

For operation of the machine gun mount, refer to TM 9-1005-245-13&P. (Volume 2, WP 0200)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE M-8 CHEMICAL ALARM

INITIAL SETUP:

Not Applicable

REFERENCE

For operation of the M-8 Chemical Alarm, refer toTM 3-6665-225-12. (Volume 2, WP 0200)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE M-13 DECONTAMINATION KIT

INITIAL SETUP:

Not Applicable

REFERENCE

For operation of the M-13 Decontamination Kit, refer to TM 3-4230-214-12&P. (Volume 2, WP 0200)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE RADIO

INITIAL SETUP:

Not Applicable

REFERENCE

For operation of the radio, refer to TM 11-5820-498-12. (Volume 2, WP 0200)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PORTABLE WORK LAMP OPERATION

INITIAL SETUP:

Not Applicable

INSTALL/OPERATE/REMOVE PORTABLE WORK LAMP

1. Remove work lamp (1) and work lamp harness (2) from stowage.

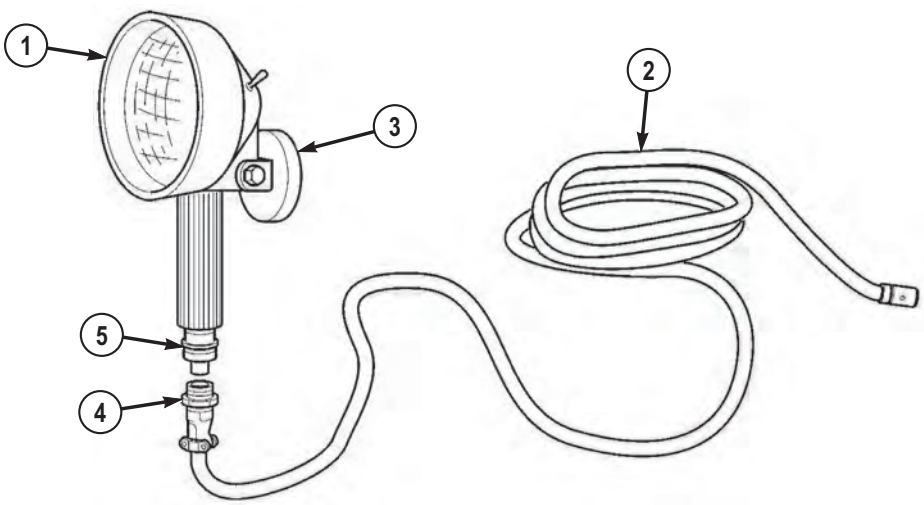


Figure 1.

2. Mount lamp (1) on vehicle using magnet (3).
3. Install work lamp harness plug (4) on work lamp terminal (5).
4. Route work lamp harness (2) through driver side door opening (6), between inside of cab roof (7) and air horn valve hoses (8).

INSTALL/OPERATE/REMOVE PORTABLE WORK LAMP - Continued

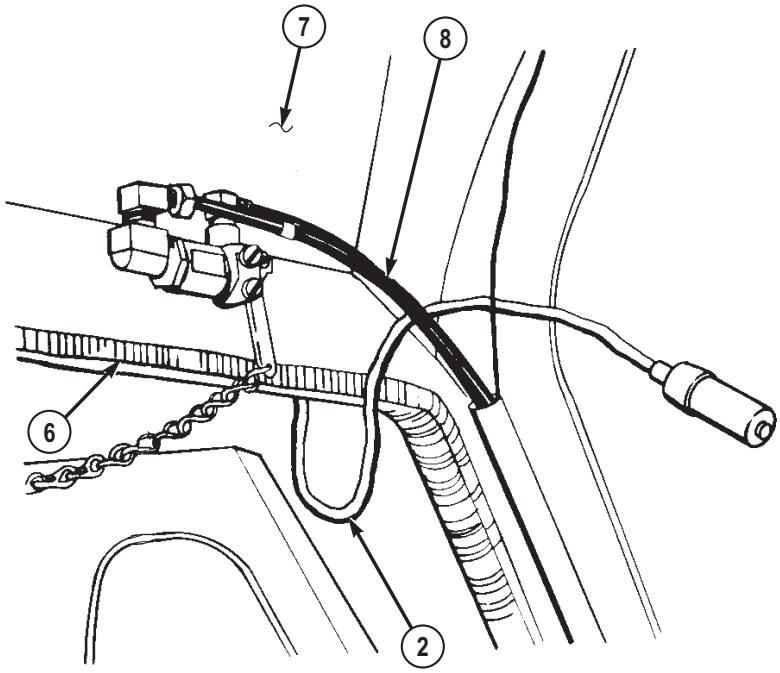


Figure 2.

5. Route work lamp harness (2) across driver side defroster (9) and across center console (10) to utility outlet (11).

INSTALL/OPERATE/REMOVE PORTABLE WORK LAMP - Continued

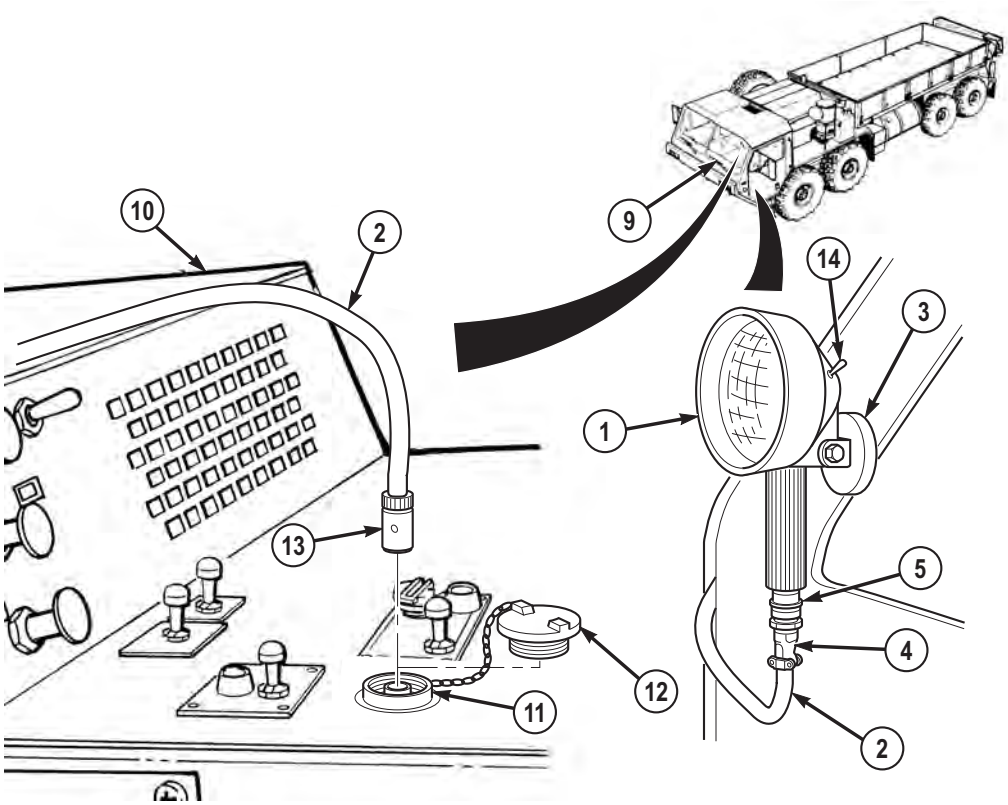


Figure 3.

6. Remove utility outlet cover (12). Insert work lamp harness plug (13) into utility outlet (11).
7. Turn on work lamp (1) using toggle switch (14).

NOTE

Perform Steps (8) through (13) when use of the portable work lamp is no longer required.

8. Turn off work lamp (1) using toggle switch (14).
9. Remove work lamp harness plug (13) from utility outlet (11). Install utility outlet cover (12).
10. Remove work lamp harness (2) from interior of cab.
11. Remove work lamp harness plug (4) from work lamp terminal (5).

INSTALL/OPERATE/REMOVE PORTABLE WORK LAMP - Continued

12. Disengage magnet (3) from vehicle.
13. Return work lamp (1) and work lamp harness (2) to stowage.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE DOME LIGHT

INITIAL SETUP:

Not Applicable

TURN DOME LIGHT ON/OFF

CAUTION

Failure to place light switches in off position when vehicle is not in use may cause battery and/or vehicle damage.

NOTE

- Dome light is located on very rear of cabin overhead centered between operator and crew seats.
- Dome light switch is a 2-position switch; down is off, up is on.
- Dome light is disabled whenever blackout lights are selected on the light control.

1. Lift up and hold UNLOCK lever (1).

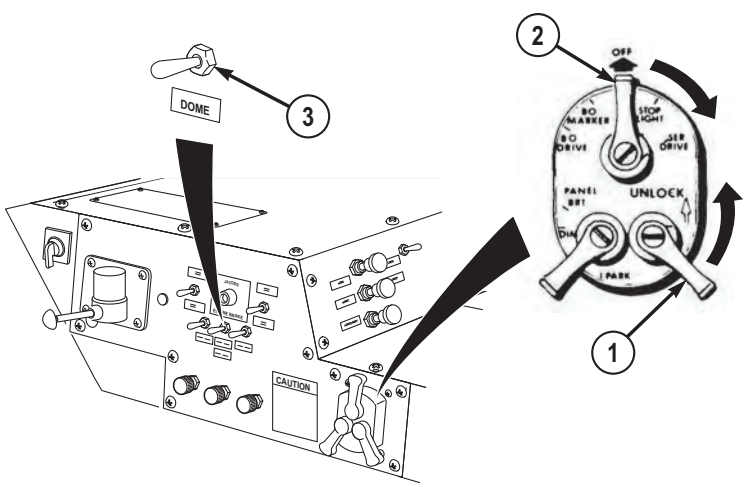


Figure 1.

TURN DOME LIGHT ON/OFF - Continued

2. Set lighting control lever (2) to STOP LIGHT or SER DRIVE position.
3. Release UNLOCK lever (1).
4. Set DOME switch (3) to ON position.

NOTE

Complete Steps (5) and (6) when dome light is no longer required.

5. Set DOME switch (3) to OFF position.
6. Set lighting control lever (2) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE PANEL LIGHTS

INITIAL SETUP:

Not Applicable

TURN PANEL LIGHTS ON/OFF

CAUTION

Failure to place light switches in the off position when vehicle is not in use may cause battery and/or vehicle damage.

1. Lift up and hold UNLOCK lever (1).

TURN PANEL LIGHTS ON/OFF - Continued

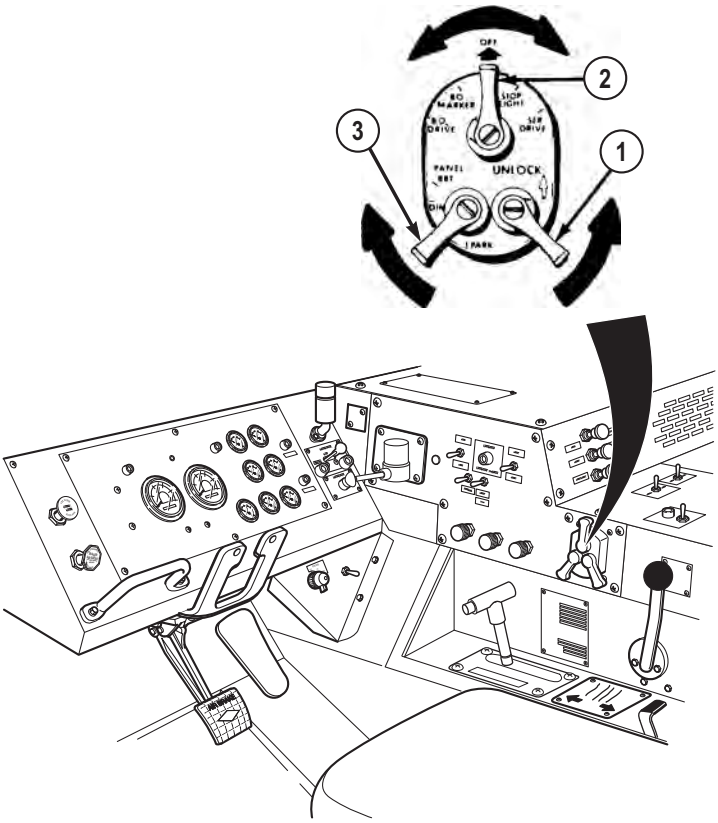


Figure 1.

NOTE

Panel lights will not function if lighting control lever is in OFF position.

2. Set lighting control lever (2) to desired position.
3. Release UNLOCK lever (1).
4. Set PANEL lever (3) to DIM or BRT (bright) as needed.

NOTE

Complete Steps (5) and (6) when panel lights are no longer required.

5. Set PANEL lever (3) to OFF position.

TURN PANEL LIGHTS ON/OFF - Continued

6. Set lighting control lever (2) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE PARKING LIGHTS

INITIAL SETUP:

Not Applicable

TURN PARKING LIGHTS ON/OFF

CAUTION

Failure to place light switches in the off position when vehicle is not in use may cause battery and/or vehicle damage.

1. Lift up and hold UNLOCK lever (1).

TURN PARKING LIGHTS ON/OFF - Continued

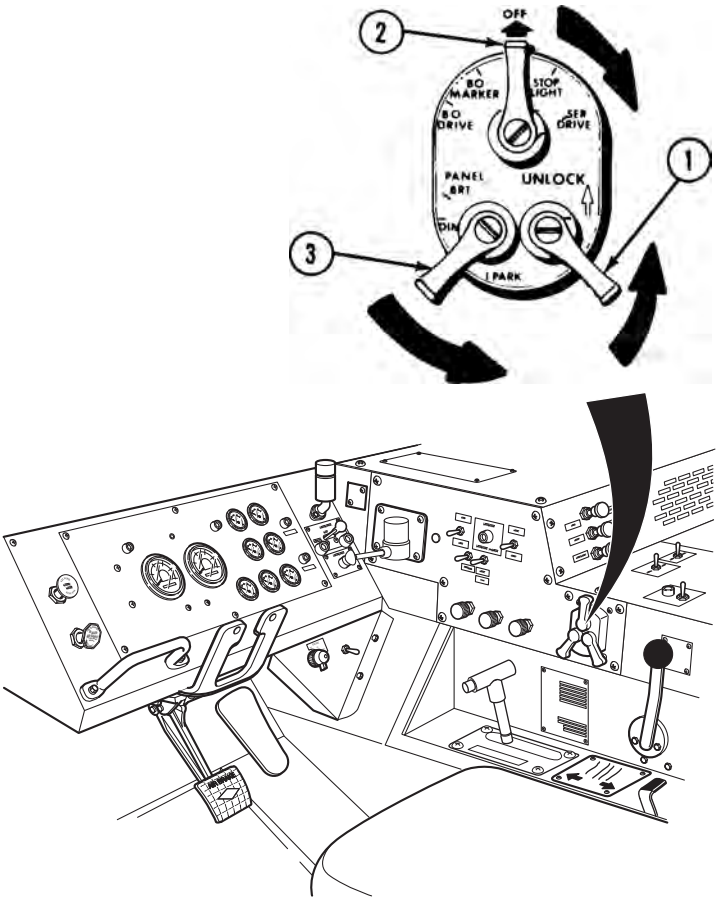


Figure 1.

2. Set lighting control lever (2) to SER DRIVE position.
3. Set PANEL lever (3) to PARK position.
4. Release UNLOCK lever (1).

NOTE

Complete Steps (5) and (6) when parking lights are no longer required.

5. Set PANEL lever (3) to OFF position.

TURN PARKING LIGHTS ON/OFF - Continued

6. Set lighting control lever (2) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE SERVICE DRIVE LIGHTS

INITIAL SETUP:

Not Applicable

TURN SERVICE DRIVE LIGHTS ON/OFF

CAUTION

Failure to place light switches in the off position when vehicle is not in use may cause battery and/or vehicle damage.

1. Lift up and hold UNLOCK lever (1).

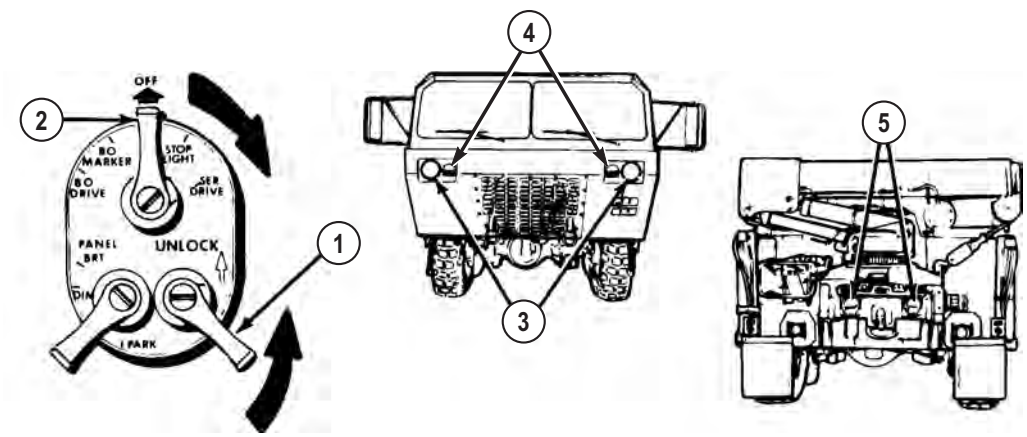


Figure 1.

2. Set lighting control lever (2) to SER DRIVE position.

NOTE

Service stop lights (incorporated in taillights) will illuminate when service brake pedal is applied.

3. Release UNLOCK lever (1). Service headlights (3), composite lights (4), and taillights (5) will illuminate.

TURN SERVICE DRIVE LIGHTS ON/OFF - Continued

4. Press dimmer switch (6) with foot to cycle between high and low headlight beams. High beam indicator (7) will illuminate (red) when high beams are selected.

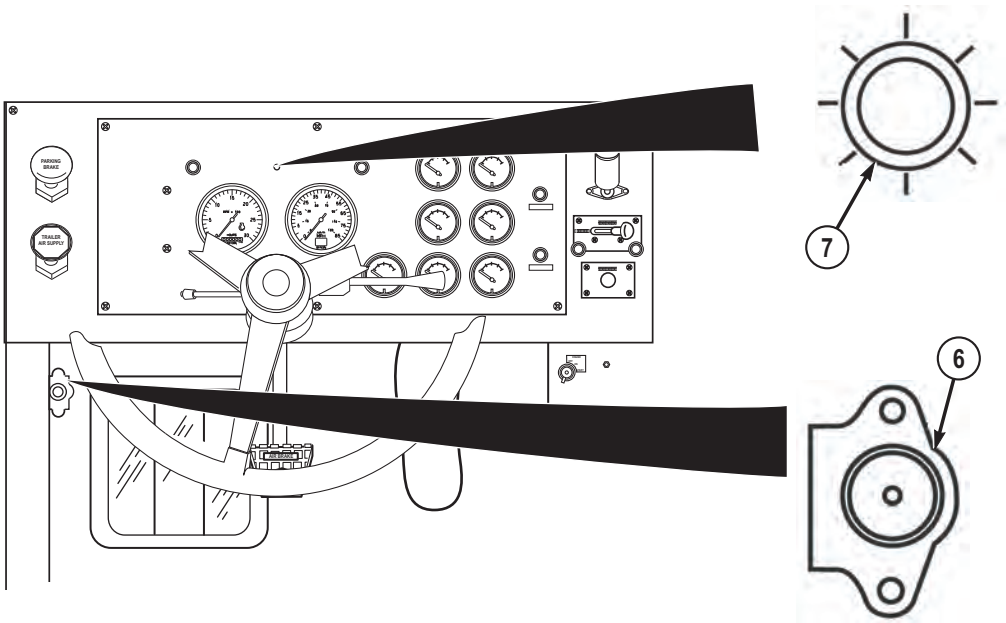


Figure 2.

NOTE

Complete Step (5) when service drive lights are no longer required.

5. Set lighting control lever (2) to OFF position. Service headlights (3), composite lights (4), and taillights (5) will go out.

TURN SERVICE DRIVE LIGHTS ON/OFF - Continued

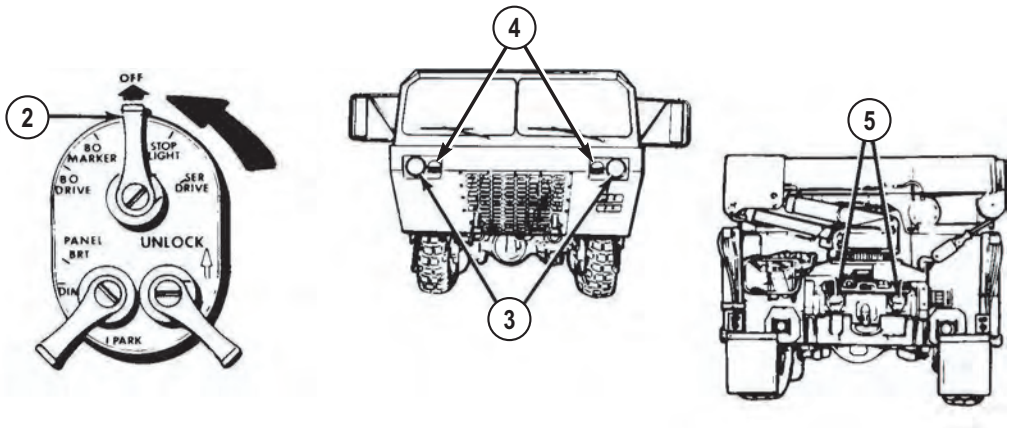


Figure 3.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE STOPLIGHTS

INITIAL SETUP:

Not Applicable

TURN STOPLIGHTS ON/OFF

CAUTION

Failure to place light switches in the OFF position when vehicle is not in use may cause battery and/or vehicle damage.

NOTE

Ensure service stoplights are turned on prior to driving vehicle.

1. Lift up and hold UNLOCK lever (1).

TURN STOPLIGHTS ON/OFF - Continued

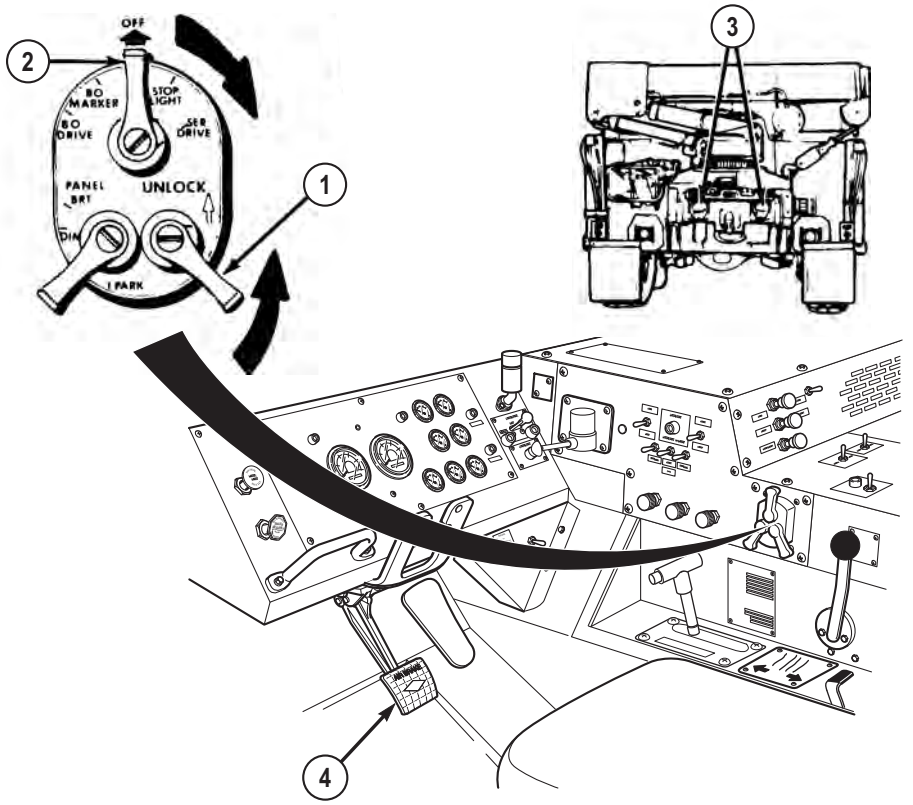


Figure 1.

2. Set lighting control lever (2) to STOP LIGHT position.
3. Release UNLOCK lever (1). Stoplights (3) will illuminate when service brake pedal (4) is applied.

NOTE

Complete Step (4) when stoplights are no longer required.

4. Set lighting control lever (2) to OFF position. Stoplights will no longer function.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE CLEARANCE LIGHTS

INITIAL SETUP:

Not Applicable

TURN CLEARANCE LIGHTS ON/OFF

CAUTION

Failure to place light switches in the OFF position when vehicle is not in use may cause battery and/or vehicle damage.

1. Lift up and hold UNLOCK lever (1).

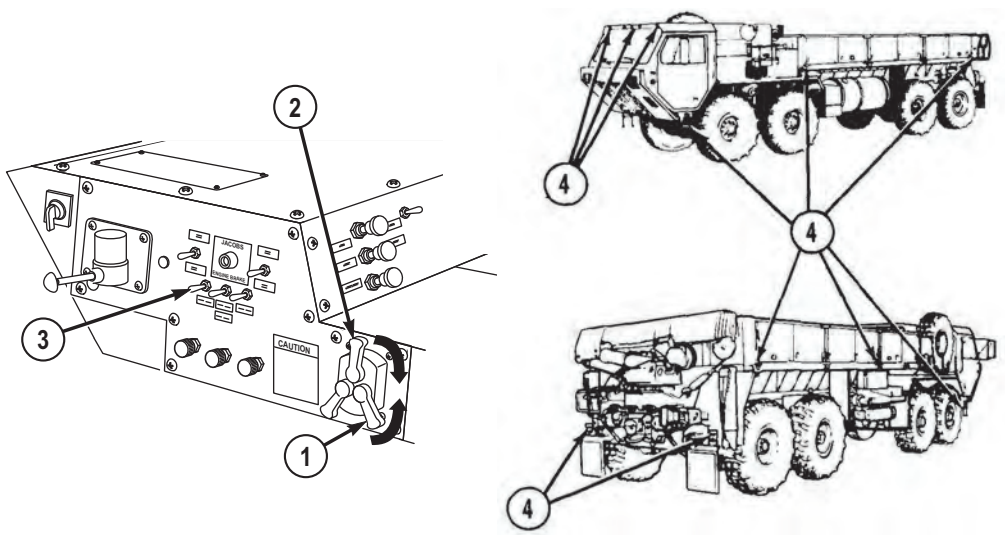


Figure 1.

2. Set lighting control lever (2) to either STOP LIGHT or SER DRIVE position.
3. Release UNLOCK lever (1).
4. Set CL LPS switch (3) to on position. Clearance lights (4) will illuminate.

TURN CLEARANCE LIGHTS ON/OFF - Continued

NOTE

Complete Steps (5) and (6) when clearance lights are no longer required.

5. Set CL LPS switch (3) to off position. Clearance lights (4) will go out.
6. Set lighting control lever (2) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE BLACKOUT DRIVE LIGHT

INITIAL SETUP:

Not Applicable

TURN BLACKOUT DRIVE LIGHT ON/OFF

CAUTION

Failure to place light switches in the OFF position when vehicle is not in use may cause battery and/or vehicle damage.

NOTE

- Use blackout drive light for night driving under blackout conditions.
- Cabin dome light/switch, vehicle mounted work lights/switch (M983, M984A1, M1977), rear beacon lights/switch (M984A only), electric horn (on steering column), and reverse alarm are disabled when lighting control lever is positioned to either blackout lighting position.

1. Lift up and hold UNLOCK lever (1).

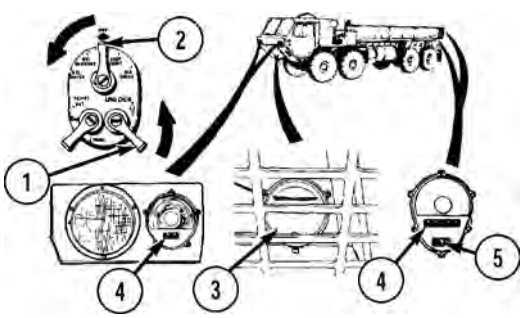


Figure 1.

2. Set lighting control lever (2) to B.O. DRIVE position.
3. Release UNLOCK lever (1); blackout drive light (3) and blackout markers (4) will illuminate.
4. Blackout stoplights (5) will illuminate when service brake pedal is applied.

TURN BLACKOUT DRIVE LIGHT ON/OFF - Continued

NOTE

Complete Step (5) when blackout lights are no longer required.

5. Set lighting control lever (2) to OFF position; blackout drive light (3) and blackout markers (4) will go out.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE BLACKOUT MARKERS

INITIAL SETUP:

Not Applicable

TURN BLACKOUT MARKERS ON/OFF

CAUTION

Failure to place light switches in the OFF position when vehicle is not in use may cause battery and/or vehicle damage.

NOTE

Cabin dome light/switch, vehicle mounted work lights/switch (M983, M984A1, M1977), rear beacon lights/switch (M984A only), electric horn (on steering column), and reverse alarm are disabled when lighting control lever is positioned to either blackout lighting position.

1. Lift up and hold UNLOCK lever (1).

TURN BLACKOUT MARKERS ON/OFF - Continued

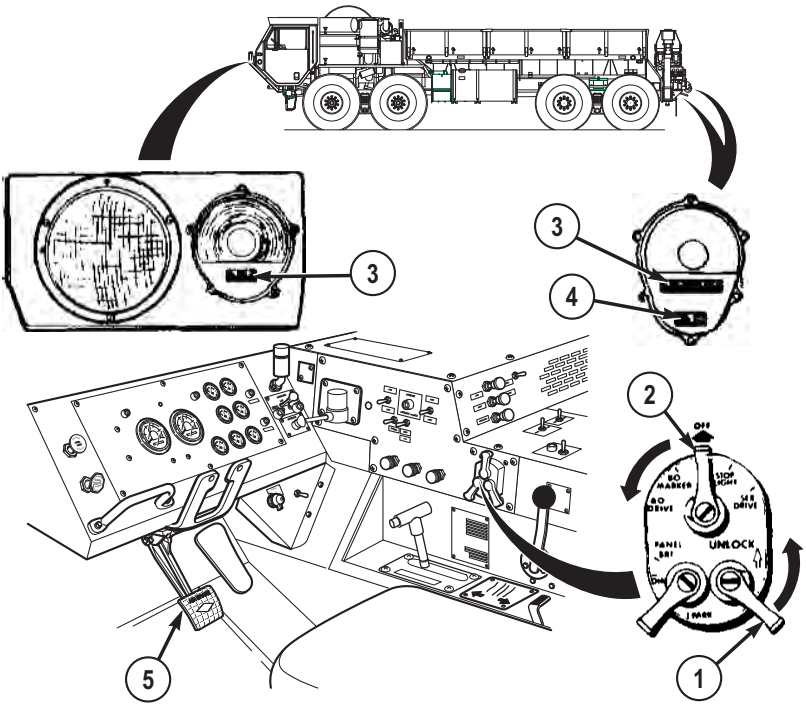


Figure 1.

2. Set lighting control lever (2) to B.O. MARKER position. Blackout markers (3) will illuminate.
3. Blackout stoplight markers (4), which are located on vehicle taillights, will illuminate when service brake pedal (5) is applied.

NOTE

Complete Step (4) when blackout markers are no longer required.

4. Set lighting control lever (1) to OFF. Blackout markers (3) will go out.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE WORK LIGHTS

INITIAL SETUP:

Not Applicable

TURN WORK LIGHTS ON/OFF

CAUTION

Failure to place light switches in the off position when vehicle is not in use may cause battery and/or vehicle damage.

NOTE

Work light switch is disabled whenever blackout lights are selected on light control switch.

1. Lift up and hold UNLOCK lever (1).

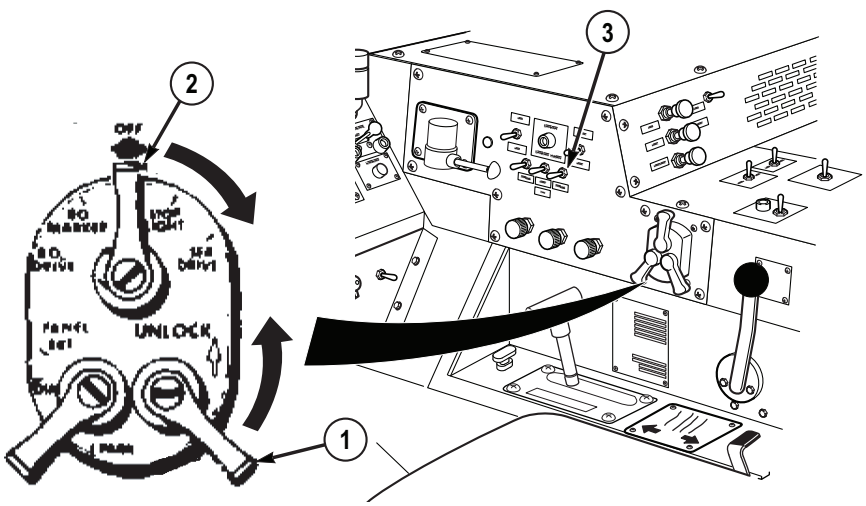


Figure 1.

2. Set lighting control lever (2) to STOP LIGHT or SER DRIVE position.

TURN WORK LIGHTS ON/OFF - Continued

3. Release UNLOCK lever (1).
4. Set WORK LIGHT switch (3) to on position.
5. Set WORK LIGHTS switch (4) on power distribution box to ON position. Stationary work lights (5) located on the retrieval assembly will illuminate.

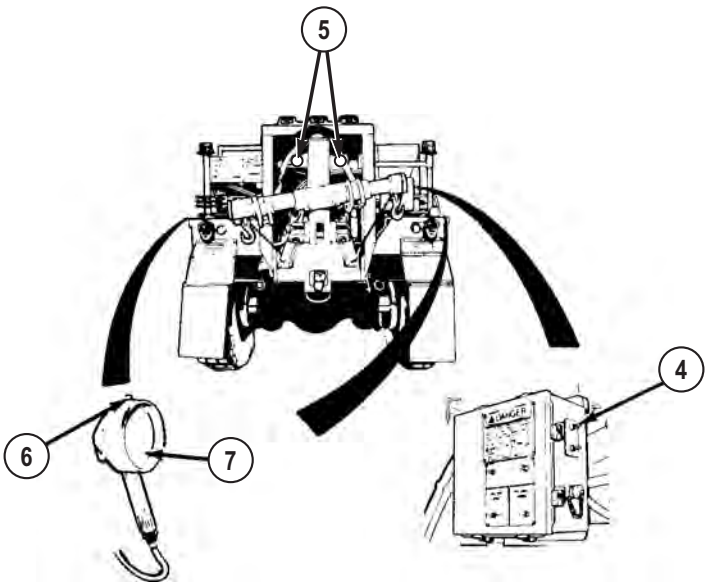


Figure 2.

NOTE

- When WORK LIGHTS switch on power distribution box is switched to the ON position, stationary work lights located on the retrieval assembly will illuminate.
- Both driver side and passenger side portable work lights are removed and operated in the same way.
- Perform Steps (6) through (9) when use of portable work lights is required.

6. Set switch (6), located on portable work light (5), to on position.
7. Pull quick pin (8) from portable work light (7).

TURN WORK LIGHTS ON/OFF - Continued

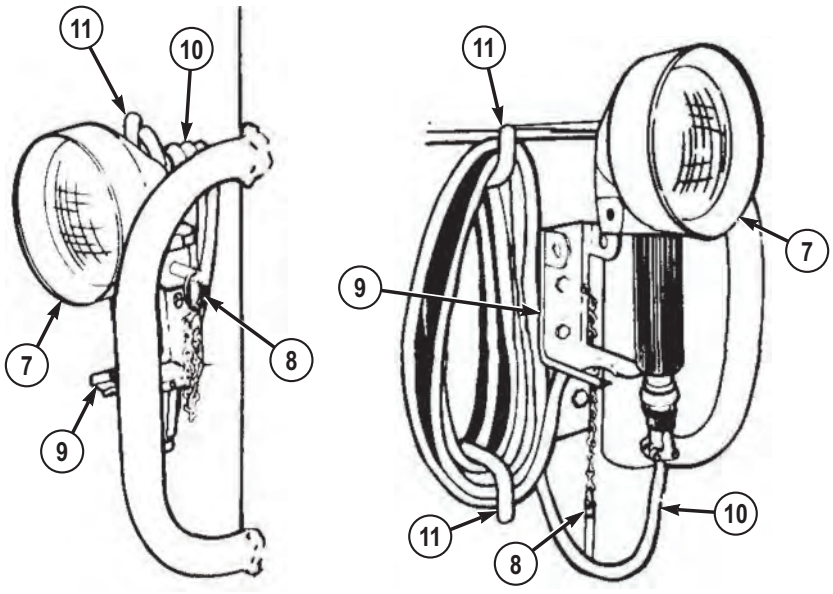


Figure 3.

8. Lift portable work light (7) from bracket (9).
9. Unwrap cord (10) from stowage hooks (11).

NOTE

If a longer cord is needed for portable work lights, complete Steps (10) through (12).

10. Remove worklamp harness from stowage.
11. Disconnect cord (10) from portable work light (7).

TURN WORK LIGHTS ON/OFF - Continued

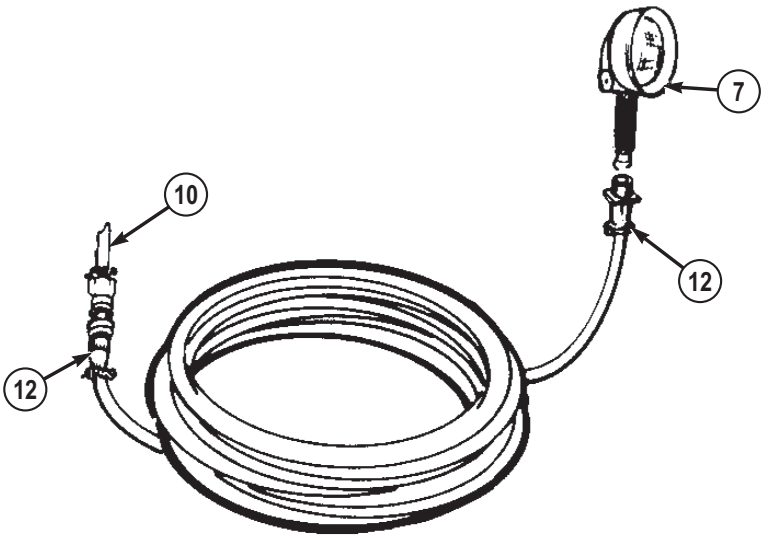


Figure 4.

12. Connect worklamp harness connectors (12) to portable work light (7) and cord (10).

NOTE

- Both driver side and passenger side portable work lights are operated and installed in the same way.
- Perform Steps (13) through (17) when use of the portable work lights is no longer required.

13. Set switch (6), located on portable work light (7), to off position.

Figure 5.

14. Disconnect worklamp harness connectors (12) from portable work light (7) and cord (10).

TURN WORK LIGHTS ON/OFF - Continued

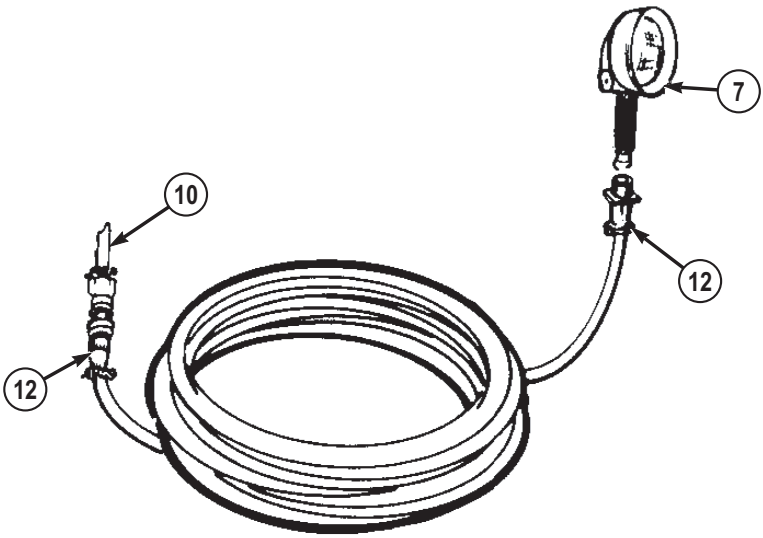


Figure 6.

15. Connect portable work light (7) to cord (10) and wrap cord (10) on stowage hooks (11) as required.

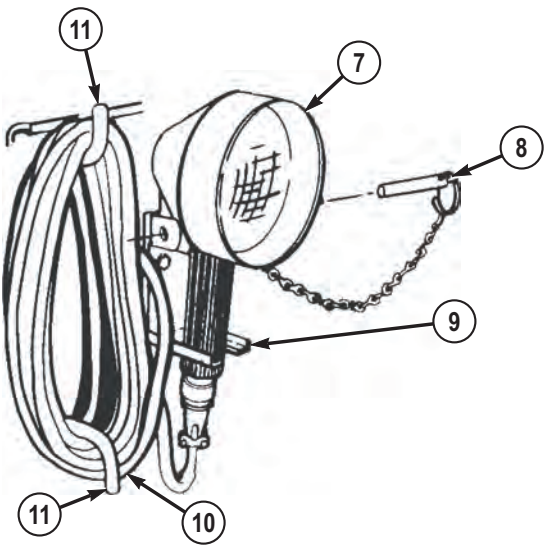


Figure 7.

TURN WORK LIGHTS ON/OFF - Continued

16. Install quick pin (7) in bracket (9) and install quick pin (8) through both bracket (9) and portable work light (7).
17. Return worklamp harness to stowage.

NOTE

Perform Steps (18) through (20) when use of all work lights is no longer required.

18. Set WORK LIGHTS switch (4) on power distribution box to OFF position. All work lights will go out.

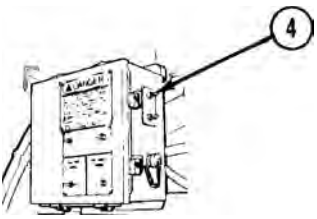


Figure 8.

19. Set WORK LIGHT switch (3) to off position.

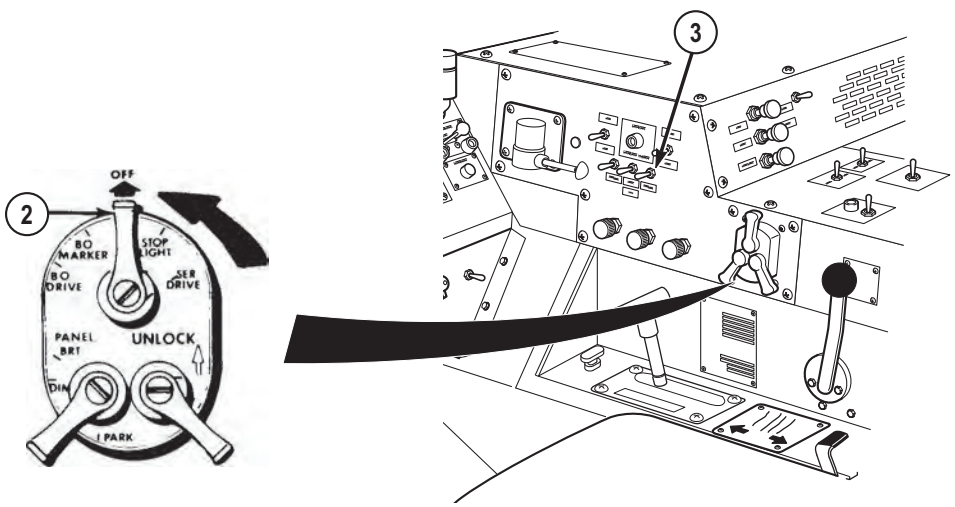


Figure 9.

TURN WORK LIGHTS ON/OFF - Continued

20. Set lighting control lever (2) to OFF position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
REAR BEACON LIGHT OPERATION

INITIAL SETUP:

Not Applicable

SET UP REAR BEACON LIGHTS

NOTE

- Beacon lights should remain in raised position except for crane operations.
- Driver side and passenger side beacon lights are set up in the same way.

1. Remove two nuts (1), lockwashers (2), washers (3), and screws (4) from support bracket (5).

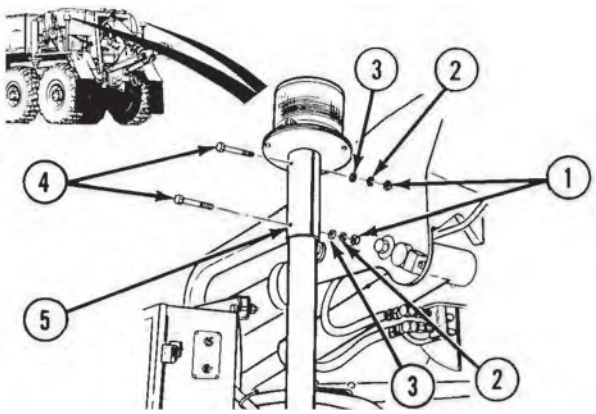


Figure 1.

CAUTION

Do not let beacon drop when raising it to operating position. Damage to beacon can result.

2. Raise beacon support tube (6) until lower set of holes in beacon support tube align with holes in support bracket (5).

SET UP REAR BEACON LIGHTS - Continued

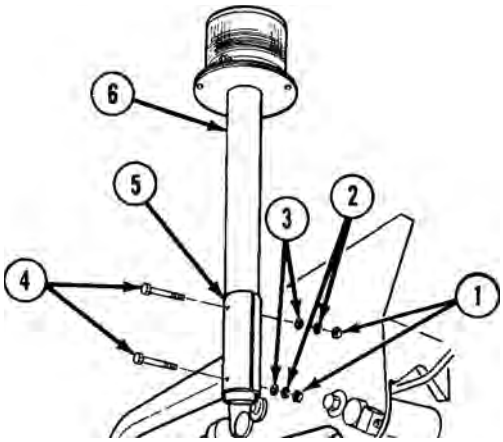


Figure 2.

3. Install two screws (4) through holes in support bracket (5) and beacon support tube (6).
4. Install two washers (3), lockwashers (2), and nuts (1).
5. Repeat Steps (1) through (4) for opposite rear beacon light.

TURN REAR BEACON LIGHTS ON/OFF

1. Lift up and hold UNLOCK lever (1).

TURN REAR BEACON LIGHTS ON/OFF - Continued

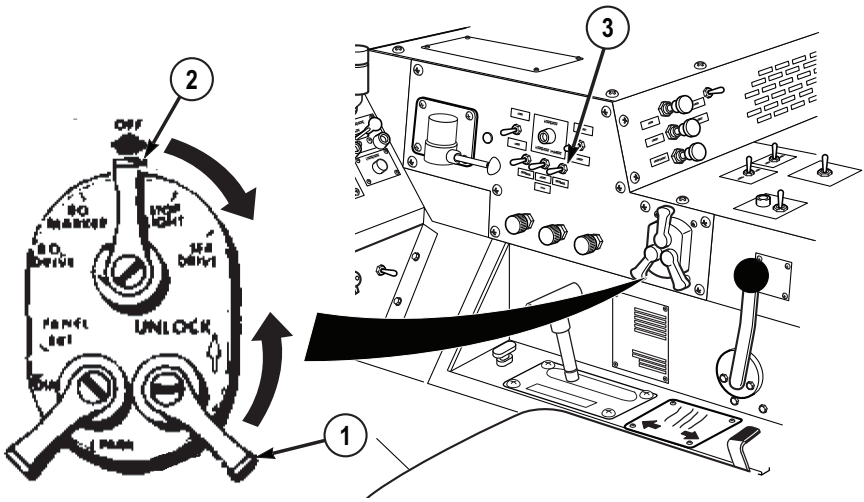


Figure 3.

2. Set LIGHTING CONTROL lever (2) to STOP LIGHT or SER DRIVE position.
3. Release UNLOCK lever (1).
4. Set WORK LIGHT switch (3) to on position.
5. Set BEACON LIGHT switch (4) located on power distribution box (5) to ON position. Rear beacon lights (6) will illuminate.

TURN REAR BEACON LIGHTS ON/OFF - Continued

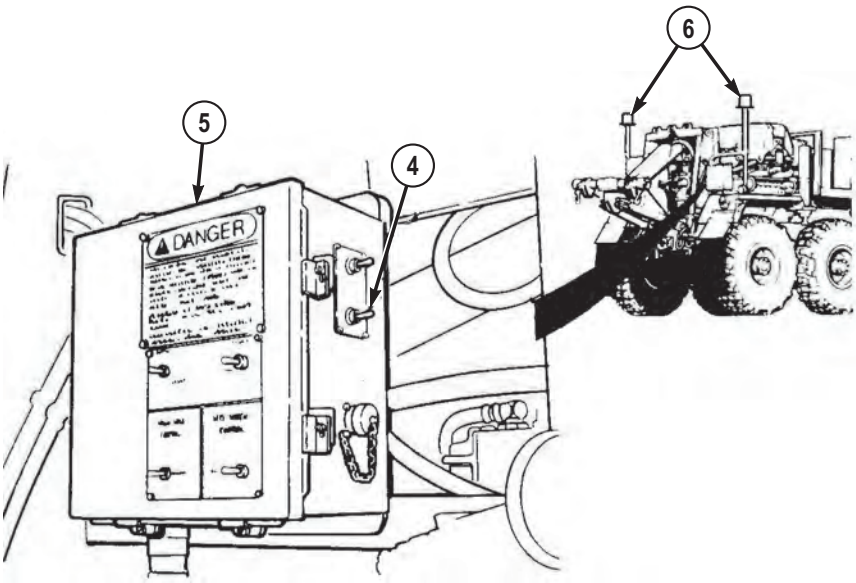


Figure 4.

NOTE

Perform Steps (6) through (8) when use of rear beacon lights are no longer required.

6. Set BEACON LIGHT switch (4) to OFF position. Rear beacon lights (6) will go out.
7. Set WORK LIGHT switch (3) to off position.

TURN REAR BEACON LIGHTS ON/OFF - Continued

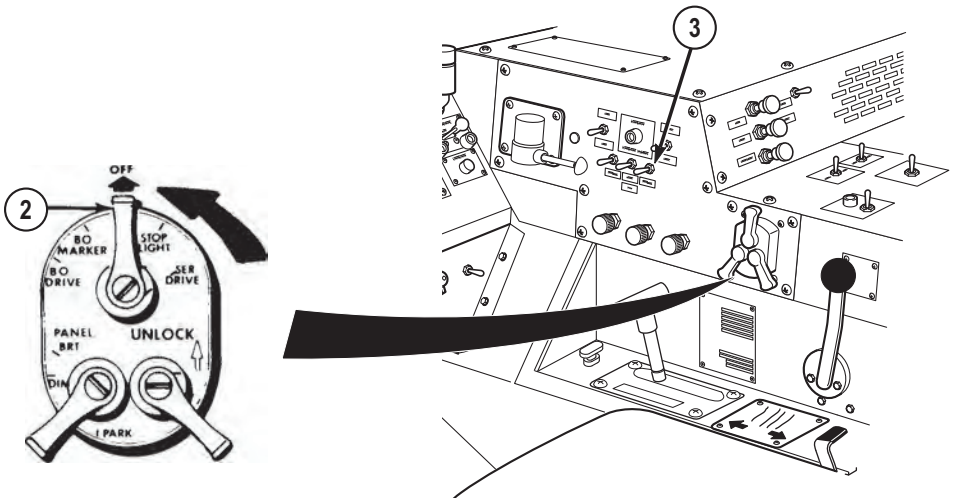


Figure 5.

8. Set LIGHTING CONTROL lever (2) to OFF position.

STOW REAR BEACON LIGHTS

CAUTION

Do not let beacon drop when removing screws. Damage to beacon can result.

NOTE

Driver side and passenger side beacon lights are stowed in the same way.

1. Remove two nuts (1), lockwashers (2), washers (3), and screws (4) from support bracket (5).

STOW REAR BEACON LIGHTS - Continued

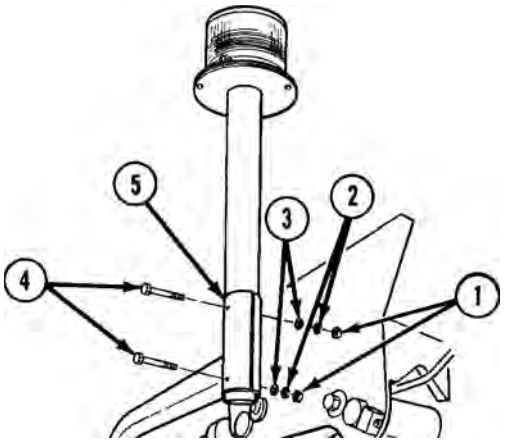


Figure 6.

2. Lower beacon support tube (6) until upper set of holes in beacon support tube align with holes in support bracket (5).

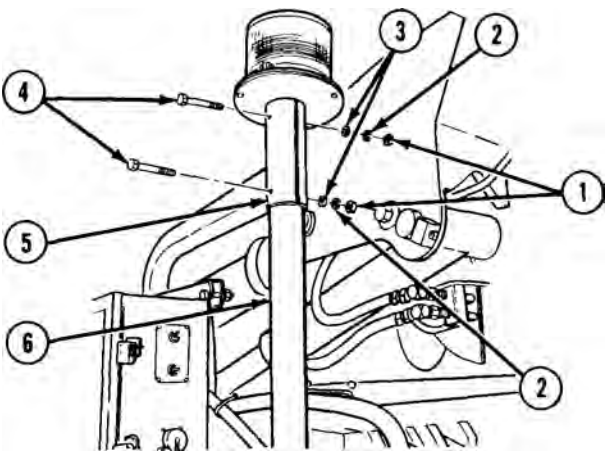


Figure 7.

3. Install two screws (4) through holes in support bracket (5) and beacon support tube (6).
4. Install two washers (3), lockwashers (2), and nuts (1).

STOW REAR BEACON LIGHTS - Continued

5. Repeat Steps (1) through (4) for opposite rear beacon light.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PORTABLE BEACON LIGHT OPERATION

INITIAL SETUP:

Not Applicable

INSTALL/REMOVE PORTABLE BEACON LIGHT

1. Remove beacon light (1) from stowage and unwind cord (2).

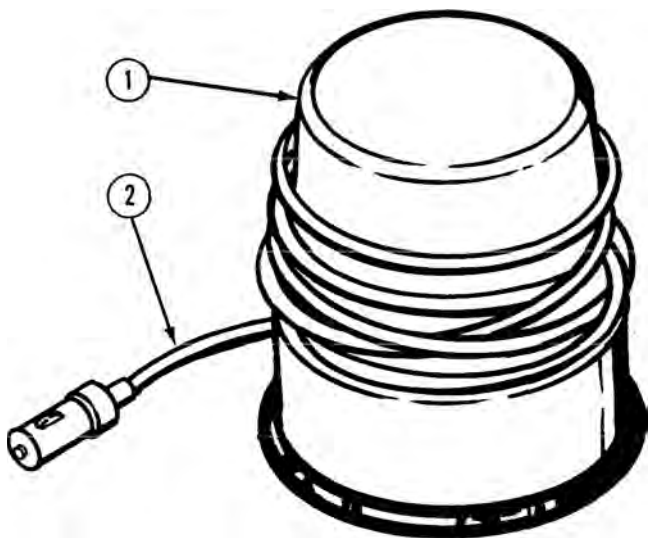


Figure 1.

2. Place beacon light (1) on driver side front corner of cab roof (3) approximately 12 in. (30 cm) from driver side cab, and approximately 2 in. (5 cm) from front edge of cab roof.

INSTALL/REMOVE PORTABLE BEACON LIGHT - Continued

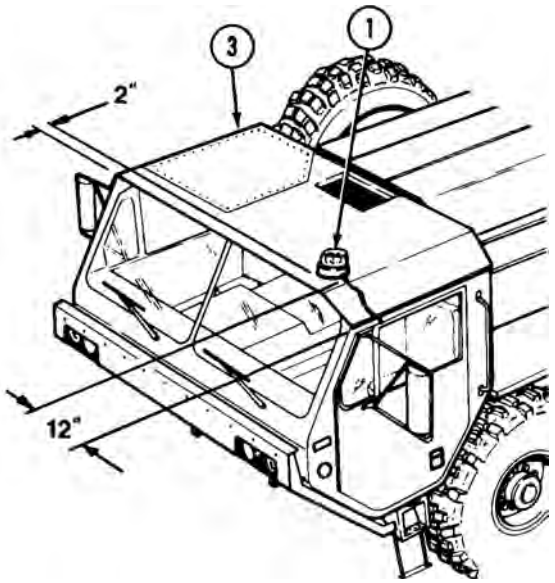


Figure 2.

3. Route beacon cord (2) through driver side door opening (4) and between inside of cab roof (3) and air horn valve hoses (5).

INSTALL/REMOVE PORTABLE BEACON LIGHT - Continued

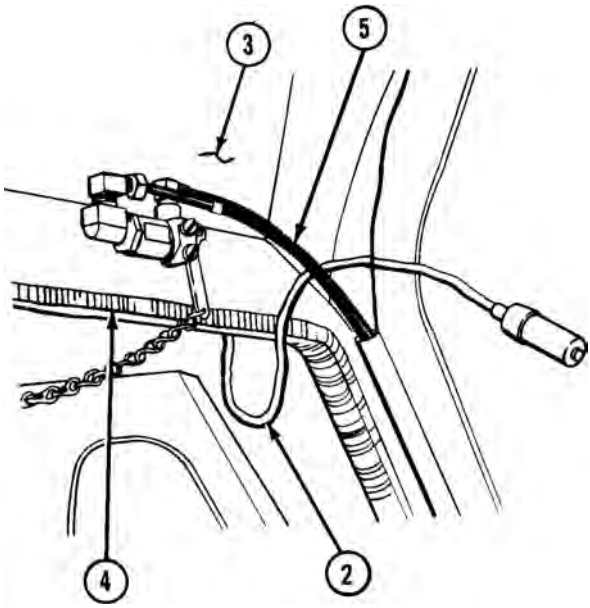


Figure 3.

4. Route beacon cord (2) down left side of driver's windshield (6), across driver side defroster (7), and across center console (8) to utility outlet (9).

INSTALL/REMOVE PORTABLE BEACON LIGHT - Continued

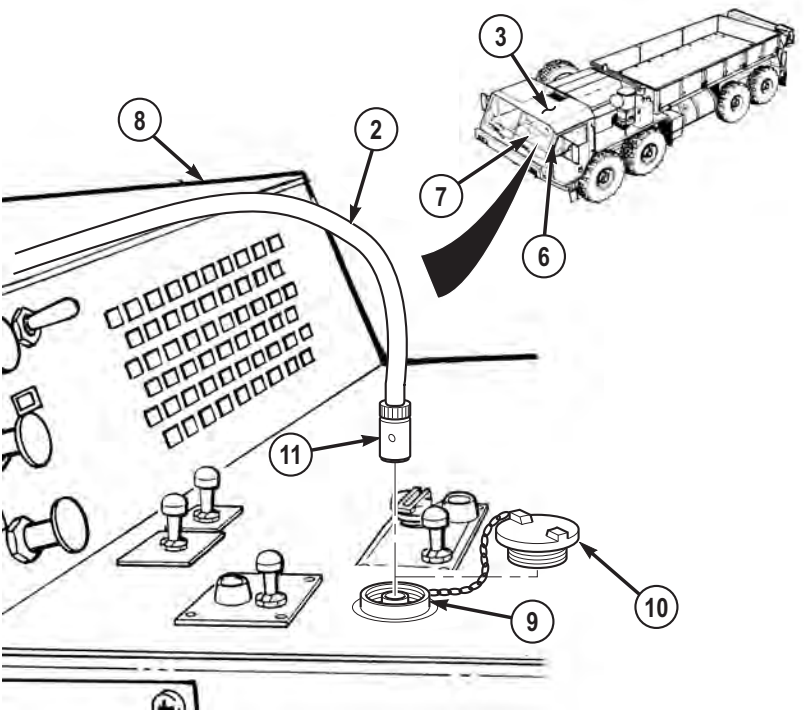


Figure 4.

5. Remove utility outlet cover (10).

NOTE

ENGINE switch must be positioned to ON for portable beacon light to operate.

6. Insert beacon cord plug (11) into utility outlet (9).

INSTALL/REMOVE PORTABLE BEACON LIGHT - Continued

NOTE

Perform Steps (7) through (11) when use of portable beacon light is no longer required.

7. Remove beacon cord plug (11) from utility outlet (9).
8. Install utility outlet cover (10).
9. Remove beacon cord (2) from interior of cab.
10. Remove beacon light from cab roof (3).
11. Rewind cord (2) and return beacon light (1) to appropriate stowage.

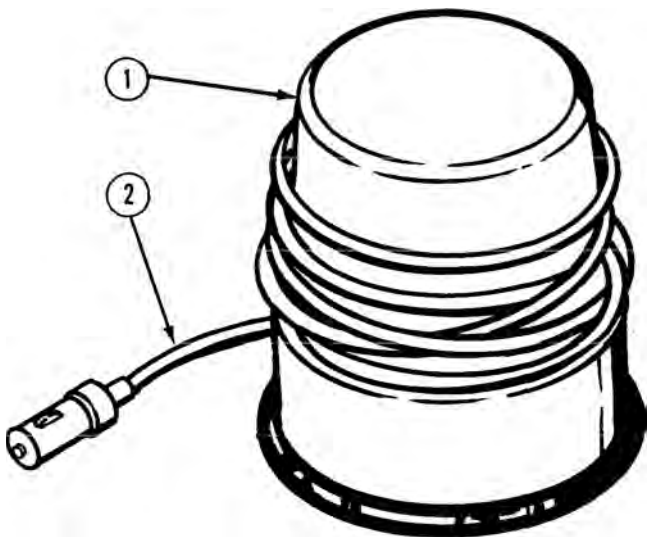


Figure 5.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE TURN SIGNALS

INITIAL SETUP:

Not Applicable

SET TURN SIGNAL ON/OFF

1. Lift up and hold UNLOCK lever (1).

SET TURN SIGNAL ON/OFF - Continued

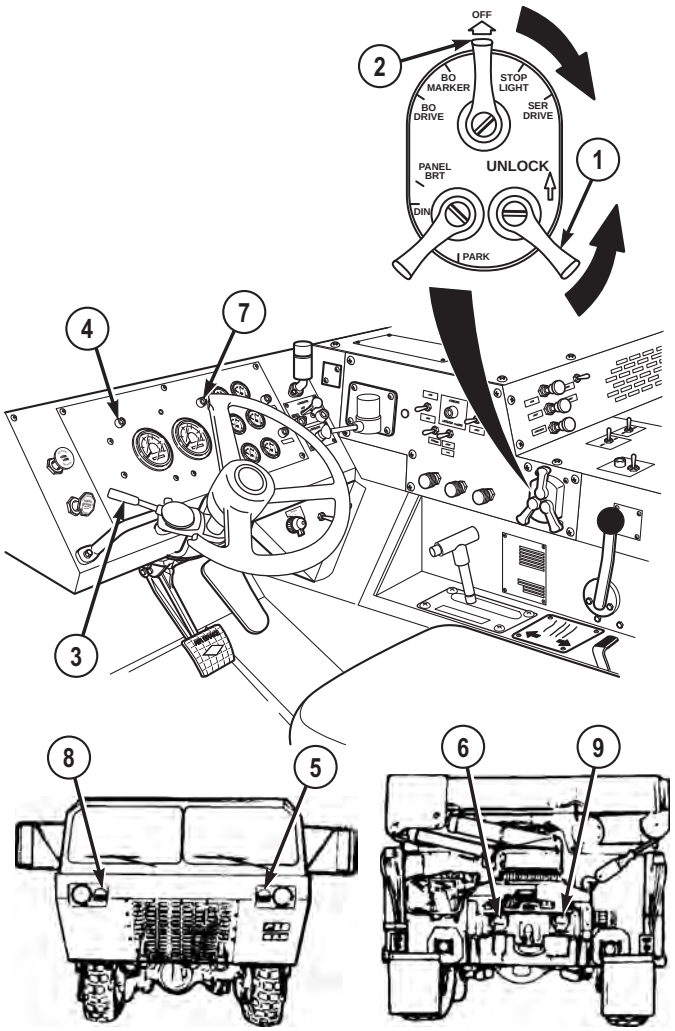


Figure 1.

2. Set lighting control lever (2) to SER DRIVE position.

NOTE

If left turn is desired, complete Step (3). If right turn is desired, skip to Step (4).

SET TURN SIGNAL ON/OFF - Continued

3. Set turn signal lever (3) down to left turn position. Left turn indicator (4), and driver side front (5) and rear (6) composite lights will flash (approximately once per second) simultaneously.

NOTE

If right turn is desired, complete Step (4).

4. Set turn signal lever (3) up to right turn position. Right turn indicator (7), and passenger side front (8) and rear (9) composite lights will flash (approximately once per second) simultaneously.

NOTE

Turn signal level may return to off (center) position automatically once turn is complete, if this is not the case and/or turn signal is no longer desired, complete Step (5).

5. Set turn signal lever (3) to center (off) position. Appropriate turn indicator and composite lights will go out.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE EMERGENCY FLASHERS

INITIAL SETUP:

Not Applicable

TURN EMERGENCY FLASHERS ON/OFF

NOTE

Highway Emergency Marker Kit (WP 0128) 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. Lift up and hold UNLOCK lever (1).

TURN EMERGENCY FLASHERS ON/OFF - Continued

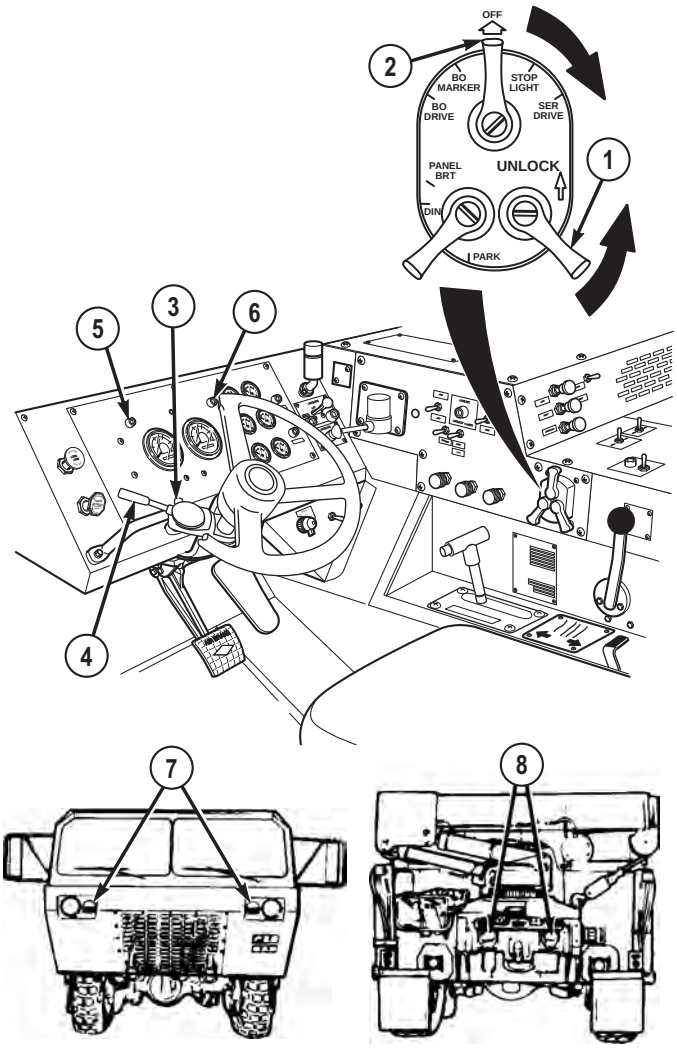


Figure 1.

2. Set lighting control lever (2) to SER DRIVE position.
3. Set turn signal lever (3) to right turn position.
4. Push down emergency flasher control (4) and push turn signal lever (3) up as far as it will go. Both left (5) and right (6) turn indicators, and front (7) and rear (8) composite lights will flash simultaneously at approximately once per second.

TURN EMERGENCY FLASHERS ON/OFF - Continued

NOTE

Perform Step (5) when emergency flashers are no longer desired.

5. Pull turn signal lever (3) down to center position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
INSTALL/REMOVE WHEEL CHOCKS

INITIAL SETUP:

Not Applicable

INSTALL WHEEL CHOCKS

NOTE

- Vehicle is equipped with four wheel chocks.
- Always chock tires if vehicle is shut down on uneven terrain.
- Always chock tires if vehicle parking brake is inoperative.
- Ensure local policy for chocking vehicle tires is followed.

1. Remove two wheel chocks (1) from stowage.

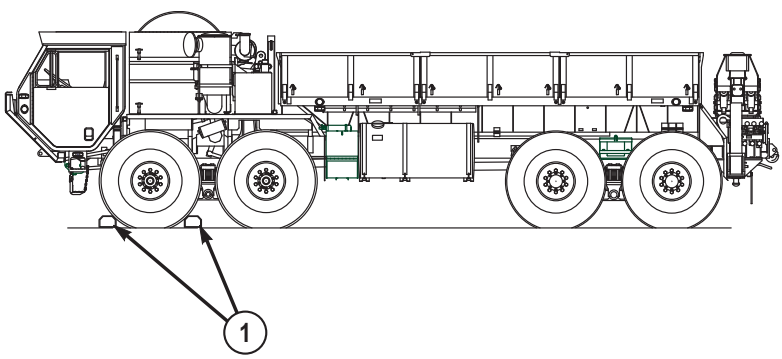


Figure 1.

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

REMOVE WHEEL CHOCKS

NOTE

- Vehicle is equipped with four wheel chocks.
- Ensure local policy for removing wheel chocks is followed.

REMOVE WHEEL CHOCKS - Continued

1. Remove wheel chocks (1) from both front and rear of tire (No. 1 axle driver side tire shown).

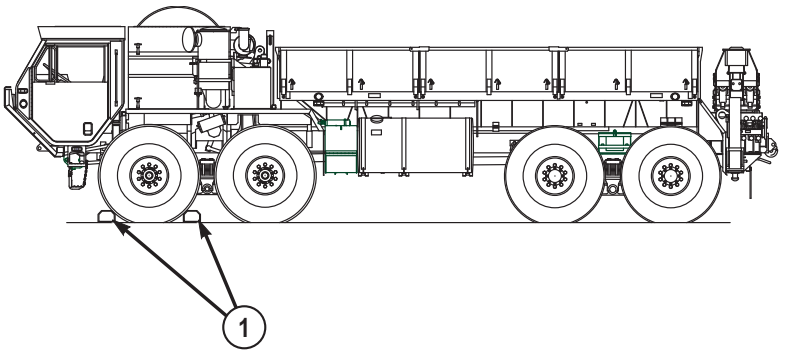


Figure 2.

2. Return wheel chocks (1) to stowage.
3. Repeat Steps (1) and (2) if more than one wheel is chocked.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CHANGE VEHICLE WEIGHT INDICATOR

INITIAL SETUP:

Not Applicable

CHANGE VEHICLE WEIGHT INDICATOR

NOTE

Refer to load classification table for appropriate vehicle weight.

1. Press in bottom of lockplate (1).

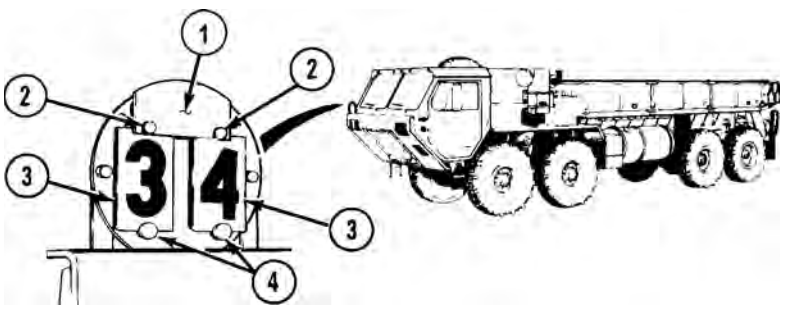


Figure 1.

2. Push lockplate (1) up and off one lockpin (2).
3. Remove number plates (3).
4. Place new number on top of number plates (3).
5. Install number plates (3) on lockpin (4).
6. Push down number plates (3). Slide lockplate (1) on lockpin (2).
7. Repeat Steps (1) through (7) to change other number.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ADJUST SEAT

INITIAL SETUP:

Not Applicable

INSTALL FOOTREST

1. Remove safety pin (1) and yoke pin (2).

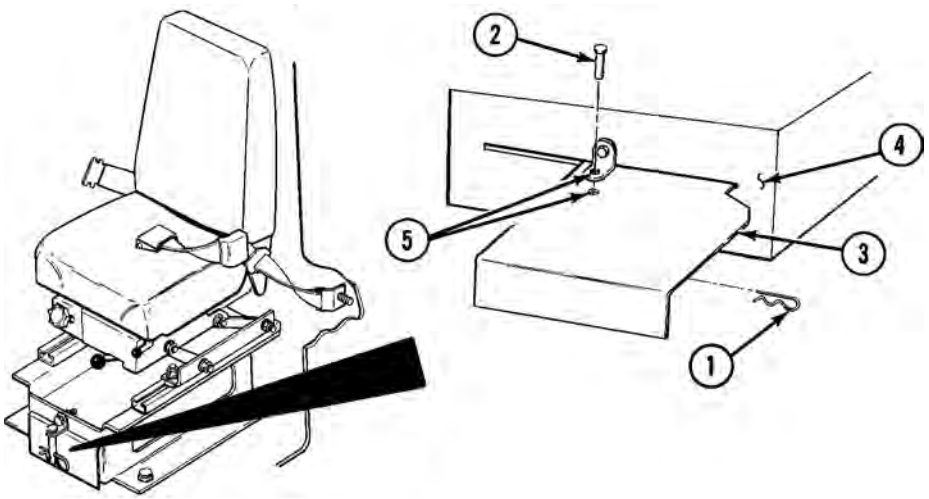


Figure 1.

2. Pull out footrest (3).
3. Slide footrest (3) toward seat brace (4) so holes (5) are aligned.
4. Install yoke pin (2) and safety pin (1).

STOW FOOTREST

1. Remove safety pin (1) and yoke pin (2).

STOW FOOTREST - Continued

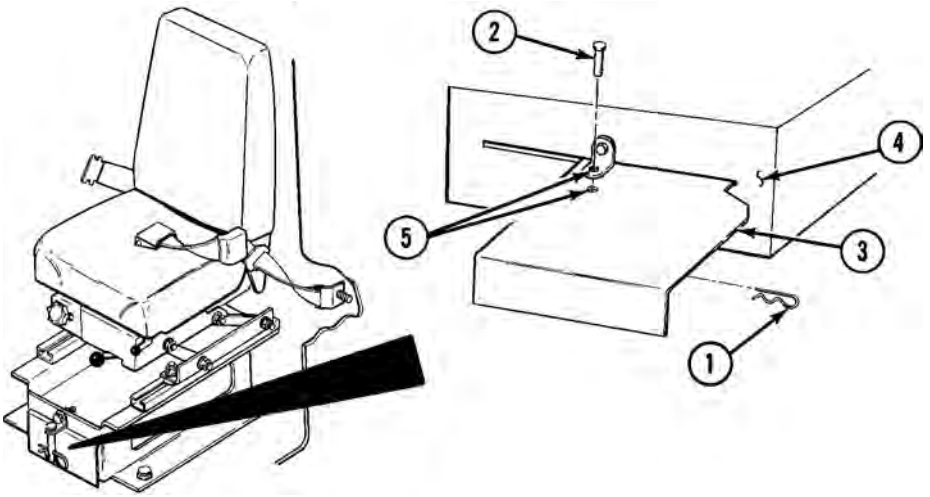


Figure 2.

2. Slide footrest (3) under seat brace (4).
3. Install yoke pin (2) and safety pin (1).

ADJUST SEAT

WARNING

Use care when adjusting knob. Seat collapses when knob screw is adjusted. Do not place hand between seat mount and low neck. Failure to comply may result in injury or death to personnel.

NOTE

- Sit in seat and perform Steps (1) through (8) as necessary.
- Driver and crew (passenger side) side seats are adjusted the same way.

1. Turn knob (1) to control cushion firmness.

ADJUST SEAT - Continued

NOTE

Retaining straps may need to be loosened before moving seat forward.

2. Push lever (2) to left and slide seat (3) forward or backward.
3. Let go of lever (2) to lock seat (3) in place.

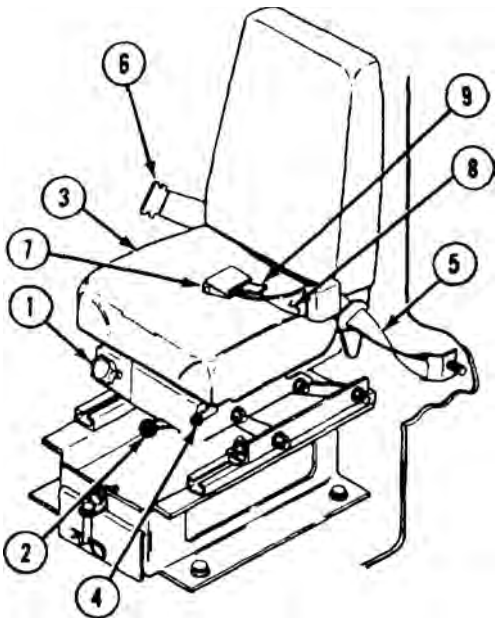


Figure 3.

4. Pull up lever (4) and lift self off seat (3) to raise seat (3).
5. Pull up lever (4) and push down on seat (3) to lower seat (3).
6. Let go of lever (4) to lock seat (3) in place.
7. Tighten seat retaining straps (5).
8. Adjust all vehicle mirrors as necessary once driver's seat is properly adjusted.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE THREE-POINT SEATBELT

INITIAL SETUP:

Not Applicable

OPERATE THREE-POINT SEATBELT

1. Put seatbelt flat metal end (1) into interconnect (2) until click is heard.

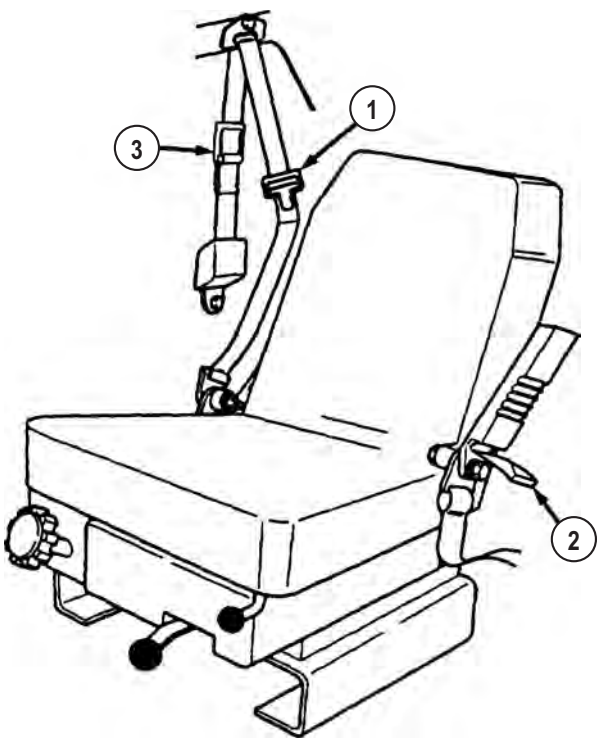


Figure 1.

2. Pull out on comfort latch (3) locking handle and move comfort latch up and down strap until snug (but not tight) fit at shoulder is achieved.

OPERATE THREE-POINT SEATBELT - Continued

3. To release seatbelt, push in button on interconnect (2).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
ADJUST AIR-RIDE SEAT

INITIAL SETUP:

Not Applicable

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 1.

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 is bounced too hard, seat tether may lock seat in down position. Park vehicle (WP 0056) 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

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE FOUR-POINT SEATBELT

INITIAL SETUP:

Not Applicable

OPERATE FOUR-POINT SEATBELT

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

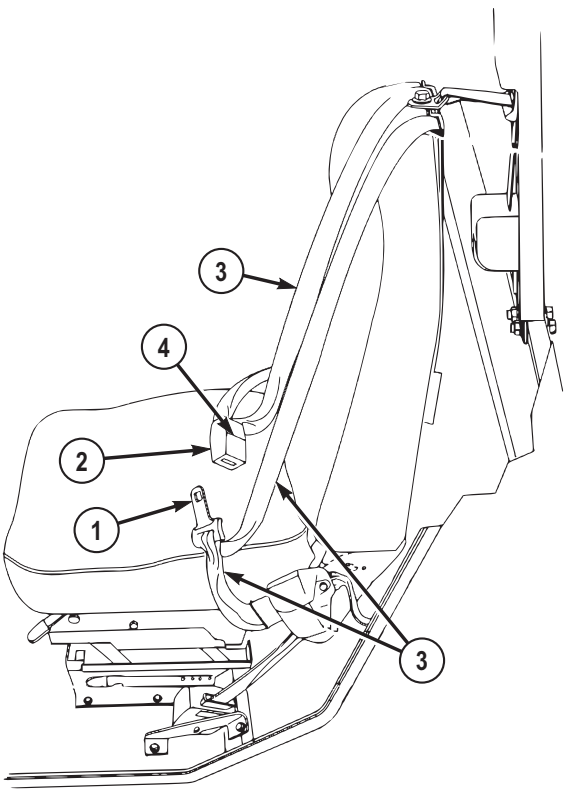


Figure 1.

OPERATE FOUR-POINT SEATBELT - Continued

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

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GROVE CRANE OPERATION (MANUAL CONTROL)

INITIAL SETUP:

Not Applicable

PREPARE CRANE FOR OPERATION

WARNING

- Do not operate crane unless outriggers are firmly in place or vehicle could roll over. Failure to comply may result in injury or death to personnel.
- If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.
- 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.
- 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 when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem. Failure to comply may result in injury or death to personnel.

CAUTION

Rear beacon lights must be in lower (stowed) position before operating crane or damage to lights may result.

PREPARE CRANE FOR OPERATION - Continued

NOTE

- Failure of hydraulic system will stop crane operation and lock crane in place. If hydraulic system fails during crane operation, refer to perform immediate action for loss of hydraulic system. (WP 0133)
- If electrical system fails during crane operation, refer to perform emergency hydraulic operation when grove crane electrical power fails. (WP 0134)

1. Lower rear beacon lights to stowed position. (WP 0096)
2. Start engine. (WP 0044)

NOTE

Grove crane can operate on up to 5 degree side slope.

3. Position vehicle on level ground so all loading and unloading can be done from one position.
4. Set transmission range selector (1) to N (neutral).
5. Pull out PARKING BRAKE control (2).

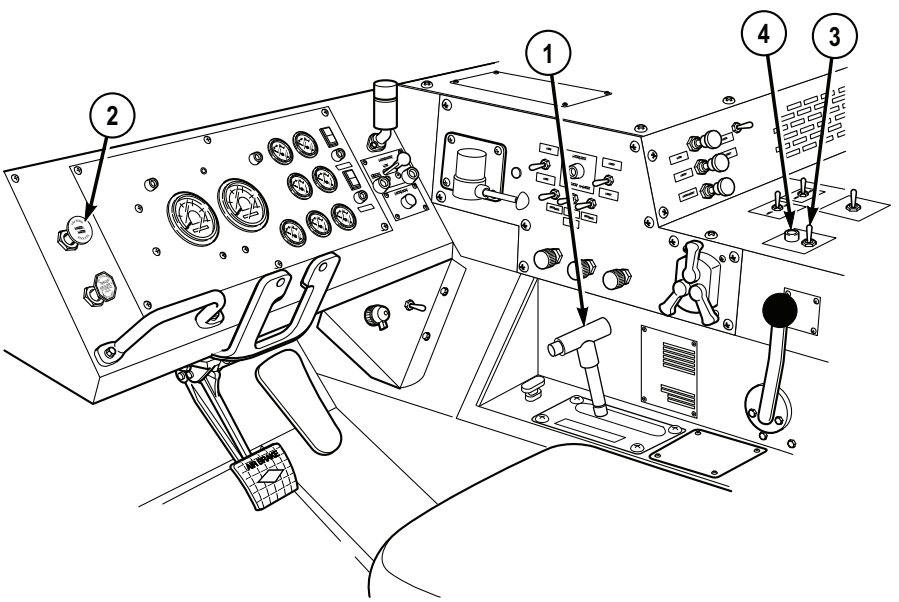


Figure 1.

6. Set PTO ENGAGE switch (3) to ON position. Indicator light (4) will illuminate.

PREPARE CRANE FOR OPERATION - Continued

7. Push in FRONT BRAKE APPLICATION control (5).

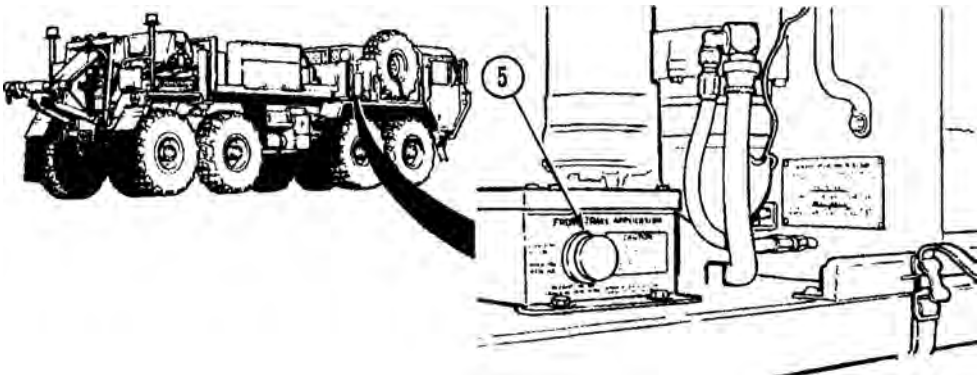


Figure 2.

8. Set POWER switch (6) to ON position.

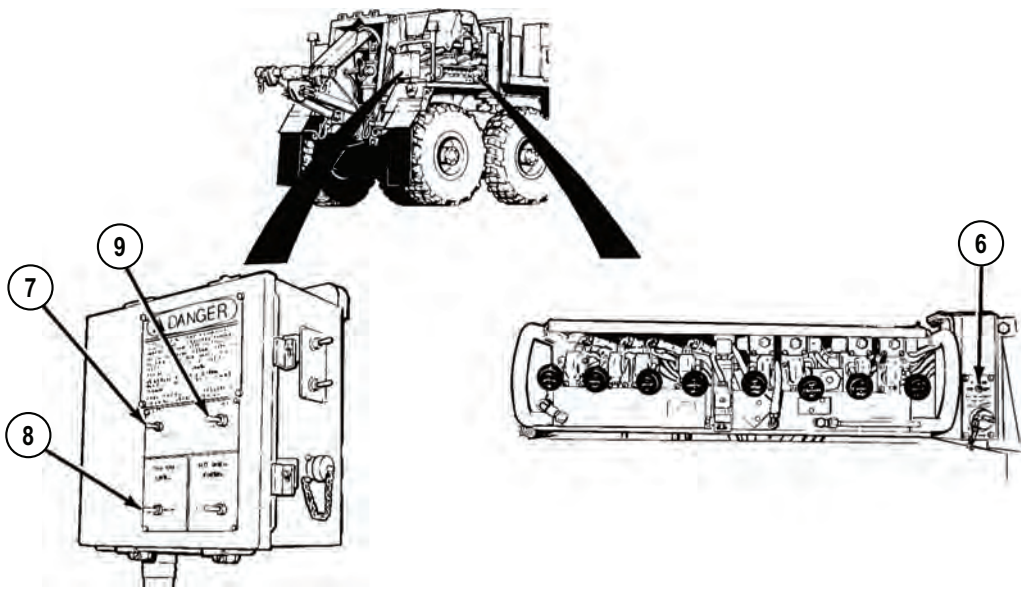


Figure 3.

9. Set POWER switch (7) to ON position.
10. Set HIGH IDLE CONTROL switch (8) to CRANE position.

PREPARE CRANE FOR OPERATION - Continued

11. Push and release LATCH switch (9). Engine speed will increase to approximately 1500 rpm.

SETUP OUTRIGGERS

WARNING

- Chock front wheels when using outriggers to prevent vehicle from rolling. Failure to comply may result in injury or death to personnel.
- Stand clear of outrigger beams while operating lever. Failure to comply may result in injury or death to personnel.

NOTE

- Always operate control levers with light, even pressure.
- Outrigger beams can only be extended/retracted from controls on same side of vehicle.
- Outrigger beams will come out slower with light pressure on lever. Pushing lever to full travel will cause faster movement.
- Either right or left outrigger may be extended first, for the purposes of this procedure; the right side is extended first.

1. Move O/R EXT control lever (1) to IN position briefly and lift and turn right outrigger lockpin (2) to unlock position.

SETUP OUTRIGGERS - Continued

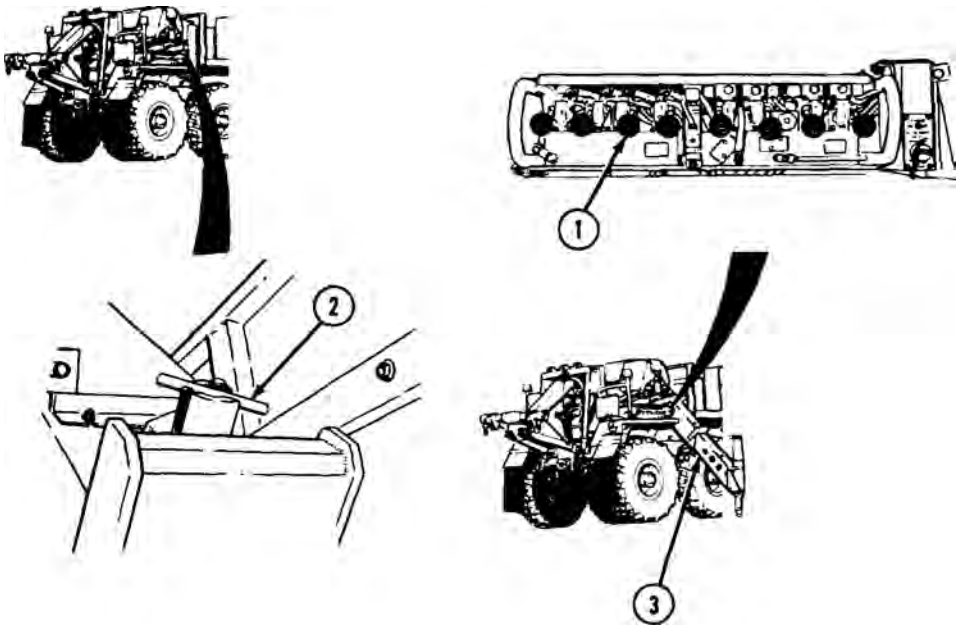


Figure 4.

2. Move O/R EXT control lever (1) to OUT position until right outrigger beam (3) is fully extended.

WARNING

Use care when removing outrigger pads from stowed position. Failure to comply may result in injury or death to personnel.

3. Remove two safety pins (4) and remove outrigger pad (5) from studs (6) on outrigger jack cylinder (7).

SETUP OUTRIGGERS - Continued

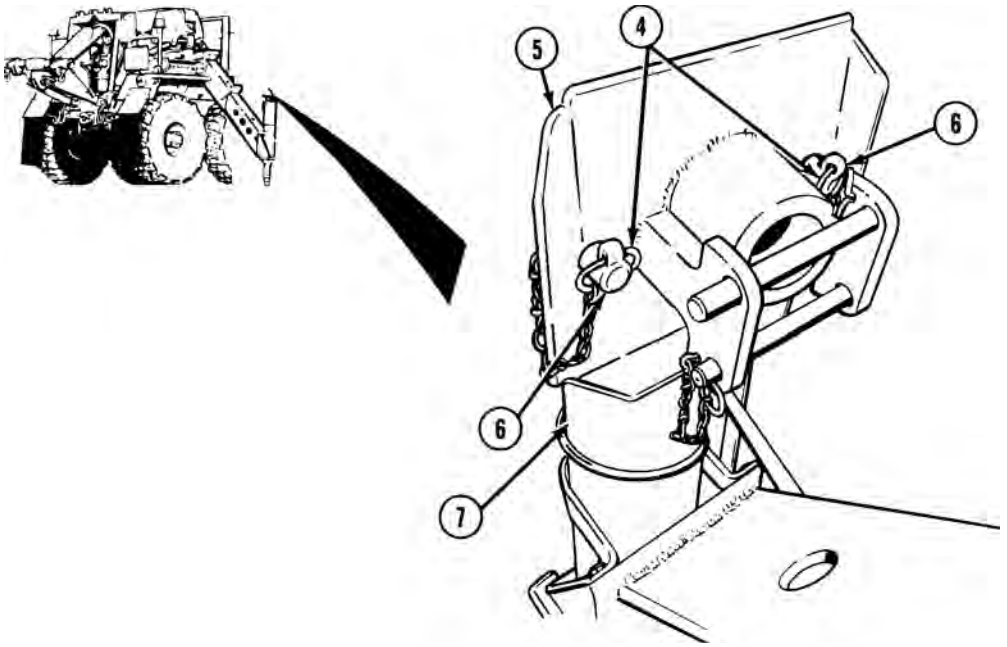


Figure 5.

4. Remove two retaining pins (8).

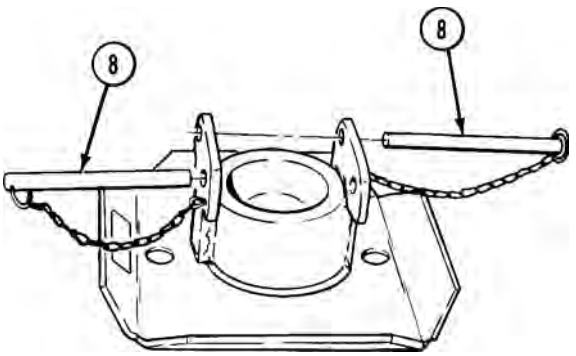


Figure 6.

5. Clean all foreign material from socket (9) in outrigger pad (5) and from rod end of outrigger jack cylinder (7).

SETUP OUTRIGGERS - Continued

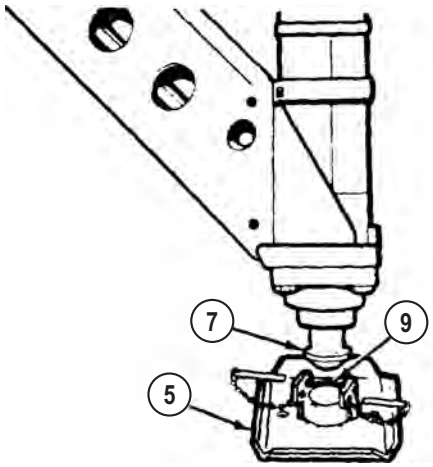


Figure 7.

NOTE

It may be necessary to retract outrigger slightly to fit pad under jack cylinder.

6. Position outrigger pad (5) directly below outrigger jack cylinder (7).

WARNING

- Lockring could pinch hands and fingers when snapped into position. Do not allow hands or fingers to get between lockring and lockring groove when installing lockring. Failure to comply may result in injury or death to personnel.
- Raised notch on lockring must face away from wheel or lockring will not seat properly in lockring groove, causing lockring to unseat. Failure to comply may result in injury or death to personnel.
- Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated. Failure to comply may result in injury or death to personnel.
- Do not apply heat to a multi-piece wheel or wheel component. Failure to comply may result in injury or death to personnel.

SETUP OUTRIGGERS - Continued

NOTE

Adjust outrigger pad position as required so rod end will lower into pad socket.

7. Move right outrigger jack (RH O/R JACK) control lever (10) to DOWN position and lower outrigger jack cylinder (7) until rod end is seated in socket (9) of outrigger pad (5).

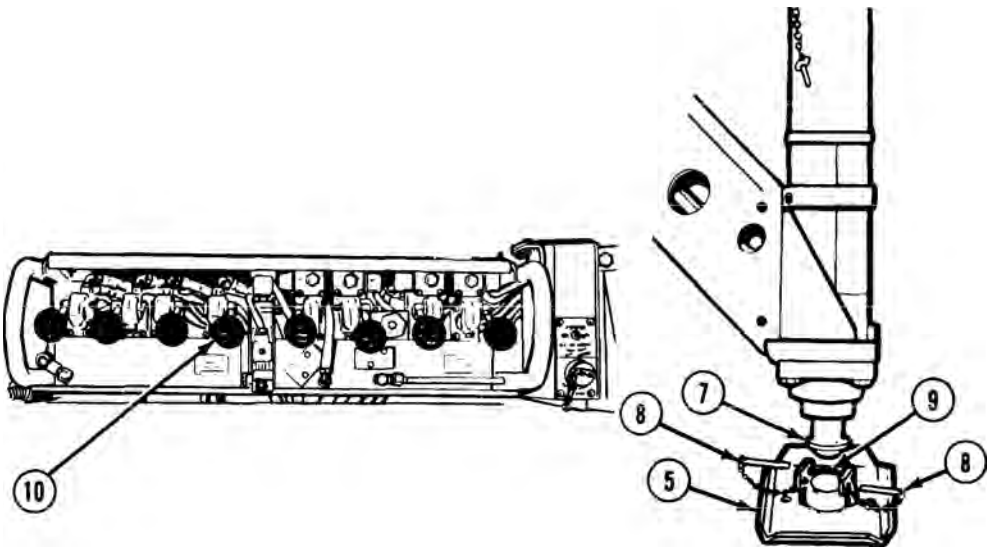


Figure 8.

8. Install retaining pins (8).
9. Move O/R EXT control lever (11) to IN position briefly and lift and turn left outrigger lockpin (12) to unlock position.

SETUP OUTRIGGERS - Continued

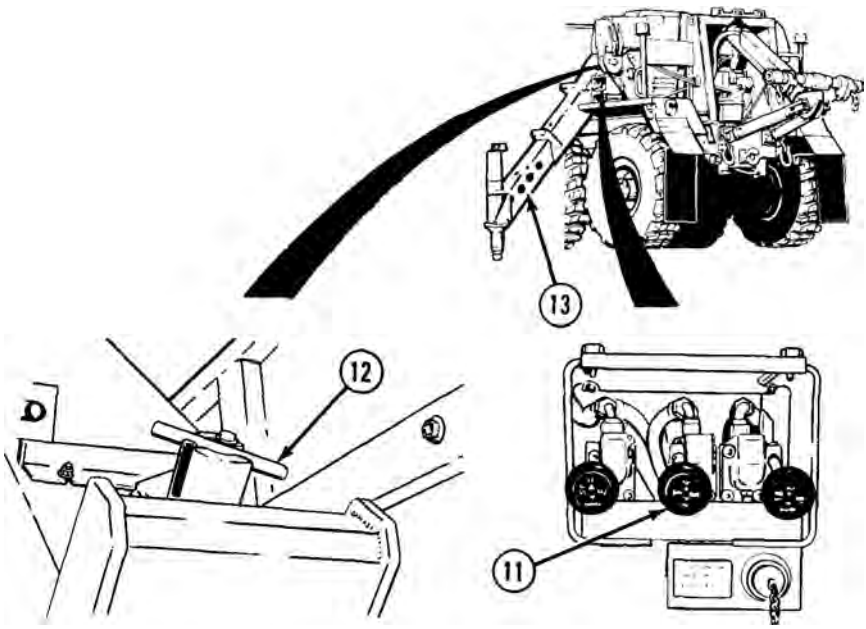


Figure 9.

10. Move O/R EXT control lever (11) to OUT position until left outrigger beam (13) is fully extended.

WARNING

Use care when removing outrigger pads from stowed position. Failure to comply may result in injury or death to personnel.

11. Remove two safety pins (14) and remove outrigger pad (15) from studs (16) on outrigger jack cylinder (17).

SETUP OUTRIGGERS - Continued

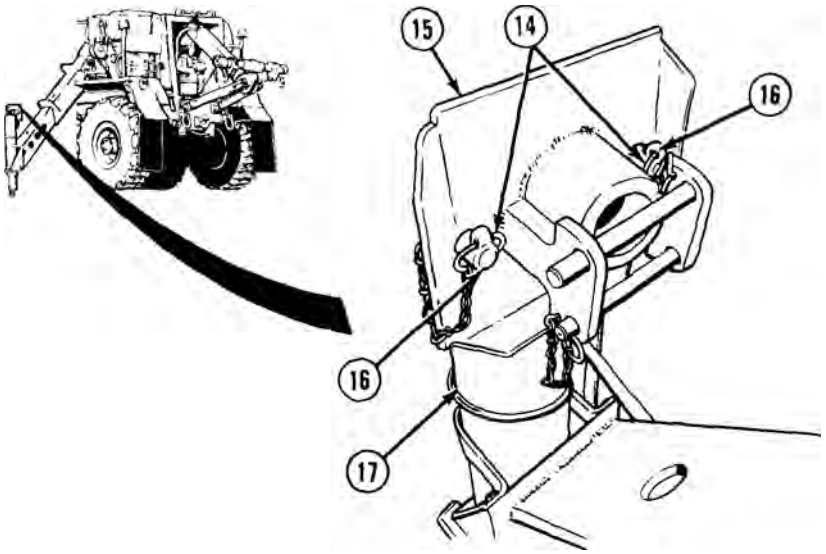


Figure 10.

12. Remove two retaining pins (18).

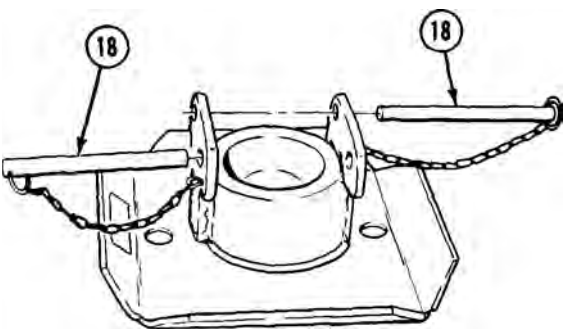


Figure 11.

13. Clean all foreign material from socket (19) in outrigger pad (15) and from rod end of outrigger jack cylinder (17).

SETUP OUTRIGGERS - Continued

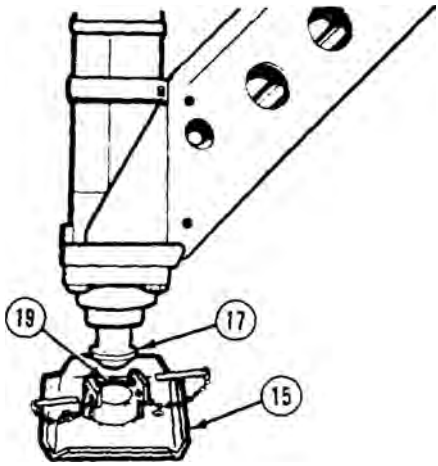


Figure 12.

NOTE

It may be necessary to retract outrigger slightly to fit pad under jack cylinder.

14. Position outrigger pad (15) directly below outrigger jack cylinder (17).

WARNING

- Lockring could pinch hands and fingers when snapped into position. Do not allow hands or fingers to get between lockring and lockring groove when installing lockring. Failure to comply may result in injury or death to personnel.
- Raised notch on lockring must face away from wheel or lockring will not seat properly in lockring groove, causing lockring to unseat. Failure to comply may result in injury or death to personnel.
- Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated. Failure to comply may result in injury or death to personnel.
- Do not apply heat to a multi-piece wheel or wheel component. Failure to comply may result in injury or death to personnel.

SETUP OUTRIGGERS - Continued

NOTE

Adjust outrigger pad position as required so rod end will lower into pad socket.

15. Move left outrigger jack (LH O/ R JACK) control lever (20) to DOWN position and lower outrigger jack cylinder (17) until rod end is seated in socket (19) of outrigger pad (15).

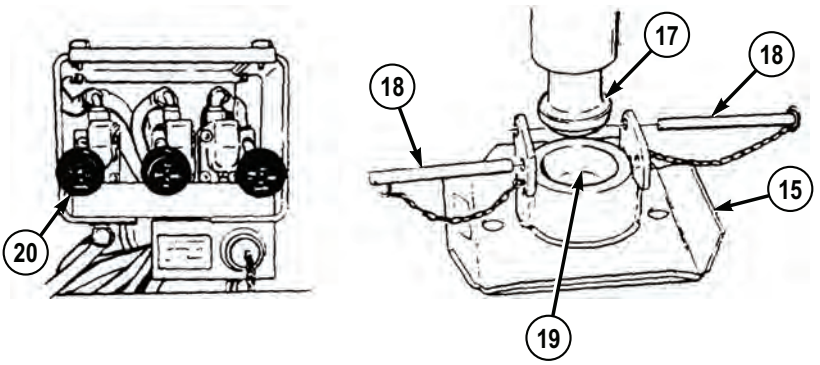


Figure 13.

16. Install retaining pins (18) in outrigger pad (15).

JACK OUTRIGGERS

WARNING

- Do not raise vehicle tires off ground with outrigger jack cylinders. Vehicle could roll over. Always chock front wheels when using outriggers. Failure to comply may result in injury or death to personnel.
- Crane must be level from side to side. Use of crane in unlevel position can cause vehicle to turn. Failure to comply may result in injury or death to personnel.

NOTE

- Both left and right outrigger jacks can be operated from driver side or passenger side control panels.

JACK OUTRIGGERS - Continued

- Operate left and right outrigger jack (LH O/R JACK and RH O/R JACK) control levers at the same time.
- Crane movement from one lever may be slower than the other when operating two levers together.

1. Simultaneously move LH O/R JACK (1) and RH O/R JACK (2) control levers to DOWN position.

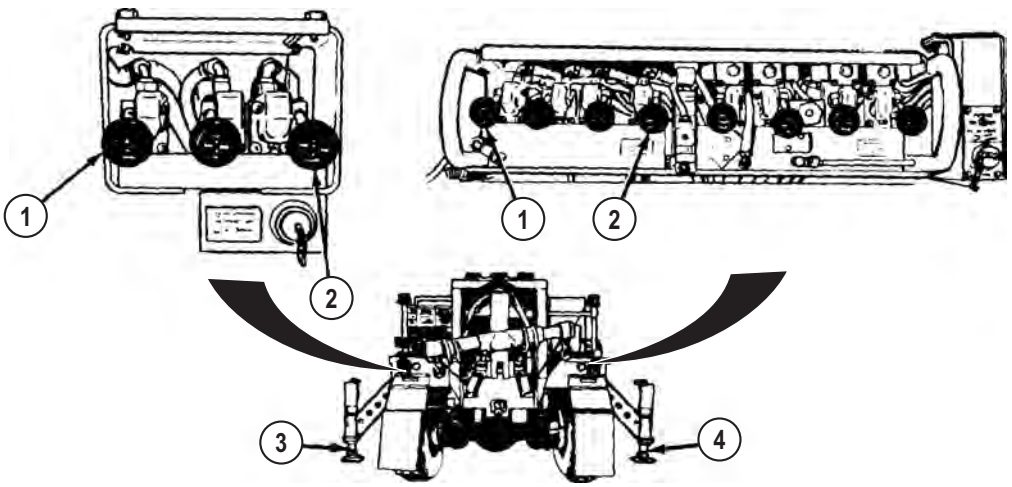


Figure 14.

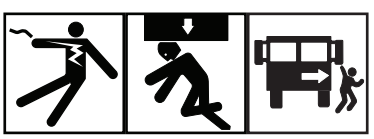
NOTE

Vehicle weight should be off No. 4 axle just enough so tires still have firm contact with ground but no longer bulge from weight of vehicle.

2. Lower left hand (3) and right hand (4) outrigger jack cylinders until vehicle weight is off rear tires.

RAISE BOOM TO OPERATING POSITION

WARNING



- Stand clear of outrigger beams while operating levers. Failure to comply may result in injury or death to personnel.

RAISE BOOM TO OPERATING POSITION - Continued

- 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.
- Keep boom clear of all electrical lines and other obstacles while operating crane. 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 drum.
- Do not operate crane with lockpin in lock position, damage to equipment may result.
- Use caution when removing slack from cable. Ensure that hook block does not catch on hook block stowage guide or damage to fender or hook block stowage guide may result.

1. Move HOIST control lever (1) to DOWN position until hook block (2) rests either on fender (3) or hook block stowage guide (4) as applicable to relieve tension on cable.

RAISE BOOM TO OPERATING POSITION - Continued

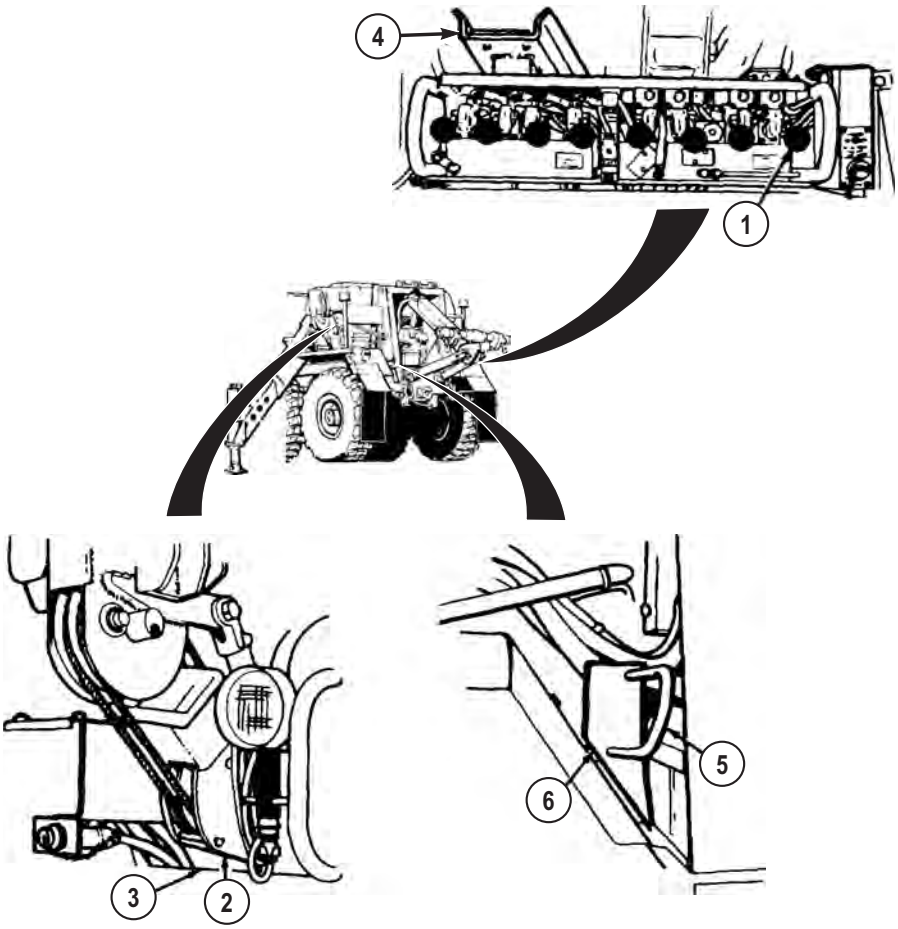


Figure 15.

2. Pull and turn lockpin handle (5) so handle end rests on bracket (6).

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

RAISE BOOM TO OPERATING POSITION - Continued

while operating crane. Failure to comply may result in injury or death to personnel.

3. Move BOOM control lever (7) to UP position until hook (8) is 5 to 6 ft. (1.5 to 1.8 m) above driver side rear fender (9), and boom (10) is approximately 45° above horizontal.

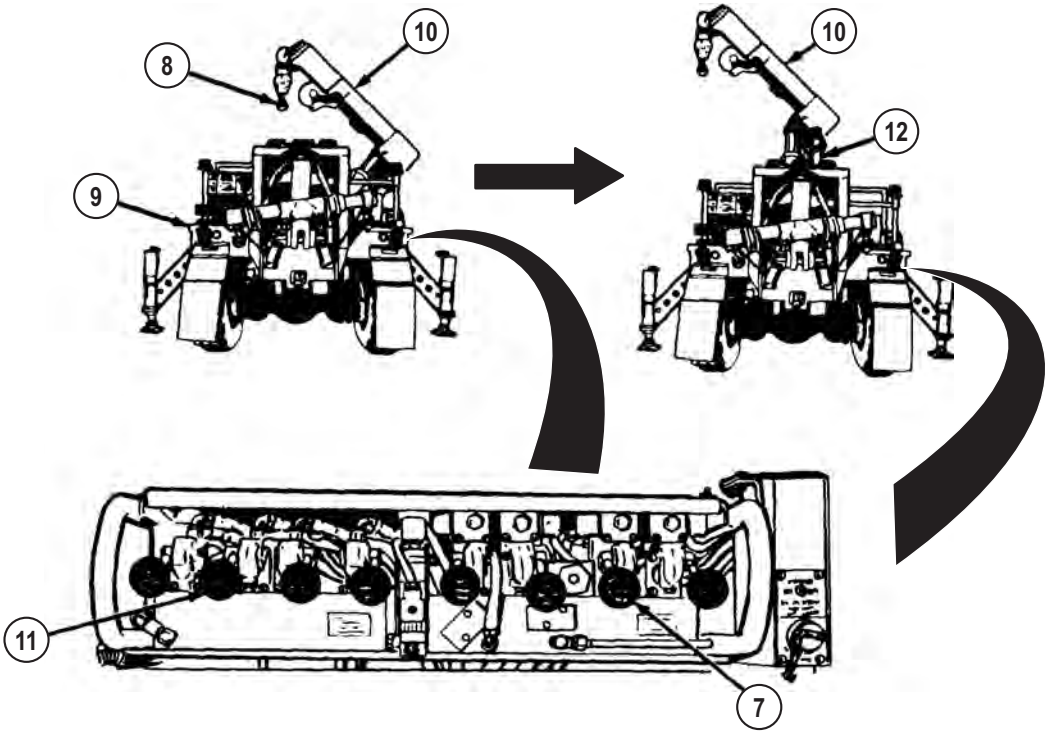


Figure 16.

NOTE

Move BOOM control lever to UP position simultaneously with MAST control lever (as required) to maintain the boom at approximately 45° above horizontal until the mast is fully erect.

4. Move MAST control lever (11) to UP position until the mast (12) is fully erect and the cylinders are fully extended.
5. Hold the MAST control lever (11) to UP position for two to three seconds after mast (12) is fully erect to ensure cylinders are fully filled with oil.
6. Operate crane with manual controls or remote-control unit. (WP 0107)

ROTATE AND TELESCOPE BOOM

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.
- Ensure area is clear of personnel prior to 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.
- Operator must keep control of load at all times. If necessary, attach cargo tie downs to load for control. Failure to comply may result in injury or death to personnel.
- If electrical power fails during crane operation, move switch on REMOTE CONTROL UNIT to SHUTDOWN position. Failure to comply may result in injury or death to personnel.

CAUTION

Boom must be above vehicle sides for clearance. Hitting side of vehicle with boom may cause damage to boom or vehicle. Material handling crane/boom will strike outrigger framework and tow A-frame during crane operations if the boom is depressed below horizontal.

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 (1) to CW position to move boom (2) clockwise.

ROTATE AND TELESCOPE BOOM - Continued

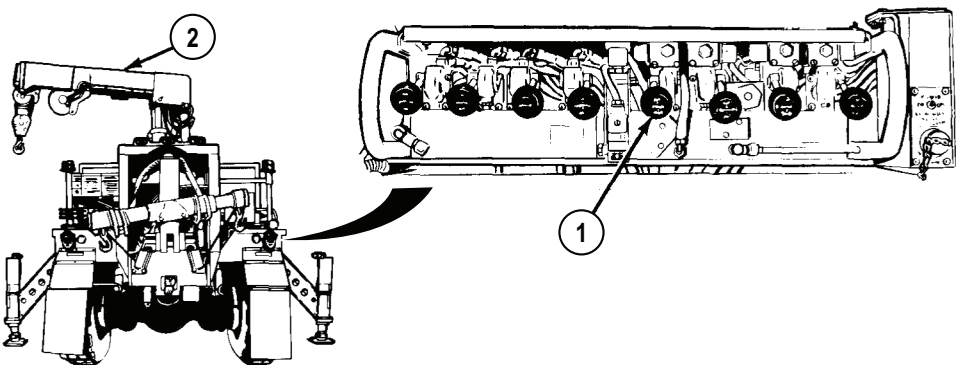


Figure 17.

2. Move SWING control lever (1) to CCW position to move boom (2) counterclockwise.

CAUTION

Keep hook block at least 1 ft. (30 cm) from end of boom. If hook block hits end of boom, it may damage cable or hook block and crane will lose power. Wait six seconds for power to return and check crane for damage.

NOTE

- When crane is overloaded, M984A overload system will automatically shut off power to telescope boom out, raise or lower boom, or hoist load any higher. Overload condition can be corrected by lowering load to ground or other supporting surface. All crane functions will be restored in approximately six seconds.
- When telescoping (extending) the boom, the TELESCOPE and HOIST control levers should be operated at same time.
- Crane movement from one lever may be slower than other when operating two levers together.

3. Move TELESCOPE control lever (3) to OUT position to extend boom (2) and move HOIST control lever (4) to DOWN position to pay out cable (5).

ROTATE AND TELESCOPE BOOM - Continued

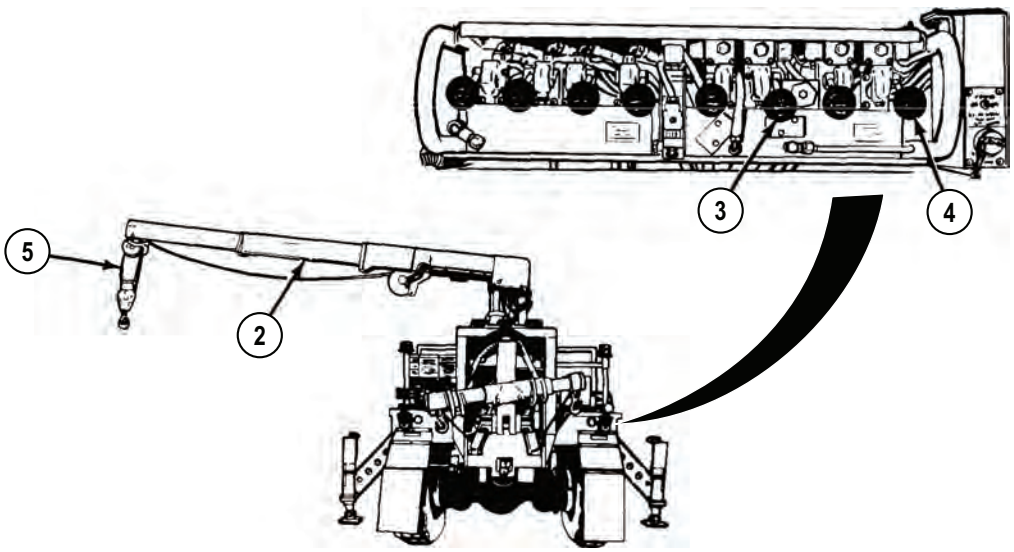


Figure 18.

CAUTION

Do not go over maximum load rating as shown on RANGE DIAGRAM. Going over load ratings will cause damage to equipment.

4. Refer to RANGE DIAGRAMS (6) on equipment body (7) to raise boom (2) to correct angle before connecting to load.

ROTATE AND TELESCOPE BOOM - Continued

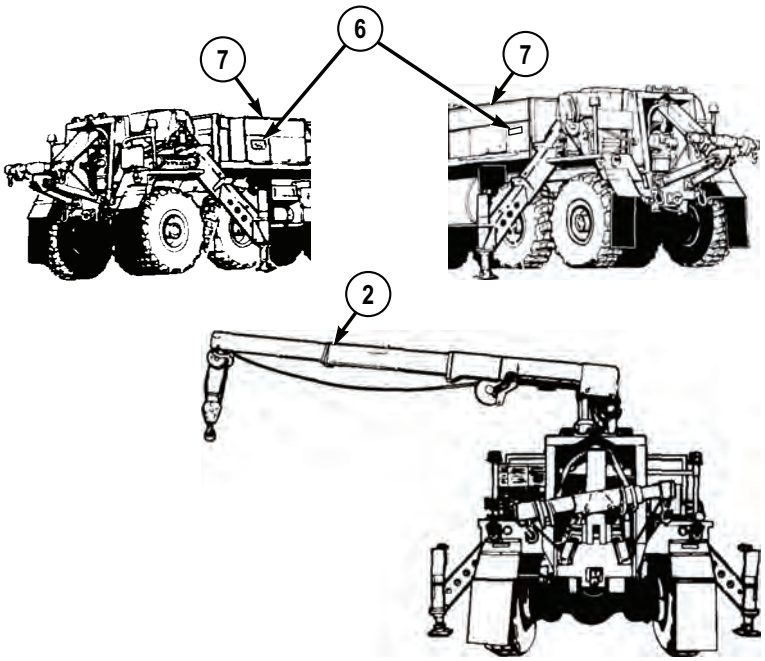


Figure 19.

RAISE AND LOWER LOAD

WARNING

Ensure area is clear of personnel prior to moving SWING lever. Boom should be swung slowly enough so crane operator has complete control. 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.
- Do not drag load sideways on ground or damage to crane may result.

1. Operate SWING control lever (1) and center end of boom (2) directly over load.

RAISE AND LOWER LOAD - Continued

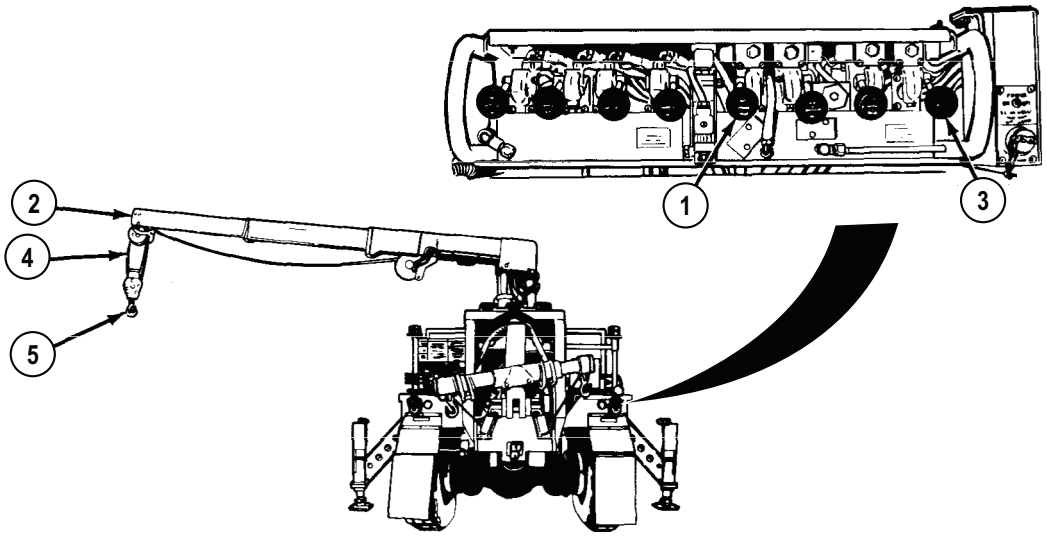


Figure 20.

CAUTION

Release hook lock before connecting to load to avoid damage to hook lock.

2. Operate HOIST control lever (3) to raise or lower cable (4) and connect load hook (5) to load.

WARNING

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

CAUTION

- Do not jerk HOIST control lever or load will bounce causing possible damage to crane or load.

RAISE AND LOWER LOAD - Continued

- Do not operate crane with boom below horizontal when there is a load on hook.

6,000 lbs at 18 ft. 2 in. Radius (2 700 kg at 5.5 m)

8,000 lbs at 16 ft. 5 in. Radius (3 600 kg at 5.0 m)

12,000 lbs at 11 ft. 10 in. Radius (5 400 kg at 3.6 m)

14,000 lbs at 9 ft. 0 in. Radius (6 300 kg at 2.7 m)

NOTE

When crane is overloaded, M984A overload system will automatically shut off power to telescope boom out, raise or lower boom, or hoist load any higher. Overload condition can be corrected by lowering load to ground or other supporting surface. All crane functions will be restored in approximately six seconds.

3. Move HOIST control lever (3) TO UP position to lift load. Move BOOM control lever (6) in UP position to raise load higher.

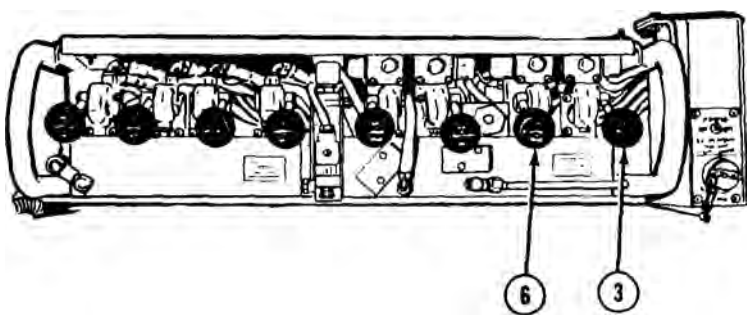


Figure 21.

4. Move HOIST control lever (3) TO DOWN position to lower load. Move BOOM control lever (6) in DOWN position to lower load further.
5. Shut down crane.

SHUT DOWN CRANE

CAUTION

- Leave about 1 ft. (30 cm) of cable between boom sheave and hook block when reeling in cable or damage to equipment may result.

SHUT DOWN CRANE - Continued

- Do not let cable unwind and become slack or cable may get tangled on drum.
- Crane should be stowed using remote control to allow operator visibility during stowing or damage to equipment may result.

NOTE

- Operate control levers with light, even pressure.
- 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.

1. Move TELESCOPE control lever (1) to IN position to pull boom extensions (2) in and move HOIST control lever (3) to UP position to reel in cable (4) until boom extensions (2) are fully retracted.

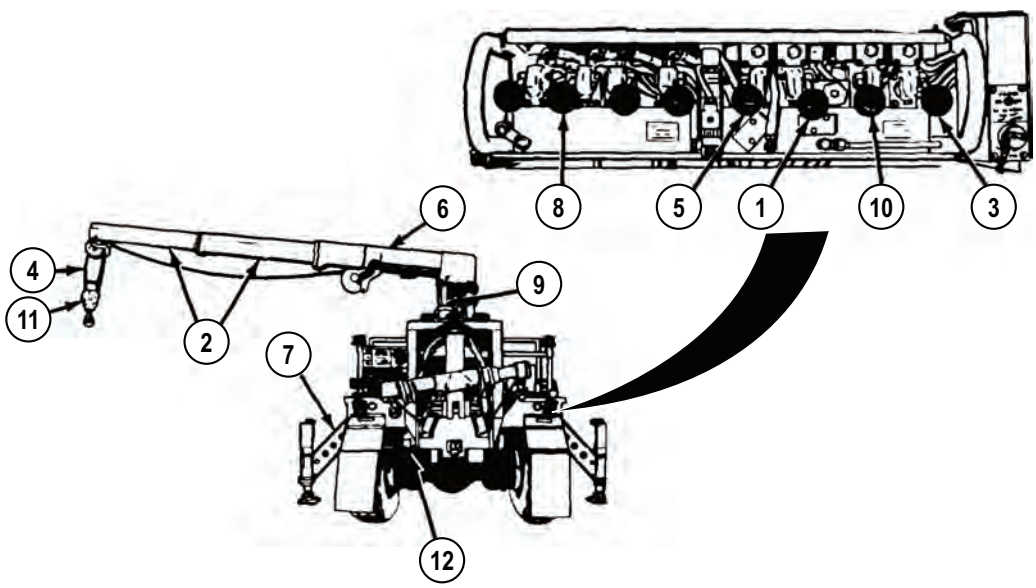


Figure 22.

2. Operate SWING control lever (5) to position boom (6) parallel with outrigger beam (7) on driver side of vehicle.
3. Move MAST control lever (8) to DOWN position to lower mast (9) until mast is completely folded down.

SHUT DOWN CRANE - Continued

4. Move BOOM control lever (10) in concert with MAST control lever (8) as required to maintain boom (6) at approximately 45° above horizontal until mast is completely folded down.
5. Move BOOM control lever (10) to DOWN position until hook block (11) is directly above vehicle left frame rail (12).

NOTE

Trucks with hook block stowage guide, perform Step (6). Trucks without hook block stowage guide, perform Step (7).

6. Move HOIST control lever (3) to DOWN position to lower hook block (11) until load hook (13) fits into hook block stowage guide (18).
7. Move HOIST control lever (3) to DOWN position to lower hook block (11) until load hook (13) fits into stowage bracket (14).

NOTE

Be sure lockpin is fully engaged in hook and stowage bracket.

8. Pull lockpin handle (15), turn and release handle so lockpin (16) slides through load hook (13).

SHUT DOWN CRANE - Continued

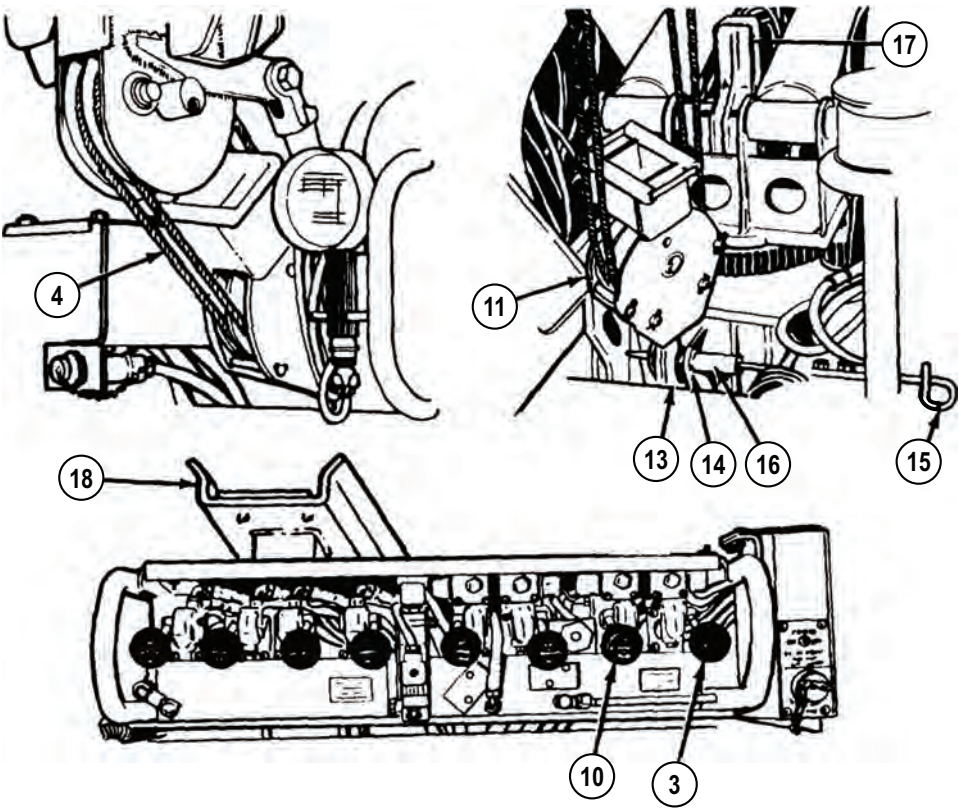


Figure 23.

NOTE

- Operate BOOM and HOIST control levers at the same time.
- Crane movement from one lever may be slower than the other when operating two levers together.

9. Move BOOM control lever (10) to DOWN position until boom rests on mast pad (17) and move HOIST control lever (3) to UP position to remove slack from cable (4).

STOW OUTRIGGERS

1. Remove two retaining pins (1) from each outrigger pad (2).

STOW OUTRIGGERS - Continued

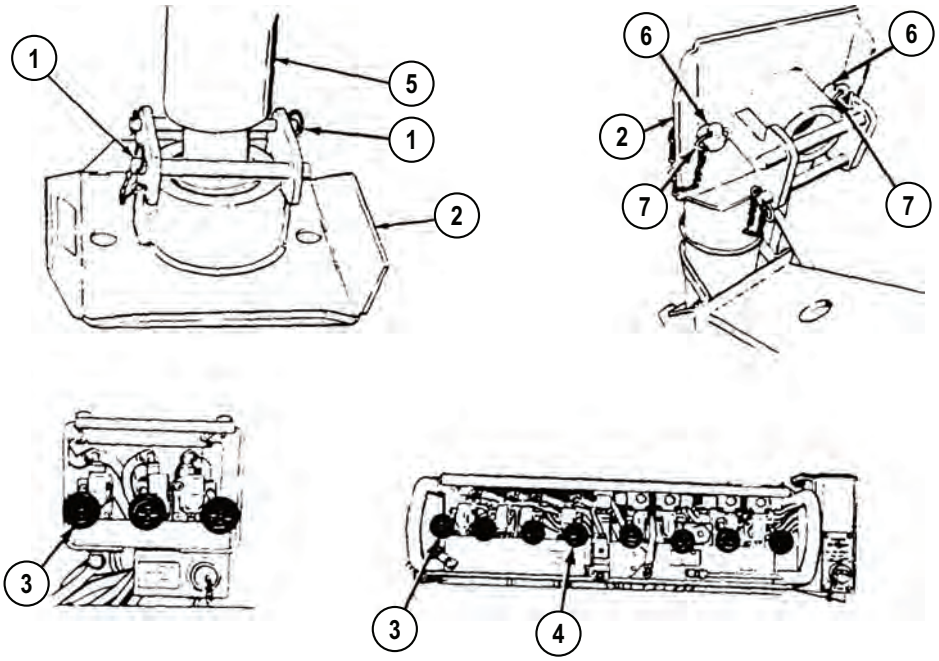


Figure 24.

NOTE

Operate left and right outrigger jack (LH O/R JACK and RH O/R JACK) control levers at the 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 (3 and 4) to UP position to retract outrigger jack cylinder (5) completely.
3. Install two retaining pins (1) into each outrigger pad (2).
4. Stow each outrigger pad (2) on appropriate stud (6).
5. Install safety pins (7) through each stud (6).

WARNING

Stand clear of outrigger beams while operating lever. Failure to comply may result in injury or death to personnel.

STOW OUTRIGGERS - Continued

6. Move right outrigger extension (O/R EXT) control lever (8) to IN position to retract outrigger beam (9) completely.

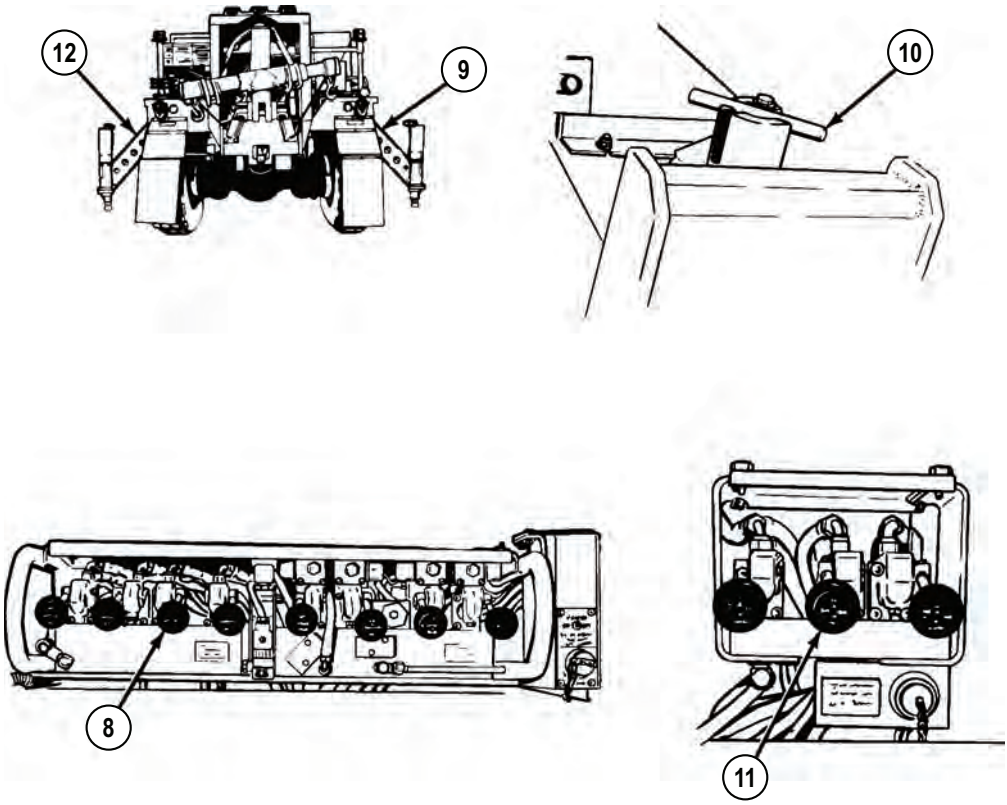


Figure 25.

7. Turn and push down outrigger lockpin (10) until lockpin is seated in outrigger beam.
8. Move left outrigger extension (O/R EXT) control lever (11) to IN position to retract outrigger beam (12) completely.
9. Turn and push down outrigger lockpin (10) until lockpin is seated in outrigger beam.
10. Set POWER switch (13) to OFF position.

STOW OUTRIGGERS - Continued

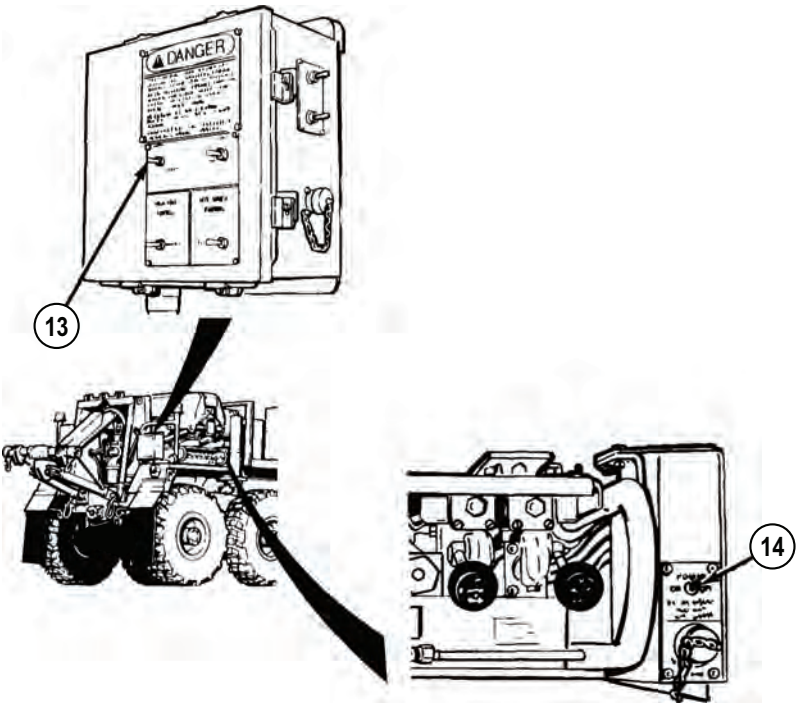


Figure 26.

11. Set ON/OFF POWER switch (14) to OFF position.
12. Set PTO ENGAGE switch (15) to OFF position. Indicator light (16) will go out.

STOW OUTRIGGERS - Continued

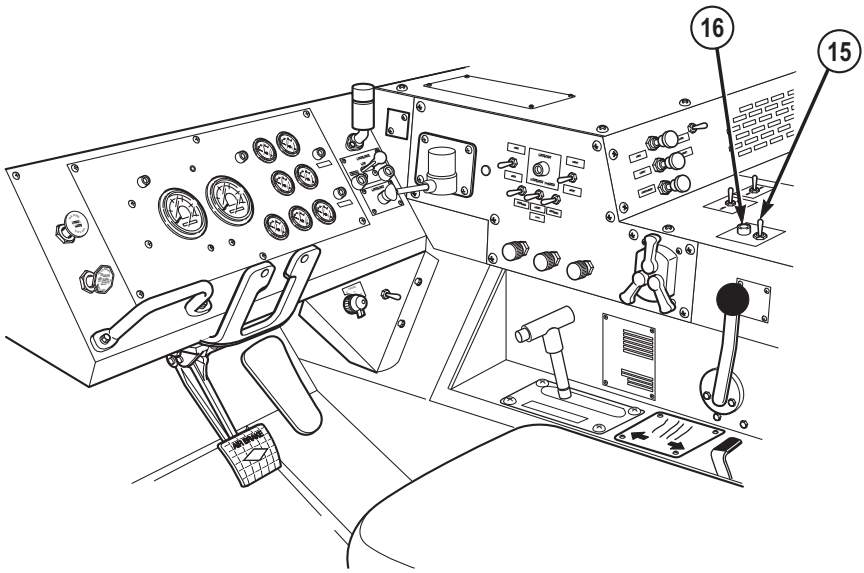


Figure 27.

13. Shut off engine. (WP 0057)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
GROVE CRANE OPERATION (REMOTE CONTROL)

INITIAL SETUP:

Not Applicable

SET UP REMOTE CONTROL UNIT

WARNING

- Do not operate crane unless outriggers are firmly in place or vehicle could roll over. Failure to comply may result in injury or death to personnel.
- If operator cannot see load during operation, operate crane from REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.
- 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.
- 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 when it is running. Failure to comply may result in injury or death to personnel. Seek medical aid should you suspect a hearing problem. Failure to comply may result in injury or death to personnel.

1. Prepare crane for use. (WP 0106)
2. Set up outriggers. (WP 0106)
3. Jack outriggers. (WP 0106)
4. Raise boom and mast to operating position. (WP 0106)
5. Remove REMOTE CONTROL UNIT (1) and cable (2) from stowage box (3).

SET UP REMOTE CONTROL UNIT - Continued

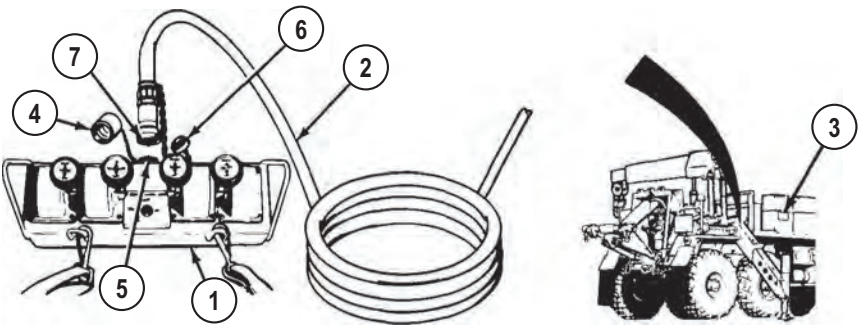


Figure 1.

6. Remove cover (4) and clean any dirt or water from REMOTE CONTROL UNIT receptacle (5).
7. Remove cover (6) and clean any dirt or water from cable plug (7).
8. Connect cable plug (7) to REMOTE CONTROL UNIT receptacle (5).

CONNECT REMOTE CONTROL UNIT TO PASSENGER SIDE OUTLET

1. Remove cover (1) and clean any dirt or water from passenger side REMOTE CONTROL CONNECTOR outlet (2).

CONNECT REMOTE CONTROL UNIT TO PASSENGER SIDE OUTLET - Continued

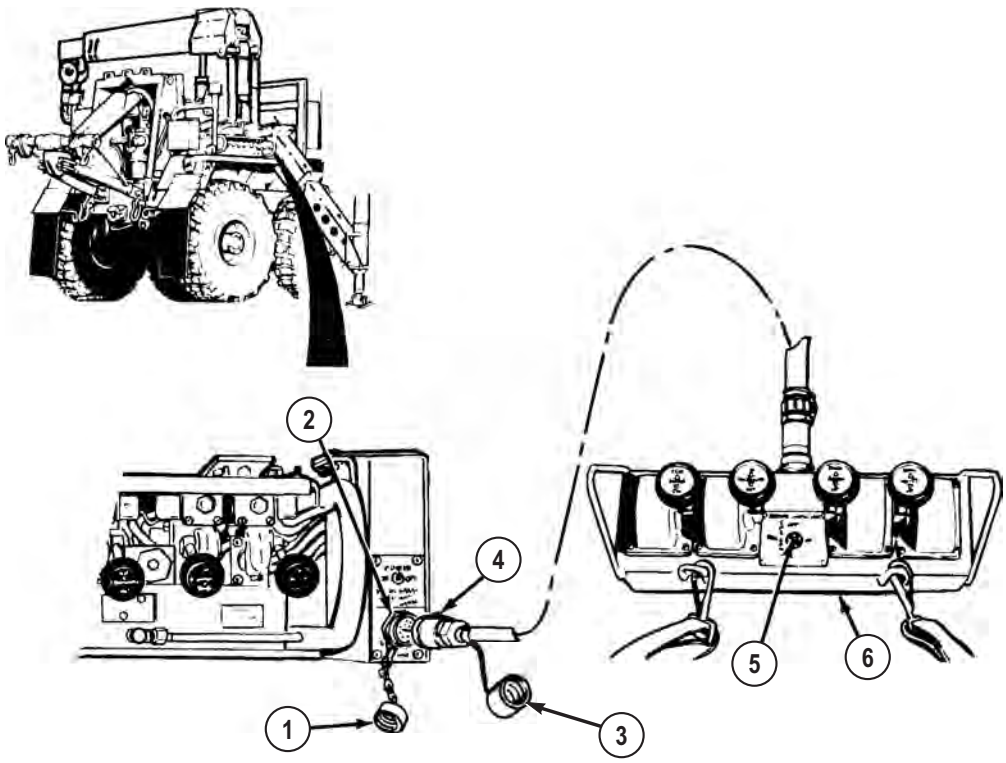


Figure 2.

2. Remove cover (3) and clean any dirt or water from cable plug (4).

WARNING

Ensure ON/OFF/MHC-SHUTDOWN power switch is in OFF position prior to connecting REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

3. Set ON/OFF/MHC-SHUTDOWN power switch (5) on REMOTE CONTROL UNIT (6) to OFF position.
4. Connect cable plug (4) to passenger side REMOTE CONTROL CONNECTOR outlet (2).

CONNECT REMOTE CONTROL UNIT TO PASSENGER SIDE OUTLET - Continued

5. Set ON/OFF/MHC-SHUTDOWN power switch (5) on REMOTE CONTROL UNIT (6) to ON position.
6. Operate crane.

CONNECT REMOTE CONTROL UNIT TO DRIVER SIDE OUTLET

1. Remove cover (1) and clean any dirt or water from driver side REMOTE CONTROL CONNECTOR outlet (2).

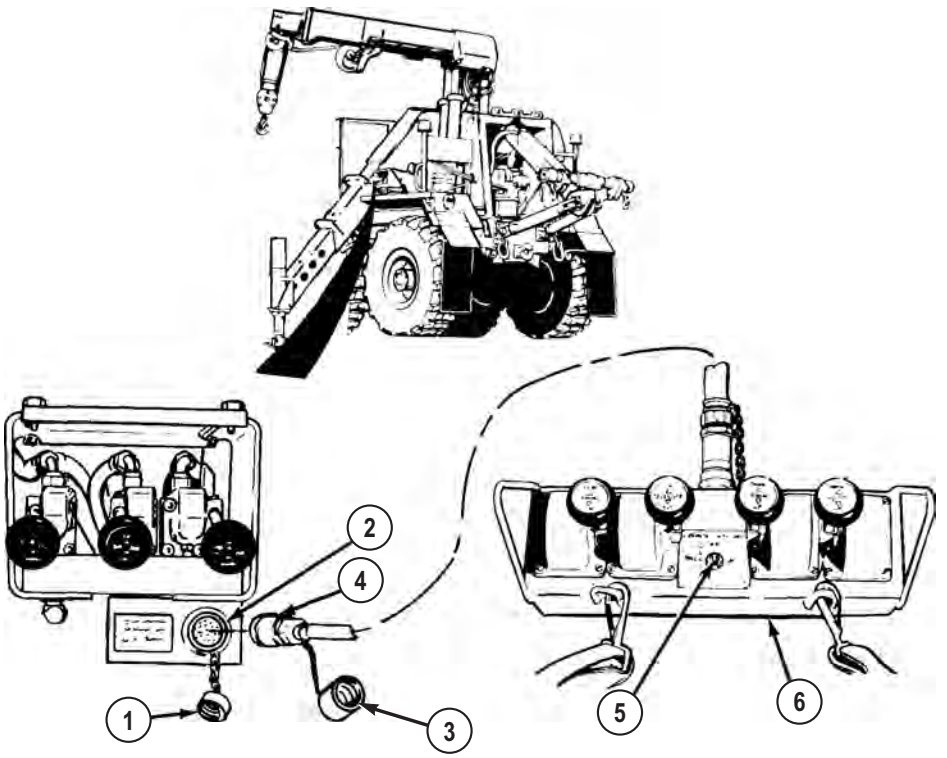


Figure 3.

2. Remove cover (3) and clean any dirt or water from cable plug (4).

CONNECT REMOTE CONTROL UNIT TO DRIVER SIDE OUTLET - Continued

WARNING

Ensure ON/OFF/MHC-SHUTDOWN power switch is in OFF position prior to connecting REMOTE CONTROL UNIT. Failure to comply may result in injury or death to personnel.

3. Set ON/OFF/MHC-SHUTDOWN power switch (5) on REMOTE CONTROL UNIT (6) to OFF position.
4. Connect cable plug (4) to driver side REMOTE CONTROL CONNECTOR outlet (2).
5. Set ON/OFF/MHC-SHUTDOWN power switch (5) on REMOTE CONTROL UNIT (6) to ON position.
6. Operate crane.

ROTATE AND TELESCOPE BOOM

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.
- Ensure area is clear of personnel prior to 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.
- Operator must keep control of load at all times. If necessary, attach cargo tie downs to load for control. Failure to comply may result in injury or death to personnel.
- If electrical power fails during crane operation, move switch on REMOTE CONTROL UNIT to SHUTDOWN position. Failure to comply may result in injury or death to personnel.

ROTATE AND TELESCOPE BOOM - Continued

CAUTION

Boom must be above vehicle sides for clearance. Hitting side of vehicle with boom may cause damage to boom or vehicle. Material handling crane/boom will strike outrigger framework and tow A-frame during crane operations if the boom is depressed below horizontal.

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 (1) to CW position to move boom (2) clockwise.

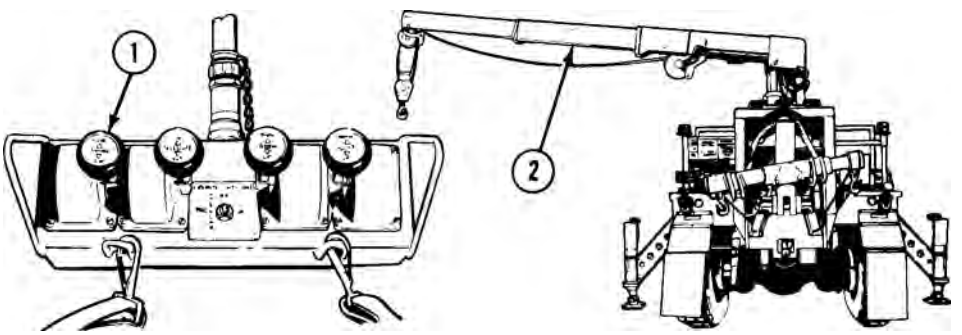


Figure 4.

2. Move SWING control lever (1) to CCW position to move boom (2) counterclockwise.

CAUTION

Keep hook block at least 1 ft. (30 cm) from end of boom. If hook block hits end of boom it may damage cable or hook block and crane will lose power. Wait six seconds for power to return and check crane for damage.

NOTE

- When crane is overloaded, M984A overload system will automatically shut off power to telescope boom out, raise or lower boom, or hoist load any higher. Overload condition can be corrected by lowering load to ground or other supporting surface. All crane functions will be restored in approximately six seconds.
- When telescoping (extending) the boom, the TELESCOPE and HOIST control levers should be operated at the same time.

ROTATE AND TELESCOPE BOOM - Continued

- Crane movement from one lever may be slower than the other when operating two levers together.

3. Move TELESCOPE control lever (3) to OUT position to extend boom (2) and move HOIST control lever (4) to DOWN position to pay out cable (5).

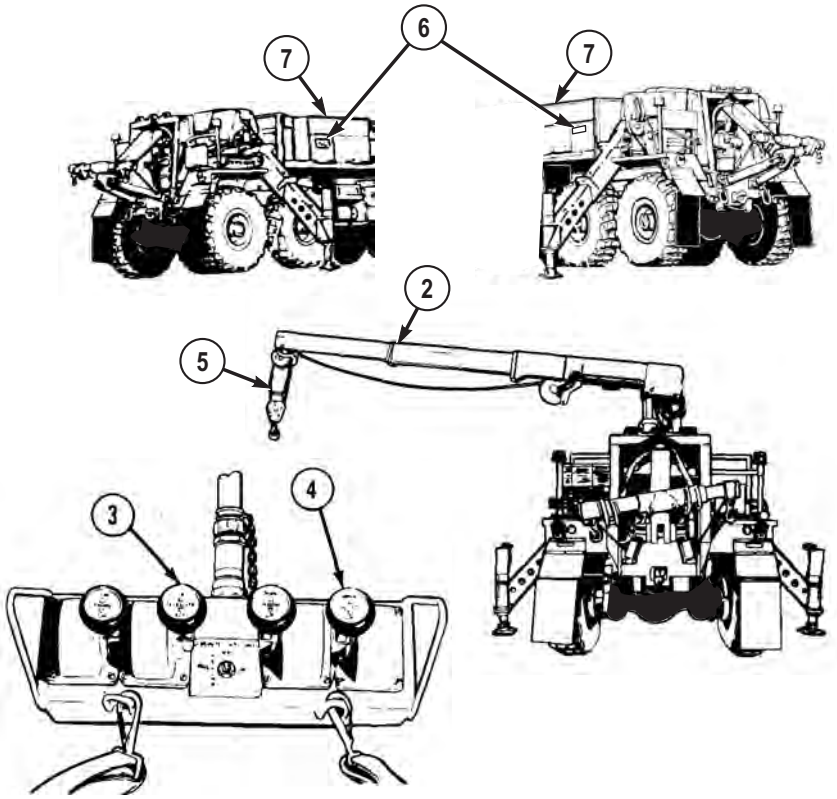


Figure 5.

CAUTION

Do not go over maximum load rating as shown on RANGE DIAGRAM. Going over load ratings could cause damage to equipment.

4. Refer to RANGE DIAGRAM (6) on equipment body (7) to raise boom (2) to correct angle before connecting to load.

RAISE AND LOWER LOAD

WARNING

Ensure area is clear of personnel prior to moving SWING lever. Boom should be swung slowly enough so crane operator has complete control. 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.
- Do not drag load sideways on ground. Dragging load could cause damage to crane.

1. Operate SWING control lever (1) and center end of boom (2) directly over load.

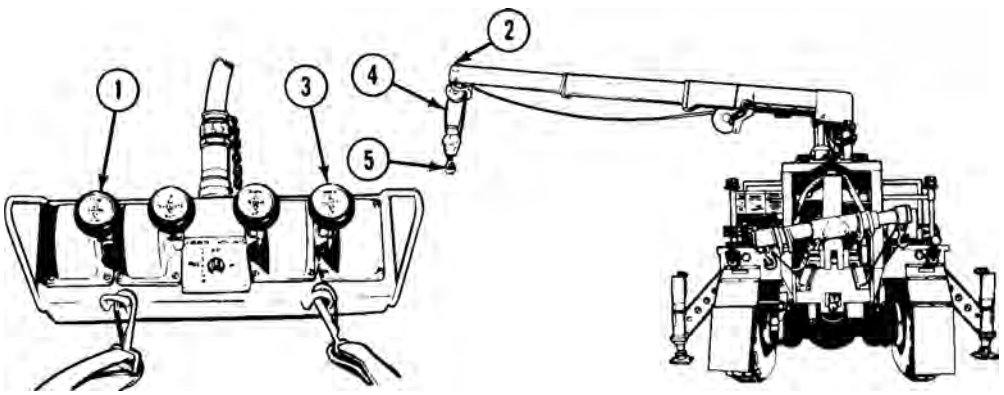


Figure 6.

CAUTION

Release hook lock before connecting load to avoid damage to hook lock.

2. Operate HOIST control lever (3) to raise or lower cable (4) and connect load hook (5) to load.

RAISE AND LOWER LOAD - Continued

WARNING

Be sure there are at least two wraps of cable on hoist drum at all times. Serious injury or death may 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.
- Do not operate crane with boom below horizontal when there is a load on hook. Failure to comply may result in damage to equipment.

6,000 lbs at 18 ft. 2 in. radius (2 700 kg at 5.5 m)

8,000 lbs at 16 ft. 5 in. radius (3 600 kg at 5.0 m)

12,000 lbs at 11 ft. 10 in. radius (5 400 kg at 3.6 m)

14,000 lbs at 9 ft. 0 in. radius (6 300 kg at 2.7 m)

- Do not go over maximum load limit. Going over maximum load limit will cause electrical shutdown for six seconds or until load is lowered.

3. Move HOIST control lever (3) to UP position to lift load. Move BOOM control lever (6) to UP position to raise load higher.

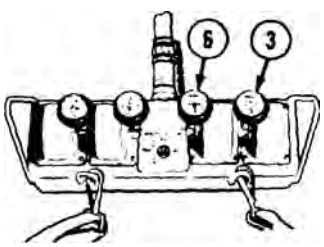


Figure 7.

4. Move HOIST control lever (3) to DOWN position to lower load. Move BOOM control lever (6) to DOWN position to lower load farther.

SHUT OFF SWITCHES

1. Set ON/OFF/MHC-SHUTDOWN power switch (1) to OFF position.

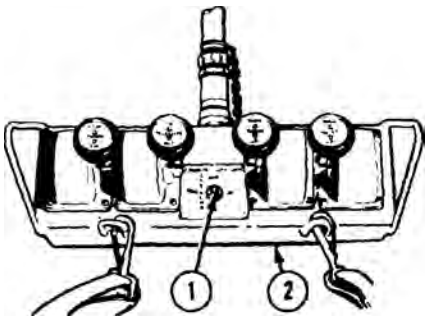


Figure 8.

2. Disconnect REMOTE CONTROL UNIT (2) from right or left remote control station.

DISCONNECT REMOTE CONTROL UNIT FROM PASSENGER SIDE OUTLET

1. Disconnect cable plug (1) from passenger side REMOTE CONTROL CONNECTOR outlet (2) and install cover (3).

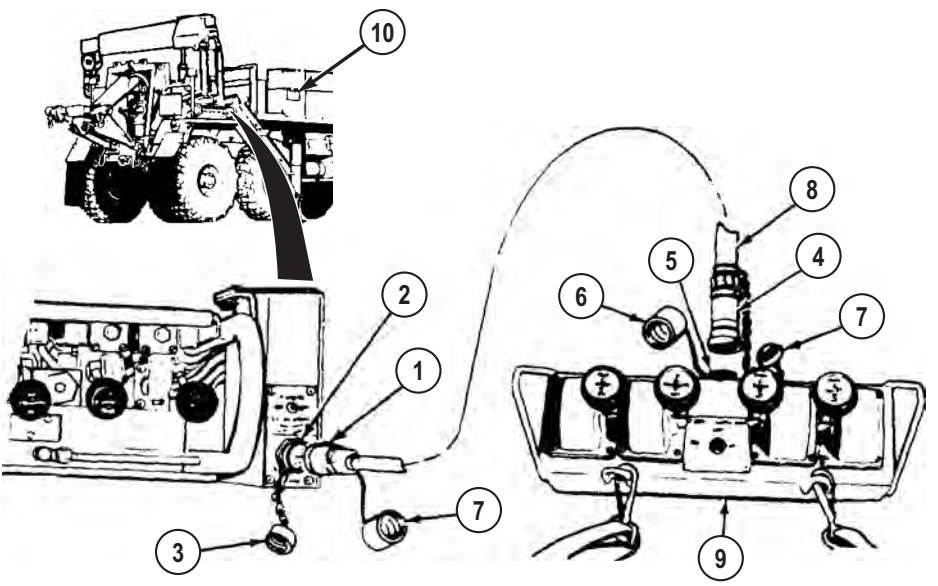


Figure 9.

DISCONNECT REMOTE CONTROL UNIT FROM PASSENGER SIDE OUTLET - Continued

2. Disconnect cable plug (4) from REMOTE CONTROL UNIT receptacle (5) and install cover (6).
3. Install covers (7) on both ends of cable (8), and coil cable (8) for stowage.
4. Return REMOTE CONTROL UNIT (9) and cable (8) to stowage box (10).
5. Shut down crane. (WP 0106)
6. Stow outriggers. (WP 0106)

DISCONNECT REMOTE CONTROL UNIT FROM DRIVER SIDE OUTLET

1. Disconnect cable plug (1) from driver side REMOTE CONTROL CONNECTOR outlet (2) and install cover (3).

DISCONNECT REMOTE CONTROL UNIT FROM DRIVER SIDE OUTLET - Continued

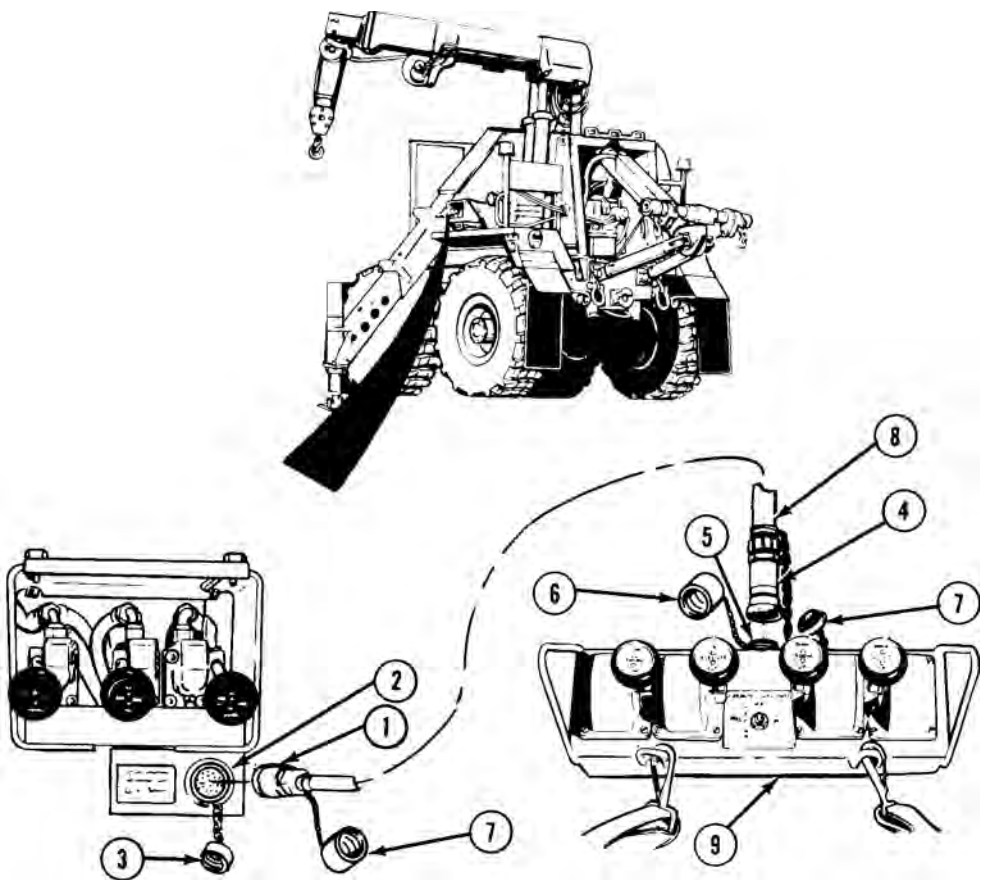


Figure 10.

2. Disconnect cable plug (4) from REMOTE CONTROL UNIT receptacle (5) and install cover (6).
3. Install covers (7) on cable (8), and coil cable (8) for stowage.
4. Return REMOTE CONTROL UNIT (9) and cable (8) to stowage box (10).

DISCONNECT REMOTE CONTROL UNIT FROM DRIVER SIDE OUTLET - Continued

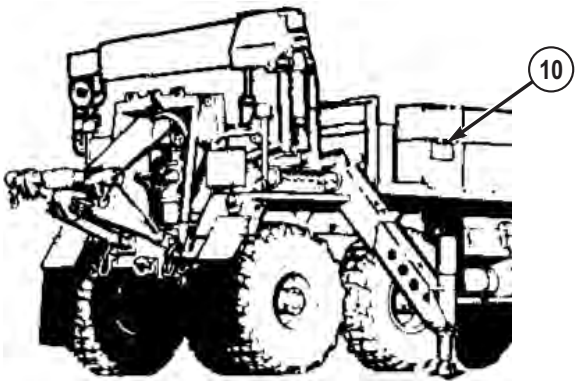


Figure 11.

5. Shut down crane. (WP 0106)
6. Stow outriggers. (WP 0106)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW SPADE INSTALLATION/REMOVAL

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

SET UP TOW SPADES

NOTE

This procedure is a two soldier task.

1. Prepare crane for operation with remote controls. (WP 0107)
2. Remove two extension adapters (1) from stowage.

SET UP TOW SPADES - Continued

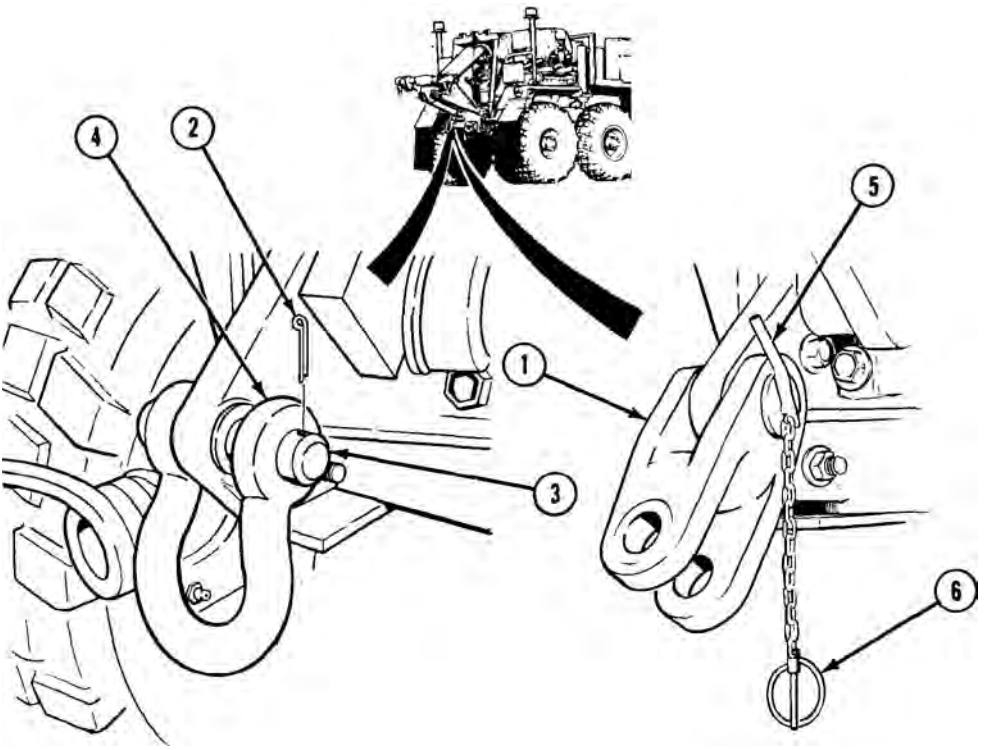


Figure 1.

NOTE

Driver side and passenger side towing shackles are removed the same way.

3. Remove cotter pin (2), pin (3), and towing shackle (4).

NOTE

Driver side and passenger side extension adapters are installed the same way.

4. Install extension adapters (1) with pins (5) and quick pins (6).
5. Release two holddowns (7) on heavy-duty winch protective screen (8) and raise heavy-duty winch protective screen.

SET UP TOW SPADES - Continued

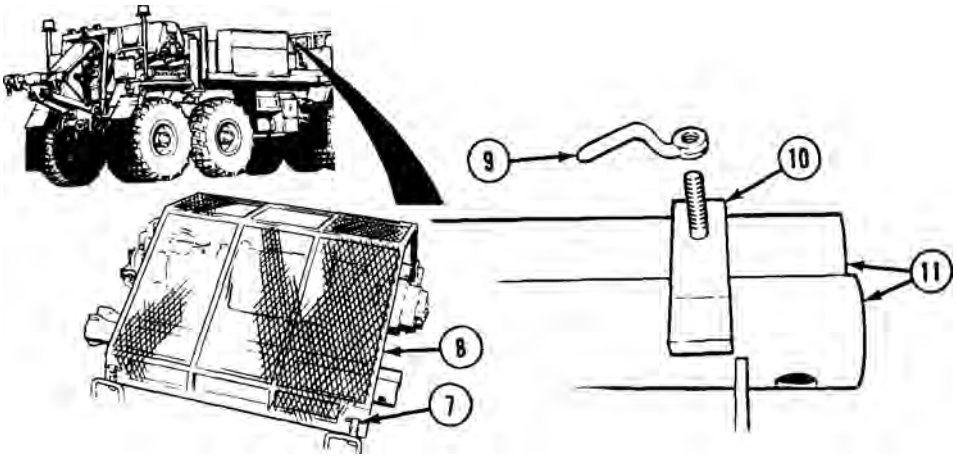


Figure 2.

6. Remove two handle locks (9) and lockplates (10) from extension bars (11).
7. Remove 8 ft. (2.5 m) chain (12) from stowage.

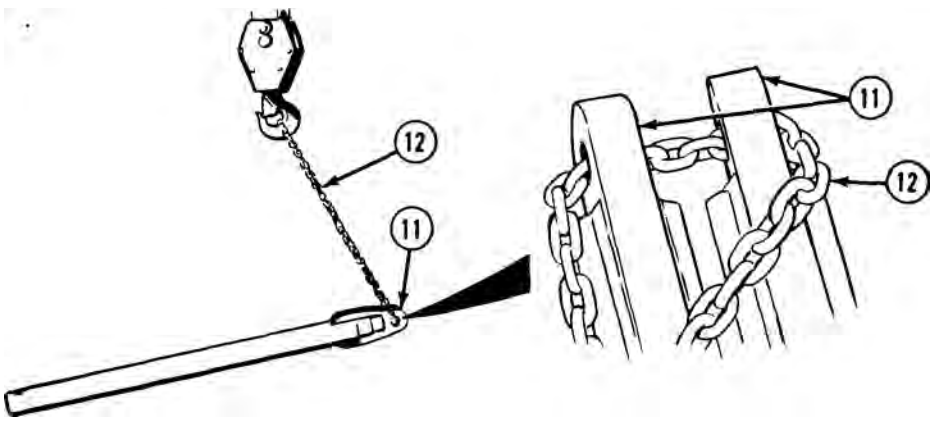


Figure 3.

8. Thread chain (12) through eyelets on flat end of extension bars (11).
9. Using crane, remove extension bars (11) and lower extension bars behind vehicle.
10. Remove chain (12) from extension bars (11).
11. Lower heavy-duty winch protective screen (8) and secure with two holddowns (7).

SET UP TOW SPADES - Continued

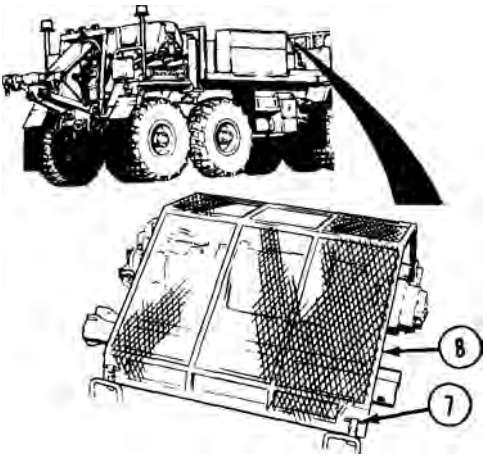


Figure 4.

NOTE

Driver side and passenger side extension bars are installed the same way.

12. Lift and hold extension bar (11) in place while assistant installs pin (13) and quick pin (14).

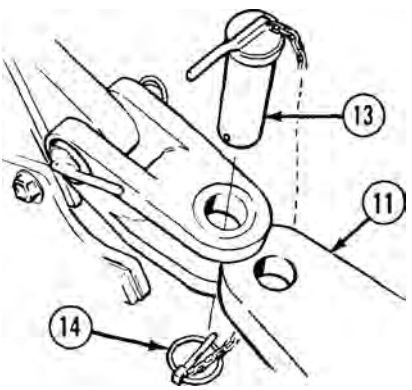


Figure 5.

13. Install two towing shackles (4) on tow spades (15) with pins (3) and cotter pins (2).

SET UP TOW SPADES - Continued

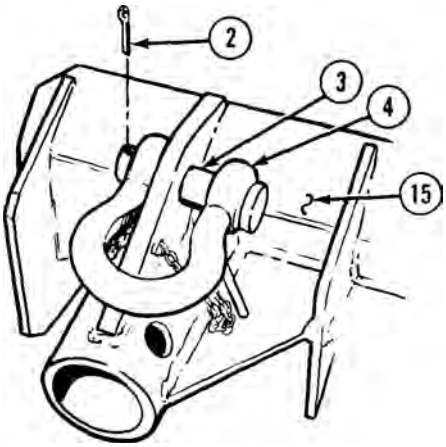


Figure 6.

14. Remove two quick pins (16) and pins (17) from tow spades (15).

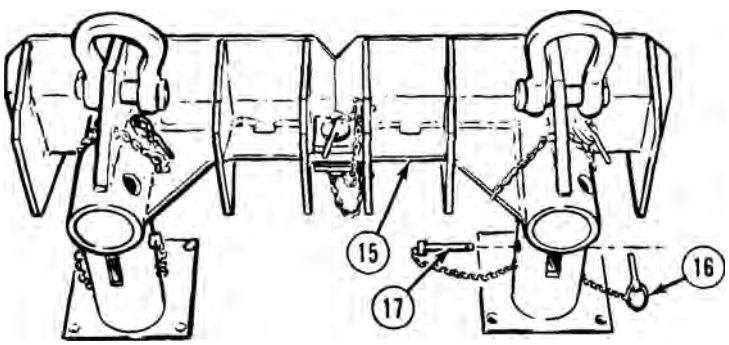


Figure 7.

15. Install 8 ft. (2.5 m) chain (12) through two towing shackles (4).

SET UP TOW SPADES - Continued

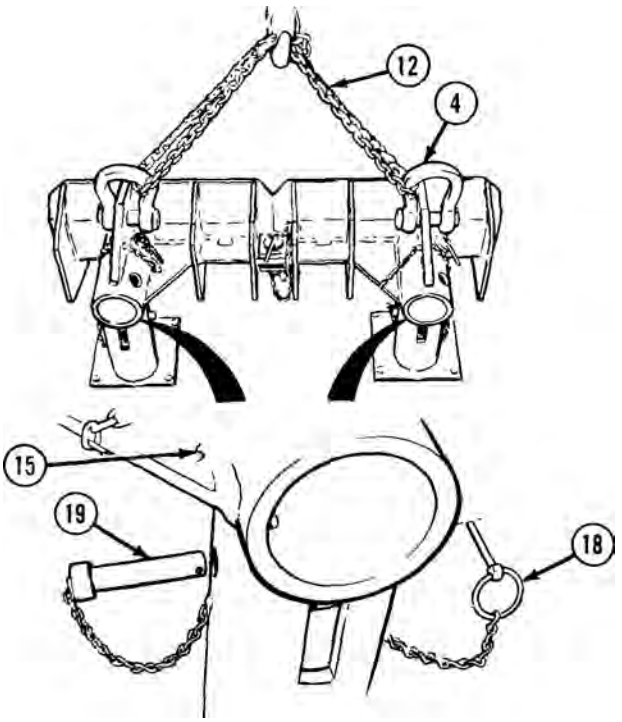


Figure 8.

WARNING

Do not hit oxygen tank when moving tow spades. Oxygen tank may explode. Failure to comply may result in injury or death to personnel.

16. Using crane, remove tow spades (15) and lower tow spades behind vehicle.
17. Remove two quick pins (18) and pins (19) from tow spades (15).

NOTE

Use pry bar to help position tow spades.

18. Operate crane while assistant installs tow spades (15) on extension bars (11).

SET UP TOW SPADES - Continued

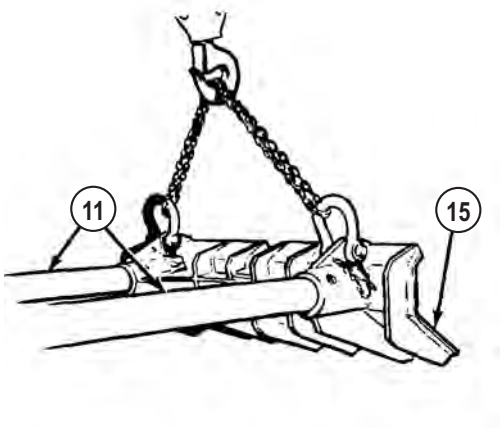


Figure 9.

19. Position tow spades (15) for type of pull being made and install pins (19) and quick pins (18).

SET UP TOW SPADES - Continued

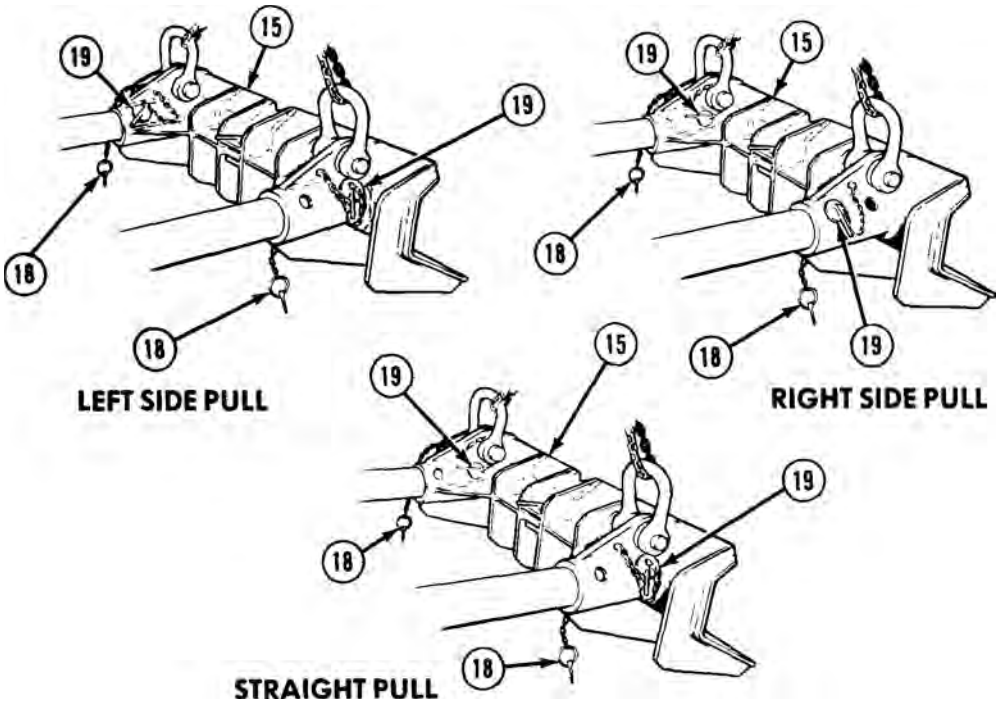


Figure 10.

20. Remove 8 ft. (2.5 m) chain (12) from two towing shackles (4).

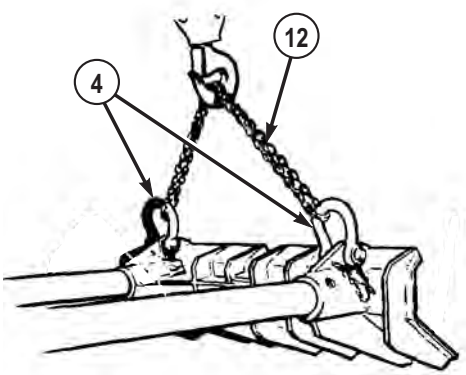


Figure 11.

SET UP TOW SPADES - Continued

21. Return crane to stowed position. (WP 0106)
22. Push RIGHT TOW CYLINDER control lever (20) and LEFT TOW CYLINDER control lever (21) to retract right tow cylinder (22) and left tow cylinder (23).

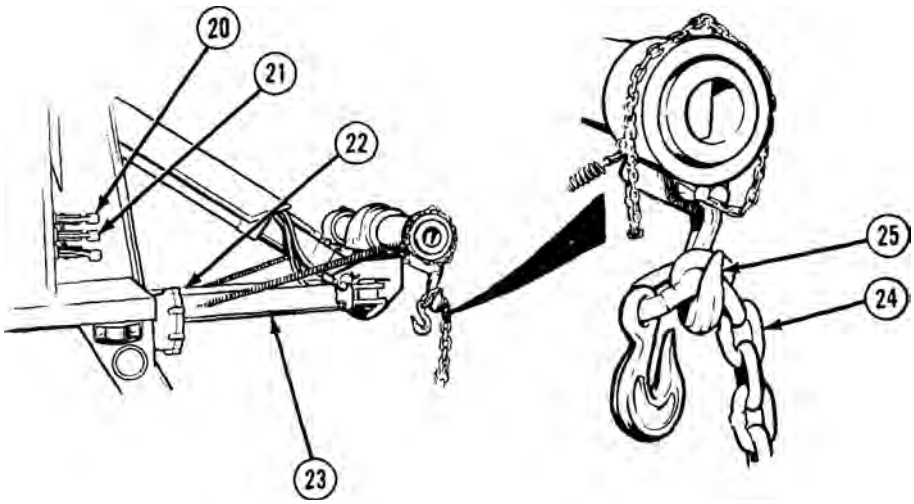


Figure 12.

23. Remove two 16 ft. (5 m) safety chains (24) from stowage.
24. Hook one end of safety chain (24) on crosstube hook (25) with one link showing.
25. Thread end of safety chain (24) through towing shackle (4).

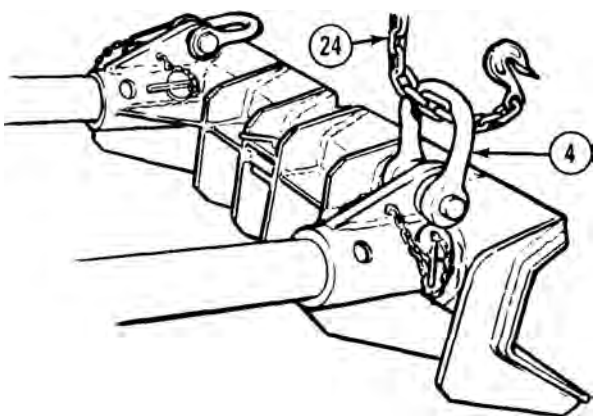


Figure 13.

SET UP TOW SPADES - Continued

26. Hook safety chain (24) together below crosstube hook (25).

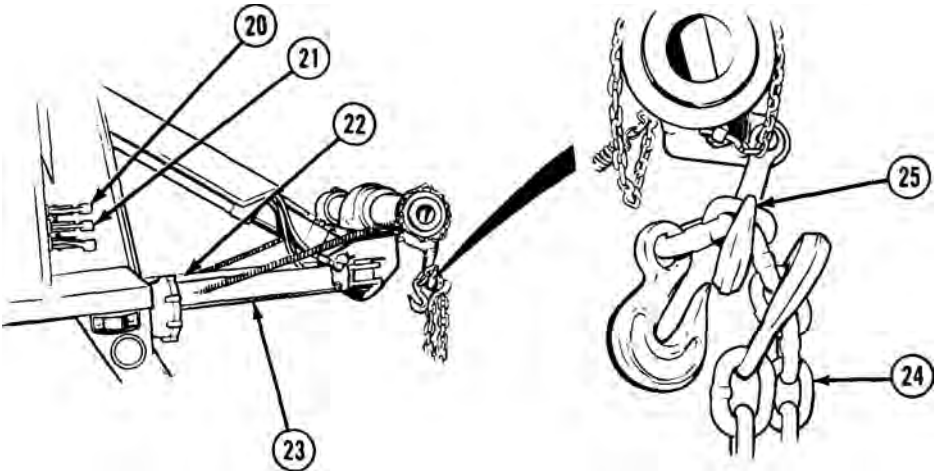


Figure 14.

27. Repeat Steps (24) through (26) for other side.
28. Pull RIGHT TOW CYLINDER control lever (20) and LEFT TOW CYLINDER control lever (21) to extend right tow cylinder (22) and left tow cylinder (23).
29. Continue operation of heavy-duty winch (WP 0043).

REMOVE AND STOW TOW SPADES

NOTE

This procedure is a two soldier task.

1. Set HIGH IDLE CONTROL switch (1) to OFF.

REMOVE AND STOW TOW SPADES - Continued

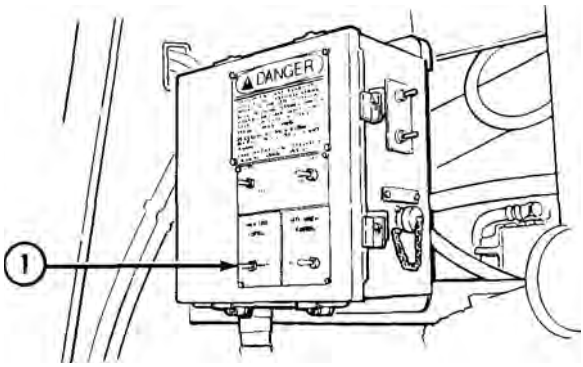


Figure 15.

2. Pull FRONT BRAKE APPLICATION knob (2) to release front brakes.

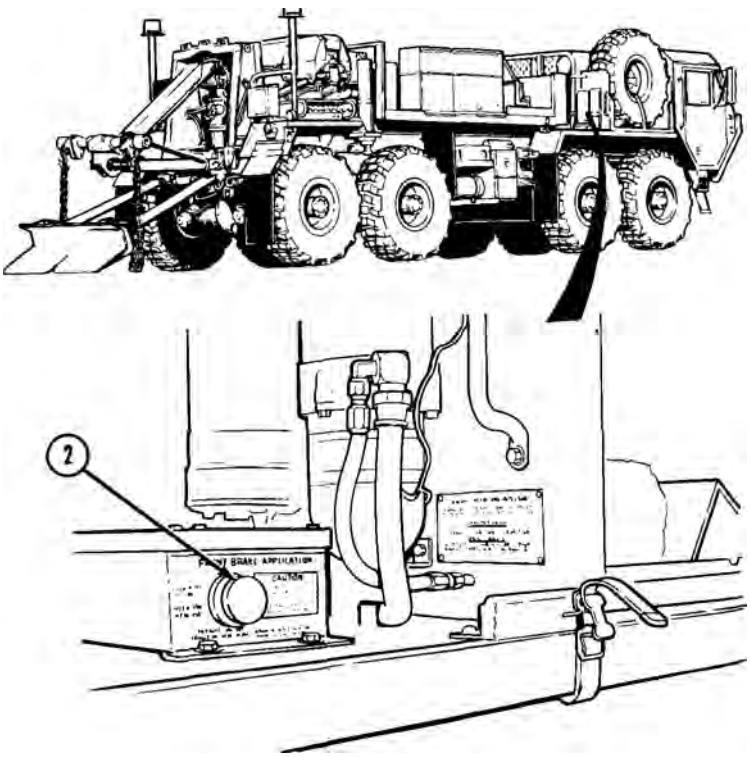


Figure 16.

REMOVE AND STOW TOW SPADES - Continued

3. Drive vehicle forward approximately 10 ft. (3 m) (WP 0050).
4. Set HIGH IDLE CONTROL switch (1) to CONTINUOUS.

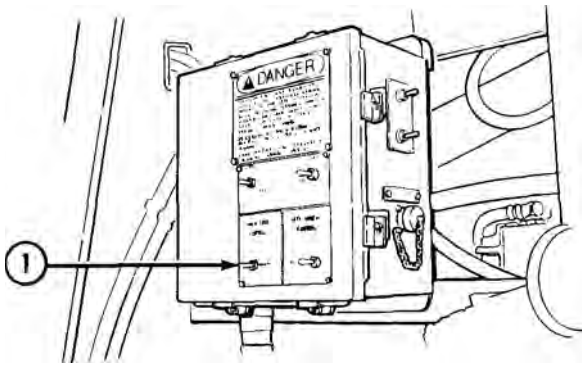


Figure 17.

5. Push RIGHT TOW CYLINDER control lever (3) and LEFT TOW CYLINDER control lever (4) to retract right tow cylinder (5) and left tow cylinder (6).

REMOVE AND STOW TOW SPADES - Continued

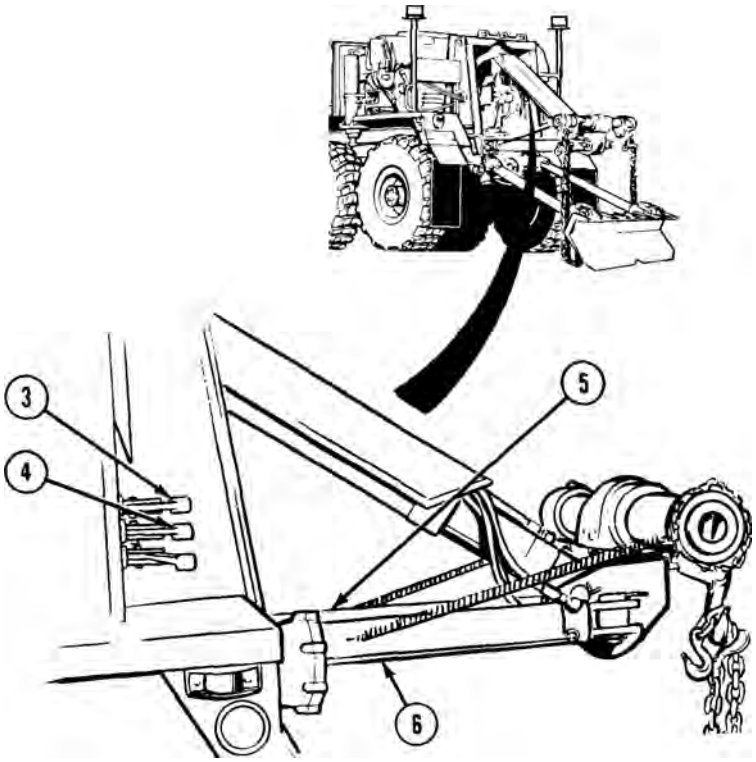


Figure 18.

6. Remove two 16 ft. (5 m) safety chains (7) and return safety chains to stowage.

REMOVE AND STOW TOW SPADES - Continued

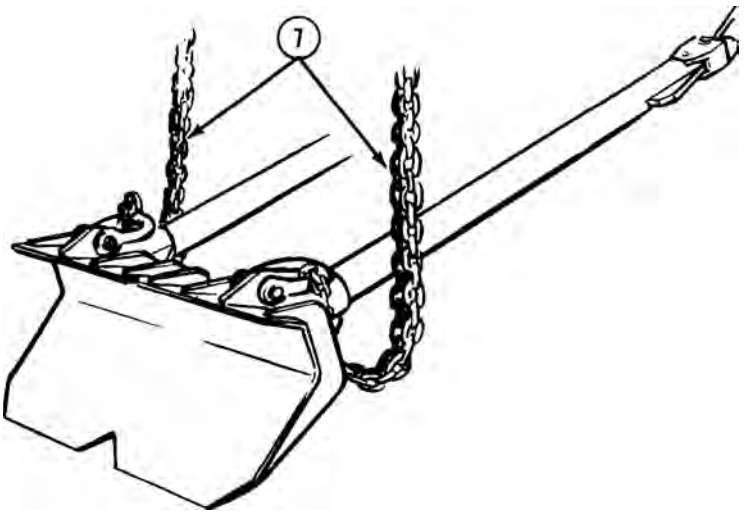


Figure 19.

7. Remove two quick pins (8) and pins (9) from tow spades (10).

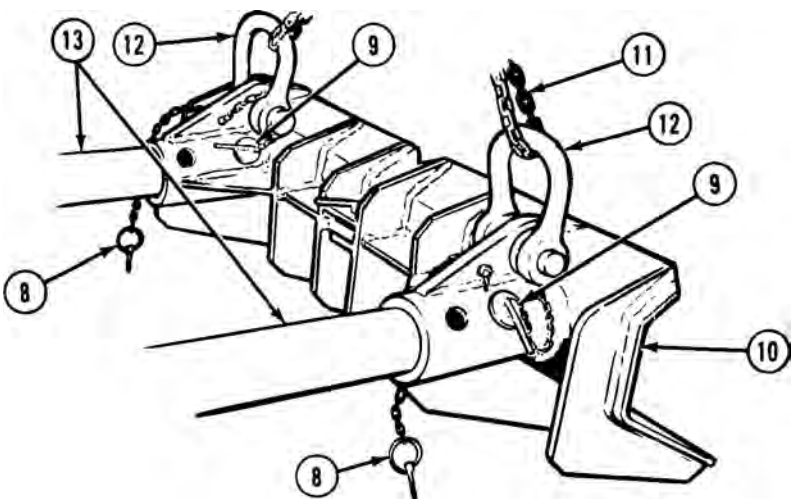


Figure 20.

8. Install 8 ft. (2.5 m) chain (11) on two towing shackles (12).
9. Set up crane for remote operation (WP 0107).

REMOVE AND STOW TOW SPADES - Continued

NOTE

Use pry bar to help remove tow spades.

10. Hold left and right extension bars (13) while assistant removes tow spades (10) from extension bars.
11. Install two pins (9) and quick pins (8) in tow spades (10).

WARNING

Do not hit oxygen tank when moving tow spades. Oxygen tank may explode. Failure to comply may result in injury or death to personnel.

12. Using crane, install tow spades (10) into equipment body (14) and install pins (15) and quick pins (16).

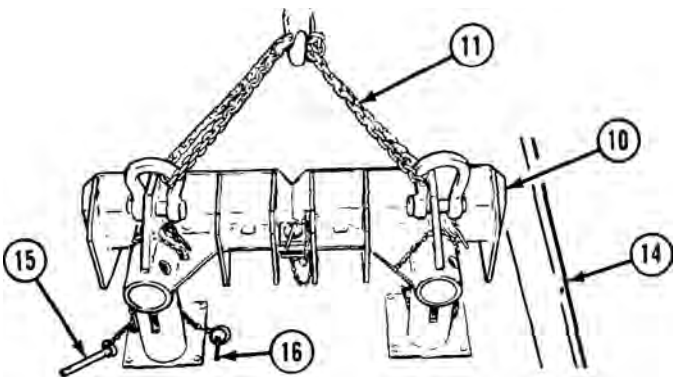


Figure 21.

13. Disconnect crane from 8 ft. (2.5 m) chain (11) and remove chain from tow spades (10).
14. Remove two cotter pins (17), pins (18), and towing shackles (12) from tow spades (10).

REMOVE AND STOW TOW SPADES - Continued

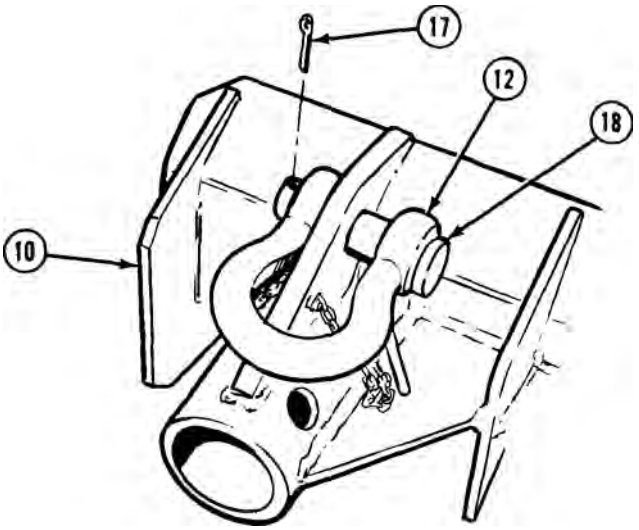


Figure 22.

NOTE

Driver side and passenger side extension bars are removed the same way.

15. Hold extension bar (13) in place while assistant removes quick pin (19) and pin (20).

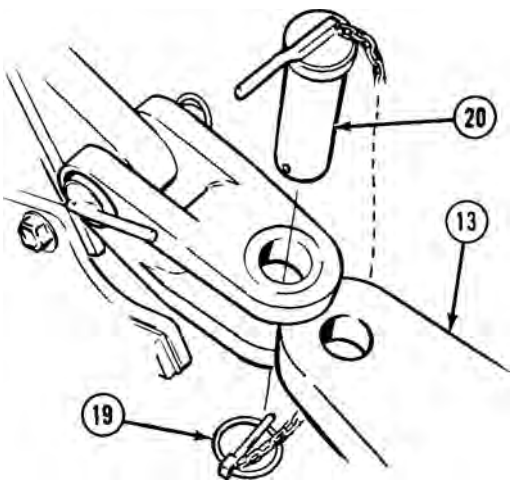


Figure 23.

REMOVE AND STOW TOW SPADES - Continued

16. Thread 8 ft. (2.5 m) chain (11) through flat end of extension bars (13).

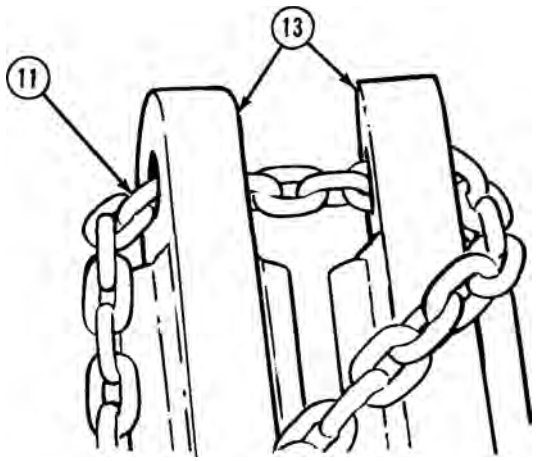


Figure 24.

17. Release two holddowns (21) on heavy-duty winch protective screen (22) and raise heavy-duty winch protective screen.

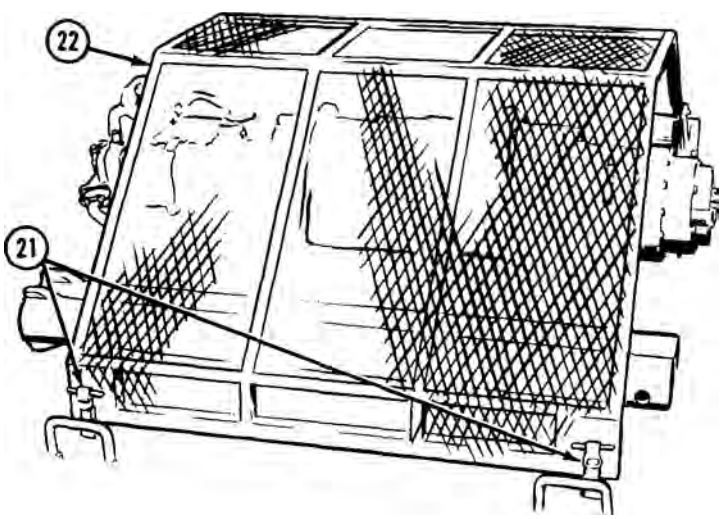


Figure 25.

18. Using crane, install extension bars (13) into equipment body (14).

REMOVE AND STOW TOW SPADES - Continued

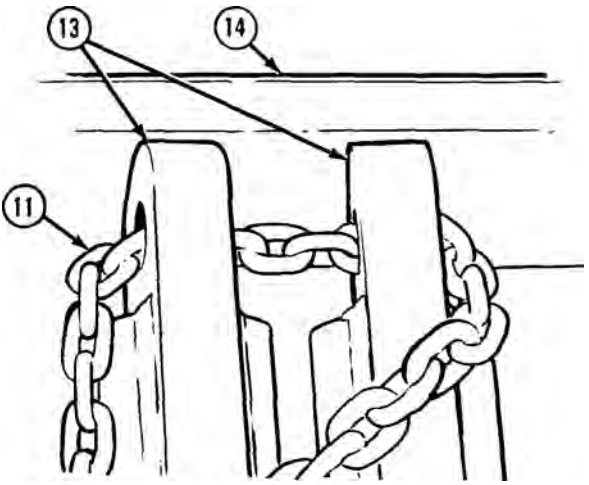


Figure 26.

19. Remove 8 ft. (2.5 m) chain (11) from extension bars (13) and put chain in stowage.
20. Return crane to stowed position (WP 0106).
21. Install two lockplates (23) and lock handles (24) onto extension bars (13).

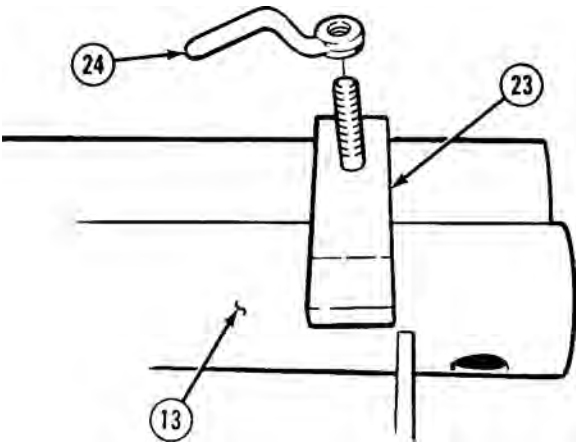


Figure 27.

22. Close heavy-duty winch protective screen (22) and latch holddowns (21).

REMOVE AND STOW TOW SPADES - Continued

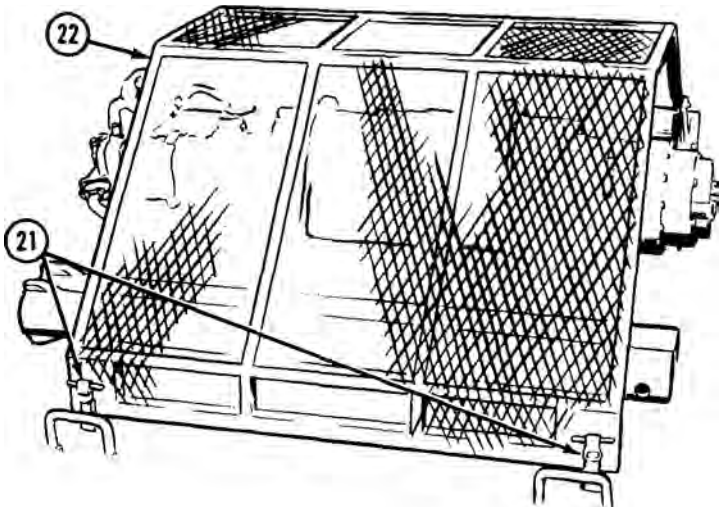


Figure 28.

NOTE

Driver side and passenger side extension adapters are removed the same way.

23. Remove quick pin (25), pin (26), and extension adapter (27).

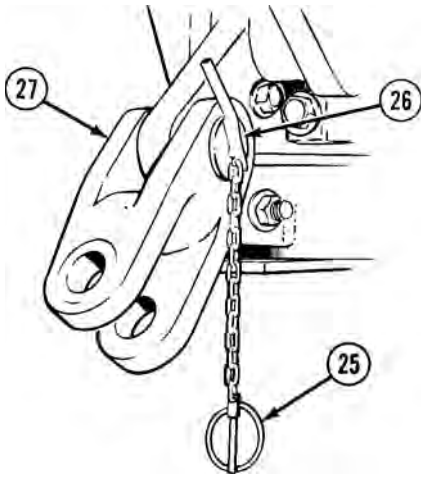


Figure 29.

REMOVE AND STOW TOW SPADES - Continued

24. Return extension adapters (27) to stowage.
25. Continue stowage of heavy-duty winch (WP 0043).

NOTE

Driver side and passenger side towing shackles are installed the same way.

26. Install two towing shackles (12) with pins (18) and cotter pins (17).

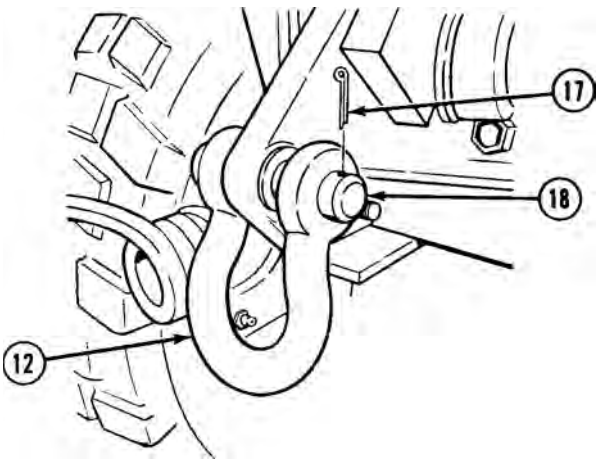


Figure 30.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
60-TON TACKLE BLOCK INSTALLATION/REMOVAL

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

SET UP 60-TON TACKLE BLOCK

NOTE

This procedure is a two soldier task.

1. Remove handle lock (1) and lock bracket (2).

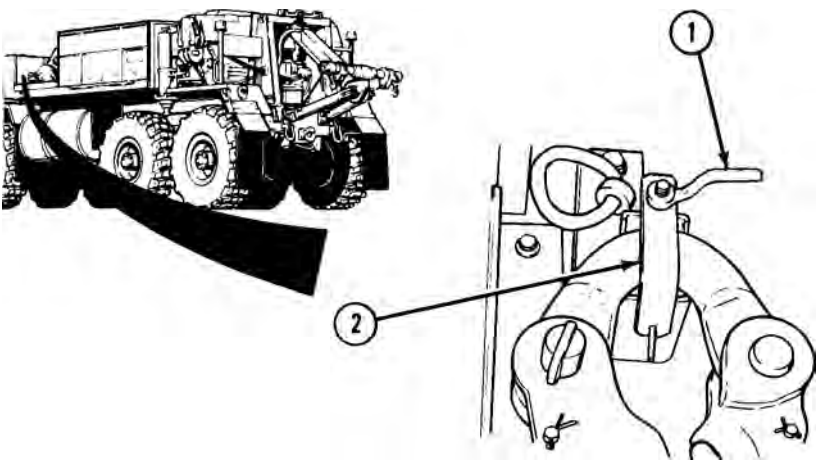


Figure 1.

2. Remove 8 ft. (2.5 m) chain (3) from stowage and attach chain to 60-ton tackle block (4).

SET UP 60-TON TACKLE BLOCK - Continued

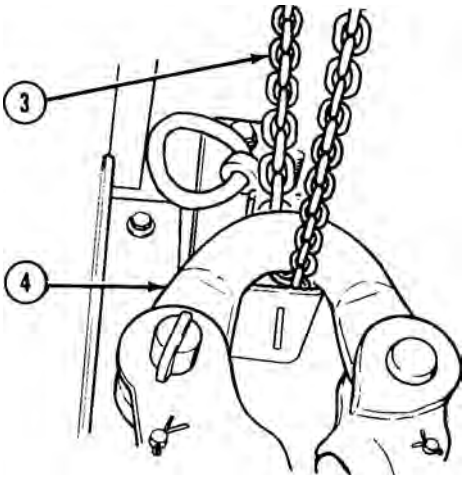


Figure 2.

3. Set up crane for remote operation. (WP 0107)
4. Using crane, remove 60-ton tackle block (4) from vehicle.

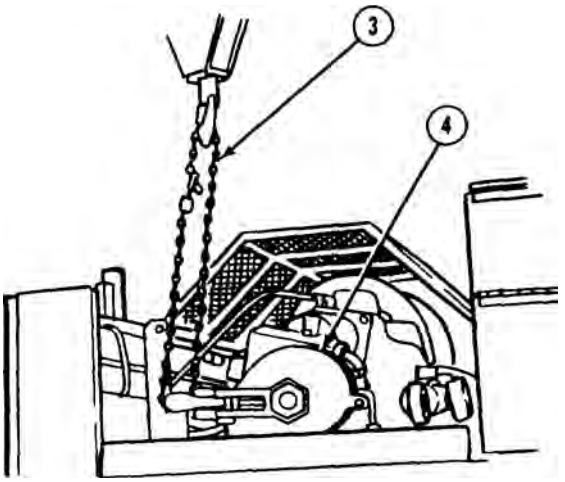


Figure 3.

5. Remove 8 ft. (2.5 m) chain (3) from 60-ton tackle block (4).
6. Return crane to stowed position. (WP 0107)

SET UP 60-TON TACKLE BLOCK - Continued

7. With aid of an assistant, carry 60-ton tackle block (4) by handles (5) to mired vehicle.

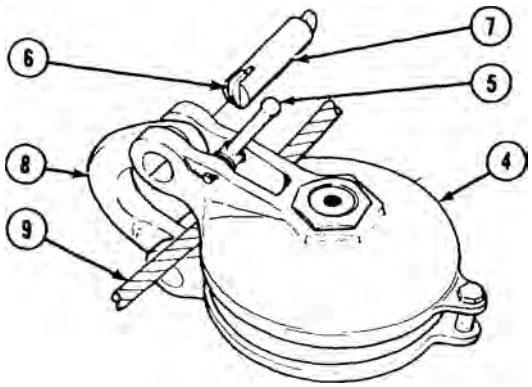


Figure 4.

8. Turn keyway (6) on pin (7) and remove pin from 60-ton tackle block (4).

WARNING

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

9. Open hook (8) and place winch cable (9) in 60-ton tackle block (4).
10. Close hook (8) and install pin (7) in 60-ton tackle block (4). Turn keyway (6) to secure pin.
11. Attach 60-ton tackle block (4) to mired vehicle(refer to FM 4-30.31). (Volume 2, WP 0200)
12. Continue with heavy-duty winch operation. (WP 0043)

REMOVE AND STOW 60-TON TACKLE BLOCK

NOTE

This procedure is a two soldier task.

1. Detach 60-ton tackle block (1) from mired vehicle.

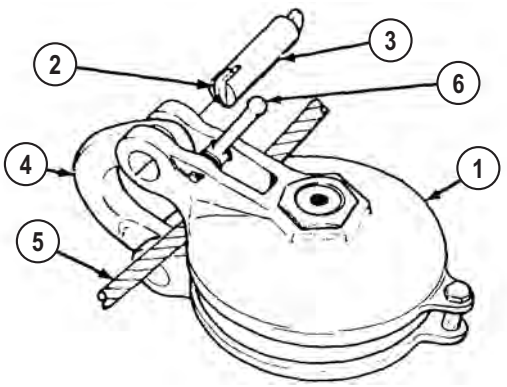


Figure 5.

2. Turn keyway (2) on pin (3) and remove pin from 60-ton tackle block (1).

WARNING

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

3. Open hook (4) and remove winch cable (5) from 60-ton tackle block (1).
4. Close hook (4) and install pin (3) in 60-ton tackle block (1). Turn keyway (2) to secure pin.
5. With aid of an assistant, lift 60-ton tackle block (1) by handles (6) and move within reach of crane.
6. Attach 8 ft. (2.5 m) chain (7) to 60-ton tackle block (1).

REMOVE AND STOW 60-TON TACKLE BLOCK - Continued

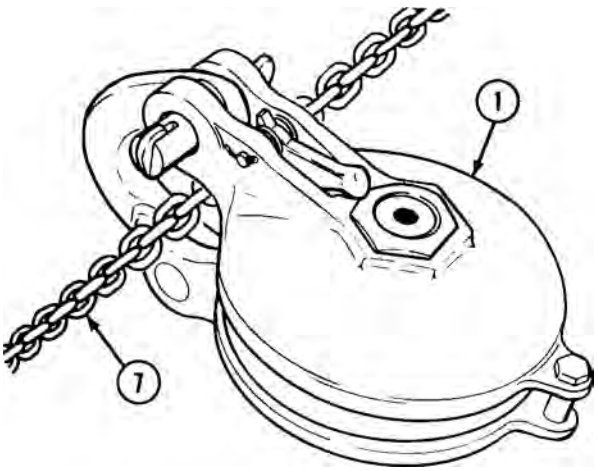


Figure 6.

7. Set up crane for remote operation. (WP 0107)
8. Using crane, place 60-ton tackle block (1) on vehicle so that hook rests in mounting bracket (8).

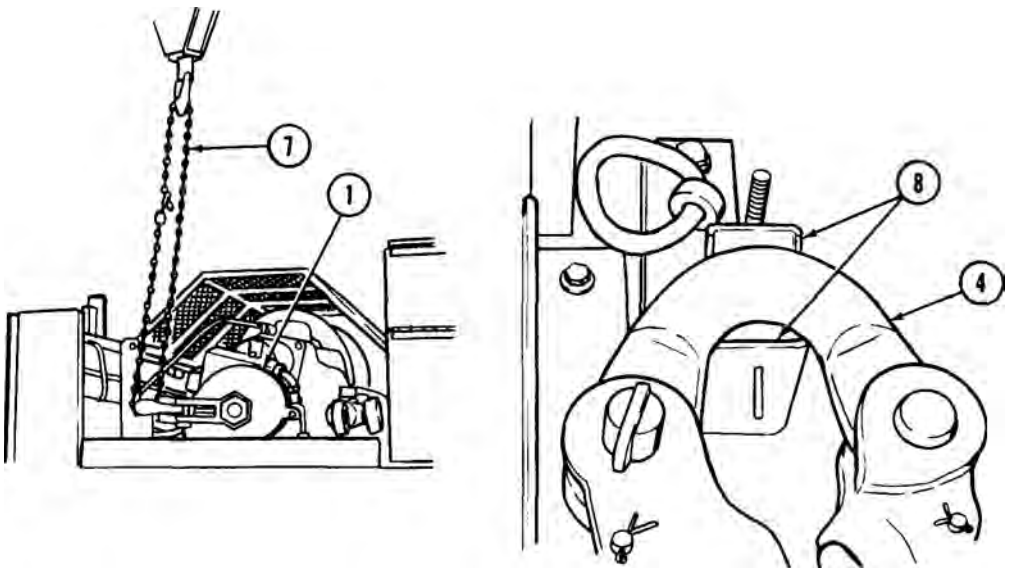


Figure 7.

REMOVE AND STOW 60-TON TACKLE BLOCK - Continued

9. Remove 8 ft. (2.5 m) chain (7) and return chain to stowage.
10. Return crane to stowed position. (WP 0107)
11. Install lock bracket (9) and handle lock (10).

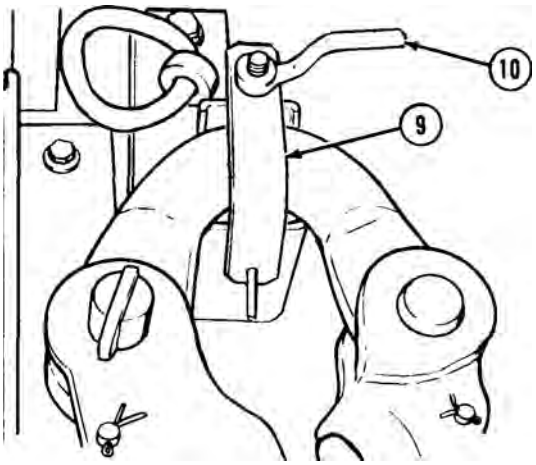


Figure 8.

12. Continue stowage of heavy-duty winch. (WP 0043)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
VISE OPERATION

INITIAL SETUP:

Not Applicable

PREPARE VISE FOR OPERATION

1. Loosen lockscrew (1).
2. Remove quick pin (2) and pin (3).

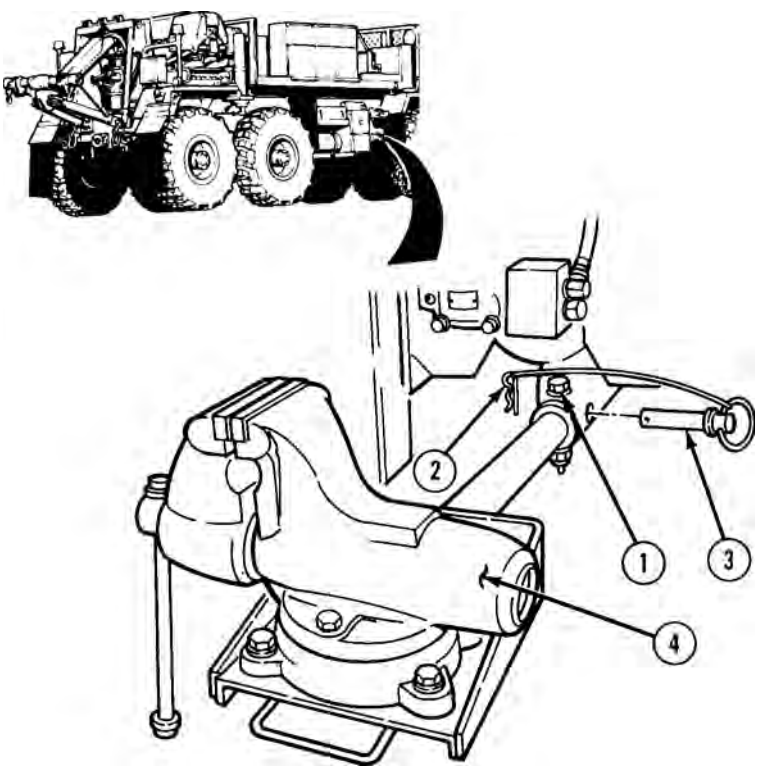


Figure 1.

3. Pull vise (4) out, and align holes.

PREPARE VISE FOR OPERATION - Continued

4. Install pin (3) and quick pin (2).

RETURN VISE TO STOWED POSITION

1. Remove quick pin (2) and pin (3).
2. Push vise (4) into stowed position.

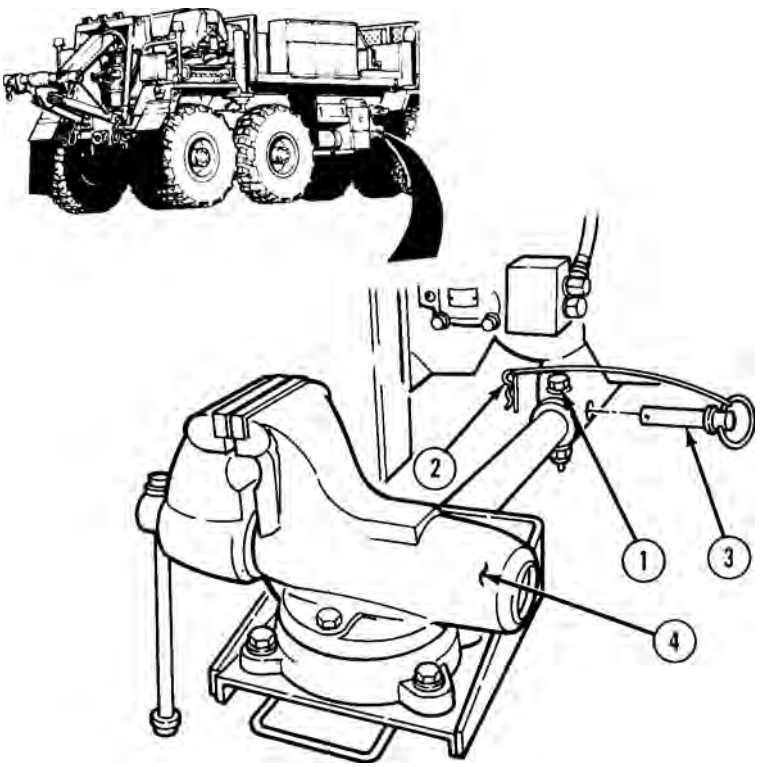


Figure 2.

3. Align holes and install pin (3) and quick pin (2).
4. Tighten lockscrew (1).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
POWER PLANT REMOVAL/INSTALLATION

INITIAL SETUP:

Not Applicable

VEHICLE AND TECHNICAL MANUAL LIST

1. The M984A1 wrecker can be used to remove and install power plants for various tracked and wheeled vehicles and vehicle series.
2. Refer to the following list of vehicles and corresponding technical manuals when removing and installing power plants:

Table 1. Technical Manual Listing.

Type Vehicle	Technical Manual
M1	TM 9-2350-255-20-(series)
M2/M3	TM 9-2350-252-20-(series)
M35	TM 9-2320-209-34-(series)
M60A3	TM 9-2350-253-20-(series)
M88A1	TM 9-2350-256-20-(series)
M911	TM 9-2320-270-34-(series)
M915	TM 9-2320-273-34
M939	TM 9-2320-272-24-(series)
M998	TM 9-2320-280-34
M977	TM 9-2320-315-14&P
M1008	TM 9-2320-283-34-(series)

REMOVE POWER PLANT

WARNING

Wrecker must be on level ground when removing power plant. Failure to comply may result in injury or death to personnel.

WARNING

Attach guide rope to sling to prevent uncontrolled movement while positioning crane. Failure to comply may result in injury or death to personnel.

1. See applicable technical manual (Table 1) for sling or special tool required for power plant removal.

NOTE

- Retrieval system may be lowered to assist in getting closer to vehicle.
- Position wrecker as close as possible to disabled vehicle, without making contact.
- Refer to applicable vehicle technical manual to connect lifting sling to power plant.

2. Position rear of wrecker directly in line with power plant (1) and as close to vehicle as possible without making contact.

REMOVE POWER PLANT - Continued

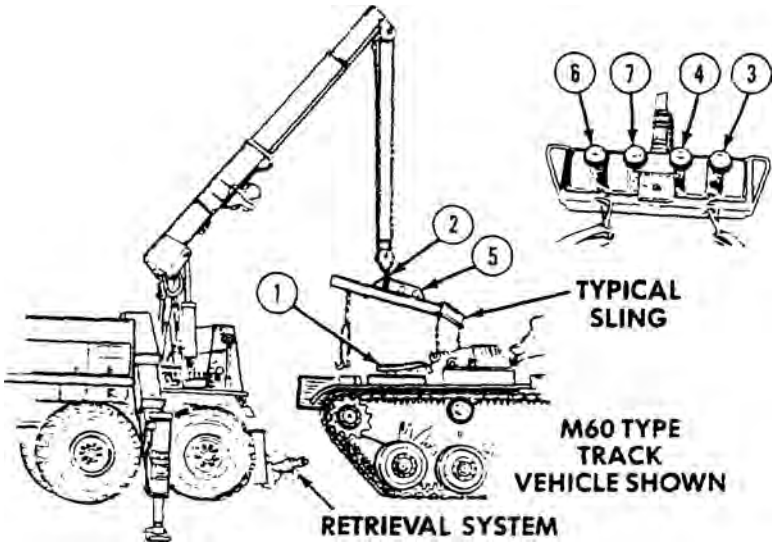


Figure 1.

3. Set up crane for operation (configure for use of remote-control unit). (WP 0107)
4. Attach sling or special tool to crane load hook (2).
5. Move HOIST control lever (3) and BOOM control lever (4) to UP position to lift sling (5), and operate SWING control lever (6) and TELESCOPE control lever (7) to position sling over power plant (1).
6. Operate HOIST control lever (3) to lower sling (5) to allow sling chains to be connected to power plant (1).

WARNING

Keep out from under power plant. Power plant can slip or fall. Failure to comply may result in injury or death to personnel.

REMOVE POWER PLANT - Continued

WARNING

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

CAUTION

- Refer to applicable vehicle technical manual to prepare vehicle for power plant removal to prevent equipment damage.
- Do not jerk HOIST control lever or load will bounce, possibly causing damage to crane or load.
- Maximum crane load limit and radius swing is:

6,000 lbs at 18 ft. 2 in. radius (2 700 kg at 5.5 m)

8,000 lbs at 16 ft. 5 in. radius (3 600 kg at 5.0 m)

12,000 lbs at 11 ft. 10 in. radius (5 400 kg at 3.6 m)

14,000 lbs at 9 ft. radius (6 300 kg at 2.7 m)

- Make sure you refer to RANGE DIAGRAM located on either side of equipment body to prevent equipment damage.
- Do not go over maximum load limit. Going over maximum load limit will cause electrical shutdown for six seconds, or until load is lowered.
- Do not allow power plant to swing and come in contact with vehicle. Power plant may be damaged.

NOTE

Chains are available on the wrecker which can be used to guide the power plant during removal.

7. Operate HOIST control lever (3) and BOOM control lever (4) to lift power plant (1) free of vehicle.

REMOVE POWER PLANT - Continued

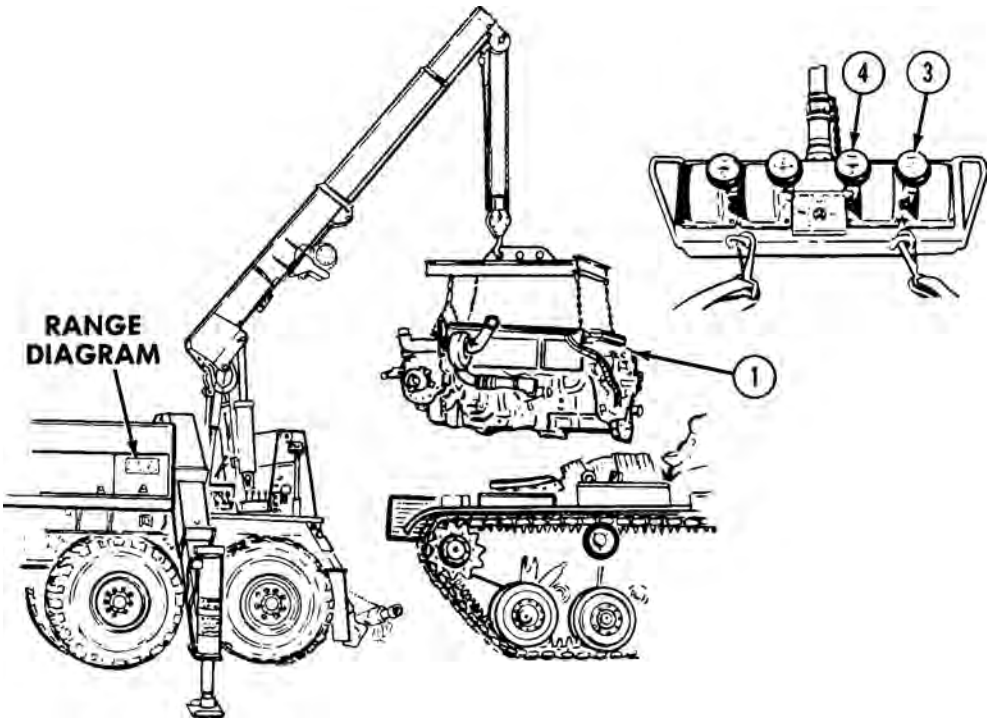


Figure 2.

8. Position power plant (1) directly behind wrecker.
9. Stow outriggers (WP 0106).

CAUTION

Drive wrecker forward at walking speed (less than 5 mph). If driven faster and power plant starts to swing, equipment can be damaged.

10. Drive vehicle forward (WP 0050) (less than 5 mph) until power plant (1) is clear of vehicle.

NOTE

- If retrieval system was lowered to assist in power plant removal, raise retrieval system to stowed position.
- Chains may be attached to shackles on rear of wrecker and power plant to prevent power plant from swinging.

REMOVE POWER PLANT - Continued

11. Operate TELESCOPE control lever (7) and HOIST control lever (3) to position power plant (1) approximately 3 ft. (1 m) behind crosstube (8), and 2 ft. (60 cm) above ground.

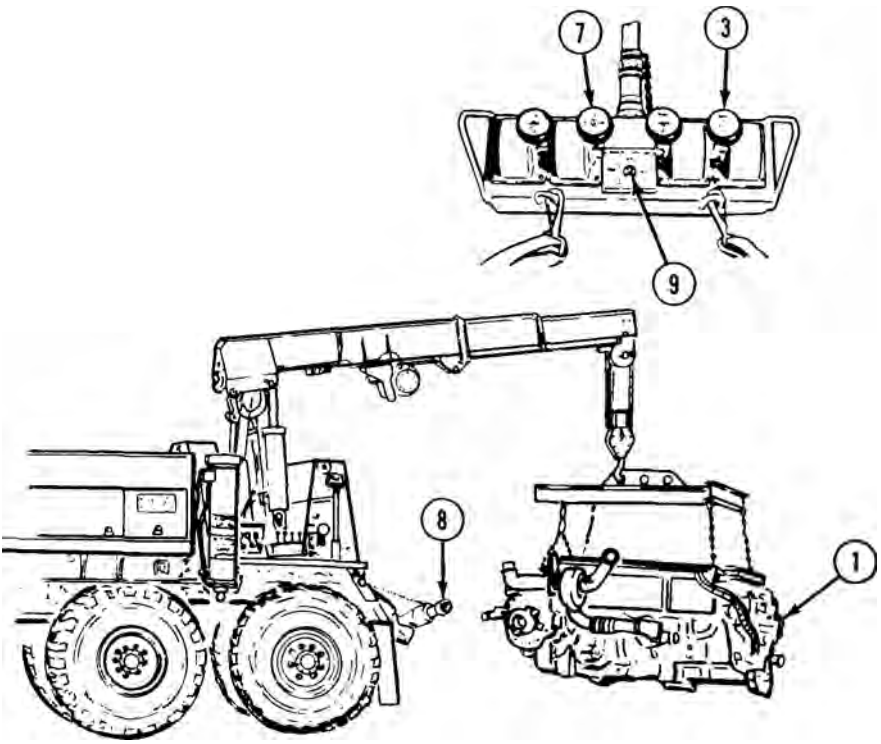


Figure 3.

12. Shut off REMOTE CONTROL UNIT switch (9).
13. Stow REMOTE CONTROL UNIT on wrecker.

CAUTION

Drive wrecker forward at walking speed (less than 5 mph). If driven faster and power plant starts to swing, equipment can be damaged.

14. Transport power plant to required destination.
15. Set up crane for operation (configure for use of remote-control unit). (WP 0107)
16. Operate remote control (10) to position power plant on supports (refer to applicable vehicle technical manual (Table 1) for power plant supports).

REMOVE POWER PLANT - Continued

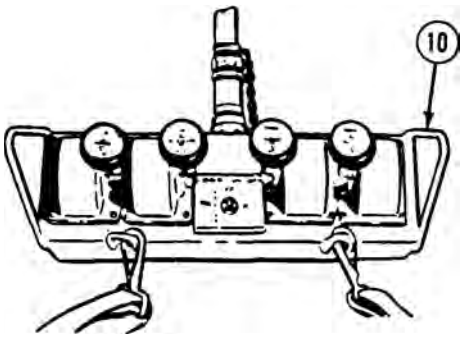


Figure 4.

17. Remove sling (5) from power plant.

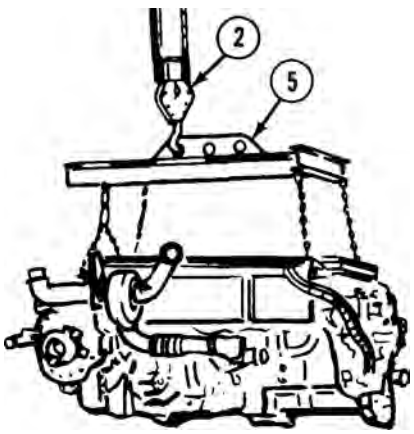


Figure 5.

NOTE

If sling is not to be used for further operation use crane to stow sling.

18. Remove load hook (2) from sling (5).
19. Shut off switches, disconnect remote-control unit, (WP 0106) and return remote-control unit to wrecker stowage.
20. Shut down crane. (WP 0106)

INSTALL POWER PLANT

WARNING

Wrecker must be on level ground when removing power plant. Failure to comply may result in injury or death to personnel.

1. See applicable vehicle technical manual (Table 1) for sling or special tool required for power plant installation.
2. Position wrecker as close to power plant (1) as possible.

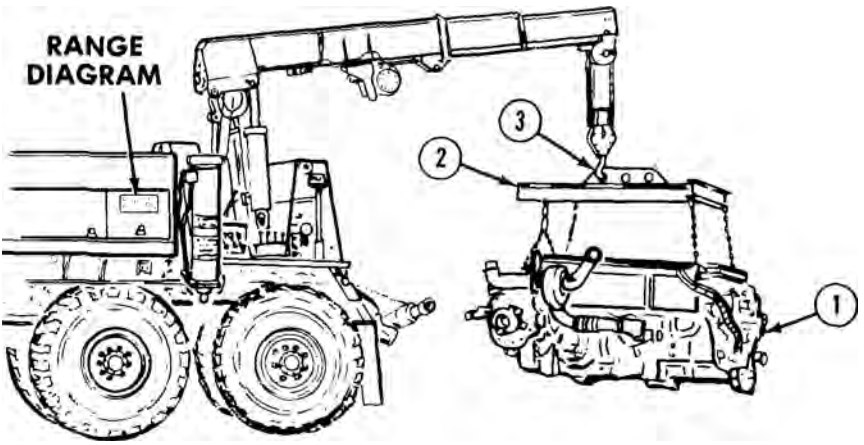


Figure 6.

3. Set up crane for operation (configure for use of remote-control unit). (WP 0107)
4. Operate crane, and attach sling (2) to crane hook block (3).
5. Attach sling (2) to power plant (1) (refer to applicable vehicle technical manual (Table 1) to connect lifting sling to power plant).

INSTALL POWER PLANT - Continued

WARNING

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

CAUTION

- Refer to applicable vehicle technical manual to prepare vehicle for power plant removal to prevent equipment damage.
- Do not jerk HOIST control lever or load will bounce, possibly causing damage to crane or load.
- Maximum crane load limit and radius swing is:
  6,000 lbs at 18 ft. 2 in. radius (2 700 kg at 5.5 m)
  8,000 lbs at 16 ft. 5 in. radius (3 600 kg at 5.0 m)
  12,000 lbs at 11 ft. 10 in. radius (5 400 kg at 3.6 m)
  14,000 lbs at 9 ft. radius (6 300 kg at 2.7 m)
- Make sure you refer to RANGE DIAGRAM located on either side of equipment body to prevent equipment damage.
- Do not go over maximum load limit. Going over maximum load limit will cause electrical shutdown for six seconds, or until load is lowered.
- Do not allow power plant to swing and come in contact with vehicle. Power plant may be damaged.

NOTE

Chains are available on the M984A which can be used to guide the power plant during removal.

6. Operate HOIST control lever (4) and TELESCOPE control lever (5) to position power plant (1) approximately 2 ft. (61 cm) above ground and 3 ft. (1 m) directly behind crosstube (6).

INSTALL POWER PLANT - Continued

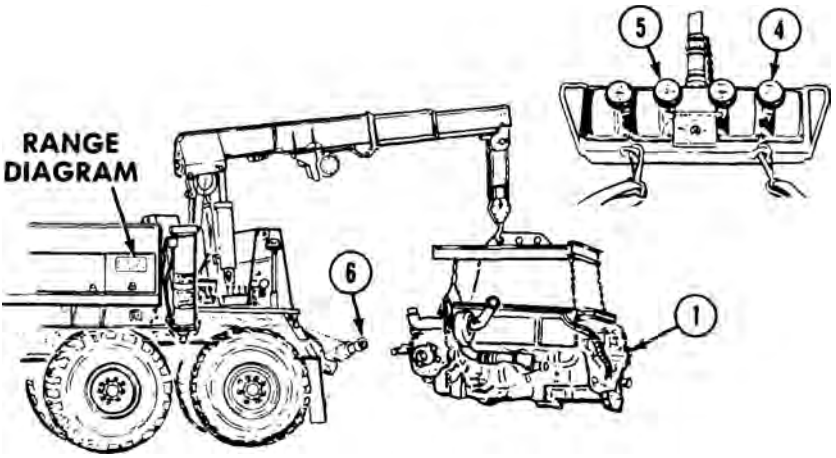


Figure 7.

7. Stow outriggers. (WP 0106)
8. Stow REMOTE CONTROL UNIT on wrecker.

CAUTION

Drive wrecker forward at walking speed (less than 5 mph). If driven faster and power plant starts to swing, equipment can be damaged.

9. Drive vehicle forward (WP 0050) (less than 5 mph) and transport power plant (1) to vehicle for installation.

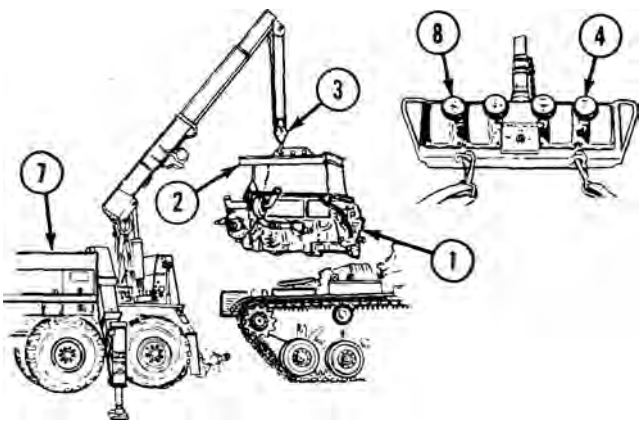


Figure 8.

INSTALL POWER PLANT - Continued

CAUTION

- Refer to applicable technical manual to prepare vehicle for power plant installation to prevent equipment damage.
- Do not allow power plant to swing and come in contact with vehicle. Power plant or vehicle may be damaged.

NOTE

- Retrieval system may be lowered to assist in getting closer to vehicle.
- Position wrecker for best access to install power plant.

10. Position rear of wrecker (7) in line with vehicle.
11. Operate HOIST control lever (4), and raise power plant high enough to clear vehicle for installation.
12. Drive wrecker slowly backward as close to vehicle without making contact to position power plant for installation.
13. Operate HOIST control lever (4), and SWING control lever (8) to position power plant for installation.
14. Setup outriggers. (WP 0106)
15. Install power plant (1) (refer to applicable vehicle technical manual). (Table 1)
16. Remove sling (2) from power plant (1).
17. Remove sling (2) from load hook (3).
18. Shut off switches, disconnect remote-control unit, (WP 0106) and return remote-control unit to wrecker stowage.
19. Shut down crane and stow outriggers. (WP 0106)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
INSTALL/REMOVE TIRE CHAINS

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

INSTALL TIRE CHAINS

CAUTION

When tire chains are used, they must be used on all four rear wheels. Chains must not be used when driving on hard surfaces where there is no wheel slippage. Improper use of tire chains may result in equipment damage.

NOTE

- This procedure is a two soldier task.
- Tire chains on No. 3 and No. 4 axle tires are all installed the same. Passenger side No. 4 axle shown.
- Maximum speed limit for vehicles driving with chains in city or on highway is 10 mph (16 km/h).
- Maximum speed limit for vehicles driving with chains off-road is 15 mph (24 km/h).

1. With aid of an assistant, place tire chain (1) on ground with cross chain connecting links (2) facing down.

INSTALL TIRE CHAINS - Continued

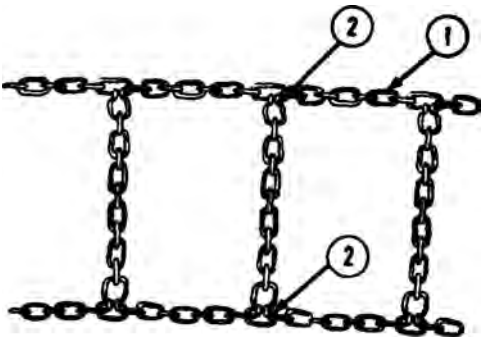


Figure 1.

NOTE

Assistant shall ensure vehicle is stopped when only tire in contact with tire chains is tire being equipped.

2. Move vehicle onto tire chain (1) while assistant guides vehicle so tire (3) is about one-third of way on tire chain.

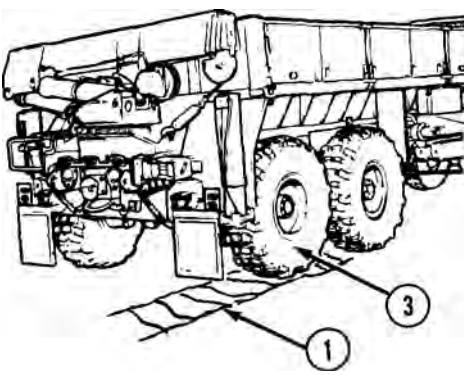


Figure 2.

NOTE

Ensure only tire in contact with tire chains is tire being equipped.

3. Park vehicle. (WP 0056)
4. With aid of an assistant, wrap tire chain (1) around tire (3).

INSTALL TIRE CHAINS - Continued

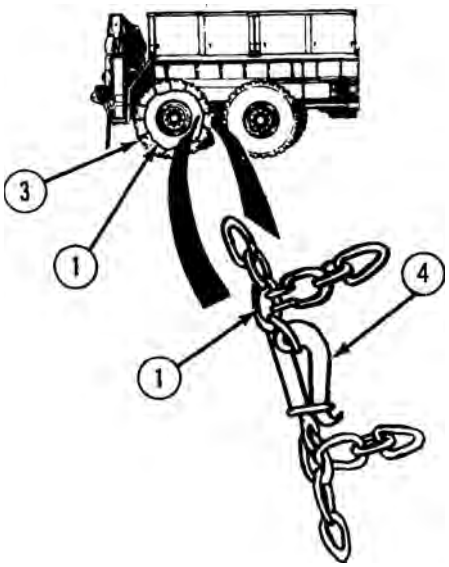


Figure 3.

5. With aid of an assistant, connect and secure inside and outside clamps (4) so tire chain (1) is as tight as possible.
6. With aid of an assistant, repeat Steps (1) through (5) on remaining tires of No. 3 and No. 4 axles.
7. Drive vehicle forward (WP 0050) about 15 ft. (4.6 m) and then drive vehicle in reverse (WP 0051) about 15 ft. (4.6 m) as guided by assistant.
8. Park vehicle. (WP 0056)

NOTE

Tire chains on No. 3 and No. 4 axle tires are all tightened up the same. Passenger side No. 4 axle shown.

9. With aid of an assistant, disconnect inside clamp (4) of tire chain (1) on tire (3).

INSTALL TIRE CHAINS - Continued

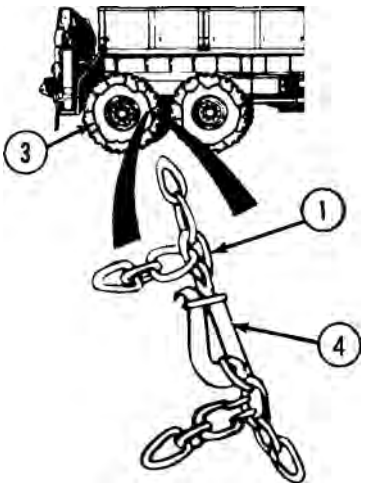


Figure 4.

10. With aid of an assistant, take up slack in tire chain (1).
11. With aid of an assistant, connect inside clamp (4).
12. With aid of an assistant, disconnect outside clamp (4) of tire chain (1) on tire (3).
13. With aid of an assistant, take up slack in tire chain (1).
14. With aid of an assistant, connect outside clamp (4).
15. With aid of an assistant, take up slack in tire chains on other three rear tires by repeating Steps (10) through (15).

REMOVE TIRE CHAINS

NOTE

- This procedure is a two soldier task.
- Tire chains on No. 4 axle tires are both removed the same. Passenger side shown.

1. Move vehicle into position so tire chain (1) and clamps (2) on tire (3) are at 4 o'clock position while assistant guides vehicle.

REMOVE TIRE CHAINS - Continued

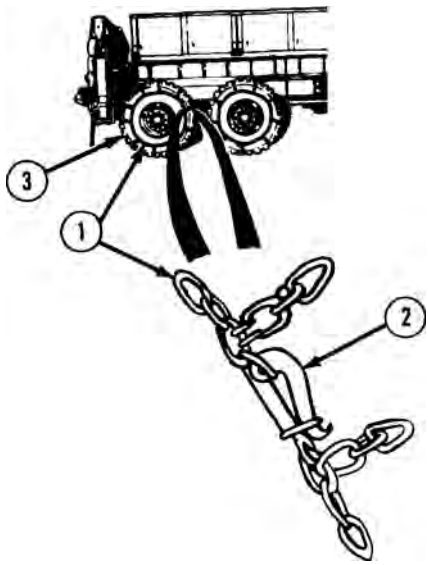


Figure 5.

2. Park vehicle. (WP 0056)
3. With aid of an assistant, disconnect inside and outside clamps (2) of tire chain (1).

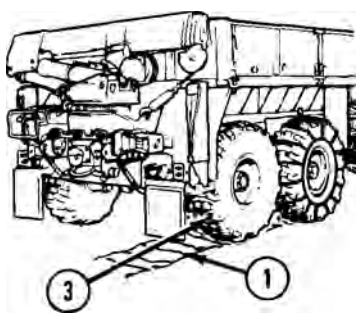


Figure 6.

4. With aid of an assistant, unwrap tire chain (1) from tire (3) and spread tire chain out on ground behind vehicle.
5. Drive vehicle forward (WP 0050) off tire chain (1) while assistant guides vehicle.
6. With aid of an assistant, repeat Steps (2) through (5) for opposite side tire.

REMOVE TIRE CHAINS - Continued

NOTE

Tire chains on No. 3 axle tires are both removed the same. Passenger side shown.

7. Move vehicle into position so tire chain (4) and clamps (5) on tire (6) are at 8 o'clock position while assistant guides vehicle.

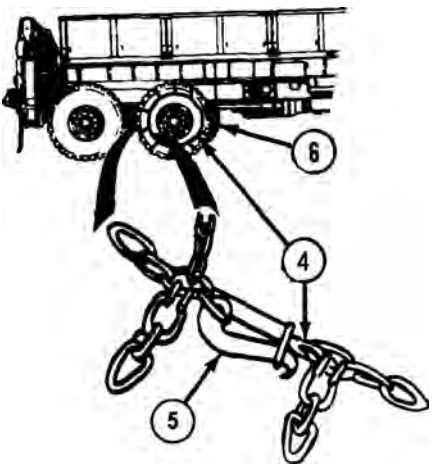


Figure 7.

8. Park vehicle. (WP 0056)
9. With aid of an assistant, disconnect inside and outside clamps (5) of tire chain (4).
10. With aid of an assistant, unwrap tire chain (4) from tire (6) and spread tire chain out on ground in front of tire.

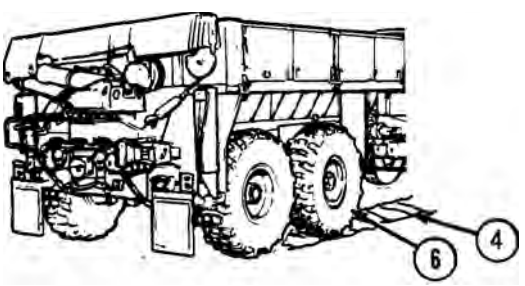


Figure 8.

11. Drive vehicle forward (WP 0050) off tire chain (4) while assistant guides vehicle.

REMOVE TIRE CHAINS - Continued

12. With aid of an assistant, repeat Steps (7) through (11) for opposite side tire.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
FORD WATER OBSTACLE

INITIAL SETUP:

Not Applicable

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.

NOTE

After vehicle fords water obstacle, service all lubrication points below fording depth and check submerged gearboxes for presence of water upon return from mission (refer to lubrication instructions (Volume 2, WP 0188) for more information).

CAUTION

Towing a trailer may affect maximum fording depth (refer to applicable trailer operators manual). Do not ford water obstacle deeper than maximum depth allowed by either vehicle or trailer (whichever depth is less). Failure to comply may result in damage to equipment.

1. Ensure depth of fording site is not more than 4 ft. (1.2 m).
2. Ensure bottom at fording site is firm enough that 4 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 LO, 8X8 DRIVE indicator (2) will illuminate.

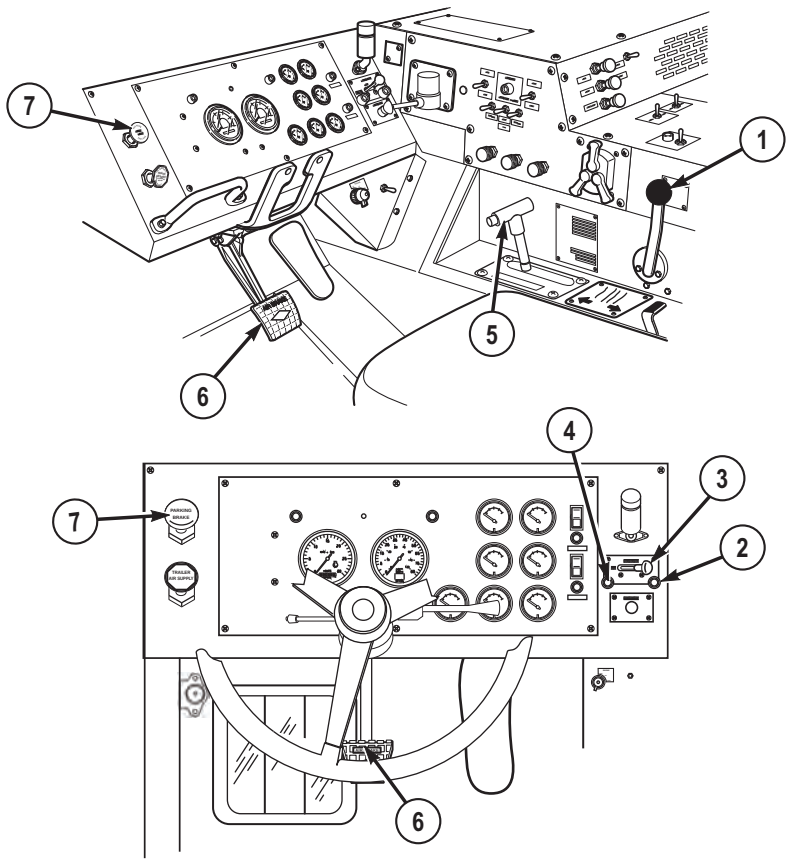


Figure 1.

7. Set TRACTION CONTROL lever (3) to INTER-AXLE DIFF. LOCK for added traction, INTER-AXLE LOCK indicator light (4) will come on.
8. Set transmission range selector (5) to 1 (1st gear range).
9. Drive vehicle slowly into water.
10. If engine stops, immediately attempt to restart engine. If engine will not start, tow or winch vehicle from water with another vehicle as soon as possible.
11. Drive vehicle at 3 to 4 mph (5 to 6 km/h) or less, through water.
12. Unless absolutely necessary, do not stop while in water.
13. If vehicle accidentally enters water deeper than 4 ft. (1.2 m), do the following:
    a. Apply service brake pedal (6) and hold to stop vehicle.
    b. Set transmission range selector (5) to R (reverse).

c. Release service brake pedal (6).

d. Slowly back vehicle out of deep water.

14. After leaving water, lightly press service brake pedal (6) and hold while driving slowly to dry out brake linings.

15. When clear of fording area, stop vehicle.

16. Apply and release PARKING BRAKE control (WP 0045) (7) several times to remove water from brake components.

17. Remove water and clean deposits from all vehicle parts as soon as possible.

18. Deliver vehicle to field level maintenance as soon as possible.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
INTERIM NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION PROCEDURES

INITIAL SETUP:

Not Applicable

INTRODUCTION AND PROCEDURES

NOTE

To reduce the effects of contamination in an NBC-contaminated environment, the HEMTT series vehicle should be operated with all windows, doors, and stowage boxes closed.

1. The HEMTT series vehicle is capable of being operated by personnel wearing nuclear, biological, or chemical (NBC) protective clothing without special tools or supporting equipment. Refer to FM 3-11.5 (Volume 2, WP 0200) for information on decontamination procedures. Specific procedures for the HEMTT series vehicle are as follows:

   a. Rubber sleeves and other rubber items, rope, and gaskets will absorb and retain chemical agents. Replacement of these items is the recommended method of decontamination.

   b. Lubricants or fluids may be present on the external surfaces of the HEMTT series vehicle or its components due to leaks or normal operation. These fluids will absorb NBC agents. The preferred method of decontamination is removal of these fluids using conventional decontamination methods in accordance with FM 3-11.5. (Volume 2, WP 0200)

   c. Continued decontamination of the external HEMTT series vehicle surfaces with supertropical bleach (STB)/decontamination solution number 2 (DS2) will degrade clear plastic (e.g., hydraulic fluid reservoir sight glass) to the point where looking through it will become impossible. This problem will become more evident for soldiers wearing protective masks. Therefore, the use of STB or DS2 decontamination in the area of clear plastic should be minimized. Clear plastic should be decontaminated with warm, soapy water.

   d. External surfaces of the HEMTT series vehicle and related equipment such as the remote control units that are marked with painted or stamped lettering will not withstand repeated decontamination with STB or DS2 without degradation

INTRODUCTION AND PROCEDURES - Continued

of this lettering. Therefore, the recommended method of decontamination for these areas is washing with warm, soapy water.

NOTE

Replacement of hardware, as well as conventional methods of decontamination, are the preferred methods of decontamination for the areas listed below.

2. Areas that will entrap contaminants, making efficient decontamination extremely difficult include the following:
   a. Exposed heads of screws.
   b. Areas adjacent to and behind exposed hydraulic lines.
   c. Hinged areas or access doors on the stowage boxes.
   d. Retaining chains for lynchpins and lockpins.
   e. Areas around the tie downs, lifting rings, crevices around access doors, external valves and drains, and exposed hydraulic connectors.
   f. Areas behind knobs, levers, externally-mounted equipment, specification and advisory data plates, and roller and locking mechanisms.
   g. Winch cable and winch hook assembly.
3. Conventional methods of decontamination should be used on all areas listed in Steps (1) and (2), while stressing the importance of thoroughness, and the probability of some degree of continuing contact, including vapor hazard.
4. For additional NBC information, refer to FM 3-11.3 (Volume 2, WP 0200) and FM 3-11.4. (Volume 2, WP 0200)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SELF-RECOVER VEHICLE USING SELF-RECOVERY WINCH

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

WINCH MIRED VEHICLE FORWARD

NOTE

- For additional information on vehicle self-recovery, refer to FM 4-30.31. (Volume 2, WP 0200)
- Vehicle self-recovery is a two soldier task. Soldiers must communicate by hand signals.

1. Shut off engine. (WP 0057)
2. Adjust mirror (1) so assistant can be clearly seen during procedure.

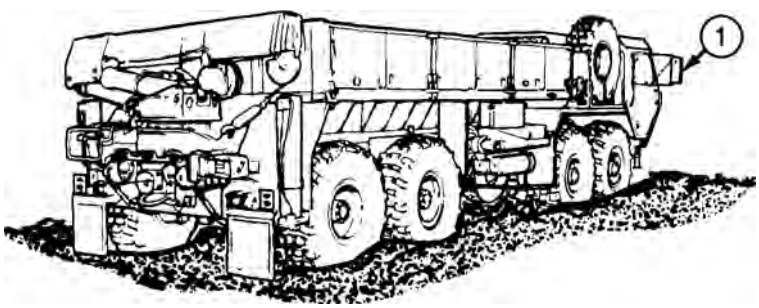


Figure 1.

3. Start engine. (WP 0044)
4. Move winch shift lever (4) to OUT position to pay out small amount of cable.
5. Release winch shift lever (4) to center position.
6. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.
7. Remove cotter pin (5) from pin (6).

WINCH MIRED VEHICLE FORWARD - Continued

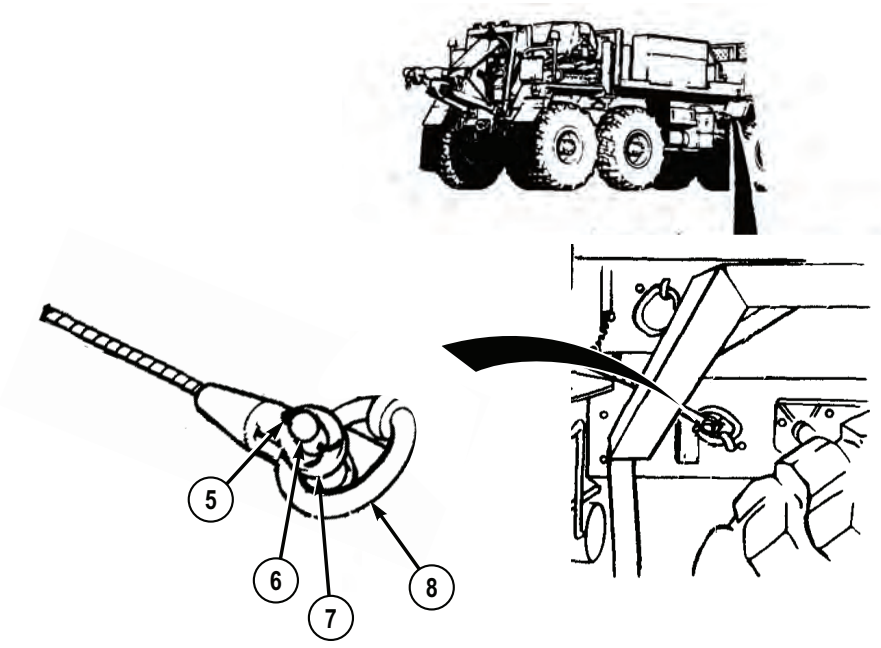


Figure 2.

8. Remove pin (6) from clevis (7) and disconnect clevis (7) from tie down ring (8).
9. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.

WINCH MIRED VEHICLE FORWARD - Continued

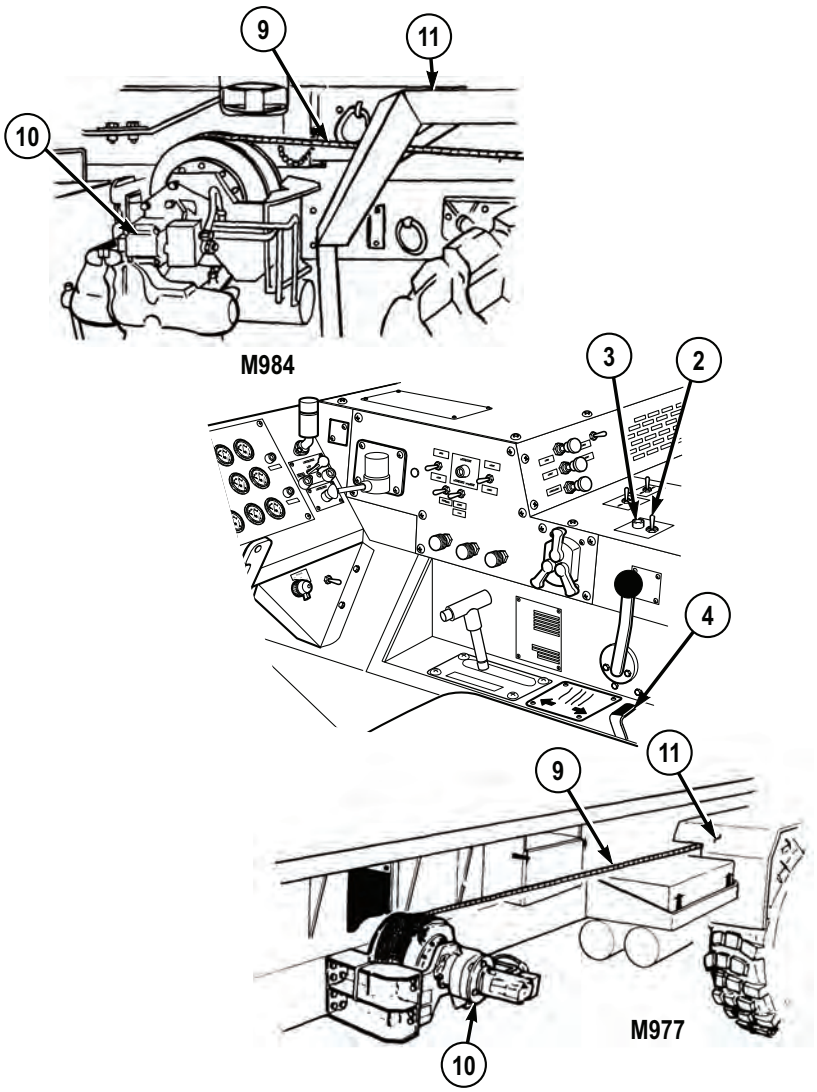


Figure 3.

10. Move winch shift lever (4) to OUT and pay out winch cable (9), while assistant routes cable (9) through notch in fender (11).

NOTE

- Do not place cable between tensioning device pulleys at this time.

WINCH MIRED VEHICLE FORWARD - Continued

- When pulling cable through tensioning device, push sheave towards frame rail to allow clevis to pass through.

11. Pay out cable (9) while assistant pulls cable (9) until it is 6 in. to 1 ft. (15 cm to 30 cm) past the front roller guide (12).

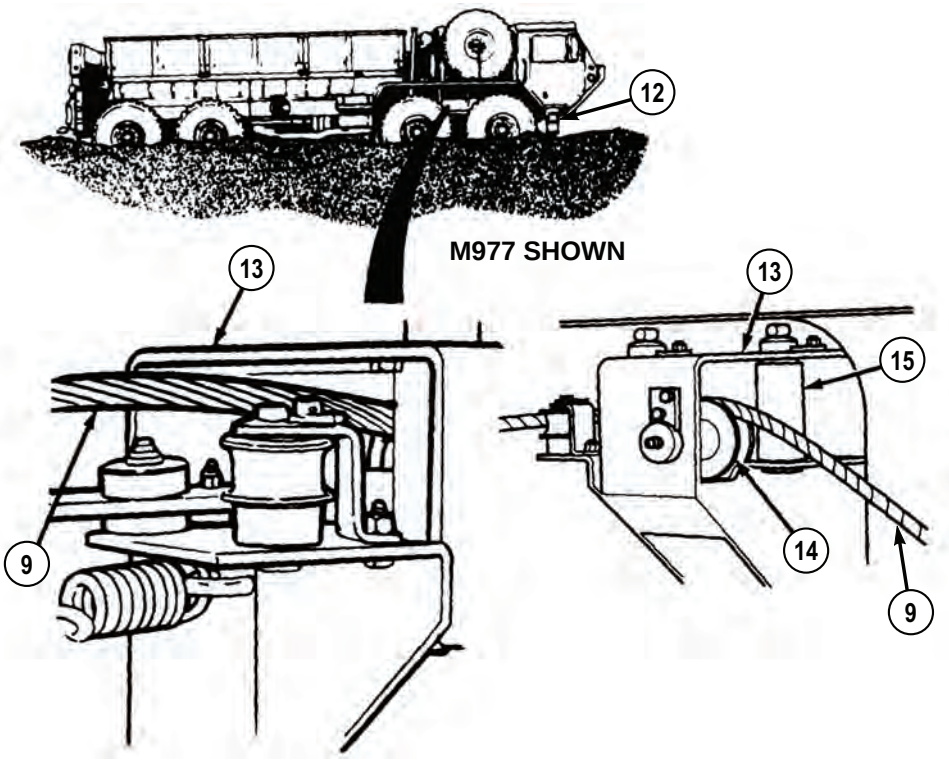


Figure 4.

12. Stop paying out cable (9).
13. Assistant routes cable (9) through cable guide (13), over sheave (14), between roller (15), and side of cable guide (13).
14. Pay out winch cable (9) as assistant routes cable over first axle and 1 ft. (30 cm) past front roller guide assembly (12).

WINCH MIRED VEHICLE FORWARD - Continued

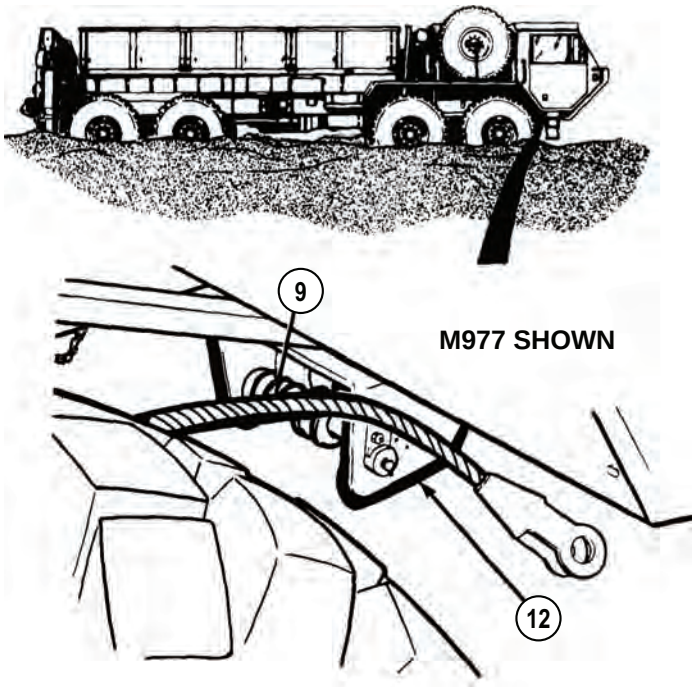


Figure 5.

15. Release winch shift lever (4) to center position.

WINCH MIRED VEHICLE FORWARD - Continued

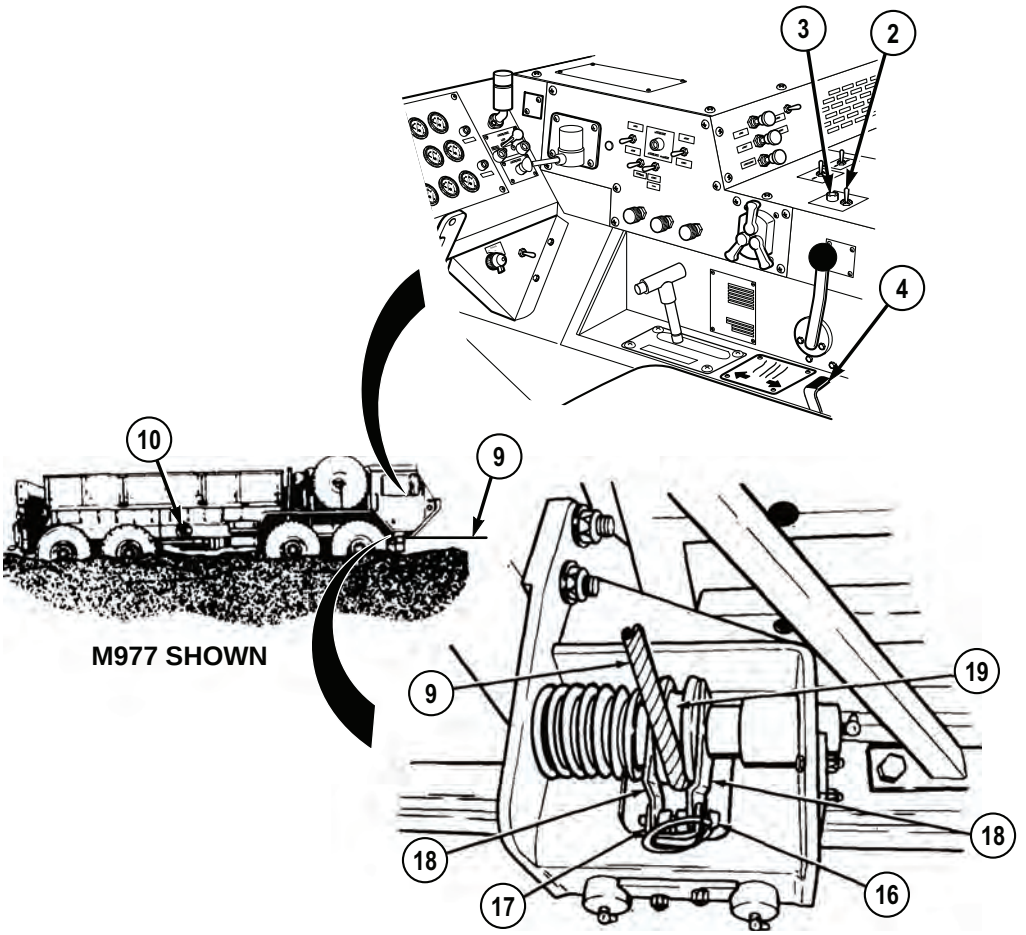


Figure 6.

16. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.
17. Remove quick release pin (16) and guide bracket (17). Move cable guide brackets (18) apart so cable (9) can be placed against bottom of sheave (19).
18. Move cable guide brackets (18) together and install guide bracket (17) and quick release pin (16).
19. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.
20. Move winch shift lever (4) to OUT and pay out winch cable (9) while assistant pulls cable to tree, another heavy vehicle (WP 0117), or another heavy object refer to FM 4-30.31. (Volume 2, WP 0200)

WINCH MIRED VEHICLE FORWARD - Continued

21. When winch cable (9) is let out to heavy object, release winch shift lever (4) to center position.
22. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.
23. If snatch block must be used for self-recovery operation, attach self-recovery winch cable (9) to snatch block (WP 0116) and connect end of self-recovery winch cable to mired vehicle left front towing eye. (WP 0117) Attach snatch block to tree, another vehicle, or heavy object refer to FM 4-30.31. (Volume 2, WP 0200)

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 on drum.

24. Check that there are at least five wraps of winch cable (9) left on winch (10). If there are not at least five wraps of winch cable left on self-recovery winch, stop using self-recovery winch and continue with Step (54) of this procedure.

CAUTION

Do not go over winch pull capacity or winch may be damaged.

25. Ensure weight of mired vehicle and amount of winch cable (9) left on self-recovery winch (10) does not go over pull capacity (refer to FM 4-30.31 (Volume 2, WP 0200) and Self-Recovery Winch Pull Capacity table below). If pull will go over capacity, stop using self-recovery winch and continue with Step (54) of this procedure.

Table 1. Self-Recovery Winch Pull Capacity.

Cable Layer	Maximum Line Pull
1st layer (five wraps)	20,000 lbs (9 080 kg)
2nd layer	18,173 lbs (8 251 kg)
3rd layer	16,663 lbs (7 565 kg)
4th layer	15,361 lbs (6 974 kg)
5th layer	14,254 lbs (6 471 kg)

NOTE

If winch cable will be connected to another vehicle acting as a stationary anchor, refer to FM 4-30.31 (Volume 2, WP 0200) or Connect/Disconnect

WINCH MIRED VEHICLE FORWARD - Continued

Self-Recovery Winch Cable to Another Vehicle (WP 0117) for connecting procedures.

26. If it is determined using self-recovery winch (10) will not go over winch pull capacity, connect winch cable (9) to heavy object.
27. Ensure winch shift lever (4) is at center position.
28. Ensure PTO ENGAGE switch (2) is set to OFF position. Indicator light (3) will go out.

WARNING

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

29. Pull back and hold tension pulley lever (20).

WINCH MIRED VEHICLE FORWARD - Continued

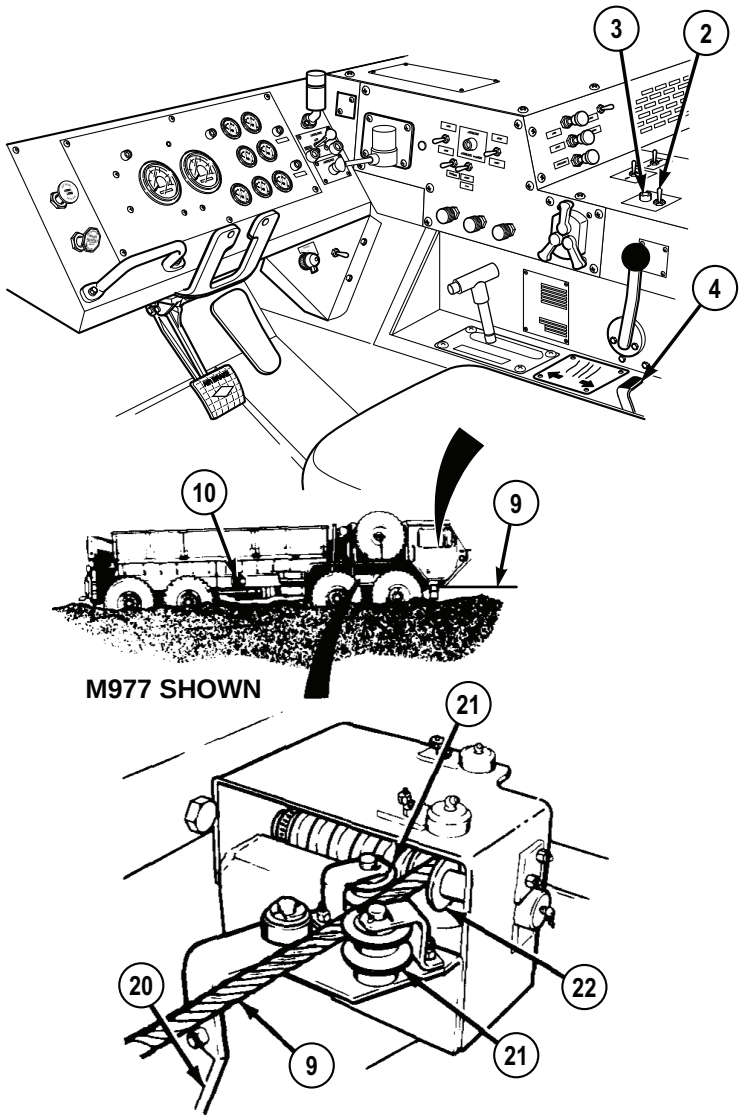


Figure 7.

30. Put winch cable (9) between tensioning device pulleys (21).
31. Release tension pulley lever (20).
32. Check that winch cable (9) rests inside grooves of both tensioning device pulleys (21) and sheave (22).

WINCH MIRED VEHICLE FORWARD - Continued

33. Check that winch cable (9) is not caught on vehicle or any other objects.

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.

34. Ensure all personnel are clear of self-recovery winch (10) and winch cable (9).
35. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.
36. Move winch shift lever (4) to IN until slack is out of cable.
37. Release winch shift lever (4) to center position.

WARNING

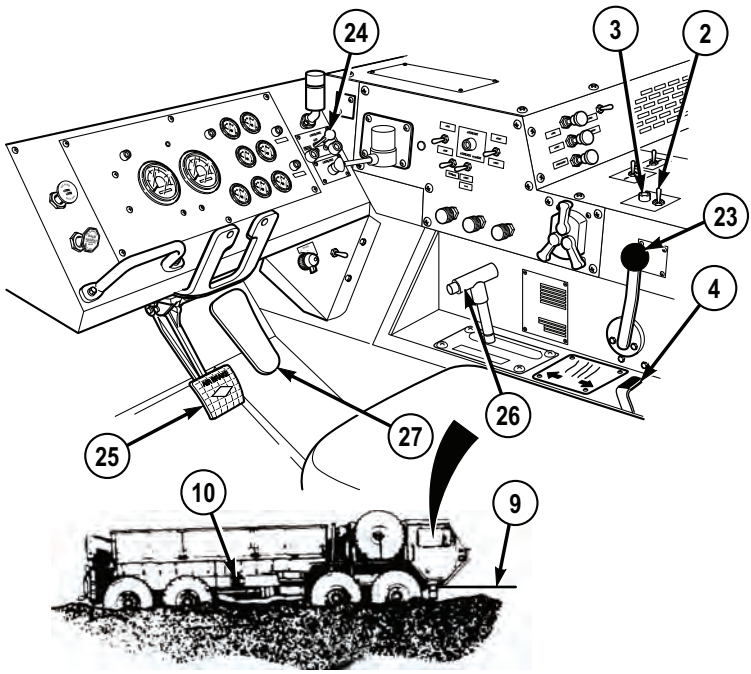
Keep all personnel clear of area near winch cable when tension is on cable. Failure to comply may result in injury or death to personnel.

CAUTION

- Self-recovery winch is not designed to winch mired vehicle by itself. Mired vehicle drive system power must always be used with winch to self-recover vehicle, or damage to equipment can result.
- If winch does not move mired vehicle, stop using winch, overheat damage may result.

38. Ensure TRANSFER CASE shift lever (23) is set to LO.

WINCH MIRED VEHICLE FORWARD - Continued



M977 SHOWN

Figure 8.

39. Ensure TRACTION CONTROL lever (24) is set to INTER-AXLE DIFF. LOCK.
40. Apply service brake pedal (25).
41. Set transmission range selector (26) to 1 (1st gear range).
42. Release service brake pedal (25).
43. Move winch shift lever (4) to IN and apply slight pressure to throttle pedal (27).

NOTE

Keep winch cable tight at all times so cable does not get tangled with vehicle.

44. Adjust position of throttle pedal (27) to change engine speed as needed to keep winch cable (9) tight and vehicle moving.
45. When mired vehicle is on solid ground, release winch shift lever (4) to center position.
46. Park vehicle. (WP 0056)

WINCH MIRED VEHICLE FORWARD - Continued

47. Set winch shift lever (4) to OUT and pay out winch cable (9) until all tension is off cable.
48. When all tension is off winch cable (9), release winch shift lever (4) to center position.
49. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.

NOTE

If winch cable is connected to another vehicle, refer to Connect/ Disconnect Self-Recovery Winch Cable to Another Vehicle (WP 0117) for disconnecting procedures.

50. Disconnect winch cable (9) from heavy object.
51. If snatch block was used, disconnect end of winch cable (10) from vehicle and remove snatch block from winch cable and from tree, other vehicle, or heavy object refer to FM 4-30.31. (Volume 2, WP 0200)

CAUTION

Do not reel clevis end of winch cable through roller guides. Clevis may catch on roller guide and cause cable or roller guide to break.

52. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.
53. Move winch shift lever (4) to IN.

WARNING

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

54. Reel in winch cable (9) while assistant uses tire iron extension handle to guide cable (9) onto self-recovery winch (10) so cable wraps are level across face of self-recovery winch (10).
55. When end of cable (9) is near front of vehicle, release winch shift lever (4) to center position.
56. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.

WINCH MIRED VEHICLE FORWARD - Continued

57. Remove quick release pin (16) and guide bracket (17). Move cable guide brackets (18) apart so winch cable (9) can be removed from sheave (19).

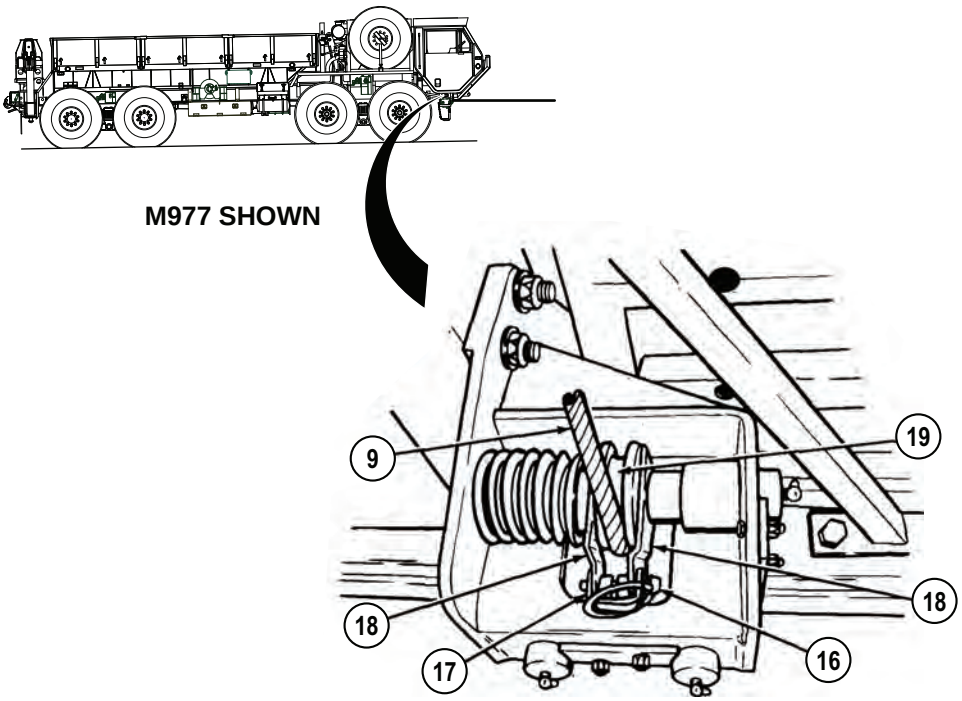


Figure 9.

58. Move cable guide bracket (18) together. Install guide bracket (17) and quick release pin (16).

59. Pull back and hold tension pulley lever (20).

WINCH MIRED VEHICLE FORWARD - Continued

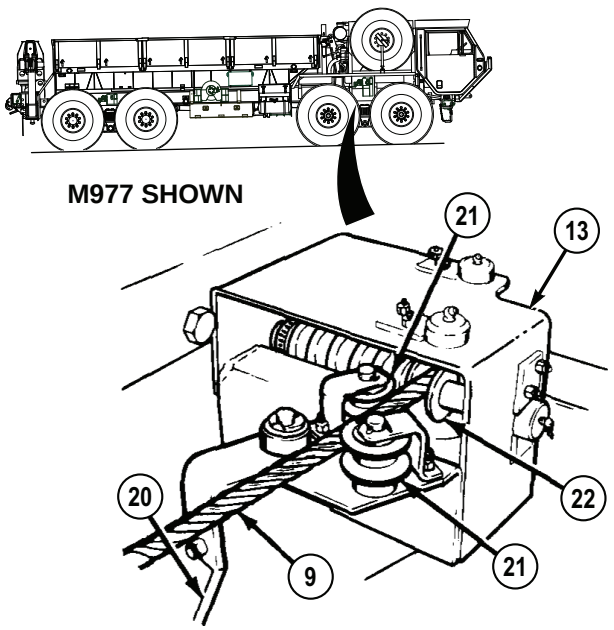


Figure 10.

60. Lift winch cable (9) out of tensioning device pulleys (21).
61. Release tension pulley lever (20).
62. Pull winch cable (9) back and out of cable guide (13).
63. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.

WINCH MIRED VEHICLE FORWARD - Continued

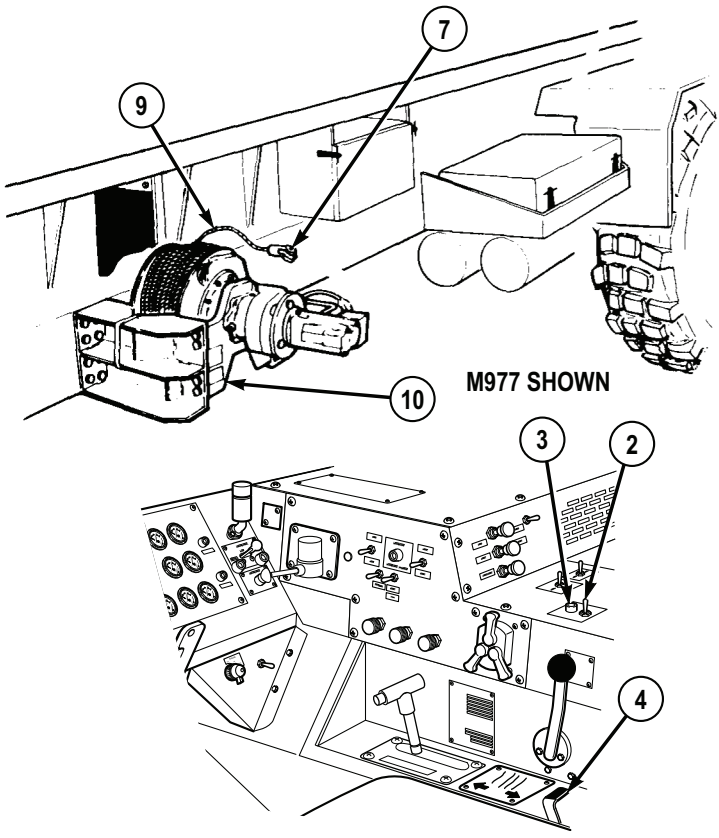


Figure 11.

64. While assistant guides winch cable (9), move winch shift lever (4) to IN.
65. When clevis (7) is approximately 2 ft. (61 cm) from winch (10), release winch shift lever (4) to center position.
66. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.
67. Assistant connects clevis (7) at end of winch cable (9) to tie down ring (8) with pin (6) and cotter pin (5).

WINCH MIRED VEHICLE FORWARD - Continued

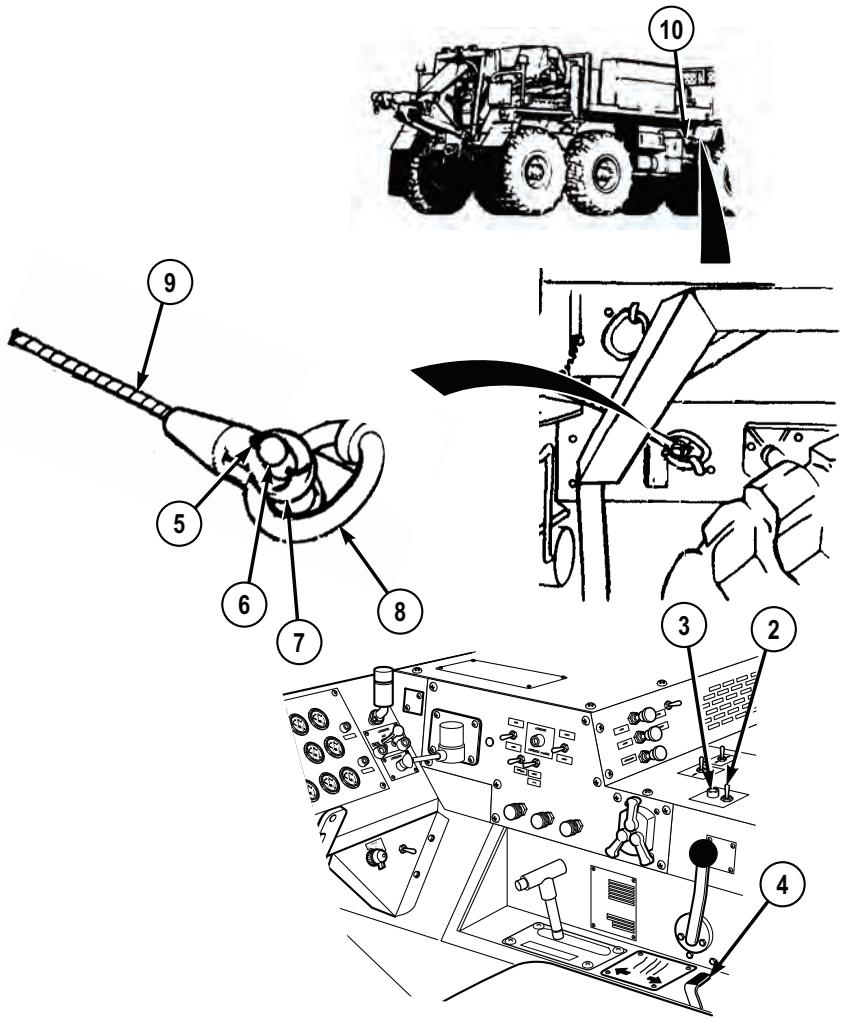


Figure 12.

68. Set PTO ENGAGE switch (2) to ON position. Indicator light (3) will illuminate.

WINCH MIRED VEHICLE FORWARD - 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.

69. Order all personnel to stand clear of area near winch (10).

CAUTION

Do not reel in winch cable too tightly. If too much tension is applied, cable or tie down ring can break, or winch may be damaged.

70. Once assistant and all other personnel are clear of area, move winch shift lever (4) to IN and take all slack out of winch cable (9).
71. When winch cable (9) is tight, release winch shift lever (4) to center position.
72. Set PTO ENGAGE switch (2) to OFF position. Indicator light (3) will go out.
73. Shut off engine. (WP 0057)
74. Adjust mirror (1) for driving.

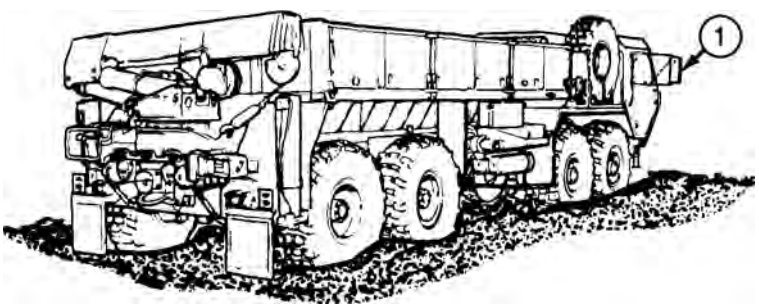


Figure 13.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SNATCH BLOCK INSTALLATION/REMOVAL

INITIAL SETUP:

Not Applicable

ATTACH SNATCH BLOCK TO SELF-RECOVERY WINCH CABLE

1. Remove snatch block (1) from stowage.

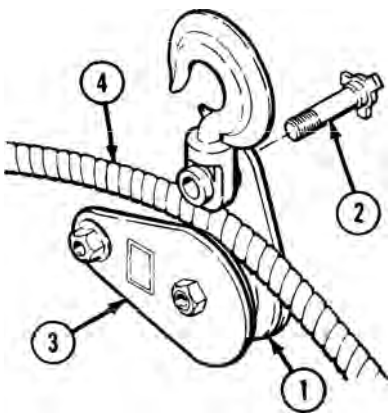


Figure 1.

2. Remove screw (2).
3. Move plate (3) to side to open snatch block (1).
4. Place winch cable (4) in snatch block (1).
5. Close plate (3) and align holes.
6. Install screw (2).
7. Ensure screw (2) is tight and winch cable (4) can be moved freely through snatch block (1).
8. Continue with self-recovery operation (WP 0115).

REMOVE SNATCH BLOCK FROM SELF-RECOVERY WINCH CABLE

1. Check that there is enough slack in winch cable (1).

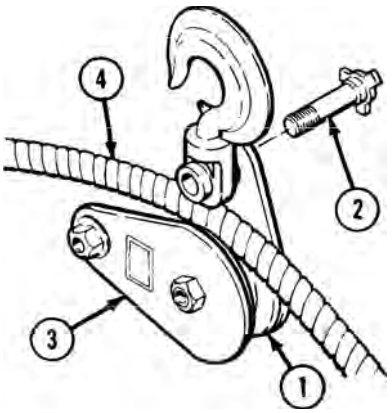


Figure 2.

2. Remove screw (2).
3. Move plate (3) to side to open snatch block (4).
4. Take winch cable (1) out of snatch block (4).
5. Close plate (3) and align holes.
6. Install screw (2).
7. Stow snatch block (4) in stowage box.
8. Continue with self-recovery operation (WP 0115).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CONNECT/DISCONNECT SELF-RECOVERY WINCH CABLE TO ANOTHER VEHICLE

INITIAL SETUP:

Not Applicable

CONNECT CABLE TO VEHICLE

CAUTION

When attaching self-recovery winch cable to another vehicle, that vehicle must be used only as an anchor point or damage to equipment can result.

NOTE

There are three tie down rings on each side of vehicle.

1. Unscrew one tie down ring (1) from mounting plate (2).

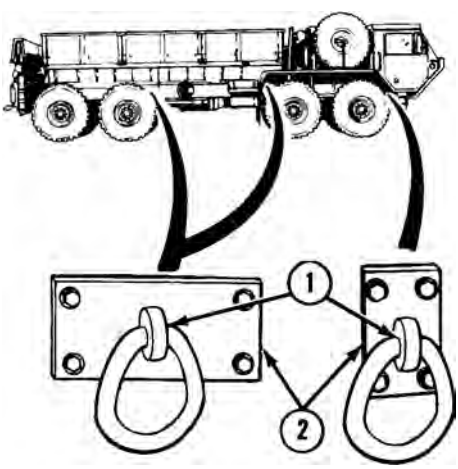


Figure 1.

2. Remove lifting shackle (3) from stowage.

CONNECT CABLE TO VEHICLE - Continued

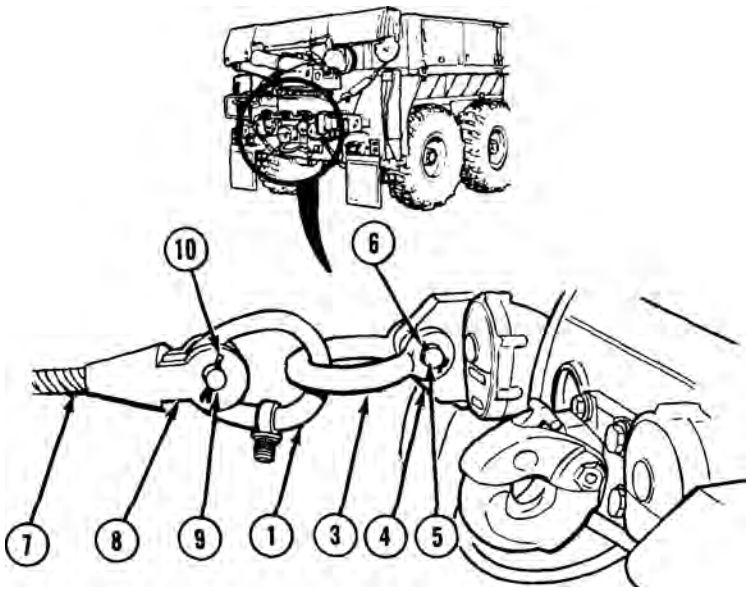


Figure 2.

3. Insert lifting shackle (3) through tie down ring (1).
4. Connect lifting shackle (3) to left front of left rear tow eye (4) with pin (5).
5. Install cotter pin (6).
6. Connect self-recovery winch cable (7) with clevis (8) to tie down ring (1) with pin (9).
7. Install cotter pin (10).
8. Continue with self-recovery winch operation. (WP 0115)

DISCONNECT CABLE FROM VEHICLE

1. Ensure there is enough slack in winch cable (1).

DISCONNECT CABLE FROM VEHICLE - Continued

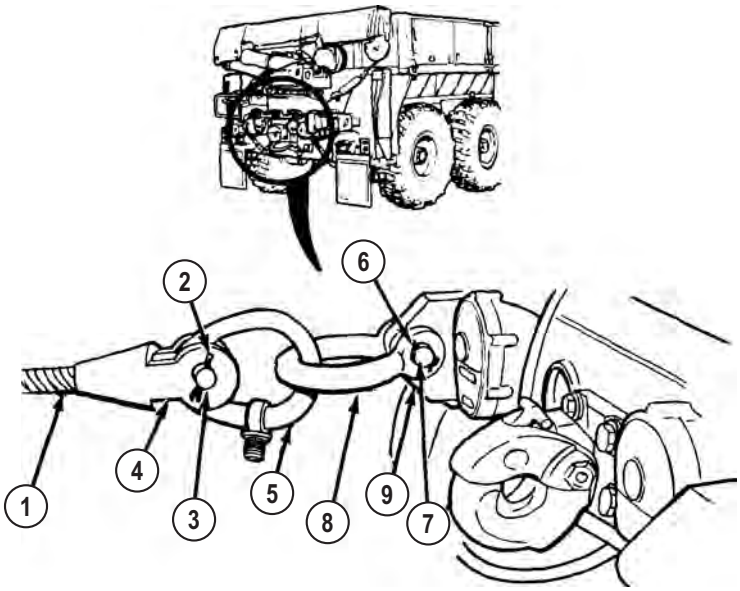


Figure 3.

2. Remove cotter pin (2).
3. Remove pin (3) and disconnect clevis (4) from tie down ring (5).
4. Remove cotter pin (6).
5. Remove pin (7) and disconnect lifting shackle (8) from tow eye (9).
6. Remove tie down ring (5) from lifting shackle (8).
7. Stow lifting shackle (8).

NOTE

There are three tie down rings on each side of vehicle.

8. Install tie down ring (5) into mounting plate (10).

DISCONNECT CABLE FROM VEHICLE - Continued

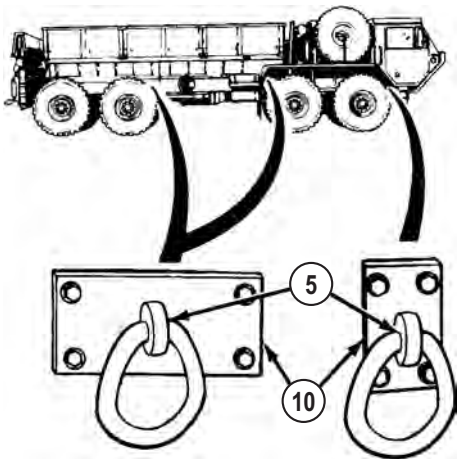


Figure 4.

9. Continue with self-recovery winch operation. (WP 0115)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TOW DISABLED VEHICLE

INITIAL SETUP:

Not Applicable

TOW DISABLED VEHICLE

CAUTION

- When towing another vehicle, do not go over GCWR given in equipment data (WP 0006). Failure to comply may result in damage to equipment.
- Propeller shaft must be removed by field level maintenance before towing disabled vehicle or equipment may be damaged.

NOTE

Disabled vehicles must be prepared and moved in accordance with FM 21-305 . If instructed to do so, manually release spring brakes (WP 0129) as part of preparing disabled vehicle for towing.

1. Install and operate portable beacon lights. (WP 0097)
2. Set TRANSFER CASE shift lever (1) to NEUT (neutral) position.
3. Set TRACTION CONTROL lever (2) to OFF.

TOW DISABLED VEHICLE - Continued

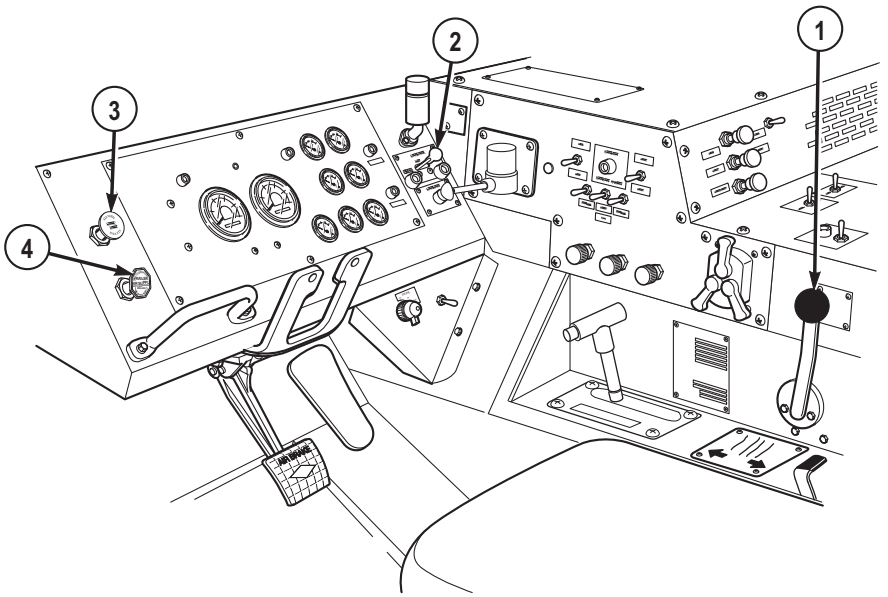


Figure 1.

4. Push in PARKING BRAKE control on disabled vehicle (refer to operator's manual).
5. Push in TRAILER AIR SUPPLY control (4) on recovery vehicle.
6. Transport disabled vehicle.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
CONNECT/DISCONNECT TOW BAR

INITIAL SETUP:

Personnel Required
Operator and Assistant(s) - - - (3)

CONNECT TOW BAR

WARNING

Do not use 10-ton tow bar with self-guided coupler (normally found on some M1120 LHS and M1977 CBT models). Self-guided coupler is not compatible with 10-ton tow bar. Failure to comply may result in injury or death to personnel

WARNING

Tow bar is heavy. Do not attempt to lift or move tow bar without the aid of two assistants and a lifting device. Failure to comply may result in injury or death to personnel.

NOTE

- This procedure is a three soldier task.
- The 10-ton tow bar should always be used in conjunction with two 16 ft. (5 m) safety chains.
- Allow ample distance between towing vehicle and disabled vehicle to connect 10-ton tow bar.

1. Align rear of towing vehicle near front of disabled vehicle.

CONNECT TOW BAR - Continued

WARNING

Tow bar is heavy. Do not attempt to lift or move tow bar without the aid of two assistants and a lifting device. Failure to comply may result in injury or death to personnel.

2. With aid of two assistants and a lifting device, remove tow bar (1) from stowage.

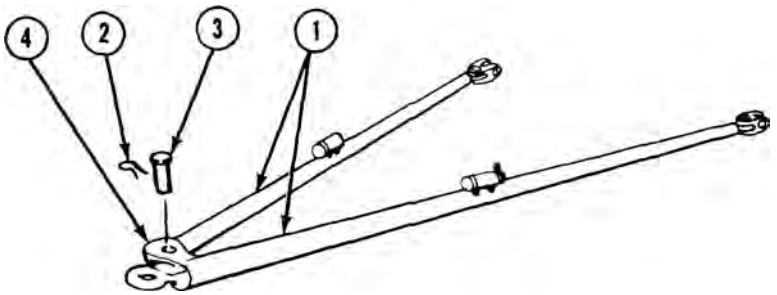


Figure 1.

3. Remove cotter hairpin (2) and pin (3) from tow bar (1).
4. Separate tow bar (1) at pivot point (4).

NOTE

Towing eyes on all models of HEMTT series vehicles are same in appearance, operation, and location. HEMTT M977 shown.

5. Position legs of tow bar (1) in front of disabled vehicle with spare pins (5) facing up.

CONNECT TOW BAR - Continued

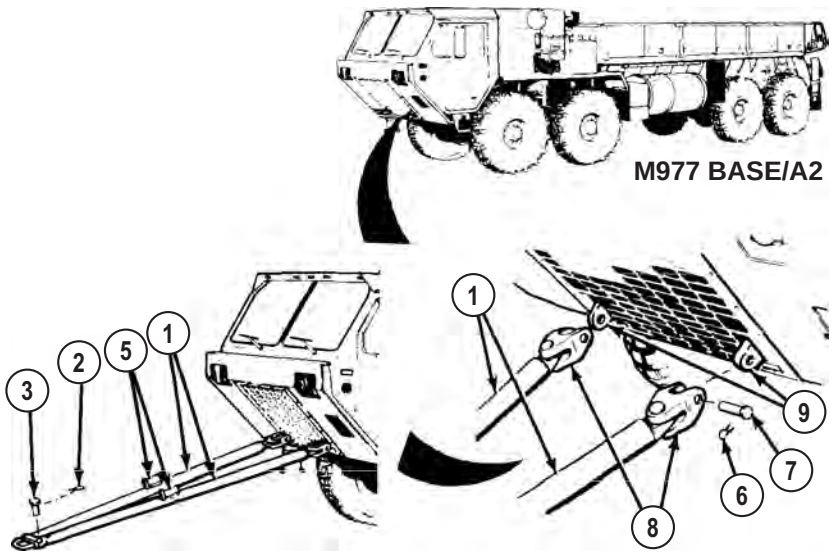


Figure 2.

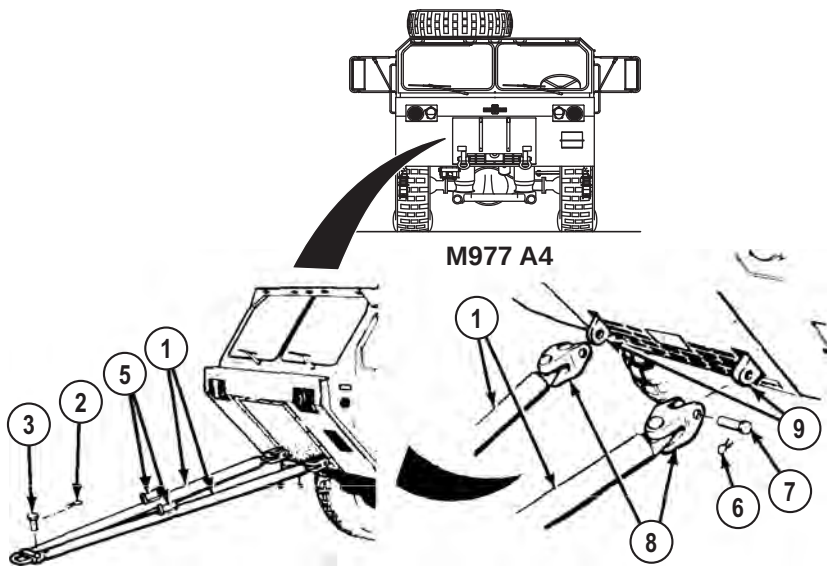


Figure 3.

6. Remove two cotter hairpins (6) and pins (7) from tow bar shackles (8).

CONNECT TOW BAR - Continued

WARNING

Tow bar is heavy. Do not attempt to lift or move tow bar without the aid of two assistants and a lifting device. Failure to comply may result in injury or death to personnel.

7. While two assistants hold one leg of tow bar (1) and align shackle (8) with towing eye (9), install pin (7) and cotter hairpin (6).
8. Repeat Step (7) for other leg of tow bar (1).
9. Align legs of tow bar (1) at pivot point (4) and install pin (3) and cotter hairpin (2).

WARNING

Do not use 10-ton tow bar with self-guided coupler (normally found on some M1120 LHS and M1977 CBT models). Self-guided coupler is not compatible with 10-ton tow bar. Failure to comply may result in injury or death to personnel

NOTE

Pintle hook on all models of HEMTT series vehicles are same in appearance, operation, and location. HEMTT M977 shown.

10. Position the towing vehicle so pintle hook (11) is aligned with tow bar lunette eye (13).
11. Remove cotter pin (10) from pintle hook (11).

CONNECT TOW BAR - Continued

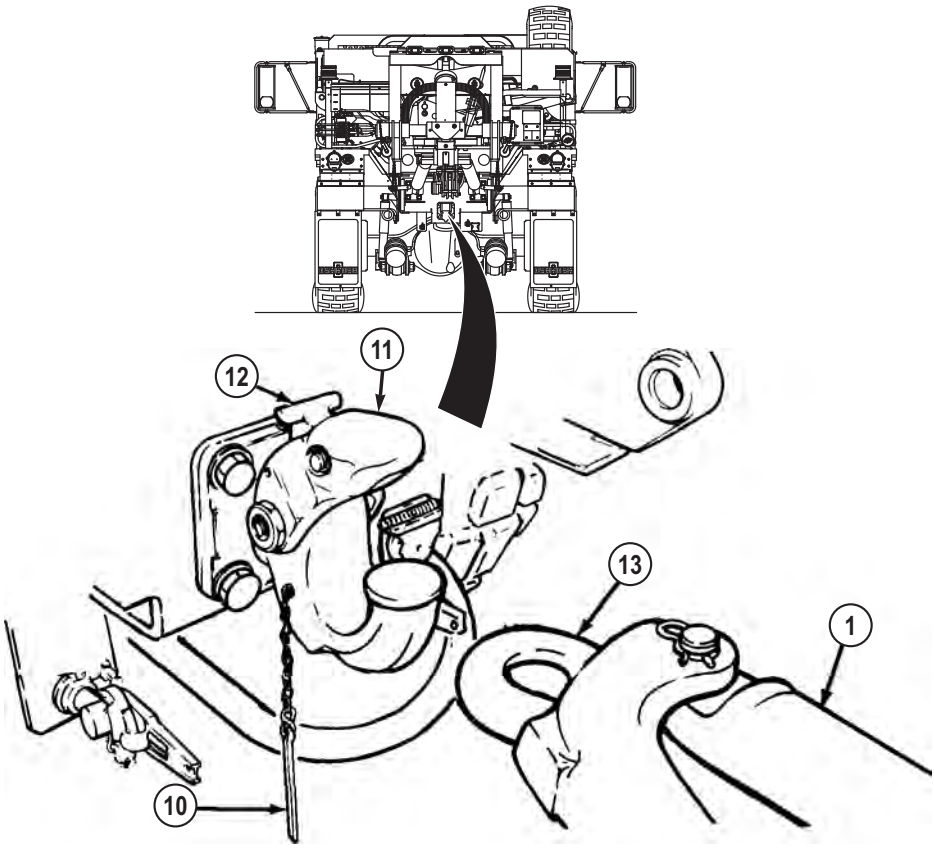


Figure 4.

12. Pull latch (12) away from vehicle and hold.
13. Lift top of pintle hook (11) and let go of latch (12). Pintle hook (11) will be locked open.

WARNING

Tow bar is heavy. Do not attempt to lift or move tow bar without the aid of two assistants and a lifting device. Failure to comply may result in injury or death to personnel.

CONNECT TOW BAR - Continued

WARNING

Do not put hands near pintle hook while aligning lunette eye with pintle hook. Failure to comply may result in injury or death to personnel.

14. While two assistants lift tow bar (1), slowly back up towing vehicle until tow bar lunette eye (13) connects to pintle hook (11).
15. Pull latch (12) and close top half of pintle hook (11).
16. Install cotter pin (10) in pintle hook (11).

NOTE

If air system of disabled vehicle is damaged, manually release spring brakes (WP 0129) and skip to Step (20).

17. Remove two intervehicular air lines (14) from stowage.

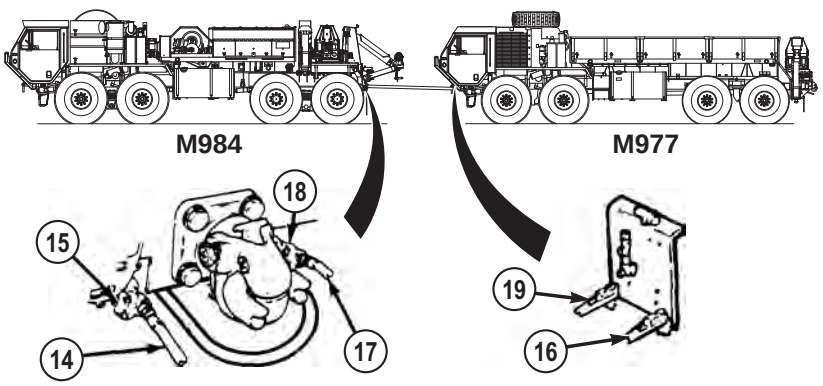


Figure 5.

NOTE

Gladhands on all models of HEMTT series vehicles are same in appearance, operation, and location. HEMTT M977 shown.

18. Connect first intervehicular air line (14) to driver side rear gladhand (15) of towing vehicle and driver side front gladhand (16) of disabled vehicle.

CONNECT TOW BAR - Continued

19. Connect second intervehicular air line (17) to passenger side rear gladhand (18) of towing vehicle and passenger side front gladhand (19) of disabled vehicle.

20. Remove two 16 ft. (5 m) safety chains (20) from stowage.

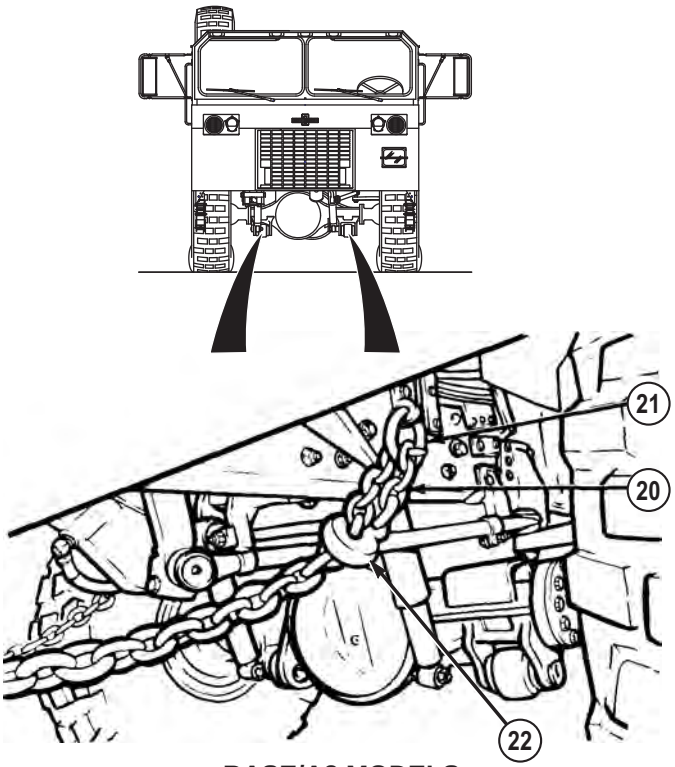
NOTE

- Both driver side and passenger side tie down rings are same. Driver side shown.
- If disabled vehicle is either a BASE or A2 model HEMTT series vehicle (refer to data plate on inside of driver side door), complete Step (21). If disabled vehicle is an A4 model HEMTT series vehicle (refer to data plate on inside of driver side door), skip to Step (22).

21. Connect 16 ft. (5 m) safety chain (20) to disabled vehicle tie down ring (21):

    a. Route end (without safety shackle) of 16 ft. (5 m) safety chain (20) through tie down ring (21).

CONNECT TOW BAR - Continued



BASE/A2 MODELS

Figure 6.

b. Attach grab hook (22) back into 16 ft. (5 m) safety chain (20).

CAUTION

Special care should be taken when connecting 16 ft. (5 m) safety chain to tie down ring. The procedure listed below routes the 16 ft. (5 m) safety chain in such a way to minimize excessive contact with vehicle air suspension air springs during towing. Failure to comply may result in damage to equipment.

NOTE

Both driver side and passenger side tie down rings are same. Driver side shown.

22. Connect 16 ft. (5 m) safety chain (20) to disabled vehicle tie down ring (21):

CONNECT TOW BAR - Continued

a. Route end (without safety shackle) of 16 ft. (5 m) safety chain (20) through tie down ring (21) from inboard to outboard until grab hook (22) hangs just below bottom of air spring (23).

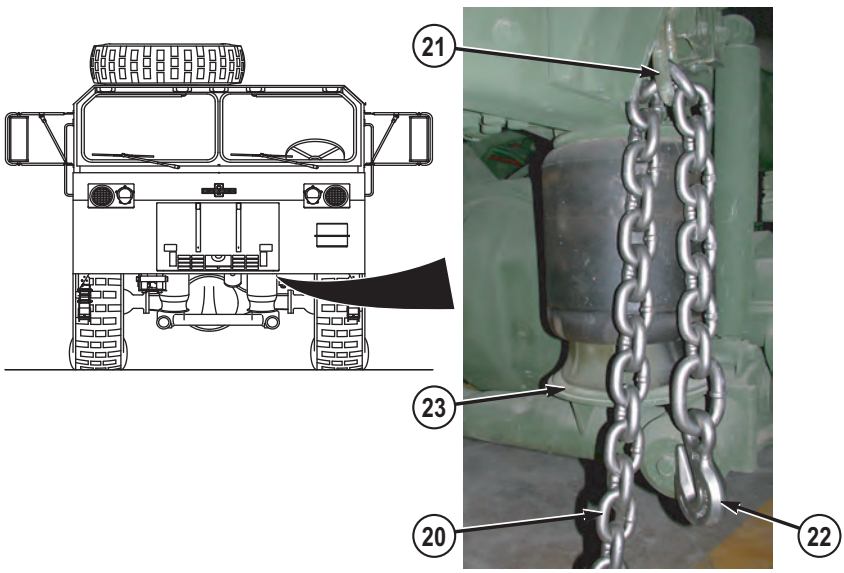


Figure 7.

b. Hook 16 ft. (5 m) safety chain (20) back to itself. Grab hook (22) should open towards ground (shown) when tension is applied to 16 ft. (5 m) safety chain (20).

CONNECT TOW BAR - Continued

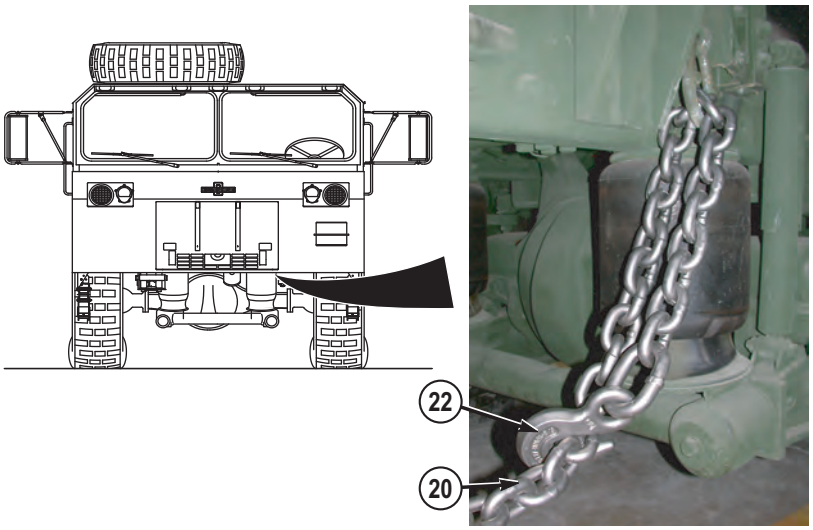


Figure 8.

23. Repeat Step (21) or (22) for other side of disabled vehicle (as applicable).

NOTE

- 16 ft. (5 m) safety chain may be attached to either safety chain loop or towing shackles.
- 16 ft. (5 m) safety chain should be attached so they are just above, but not in contact with the ground.

24. Route free ends of two 16 ft. (5 m) safety chains (20) through safety chain loop (24) on towing vehicle and attach each 16 ft. (5 m) safety chain (20) back into itself as shown.

CONNECT TOW BAR - Continued

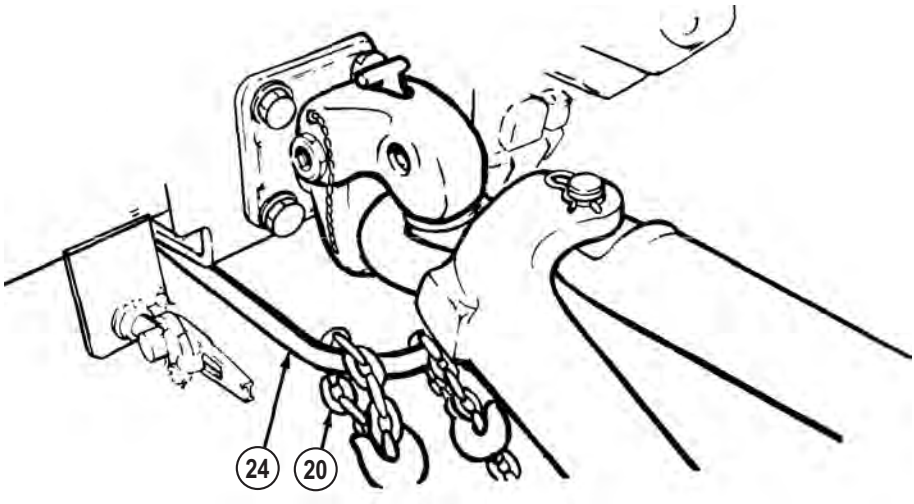


Figure 9.

25. Tow disabled vehicle. (WP 0118)

DISCONNECT TOW BAR

NOTE

- This procedure is a three soldier task.
- Vehicle should be parked and disconnected on level ground.

1. Park towing vehicle. (WP 0056)
2. Pull out TRAILER AIR SUPPLY control (1) on towing vehicle.

DISCONNECT TOW BAR - Continued

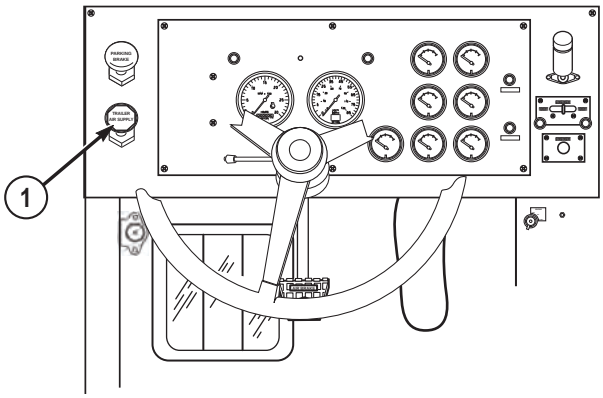


Figure 10.

NOTE

If disabled vehicle parking brake is inoperable and/or spring brakes on disabled vehicle were manually released, install wheel chocks (refer to operator's manual).

3. Engage parking brake on disabled vehicle (refer to operator's manual).
4. Disconnect two 16 ft. (5 m) safety chains (2) from towing vehicle and disabled vehicle. Return 16 ft. (5 m) safety chains (2) to stowage.

DISCONNECT TOW BAR - Continued

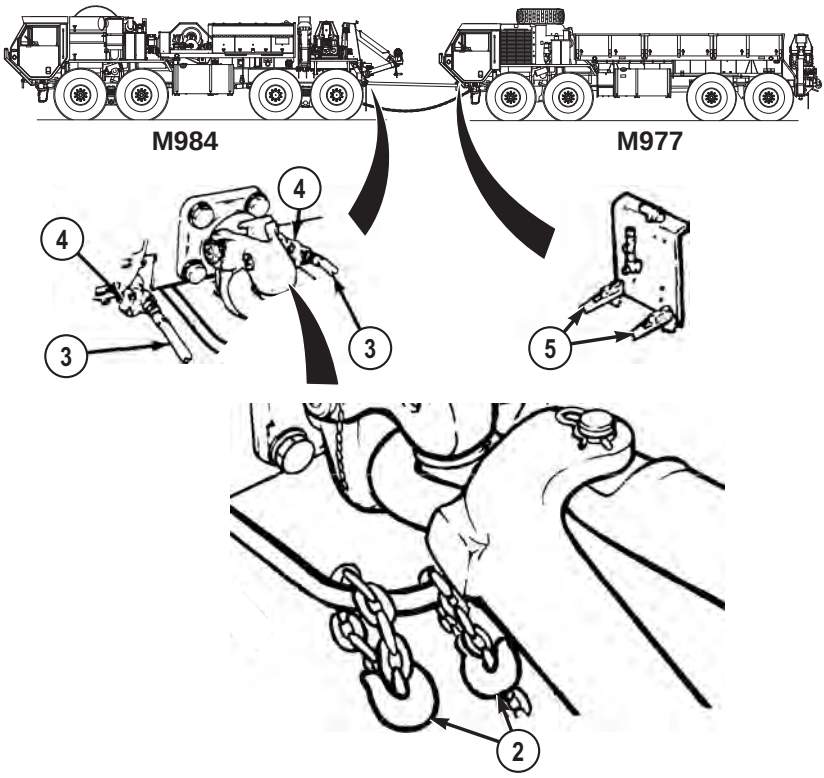


Figure 11.

NOTE

If spring brakes on disabled vehicle were manually released before towing, skip to Step (6).

5. Disconnect two intervehicular air lines (3) from towing vehicle rear gladhands (4) and from disabled vehicle front gladhands (5). Return intervehicular air lines (5) to stowage.

6. Remove cotter pin (6) from towing vehicle pintle hook (7).

DISCONNECT TOW BAR - Continued

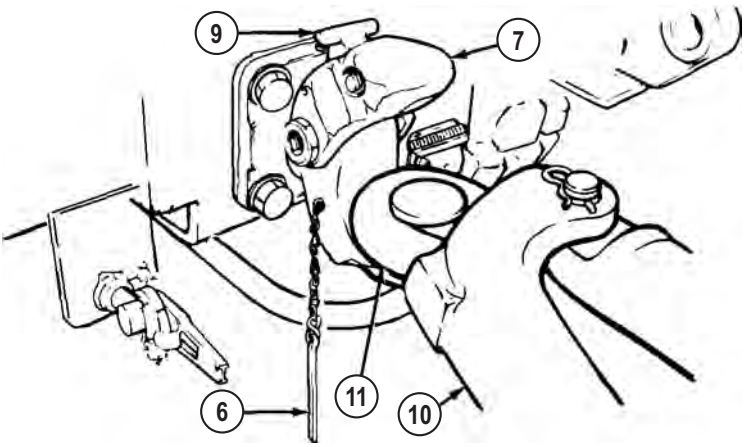


Figure 12.

7. Pull latch (9) away from vehicle and hold.
8. Lift top of pintle hook (7) and let go of latch (9). Pintle hook (7) will be locked open.
9. As two assistants lift tow bar (10) until lunette eye (11) is clear of pintle hook (10), drive towing vehicle forward (WP 0050) approximately 15 ft. (4.6 m).
10. As assistants lower tow bar (10) to the ground, park towing vehicle. (WP 0056)
11. Pull latch (9) to close towing vehicle pintle hook (7) and install cotter pin (6) in pintle hook (7).
12. Remove cotter hairpin (12) and pin (13) and separate tow bar (10) at pivot point (14).

DISCONNECT TOW BAR - Continued

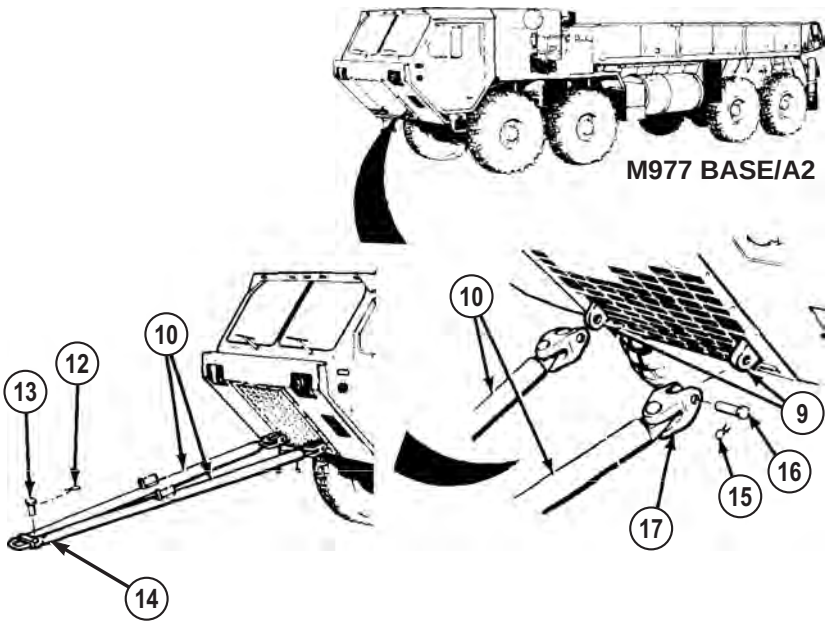


Figure 13.

DISCONNECT TOW BAR - Continued

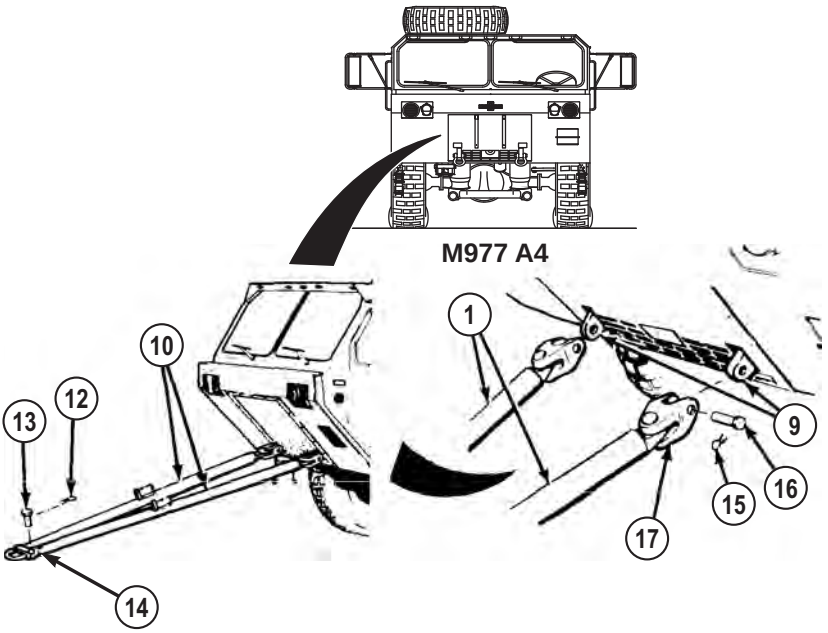


Figure 14.

13. With aid of an assistant, hold one leg of tow bar (10) while another assistant removes cotter hairpin (15) and pin (16) from shackle (17).
14. Repeat Step (13) for other leg of tow bar (10).
15. With aid of two assistants, lower tow bar (10) to the ground.
16. Install two pins (16) and cotter hairpins (15) is shackles (17).
17. Align legs of tow bar (10) at pivot point (14) and install pin (13) and cotter hairpin (12).

WARNING

Tow bar is heavy. Do not attempt to lift or move tow bar without the aid of two assistants and a lifting device. Failure to comply may result in injury or death to personnel.

DISCONNECT TOW BAR - Continued

18. With aid of two assistants and lifting device, return tow bar (10) to stowage.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN EXTREME HEAT

INITIAL SETUP:

Not Applicable

EXTREME HEAT 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 strain as low as possible. Vehicle cooling and lubrication systems support each other. Failure of one system will rapidly cause failure of other systems.

NOTE

- Close heater valves to improve the efficiency of cabin air conditioning kit.
- Closing the heater valves disables cabin heat.

1. Keep operating temperatures as low as possible:
   a. Set transmission range selector (1) to N (neutral) while engine is running and not required to move.
   b. Use low gear ranges only when necessary.
   c. Stop vehicle for cooling off periods, and idle engine as often as possible. Let engine idle for approximately 3 minutes before shutting down. Idling will cool engine faster than quick shutdown and may prevent damage from remaining engine heat.
   d. Check oil levels often. Oil seals are more likely to leak in extreme hot weather.
   e. Check air filter restriction indicator (2) frequently. If indicator shows red:
      (1) Park vehicle. (WP 0056)

EXTREME HEAT OPERATION - Continued

(2) Shut off engine. (WP 0057)

(3) Notify field level maintenance.

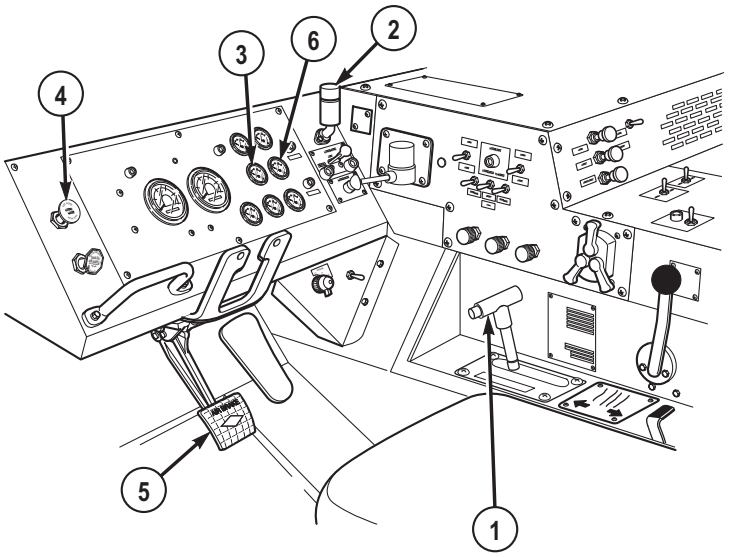


Figure 1.

2. If TRANS TEMP gauge (3) reads 250°F (121°C) or above, perform the following steps:
   a. Slow vehicle.
   b. Set transmission range selector (1) to next lower gear range.
   c. Continue operation.
   d. When TRANS TEMP gauge (3) reads normal range:
      (1) Set transmission range selector (1) to normal gear range.
      (2) Continue operation.
   e. If TRANS TEMP gauge (3) does not return to normal range:
      (1) Stop vehicle.
      (2) Set transmission range selector (1) to N (neutral).
      (3) Pull out PARKING BRAKE control (4).
      (4) Allow transmission to cool.
   f. When TRANS TEMP gauge (3) reads normal range:

EXTREME HEAT OPERATION - Continued

(1) Apply service brake pedal (5).

(2) Push in PARKING BRAKE control (4).

(3) Set transmission range selector (1) to normal gear range.

(4) Continue operation.

3. If WATER TEMP gauge (6) indicates coolant temperature is near overheating, perform the following steps:

   a. Slow vehicle.

   b. Set transmission range selector (1) to next lower gear range.

   c. Continue operation.

   d. When WATER TEMP gauge (6) reads normal range:

      (1) Set transmission range selector (1) to normal gear range.

      (2) Continue operation.

   e. If WATER TEMP gauge (6) does not return to normal range:

      (1) Stop vehicle.

      (2) Set transmission range selector (1) to N (neutral).

      (3) Pull out PARKING BRAKE control (4).

      (4) Allow engine to cool.

   f. When WATER TEMP gauge (6) reads normal range:

      (1) Apply service brake pedal (5).

      (2) Push in PARKING BRAKE control (4).

      (3) Set transmission range selector (1) to normal gear range.

      (4) Continue operation.

4. Check cooling system often and notify field level maintenance if any of the following are found:

   a. Low coolant level in radiator.

   b. Leaking hose connections which have been tightened but still leak.

   c. Cracked or leaking hoses.

   d. Radiator or charge air cooler fins/grill plugged with mud, debris, etc.

NOTE

- Batteries do not hold charge well in extreme heat.

EXTREME HEAT OPERATION - Continued

- Battery will be tagged (white circle printed on top) for use in extreme heat conditions as specific gravity must be changed to adjust for heat (refer to TM 9-6140-200-14).

5. Keep batteries full, but do not overfill. Check battery electrolyte daily.
6. In hot, damp climates check body and chassis often and notify field level maintenance if any of the following are found:
   a. Signs of pitting or paint blistering on metal surfaces.
   b. Signs of mildew, mold, or fungus on fabrics and rubber.
7. Adjust lubrication intervals as specified in applicable lubrication instructions (refer to PMCS).
8. Park vehicle (WP 0056) in sheltered area, out of wind if possible. If no shelter is available, park so vehicle does not face into wind.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATION IN EXTREME DUST

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN EXTREME DUST

CAUTION

Clouds of dust can scratch glass surfaces. Keep glass surfaces covered as much as possible in these conditions to prevent scratching.

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) located on top right side of driver's instrument panel.

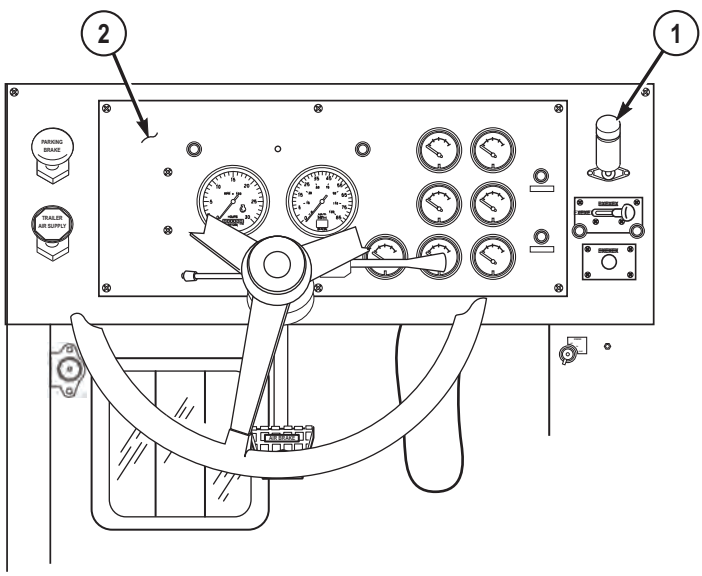


Figure 1.

3. Continuously scan gauges and indicators on driver's instrument panel (2) to be sure dust does not affect equipment.

OPERATE VEHICLE IN EXTREME DUST - Continued

4. Allow as much distance as possible between vehicles and operate at low speeds.
5. At stops, check and drain fuel/water separator (3).

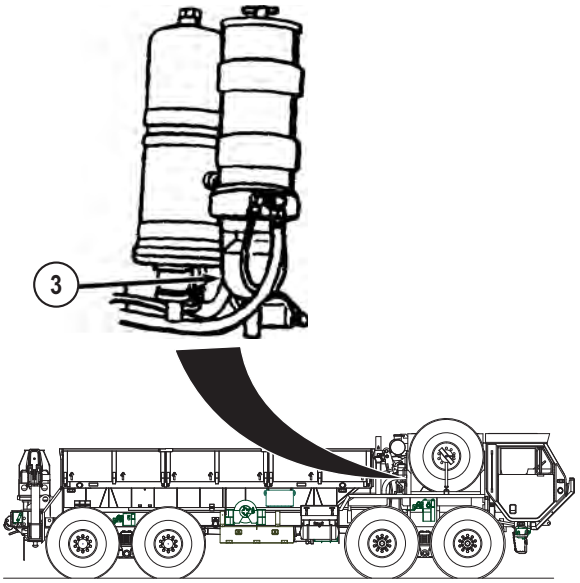


Figure 2.

6. When possible, park vehicle so it does not face into wind.

OPERATE GROVE CRANE IN EXTREME DUST

NOTE

Lubricate outrigger bottom plate, boom wear pads, and exposed rotation gears often when cranes are operating in dusty environment (refer to PMCS - Semiannual procedures (Volume 2, WP 0186) for more information).

1. When operating the grove crane in a blowing dust environment, perform the following:
   a. Check gear teeth of rotation gear bearing and pinion for an accumulation of dust within the lubricant.

OPERATE GROVE CRANE IN EXTREME DUST - Continued

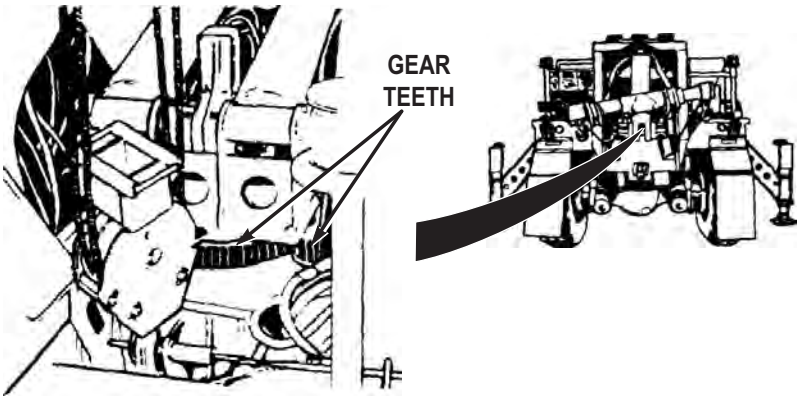


Figure 3.

b. If level of dust prevents rotation of crane, notify field level maintenance and have lubricant removed.

c. If necessary, notify field level maintenance to apply a light coating of wax to gear teeth for rust prevention.

d. Refer to appropriate PMCS for proper lubrication of gear teeth when returning to normal operating conditions.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN SAND OR MUD

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN SAND OR MUD

CAUTION

Blowing sand may scratch glass surfaces. Glass surfaces should remain covered as much as possible in these conditions to prevent scratching.

NOTE

Operating in mud can worsen vehicle braking and speed up brake 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 brakedrums totally out of mud, so that drying action can take place. If adequate braking is not restored by drying brakes, notify field level maintenance.

1. Leave glass surfaces covered if not needed for operations. 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. Best time to drive on sand is at night or early morning when sand is damp. Damp sand gives better traction.

   a. Check air filter restriction indicator (1) often.

2. Adjust tires to correct tire pressure for type tire and environment. (WP 0006)

NOTE

Positioning TRANSFER CASE shift lever to LO automatically activates 8X8 drive.

3. Set TRANSFER CASE shift lever (2) to LO. 8X8 DRIVE indicator (3) will illuminate.

OPERATE VEHICLE IN SAND OR MUD - Continued

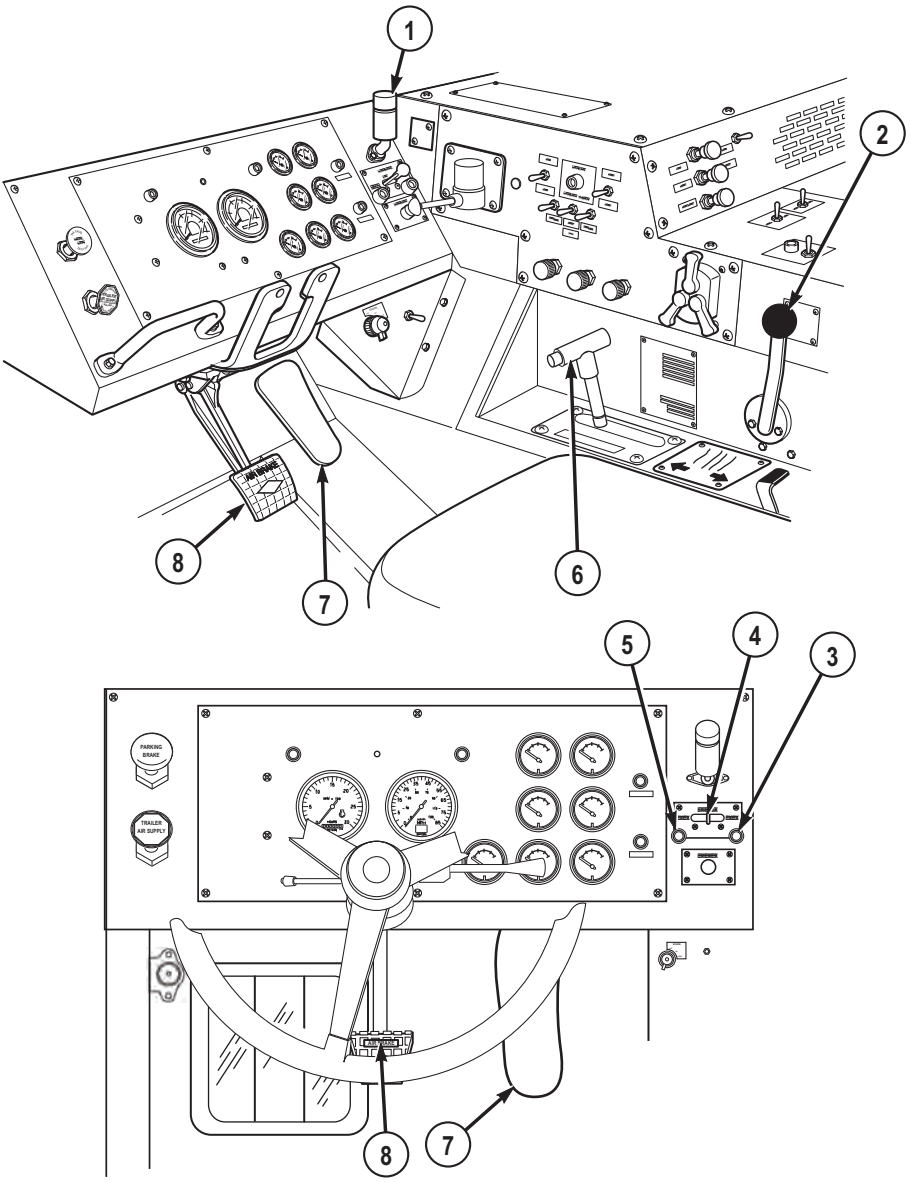


Figure 1.

OPERATE VEHICLE IN SAND OR MUD - Continued

CAUTION

Wheel hop condition should be avoided to prevent possible damage to drivetrain. If wheel hop begins to occur, ease up on throttle to allow tires to grip surface. If wheel hop continues, release throttle and apply brakes. Apply throttle slowly as traction permits.

4. Start slowly. Do not spin wheels when starting to move vehicle.
5. Set TRACTION CONTROL lever (4) to INTER-AXLE DIFF LOCK for added traction. Indicator light (5) will illuminate.
6. Set transmission range selector (6) to 2 (2nd) or 1 (1st), 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 pedal (7) steady after vehicle reaches desired speed.
9. Turn vehicle slowly when on loose sand or mud.
10. Steer vehicle straight up and down hills if possible.
11. To move vehicle forward and turn after vehicle is stopped in loose sand or mud, do the following:
    a. Set transmission range selector (6) to R (reverse).
    b. Press throttle pedal (7) and move vehicle straight back about 20 ft. (6.1 m).
    c. Release throttle pedal (7) and press service brake pedal (8).
    d. Set transmission range selector (6) to 1 (1st).
    e. Release service brake pedal (8) and press throttle pedal (7) to move vehicle forward.
    f. Turn vehicle gradually.
    g. Set transmission range selector (6) to D (drive) when vehicle picks up speed and is moving forward smoothly.
12. If vehicle starts to skid, do the following:
    a. Release throttle pedal (7).
    b. Steer in direction of skid until vehicle stops skidding.
    c. Press throttle pedal (7) slowly and steer vehicle on straight course.

OPERATE GROVE CRANE IN SAND OR MUD

CAUTION

Take necessary precautions to ensure a firm footing for the crane outriggers by using a field-expedient blocking underneath the outrigger pads. Refer to FM 4-30.31 for additional information on vehicle recovery operations.

NOTE

Lubricate outrigger bottom plate, boom wear pads, and exposed rotation gears often when cranes are operating in dusty environment (refer to PMCS - Semiannual procedures (Volume 2, WP 0186) for more information).

1. When operating a grove crane in a blowing sand environment, perform the following:
2. Check gear teeth of rotation gear bearing and pinion for an accumulation of sand within the lubricant.

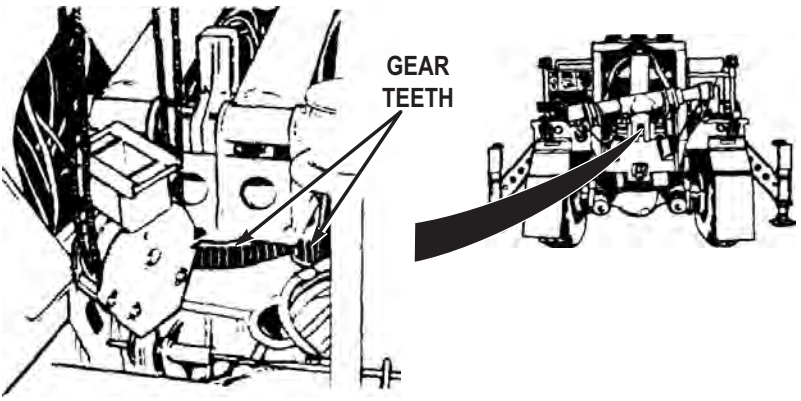


Figure 2.

3. If level of sand prevents rotation of crane, notify field level maintenance and have lubricant removed.
4. If necessary, notify field level maintenance to apply a light coating of wax to gear teeth for rust prevention.
5. Refer to PMCS for proper lubrication of gear teeth when returning to normal operating conditions.

PARK VEHICLE

1. Park vehicle as follows:

PARK VEHICLE - Continued

a. Vehicle should not face into wind.

b. Clean mud off vehicle as soon as possible.

CAUTION

- Do not hit axle breathers when cleaning mud from axles.
- Do not direct high pressure water stream at glass surfaces, seals, air intake, axle breathers, exhaust outlet, or any other component of vehicle that could be easily damaged by high pressure water stream.

2. Clean mud from wheels, brakes, axles, universal joints, steering mechanism, and radiator as soon as possible.

3. Make sure axle breather vent caps move freely on breather body.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN DESERT ENVIRONMENT

INITIAL SETUP:

Not Applicable

DESERT ENVIRONMENT OPERATION

NOTE

FM 90-3 contains detailed instructions for living and working in desert.

1. Principles for operating in extreme heat (WP 0120) and extreme dust (WP 0121), sand, or mud (WP 0122) apply to desert environment.

NOTE

- Close heater valves to improve the efficiency of cabin air conditioning kit.
- Closing the heater valves disables cabin heat.

2. Temperatures may change as much as 70°F (21°C) degrees between day and night. These changes may damage equipment if vehicle is not properly prepared.
   a. 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.
   b. Precision instruments may be affected by temperature changes and may need adjustment more often.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN COLD ENVIRONMENT (32°F [0°C] TO -25°F [-32°C])

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN COLD ENVIRONMENT

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 . Refer to FM 31-70 , FM 31-71 , and FM 21-305 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.
- 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.
- 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.
- Special care must be used during operations in extreme cold environment. In extreme cold, engine coolant and fluid in windshield

OPERATE VEHICLE IN COLD ENVIRONMENT - Continued

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 is a must for extreme cold operation.

1. Install tire chains, as needed. (WP 0112)

NOTE

Use ether start system when starting a cold engine.

2. Start engine (WP 0044) and allow engine warm up thoroughly.
3. Let engine warm up thoroughly.

NOTE

Positioning TRANSFER CASE shift lever to LO automatically activates 8X8 drive.

4. Set TRANSFER CASE shift lever (1) to LO. 8X8 DRIVE indicator (2) will illuminate.

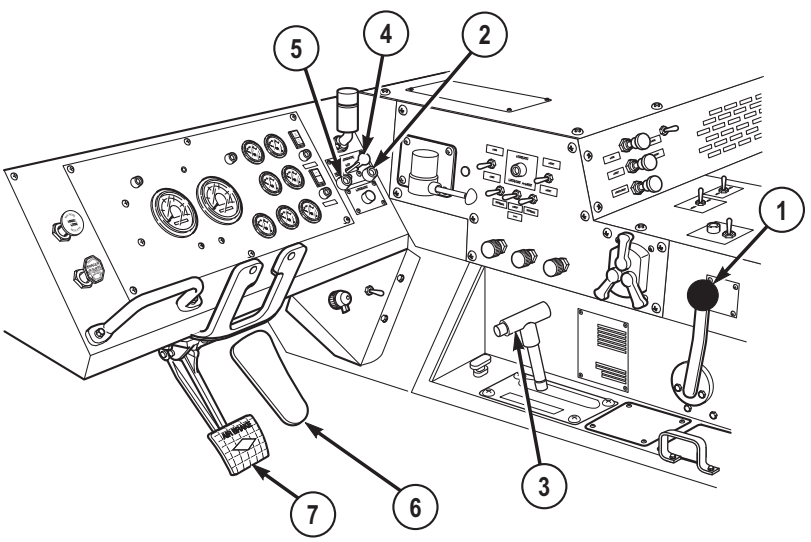


Figure 1.

5. Set transmission range selector (3) to 1 (1st gear range) and drive at lowest possible speed to warm driveline components and tires.
6. Drive on mud, snow, ice, and slippery surfaces as follows:

OPERATE VEHICLE IN COLD ENVIRONMENT - Continued

NOTE

- TRACTION CONTROL lever should be set to 8X8 DRIVE when transfer case shift lever is set to HI range while driving on slippery surfaces.
- Positioning TRANSFER CASE shift lever to LO automatically activates 8X8 drive.

a. Set TRANSFER CASE shift lever (1) to LO for added traction. 8X8 DRIVE indicator (2) will illuminate.

NOTE

TRACTION CONTROL lever should be set to INTER-AXLE DIFF. LOCK when transfer case shift lever is set to LO range while driving on slippery surfaces.

b. Set TRACTION CONTROL lever (4) in INTER-AXLE DIFF. LOCK (when LO range is used - recommended) or 8X8 DRIVE (if HI range is required), as needed, when driving on slippery surfaces. INTER-AXLE LOCK indicator (5) and/or 8X8 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 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.

OPERATE VEHICLE IN COLD ENVIRONMENT - Continued

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.

n. Keep windshield, windows, mirrors, headlights, stoplights, and body 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 absolutely necessary for better traction, lower vehicle tire pressure to emergency air pressure limit:

(1) Ensure 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.

OPERATE VEHICLE IN COLD ENVIRONMENT - Continued

(3) If vehicle remains stuck, use another vehicle to winch or tow stuck vehicle clear.

(4) If another vehicle is not available, self-recover vehicle using self-recovery winch. (WP 0115)

7. Park vehicle (WP 0056) as follows:

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.

NOTE

Do not hit axle breathers when cleaning mud, snow, and ice from axles.

8. Clean snow, ice, and mud off vehicle as soon as possible.

9. Clean mud, snow, and ice from wheels, brakes, axles, universal joints, mirrors, steering mechanism, and radiator as soon as possible.

10. Ensure axle breather vent caps move freely on breather body.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATION IN EXTREME COLD ENVIRONMENT

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN EXTREME COLD ENVIRONMENT (-26°F[-32°C] to -65°F[-54°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.
- Refer to FM 31-70 , FM 31-71 , and FM 21-305 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 immediately.
- 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.
- 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.

OPERATE VEHICLE IN EXTREME COLD ENVIRONMENT (-26°F[-32°C] to -65°F[-54°C]) - Continued

- 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 is a must for extreme cold operation.

1. Principles and procedures for operating in cold environment (WP 0124) also apply to extreme cold environment.
2. Ensure arctic engine heater kit has been installed.
3. Operate arctic engine heater (WP 0079) as needed.

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

If additional air is put in tires for standby periods, lower tire pressure to normal amounts before driving vehicle.

4. In areas where temperatures reach -50°F (-46°C) or colder, fill tires with air approximately 10 psi above normal for long standby periods and overnight.

OPERATE GROVE CRANE IN EXTREME COLD ENVIRONMENT (-26°F[-32°C] to -65°F [-54°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.

OPERATE GROVE CRANE IN EXTREME COLD ENVIRONMENT (-26°F[-32°C] to -65°F [-54°C]) - Continued

1. Before operating crane, perform warm-up as follows:
   a. Start engine. (WP 0044)
   b. Properly warm up vehicle.
   c. Set PTO ENGAGE switch (1) to ON position. Indicator light (2) will illuminate.

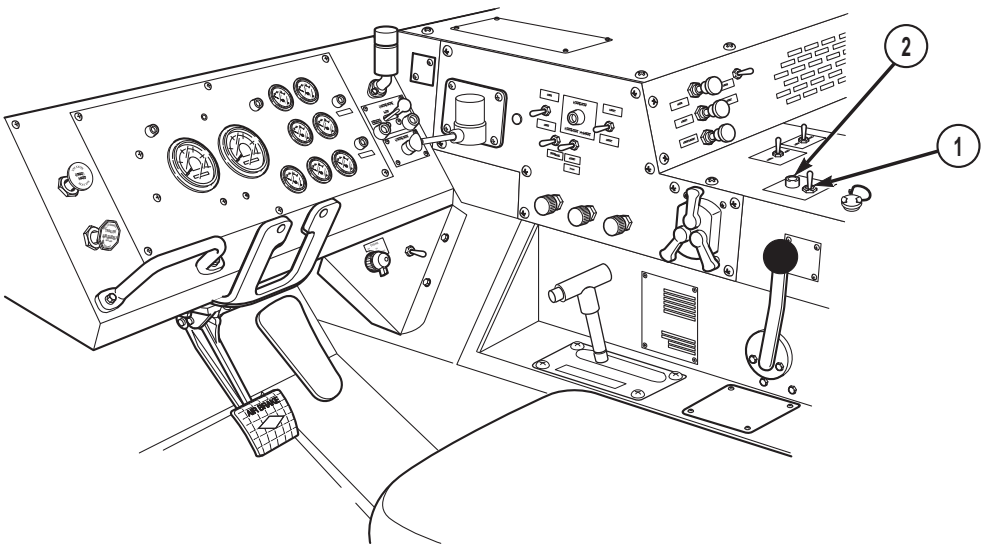


Figure 1.

   d. While engine is at low idle, fully exercise all functions of crane for at least 5 minutes.
   e. With engine at high idle, fully exercise all functions of crane for at least 10 minutes.
2. Continue with operation of crane.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN FOREST OR ROCKY TERRAIN

INITIAL SETUP:

Not Applicable

OPERATE VEHICLE IN FOREST OR ROCKY TERRAIN

WARNING

Ensure tire pressure is correct for vehicle operation. Failure to comply may result in injury or death to personnel.

NOTE

When driving over very rocky terrain is part of the mission route, be sure spare wheel and tire are on vehicle, in good repair, and at correct pressure for normal operations. There is greater chance of tire punctures when operating in rocky terrain.

1. Fold vehicle side mirrors in far enough so area to rear of vehicle can still be seen, but mirrors will not be damaged by rocks, trees, and other obstructions.

CAUTION

Before driving over ground obstructions such as stumps and large rocks, ensure vehicle has adequate clearance. Stumps and rocks may damage components underneath vehicle.

2. Avoid driving over obstructions if possible.

CAUTION

Ensure vehicle can clear overhanging tree limbs and other obstructions. Low overhead obstructions may damage cargo, cargo cover, and other parts on top of vehicle.

3. Avoid low overhanging obstructions if possible.

OPERATE VEHICLE IN FOREST OR ROCKY TERRAIN - Continued

4. Check traction and braking. Rocks and fallen leaves can be very slick, especially when wet.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
OPERATE VEHICLE IN SALTWATER AREAS

INITIAL SETUP:

Not Applicable

OPERATION

1. Inspect vehicle and major components (crane, tanker module, LHS, etc.) frequently for the buildup of salt deposits, rust, and corrosion.

NOTE

Do not direct high-pressure water hose nozzles, or steam cleaner nozzles into hydraulic system seals and/or electrical junction boxes.

2. If salt deposits are located, clean the affected areas using authorized local procedures.
3. Frequently wash the vehicle and major components to prevent the buildup of salt deposits.
4. If corrosion is present, notify your supervisor as these conditions need to be corrected immediately.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SET UP/SECURE HIGHWAY EMERGENCY MARKER KIT

INITIAL SETUP:

Not Applicable

PREPARE VEHICLE/MARKERS FOR USE

1. Turn vehicle emergency flashers on. (WP 0099)
2. Remove emergency marker kit (1) from stowage brackets (2).

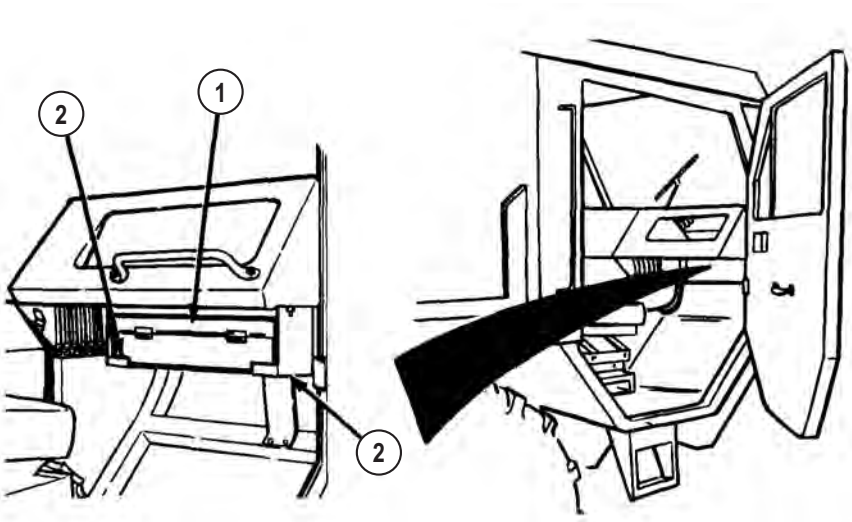


Figure 1.

3. Remove markers (3) from case.

PREPARE VEHICLE/MARKERS FOR USE - Continued

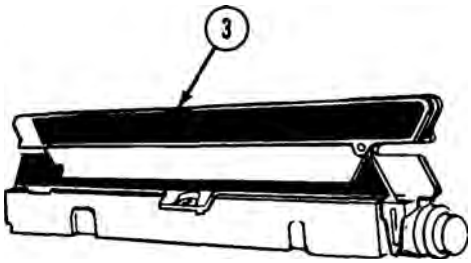


Figure 2.

4. Raise arms (4).

Figure 3.

5. Snap pin (5) into slot (6).

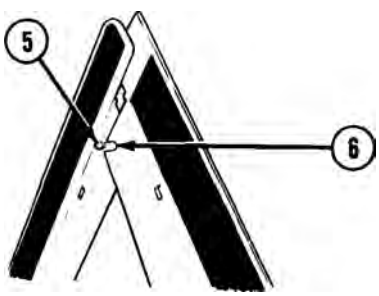


Figure 4.

6. Rotate marker (3) about ¼ turn on base (7) until it stops.

PREPARE VEHICLE/MARKERS FOR USE - Continued

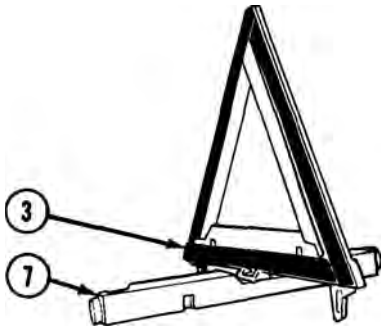


Figure 5.

PLACE MARKERS ON UNDIVIDED HIGHWAY

1. Place one marker (1) about 40 paces (100 ft. [30 m]) in front of vehicle, so marker faces traffic approaching from front.

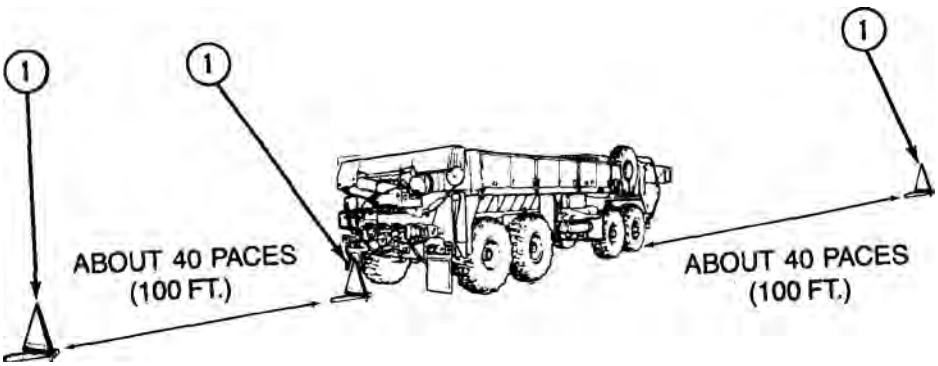


Figure 6.

2. Place another marker (1) directly behind vehicle, so marker faces traffic approaching from rear.
3. Place third marker (1) approximately about 40 paces (100 ft. [30 m]) behind vehicle, so marker faces traffic approaching from rear.

PLACE MARKERS ON DIVIDED HIGHWAY

1. Place one marker (1) directly behind vehicle, so marker faces traffic approaching from rear.

PLACE MARKERS ON DIVIDED HIGHWAY - Continued

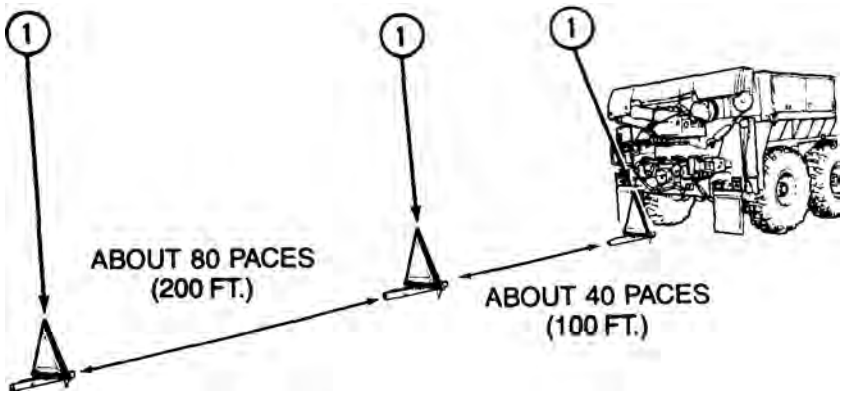


Figure 7.

2. Place second marker (1) about 40 paces (100 ft. [30 m]) behind vehicle, so marker faces traffic approaching from rear.
3. Place third marker (1) about 80 paces (200 ft. [60 m]) behind second marker, so marker faces traffic approaching from rear.

SECURE MARKERS

1. Rotate marker (1) over base (2).

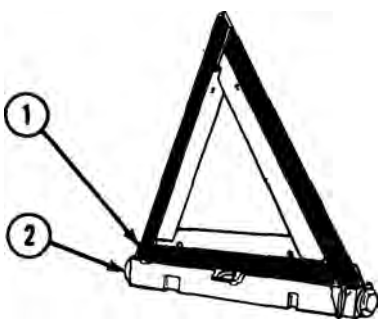


Figure 8.

2. Separate arms (3).

SECURE MARKERS - Continued

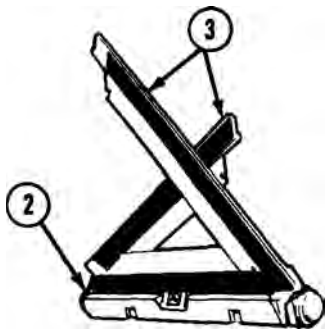


Figure 9.

3. Fold arms (3) down onto base (2).

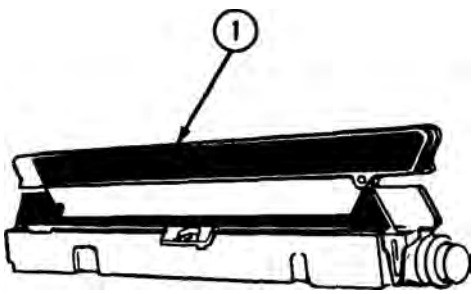


Figure 10.

4. Put markers (1) in case.
5. Put emergency marker kit (4) in stowage brackets (5).

SECURE MARKERS - Continued

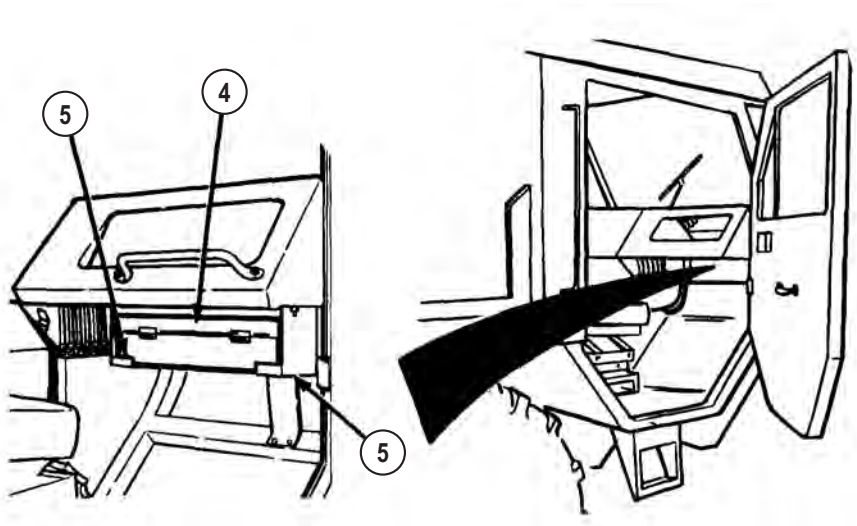


Figure 11.

6. Turn vehicle emergency flashers off. (WP 0099)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
MANUALLY RELEASE SPRING BRAKES

INITIAL SETUP:

Not Applicable

CHOCK REAR WHEELS

NOTE

This procedure should only be used when vehicle air system is totally inoperative and vehicle cannot be towed with rear end raised by wrecker.

1. Remove wheel chocks (1) from stowage.

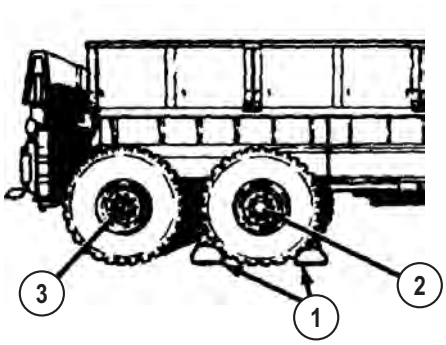
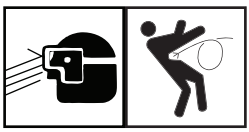


Figure 1.

2. Place wheel chocks (1) in front and back of one wheel on No. 3 (2) or No. 4 (3) axle.

RELEASE BRAKES

WARNING



Ensure brake chamber is caged while releasing brakes. Spring is under 2,500 lbs (1 135 kg) tension. Failure to comply may result in injury or death to personnel.

NOTE

Driver side brake chamber on No. 4 axle is shown. Steps are same for No. 4 axle passenger side and No. 3 axle.

1. Remove dust cap (1) from brake chamber (2).

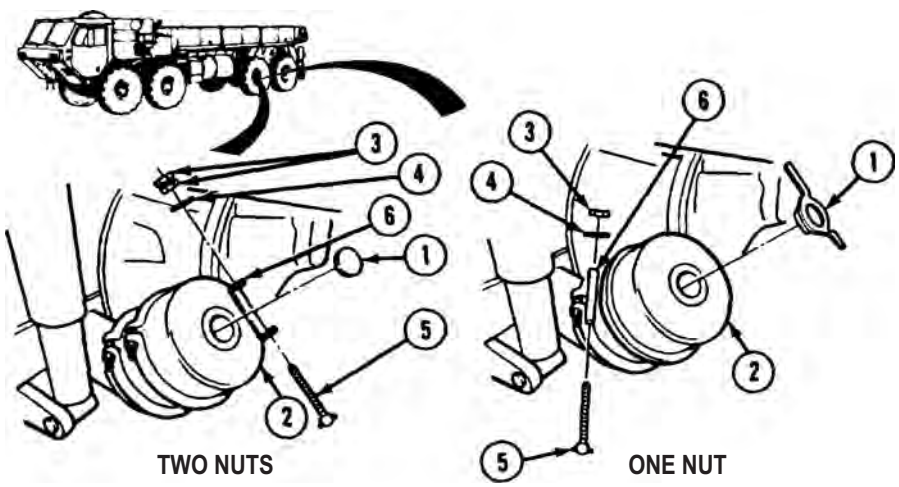


Figure 2.

NOTE

There are two types of brake chambers: older vehicles have two nuts, newer vehicles have one nut.

2. Remove either one or two nuts (3) (as applicable), washer (4), and release-bolt (5) from bracket (6).
3. Insert release-bolt (5) into brake chamber (2).

RELEASE BRAKES - Continued

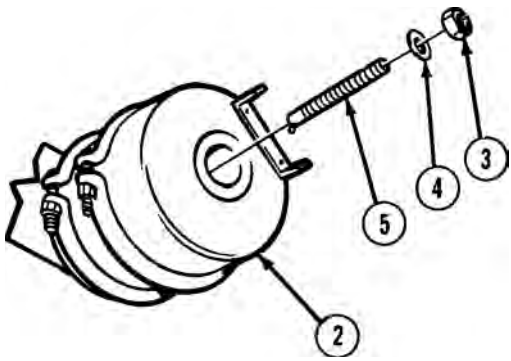


Figure 3.

4. Turn release-bolt (5) 1/4 turn to engage inside brake chamber (2).
5. Install washer (4) and nut (3) on release-bolt (5).
6. Tighten nut (3) until clevis (7) is pulled to rear of brake chamber (2).

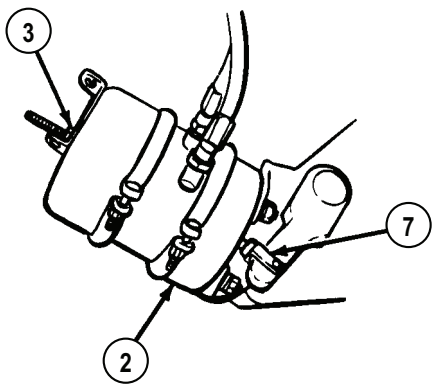


Figure 4.

7. Repeat Steps (1) through (6) to release three remaining spring brakes on No. 3 and No. 4 axles.

END OF TASK

END OF WORK PACKAGE

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OPERATOR MAINTENANCE
LIMP HOME/FLAT TIRE WITH NO SPARE

INITIAL SETUP:

Not Applicable

INSTALL LIMP HOME SETUP ON PASSENGER SIDE FRONT OR ANY REAR WHEEL

CAUTION

- Do not use this procedure on fully loaded M983 vehicle with trailer in tow. Limp home setup will not support extra weight and equipment could be damaged.
- Vehicle must not be driven faster than 10 mph (16 km/h) or farther than 30 miles (48 km) in limp home condition.

NOTE

- Use limp home procedure for emergency only in case of wheel bearing failure, wheel damage, or when unable to change wheel and tire.
- For limp home setup on driver side front No. 1 and 2 axles, refer to Limp Home Setup/Driver Side Front section.
- Limp home setup for No. 4 axle is shown. Other limp home setups are done is same manner.

1. Remove two wheel chocks (1), jack base plate (2), jack (3), 7 ft. (2.1 m) chain (4), and shackle (5) from stowage.

INSTALL LIMP HOME SETUP ON PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

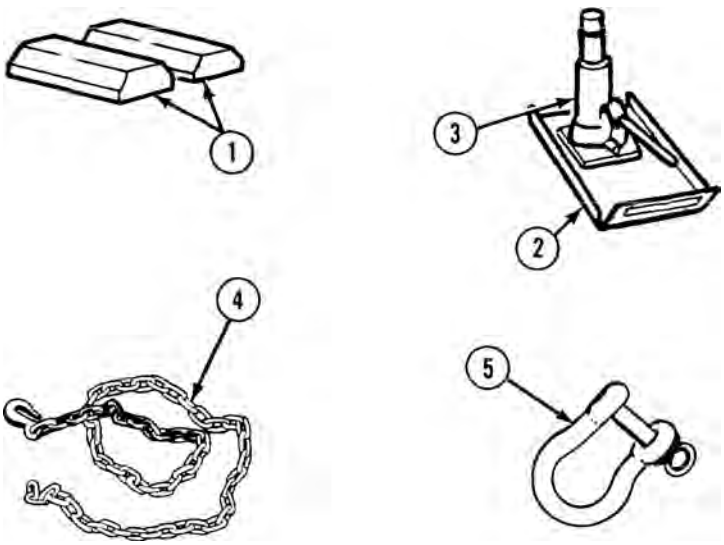

Figure 1.

2. Install two wheel chocks (WP 0100) (1) in front of and behind tire (6) across from tire (7) being raised.

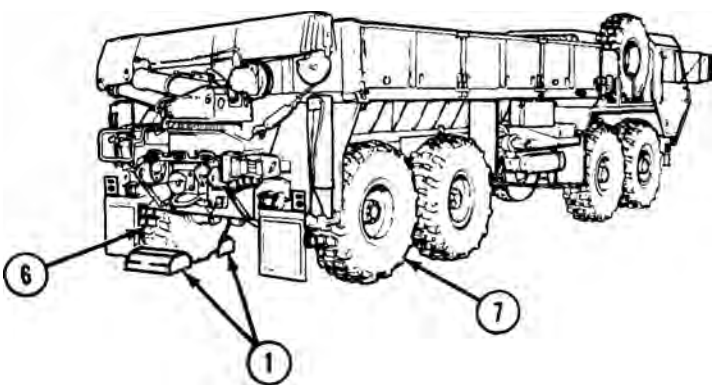

Figure 2.

3. Position jack base plate (2) and jack (3) under equalizer beam (8) 4 to 5 in. (102 to 127 mm) from center pivot point (9) towards axle to be raised (No. 4 axle shown).

INSTALL LIMP HOME SETUP ON PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

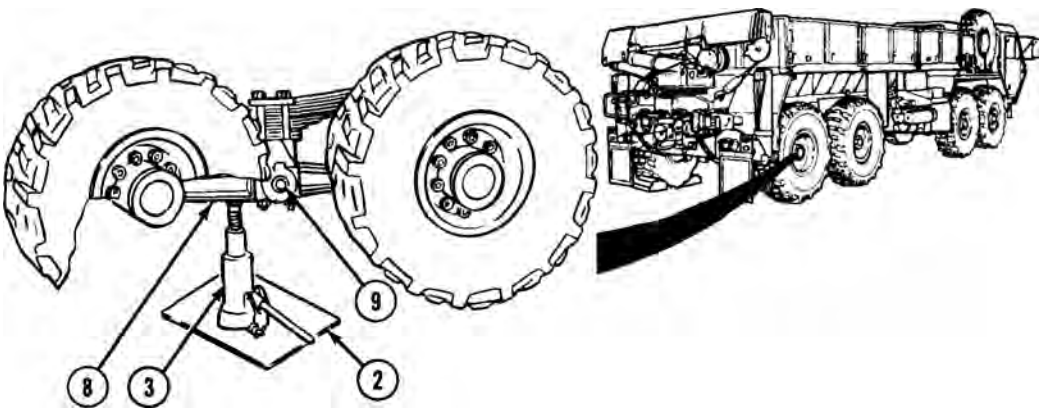

Figure 3.

4. Raise jack (3) until it touches equalizer beam (8).
5. Raise jack (3) until axle (10) is as close as it will go to axle stop (11).

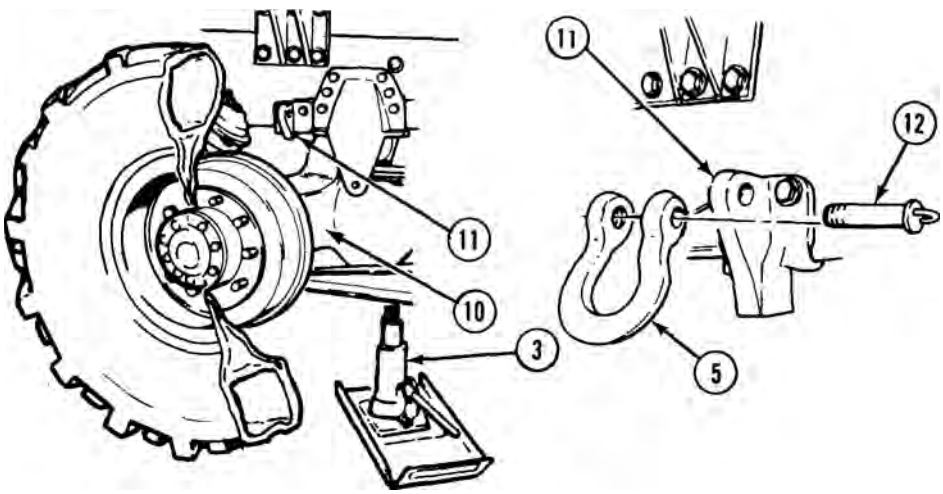

Figure 4.

6. Install shackle (5) on axle stop (11) with pin (12).

INSTALL LIMP HOME SETUP ON PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

CAUTION

Do not wrap 7 ft. (2.1 m) chain around any air line or brake chamber bracket. Air line could be crushed and damaged to bracket could result.

7. Route 7 ft. (2.1 m) chain (4) through shackle (5).

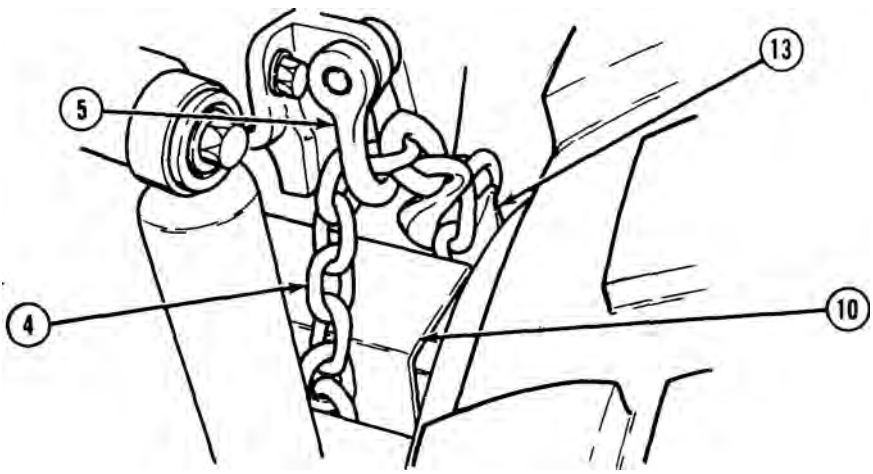

Figure 5.

8. Loop end of 7 ft. (2.1 m) chain (4) around axle (10).
9. Bring 7 ft. (2.1 m) chain (4) up to chain hook (13) and fasten as tight as possible.

WARNING

Keep hands away from chain when lowering jack. Hands and fingers could be crushed. Failure to comply may result in injury or death to personnel.

NOTE

Axle will drop slightly when jack is lowered.

10. Lower jack (3) and remove jack from under equalizer beam (8).

INSTALL LIMP HOME SETUP ON PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

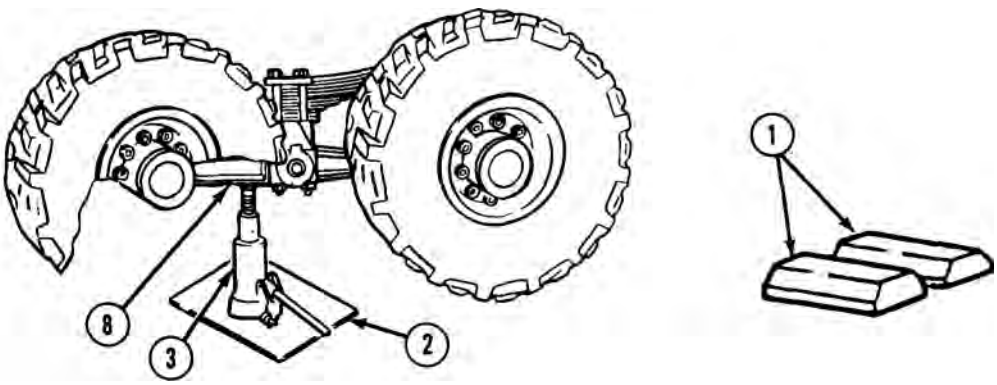

Figure 6.

11. Return jack (3), and jack base plate (2) to stowage.
12. Remove and stow two wheel chocks (1).

REMOVE LIMP HOME SETUP FROM PASSENGER SIDE FRONT OR ANY REAR WHEEL

1. Remove two wheel chocks (1), jack base plate (2), and jack (3) from stowage.

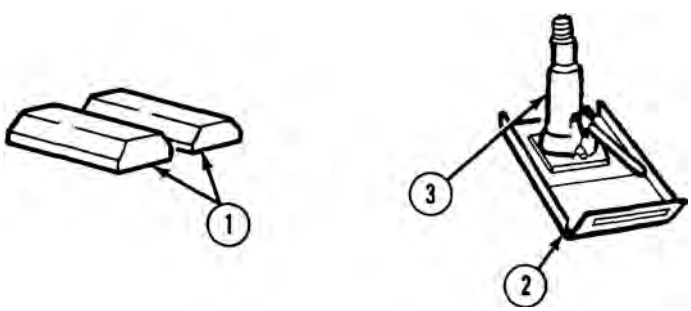

Figure 7.

2. Install two wheel chocks (WP 0100) (1) in front of and behind tire (4) across from tire (5) being raised.

REMOVE LIMP HOME SETUP FROM PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

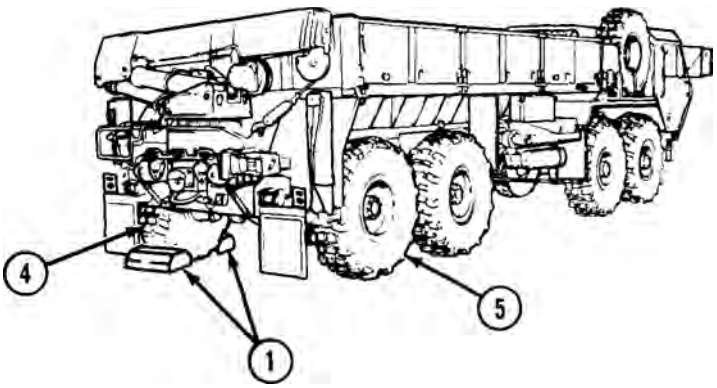

Figure 8.

3. Position jack base plate (2) and jack (3) under equalizer beam (6) 4 to 5 in. (102 to 127 mm) from center pivot point (7).

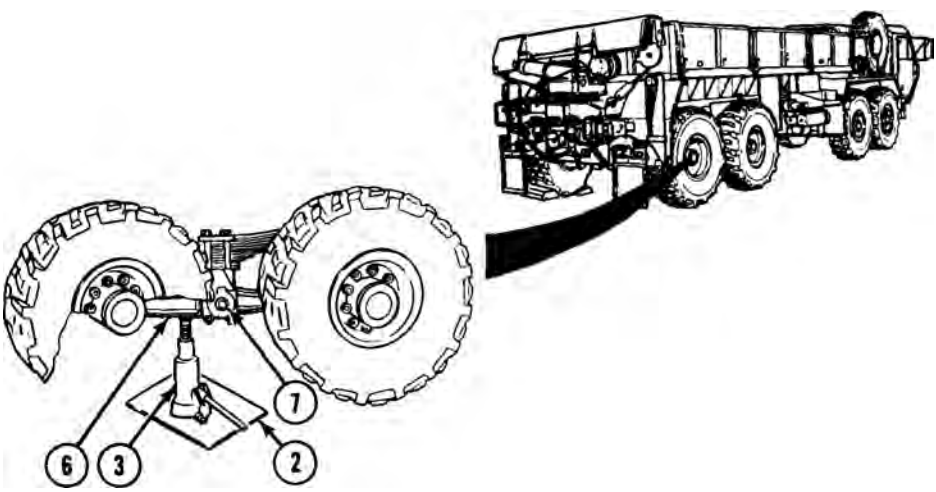

Figure 9.

4. Raise jack (3) until it touches equalizer beam (6).

REMOVE LIMP HOME SETUP FROM PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

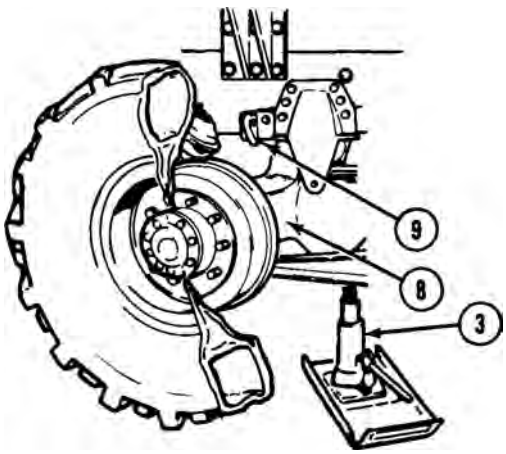

Figure 10.

5. Raise jack (3) until axle (8) is as close as it will go to axle stop (9).
6. Unhook 7 ft. (2.1 m) chain (10) and remove from shackle (11) and axle (8).

REMOVE LIMP HOME SETUP FROM PASSENGER SIDE FRONT OR ANY REAR WHEEL - Continued

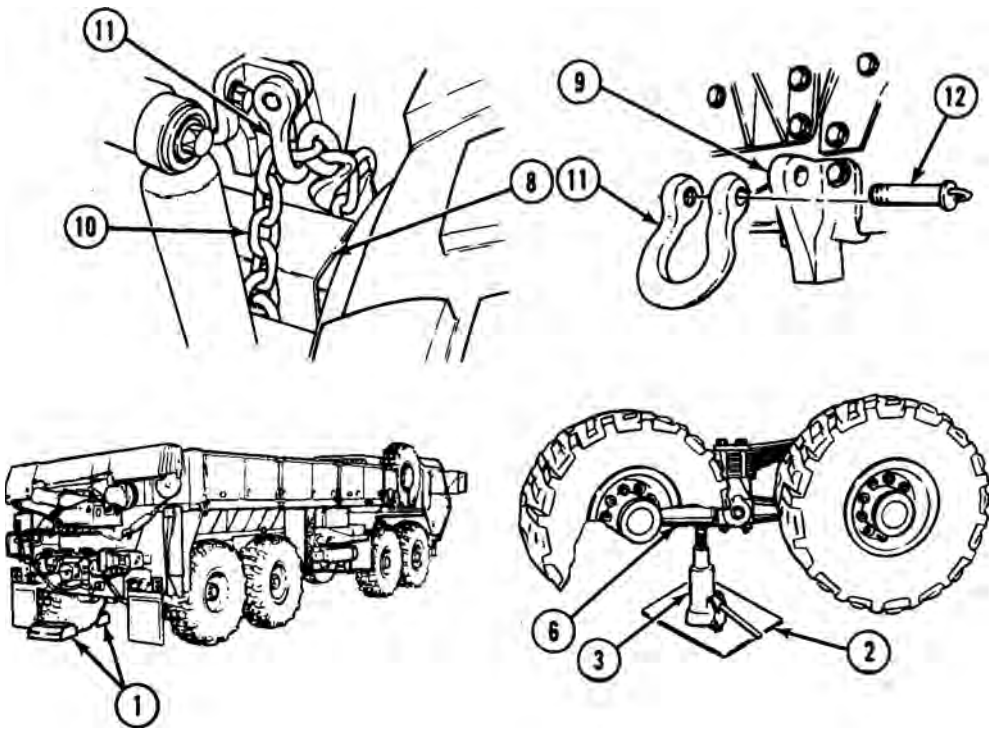

Figure 11.

7. Remove pin (12) from shackle (11) and axle stop (9).
8. Remove shackle (11) from axle stop (9) and reinstall pin (12) in shackle (11).
9. Lower jack (3) and remove jack (3) from equalizer beam (6).
10. Return jack base plate (2), jack (3), 7 ft. (2.1 m) chain (10), and shackle (11) to stowage.
11. Remove and stow two wheel chocks (1).

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT

CAUTION

- Do not use this procedure on fully loaded M983 vehicle with trailer in tow. Limp home setup will not support extra weight and equipment could be damaged.

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

- Vehicle must not be driven faster than 10 mph (16 km/h) or farther then 30 miles (48 km) in limp home condition.

NOTE

- Use limp home procedure for emergency only in case of wheel bearing failure, wheel damage, or when unable to change wheel and tire.
- Limp home setup No. 1 axle is shown. Setup for No. 2 axle is done in same manner.
- For limp home setup on other axles, refer to passenger side front or any rear wheel section above.

1. Remove two wheel chocks (1), jack base plate (2), jack (3), and 7 ft. (2.1 m) chain (4) from stowage.

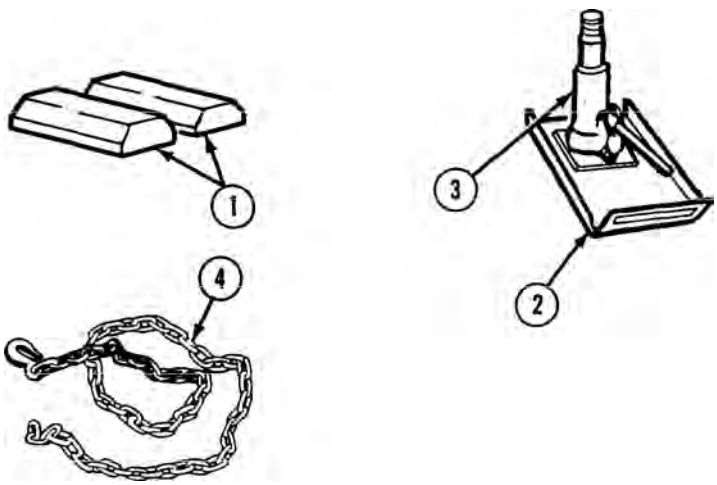

Figure 12.

2. Install two wheel chocks (WP 0100) (1) in front of and behind tire (5) across from tire (6) being raised.

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

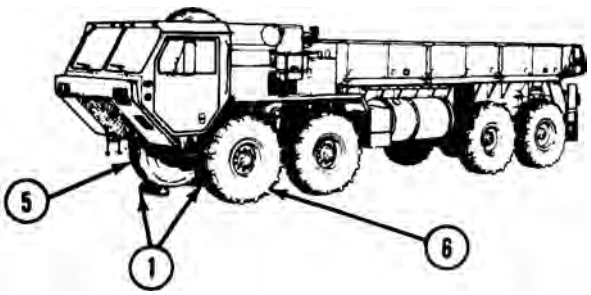

Figure 13.

3. Place jack base plate (2) and jack (3) under end of equalizer beam (7).

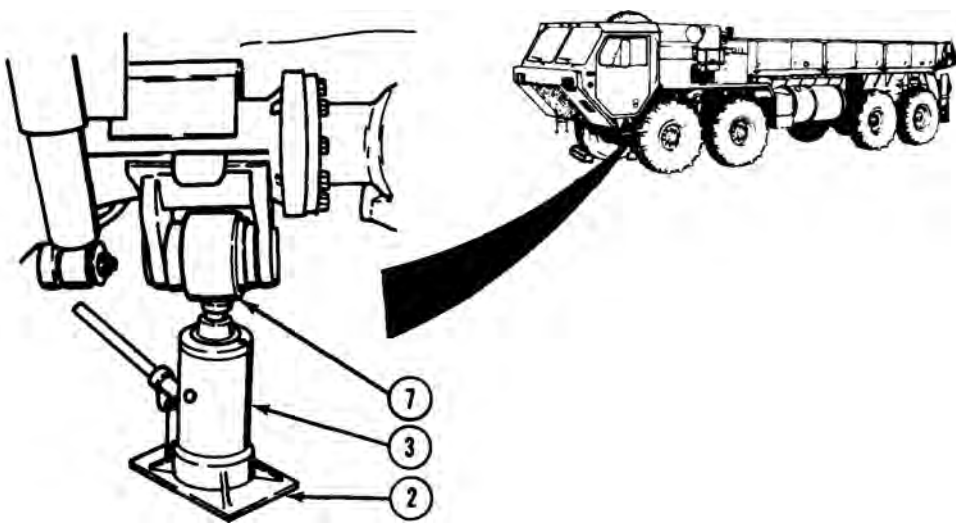

Figure 14.

4. Raise jack (3) until it touches end of equalizer beam (7).
5. Raise jack (3) until axle (8) is as close as it will go to axle stop (9).

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

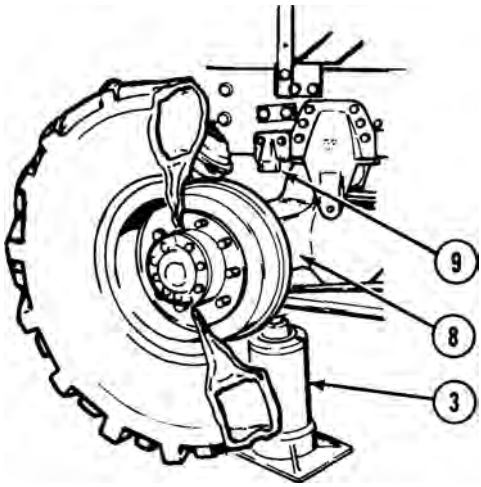

Figure 15.

CAUTION

Do not wrap 7 ft. (2.1 m) chain around lateral torque rod or shift cables as they could be crushed. Failure to comply may result in damage to equipment.

6. Loop end of 7 ft. (2.1 m) chain (4) around frame (10) and axle (8).

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

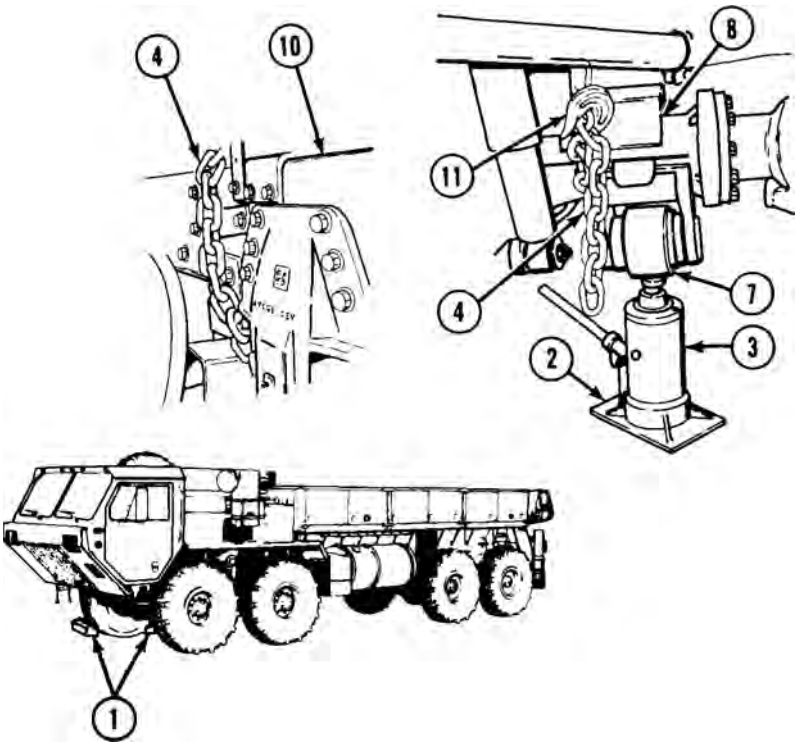

Figure 16.

WARNING

Keep hands away from chain when lowering jack. Hands and fingers could be crushed. Failure to comply may result in injury or death to personnel.

7. Bring end of 7 ft. (2.1 m) chain (4) up to chain hook (11) and fasten back into itself as tight as possible.

NOTE

Axle will drop slightly when jack is lowered.

8. Lower jack (3) and remove jack (3) from end of equalizer beam (7).

INSTALL LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

9. Return jack base plate (2), and jack (3) to stowage.
10. Remove and stow two wheel chocks (1).

REMOVE LIMP HOME SETUP/DRIVER SIDE FRONT

1. Remove two wheel chocks (1), jack base plate (2), and jack (3) from stowage.

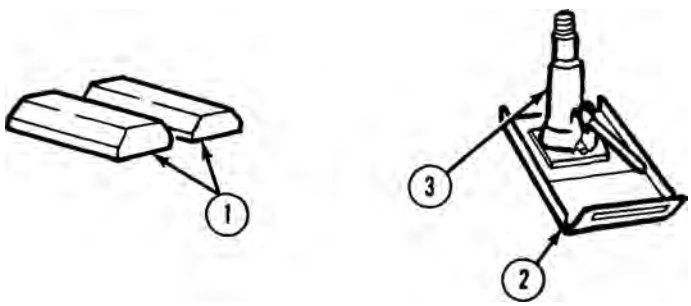

Figure 17.

2. Install two wheel chocks (1) in front of and behind tire (4) across from tire (5) being raised.

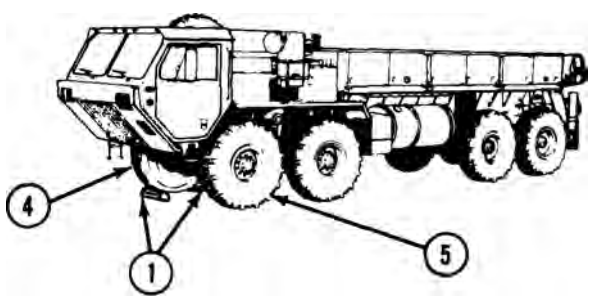

Figure 18.

3. Place jack base plate (2) and jack (3) under end of equalizer beam (6).

REMOVE LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

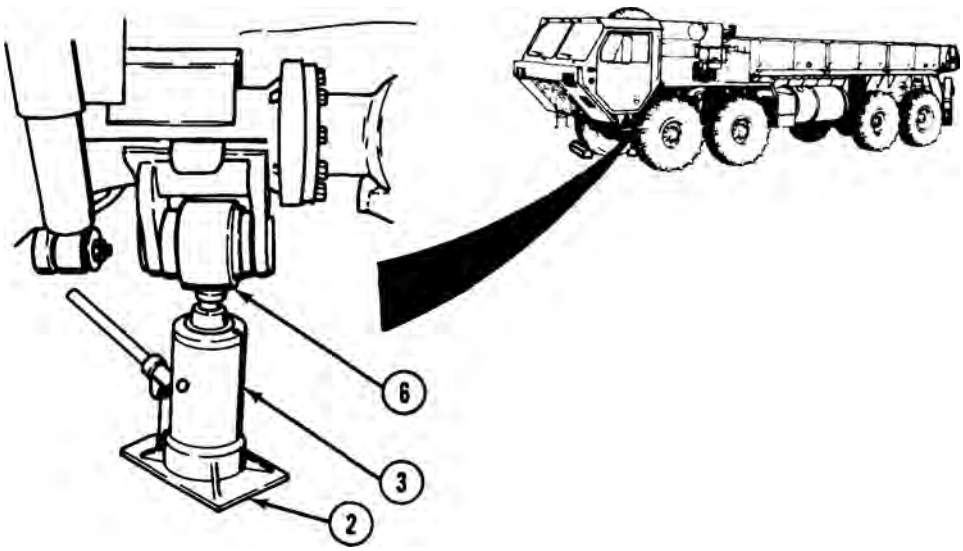

Figure 19.

4. Raise jack (3) until it touches end of equalizer beam (6).
5. Raise jack (3) until axle (7) is as close as it will go to axle stop (8).

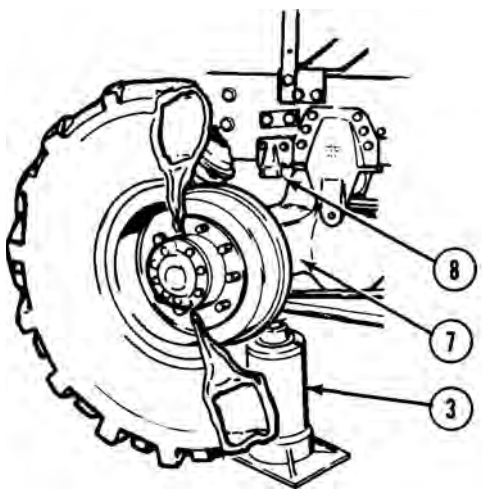

Figure 20.

6. Unhook 7 ft. (2.1 m) chain (9) and remove from around frame (10) and axle (7).

REMOVE LIMP HOME SETUP/DRIVER SIDE FRONT - Continued

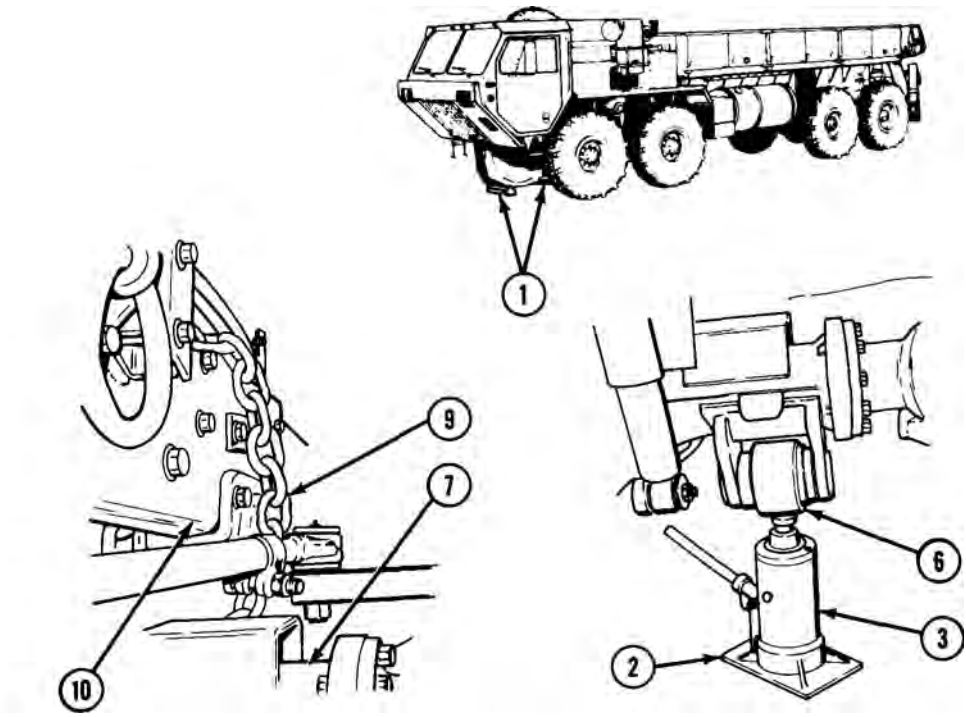

Figure 21.

7. Lower jack (3) and remove jack from equalizer beam (6).
8. Return jack base plate (2), jack (3), and 7 ft. (2.1 m) chain (9) to stowage.
9. Remove and stow two wheel chocks (1).

END OF TASK

END OF WORK PACKAGE

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OPERATOR MAINTENANCE
SLAVE START VEHICLE

INITIAL SETUP:

Personnel Required
Operator and Assistant - - - (2)

PREPARE ASSIST VEHICLE

NOTE

This procedure is a two soldier task.

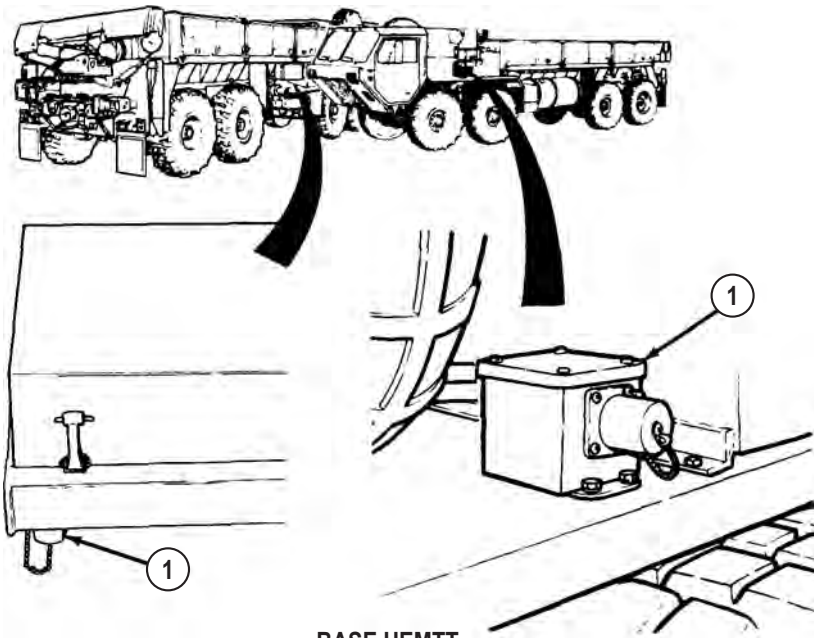
1. Start engine of assist vehicle. (WP 0044)

NOTE

- Model of truck can be determined by information plate on inside of driver side cabin door.
- Base Model HEMTT - Slave receptacle may be located either on battery box or driver side front fender.
- A2 Model HEMTT - Slave receptacle is located on driver side front fender.
- A4 Model HEMTT - Slave receptacle is located on driver side front fender.

2. Move assist vehicle into position beside disabled vehicle so slave receptacles (1) on both vehicles are side by side.

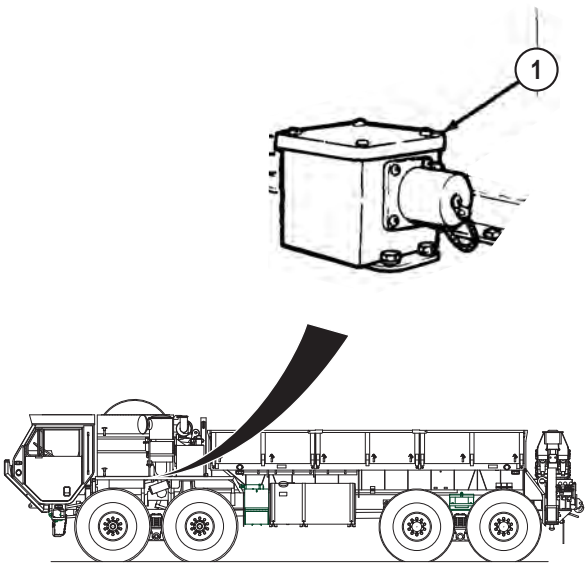
PREPARE ASSIST VEHICLE - Continued



BASE HEMTT

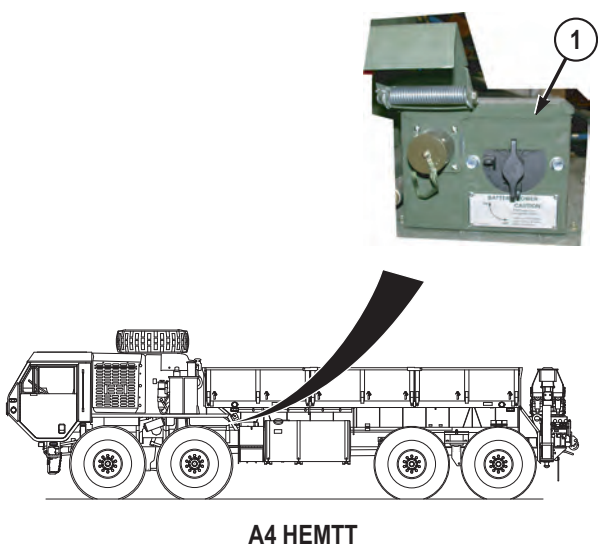
Figure 1.

PREPARE ASSIST VEHICLE - Continued



A2 HEMTT

Figure 2.



A4 HEMTT

Figure 3.

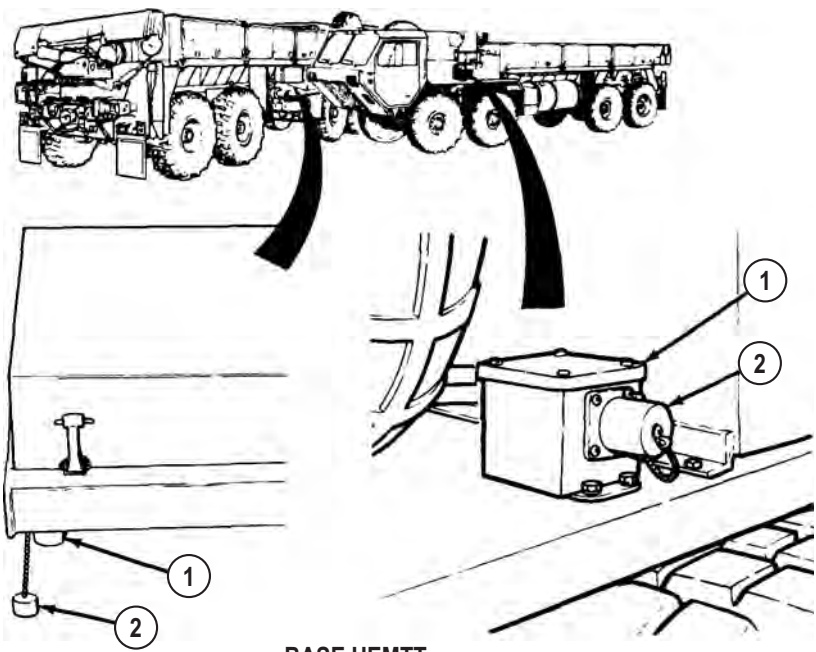
3. Shut off engine of assist vehicle. (WP 0057)

SLAVE START DISABLED VEHICLE

NOTE

- Model of truck can be determined by information plate on inside of driver side cabin door.
- Base Model HEMTT - Slave receptacle may be located either on battery box or driver side front fender.
- A2 Model HEMTT - Slave receptacle is located on driver side front fender.
- A4 Model HEMTT - Slave receptacle is located on driver side front fender.

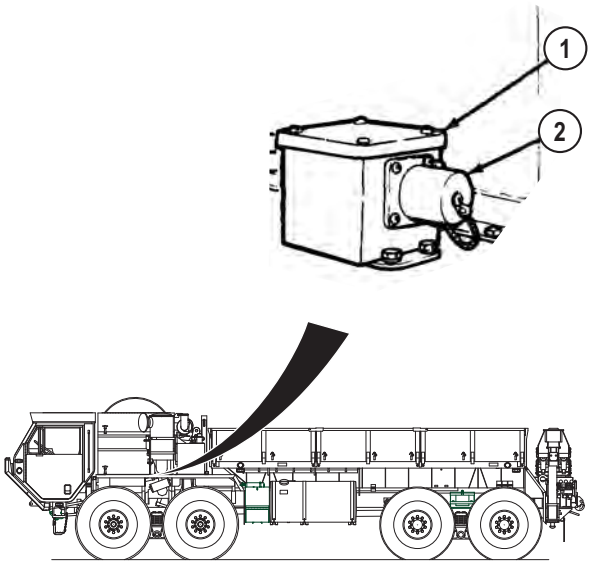
1. Remove caps (2) from slave receptacles (1) on both vehicles.



BASE HEMTT

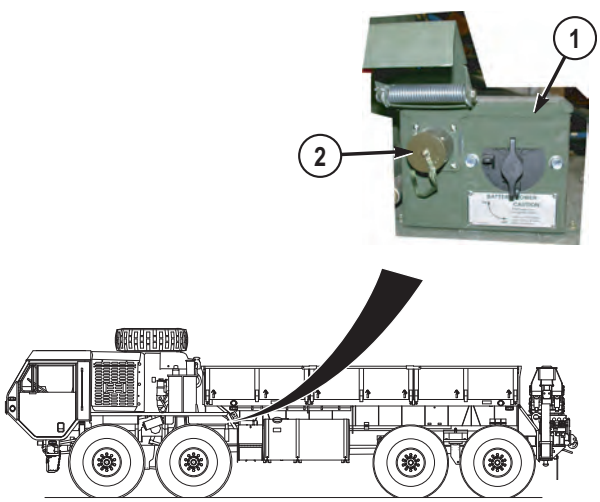
Figure 4.

SLAVE START DISABLED VEHICLE - Continued



A2 HEMTT

Figure 5.

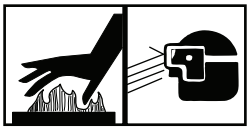


A4 HEMTT

Figure 6.

SLAVE START DISABLED VEHICLE - Continued

WARNING



Hot transmission/oil can cause severe burns. Wear gloves and proper eye protection while performing troubleshooting or maintenance. Failure to comply may result in injury or death to personnel.

NOTE

Make sure connectors and receptacles are free from dirt, sand, and debris before use.

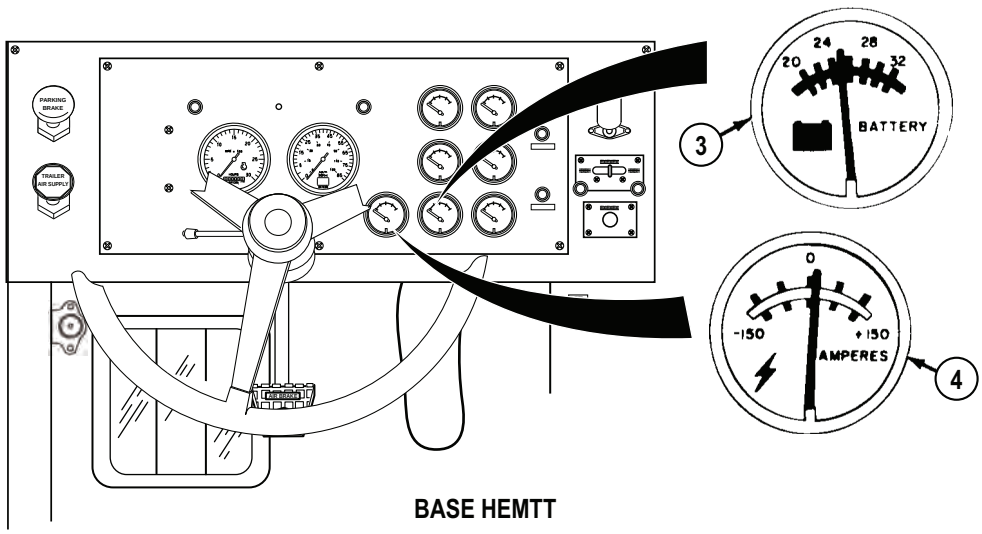
2. Remove NATO slave cable from stowage and plug into slave receptacles of both vehicles.
3. Start engine of assist vehicle. (WP 0044)
4. Using the throttle pedal, increase assist vehicle engine speed to more than 1000 rpm, while assistant starts engine of disabled vehicle. (WP 0044)
5. As soon as disabled vehicle engine is running smoothly, remove NATO slave cable from slave receptacles (1) on both vehicles and return to stowage.
6. Install caps (2) on slave receptacles (1) of both vehicles.
7. Move assist vehicle. (WP 0050)
8. Shut off engine of assist vehicle. (WP 0057)

NOTE

- Model of truck can be determined by information plate on inside of driver side cabin door.
- A4 Model HEMTT does not have an AMPERES gauge. Battery voltage readout is located in top right corner of Liquid Crystal Display (LCD) on instrument panel.
- Gauges are located in different places dependent on model HEMTT. Select correct view below for model HEMTT being serviced.

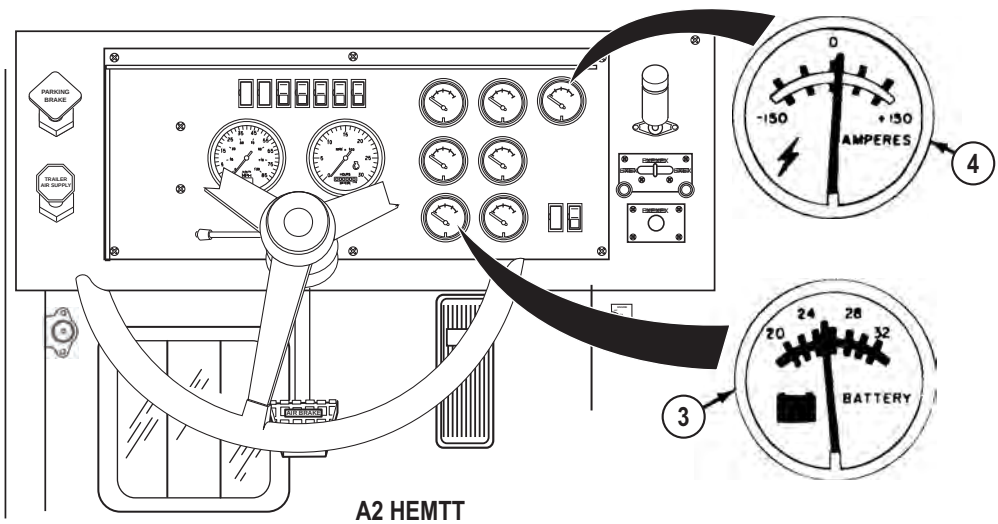
9. Check BATTERY gauge (3) of disabled vehicle. If BATTERY gauge (3) shows less than 24 volts, notify field level maintenance. If BATTERY gauge (3) shows 24 volts or more, continue with Step (11).

SLAVE START DISABLED VEHICLE - Continued



BASE HEMTT

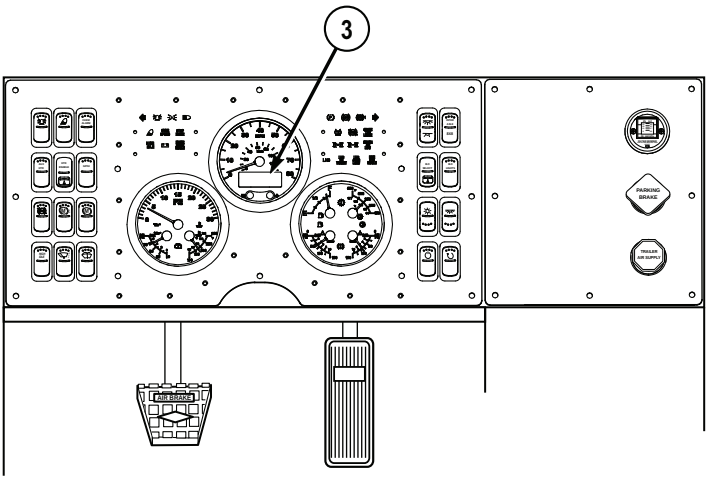
Figure 7.



A2 HEMTT

Figure 8.

SLAVE START DISABLED VEHICLE - Continued



A4 HEMTT

Figure 9.

10. Check AMPERES gauge (4) of disabled vehicle (as applicable). If AMPERES gauge shows discharge condition, notify field level maintenance. If AMPERES gauge (4) shows charging, continue operation of vehicle.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
PERFORM IMMEDIATE ACTION FOR LOSS OF AIR SUPPLY SYSTEM PRESSURE

INITIAL SETUP:

Not Applicable

PERFORM PROCEDURE

1. If AIR indicator (1) illuminates and warning buzzer sounds while driving vehicle, check AIR PRESS gauge (2).

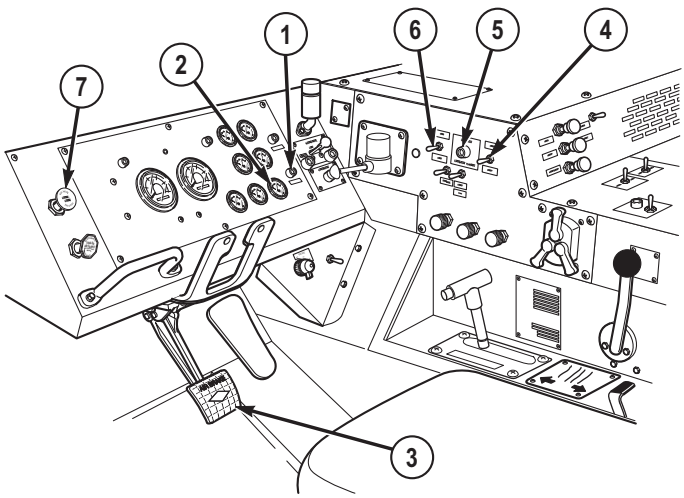


Figure 1.

NOTE

If both red needle and green needle on AIR PRESS gauge read zero, skip to Step (4).

2. If red pointer on AIR PRESS gauge (2) is at zero and green needle shows normal air pressure of 100 to 120 psi (690 to 827 kPa), complete the following:
   a. Continue operation of vehicle. Brakes on all eight wheels and trailer will work even if air pressure from No. 2 air tank has been lost.
   b. Notify field level maintenance as soon as possible.

PERFORM PROCEDURE - Continued

WARNING

When green pointer of AIR PRESS gauge is at zero, braking capability is greatly reduced. Extra care must be used to avoid collision. Failure to comply may result in injury or death to personnel.

NOTE

If both red needle and green needle on AIR PRESS gauge read zero, skip to Step (4).

3. If green needle on AIR PRESS gauge (2) is at zero and red needle shows normal air pressure of 100 to 120 psi (690 to 827 kPa), complete the following:
   a. Continue operation of vehicle. Brakes on third and fourth axles and trailer will work even if air pressure from No. 3 air tank has been lost.
   b. Leave additional distance between vehicles.
   c. Apply service brake pedal (3) earlier than usual when slowing vehicle.
   d. 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.

   e. If necessary to slow vehicle, set Jacobs engine brake HIGH/LOW switch (6) to LOW and set ON/OFF switch (7) to ON.
   f. Notify field level maintenance as soon as possible.
4. If both red needle and green needle on AIR PRESS gauge (2) read zero, complete the following:
   a. Downshift as needed to control vehicle speed until place is found to stop.

PERFORM PROCEDURE - Continued

WARNING

Use of service brake pedal will not slow or stop vehicle when both pointers of AIR PRESS gauge 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.

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.

b. Look for place to stop vehicle without blocking other traffic.

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 level maintenance.

END OF TASK

END OF WORK PACKAGE

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OPERATOR MAINTENANCE
PERFORM IMMEDIATE ACTION FOR LOSS OF HYDRAULIC SYSTEM

INITIAL SETUP:

Not Applicable

NOTE

Steering wheel will be harder to turn after failure of hydraulic system.

1. If failure occurs while driving, continue steering as before.

NOTE

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.

2. Do not try to continue operation of any crane or winch.
3. Do not try to repair hydraulic system. Notify your supervisor.
4. Notify field level maintenance.

END OF TASK

END OF WORK PACKAGE

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OPERATOR MAINTENANCE
PERFORM EMERGENCY HYDRAULIC OPERATION WHEN GROVE CRANE ELECTRICAL POWER FAILS

INITIAL SETUP:

Not Applicable

NOTE

- If crane electrical power systems fails during crane operation, crane will be locked in position it was in at time of failure.
- Do not try to operate any electrical equipment on vehicle or crane.
- Do not try to repair electrical system.
- This procedure will provide emergency hydraulic power to lower crane and load when electrical power has failed.
- Screwdriver can be put in slot in front of solenoid valve button to hold button in while operating controls.

1. Push up and hold solenoid valve button (1).
2. Shut down crane.

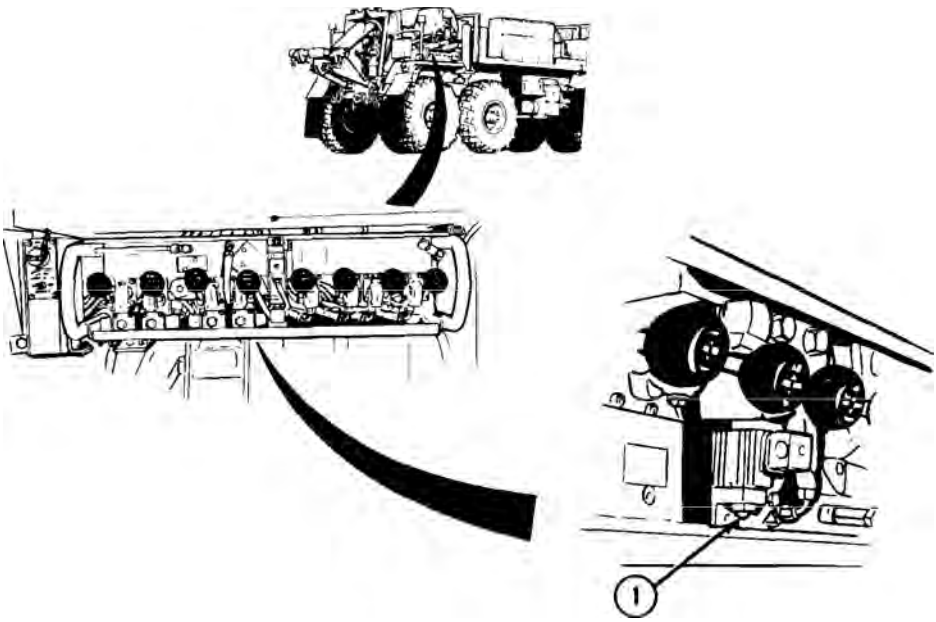


Figure 1.

3. Notify field level maintenance.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
STOWAGE AND SIGN GUIDE

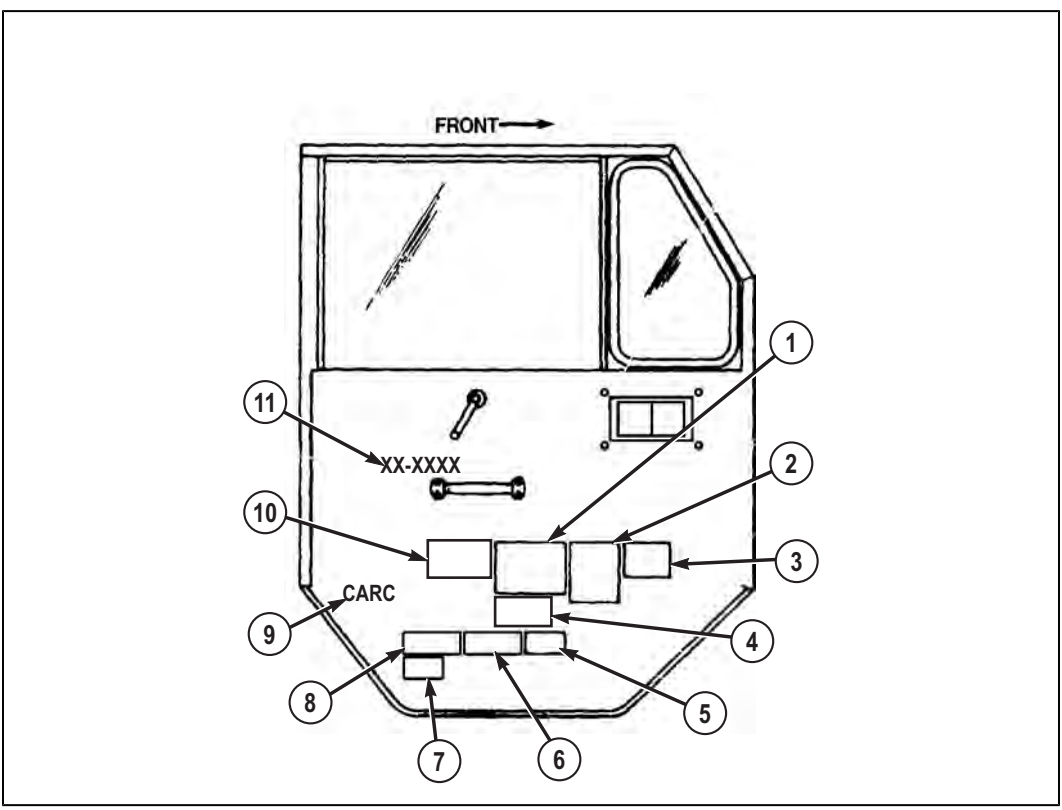
Scope

This work package shows locations for data plates, decals, and stencils that are required to be in place on the HEMTT series vehicles.

General

The following figures show the location of metal signs, decals, and stencils used on the vehicle. Most of these signs and stencils contain cautions or information needed to operate the vehicle safely. For stowage locations of Components Of End Item (COEI) and Basic Issue Items (BII), refer to Components of End Item and Basic Issue Items tables. (Volume 2, WP 0201)

Table 1. Inside Driver Side Door.



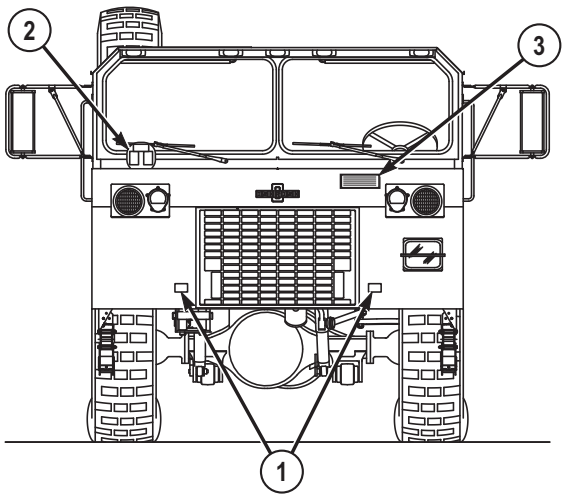
General - Continued

Table 1. Inside Driver Side Door. - Continued

INDEX	DECAL/PLATE/STENCIL
1	Manufacturer's Certification Information
2	Parts Data
3	Name Plate
4	Overhaul Data (not included on all vehicles)
5	Tire Inflation Data
6	Warranty Information
7	Rustproofing Data/Rustproofing CAUTION
8	Noise Exemption Decal (not included on all vehicles)
9	"CARC" Stencil (not included on all vehicles)
10	Shipping Data
11	Registration Number (inside both driver and passenger side doors) (not included on all vehicles)

General - Continued

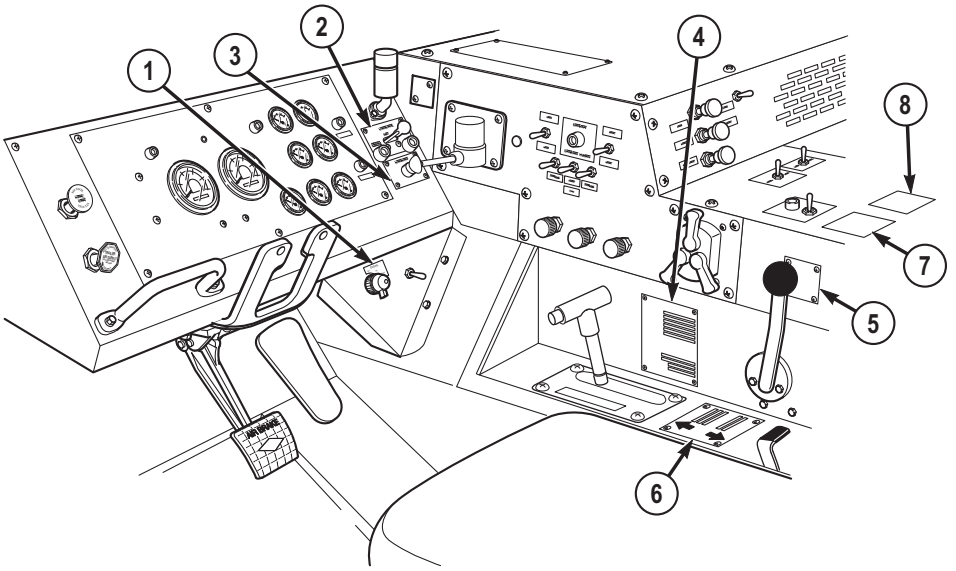
Table 2. Front Exterior.



INDEX	PLACARD/STENCIL
1	"TIE DOWN" Stencil
2	Sign Kit/Weight Indicator
3	"U.S. ARMY" Stencil

General - Continued

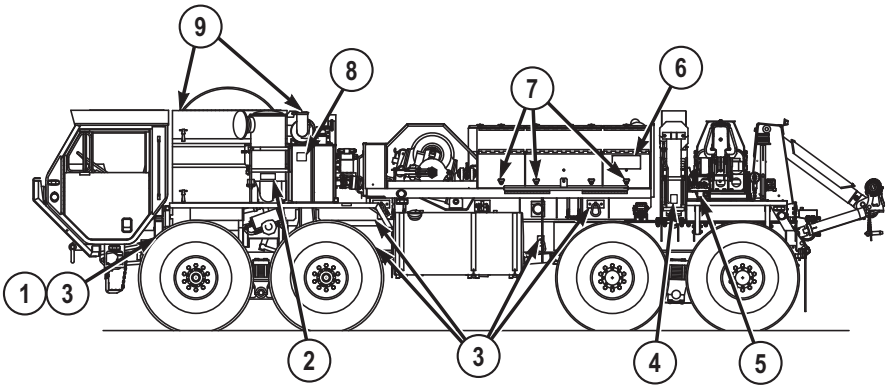
Table 3. M984A1 Wrecker Cabin.



INDEX	DECAL/PLATE
1	Engine ON/OFF Decal
2	Traction Control Data Plate
3	Ether Start Data Plate
4	Vehicle Data Plate
5	Transfer Case Data Plate
6	Self-Recovery Winch Data Plate
7	Crane Data Plate
8	Heavy-Duty Winch Data

General - Continued

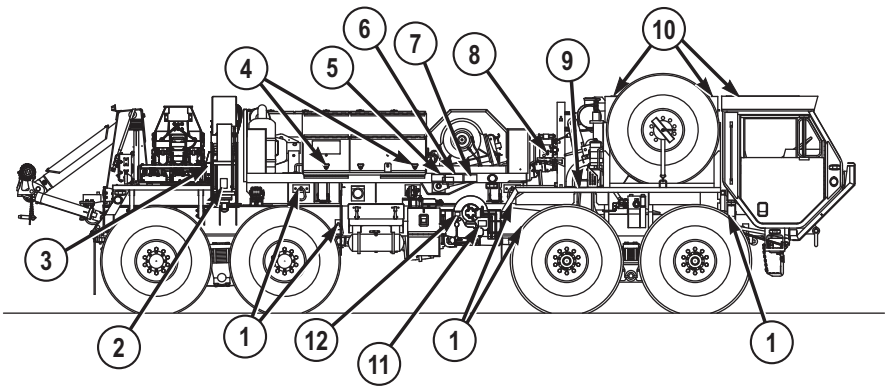
Table 4. M984A1 Wrecker Driver Side Exterior.



INDEX	DECAL/PLACARD/STENCIL
1	Vehicle Identification Number (VIN) Placard
2	CAUTION Decal (hearing protection required)
3	"TIE DOWN" Stencil
4	Outrigger Instruction Placard
5	L.H. REMOTE CONTROL HOOKUP Placard
6	Crane Range Diagram
7	"CAUTION: SPRING LOADED DOOR" Stencil
8	"FULL COLD" Stencil
9	"NO STEP" Stencil (multiple on exhaust and engine access panels)

General - Continued

Table 5. M984A1 Wrecker Passenger Side Exterior.



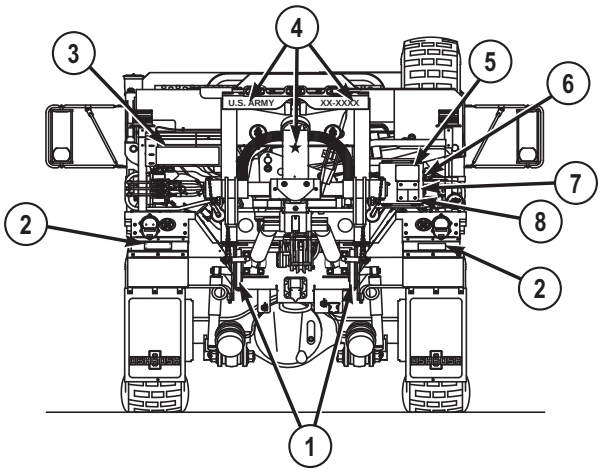
INDEX	DECAL/PLACARD/PLATE/STENCIL
1	"TIE DOWN" Stencil
2	Outrigger Instruction Placard
3	R.H. REMOTE CONTROL HOOKUP Placard
4	"CAUTION: SPRING LOADED DOOR" Stencil
5	Shipping Data Placard
6	CAUTION Decal
7	CAUTION Decal (hearing protection required)
8	Heavy-Duty Winch HIGH IDLE Placard
9	FRONT BRAKE APPLICATION Placard
10	"NO STEP" Stencil (multiple on exhaust and engine access panels)
11	Self-Recovery Winch Data Plate

General - Continued

Table 5. M984A1 Wrecker Passenger Side Exterior. - Continued

12	WARNING (self-recovery winch) Plate

Table 6. M984A1 Wrecker Rear Exterior.



INDEX	PLACARD/PLATE/STENCIL
1	"SLING POINT" and "TIE DOWN" Stencils (one each per side)
2	WARNING Placard
3	Retrieval System and Crane Instruction Plate
4	"US ARMY" and Serial Number Stencil or US Army Star Stencil **NOTE** Vehicle may have either, but never both.
5	DANGER Placard

General - Continued

Table 6. M984A1 Wrecker Rear Exterior. - Continued

6	Work Lights and Work Beacon Plate
7	Winch Control Placard
8	Power Distribution Box Data Placards

Table 7. Miscellaneous Decals/Placards/Plates/Stencils.

LOCATION	M977/ M985	M978	M983	M984A 1	M985 E1	M1120 LHS	M1977 CBT
Axle Housing	4	4	4	4	4	4	4
Carrier	4	4	4	4	4	4	4
Transfer Case	1	1	1	1	1	1	1
Engine	1	1	1	1	1	1	1
Transmission	1	1	1	1	1	1	1
Heavy-Duty Winch	0	0	0	1	0	0	0
Total	11	11	11	12	11	11	11

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.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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0817004

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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
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621