

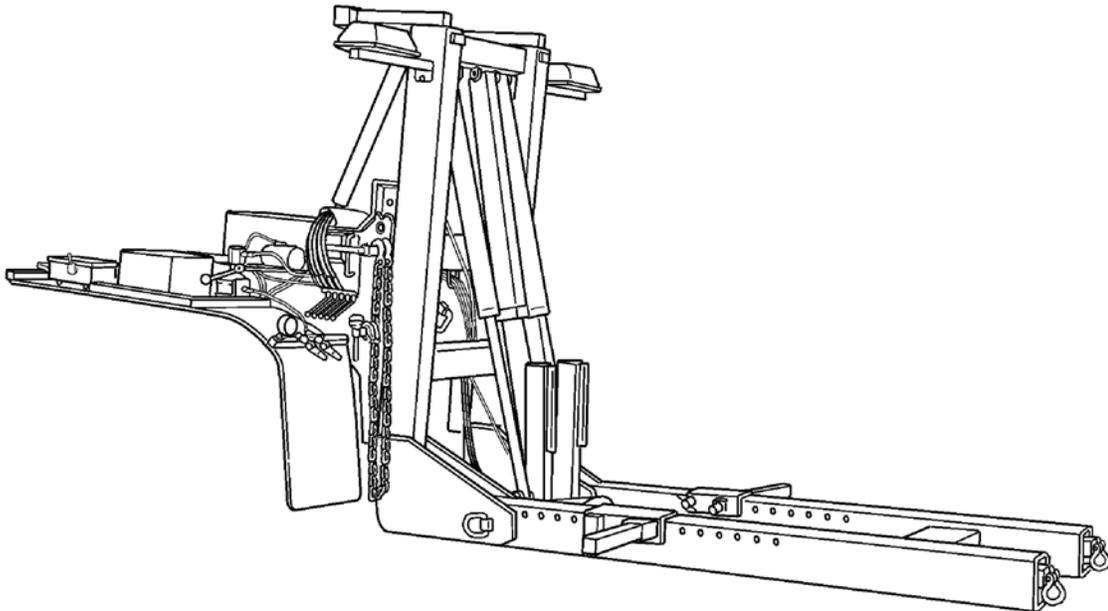
**OPERATOR'S, UNIT, AND DIRECT SUPPORT
MAINTENANCE MANUAL**

WITH

REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

**FIFTH WHEEL TOWING DEVICE MODEL 250M
(NSN 2510-01-458-8253)
FOR SERIAL NUMBERS 250M499 THROUGH 250M999**



Approved for public release; distribution is unlimited.

**HEADQUARTERS, DEPARTMENT OF THE ARMY
July 1, 2004**

SAFETY WARNING ICONS

FOR INFORMATION ON FIRST AID, REFER TO FM 21-11.



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



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



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



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



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



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



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

SAFETY WARNING ICONS - Continued



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



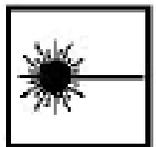
HEAVY PARTS - heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.



HELMET PROTECTION - arrow bouncing off head with helmet shows that falling parts present a danger.



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



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

SAFETY WARNING ICONS - Continued



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



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



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



SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.



SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.



SHARP OBJECT - pointed object in foot shows that a sharp object presents a danger to limb.



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

HAZARDOUS MATERIALS WARNINGS ICONS



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



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



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



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



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



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

HAZARDOUS MATERIALS WARNINGS ICONS - Continued



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



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



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

WARNING SUMMARY

WARNING

GENERAL



After washing the fifth wheel towing device, ensure appropriate breather valve is opened prior to operation of the fifth wheel towing device. Failure to comply may result in injury or death to personnel.

Improper cleaning methods and use of unauthorized cleaning liquids or solvents can cause injury or death to personnel and damage equipment. To prevent this, refer to TM 9-247 for further instructions.

No personnel shall perform maintenance above or below the main frame without the main frame being supported at the front by use of a jack stand or the prime mover. Failure to comply may result in injury or death to personnel.

WARNING

TRANSPORT



Ensure the top hydraulic pressure release valve is open prior to operating hydraulics. Failure to comply could cause injury or death to personnel or damage to equipment.

Ensure the boom has sufficient overhead clearance prior to folding the boom into a vertical position. Failure to comply may result in injury or death to personnel.

DO NOT operate boom until mast is in track. Failure to comply could cause serious injury or death to personnel or damage to equipment.

Visibility from the prime mover is significantly reduced when backing. Proper procedures must be followed and extreme caution used when backing to prevent injury or death to personnel or damage to equipment.

WARNING

FOLDING/UNFOLDING



Operators must take caution while folding the mast assembly to the vertical position. The transport leg assembly does not stay locked in the vertical position. The handle will swing free and may cause injury or death to personnel.

Ensure tool boxes are closed and the main frame is free of all unsecured items. Failure to comply may result in injury or death to personnel.

WARNING

COMPRESSED AIR



Compressed air used for cleaning or drying purposes, or for clearing restrictions, should never exceed 30 psi (207 kPa). Wear protective clothing (goggles/shield, gloves, etc.) and use caution to avoid injury or death to personnel.

Air under 100 psi pressure is used in the operation of the air brake system. Serious injury or death can result if precautions are not taken.

WARNING

WORK SAFETY



Unless otherwise specified, perform all lubrication and preventive maintenance checks with fifth wheel towing device on level ground and uncoupled. Failure to follow this warning may result in injury or death to personnel.

If personnel becomes dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical attention. Failure to comply may result in injury or death to personnel.

WARNING

ELECTRICAL SYSTEM



When troubleshooting an electrical malfunction or performing electrical maintenance, ALWAYS disconnect intervehicular electrical cable from towing vehicle. Failure to do so may result in injury or death due to electric shock.

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

Although battery ground cable must be connected in order to test electrical circuit voltage, disconnect battery ground cable from prime mover before performing resistance tests or replacing parts. This will prevent shock to personnel, and damage to parts and equipment.

DO NOT touch heat shrinkable tubing for at least 30 seconds after heating. Heat shrinkable tubing is hot and will burn you causing serious injury or death.

WARNING

COUPLING/UNCOUPLING



During coupling to prime mover, it may be required to adjust the angle of the main frame (WP 0005) to accommodate the height of the fifth wheel plate. Always ensure when coupling that the transport legs and bottom pressure relief valve assembly do not make contact with the prime mover. Failure to comply may result in injury or death to personnel.

All persons not involved in coupling/uncoupling operation must stand clear of prime mover and fifth wheel towing device to prevent serious injury or death.

Never stand between the prime mover and fifth wheel towing device when the prime mover is being backed up to the fifth wheel towing device. Serious injury or death may result.

WARNING

LOADING/UNLOADING OPERATION



All persons not involved in the loading or unloading operation must stand clear of prime mover and fifth wheel towing device. Failure to comply may result in injury or death to personnel.

Due to the dimensions and center of gravity of some loads, proper procedures must be followed when loading and unloading equipment to prevent damage to equipment and injury or death to personnel.

Visibility from the prime mover is significantly reduced when backing, whether the fifth wheel towing device is loaded or not. Proper procedures must be followed and extreme caution used when backing to prevent damage to equipment and injury or death to personnel.

Use extremely low speed when loading and unloading vehicles. Higher speeds will exaggerate motions and create hazardous conditions, which could result in personnel injury or death or damage to equipment.

Tow bar assemblies weigh 47 lbs. Use an assistant and caution when removing and handling them to prevent injury or death to personnel and damage to equipment.

The location of the boom extension clevis tiedown chains should be located between the rear of the cab and the forward rear axle on towed vehicle frame. Failure to comply may result in injury or death to personnel.

WARNING

HAZARDOUS WASTE DISPOSAL

When servicing this equipment, performing maintenance, or disposing of materials such as engine coolant, transmission fluid, lubricants, battery acids or batteries, and CARC paint, consult your Unit/Local Hazardous Waste Disposal Center or safety office for local regulatory guidance. If further information is needed, please contact the Army Environmental Hotline at 1-800-872-3845. Failure to comply may result in injury or death to personnel.

WARNING

BATTERIES



Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine stopped. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury or death to personnel can result.

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in injury or death to personnel.

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

Battery box is not a step. Stepping on battery box can cause it to swivel, causing injury or death to personnel.

WARNING

CARC PAINT



CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

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

CARC PAINT (Continued)



DO NOT let skin or eyes come in contact with CARC paint. Always wear protective equipment (gloves, ventilation mask, safety goggles, etc.).

DO NOT use CARC paint without adequate ventilation. Failure to comply may result in injury or death to personnel.

NEVER weld or cut CARC-coated materials. Failure to comply may result in injury or death to personnel.

DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use. Failure to comply may result in injury or death to personnel.

BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected. Failure to comply may result in injury or death to personnel.

WARNING

HEAVY COMPONENTS



Tow bars weigh 47 lbs each. Use caution when removing and handling them to prevent injury or death to personnel and damage to equipment.

To avoid personal injury or death, use a hoist or get assistance when lifting components that weigh more than 50 lbs (23 kg).

When tilting towbar assembly, upper section is not secure and may fall out and cause personal injury or death.

Winch assembly weighs approximately 120 lbs (54.4 kg). Use caution when removing and handling to prevent injury or death to personnel and damage to equipment.

Some personnel may have difficulty operating the FWTD because of heavy components. Use additional personnel when necessary and always use caution when operating to prevent injury or death to personnel.

WARNING

HYDRAULICS



Ensure hydraulic protection valve is open (breather switch inline with breather) prior to operating hydraulics. Failure to comply could cause injury or death to personnel or damage to equipment.

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

While operating or performing maintenance on any hydraulic systems, never place personnel or equipment in a potentially hazardous position (i.e., between moving parts or under hydraulic supported equipment). Failure to comply may result in severe injury or death to personnel.

WARNING

BOOM/MAST OPERATION



DO NOT operate boom until mast is in track. Failure to comply could cause serious injury or death to personnel or damage to equipment.

Clevises must be installed in mast assembly to prevent mast assembly from disengaging from track. Failure to comply may cause injury or death to personnel or damage to equipment.

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through glove and cut hand.

Never walk under booms during any operations. Failure to comply may cause injury or death to personnel.

WARNING

WINCHES



All personnel must stand clear during winching operations. A snapped cable or shifting load could cause injury or death to personnel.

Ensure cable is properly mounted on rear winch shaft before operating reel. Failure to do so may result in injury or death to personnel.

Winch is not designed for recovery of vehicles in mired conditions. Failure to comply may result in injury or death to personnel.

If winch cable has to be cut to remove winch assembly, wrap cut end of cable in tape and secure loose end of cable to prevent it from swinging free during winch assembly removal. Failure to follow this warning could result in injury or death to personnel.

WARNING

WIRE ROPES



Wire rope can become frayed or contain broken wires. Wear heavy leatherpalmed work gloves when handling wire rope. Frayed or broken wires can injure hands.

WARNING

TOWING



Secure any materials or equipment loaded in the beds of towed equipment. Failure to comply may result in injury or death to personnel.

When loaded, shut down towed equipment, turn off all switches, close doors and hatches, and swing in mirrors. Failure to comply may result in injury or death to personnel.

Stopping distances greatly increase when the towed vehicle has nonfunctioning brakes. Care should be taken to ensure adequate stopping distance is obtained and speed is adjusted accordingly. Failure to comply may result in injury or death to personnel.

WARNING

TOWING (Continued)



Towing of a single vehicle with non-functioning brakes must be limited to not more than 25 mph on the highway and 15 mph off-road. Failure to comply may result in injury or death to personnel.

Towing of vehicle combinations with non-functioning brakes is prohibited. Failure to comply may result in injury or death to personnel.

Prior to transporting loads, ensure the transport leg assembly is locked in the vertical position or the handle may swing free and cause injury or death to personnel.

M1074 and M1075 (PLS Series) can only be transported with no payload. Failure to comply may result in injury or death to personnel.

WARNING

TIEDOWN



Put transmissions in neutral on towed equipment. Failure to comply may result in injury or death to personnel.

Make sure gun turrets or other rotating parts are properly secured. Failure to comply may result in death or injury to personnel.

Make sure all BII items are properly stowed on the towing device. Remote should be stored with control switches toward the top of the tool box. Failure to comply may result in injury or death to personnel.

Check the prime mover and the trailer brakes and lights for proper operation. Failure to comply may result in injury or death to personnel.

Check all tiedowns at first opportunity after departure. Recheck all tiedowns at halts and any time you suspect a problem. Failure to comply may result in injury or death to personnel.

Safety chains should be installed at a 45° angle to prevent shifting. Failure to comply may result in injury or death to personnel.

WARNING

DRYCLEANING SOLVENT



Drycleaning solvent MIL-PRF-680 Type III is an environmentally compliant low toxic material. However, it may be irritating to the eyes and skin. The use of protective gloves and goggles is suggested. Use in well ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may result in injury or death to personnel.

Drycleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves, and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F-138°F (38°C-59°C). If you become dizzy while using cleaning solvent, immediately wash your eyes and get medical aid. Failure to comply may result in injury or death to personnel.

Compressed air used for cleaning or drying purposes, or for clearing restrictions should never exceed 30 psi (207 kPa). Wear protective clothing (goggles/shield, gloves, etc.) and use caution to avoid injury to personnel. Failure to comply may result in injury or death to personnel.

WARNING

AIR SYSTEM



Apply antiseize tape only to pipe threads of male fittings of air system or damage to air valves may result. Failure to comply may result in injury or death to personnel.

DO NOT overtighten or use power tools to tighten fittings taped with antiseize tape. Over tightening could damage fitting threads and cause connection to leak. Failure to comply may result in injury or death to personnel.

TM 9-2510-247-13&P

HEADQUARTERS, DEPARTMENT OF THE ARMY
WASHINGTON, DC, 15 May 2005

CHANGE
NO. 1

TECHNICAL MANUAL
OPERATOR'S UNIT AND
DIRECT SUPPORT MAINTENANCE MANUAL
WITH
REPAIR PARTS AND SPECIAL TOOLS LIST
FOR
FIFTH WHEEL TOWING DEVICE MODEL 250M
(NSN 2510-01-458-8253)
FOR SERIAL NUMBERS 250M499 THROUGH 250M999

DISTRIBUTION STATEMENT A- Approved for public release; distribution is unlimited.

TM 9-2510-247-13&P, 1 July 2004, is updated as follows:

1. New or changed material is indicated by a vertical bar in the margin.
2. Replace the following work packages with their revised version.

Remove and Replace Work Packages:

WP 0010 00
WP 0082 00
WP 0091 00

3. File this change sheet in front of publication for reference purposes.

By Order of the Secretary of the Army:

Official:



SANDRA R. RILEY

*Administrative Assistant to the
Secretary of the Army*

0511009

PETER J. SCHOOMAKER
*General, United States Army
Chief of Staff*

DISTRIBUTION: To be distributed in accordance with the Initial Distribution Number (IDN) 256692, requirements for TM 9-2510-247-13&P.

INSERT LATEST CHANGED PAGES/WORK PACKAGES. DESTROY SUPERSEDED DATA.
LIST OF EFFECTIVE PAGES/WORK PACKAGES

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Change 1 15 May 2005

**TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 35 AND TOTAL
NUMBER OF WORK PACKAGES IS 91, CONSISTING OF THE FOLLOWING:**

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TECHNICAL MANUAL
TM 9-2510-247-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., July 1, 2004

OPERATOR'S, UNIT, AND DIRECT SUPPORT MAINTENANCE MANUAL
WITH
REPAIR PARTS AND SPECIAL TOOLS LIST
FOR
FIFTH WHEEL TOWING DEVICE
MODEL 250M
(NSN 2510-01-458-8253)

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028-2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <http://aeprs.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. 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 email your letter, DA Form 2028, or DA Form 2028-2 direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630. The email address is amsta-ac-nml@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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HOW TO USE THIS MANUAL

This manual is designed to help you operate and maintain the 250M Fifth Wheel Towing Device.

FEATURES OF THIS MANUAL:

- A table of contents is provided at the beginning of this manual.
- WARNINGS, CAUTIONS, NOTES, subject headings, and other important information are highlighted in BOLD print as visual aid.

WARNING

A WARNING indicates a hazard which can result in death or serious injury.

CAUTION

A CAUTION is a reminder of safety practices or directs attention to usage practices that may result in damage to equipment.

NOTE

A NOTE is a statement containing information that will make the procedure easier to perform.

- Statements and words of particular importance are printed in CAPITAL LETTERS to create emphasis.
- Instructions are located with illustrations that show the specific task the operator or mechanic is performing.
- Dashed leader lines used in illustrations indicate that called out items are not visible (i.e., they are located within the structure). Dashed leader lines in the Lubrication Chart indicate that lubrication is required on BOTH sides of the equipment.
- Technical instructions include metric units in addition to standard units. A metric conversion chart is provided on the inside back cover.
- An alphabetical index is provided at the end of the manual to assist in locating information not readily found in the Table of Contents.

FOLLOW THESE GUIDELINES WHEN YOU USE THIS MANUAL:

- Read through this manual and become familiar with its contents before attempting to operate or maintain the fifth wheel towing device.
- A warning summary is provided at the beginning of this manual and should be read before attempting to operate or maintain the fifth wheel towing device.
- Within a chapter or work package, headings are used to help group the material to assist in quickly finding tasks. Read all preliminary information found at the beginning of each task. After completing a task, ALWAYS perform the follow-on maintenance at the end of the task.

TM 9-2510-247-13&P

CHAPTER 1

**GENERAL INFORMATION,
EQUIPMENT DESCRIPTION,
AND THEORY OF OPERATION**

GENERAL INFORMATION INDEX

WP Sequence No.

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

General Information	0001 00
Equipment Description and Data	0002 00
Theory of Operation	0003 00

**FIFTH WHEEL TOWING DEVICE MODEL 250M
GENERAL INFORMATION**

TYPE OF MANUAL

Operator's, Unit, and Direct Support Maintenance Manual with Repair Parts and Special Tools List.

EQUIPMENT NAME AND MODEL NUMBER

Fifth Wheel Towing Device (FWTD), 250M.

PURPOSE OF EQUIPMENT

The Fifth Wheel Towing Device is intended to provide units, as authorized on TOEs, with the capability to recover disabled vehicles.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, (Functional User's Manual for the Army Maintenance Management System) as contained in the Maintenance Management Update.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-3 for procedures for destruction of Army materiel to prevent enemy use.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to WP 0021, or WP 0078, for instructions for preparing the fifth wheel towing device for storage or shipment.

OFFICIAL NOMENCLATURE, NAMES, DESIGNATIONS, AND ABBREVIATIONS

NOTE

Refer to MIL-STD-12D for standard abbreviations.

Official Name	Common Name or Abbreviation
Army Master Data File	AMDF
Basic Issue ItemBII
Commercial and Government Entity Code	CAGEC
Components of End Item	COEI
Corrosion Prevention and Control	CPC
Equipment Improvement Recommendations	EIR
Gross Vehicle Weight	GVW
International Standards Organization	ISO
Intervehicular Electrical Cable (IVEC)	IVEC
Maintenance Allocation Chart	MAC
Modified Table of Organization and Equipment	MTOE
National Item Identification Number (last 9 digits of NSN)	NIIN
National Stock Number	NSN
Preventive Maintenance Checks and Services	PMCS
Quality Deficiency Report.....	QDR
Repair Parts and Special Tools List	RPSTL
Tables of Organization and Equipment.....	TOE
Unit of Issue	U/I

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your fifth wheel towing device needs improvement, let us know. Send us an SF Form 368 (Product Quality Deficiency Report). You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630. We'll send you a reply.

WARRANTY INFORMATION

Tru-Hitch, Inc. (Tru.Hitch@snet.net), 1-800-450-8659, warrants to the first user purchaser of each new fifth wheel towing device that it is free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to repairing or replacing, as Tru-Hitch, Inc. may elect, any part or parts thereof, including equipment or trade accessories, which shall be returned to Seller's place of business with transportation charges prepaid, and as to which examination shall disclose to the satisfaction of Tru-Hitch, Inc. to have been thus defective provided that such part or parts shall be so returned not later than twelve (12) months after the delivery of such Equipment to the first user purchaser. Such defective part or parts will be repaired or replaced free of charge for installation to the first user purchaser at Seller's place of business.

The warranty shall not apply (1) to normal maintenance service or adjustments, including, but not limited to, hydraulic inspection or adjustment, nor to replacement of hydraulic fluids, lubricants or filters when such adjustments or replacements are made as part of normal maintenance service, or (2) to any Equipment which shall have been repaired or altered in any way so as to, in Seller's judgment, affect adversely its stability or reliability, or (3) to any Equipment which shall have been subject to misuse, negligence or accident, or loaded beyond the factory rated load capacity.

Neither seller nor Tru-Hitch, Inc. makes any warranty other than that which is specifically described herein. This warranty is expressly in lieu of all other warranties expressed or implied. There are no implied warranties of merchant ability or fitness for a particular purpose. This warranty states the entire and exclusive liability of seller and Tru-Hitch, Inc. and purchaser's exclusive remedy for any claim for damages in connection with the sale of furnishings of the equipment, its design, suitability for use, installation or operation, or for any claimed defects therein. Neither seller nor Tru-Hitch, Inc. will be liable for any incidental or consequential damages whatsoever.

SAFETY, CARE, AND HANDLING

1. **First Aid.** For first aid information, refer to FM 21-11, *First Aid for Soldiers*.
2. **Personnel Safety Precautions**
 - a. Read and become familiar with all WARNINGS in the warning summary at the front of this manual.
 - b. Pay attention to WARNING decals on the towing device. These provide safety instructions and identify specific hazards which, if not followed, may result in serious injury or death to personnel.
 - c. Throughout this manual, WARNINGS and CAUTIONS are given immediately preceding the procedural steps to which they apply. Read these WARNINGS and CAUTIONS and follow them exactly.
 - d. When performing operations with the towing device in conjunction with another vehicle, ensure that all Warnings, Cautions, and special instructions in the vehicles operators manual are followed.

2. Personnel Safety Precautions - Continued

- e. When performing maintenance, protect yourself against injury. Wear protective gear such as safety goggles or lenses, safety shoes, rubber apron, gloves, etc.
- f. Notify others in the area if you are handling flammable materials. Know the location of fire extinguishers and emergency procedures in case of accident or fire.
- g. Before performing maintenance, ensure that the fifth wheel towing device is secured against movement.
- h. When lifting heavy parts, have someone help you. Ensure that lifting or jacking equipment is working properly, is of sufficient capacity for the assigned task, and is secure against slipping.

CORROSION PREVENTION AND CONTROL (CPC)

1. CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements made to prevent the problem in future items.
2. While corrosion is typically associated with 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.
3. If a corrosion problem is identified, it can be reported using SF 368 (*Product Quality Deficiency Report*). Use of key words such as "CORROSION," "RUST," "DETERIORATION," or "CRACKING" will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA Pam 738-750.

END OF WORK PACKAGE

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

1. This fifth wheel towing device is designed to transport wheeled vehicles on highways, unimproved roads (graded level), and cross-country.
2. The prime movers for the fifth wheel towing device are listed in WP 0091.
3. The following fifth wheel towing device positions are supplied for operator/maintenance personnel reference:
 - a. **SHIPPING/STORAGE CONFIGURATION:** The fifth wheel towing device shall be shipped or stored inverted in the smallest configuration (WP 0021).

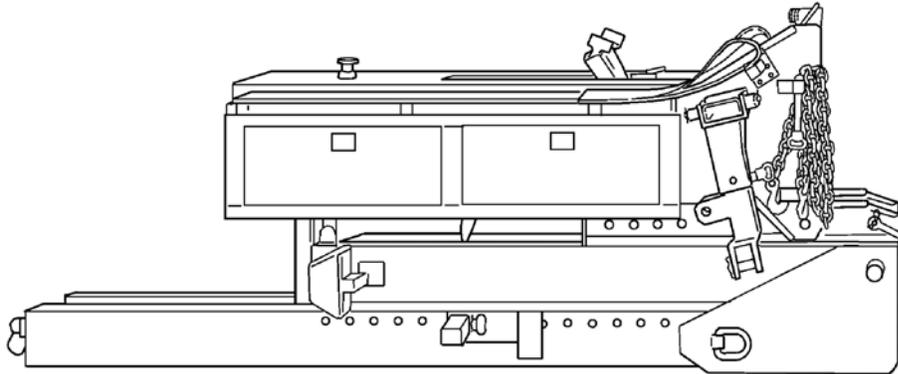


Figure 1. Primary Shipping Configuration Storage

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES - Continued**NOTE**

The storage configuration may be modified to accommodate space and operating time.

- (1) STORAGE CONFIGURATION A: Storage position with the boom extensions left in the extended position.
- (2) STORAGE CONFIGURATION B: Storage position with the boom extensions left in the extended position and the main frame left in the vertical position with the main frame cylinders fully retracted.
- (3) The SHIPPING CONFIGURATION may be modified to accommodate mode of shipping (WP 0021).

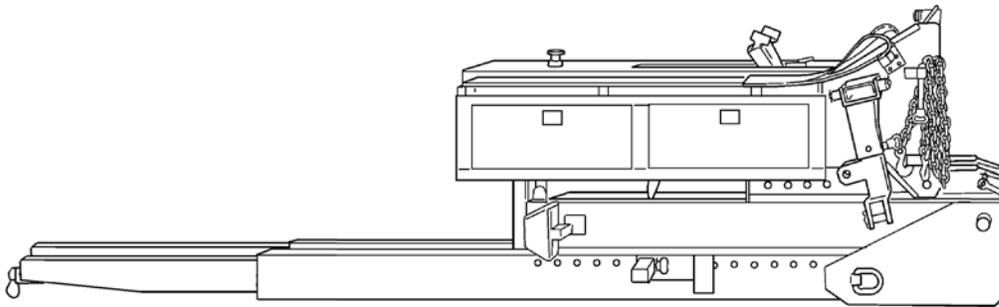


Figure 2. Storage Configuration A.

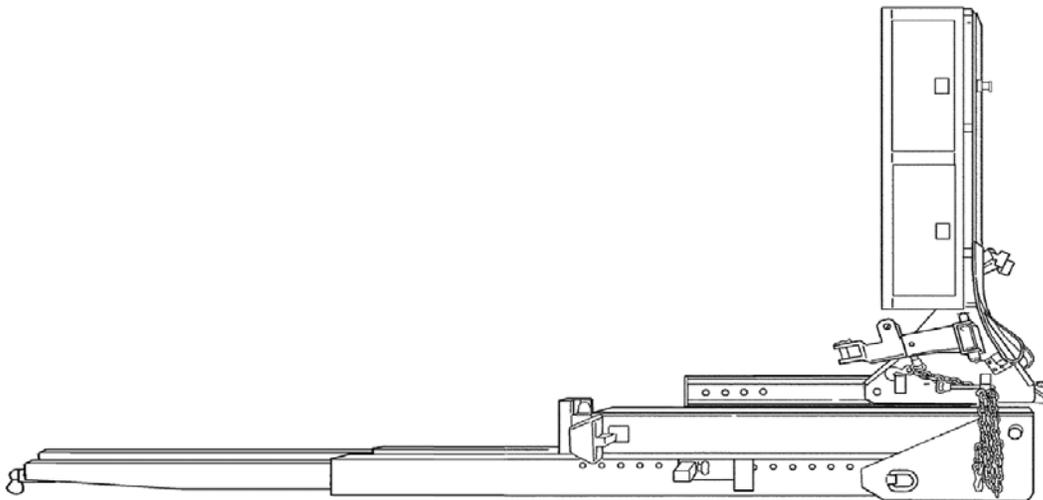


Figure 3. Storage Configuration B.

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES - Continued

- b. **COUPLING CONFIGURATION:** The fifth wheel towing device set on the ground with the boom extended at a right angle to the mast. The boom extensions are fully extended. The transport legs are locked in the up position (WP 0006).

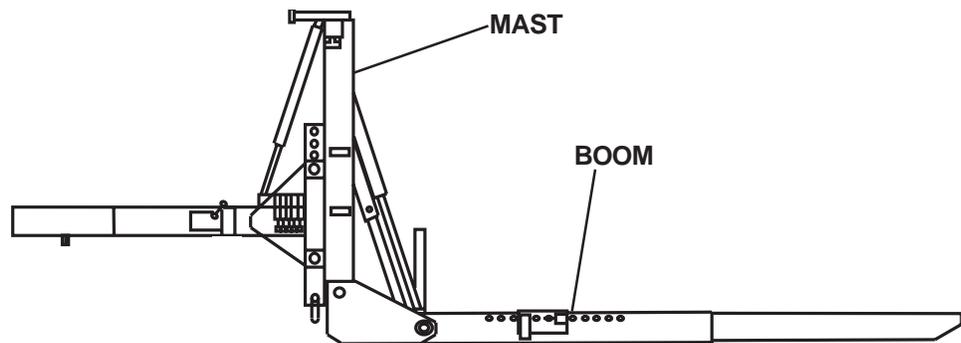


Figure 4. Coupling Configuration.

- c. **LOADING CONFIGURATION:** The fifth wheel towing device connected to the fifth wheel of the prime mover with the boom extended at a right angle to the mast and 0.5 in (1.3 cm) above the ground. The boom extensions are fully retracted. The transport legs are locked in the down position with the fifth wheel towing device resting on the transport legs (WP 0009).

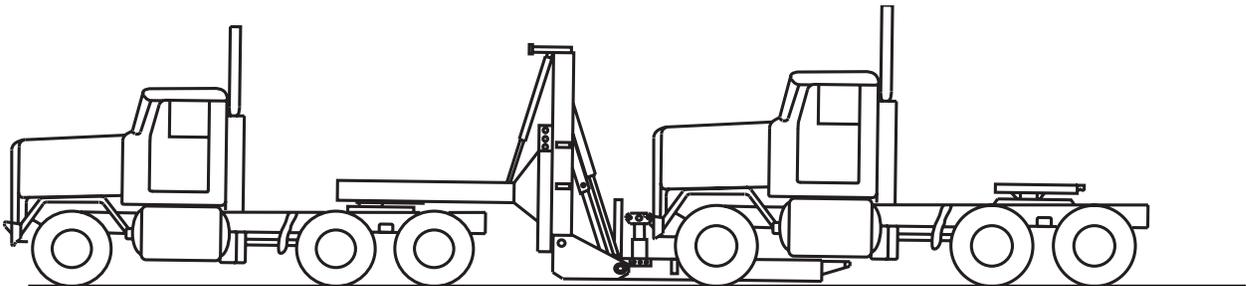


Figure 5. Loading.

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES - Continued

- d. **TRANSPORTATION CONFIGURATION:** The fifth wheel towing device connected, folded, and secured to the fifth wheel of the prime mover (WP 0007).

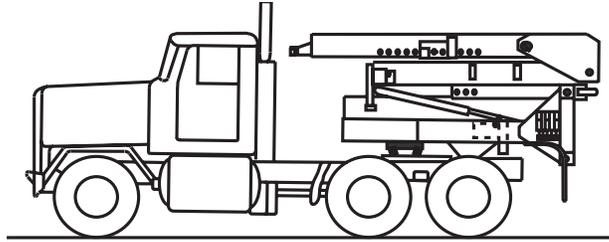


Figure 6. Transport Confituration

- e. **TOWING CONFIGURATION:**

- (1) **Towing Configuration Connected:** The fifth wheel towing device connected to the fifth wheel of the prime mover. The boom extended at a right angle to the mast with the boom extensions extended. The tow vehicle connected and the boom at appropriate towing height (WP 0017).
- (2) **Towing Configuration Disconnected:** Same position as connected position, except the boom is lowered until the fifth wheel towing device is supported by the weight of the towed vehicle and the main frame weight is off of the 5th wheel plate. The prime mover is disconnected and removed from the configuration (WP 0007 or WP0017).

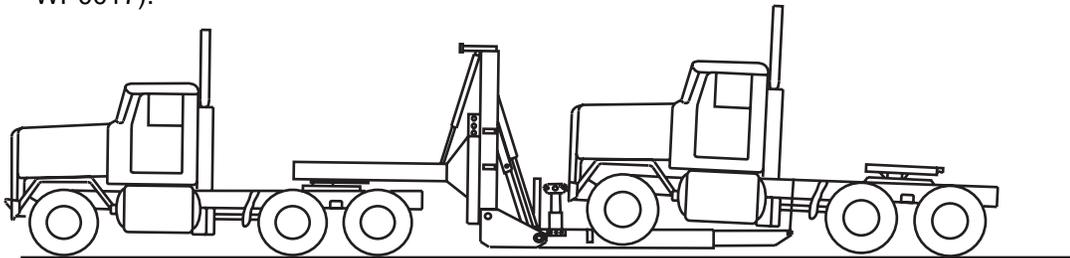


Figure 7. Towing Configuration Connected.

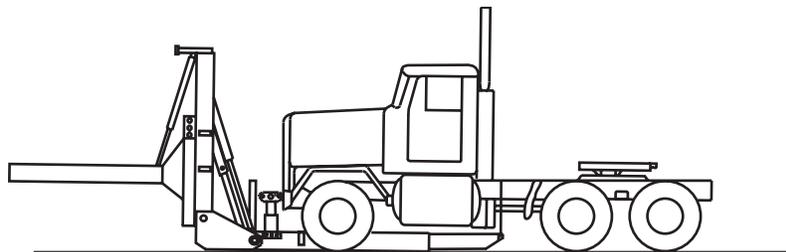


Figure 8. Towing Configuration Disconnected.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

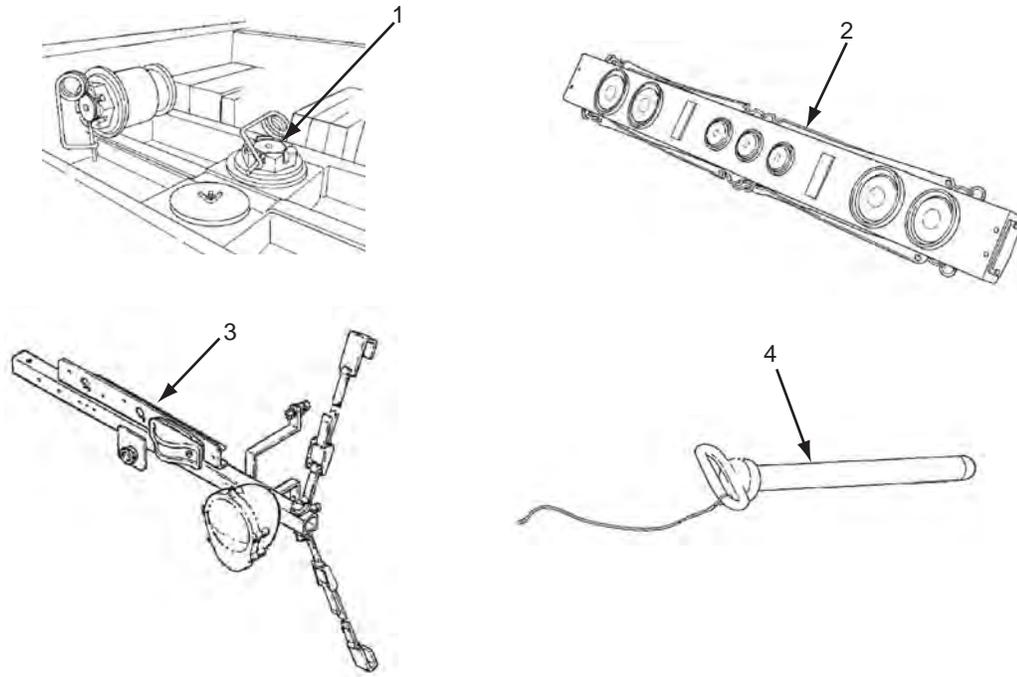


Figure 9. Kingpin, 12/24 Volt Light Bars, Pivot Pin.

Key	Component	Description
1	Kingpin	A removable kingpin is inserted from the bottom and extends below the towing device to attach to the prime mover fifth wheel plate for towing. Two kingpins are provided for use with different prime movers. The second kingpin is stored in a kingpin holder on the frame.
2	12 Volt Light Bar (AAL)	The 12 volt light bar has combination stop, turn, taillights, and red clearance lights on either side.
3	24 Volt Light Bar	The 24 volt light bar has combination stop, turn, taillights, and red clearance lights on either side, and blackout lights. The 24 volt light bar is stowed in the tool box.
4	Pivot Pin	Two pivot pins are inserted into the mast assembly to allow boom section to move into vertical position. The pivot pins are stored in the toolbox.

LOCATION AND CONTENTS OF PLATES, DECALS, AND STENCILS

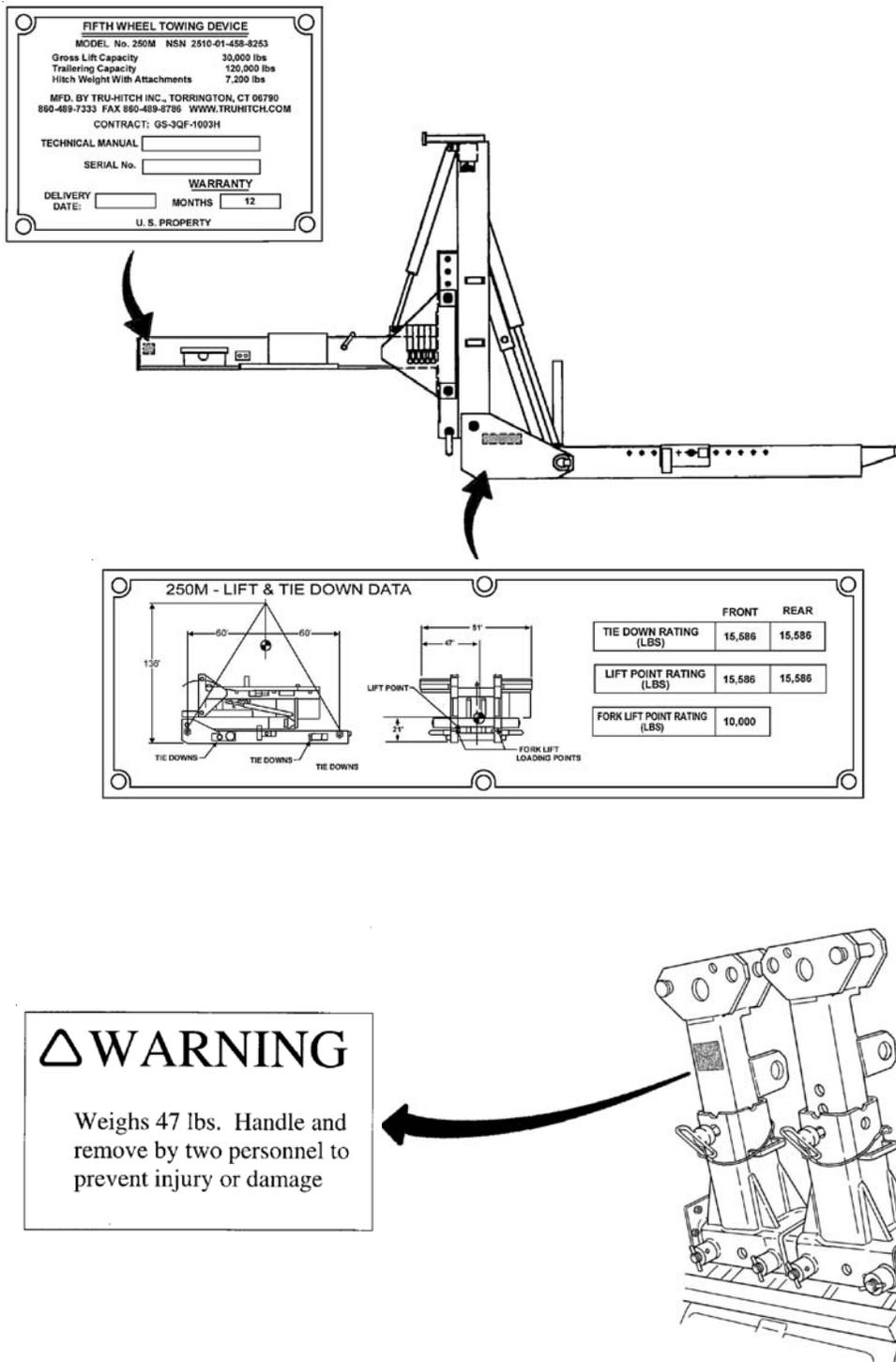


Figure 10. Data Plates

EQUIPMENT DATA

TOWING DEVICE:

Overall Dimensions

Length	(Fully Extended)	28 ft. 6 in. (868.7 cm)
	(Transport Configuration)	12 ft. 6 in. (381 cm))
Width	91 in. (231.1 cm)
Height	(Transport Configuration)	64 in. (153 cm)
	(Towing Configuration)	9 ft. 4 in. (284.5 cm)
	(Maximum Height on Ground)	13 ft. 6 in. (411.5 cm)
	(Maximum Height, Coupled, Boom Vertical)11 ft. 7 in. + Fifth Wheel	(353.1 cm + Fifth Wheel)

The height of the fifth wheel must be added to achieve the minimum overhead allowable height for performing some indoor maintenance tasks.

VEHICLE WEIGHTS:

Empty Net Weight	7,200 lbs. (3,266 kg)
Maximum Towing Weight	
Highway or Improved Roads	120,000 lbs. (54,431 kg)
Cross Country	120,000 lbs. (54,431 kg)

ELECTRICAL ITEM

Type	12/24 Volt
Lights	12/24 Volt
Hydraulic Electrical Motor (Primary)	12 Volt
Hydraulic Electrical Motor (Isolated)	12 Volt
Batteries	12 Volt
Solenoids (Primary)	12 Volt
Solenoids (Isolated)	12 Volt

WARNING

BRAKES

Stopping distances greatly increase when the towed vehicle has nonfunctioning brakes. Care should be taken to ensure adequate stopping distance is obtained and speed is adjusted accordingly. Failure to comply may result in injury or death to personnel.

SPEED

Transport	
Highway and Improved Roads	50 mph (80.5 KpH)
Unimproved Roads (Graded Gravel) and Cross Country	50 mph (80.5 KpH)
Towing (Max Load - Must not exceed lowest top allowable speed stated in prime mover TM or towed vehicle TM)	
Highway and Improved Roads	25 mph (80.5 KpH)
Unimproved Roads (Graded Gravel) and Cross Country	15 mph (40.2 KpH)

EQUIPMENT DATA - Continued

HYDRAULIC SYSTEM CAPACITY 18.0 gal (68.14 L)

HYDRAULIC RESERVOIR CAPACITY 8.75 gal (33.1 L)

HYDRAULIC OPERATING PRESSURE

(with no load during MAST and BOOM operations) 300-800 psi

(with load, during Mast and BOOM operations) up to 3000 psi

WINCH CAPACITY 10,000 lbs. (4,536 kg)

(with pulley block) 20,000 lbs. (9,072 kg)

END OF WORK PACKAGE

THEORY OF OPERATION

KINGPIN

Removable Kingpin. Two are provided, one is 3.5 inch (88.9 mm), the other is 2 inch (50.8 mm), for fifth wheel plate and kingpin coupling. For kingpin used with prime mover and placement on fifth wheel towing device, see WP 0034, Kingpin Placement.

HYDRAULIC FLOW VALVE

Hydraulic Flow Valves Adjustment. Located on hydraulic safety valves on center mast. This procedure for flow valve adjustment is to be used from 120°F to -50°F (49 °C to -46°C). As oil viscosity varies with temperatures, it will be required to change the hydraulic flow valve for the boom and mast functions. The adjustment is made at the flow control knobs located on the hydraulic safety valves located on the front side of the center mast frame. To adjust, turn control knob COUNTERCLOCKWISE TO LOWER back pressure and CLOCKWISE TO INCREASE back pressure. System should maintain 300-800 psi back pressure when the boom or mast is operated, using MAST RETRACT or BOOM EXTEND with no load. The hydraulic flow valves will need to be adjusted as necessary as temperatures vary or when OHA 5606 is replaced with standard hydraulic fluid (reference WP 0004, item 7).

END OF WORK PACKAGE

TM 9-2510-247-13&P

CHAPTER 2
OPERATOR INSTRUCTIONS

OPERATOR INSTRUCTIONS INDEX

WP Sequence No.

OPERATOR INSTRUCTIONS

Description and Use of Operator's Controls and Indicators	0004 00
Operation Under Usual Conditions	0005 00
Coupling	0006 00
Transport Configuration	0007 00
Prepare Towing Device	0008 00
Prepare Tow Bar Assemblies	0009 00
Connecting to Towed Vehicle	0010 00
Performance of Pre-Picking Lifts	0011 00
Winching Operations	0012 00
Preparing Equipment for Towing	0013 00
Securing Equipment	0014 00
Operate Lights	0015 00
Gladhands	0016 00
Transporting Loads	0017 00
Disconnecting Towed Vehicle	0018 00
Stowage of Tow Bar Assemblies	0019 00
Uncoupling	0020 00
Prepare for Shipping/Storage	0021 00
Operation Under Unusual Conditions	0022 00

DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

HYDRAULIC SYSTEM CONTROLS AND INDICATORS

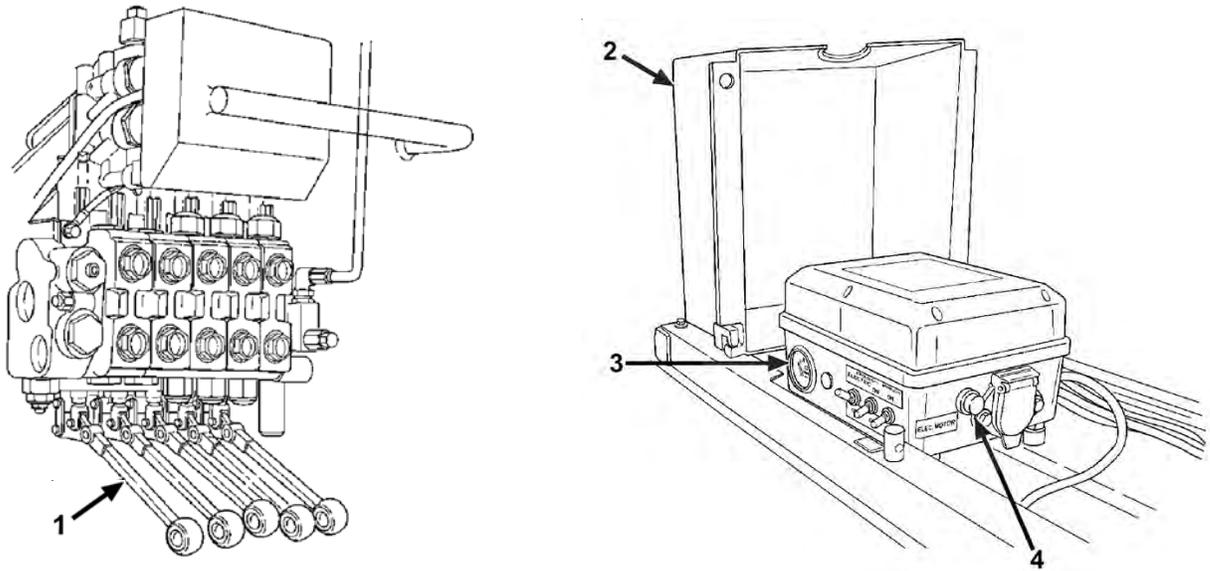


Figure 11. Hydraulic and Electrical Controls

KEY	CONTROL OR INDICATOR	FUNCTION
1	Hydraulic Control Levers	Provides manual operation of equipment.
2	Electrical Control Box Cover/Step	Doubles as a cover for electrical control box and a step for aid in reaching valve control levers during operation.
3	Voltmeter	Provides ability to monitor voltage of fifth wheel towing device.
4	Electric Motor Switch	Must be depressed at all times to operate hydraulic control levers.

HYDRAULIC SYSTEM CONTROLS AND INDICATORS - Continued

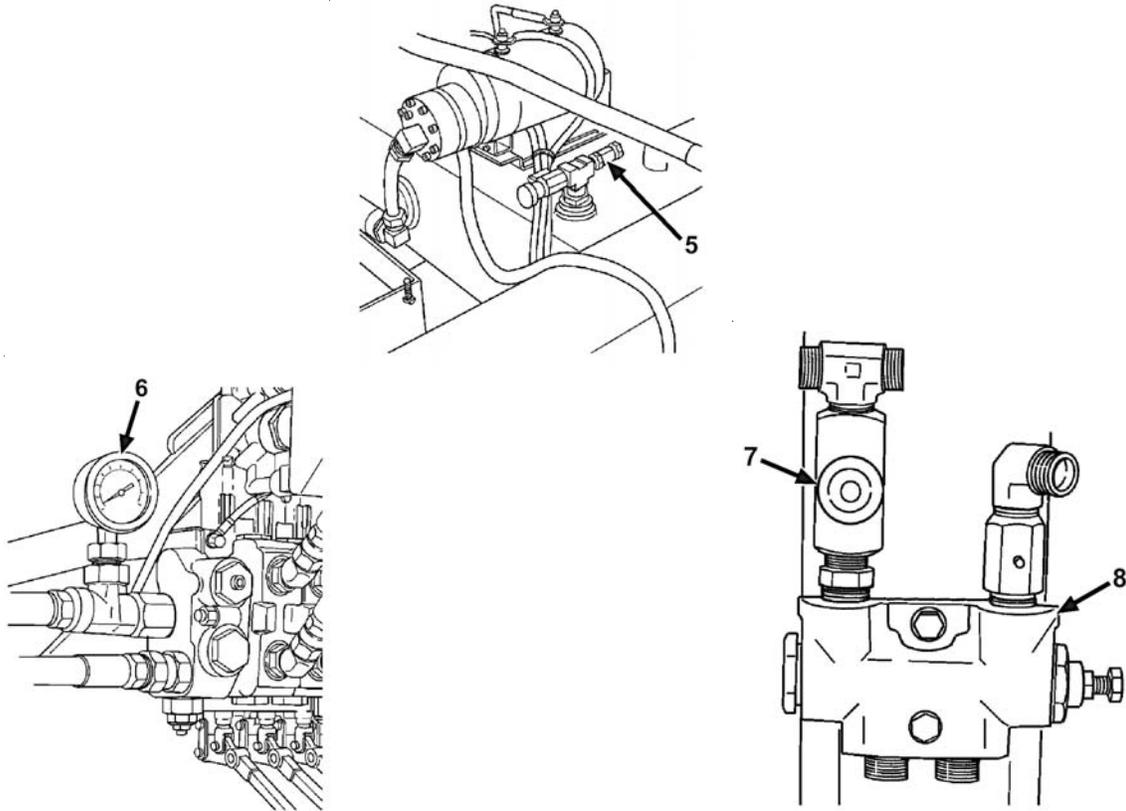


Figure 12. Hydraulic Valves and Gauges

KEY	CONTROL OR INDICATOR	FUNCTION
5	Top Hydraulic Relief Valve	Provides remote point for air to be drained from reservoirs.
6	Pressure Gauge	Provides ability to monitor hydraulic fluid pressure. Must maintain back pressure of 300 to 800 psi when the boom or mast is operated with no load.
7	Hydraulic Flow Valves	Provides ability to adjust hydraulic back pressure (WP 0003).
8	Hydraulic Safety Valves	Control hydraulic pressure and contain hydraulic flow valves to allow for adjustment of back pressure.

COUPLING AND CONNECTORS CONTROLS AND INDICATORS

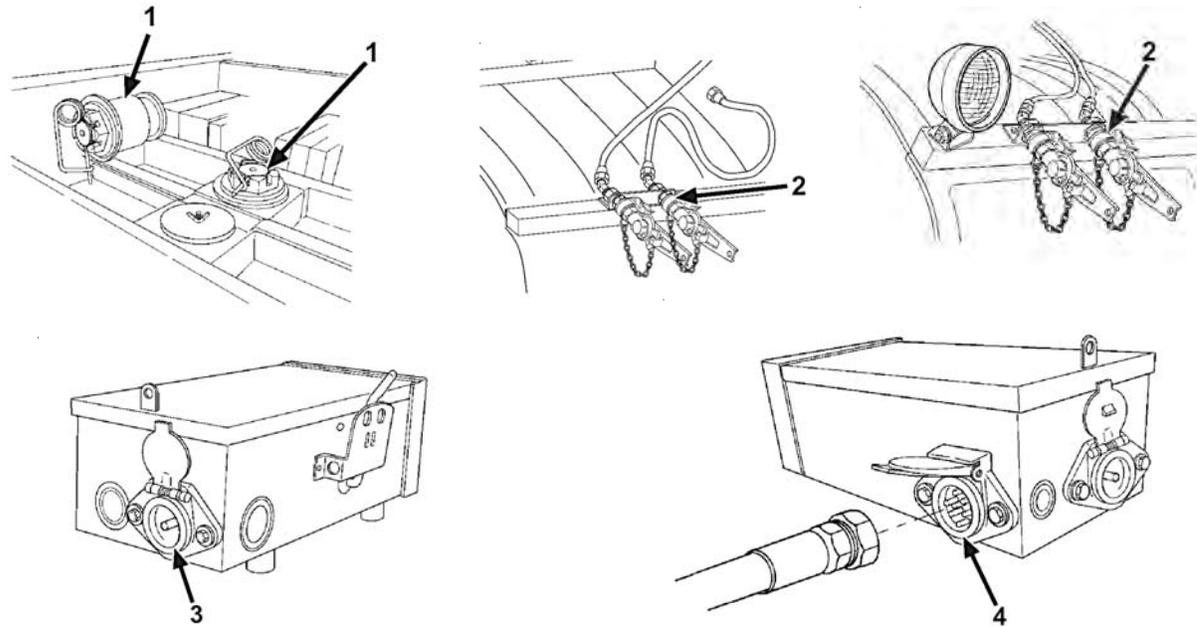


Figure 13. Coupling and Connecting Items

KEY	CONTROL OR INDICATOR	FUNCTION
1	Kingpins (removable)	Secures fifth wheel towing device to fifth wheel of prime mover. Kingpins are removable and two sizes are provided.
2	Gladhands	Connect to the prime mover and towed vehicle to supply air for the towed vehicle brakes.
3	Electrical Connector	Connection point for the 24-volt inter-vehicular electrical cable from prime mover.
4	Electrical Connector	Connection point for the 12-volt inter-vehicular electrical cable from prime mover.

TIEDOWN AND ACCESSORY ITEMS CONTROLS AND INDICATORS

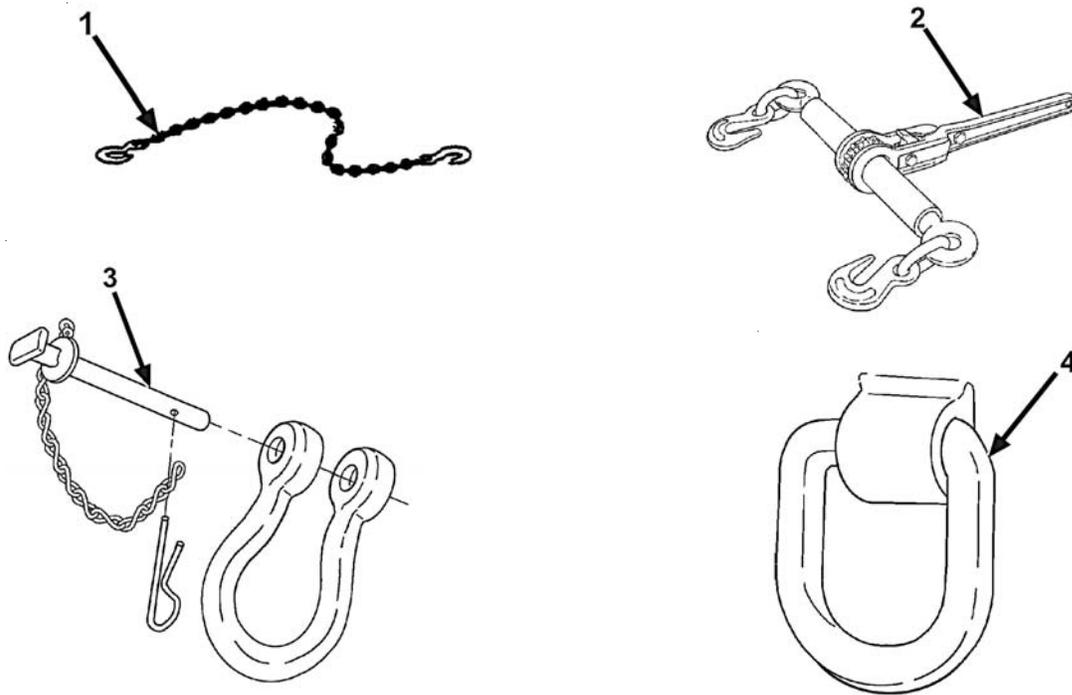


Figure 14. Tiedown Accessories

KEY	CONTROL OR INDICATOR	FUNCTION
1	Chain Assemblies	(Two) chain assemblies 3/8 inch (9.52 mm). (Two) chain assemblies 1/2 inch (12.7m).
2	Load Binders	(Two) load binders used to secure loads to towing device.
3	Clevises	(Two) clevises provide tiedown point for chains and additional safety to prevent mast from disengaging track.
4	D-rings	(Six) D-rings provide tiedown point for chains.

END OF WORK PACKAGE

OPERATION UNDER USUAL CONDITIONS

SCOPE

1. This section provides instructions on operating the 250M Fifth Wheel Towing Device under usual conditions.
2. Refer to WP 0022 for operating instructions under unusual conditions.
3. Perform applicable Operator PMCS, before, during, and after operation (WP 0031).

UNFOLDING FROM SHIPPING/STORAGE CONFIGURATION

The following operation assumes the fifth wheel towing device is on the ground and folded into the shipping/storage configuration.

**WARNING**

Operators must take caution while folding the mast assembly to the vertical position. The transport leg assembly does not stay locked in the vertical position. The handle will swing free and may cause injury or death to personnel.

Control box cover is heavy. Caution must be used during removal if in shipping configuration to prevent injury to personnel.

Some personnel may have difficulty operating the FWTD because of heavy components. Use additional personnel when necessary and always use caution when operating to prevent injury or death to personnel.

UNFOLDING FROM SHIPPING/STORAGE CONFIGURATION - Continued**NOTE**

Illustrations are upside down because they are in shipping configuration.

1. Unlock control box (3), and 12-24 volt junction box (1).
2. Set selector switch on 12/24 volt junction box (1) to 12 volts.
3. Switch electrical control box (2) to ON position.

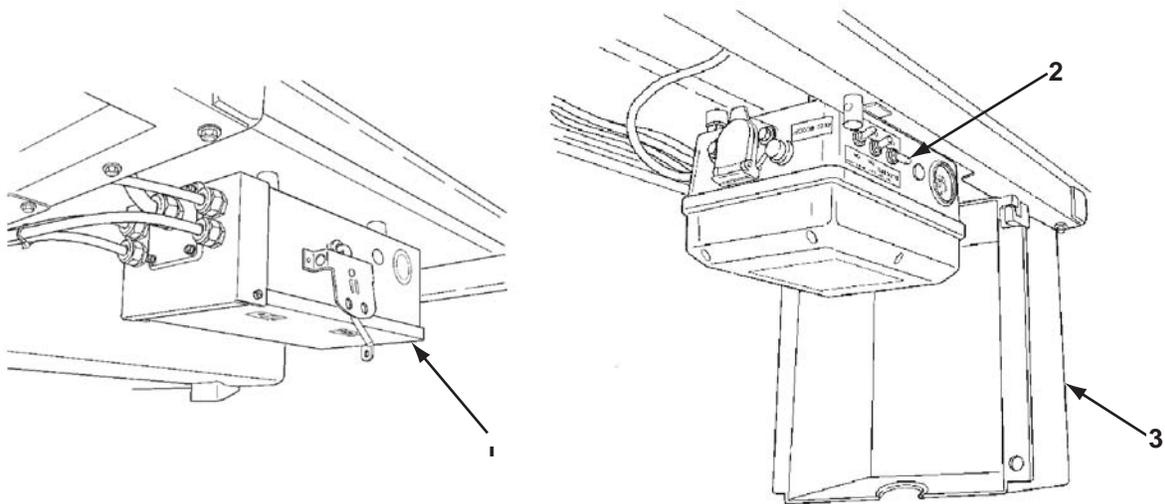


Figure 15. Electrical Control boxes

UNFOLDING FROM SHIPPING/STORAGE CONFIGURATION - Continued

4. Using valve control levers, EXTEND LEFT OUT and EXTEND RIGHT OUT, fully extend boom extensions.
5. Using valve control levers, MAST RETRACT until arrow (1) at pivot pin hole is aligned with arrow (2) on mast.

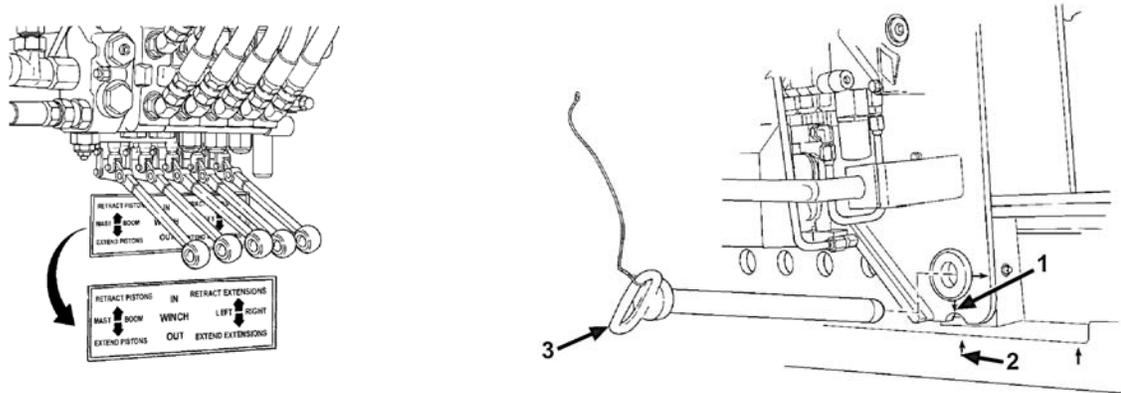


Figure 16. Hydraulic Control Levers and Pin alignment

6. Insert both pivot pins (3) (do not insert spring clips into pivot pins) and remove both clevises (4) from mast.

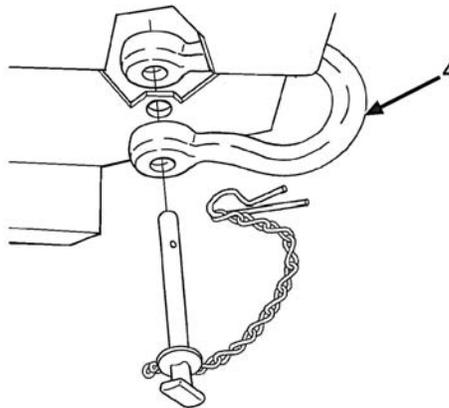


Figure 17. Clevis

UNFOLDING FROM SHIPPING/STORAGE CONFIGURATION - Continued

7. Using remote control or valve control levers, MAST EXTEND to unfold main frame assembly to a vertical position onto mast.

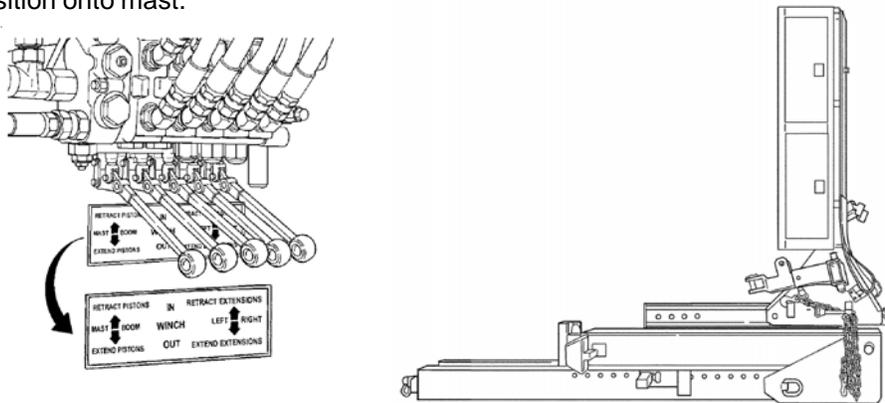


Figure 18. Hydraulic Control Levers and Unfolded FWTD

8. Remove both pivot pins.
9. Close bottom breather relief valve by turning breather lever (5) to a 90° angle with the fitting (6). Open top breather valve by turning breather lever (5) in line with breather (6).
10. Turn bottom breather elbow 180° from original shipping position.

NOTE

With main frame in the vertical position, the bottom breather is on the fifth wheel side of the hydraulic tank and the top breather is located towards the rear of the fifth wheel towing device.

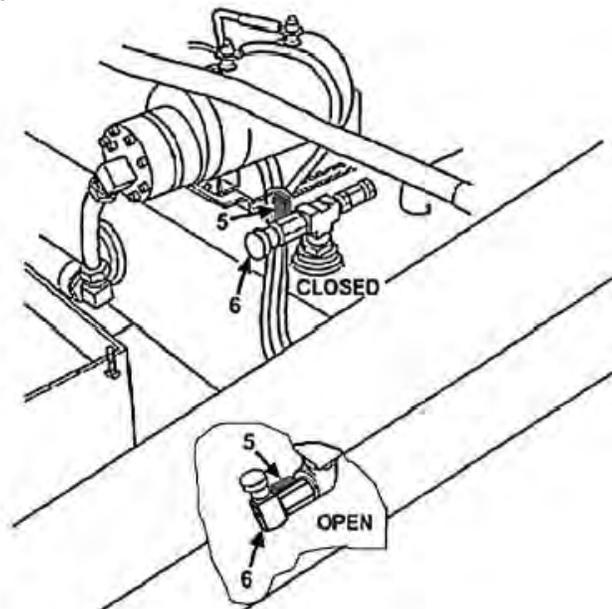


Figure 19. Breather Valves

UNFOLDING FROM SHIPPING/STORAGE CONFIGURATION - Continued

11. Using remote control or valve control levers, MAST RETRACT until bottom of main frame assembly (7) is approximately 1 ft. above the bottom of the mast slide (8).
12. Reinstall both clevises (4) on mast.
13. Using remote control or valve control levers, BOOM EXTEND to unfold main frame assembly until fenders are horizontal with the prime mover fifth wheel.

NOTE

Ensure transport legs are locked in the upright position.

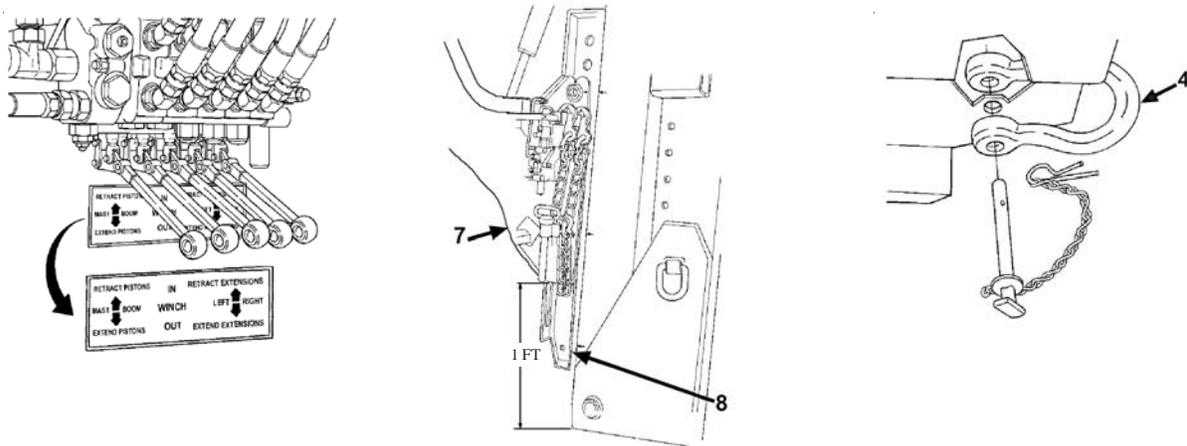


Figure 20. Control Levers, Mast, and Clevis

14. Using remote control or valve control levers, MAST RETRACT until main frame is at highest position without striking the top of the mast.

END OF WORK PACKAGE

COUPLING

Coupling operations will be conducted with the towing device set on the ground with the boom extended at a right angle to the mast section, transport legs locked in the up position, and boom extensions fully extended.

**WARNING**

During coupling to prime mover, it may be required to adjust the angle of the main frame (WP 0005) to accommodate the height of the fifth wheel plate. Always ensure when coupling that the transport legs and bottom pressure relief valve assembly do not make contact with the prime mover. Failure to comply may result in death or injury to personnel.

All persons not involved in coupling/uncoupling operation must stand clear of prime mover and fifth wheel towing device to prevent serious injury or death.

Never stand between the prime mover and fifth wheel towing device when the prime mover is being backed up to the towing device. Serious injury or death may result.

CAUTION

To prevent damage to the equipment, coupling should be done by two people, the first person in the prime mover cab and the second acting as a ground guide.

NOTE

Prime mover mud flaps should be removed and stored IAW the prime movers current TM prior to coupling with the FWTD. Failure to remove mud flaps may cause damage the prime mover.

Refer to WP 0091 for authorized prime movers and towed vehicles.

When performing operations with the towing device in conjunction with another vehicle, ensure that all Warnings, Cautions, and special instructions in the other vehicles operator's manual are followed.

Refer to kingpin placement (WP 0034) for proper placement of kingpin for coupling.

COUPLING - Continued

1. Line up prime mover with towing device.
2. Ensure proper kingpin is being used.
3. Switch voltage selector box (1) to 12 volts.
4. Switch electric control box to ON position (2), depress and hold electric motor switch (3) and BOOM RETRACT control valve lever (4) to align kingpin with fifth wheel.

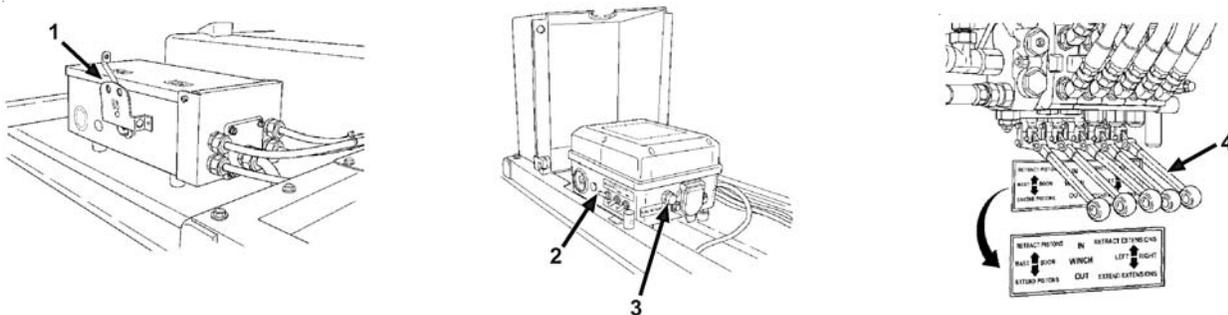


Figure 21. Master Controls

CAUTION

On prime movers equipped with a fifth wheel lockout device, ensure lockout is disengaged before traveling off-road to prevent damage to equipment.

5. Unlock the fifth wheel in accordance with prime movers operation procedures.
6. Slowly back the prime mover under the towing device, allowing the frame to slide up the approach ramps to the fifth wheel plate.
7. Using remote control or valve control levers, BOOM EXTEND to raise the main frame to a level position.
8. Slowly back prime mover under towing device until kingpin engages and locks in place.

COUPLING - Continued**NOTE**

The NATO slave cable should be connected and the prime mover left idling at all times while operating the fifth wheel towing device to prevent battery drainage.

9. Using remote control or valve control levers, BOOM EXTEND to raise rear of main frame to allow the transport legs to be engaged.
10. Rotate handle (5) clockwise to lower and lock transport legs in the down position. Using valve control levers, BOOM RETRACT to lower rear of main frame onto transport legs.
11. Using remote control or valve control levers, RETRACT RIGHT IN, and RETRACT LEFT IN, fully retract boom extensions.
12. Connect gladhands (6) to towing device.

CAUTION

Inter-vehicular electrical cable (IVEC) may get caught and damaged on rear wheel of prime mover if IVEC is too long. If IVEC hangs near tire, secure excess cable to prevent contact with rear tire.

Items in tool box may fall out when opening. Use caution to prevent injury.

13. Connect the inter-vehicular electrical cable (IVEC) to the 12-24 volt junction box on towing device and prime mover.
 - a. Ensure that the IVEC station on the prime mover is in the vertical position. If not, or if the IVEC is too long, it may get caught on the rear wheel, especially during left hand turns.
 - b. If excess slack exists in the IVEC, secure it prior to movement.
14. Towing device is now operational.

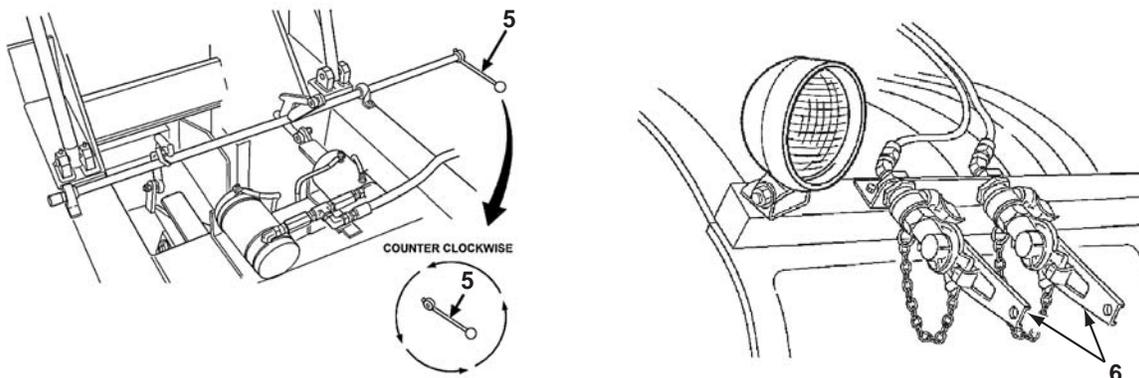


Figure 22. Rear Gladhands and Support Leg Assembly

END OF WORK PACKAGE

TRANSPORT CONFIGURATION

The transport configuration will be used to move the fifth wheel towing device when not loaded. This task assumes the fifth wheel towing device is coupled to a prime mover and transport legs are engaged.

**WARNING**

Ensure hydraulic protection valve is open (breather switch inline with breather) prior to operating hydraulics. Failure to comply could cause injury to personnel or damage to equipment.

Never walk under Booms during any operations. Failure to comply may cause injury or death to personnel.

CAUTION

Never transport a towed vehicle with the transport legs in the down position. Failure to comply could cause damage to equipment.

NOTE

The hydraulic pressure release valve is open when the valve control handle is in line with the breather valve.

1. Set 12-24 volt junction box (1) to proper voltage.
2. Remove electrical control box cover (2) from electrical control box (3) and switch electric toggle (4) to ON position.

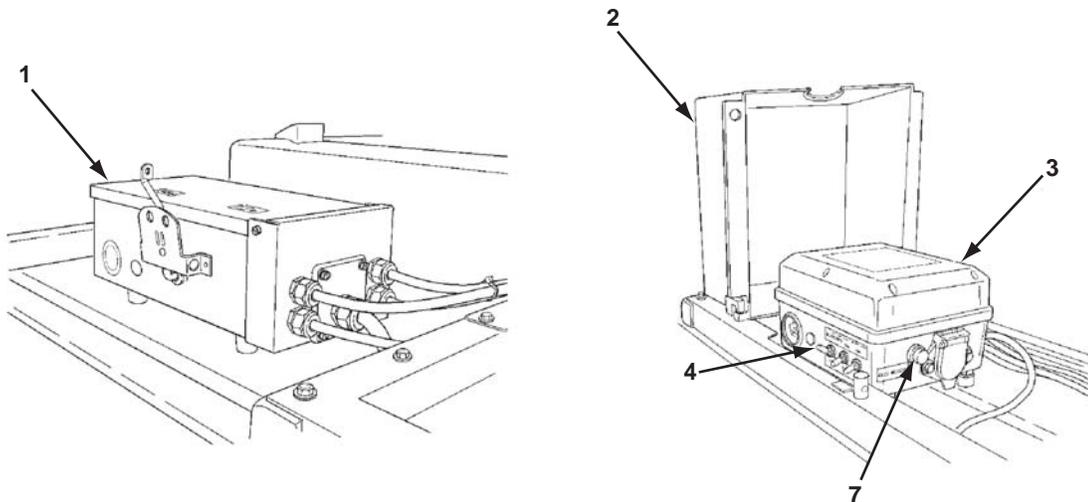


Figure 23. Electric Control Boxes

TRANSPORT CONFIGURATION - Continued

- Remove remote control box (5) from tool box and press power ON (6).

NOTE

Electric motor switch (7) on electrical control box (3) must be depressed at all times to operate hydraulic valve control levers (8).

All operations can be performed using either the hydraulic valve controls or the remote control.

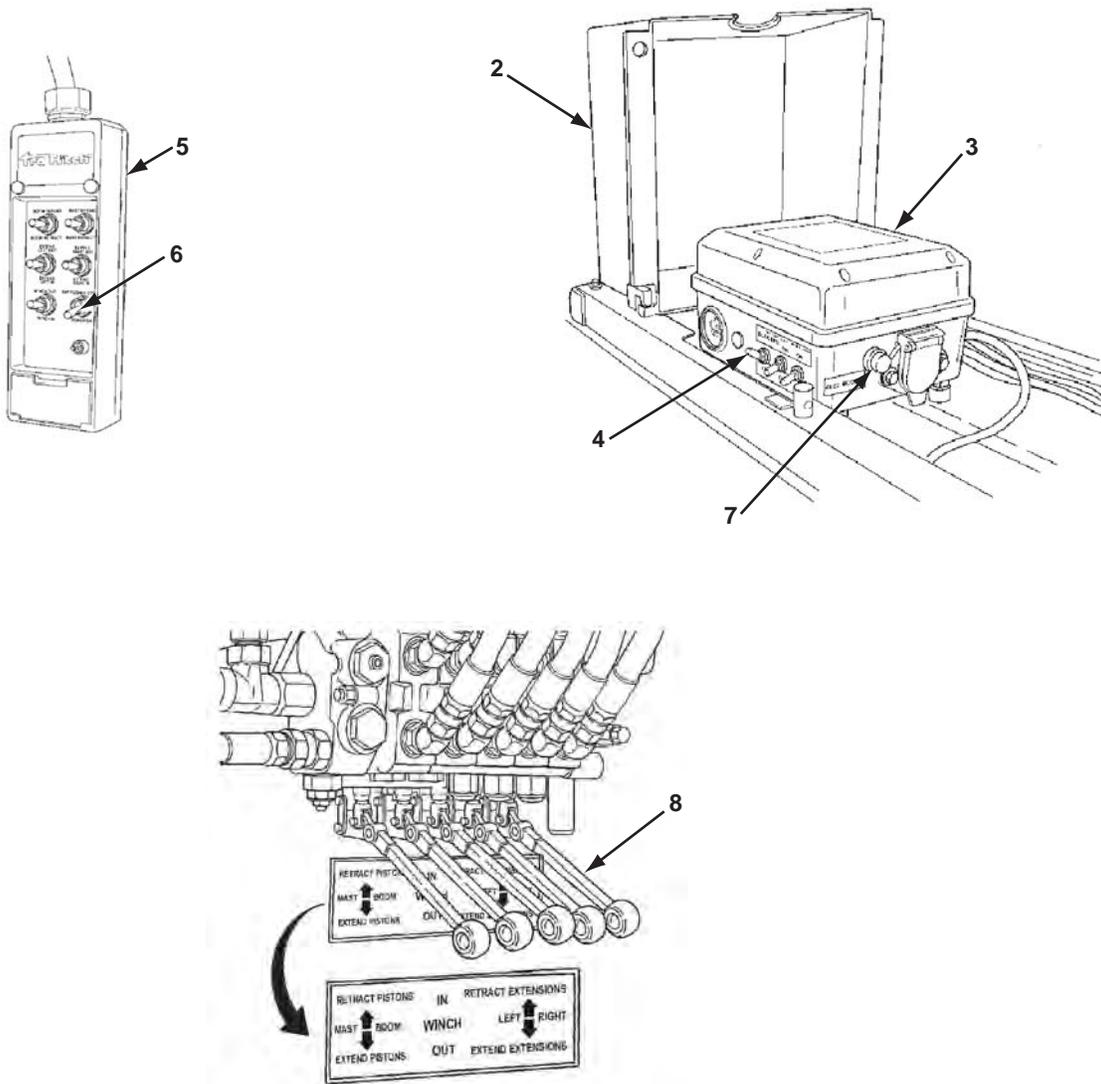


Figure 24. Hydraulic Controls and Electric Control Box

TRANSPORT CONFIGURATION - Continued



WARNING

Ensure the boom has sufficient overhead clearance prior to folding the boom into a vertical position. Failure to comply may result in injury or death to personnel.

- Using remote control box or valve control levers, BOOM RETRACT (9) to raise boom to a closed vertical position.

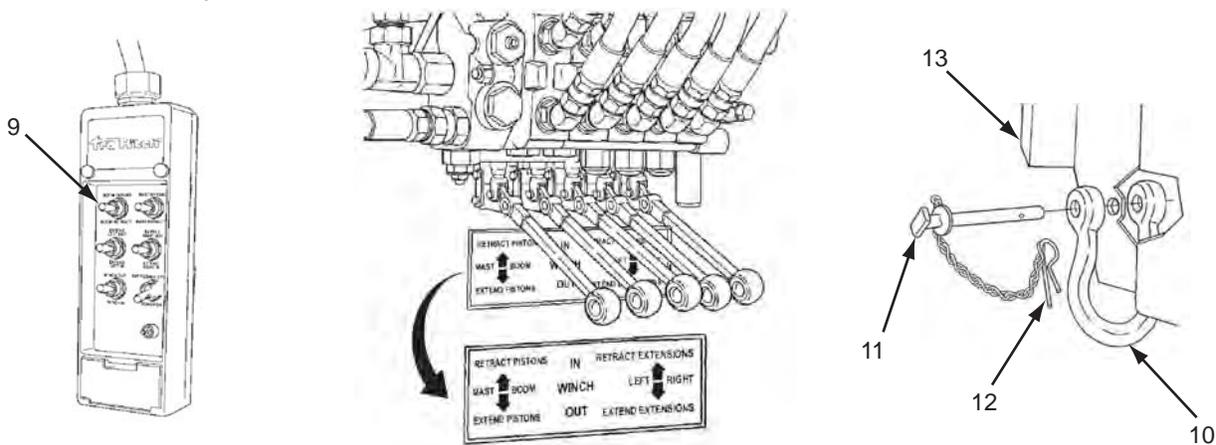


Figure 25. Hydraulic Controls and Clevis

- Remove two clevises (10), clevis pins (11), and spring pins (12) from mast assembly (13).
- Using remote control box or valve control levers, MAST EXTEND (14) to line up arrows (15 and 16).

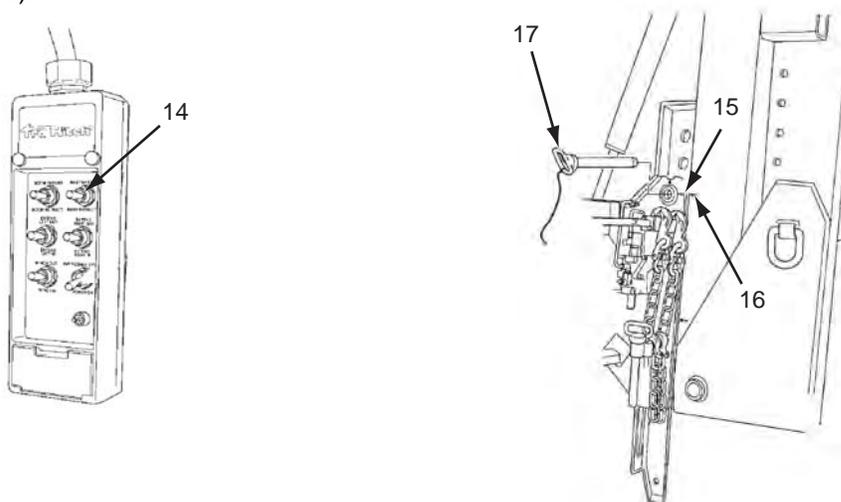


Figure 26. Remote Control and Pin Alignment

TRANSPORT CONFIGURATION - Continued



WARNING

DO NOT operate boom until mast is in track. Failure to comply could cause serious injury or death to personnel or damage to equipment.

7. Main frame fifth wheel area should be clear of obstructions.
8. Insert pivot pins (17) into aligned holes (15 and 16).

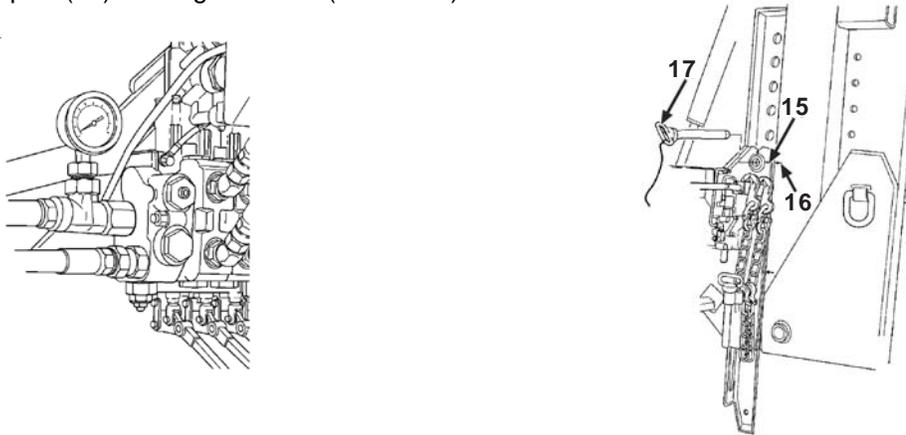


Figure 27. Pin Alignment and Valve

9. Using remote control box or valve control levers, MAST RETRACT (18) to fold mast onto main frame.

NOTE

Hydraulic pressure gauge should read 300-800 psi. If adjustment is needed, refer to WP 0003.

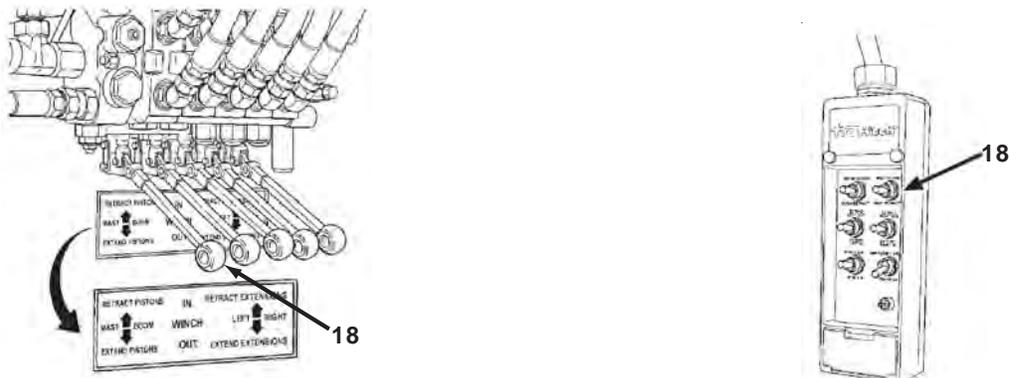


Figure 28. Hydraulic Controls

10. Remove pivot pins (17).

TRANSPORT CONFIGURATION - Continued

CAUTION

DO NOT over extend mast. This could cause damage to mast supports.

11. Install two clevises on mast and secure with clevis pins and spring pins.
12. Using remote control box or valve control levers, MAST EXTEND (19) to line up arrows (20 and 21).

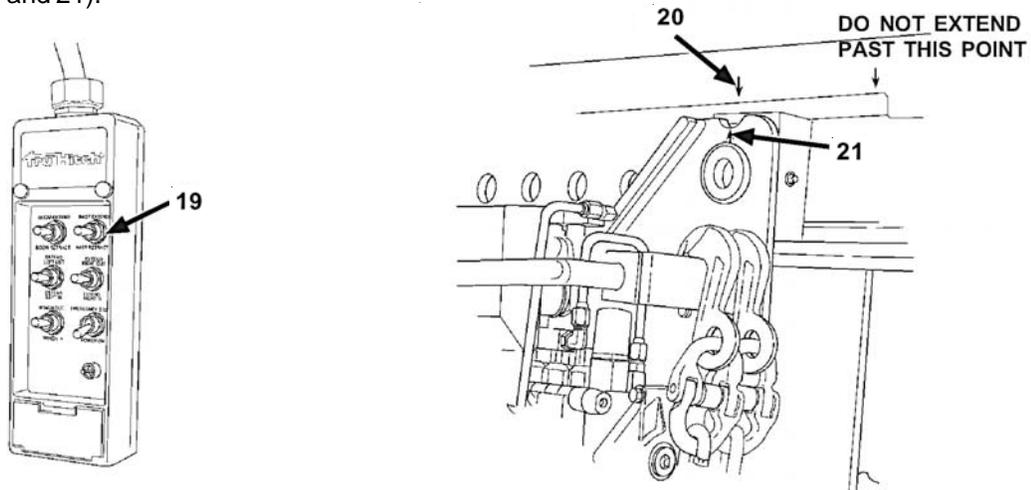


Figure 29. Pin Alignment Items

13. Install two 3/8 inch safety chains (11) as shown.
14. Using remote control box or hydraulic valve control levers, MAST RETRACT until safety chains (11) are tight.

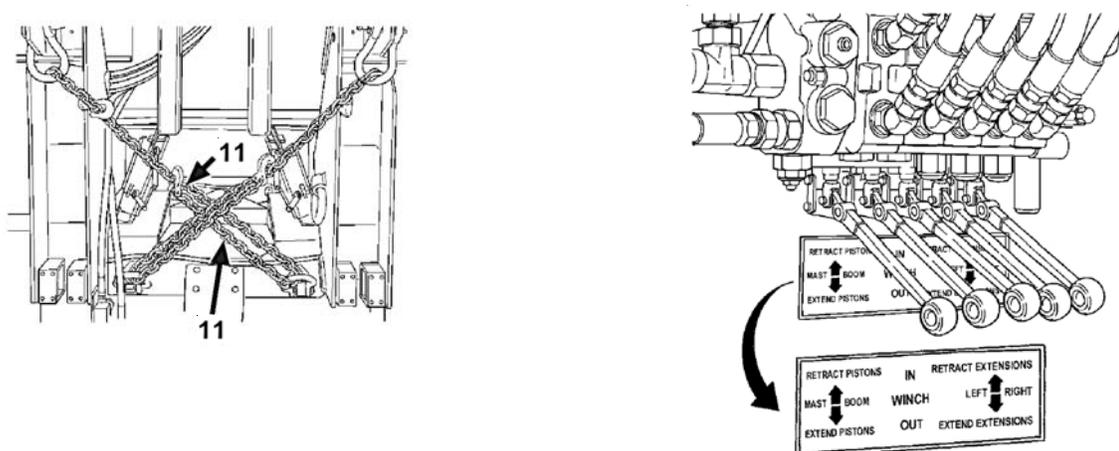


Figure 30. Chain Tightening Items

END OF WORK PACKAGE

PREPARE TOWING DEVICE

The following operations assume the fifth wheel towing device is coupled to a prime mover and in transport configuration.

**WARNING**

Ensure hydraulic pressure release valve is open (breather switch inline with breather) prior to operating hydraulics. Failure to comply could cause injury or death to personnel or damage to equipment.

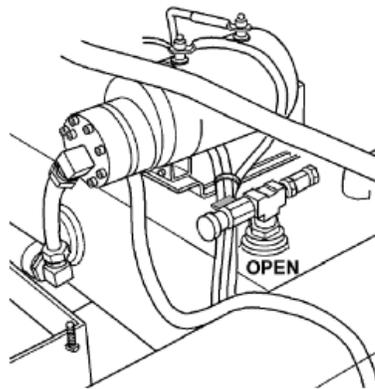


Figure 31. Top Breather Valve

1. Set 12/24 volt junction box (1) to proper voltage.
2. Remove electrical control box cover (2) from electrical control box (3) and switch electric toggle (4) to ON position.

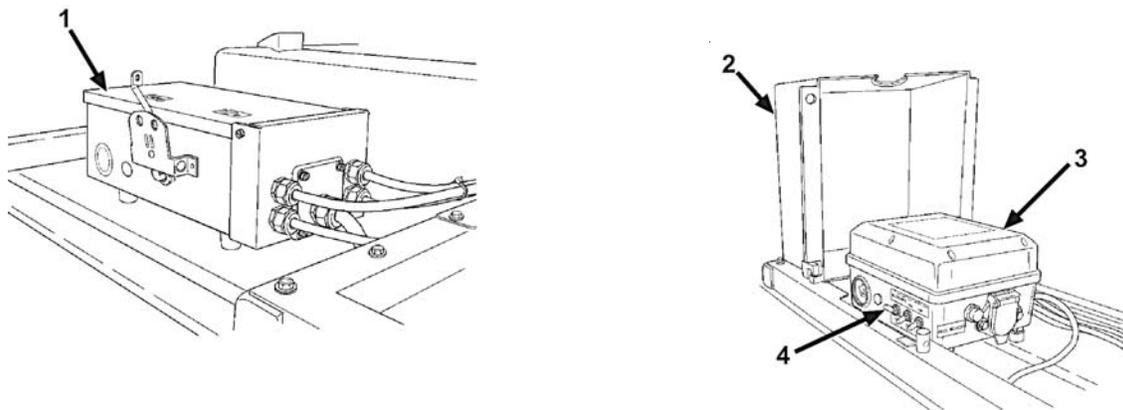


Figure 32. Electrical Control Boxes

PREPARE TOWING DEVICE - Continued

3. Remove remote control box (5) from tool box and press power ON (6).

NOTE

Electric motor switch (7) on electrical control box (8) must be depressed at all times to operate hydraulic valve control levers (9).

All operations can be performed using either the hydraulic valve controls or the remote control.

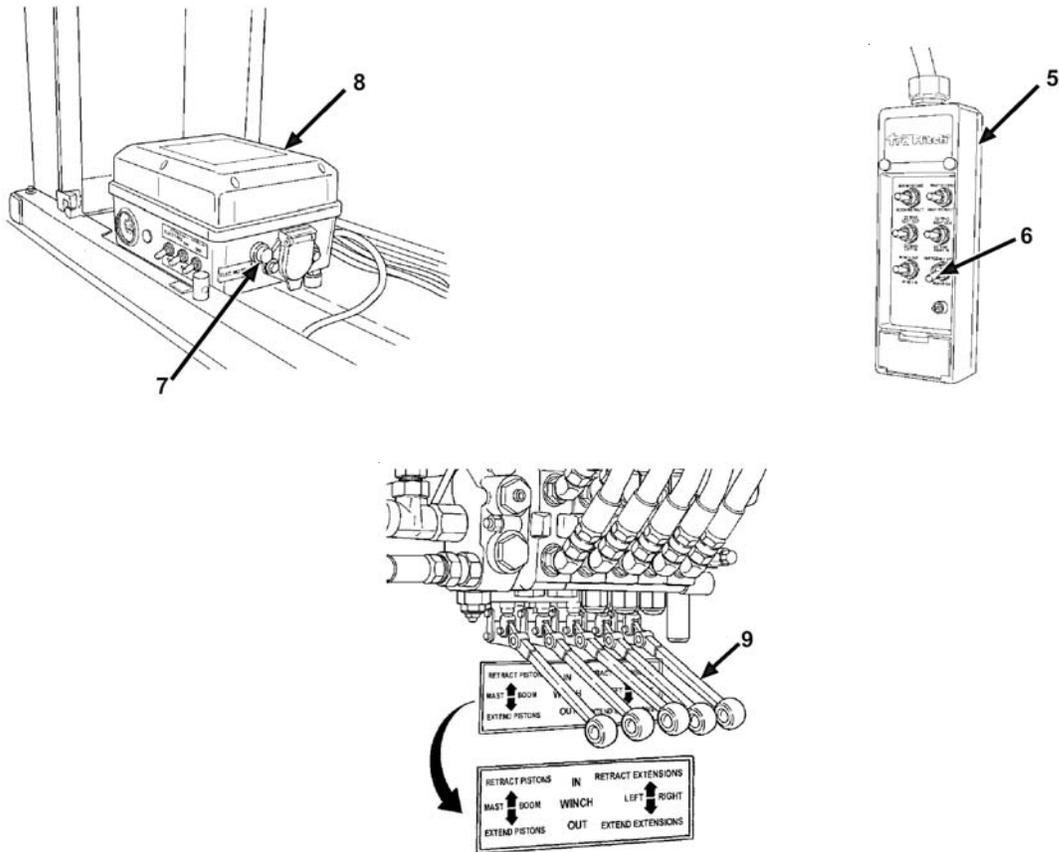


Figure 33. Hydraulic and Electrical Controls

PREPARE TOWING DEVICE - Continued

CAUTION

DO NOT extend past arrows on mast. Damage to equipment may result.

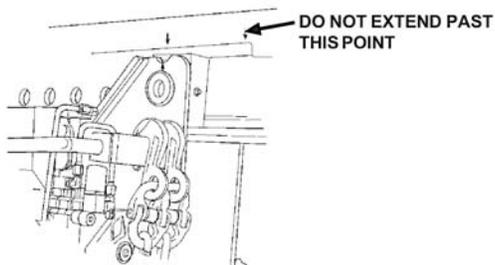


Figure 34.

4. Using remote control box (10) or hydraulic valve control levers (9), MAST EXTEND until there is slack in safety chains (11).
5. Remove safety chains (11) from rear of towing device.
6. Remove two spring pins (12) from two clevis pins (13) and remove two clevises (14) from mast (15).

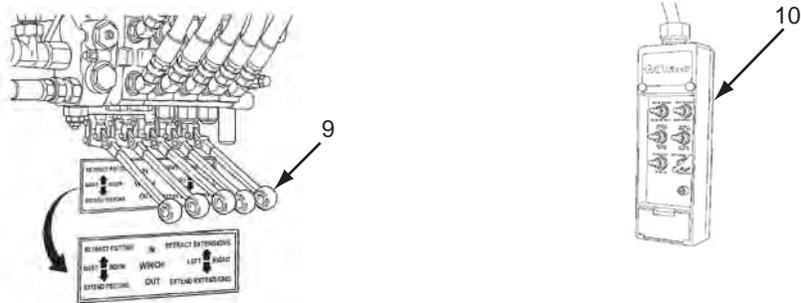


Figure 35. Hydraulic Controls

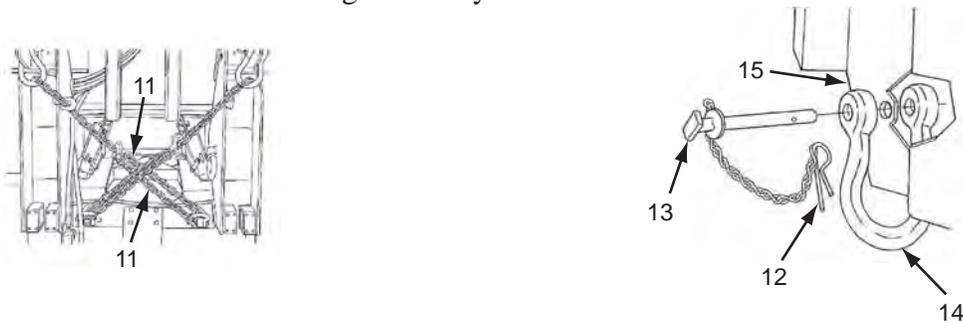


Figure 36. Shipping Chains and Clevis

PREPARE TOWING DEVICE - Continued



WARNING

DO NOT operate boom until mast is in track. Failure to comply could cause serious injury or death to personnel or damage to equipment.

- Using remote control box (28) or valve control levers, MASS RETRACT (16) to line up arrows (17 and 18).

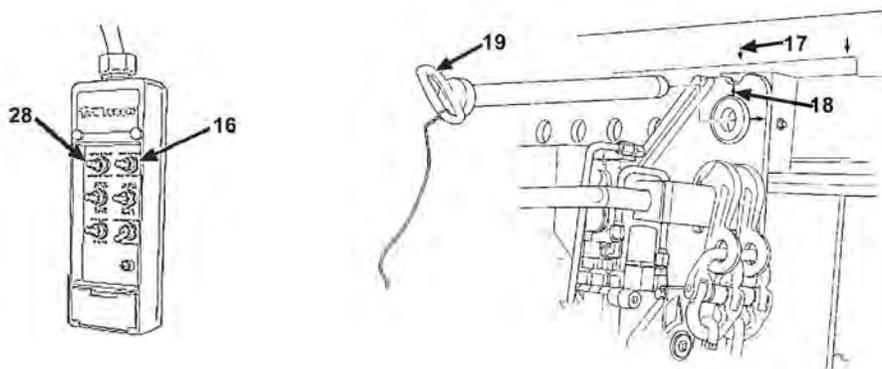


Figure 37. Remote Control and Pin Alignment

- Insert pivot pins (19) into aligned holes. Do not insert spring pins onto pivot pins. Ensure pivot pin lanyards are free from moving parts.

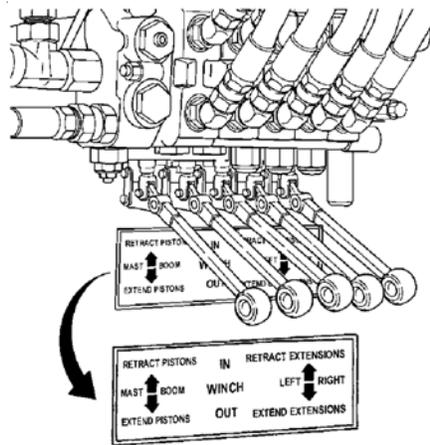


Figure 38. Main Valve Controls

- Using remote control box (28) or valve control levers, MAST EXTEND (16) to raise mast until pivot pin (19) loosens.
- Remove pivot pins (19).

PREPARE TOWING DEVICE - Continued

11. Using remote control box or valve control levers, MAST RETRACT (16) to lower mast until arrow (22) is approximately 4 inches (101.6 mm) below frame (23). This will ensure the mast is in track.

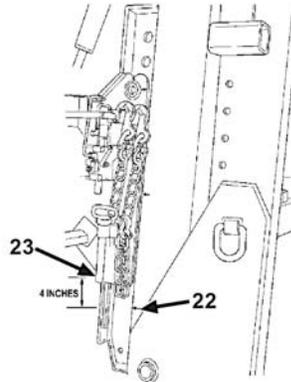


Figure 39. Mast Alignment

**WARNING**

Clevises must be installed in mast assembly to prevent mast assembly from disengaging from track. Failure to comply may cause injury or death to personnel or damage to equipment.

Never walk under Booms during any operation. Failure to comply may cause injury or death to personnel.

12. Install two clevises (24) onto mast assembly (25) and secure with clevis pins (26) and spring pins (27).
13. Using remote control box or valve control levers, BOOM EXTEND (16) to lower boom approximately parallel to ground. Hydraulic pressure gauge should read 300-800 psi. If adjustment is needed, refer to WP 0003.
14. MAST RETRACT (16) to lower boom to approximately 0.5 inch (12.7 mm) from ground.

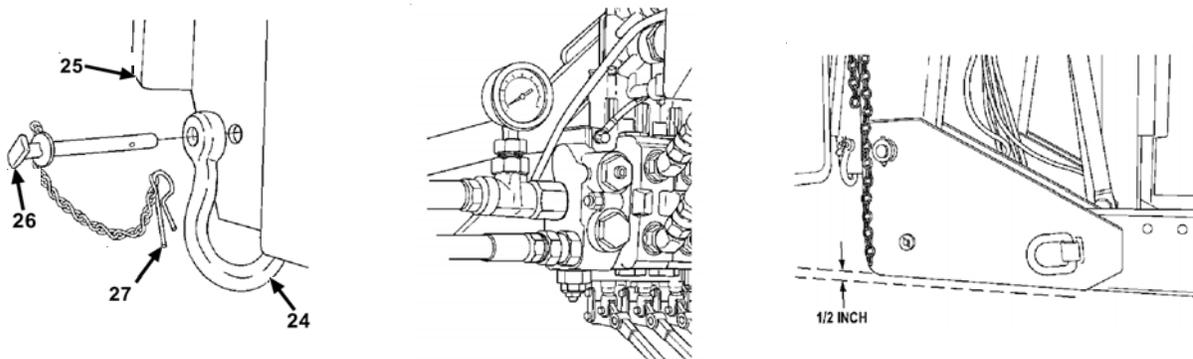


Figure 40. Clevis, Valve, and Boom Clearance

END OF WORK PACKAGE

PREPARE TOW BAR ASSEMBLIES

**WARNING**

All persons not involved in the loading or unloading operation must stand clear of prime mover and fifth wheel towing device. Failure to comply may result in death or injury to personnel.

Due to the dimensions and center of gravity of some loads, proper procedures must be followed when loading and unloading equipment to prevent damage to equipment and injury or death to personnel.

Visibility from the prime mover is significantly reduced when backing, whether the fifth wheel towing device is loaded or not. Proper procedures must be followed and extreme caution used when backing to prevent damage to equipment and injury or death to personnel.

Use extremely low speed when loading and unloading vehicles. Higher speeds will exaggerate motions and create hazardous conditions, which could result in personnel injury or death or damage to equipment.

Tow bar assemblies weigh 47 lbs. Use an assistant and caution when removing and handling them to prevent injury or death to personnel and damage to equipment.

NOTE

Refer to WP 0091 for authorized prime movers and towed vehicles.

Prime mover and disabled vehicle should be on the same plane when coupling. If planes are uneven, use winch to maneuver disabled vehicle to even plane with prime mover.

If the vehicle being recovered is not equipped with front towing eyes, skip to step b.(2)

1. Tow bar assemblies should be in stowage position.
2. Remove spring pin (1) from hitch pin (2) and remove hitch pin from upper section of tow bar assembly (3). Set aside hitch pin (2) for future use.

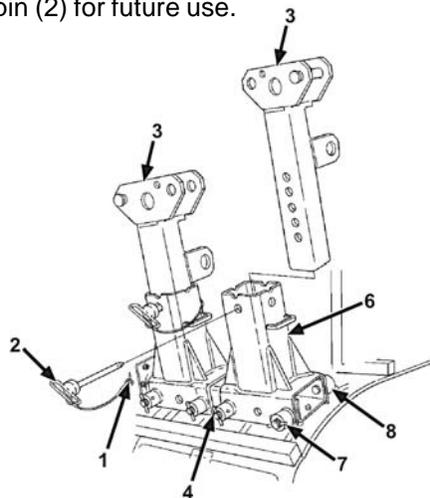


Figure 41. Tow Bar Assemblies

PREPARE TOW BAR ASSEMBLIES - Continued

**WARNING**

When tilting towbar assembly, upper section is not secure and may fall out and cause personal injury or death.

3. Loosen T-bolts (4 and 5). Tilt lower section of towbar assembly (6) away from storage bracket and remove upper section (3). Set aside for future use.
4. Loosen T-bolts (7 and 8) and remove lower section (6). Set aside for future use.
5. Loosen all four T-bolts on inner towbar assembly and slide to outer position. Tighten T-bolts (7 and 8).
6. Repeat steps 2 through 4 for remaining towbar assembly.

NOTE

Both the upper and lower sections are offset to allow for variations in the distance between the towing eyes on the towed vehicle.

Refer to WP 0089 for correct pin size and pin location.

7. Position lower section (6) onto boom and line up center hole (9) with the second hole from mast. Do not tighten lower section T-bolts.
8. Install upper section (3) into lower section (6).
9. Repeat steps 7 and 8 for remaining tow bar assembly.
10. Estimate position of tire stop assembly (10) so front tires of towed vehicle meet the tire stop assembly and the tow bar assemblies are not moved beyond the fourth hole (11) from the mast.

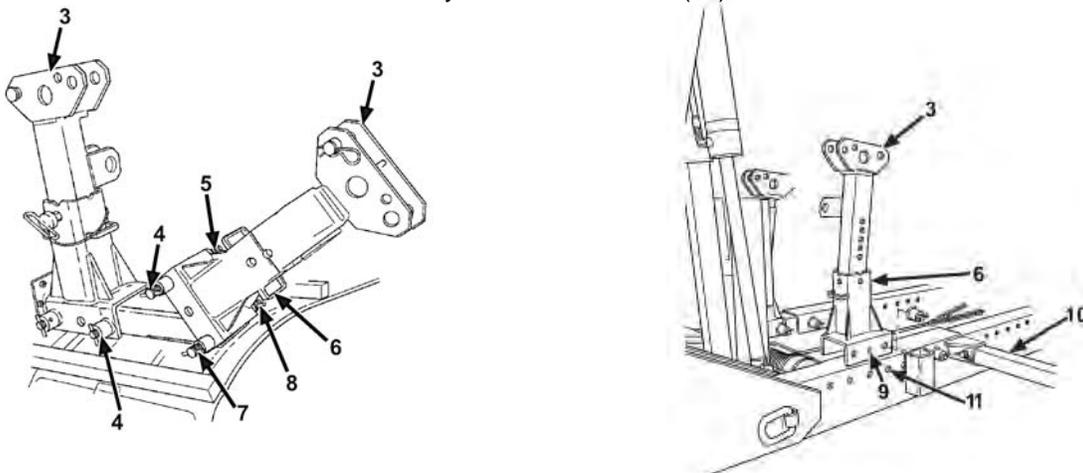


Figure 42. Tow Bar Assembly Preparation

END OF WORK PACKAGE

CONNECTING TO TOWED VEHICLE

NOTE

If the upper receiver connection holes are too high to be connected to the disabled vehicle, perform the pre-pick lifting procedures (WP 0011) prior to performing step 3.

Wheels on towed vehicle should be chocked and parking brakes engaged.

If valve control levers are used, an assistant must monitor boom extensions to ensure boom extensions do not contact towed vehicle.

1. Remove front towing clevis from towed vehicle.
2. Using tire stop as a guide, reference Figure 43, align boom to frame of towed vehicle and back prime mover and towing device under vehicle.
3. Adjust tire stop so front of towed vehicle is 6 to 12 inches from bump stop when not using tow bar assembly.

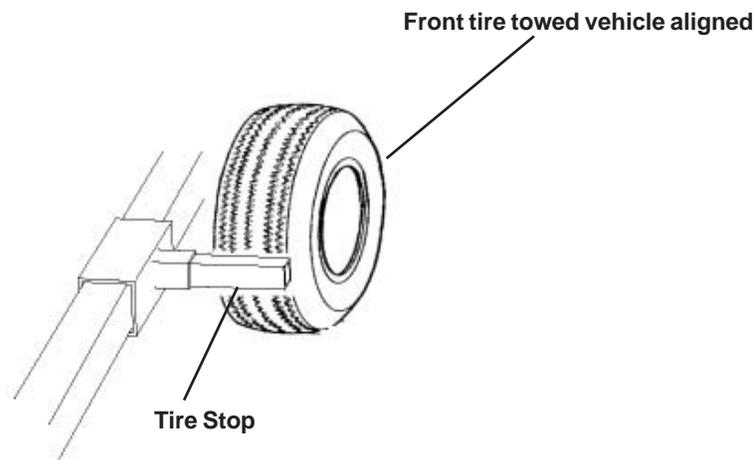


Figure 43. Tire Stop

CONNECTING TO TOWED VEHICLE - Continued**WARNING**

The location of the boom extension clevis tiedown chains should be located between the rear of the cab and the forward rear axle on towed vehicle frame.

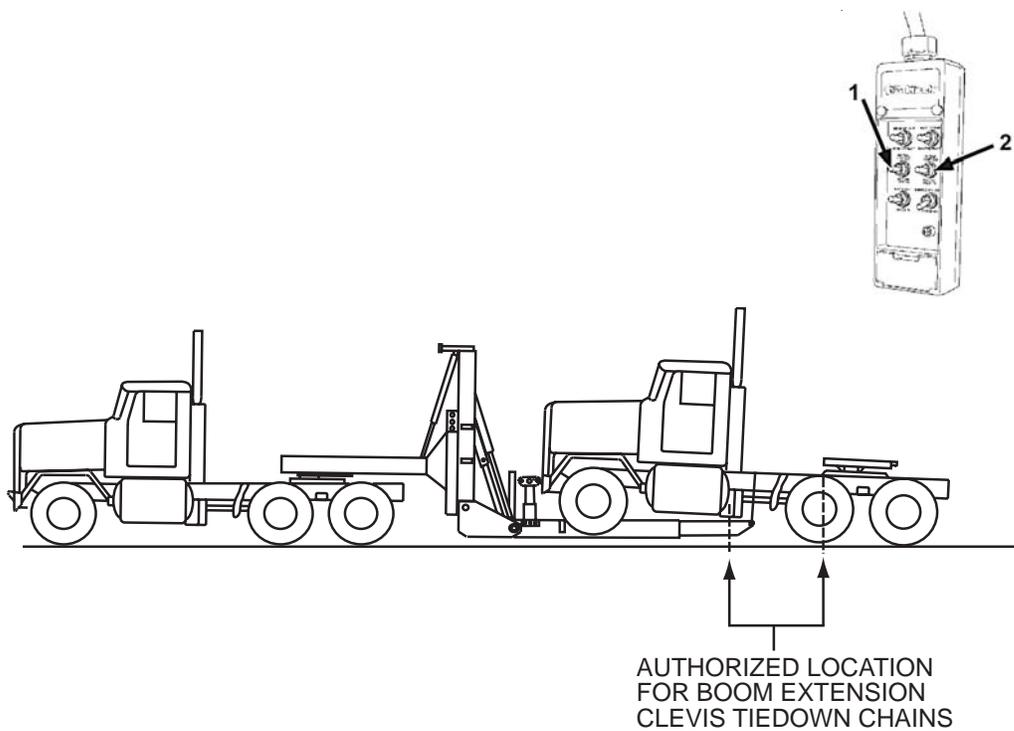


Figure 44. Towing Connection Location

4. Using remote or valve control levers, EXTEND LEFT OUT (1) and EXTEND RIGHT OUT (2), extend boom extensions to required length.

CONNECTING TO TOWED VEHICLE - Continued

- Using remote control or valve control levers, BOOM EXTEND until transport leg assembly is free of fifth wheel. Rotate handle (3) counter-clockwise and raise transport legs.

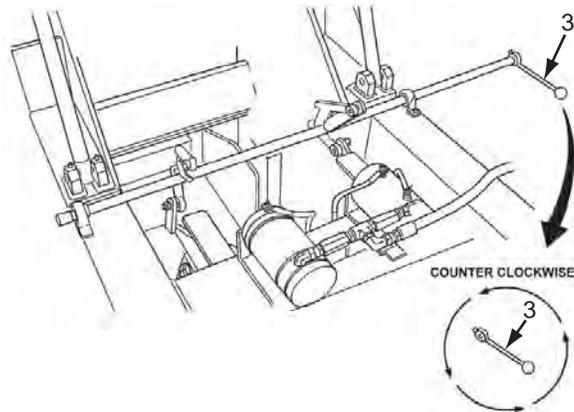


Figure 45. Support Leg Assembly

- Using remote control or valve control levers, BOOM RETRACT until boom touches ground.

NOTE

If towed vehicle is not equipped with front towing eyes, skip step 6.

- Position upper section (4) of towbar assembly under front towing eye (5) of towed vehicle. Adjust tow bar assembly back as needed.
- Using remote control or valve control levers, BOOM RETRACT to lift boom extensions to allow for ground clearance when attaching 1/2 inch chains.

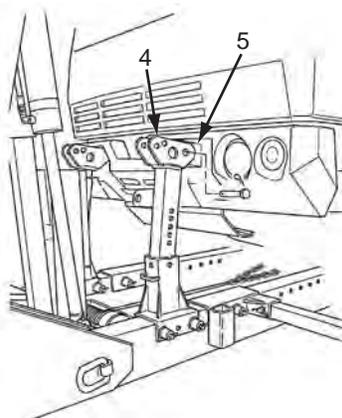


Figure 46. Tow Bar Assembly Location

CONNECTING TO TOWED VEHICLE - Continued

CAUTION

Use care not to wrap chain around frame flange or any air, hydraulic or fuel lines that may run along the frame. This could bend frame flange or damage hoses and lines. Chain may be wrapped over both frame rails. This will not pull down on frame flange.

NOTE

Boom extensions should be secured behind the second axle when towing the PLS systems.

9. Secure boom extensions, as close to the frame as possible, using one of the following methods:
 - a. Frame hooks on frame (covered in this task).
 - b. Chain around frame (must use both sides of frame).
 - c. Chain around area that could withstand towing force to include rear axle or spring hangers.
10. Position frame hook (8) over frame flange (9) and install 1/2 inch chain (10) through clevis (11) and back to boom extension clevis (12).
11. Repeat step 8 for remaining frame hook.
12. Using remote control or hydraulic valve lever controls, BOOM EXTEND to tighten rear safety chains.

NOTE

Remove wheel chocks from towed vehicle, and disengage parking brake, air line may need to be attached to towed vehicle (WP 016).

If the vehicle being recovered is not equipped with front towing eyes, skip to step 11.

13. Position upper section (4) to towing eye (5) of towed vehicle and secure with hitch pin (6) and spring clip (7).

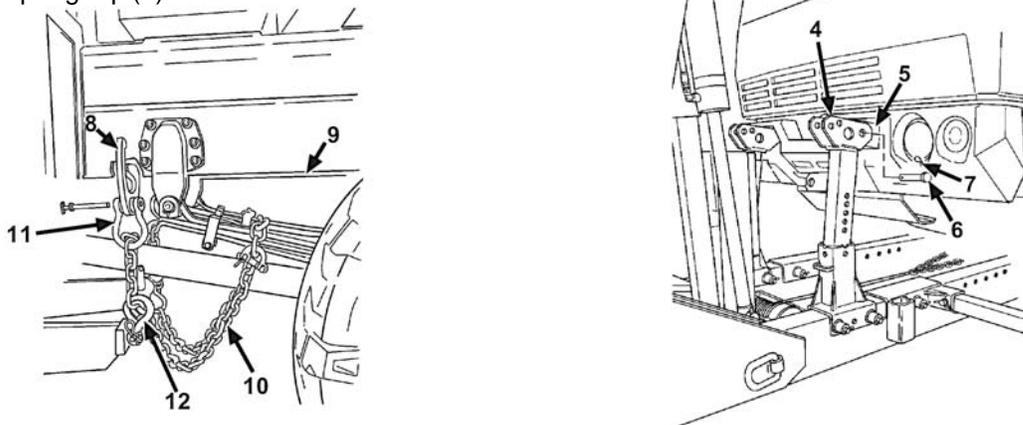


Figure 47. Frame Hooks and Tow Bars

CONNECTING TO TOWED VEHICLE - Continued**NOTE**

If towed vehicle is not equipped with front towing eyes, ensure the distance from the front bumper of the towed vehicle to the bumpers on the fifth wheel towing device is approximately 12 in. (305 mm) and front tires are firmly placed against tire stops. Distance can be adjusted by extending or retracting both boom extensions simultaneously.

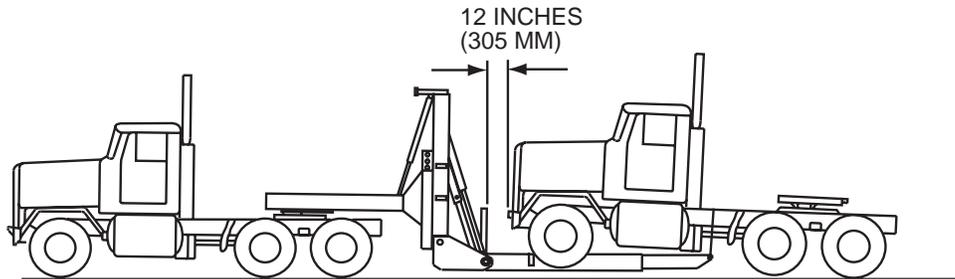


Figure 48. Towing Configuration

NOTE

If U-bolts are not present, use rubber pads between crossmember and boom.

14. Position rubber blocks (16) between towed vehicle U-bolts (17) and boom.
15. Using remote control or hydraulic valve lever controls, BOOM EXTEND to raise boom assembly until blocks touch U-bolts.

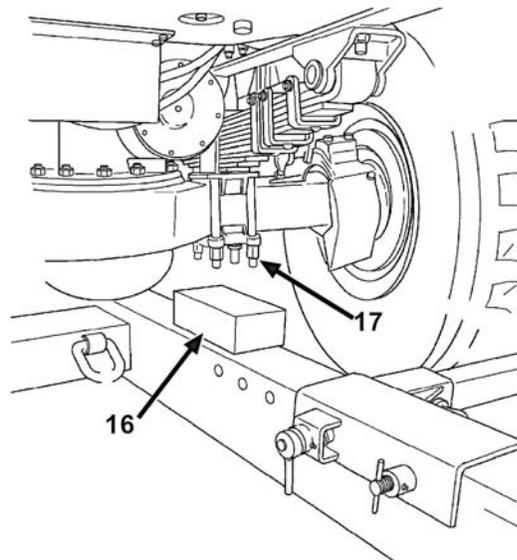


Figure 49. Pad Location

CONNECTING TO TOWED VEHICLE - Continued**NOTE**

If the vehicle being recovered is not equipped with front towing eyes, skip steps 15 through 18.

If PLS System is being towed by M915, insure hitch pin (13) is in the fourth hole from the top.

16. Install hitch pin (13) through upper tow bar assembly (14) and secure with spring clip (15).
17. Repeat step 13 for remaining tow bar assembly.
18. BOOM EXTEND to raise the lower tow bar assembly (14) until hitch pin (13) seats in lower towbar assembly (15). Install second hitch pin (18) through both upper and lower tow bar assembly and secure with spring clip (19) to bolts on lower section of tow bar assembly and tighten.
19. Repeat step 16 for remaining tow bar assembly.

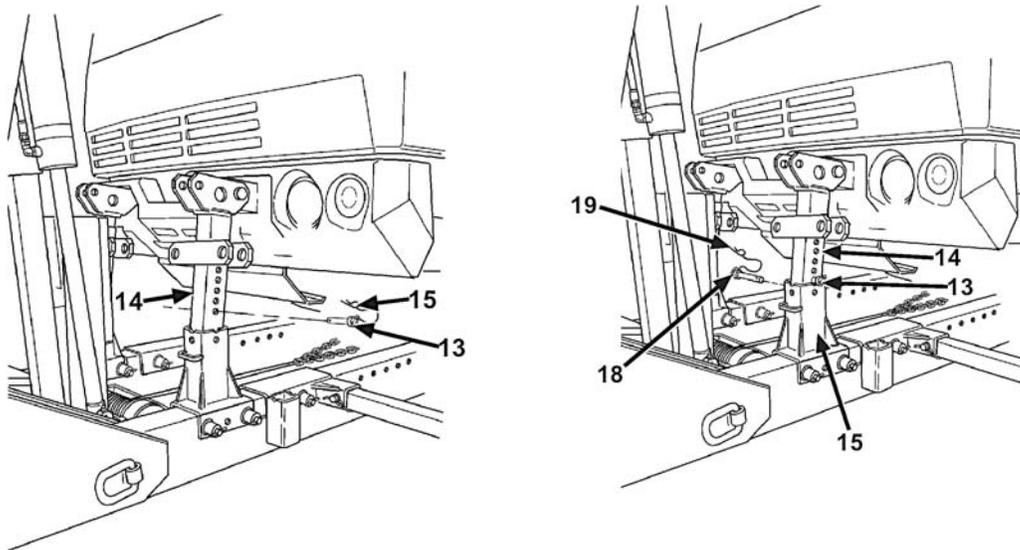


Figure 50. Tow Bar Assembly

CONNECTING TO TOWED VEHICLE - Continued**NOTE**

When towing PLS System with M915 place hitch pin (20) in third hole of mast.

20. Using valve lever controls, BOOM EXTEND to level fifth wheel and install hitch pin (20) into center boom lock (21).
21. Using valve lever controls, BOOM RETRACT to lock hitch pin (20) into position. Secure hitch pin with spring pin and lanyard.
22. Install 3/8 inch chain to secure front axle to boom. Refer to section WP 0014.
23. Using valve lever controls, MAST EXTEND to raise towed vehicle to towing height required for terrain.
24. Install pivot pin (22) in slot above arrow (23) and MAST RETRACT to lock pin into position, using valve lever control.
25. Ensure towed vehicle's steering wheel is secured in place to prevent rotation while in transport.
26. Connect 70 ft. cable from fifth wheel towing device to light assembly. Install towlight assembly on rear of towed vehicle. Refer to section WP 0015.
27. If not connected after step 11, connect air lines from fifth wheel towing device to towed vehicle. Refer to section WP 0016.
28. Inspect lights and brakes on towed vehicle for proper operation.
29. Ensure electrical control box power switch is in OFF position. Ensure remote control power switch is in OFF position.

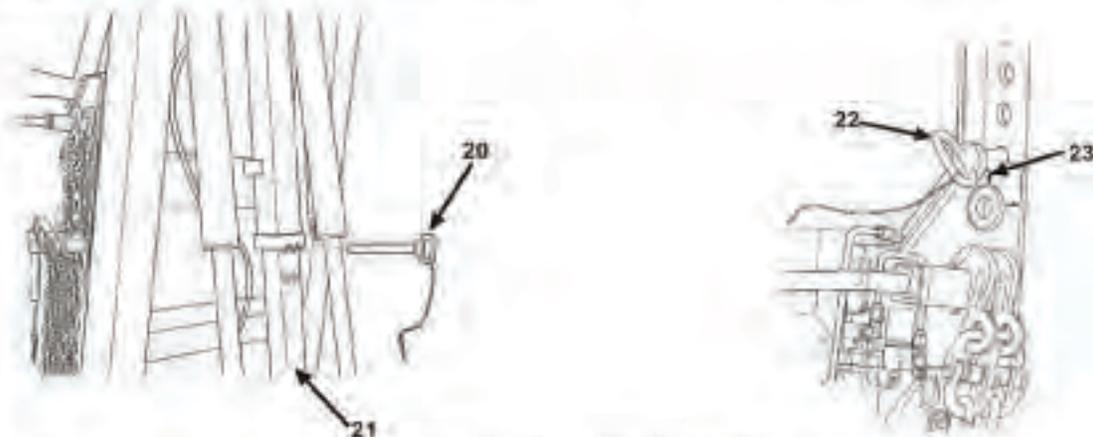


Figure 51. Lock Pin Placement

END OF WORK PACKAGE

PERFORMANCE OF PRE-PICKING LIFTS

Pre-picking operations shall be performed with the fifth wheel towing device in the coupled configuration with the booms 1 inch above and parallel to the ground.

1. Position prime mover in front of the disabled vehicle.
2. Using remote control or valve control levers, EXTEND LEFT OUT and EXTEND RIGHT OUT, extending the boom extensions under the front of the disabled vehicle so the boom extensions pass under the front axle and are extended under and approximately 1 foot to the rear of the front axle U-bolts or cross members.
3. Place one 2-inch block between the U-bolt ends and the boom extensions, if necessary.
4. Using remote control or valve control levers, BOOM EXTEND, to lower rear of booms and raise the front of the booms approximately 1 foot above the ground. Lock transport legs into the stowed position.
5. Place one of four 6 inch blocks under each boom assembly to create a pivot point.
6. Using remote control or valve control levers, BOOM RETRACT, to lower front of booms and raise the rear of the booms. Ensure the 2 and 6 inch blocks remain in place. Boom retract until the front wheels of the disabled vehicle are approximately 7-8 inches above the ground.
7. Insert the second set of 6 inch blocks under the front tires of the disabled vehicle.
8. Using remote control or valve control levers, BOOM EXTEND, until the front wheels of the disabled vehicle are resting on the lift blocks, the booms are free of the U-bolts, and the 6 inch pivot blocks under the booms are free. Remove pivot blocks.
9. Place transport legs in the down position.
10. Using remote control or valve control levers, BOOM RETRACT until the unit rests on the transport legs and the booms are again 1 inch above and parallel to the ground.
11. With the booms 1 inch above the ground, connect towed vehicle accordingly to WP 0010.

END OF WORK PACKAGE

WINCHING OPERATIONS

**WARNING****WINCHES**

All personnel must stand clear during winching operations. A snapped cable or shifting load could cause injury or death to personnel.

Winch is not designed for recovery of vehicles in mired conditions. Failure to comply may result in death or injury to personnel.

WIRE ROPES

Wire rope can become frayed or contain broken wires. Wear heavy leather palmed work gloves when handling wire rope. Frayed or broken wires can injure hands.

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through glove and cut hand.

NOTE

Use a large rag or piece of cloth as a damper on the cable.

Ensure wheels are chocked in front of towed vehicle to prevent towed vehicle from rolling forward.

1. Position boom extensions under towed vehicle. Using remote control or valve lever controls, BOOM EXTEND until contact is made with towed vehicle, if possible. If contact cannot be made, line up towing device as close as possible.
2. Attach chain around front axle of towed vehicle.

WINCHING OPERATIONS - Continued

3. Place damper on center point of cable. Adjust to center of cable periodically during the winching operation.
4. Pull winch free spool lever (1) to allow payout of winch cable and remove winch cable chains (4) from stowage position.

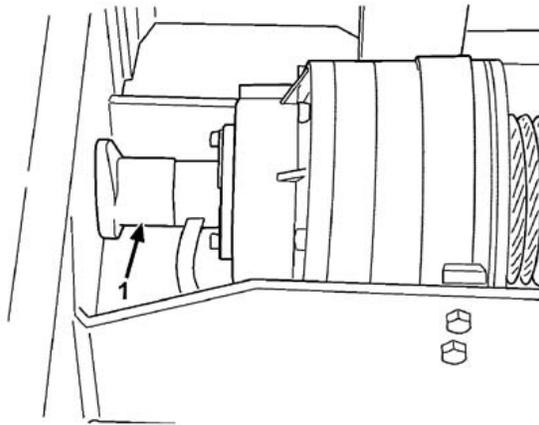


Figure 52. Winch Free Spool Lever

5. Using double hook (2) and pulley block (3), thread winch cable chains (4) back to front D-rings (5). Reel excess cable onto winch spool.
6. Remove wheel chocks. Disengage brakes on towed vehicle. Using remote control or valve control levers, pull towed vehicle onto towing device. BOOM RETRACT to allow clearance between boom and towed vehicle. If required, continue winching operation until towed vehicle is positioned to connect to towing bars on boom.
7. Continue towed vehicle connection. Refer to WP 0010.

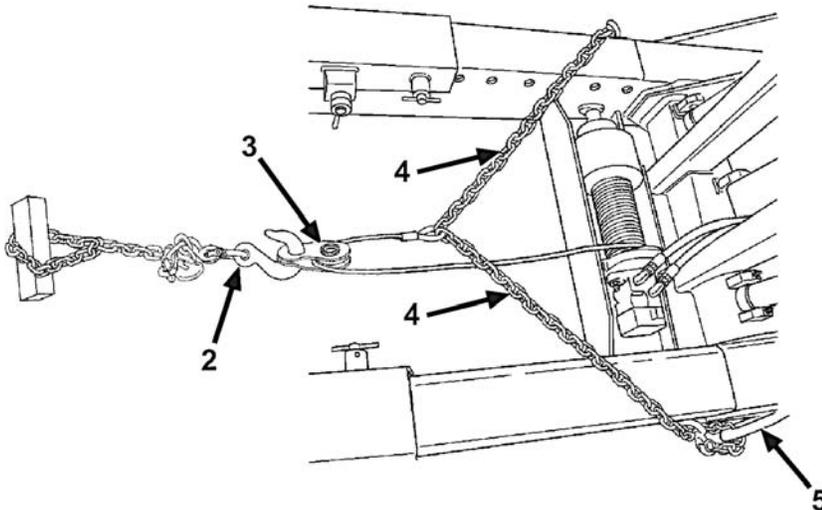


Figure 53. Winch During Use

END OF WORK PACKAGE

PREPARING EQUIPMENT FOR TOWING

**WARNING**

Secure any materials or equipment loaded in the beds of towed equipment. Failure to comply may result in death or injury to personnel.

When loaded, shut down towed equipment, turn off all switches, close doors and hatches, and swing in mirrors. Failure to comply may result in death or injury to personnel.

NOTE

Reduce towed equipment to lowest height configuration consistent with the operational requirements.

Reference towed vehicle TM for drive train disconnect requirements.

1. Set parking brakes on prime mover and towed vehicle.
2. Follow instructions for loading equipment (WP 0010) prior to securing towed vehicle.

NOTE

Prior to transporting towed vehicle, ensure parking brakes and wheel chocks are released.

END OF WORK PACKAGE

SECURING EQUIPMENT

**WARNING**

Put transmissions in neutral on towed equipment.

Make sure gun turrets or other rotating parts are properly secured.

Make sure all BII items are properly stowed on the fifth wheel towing device. Remote should be stored with control switches toward the top of the tool box.

Check the prime mover and the fifth wheel towing device brakes and lights for proper operation.

Check all tiedowns at first opportunity after departure. Recheck all tiedowns at halts and any time you suspect a problem

Safety chains should be installed at a 45° angle to prevent shifting.

Failure to comply with these warnings may result in serious injury or death.

NOTE

Tighten chains using the load binders.

Attach load binders so that a downward motion of the handle tightens and an upward motion loosens the load binder. Lock handle in up position.

Secure excess chain to the tension-bearing part of the chain.

Additional chains may be needed for heavier equipment.

1. Lift cam lever (1) on tire stop. Lift end of tire stop and adjust to nearest 1/2 hole (2) so wheel is showing. Lower cam lever (1) and lock position.
2. Repeat step 1 for remaining tire stop assembly.
3. Position safety chain (3) around axle (4) over boom (5) under tire stop (6), and through D-ring (7) or tiedown bracket (8).

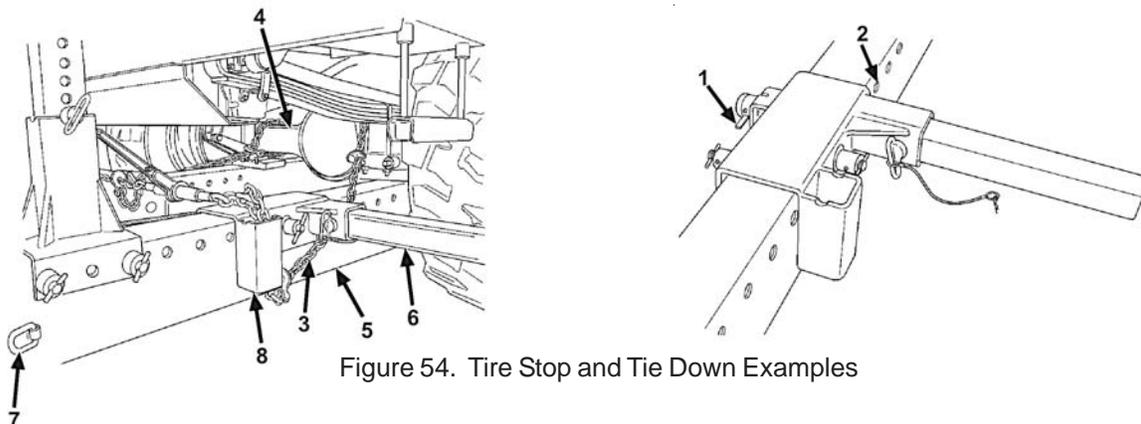


Figure 54. Tire Stop and Tie Down Examples

SECURING EQUIPMENT - Continued

4. If safety chain is through D-ring (7), secure with load binder (9) as shown.

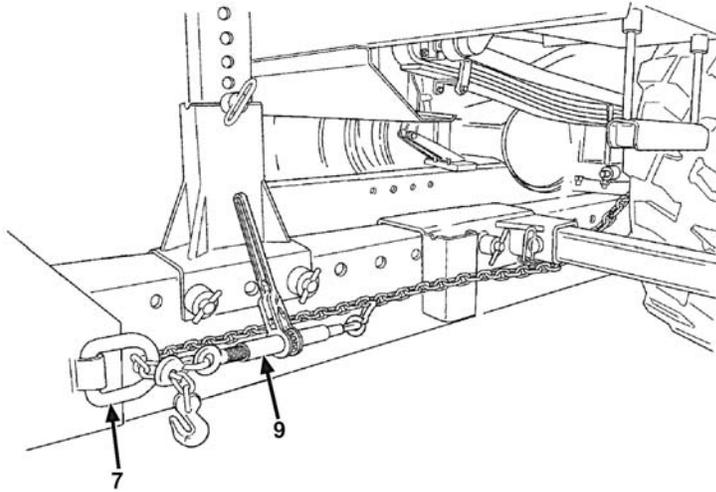


Figure 55. Tie Down - Example #1

5. If safety chain is through tiedown bracket (8), secure with load binder (9) over top of winch cable (10) as shown.

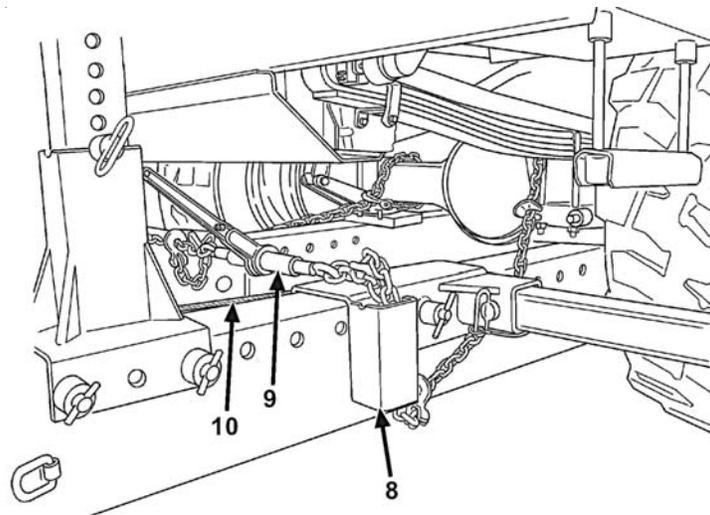


Figure 56. Tie Down - Example #2

NOTE

After completion of tiedown procedures, refer to WP 0010, steps 23 through 28, to complete the loading procedures.

END OF WORK PACKAGE

OPERATE LIGHTS

1. Connect inter-vehicular electrical cable (IVEC) to 12-24 volt junction box receptacle.

NOTE

The strobe lights, worklights, and tow light assembly can be operated with either 12 volt or 24 volt systems.

When operating the fifth wheel towing device strobe lights, the dummy plug located in the BII must be inserted into the 12-volt receptacle on the 12/24 volt junction box.

When using the 70 ft. tow light electric cable, care should be taken to route the cable to eliminate damage during operations (i.e., pinching, binding, pulling or rubbing).

The batteries on the fifth wheel towing device will run low during extended operation of the strobe lights and must be recharged. Connect the 24-volt NATO slave cable and allow the prime mover to idle for an extended period of time if prime mover is equipped with IVEC connector.

When operating the towed configuration using the 24-volt light system, disregard steps 3 through 5.

All lights will be checked for proper function prior to operation of the prime mover or towing configuration.

2. Set 12-24 volt junction box to proper voltage.
3. If the prime mover is a 12 volt system, the 12 volt light bar (1) will be used.
4. Install 12 volt tow light cable in receptacle (2) on electrical control box (3). Connect 12 volt tow light cable to tow light assembly (1).
5. Connect 12 volt tow light assembly to rear of towed vehicle.
6. If the prime mover is a 24 volt system, the 24 volt light bar (4) will be used. If equipped, connect IVEC cable to 24 volt receptacle (5) on electrical control box (3).

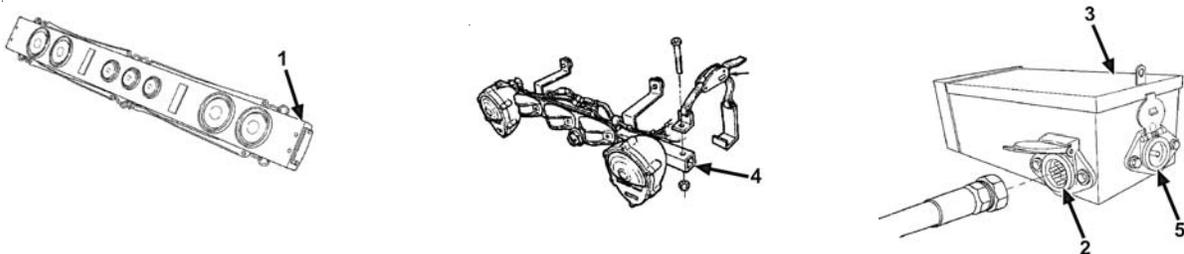


Figure 57. Light Components

OPERATE LIGHTS - Continued

7. Connect 24 volt tow light assembly to 24 volt receptacle (6) on fifth wheel towing device.
8. Connect 24 volt tow light assembly to rear of towed vehicle and connect the 24-volt tow light cable to the light bar.
9. To operate tow light assembly, switch electrical control box ELECTRIC switch (7) to ON position.
10. To operate worklight, switch electrical control box WORKLIGHT switch (8) to ON position.
11. To operate strobe lights, switch electrical control box STROBE switch (9) to ON position.
12. To shut off strobe lights, switch electrical control box STROBE switch (9) to OFF position.
13. To shut off worklight, switch electrical control box WORKLIGHT switch (8) to OFF position.
14. To shut off tow light assembly, disconnect tow light assembly.

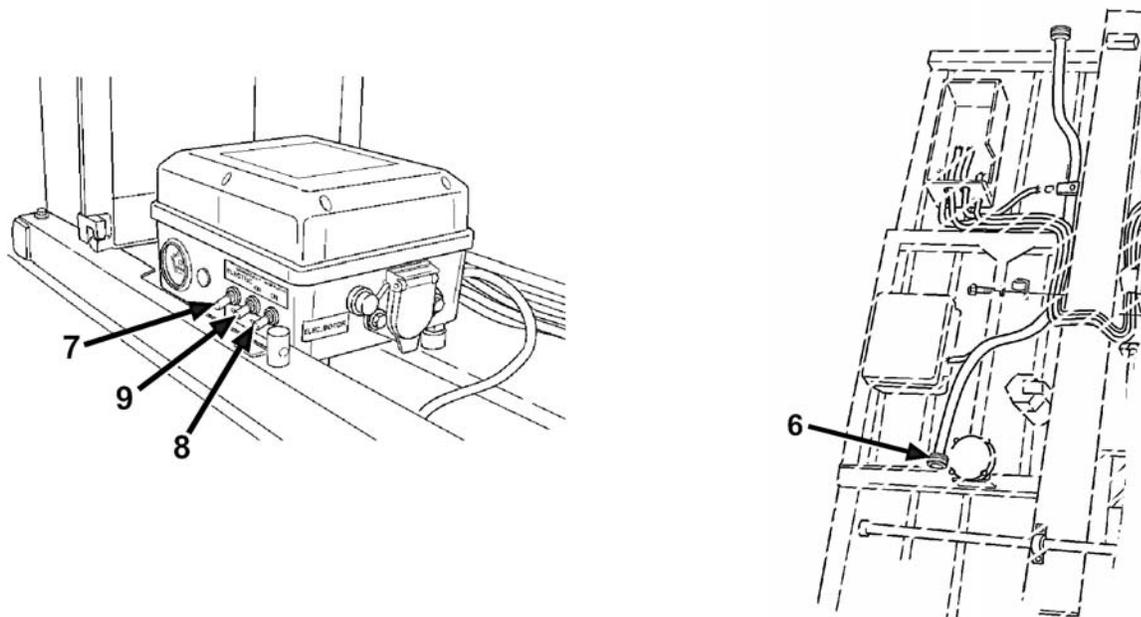


Figure 58. Light Controls and Connections

END OF WORK PACKAGE

GLADHANDS

NOTE

There are two sets of gladhands. Both sets are operated in the same manner.

1. Remove dummy coupling (1) from gladhand (2).
2. Raise prime mover or towed vehicle air hose coupling (3) to a vertical position and align outlet holes.
3. Rotate coupling to the horizontal locked position.

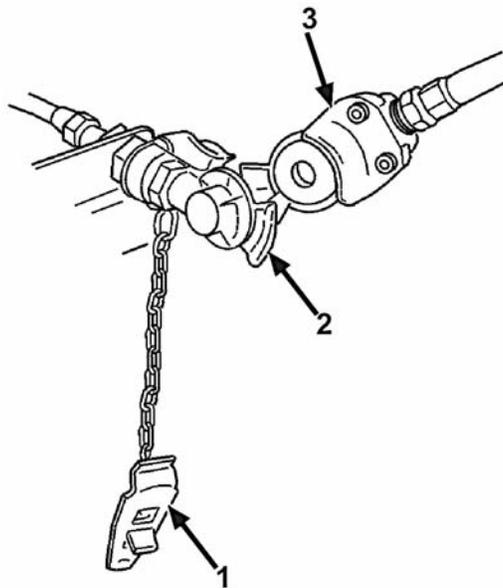


Figure 59. Gladhand Connection

END OF WORK PACKAGE

TRANSPORTING LOADS

1. General

- a. The 250M Fifth Wheel Towing Device, with its prime mover, will have different operational characteristics based on gross weight, differences between loaded and unloaded weight and suspension characteristics. Safe operating limits are affected by the interaction of the vehicle characteristics, load, road surface, weather, driver skill, and vehicle speed.
- b. Before operating the towing device, ensure that all the operating procedures contained in this manual have been read and fully understood.
- c. The 250M Fifth Wheel Towing Device, when coupled to a prime mover and loaded, acts in the same manner as a trailer. All precautions contained in prime movers operating instructions in reference to towing a trailer apply to the fifth wheel towing device.
- d. The batteries on the fifth wheel towing device will run low during extended operation of the strobe lights and must be recharged by connecting the 24-volt NATO slave cable to the IVEC connector and allowing the prime mover to idle for an extended period of time.

**WARNING**

Prior to transporting loads, ensure the transport leg assembly is locked in the vertical position or the handle may swing free and cause injury or death to personnel.

2. **Pre-Trip Inspection.** Certain items should be inspected prior to each trip. Appropriate procedures for services and PMCS (WP 0031) will be completed prior to operating the 250M Fifth Wheel Towing Device.

3. Driving.

- a. **General.** When driving the prime mover and towing device with attached vehicle, the overall length must be kept in mind, both when passing other vehicles and when turning. Because the unit pivots at the fifth wheel, backing is also affected.

CAUTION

Never travel with the fifth wheel towing device boom in the vertical position. Failure to comply may cause damage to equipment.

- b. **Road Surfaces.** Uneven terrain, steep grades, crowned roads, and unimproved road surfaces can introduce forces that will make handling difficult. Even a vehicle that is properly maintained and loaded can be hazardous when excessive speed and certain road conditions are combined.
- c. **Grades.** Operations on grades requires caution. Use the same gear in descending a long grade as when ascending. Gear selection should be made before descending a grade to minimize the chance of a missed shift. Avoid excessive use of brakes on long down grades in order to maintain air pressure and prevent overheating of the brakes.
- d. **Side Slopes.** This device is not recommended to be loaded on an excessive side slope. The towing device can be safely operated, with or without payloads, on side slopes commonly encountered on highways or unimproved roads.

TRANSPORTING LOADS - Continued

CAUTION

DO NOT over steer during small radius turns. Know the position of the fifth wheel towing device in conjunction with the prime mover. Failure to comply may result in vehicle contact between the fifth wheel towing device and the primemover and may cause damage to equipment.

- e. **Turning.** When turning corners, allow extra room. The towed vehicle wheels will follow a track that is inside the radius of the prime mover wheels. For right turns, drive about halfway into the intersection and then cut sharply to the right. The forces affecting the stability of a tractor combination are increased during turning. The smaller the radius, the greater the force trying to pull the vehicle over. Therefore, the tighter the curve, the slower the speed must be in order to avoid a rollover.

**WARNING**

Stopping distances greatly increase when the towed vehicle has nonfunctioning brakes. Care should be taken to ensure adequate stopping distance is obtained and speed is adjusted accordingly. Failure to comply may result in injury or death to personnel.

Towing of a single vehicle with non-functioning brakes must be limited to not more than 25 mph on the highway and 15 mph off-road. Failure to comply may result in injury or death to personnel.

Towing of vehicle combinations with non-functioning brakes is prohibited. Failure to comply may result in injury or death to personnel.

- f. **Stopping.** In normal operation, brake pressure should be applied gradually and smoothly. Selecting a lower gear before beginning a long downgrade is the safest, most effective way to maintain control of the vehicle combination.
- g. **Parking.** When the prime mover and the towing device are to be parked and left unattended, set the parking brake on the prime mover and place chock blocks in front and behind wheels to prevent rolling.

**WARNING**

Visibility from the prime mover is significantly reduced when backing. Proper procedures must be followed and extreme caution used when backing to prevent damage to equipment and injury or death to personnel.

- h. **Backing.** When backing, use the assistant driver as a ground guide. Adjust rear view mirrors before backing. Use slow speed and extreme caution when backing this combination.

DISCONNECTING TOWED VEHICLE

**WARNING****LOADING/UNLOADING OPERATION**

All persons not involved in the loading or unloading operation must stand clear of prime mover and fifth wheel towing device. Failure to comply may result in injury or death to personnel.

Due to the dimensions and center of gravity of some loads, proper procedures must be followed when loading and unloading equipment to prevent damage to equipment and injury or death to personnel.

Visibility from the prime mover is significantly reduced when backing, whether the fifth wheel towing device is loaded or not. Proper procedures must be followed and extreme caution used when backing to prevent damage to equipment and injury or death to personnel.

Use extremely low speed when loading and unloading vehicles. Higher speeds will exaggerate motions and create hazardous conditions, which could result in personnel injury or death or damage to equipment.

HEAVY COMPONENTS

Tow bars weigh 47 lbs. Use caution when removing and handling them to prevent injury or death to personnel and damage to equipment.

NOTE

Set parking brake and chock wheels on towed vehicle.

1. Turn electrical control box power switch to ON position.
2. Disconnect 70 ft. cable from fifth wheel towing device and light assembly. Remove towlight assembly on rear of towed vehicle and store properly.
3. Ensure towed vehicle's steering wheel is unsecured.

DISCONNECTING TOWED VEHICLE - Continued

4. Using remote control or valve control levers, MAST EXTEND to unlock pivot pin (22) and remove pin.
5. Repeat step 5 for remaining pivot pin.
6. Using remote control or valve control levers, MAST RETRACT to lower towed vehicle.
7. Using remote control or valve control levers, BOOM EXTEND to unlock hitch pin (20) from center mast (21) and remove pin.

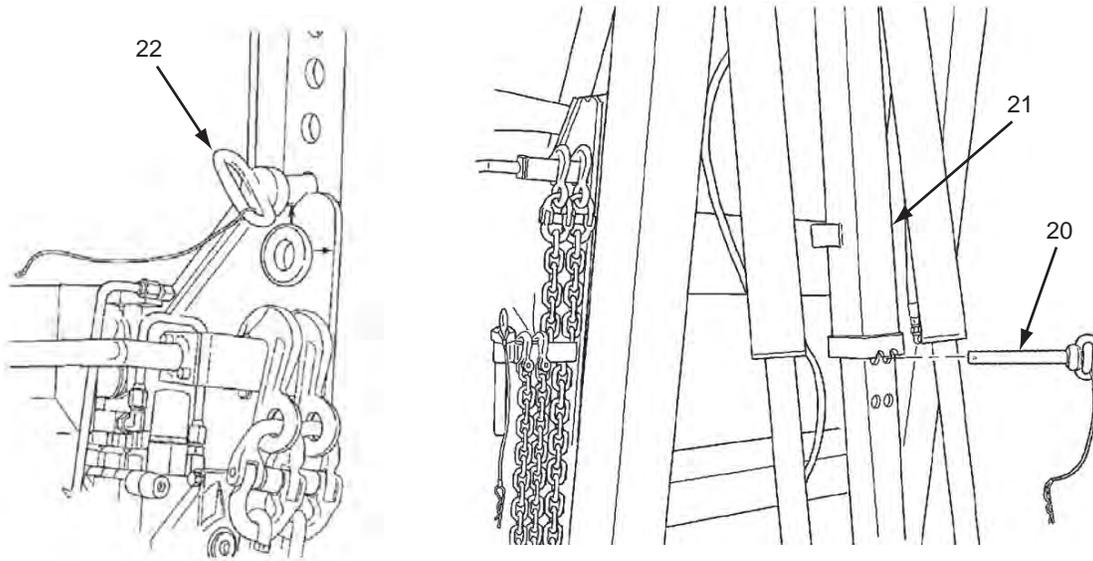


Figure 60. Mast Pin Placement

DISCONNECTING TOWED VEHICLE - Continued

8. Using remote control or valve control levers, MAST RETRACT until rubber blocks (16) are loose.
9. Remove rubber blocks (16) from between towed vehicle U-bolts (17) and boom.

NOTE

Prime mover may be moved slightly forward or backward to relieve tension on hitch pin (13).

10. Using remote control or valve control levers, BOOM EXTEND to raise boom until hitch pins (13) and (18) are loose.
11. Remove hitch pins (13) and (18) from tow bar assembly.
12. Disconnect air lines from fifth wheel towing device to towed vehicle.
13. Repeat step 11 for remaining tow bar assembly.
14. BOOM RETRACT and MAST RETRACT to position booms on the ground.
15. Remove hitch pin (6) and spring clip (7) from upper section (4) of tow bar assembly and front towing eye (5) of towed vehicle.

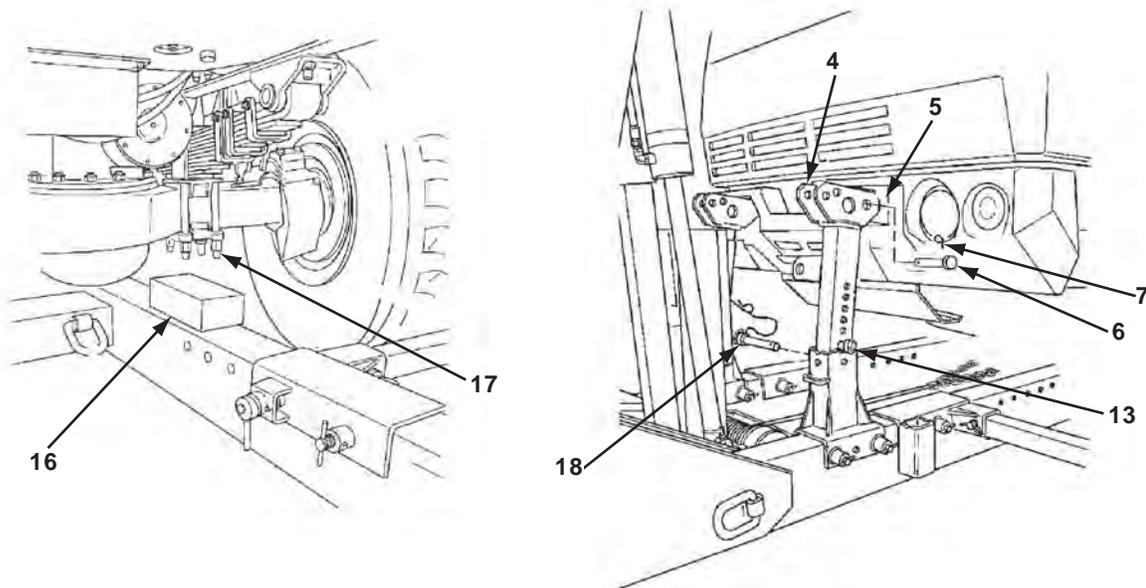


Figure 61. Pad and Tow Bar Assembly Locations

DISCONNECTING TOWED VEHICLE - Continued

CAUTION

When loosening rear safety chains, do not allow boom extensions to contact underside of towed vehicle. Damage to towed vehicle may occur.

16. Using remote control or valve control levers, BOOM RETRACT to loosen rear safety chains.
17. Remove chains (10) from boom extension clevis (12) and frame hook clevis (11).
18. Remove frame hook (8) from frame flange (9).
19. Repeat steps 17 and 18 for remaining frame hook.

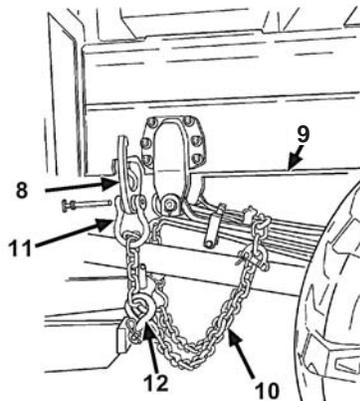


Figure 62. Frame Hook Connection

20. Using remote control or valve control levers, BOOM EXTEND until transport leg assembly can be lowered. Rotate handle (3) clockwise and lower transport legs.
21. BOOM RETRACT until boom is slightly off ground and, using remote control or valve control levers, RETRACT RIGHT IN (4) and RETRACT LEFT IN (5), retract boom extensions to storage position and pull prime mover and towing device away from towed vehicle.

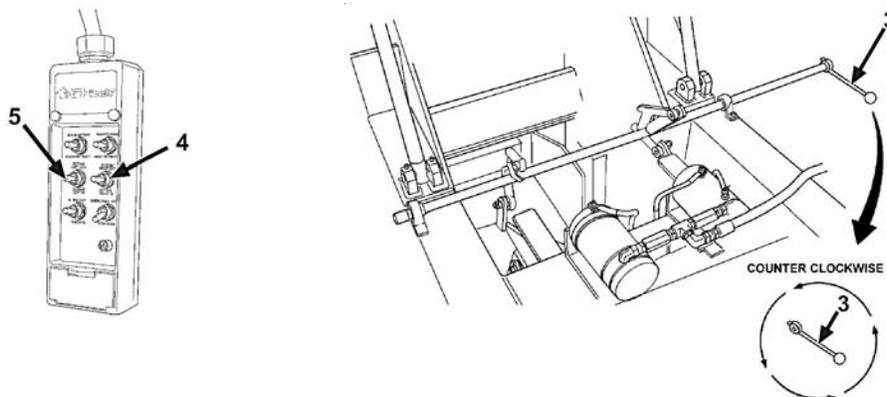


Figure 63. Remote Control and Support Leg Assembly

END OF WORK PACKAGE

STOWAGE OF TOW BAR ASSEMBLIES

1. Remove upper section (1) of tow bar assembly from lower section (2) and set aside.
2. Loosen all four T-bolts (3&4) on lower section (2) and remove lower section from boom.

NOTE

If necessary, use same procedure of tilting lower section of towbar assembly to insert upper section. Refer to steps 1 through 5 in WP 009.

3. Position lower section (2) onto storage bracket (5) slide to inner position and tighten all T-bolts (3&4).

CAUTION

Ensure offset mounting plates are facing forward to avoid contact with the mast during operation. Damage to equipment may occur.

4. Position upper section (1) onto lower section (2) and secure with hitch pin (6) and spring pin (7).
5. Repeat steps (1 through 4) for remaining tow bar assembly.

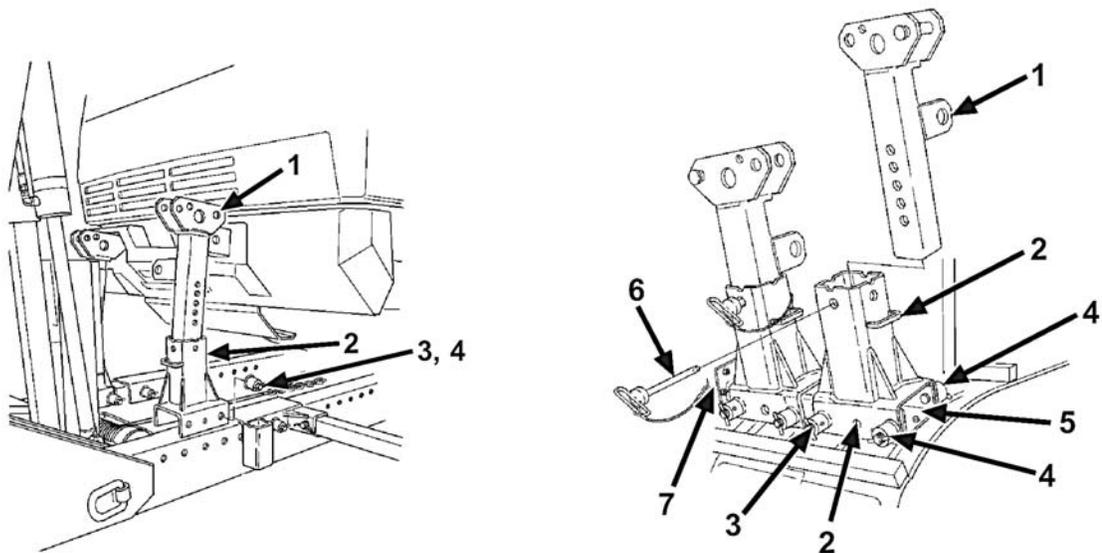


Figure 64. Tow Bar Assembly and Storage

END OF WORK PACKAGE

UNCOUPLING

**WARNING**

All persons not involved in coupling/uncoupling operation must stand clear of prime mover and towing device to prevent serious injury or death.

CAUTION

To prevent damage to the equipment, uncoupling should be done by two people, the first person in the prime mover cab and the second acting as a ground guide.

1. Set prime mover parking brake.
2. Unhook gladhands (1) and 24-volt NATO slave cable (2).

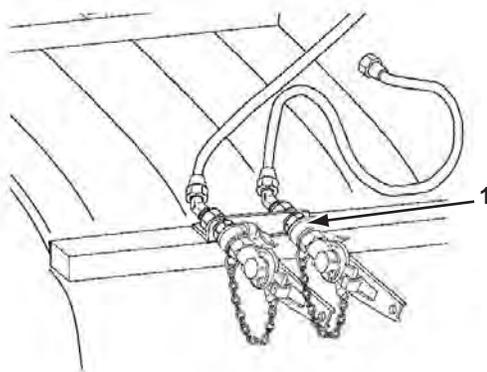


Figure 65. Gladhands

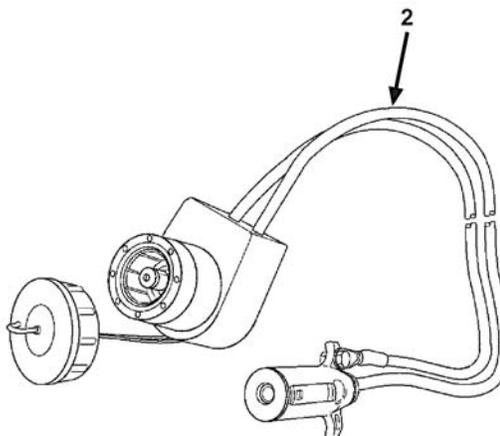


Figure 66. NATO Slave Cable

UNCOUPLING - Continued

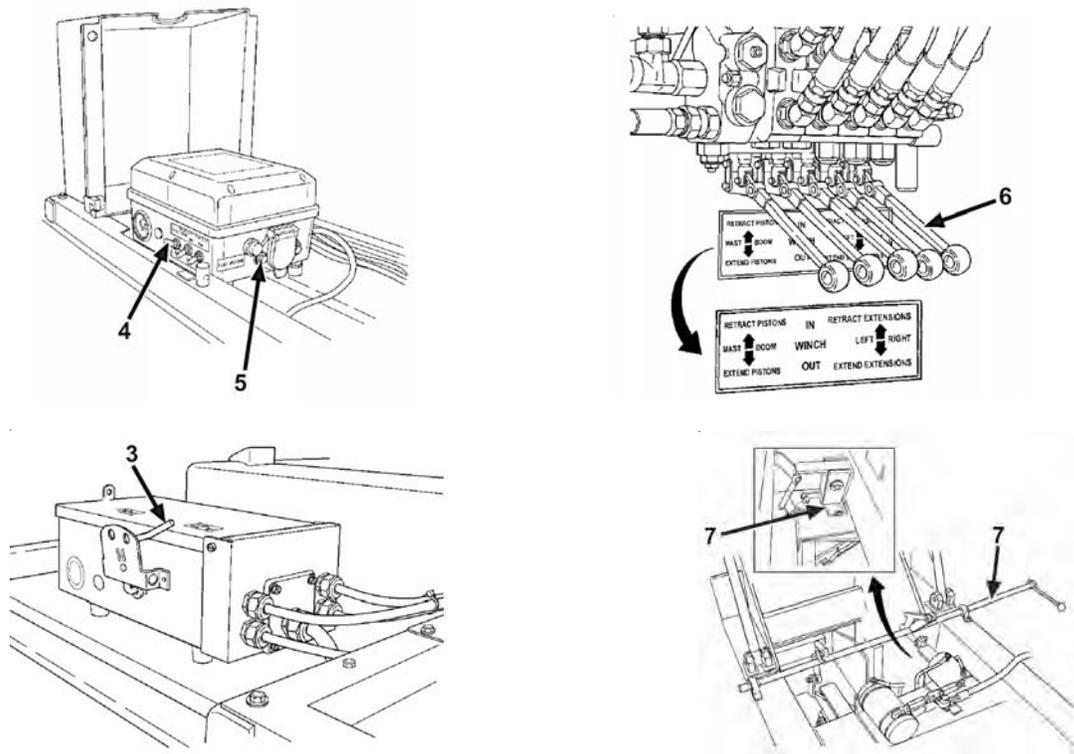


Figure 67. Master Controls and Transport Legs

3. Set junction box selector switch (3) to 12-volt.

NOTE

Power switch (4) must be in the on position. The electric motor button (5) must be pushed to use the valve control levers.

4. Using remote control or valve control levers (6), EXTEND RIGHT OUT and EXTEND LEFT OUT, fully extend boom extensions.
5. Using remote control or valve control levers, bring main frame to a level position and allow stowage of transport legs (7).
6. Unlock the fifth wheel in accordance with prime movers operating procedures.

UNCOUPLING - Continued**WARNING**

All persons not involved in coupling/uncoupling operation must stand clear of prime mover and fifth wheel towing device to prevent serious injury or death.

7. Release the prime mover parking brake and slowly drive the prime mover forward, allowing the towing device to release from the fifth wheel.
8. Stop the prime mover when towing device is released from fifth wheel.
9. Using remote control or valve control levers, BOOM RETRACT until booms are resting on the ground.
10. Slowly drive the prime mover away from towing device.

END OF WORK PACKAGE

PREPARE FOR SHIPPING/STORAGE

1. Uncouple towing device from prime mover (WP 0020).
2. Using remote control or valve control levers, MAST EXTEND to lower mast until arrow (1) is approximately 4 inches (101.6 mm) below frame (2).

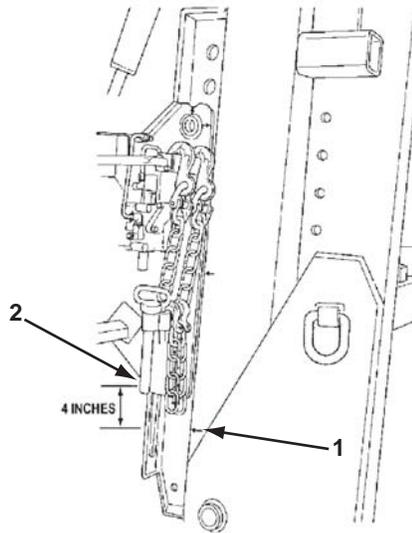


Figure 68. Mast Alignment

3. Lock transport legs in up position.

**WARNING**

Operators must take caution while folding the mast assembly to the vertical position. The transport leg assembly does not stay locked in the vertical position. The handle will swing free and may cause injury or death to personnel.

Ensure tool boxes are closed and the main frame is free of all unsecured items. Failure to comply may result in death or injury to personnel or equipment.

PREPARE FOR SHIPPING/STORAGE - Continued

4. Using valve control levers, BOOM RETRACT, to fold towing device.
5. With kingpin in vertical position, close top pressure relief valve (6) by turning breather switch (5) elbow 90° from breather.

NOTE

With main frame in the vertical position, the bottom breather is on the fifth wheel side of the hydraulic tank and the top breather is located towards the rear of the fifth wheel towing device. (Both breathers look the same.)

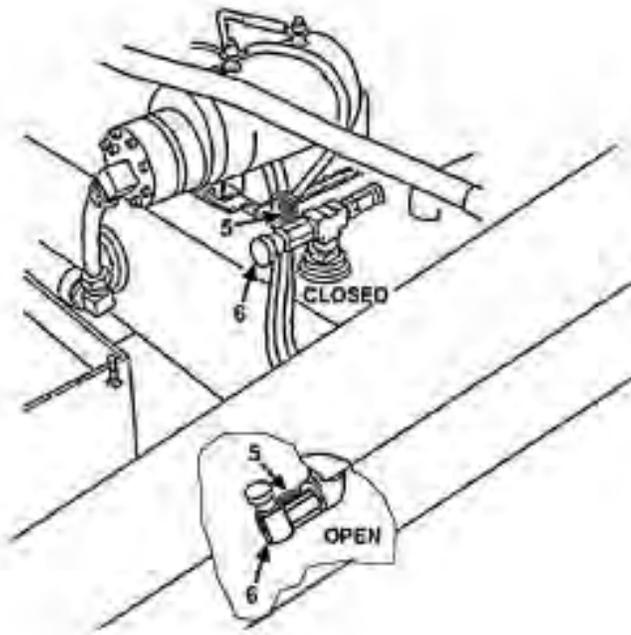


Figure 19. Breather Valve

PREPARE FOR SHIPPING/STORAGE - Continued

6. Open bottom pressure relief valve by turning breather switch inline with fitting. Remove both mast clevises from unit.
7. Using valve control levers, MAST EXTEND, to line up arrows (3 and 4) and insert pivot pin (5). (Do not insert spring clips.)
8. Using valve control levers, MAST RETRACT, to fold main frame assembly over onto mast.
9. Continue mast retract until pivot pin loosens. Remove pivot pin.
10. Using valve control levers, MAST EXTEND, to center main frame over booms and re-install both mast clevises to unit.
11. Using valve control levers, RETRACT LEFT IN and RETRACT RIGHT IN, fully retract boom extensions.
12. Switch electric control box to OFF.
13. Ensure electric control box, tool boxes, and 12/24 volt junction box are secured with locks.
14. Towing device can now be transported by forklift.

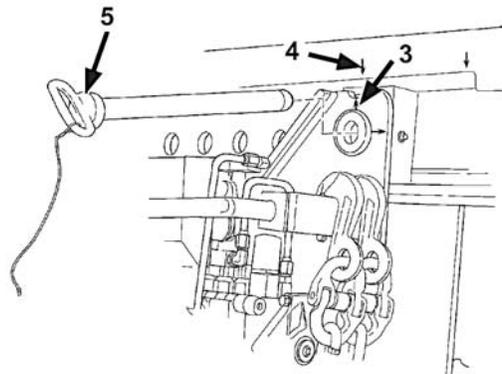


Figure 69. Pin Alignment

END OF WORK PACKAGE

OPERATION UNDER UNUSUAL CONDITIONS

GENERAL

1. This section contains special instructions for operating and servicing the towing device under unusual conditions.
2. In addition to performing all the usual PMCS procedures, special care must be taken in regard to cleaning and lubrication when extremes in temperature, humidity, and terrain conditions are present or anticipated. Proper cleaning, lubrication, storage, and handling ensures proper operation and function and guards against excessive wear.
3. When chronic failure of material results from subjection to extreme conditions, report the condition on SF Form 368.

OPERATION IN EXTREME COLD**CAUTION**

Oil level must be checked in cold temperatures after fifth wheel towing device has been winterized and removed from maintenance facility. Damage to equipment may occur if oil level is not maintained.

1. Operation

- a. Insulation may crack and cause electrical short circuits. Construction materials can become hard, brittle, and easily damaged or broken. Handle construction materials with care in extreme cold.
- b. Refer to FM 9-207 and FM 21-305 for special instruction on driving hazards in extreme cold.
- c. Refer to WP 0039 for proper lubrication during extreme cold weather conditions.

2. At-Halt Parking

- a. When parking short term, park in a sheltered area out of the wind.
- b. When parking long term, prepare a footing of planks or brush if high, dry ground is not available.
- c. Remove all buildup of ice and snow as soon as possible after shutdown.
- d. Cover and shield the towing device with canvas covers if available. Keep ends of covers off the ground to keep them from freezing to the ground.

OPERATION IN EXTREME HEAT AND HIGH HUMIDITY

1. Refer to WP 0039 for proper lubrication during extreme heat conditions. Adequate lubrication is essential. Extreme heat will cause oil films to evaporate, resulting in inadequate lubrication.
2. Cover inactive towing device with tarpaulins, if they are available and if there is no other available shelter. For several hours each week, shake out and air canvas covers or other items subject to deterioration from mildew or attacks by insects or vermin.
3. If inactive for long periods in hot, humid weather, towing device is subject to rapid rusting and accumulation of fungi growth. Frequently inspect, clean, and lubricate to prevent excessive deterioration.

OPERATION IN SANDY OR DUSTY AREAS

1. Inspect, clean, and lubricate towing device frequently when operating in dusty or sandy areas. Refer to WP 0039 for proper lubrication instructions.
2. Make sure no dust or sand enters exposed mechanisms or lubrication fittings during inspections and repair operations. Cover exposed parts with tarpaulins or other suitable cover during disassembly and assembly.

OPERATION IN MUD AND SNOW**NOTE**

Refer to FM 21-305 for special instructions for operation in snow.

1. Frequently clean, inspect, and lubricate towing device. Refer to WP 0039 for proper lubrication instructions.
2. After each operation remove ice, snow, and mud from underneath towing device and from hoses, lines, tubes, and electrical connections.

OPERATION IN SALTWATER AREAS

1. Wash salt deposits from all equipment with fresh water.
2. Moist and salty areas can destroy the rust-preventative qualities of oils and greases. When equipment is active, exposed surfaces should be cleaned and lubricated daily. Refer to WP 0039 for proper lubrication in high humidity and saltwater areas.
3. When equipment is inactive, unpainted parts should be coated with lubricating oil (refer to WP 0039). All covers and caps should be in place.

OPERATION ON ROCKY TERRAIN

Before driving over stumps or rocks, make sure the towing device can clear them. Such objects can damage components on the underside of the towing device. Beware of low hanging limbs that can damage cargo.

FORDING

1. Before Fording

- a. Refer to operating instructions in prime mover technical manual for information on fording operations. Towing vehicle fording instructions are also applicable.
- b. The fording depth of fifth wheel towing device is limited to the fording depth limit of the prime mover or the towed vehicle, whichever is lower.
- c. Before entering the water, check bottom surface conditions. If bottom is too soft, do not ford.
- d. Cables and terminals must be protected by applying silicone compound (item 11, WP 0085).

2. After Fording

- a. Drain or dry all areas where water has collected.
- b. Lubricate all unpainted surfaces. See lubrication chart (WP 0039).
- c. Dry all lubrication points and lubricate. See lubrication chart (WP 0039).

ROLL-ON/ROLL-OFF (RORO) OPERATIONS

The following procedures are roll-on/roll-off (RORO) procedures for shipment of the fifth wheel towing device.

1. Prepare tow bar assemblies for loading equipment (WP 0009).
2. Connect to towed vehicle (WP 0010, steps 1 through 5).
3. Position rubber blocks (item 6, WP 0083) between front spring saddle of towed vehicle and boom.
4. Using valve control levers, BOOM EXTEND to a height to allow rubber blocks (item 6, WP 0083) to be placed on ground UNDER boom, approximately 4 feet (48 inches) forward of rubber blocks placed on top of boom in step 3.
5. Using valve control levers, BOOM RETRACT to position boom extensions as high as possible, ensuring not to contact underside of towed vehicle.
6. If frame hooks (item 5, WP 0083) are used to secure boom extensions to towed vehicle, frame hooks can be coupled directly to boom extension clevis.

ROLL-ON/ROLL-OFF (RORO) OPERATIONS - Continued

7. Continue with connecting to towed vehicle (WP 0010, steps 11 through 26). OMIT STEP 14.
8. DO NOT install hitch pin into center mast (WP 0010, step 19).
9. MAST EXTEND to raise mast to highest position. Lock pin should be inserted in fifth hole on mast section (WP 0010, step 22).
10. When ascending ramp, it may be necessary to BOOM EXTEND for additional height after prime mover passes the crest. Use remote control to extend and retract booms as necessary.

11. After towed vehicle travels over the crest, BOOM RETRACT to level fifth wheel section.

END OF WORK PACKAGE

TM 9-2510-247-13&P

CHAPTER 3
OPERATOR TROUBLESHOOTING

OPERATOR TROUBLESHOOTING PROCEDURES INDEX

WP Sequence No.

OPERATOR TROUBLESHOOTING PROCEDURES

Operator Troubleshooting Procedures	0023 00
Operator Troubleshooting	0024 00

OPERATOR TROUBLESHOOTING PROCEDURES

GENERAL

1. This section provides information for identifying and correcting malfunctions that you may find while operating the fifth wheel towing device.
2. The Troubleshooting Symptom Index (WP 0023 00-2) lists common malfunctions which may occur and refers you to the proper page in Table 1 for a troubleshooting procedure.
3. If you are unaware of the location of an item mentioned in troubleshooting, refer to WP 0002 00-5, WP 0002 00-6, WP 0004 00-1, WP 0004 00-3, WP 0004 00-4 .
4. Before performing troubleshooting, read and follow all safety instructions found in the warning summary at the front of this manual.
5. This section cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed, or is not corrected by the listed corrective actions, notify your supervisor.
6. When troubleshooting a malfunction:
 - a. Locate the symptom or symptoms in WP 0023 00-2 that best describes the malfunction. If the appropriate symptom is not listed, notify your supervisor.
 - b. Turn to the page in Table 1 where the troubleshooting procedures for the malfunction in question are described. Headings at the top of each page show how each troubleshooting procedure is organized: **Malfunction, Test or Inspection** (in step number order), and **Corrective Action**.
 - c. Perform each step in the order listed until the malfunction is corrected and the item being inspected is operational. DO NOT perform any maintenance task unless the troubleshooting procedure tells you to do so.

EXPLANATION OF COLUMNS

The columns are defined as follows:

- (1) **MALFUNCTION.** A visual or operational indication that something is wrong with the equipment.
- (2) **TEST OR INSPECTION.** A procedure to isolate the problem in a system or component.
- (3) **CORRECTIVE ACTION.** A procedure to correct the problem.

OPERATOR TROUBLESHOOTING SYMPTOM INDEX

**Troubleshooting
Procedure Page**

KINGPIN

Kingpin Fails to Lock in Fifth Wheel WP 0024

ELECTRICAL SYSTEM

All Lights Inoperable WP 0024

One or More Lights Inoperable WP 0024

AIR BRAKE SYSTEM

Brakes on Towed Vehicle Fail to Disengage WP 0024

HYDRAULIC SYSTEM

Hydraulic Functions Slow or Inoperative WP 0024

Hydraulic Functions do not Operate with Remote Control WP 0024

END OF WORK PACKAGE

TABLE 1. OPERATOR TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

KINGPIN**KINGPIN FAILS TO LOCK IN FIFTH WHEEL**

- | | |
|---------|--|
| Step 1. | Check kingpin size and location for compatibility with prime mover fifth wheel.
Replace kingpin in accordance with WP 0034. |
| Step 2. | Check kingpin for damage.
Notify Unit Maintenance if kingpin is damaged. |

ELECTRICAL SYSTEM**1. ALL LIGHTS INOPERABLE**

- | | |
|---------|---|
| Step 1. | Check that all electrical switches are set in the correct position (WP 0015). |
| Step 2. | Check electrical connections at cable receptacles.
Reconnect cables if not properly connected. |
| Step 3. | Check connectors for dirty, corroded, or damaged pins.
Clean in accordance with procedures in WP 0035.
Notify Unit Maintenance if pins are damaged. |
| Step 4. | Check voltmeter on control box for reading of 12 volt dc.
Notify Unit Maintenance if voltage reading is below 12 volts dc. |

TABLE 1. OPERATOR TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

ELECTRICAL SYSTEM

2. ONE OR MORE LIGHTS INOPERABLE

- Step 1. Check for burned out or defective bulbs/lights.
Notify Unit Maintenance.
- Step 2. Check for broken lead wires or loose connections.
Notify Unit Maintenance.
- Step 3. Check for dirty or corroded connectors at back of light.
Clean in accordance with procedures in paragraph WP 0032.
Notify Unit Maintenance.

AIR BRAKE SYSTEM

BRAKES ON TOWED VEHICLE FAIL TO DISENGAGE

- Step 1. Check Control (blue/service) Air Line connection at gladhand.
If line is not properly connected, remove and reconnect.
If no air is flowing from prime mover, notify Unit Maintenance and use another prime mover.
- Step 2. Check for dirty or damaged packing in the gladhand.
Clean in accordance with procedures in WP 0033.
Notify Unit Maintenance if packing is leaking.
- Step 3. Inspect Control (blue/service) Air Line for damage.
Notify Unit Maintenance if damage is found.
- Step 4. Check brake system hardware for damaged or missing components.
Notify Unit Maintenance for further inspections and/or repairs.

TABLE 1. OPERATOR TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

HYDRAULIC SYSTEM

1. HYDRAULIC FUNCTIONS SLOW OR INOPERATIVE

- Step 1. Check that ELECTRIC POWER ON/OFF Switch is in ON position (WP 0005).
- Step 2. Check outside temperature.
If temperature is less than 0°F (-17°C), hydraulic oil may not flow easily.
- Step 3. Check hydraulic reservoir oil level (Figure 104, WP 0056 00-5).
- Step 4. Check hydraulic operating pressure (WP 0002 00-7).
Notify Unit Maintenance if pressure is below operating limits.
- Step 5. Check hydraulic valves, tubes and hoses for leaks.
Tighten loose connections.
Notify Unit Maintenance of damaged or defective components.

2. HYDRAULIC FUNCTIONS DO NOT OPERATE WITH REMOTE CONTROL

- Step 1. Check that all electrical switches are set in the correct position (WP 0005).
- Step 2. Check electrical connections at cable receptacles on electrical control box.
Reconnect cables if not properly connected.
- Step 3. Operate hydraulic functions from valve lever controls (WP 0005).
If hydraulic operations function, notify Unit Maintenance.

END OF WORK PACKAGE

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CHAPTER 4
UNIT TROUBLESHOOTING

UNIT TROUBLESHOOTING PROCEDURES INDEX

WP Sequence No.

UNIT TROUBLESHOOTING PROCEDURES

Unit Troubleshooting Procedures	0025 00
Kingpin	0026 00
Electrical	0027 00
Hydraulic System	0028 00
Air Brake System	0029 00
Winch	0030 00

UNIT TROUBLESHOOTING PROCEDURES

GENERAL

1. This section provides information for identifying and correcting malfunctions that you may find while operating and maintaining the Fifth Wheel Towing Device.
2. The Troubleshooting Symptom Index (WP 0025 00-2) lists common malfunctions which may occur and refers you to the proper work package for a troubleshooting procedure.
3. If you are unaware of the location of an item mentioned in troubleshooting, refer to paragraphs WP 0002 00-5, and WP 0002 00-6, WP 0004 00-1 through WP 0004 00-3, and WP 0031.
4. Before performing troubleshooting, read and follow all safety instructions found in the warning summary at the front of this manual.
5. This section cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.
6. When troubleshooting a malfunction:
 - a. Locate the symptom or symptoms in WP 0025 00-2 that best describes the malfunction. If the appropriate symptom is not listed, notify your supervisor.
 - b. Turn to the work package where the troubleshooting procedures for the malfunction in question are described. Headings at the top of each page show how each troubleshooting procedure is organized: Malfunction, Test or Inspection (in step number order), and Corrective Action.
 - c. Perform each step in the order listed until the malfunction is corrected and the item being inspected is operational. DO NOT perform any maintenance task unless the troubleshooting procedure tells you to do so.

EXPLANATION OF COLUMNS

The columns are defined as follows:

- a. **MALFUNCTION.** A visual or operational indication that something is wrong with the equipment.
- b. **TEST OR INSPECTION.** A procedure to isolate the problem in a system or component.
- c. **CORRECTIVE ACTION.** A procedure to correct the problem.

UNIT TROUBLESHOOTING SYMPTOM INDEX

**Troubleshooting
Procedure Page**

KINGPIN WP 0026
 Kingpin Fails to Lock in Fifth Wheel

ELECTRICAL SYSTEM WP 0027

- Hydraulic Functions do not Operate when Electric On/Off Switch is On
- Loss of Power to 12/24 Volt Junction Box
- Voltmeter Inoperable
- Remote Control Inoperable
- All Lights Inoperable
- Work Light Inoperable
- Light Bar Assembly Inoperable
- Strobe Lights Inoperable

HYDRAULIC SYSTEM WP 0028

- Hydraulic Functions Slow or Inoperable
- Boom Hydraulic Cylinder Leaks
- Cannot Relieve Hydraulic Pressure from One or More Levers
- Cylinders do not Extend or Retract when Push Switch on Electric Control Box and Levers are Activated
- Hydraulic Fluid Coming from Breather Valve
- Boom Will Not Operate
- Mast Will Not Operate

AIR BRAKE SYSTEM WP 0029

- Air Brake System Will Not Operate

WINCH WP 0030

- Winch Will Not Operate

END OF WORK PACKAGE

UNIT TROUBLESHOOTING

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

KINGPIN**KINGPIN FAILS TO LOCK IN FIFTH WHEEL**

- Step 1. Is proper kingpin (2 inches or 3 1/2 inches) installed in Fifth Wheel Towing Device?
If no, install proper kingpin size for compatibility to prime mover (WP 0034).
If yes, go to step 2.
- Step 2. Is kingpin bolster plate resting on the prime mover's fifth wheel and parallel with the prime movers chassis while coupling?
If no, adjust position of kingpin bolster plate (WP 0006).
If yes, go to step 3.
- Step 3. Is fifth wheel lockout device on prime mover open before coupling?
If no, refer to prime mover TM to open lockout device.
If yes, refer to prime mover TM to determine fault.

END OF WORK PACKAGE

UNIT TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ELECTRICAL SYSTEM**1. NOTHING HAPPENS WHEN ELECTRICAL CONTROL BOX ON/OFF SWITCH IS ENGAGED**

- Step 1. Is push button being engaged to activate hydraulic motors?
If no, engage push button to activate hydraulic motors.
If yes, go to step 2.
- Step 2. Is there minimum 12VDC on batteries?
If no, connect IVEC cable to prime mover and 12/24 volt junction box.
If yes, go to step 3.
- Step 3. Is there voltage at on/off switch?
If no, check for broken wire that supplies on/off switch (WP 0088).
If yes, go to step 4.
- Step 4. Is there power on only one side of on/off switch?
If no, go to step 4.
If yes, replace switch.
- Step 5. Is there power to 12-24 volt junction box?
If no, disconnect cable connector at junction box receptacle. Check for minimum 12 or 24 volt output from prime mover as determined by prime mover.
If yes, go to step 5.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ELECTRICAL SYSTEM - Continued

- Step 6. Is voltage coming into and out of solenoids?
 If no, check if power is present at solenoid, but not coming out of solenoid.
 If power is present at solenoid , but not coming out of solenoid, replace solenoid.
 If yes, go to step 6.
- Step 7. Is voltage found at top of hydraulic motors when push button switch is on?
 If no, repeat steps 1 through 5.
 If yes, replace on/off switch.

2. LOSS OF POWER TO THE 12/24 VOLT JUNCTION BOX

- Step 1. Is there minimum 12VDC on batteries?
 If no, go to step 2.
 If yes, go to step 3.
- Step 2. Is NATO slave cable connected?
 If no, install NATO cable in receptacle on prime mover and receptacle on 12/24
 volt junction box.
 If yes, go to step 3.
- Step 3. Are there any broken or frayed wires?
 If no, go to step 4.
 If yes, repair or replace wires as necessary (WP 0051).
- Step 4. Do all connections inside 12-24 volt junction box have voltage?
 If no, ensure all connections are clean. Pay special attention to all grounds
 (WP 0088). If connections still do not have voltage, replace 12-24 volt
 junction box.

3. VOLTMETER DOES NOT WORK

- Step 1. Is there minimum 12VDC on batteries?
 If no, go to step 2.
 If yes, go to step 3.
- Step 2. Is NATO slave cable connected?
 If no, install NATO cable in receptacle on prime mover and receptacle on 12/24
 volt junction box.
 If yes, go to step 3.

UNIT TROUBLESHOOTING - Continued

**MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION**

ELECTRICAL SYSTEM - Continued

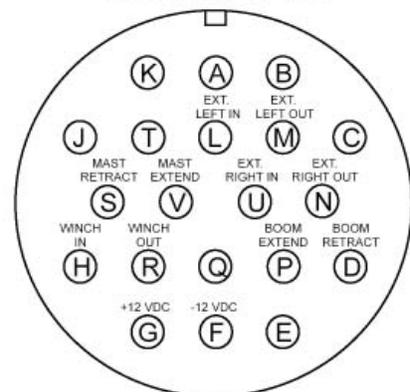
3. VOLTMETER DOES NOT WORK - Continued

- Step 3. Are there any broken or frayed wires?
If no, go to step 4.
If yes, repair or replace wires as necessary (WP 0051).
- Step 4. Is voltage found at plus (+) side of voltmeter?
If no, ensure connection is clean and there is a good connection on (+) feed wire (WP 0088).
If yes, replace voltmeter.

4. REMOTE CONTROL DOES NOT OPERATE

- Step 1. Is ON switch on remote in on position?
If no, place ON switch in on position (WP 0007, step 3).
If yes, go to step 2.
- Step 2. Is there minimum 12VDC on batteries?
If no, go to step 3.
If yes, go to step 4.
- Step 3. Is NATO slave cable connected?
If no, install NATO cable in receptacle on prime mover and receptacle on 12/24 volt junction box.
If yes, go to step 4.
- Step 4. Is voltage coming into remote control?
If no, ensure connection is clean and there is a good connection on (+) feed wire (WP 0088).
If yes, go to step 5.

Remote Control Cable Connector Pin View



- Step 5. Is voltage coming out of remote control?
If no, replace remote control.
If yes, test solenoids on control valve and replace as necessary (WP 0045).

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ELECTRICAL SYSTEM - Continued
5. ALL LIGHTS ARE INOPERABLE

- Step 1. Is there minimum 12VDC on batteries?
 If no, go to step 2.
 If yes, go to step 3.
- Step 2. Is NATO slave cable connected?
 If no, install NATO cable in receptacle on prime mover and receptacle on 12/24
 volt junction box.
 If yes, go to step 3.
- Step 3. Are there any broken or frayed wires?
 If no, go to step 4.
 If yes, repair or replace wires as necessary (WP 0051).
- Step 4. Are all bulbs working properly?
 If no, replace bulbs (WP 0047, WP 0048, or WP 0049).
 If yes, replace light assemblies (WP 0047, WP 0048, or WP 0049).

6. WORK LIGHT INOPERABLE

- Step 1. Is WORK LIGHT switch ON?
 If no, put WORKLIGHT switch in ON position.
 If yes, go to step 2.
- Step 2. Is there minimum 12VDC on batteries?
 If no, go to step 3.
 If yes, go to step 4.
- Step 3. Is NATO slave cable connected?
 If no, install NATO cable in receptacle on prime mover and receptacle on 12/24
 volt junction box.
 If yes, go to step 4.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

ELECTRICAL SYSTEM - Continued

- Step 3. Are there any broken or frayed wires?
If no, go to step 5.
If yes, repair or replace wires as necessary (WP 0051).
- Step 4. Is the bulb working properly?
If no, replace bulb (WP 0048).
If yes, replace worklight assembly (WP 0048).

7. LIGHT BAR ASSEMBLY INOPERABLE

- Step 1. Is light bar cable properly installed in receptacle on prime mover?
If no, install light bar cable in receptacle on prime mover (WP 0015).
If yes, go to step 2.
- Step 2. Is light bar cable damaged?
If no, go to step 3.
If yes, repair or replace light bar cable as necessary (WP 0047).
- Step 3. Is voltage going into light bar assembly?
If no, replace light bar cable.
If yes, replace light bar assembly and return used light bar assembly to manufacturer for evaluation.

8. STROBE LIGHTS INOPERABLE

- Step 1. Is STROBE LIGHT switch ON?
If no, put STROBE LIGHT switch in ON position (WP 0015).
If yes, go to step 2.
- Step 2. Is just one side inoperable?
If no, go to step 4.
If yes, check electrical ground (WP 0088).
- Step 3. Is bulb working properly?
If no, replace bulb (WP 0049).
If yes, replace strobe light assembly and send faulty assembly to manufacturer for evaluation.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ELECTRICAL SYSTEM - Continued

- Step 4. Are both strobe lights inoperable?
If no, go to step 5.
If yes, check electrical ground (WP 0088).
- Step 5. Is there minimum 12VDC on batteries?
If no, go to step 6.
If yes, go to step 7.
- Step 6. Is NATO slave cable connected?
If no, install NATO cable in receptacle on prime mover and receptacle on 12/24 volt junction box.
If yes, go to step 7.
- Step 7. Is wiring from electrical control box damaged, kinked, or frayed?
If no, replace strobe light assembly (WP 0049).
If yes, replace wiring (WP 0051).

END OF WORK PACKAGE

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC SYSTEM
1. HYDRAULIC FUNCTIONS SLOW OR INOPERATIVE

- Step 1. Is there minimum 12VDC on batteries?
 If no, go to step 2.
 If yes, go to step 3.
- Step 2. Is NATO slave cable connected?
 If no, install NATO cable in receptacle on prime mover and receptacle on 12/24 volt junction box.
 If yes, go to step 3.
- Step 3. Is pressure gauge reading 300-800 psi when performing MAST RETRACT and BOOM EXTEND functions during folding and unfolding (WP 0005 and WP 0021)?
 If no, adjust flow control valves (WP 0003).
 If yes, go to step 4.
- Step 4. Is the temperature below 0°F (-18°C)?
 If no, purge hydraulic oil (WP 0056 00-5) and fill with new hydraulic fluid.
 If yes, purge hydraulic oil (WP 0056 00-5) and fill with 5606 Arctic oil (WP 0056 00-5).

2. BOOM HYDRAULIC CYLINDER LEAKS

- Step 1. Is pressure gauge reading 300-800psi when performing MAST RETRACT and BOOM EXTEND functions during folding and unfolding (WP 0005 and WP 0021)?
 If no, adjust flow control valves (WP 0003).
 If yes, go to step 2.
- Step 2. Did adjusting the flow valves stop leak?
 If no, replace hydraulic cylinder (WP 0064).
 If yes, discontinue with troubleshooting.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC SYSTEM - Continued**3. CANNOT RELIEVE HYDRAULIC PRESSURE FROM ONE OR MORE LEVERS**

- Step 1. Is hydraulic breather valve in CLOSED position (WP 0021)?
If no, go to step 2.
If yes, move breather valve to OPEN position (WP 0021).
- Step 2. Is return line obstructed (WP 0056 00-5 steps 3 thru 5)?
If no, replace breather valve (WP 0065).
If yes, clean or replace return line.

4. CYLINDERS DO NOT EXTEND OR RETRACT WHEN PUSH SWITCH ON ELECTRIC CONTROL BOX AND LEVERS ARE ACTIVATED

- Step 1. Are hydraulic motors running and hydraulic pressure being maintained?
If no, check to see if there is voltage at push button switch and solenoid.
If yes, adjust hydraulic flow control valves (WP 0003).

5. HYDRAULIC FLUID COMING FROM BREATHER VALVE

- Step 1. Is oil at correct level (WP 0056)?
If no, adjust oil level (WP 0056) and ensure breather valve on top of reservoir is open at all times.
If yes, adjust hydraulic flow valves (WP 0003).
- Step 2. Is hydraulic pressure gauge showing pressure?
If no, adjust hydraulic flow valves (WP 0003).
If yes, go to step 2.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

HYDRAULIC SYSTEM - Continued**6. BOOM WILL NOT OPERATE**

- Step 1. Is hydraulic pressure gauge showing pressure?
If no, adjust hydraulic flow valves (WP 0003).
If yes, go to step 2.
- Step 2. Are hydraulic motors running?
If no, check batteries for voltage. Check IVEC cable connection from prime mover. Check for voltage at solenoids.
If yes, go to step 3.
- Step 3. Will mast, extensions, and winch functions operate using the valve control levers?
If no, remove hose from hydraulic lock valve to base end of boom hydraulic cylinder. Hold oil drain pail under open port in hydraulic cylinder. Operate control lever BOOM RETRACT gradually.
If oil returns from cylinder, but there is no movement of booms or cylinder, the cylinder packing is allowing oil to bypass and the hydraulic cylinder must be replaced.
If oil does not return from cylinder when operating boom retract lever, put end of removed hose in drain pan and gradually operate BOOM EXTEND control lever.
If oil does not flow out of hose, remove hose between control valve and lock valve. Re-attach swivel end at control valve and put other end of hose in drain pan. Operate BOOM EXTEND control lever.
If oil does not flow out of hose, replace control valve.
If oil does flow out of hose, replace lock valve.
If yes, go to step 4.
- Step 4. Will boom operate using the remote control?
If no, replace remote control.
If yes, return to step 3.

UNIT TROUBLESHOOTING - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC SYSTEM - Continued
7. MAST WILL NOT OPERATE

- Step 1. Is hydraulic pressure gauge showing pressure?
 If no, adjust hydraulic flow valves (WP 0003).
 If yes, go to step 2.
- Step 2. Are hydraulic motors running?
 If no, check batteries for voltage. Check IVEC cable connection from prime mover. Check for voltage at solenoids.
 If yes, go to step 3.
- Step 3. Will boom, extension, and winch functions operate using the valve control levers?
 If no, remove hose from hydraulic lock valve to base end of boom hydraulic cylinder. Hold oil drain pail under open port in hydraulic cylinder. Operate control lever MAST RETRACT gradually.
 If oil returns from cylinder, but there is no movement of mast or cylinder, the cylinder packing is allowing oil to bypass and the hydraulic cylinder must be replaced.
 If oil does not return from cylinder when operating MAST RETRACT lever, put end of removed hose in drain pan and gradually operate MAST EXTEND control lever.
 If oil does not flow out of hose, remove hose between control valve and lock valve.
 Re-attach swivel end at control valve and put other end of hose in drain pan.
 Operate MAST EXTEND control lever.
 If oil does not flow out of hose, replace control valve.
 If oil does flow out of hose, replace lock valve.
 If yes, go to step 4.
- Step 4. Will mast operate using the remote control?
 If no, replace remote control.
 If yes, return to step 3.

END OF WORK PACKAGE

UNIT TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

AIR BRAKE SYSTEM**AIR BRAKE SYSTEM WILL NOT OPERATE**

- Step 1. Are gladhands properly fitted and secure?
If no, adjust gladhand connections (WP 0016).
If yes, go to step 2.
- Step 2. Are there any air leaks?
If no, replace air brake protection valve (WP 0054).
If yes, replace and repair air lines and fittings or gladhands as necessary (WP 0055).

END OF WORK PACKAGE

UNIT TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

WINCH**WINCH WILL NOT OPERATE**

- Step 1. Is free spool lever engaged?
If no, engage free spool lever (WP 0012, step 3).
If yes, go to step 2.
- Step 2. Is hydraulic pressure present and shown at the pressure gauge?
If no, charge hydraulic system (WP 0056).
If yes, go to step 3.
- Step 3. Are there leaks in the hydraulic system?
If no, replace winch (WP 0077).
If yes, repair leaks as necessary (WP 0056).

END OF WORK PACKAGE

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CHAPTER 5

OPERATOR MAINTENANCE INSTRUCTIONS

OPERATOR MAINTENANCE INSTRUCTIONS INDEX

WP Sequence No.

OPERATOR MAINTENANCE INSTRUCTIONS

Operator Preventive Maintenance Checks and Services (PMCS)	0031 00
Electrical Connectors	0032 00
Gladhands	0033 00
Kingpin Placement	0034 00
Cleaning	0035 00

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

GENERAL

To ensure that the fifth wheel towing device is ready for operation at all times, it must be inspected on a regular basis so that defects may be found and corrected before they result in serious damage, equipment failure, or injury to personnel. Table 2 contains systematic instructions on inspections, adjustments, and corrections to be performed by the operator/crew to keep your equipment in good operating condition and ready for its primary mission.

EXPLANATION OF TABLE ENTRIES

1. **Item Number (Item No.) Column.** Numbers in this column are for reference. When completing DA Form 5988 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must perform checks and services for the interval listed.
2. **Interval Column.** This column tells you when you must perform the procedure in the procedure column.
 - a. *Before* procedures must be done before you operate the towing device.
 - b. *During* procedures must be done while you are operating the towing device.
 - c. *After* procedures must be done immediately after you have operated the towing device.
 - d. *Weekly* procedures must be done once each week.
 - e. *Monthly* procedures must be done once each month. The monthly PMCS shall include the performance of a Before, During, After, and Weekly PMCS.
3. **Location, Item to Check/Service Column.** This column provides the location and item to be checked or serviced.

NOTE

The WARNINGS and CAUTIONS appearing in your PMCS table should always be observed. WARNINGS and CAUTIONS appear before applicable procedures. You must observe these WARNINGS to prevent serious injury to yourself and others, and CAUTIONS to prevent your equipment from being damaged.

4. **Procedure Column.** This column gives the procedure you must perform to check or service the item listed in the Item to Check/Service column to know if the equipment is ready or available for its intended mission or for operation. You must perform the procedure at the time stated in the interval column.
5. **Not Fully Mission Capable if: Column.** Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you perform check and service procedures that show faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

GENERAL PMCS PROCEDURES**NOTE**

Prior to the performance of the monthly PMCS checks and services, ensure the fifth wheel towing device is placed into the hydraulic oil fill position (Figure 104, WP 0056 00-7). This position may be adjusted to accommodate particular steps being performed.

1. Always perform PMCS in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry. If the fifth wheel towing device does not perform as required, refer to the appropriate troubleshooting procedure in WP 0024.
2. If anything looks wrong and you can't fix it, write it on your DA Form 5988. If you find something seriously wrong, IMMEDIATELY report it to your supervisor.
3. Before performing preventive maintenance, read all the checks required for the applicable interval and prepare all the tools you need to make all the checks. You'll always need a rag (Item 10, WP 0085) or two.
 - a. **Keep It Clean.** Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (Item 14, WP 0085) on all metal surfaces. Use detergent (Item 4, WP 0085) and water when you clean rubber or plastic.
 - b. **Deterioration, Rust, and Corrosion.**
 - (1) Be alert for deterioration of plastic and rubber materials. Report it to your supervisor.
 - (2) Check metal parts of vehicle for rust and corrosion. If any bare metal or corrosion exists, clean and apply a light coat of oil (Item 9, WP 0085). Report it to your supervisor.
 - c. **Bolts, Nuts, and Screws.** Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, report it to your supervisor.
 - d. **Welds.** Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to your supervisor.
 - e. **Electrical Wires and Connectors.** Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and ensure that the wires are in good condition.
 - f. **Hoses.** Look for wear, damage, and signs of leaks. Ensure that clamps and fittings are tight. Wet spots indicate leaks, but a stain around a fitting or connector may also indicate a leak. If a leak comes from a loose fitting or connector, tighten. If something is broken or worn out, report it to your supervisor.

GENERAL PMCS PROCEDURES - Continued

- g. **Fluid Leakage.** It is necessary for you to know how fluid leakage affects the status of your fifth wheel towing device. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Be familiar with them, and remember - when in doubt, notify your supervisor.

Leakage Definitions of PMCS

Class I	Leakage indicated by wetness or discoloration, but not great enough to form drops.
Class II	Leakage great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage great enough to form drops that fall from the item being checked/inspected.

CAUTION

Operation is allowable with Class I and Class II leakage. WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR. When operating with Class I or Class II leaks, check fluid levels more frequently. Class III leaks must be reported immediately to your supervisor. Failure to do this will result in damage to vehicle and/or components.

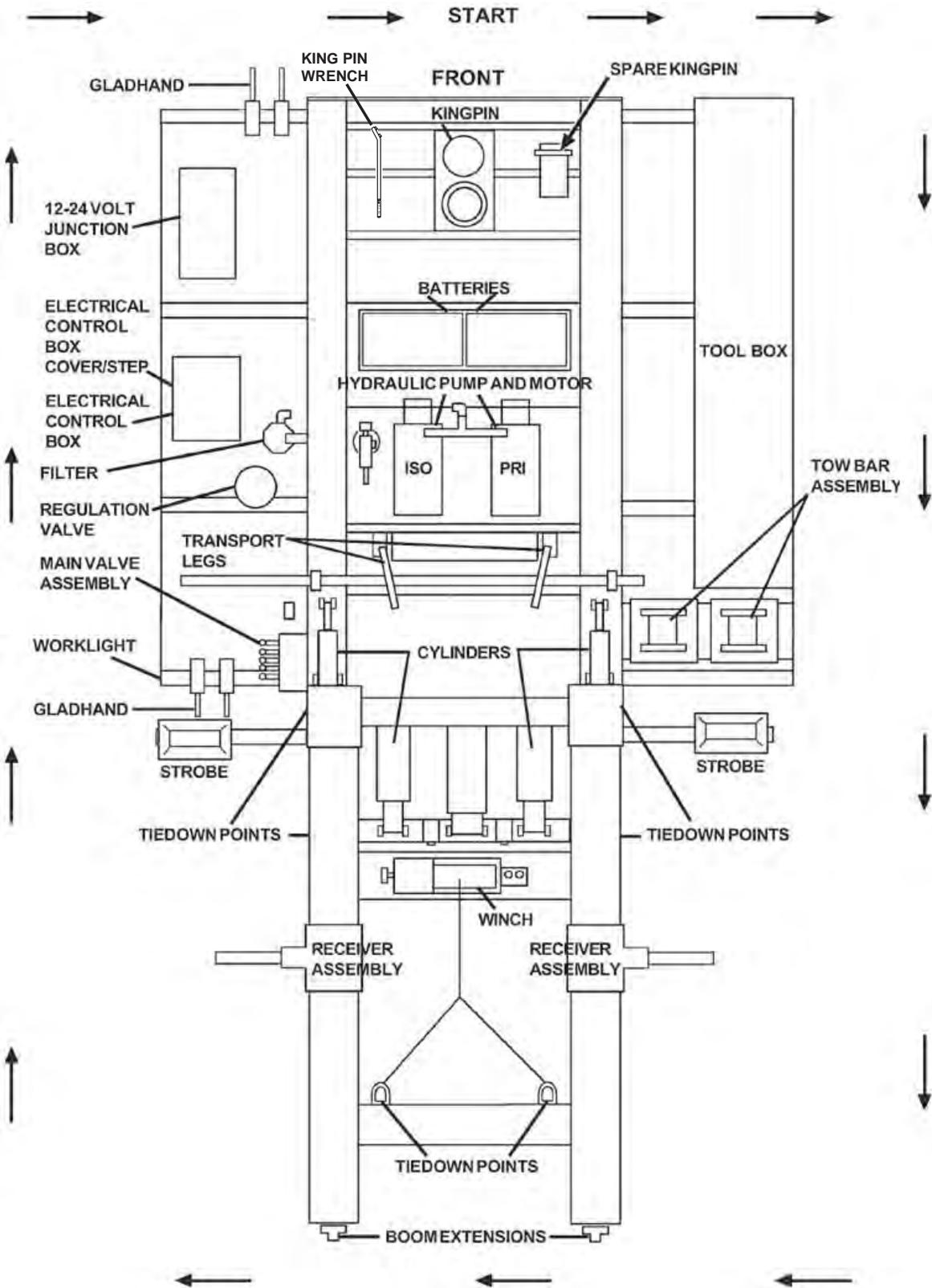


Figure 70. General PMCS Procedure Chart

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
1	Before	OVERALL VIEW	<p align="center">NOTE</p> <p>Prior to the performance of the monthly PMCS checks and services, ensure the fifth wheel towing device is placed into the hydraulic oil fill position (Figure 104, WP 0056 00-7). This position may be adjusted to accommodate particular steps being performed.</p> <p>Review ALL WARNINGS, CAUTIONS, and NOTES before performing PMCS and operating the fifth wheel towing device.</p> <p>Perform all PMCS checks if:</p> <ul style="list-style-type: none"> a. You are the assigned operator, but have not operated the fifth wheel towing device since the last Weekly inspection. b. You are operating the fifth wheel towing device for the first time. 	
			Check fifth wheel towing device for evidence of fluid leakage.	Class III oil leak evident.
			Check fifth wheel towing device for obvious damaged or missing parts that would impair operation.	Damaged, missing parts that impair operation.
			Check fifth wheel towing device for damage to any gauges.	Non-operational gauges.

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

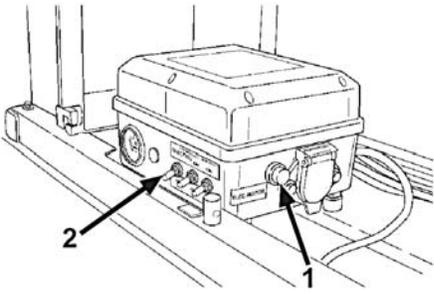
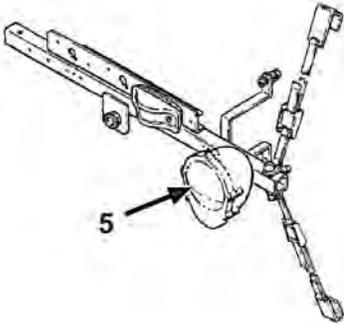
Item No.	Interval	Location Item To Check/ Service	Procedure	Not Fully Mission Capable If:
2	Before	ELECTRICAL CONTROL BOX	<p>Check electrical control box for proper operation of electric motor switch (1) and ON/OFF switch (2).</p> 	Electric motor switch or ON/OFF switch non-operational.
3	Before	LIGHTS	<p>NOTE</p> <p>Vehicle operation with damaged or non-operational lights may violate AR-385-55.</p> <p>If present, check all brake/tail/stop/blackout lights (5) on 24 volt light bar for proper operation and cleanliness.</p> <p>Check blackout light system for proper function. When blackout is initiated, the Fifth Wheel Towing Device worklight should remain functional.</p> 	<p>Any damaged components or parts.</p> <p>Any damaged components or parts.</p>

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

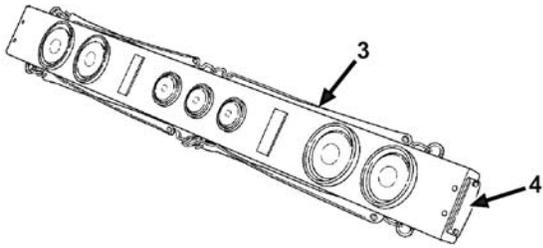
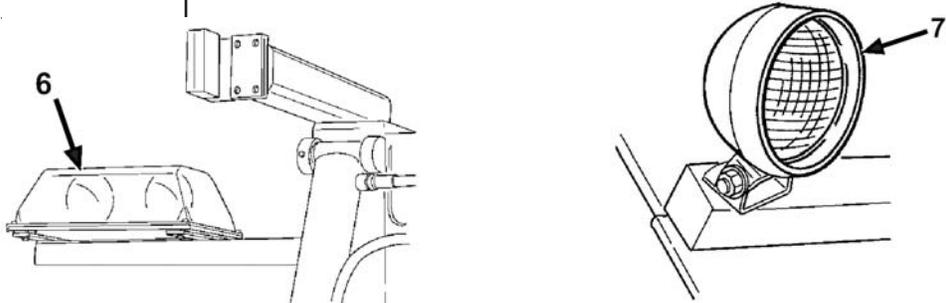
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
4	Before	LIGHTS	<p>If present, check all brake/tail/stop lights (3) and clearance lights (4) on 12 volt light bar for proper operation and cleanliness.</p> 	
5	Before		<p>Check strobe lights (6) and work light (7) for proper operation and cleanliness.</p> 	Any damaged components or parts.

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

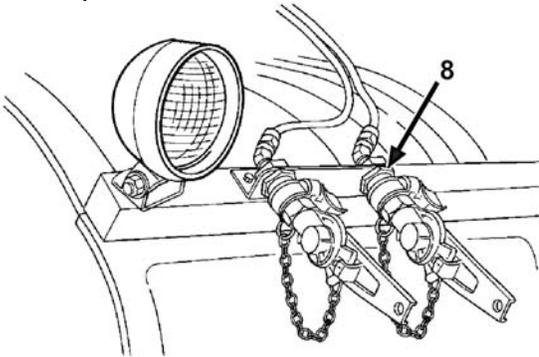
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
6	Before	BRAKES	<p>Have an assistant actuate the service brakes on prime mover. Listen for air leaks at the gladhands (8).</p> 	Brakes fail to hold or air leaks are found.
7	During	OVERALL VIEW	Check fifth wheel towing device for evidence of fluid leakage.	Class III oil leak evident.
8	After	OVERALL VIEW	<p>Check fifth wheel towing device for evidence of fluid leakage.</p> <p>Check fifth wheel towing device for obvious damaged or missing parts that would impair operation.</p> <p>Check fifth wheel towing device for damage to any gauges.</p>	<p>Class III oil leak evident.</p> <p>Damaged or missing parts that impair operation.</p> <p>Non-operational gauges.</p>

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

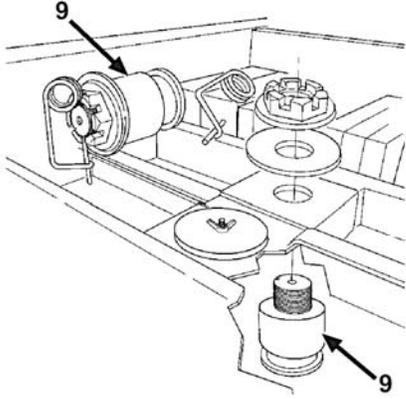
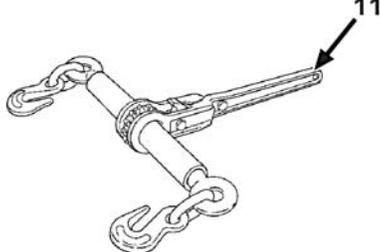
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:	
		Item To Check/Service			
9	After	KINGPIN	Visually inspect kingpins (9) for cracks, damage, or excessive wear.	Excessive wear, cracks, or damage.	
	After		Inspect for chips, nicks, gouges, and wear.	Nick, chip, or gouges deeper than 1/8 inch (.32 cm) is found anywhere on wear surface or wear exceeds 1/16 inch (.16 cm) over 25% of wear surface.	
10	After	TIEDOWNS		Kingpin plate is cracked or dented.	
11	After				Inspect kingpin plate for cracks and dents.
12	After				Check chains (10), load binders (11) and other tiedowns for serviceability and proper quantity.
					

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

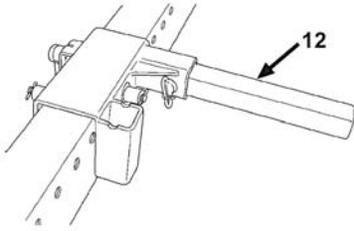
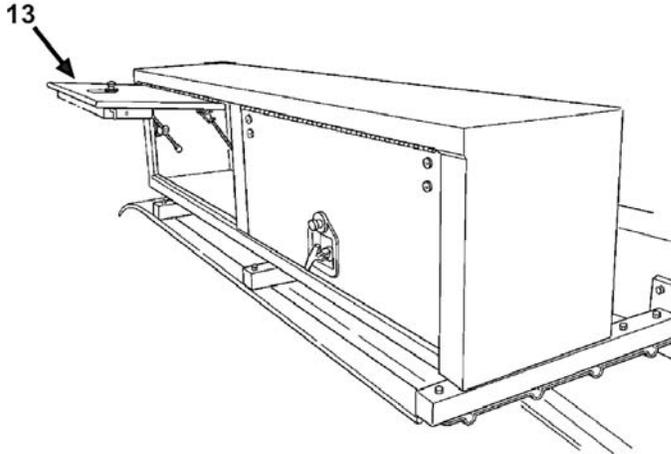
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
13	After	RECEIVER ASSEMBLY	<p>Check receiver assemblies (12) for proper operation and cleanliness</p> 	
14	Weekly	TOOLBOX	<p>Check tool box lid (13) for proper operation and serviceability.</p> 	

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

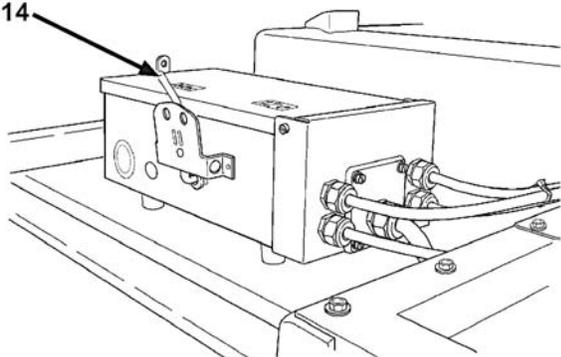
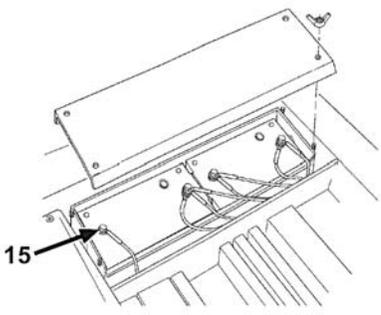
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
15	Weekly	12/24 JUNCTION BOX	<p>Check junction box selector switch (14) and electrical connection plugs for excessive wear, corrosion, and serviceability.</p> 	Excessive wear present.
16	Weekly	BATTERIES	<p>Check for corrosion on battery posts (15). Check for leaks. Apply light coat of grease (item 7, WP 0085).</p> 	Excessive corrosion on battery posts or leaks present.

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

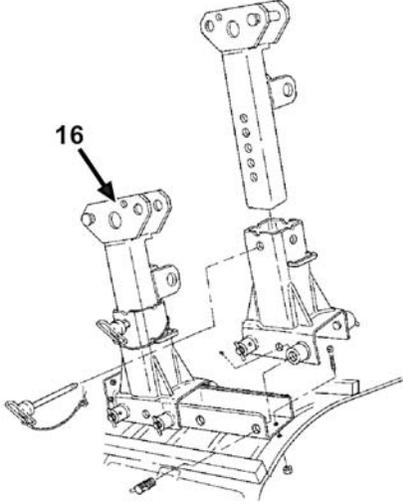
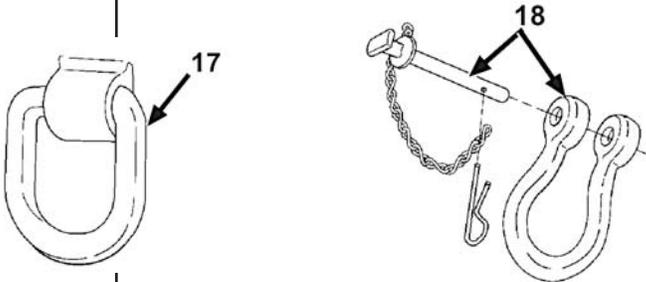
Item No.	Interval	Location Item To Check/ Service	Procedure	Not Fully Mission Capable If:
17	Weekly	TOW BAR ASSEMBLY	<p>Check tow bar assemblies (16) for proper operation and cleanliness.</p> 	
18	Weekly	TIEDOWN POINTS	<p>Check D-rings (17), and clevis (18) for serviceability.</p> 	<p>Tiedown points, load binders, or chains not sufficient for proper securing of equipment</p>

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

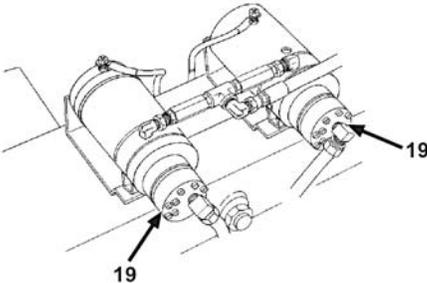
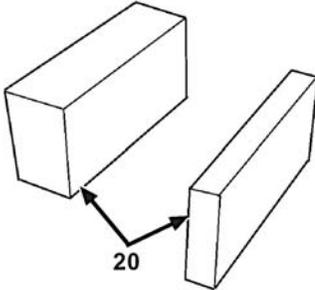
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
19	Weekly	HYDRAULIC MOTORS & PUMPS	<p>Inspect hydraulic motors (19) for missing, broken, kinked, or damaged wires. Check for hydraulic fluid leaks.</p> 	Missing, broken, kinked, or damaged wires. Class III fluid leak evident.
20	Weekly	HYDRAULIC CYLINDERS	Inspect hydraulic cylinders for scratches and wear.	Excessive wear present.
21	Weekly	BOOM EXTENSIONS	Inspect boom extension wear pad for excessive wear.	Excessive wear present.
22	Weekly	RUBBER BLOCKS	<p>Check rubber blocks (20) for serviceability.</p> 	ALL rubber blocks are missing.

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

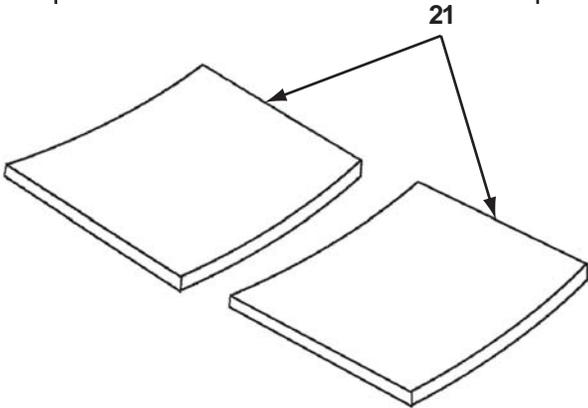
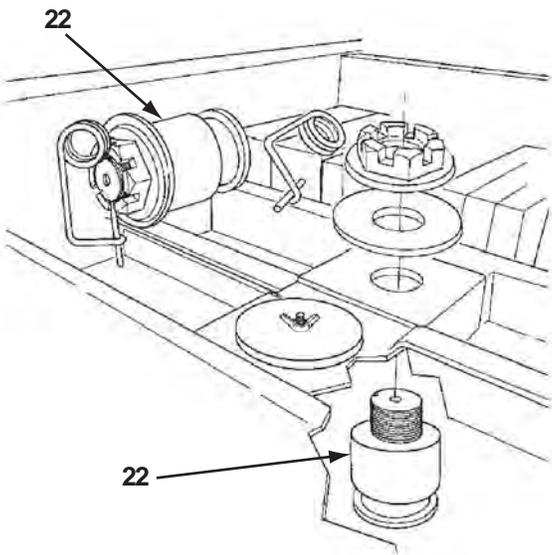
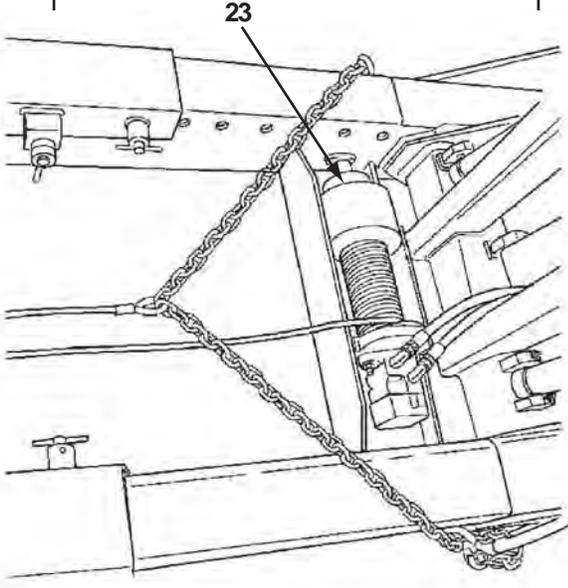
Item No.	Interval	Location Item To Check/ Service	Procedure	Not Fully Mission Capable If:
23	Weekly		<p>Check belting (21) for serviceability.</p> 	
24	Monthly	KINGPIN	<p>Apply grease to kingpins (22). Refer to WP 0039. Refer to prime mover lube order for fifth wheel.</p> 	

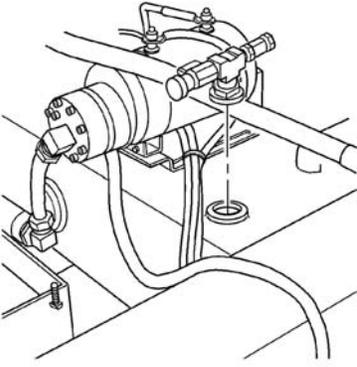
Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
25	Monthly	OVERALL VIEW	Check reservoir, hydraulic controls, lines, and fittings for looseness, leaks, or other damage.	Any hydraulic component is loose, leaking, or damaged.
26	Monthly	LUBRICATION		
27	Monthly	WINCH		



The diagram shows a detailed view of a winch assembly. A central cylindrical component is highlighted with a callout number '23'. The assembly includes various cables, pulleys, and structural supports. The drawing is a line-art technical illustration.

Table 2. Operator Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
28	Monthly	HYDRAULIC SYSTEM	<p>Position fifth wheel towing device in hydraulic oil fill position (refer to Figure 104 in WP 0056 00-7).</p>  <p>Use kingpin wrench to check hydraulic fluid level in reservoir.</p>	Hydraulic fluid low. Any leaks are evident.

END OF WORK PACKAGE

ELECTRICAL CONNECTORS

1. Cleaning**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

- a. Disconnect inter-vehicular electrical cable (1) from prime mover to towing device receptacle (2).
- b. Use a rag (Item 10, WP 0085) to remove any build up of grease or dirt from exterior of connector and receptacle. Allow to dry.
- c. Using a scrub brush (Item 1, WP 0085) and detergent (item 4, WP 0085), clean metal surfaces. Allow to dry.

2. Inspection

- a. Inspect connector for damage.
- b. Notify Unit Maintenance if any damage is found.

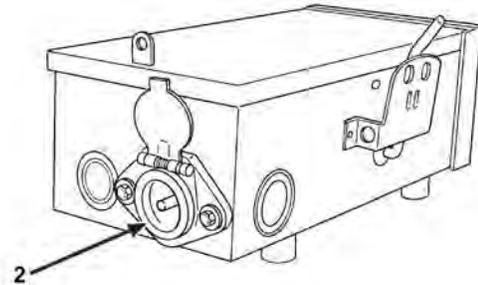
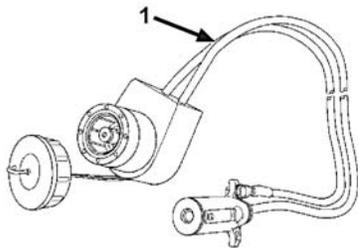


Figure 71. Electrical Connectors

END OF WORK PACKAGE

GLADHANDS

1. Cleaning

- a. Use a rag (Item 10, WP 0085) to remove any buildup of grease and dirt from gladhands.
- b. Use a rag (Item 10, WP 0085), detergent (item 4, WP 0085), and water to thoroughly clean gladhand connecting surfaces (1), to include rubber grommet.
- c. Allow parts to dry thoroughly.

2. Inspection

- a. Inspect gladhands for damage.
 - (1) Check rubber grommet and screen for damage.
 - (2) Use a soapy water solution (detergent, Item 4, WP 0085 and water) to check for air leaks.
- b. Notify Unit Maintenance if damage is found.

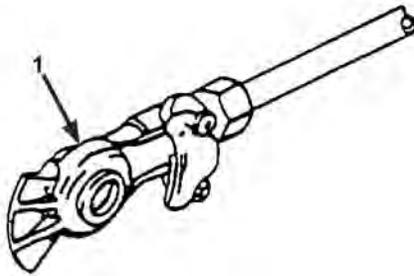


Figure 72. Gladhand

END OF WORK PACKAGE

KINGPIN PLACEMENT

NOTE

The main frame may be lowered using MAST EXTEND to ease kingpin placement. After placement, return mainframe to the highest position using MAST RETRACT.

REMOVAL

1. Remove spring pin (1) from top of kingpin (2).
2. Using kingpin wrench (3), align tabs on wrench (3) with slots on kingpin nut (4).
3. Remove kingpin nut (4) and grommet (5).
4. Rotate kingpin (2) to disengage safety (6) and lower kingpin from main frame.
5. If changing location of kingpin, remove wing nut (7) and wooden plug (8).

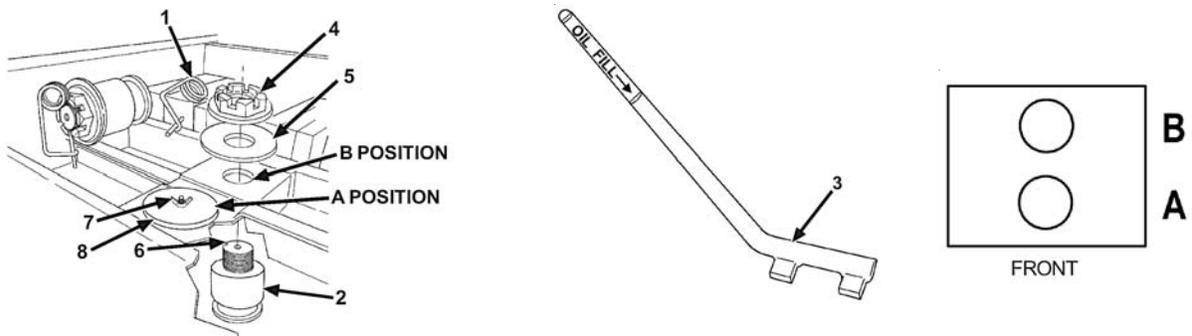


Figure 73. Kingpin Placement

KINGPIN PLACEMENT - Continued**INSTALLATION****NOTE**

The size and location of kingpin installation is determined by the prime mover used. The M911 Truck, Tractor, and M920 Truck, Tractor, require the 3 1/2 inch (88.9 mm) kingpin to be installed in position A. The M915 series Truck Tractor requires the 2 inch (50.8 mm) kingpin to be installed in position B. The M916, M916A1, and M916A2 Truck, Tractor, require the 3 1/2 inch (88.9 mm) kingpin to be installed in position B.

1. From bottom of main frame, insert kingpin (2) up through position A or position B as determined in note above.
2. If changing location of kinpin, install wooden plug (8) in unused position and secure with wing nut (7).
3. Rotate kingpin (2) to engage safety (6) and secure with grommet (5) and kingpin nut (4).
4. Tighten kingpin nut until seated.
5. Using kingpin wrench (3), align tabs on wrench (3) with slots on kingpin nut (4). Tighten kingpin nut until two notches pass springpin hole.
6. Install spring pin (1) through top of kingpin (2).

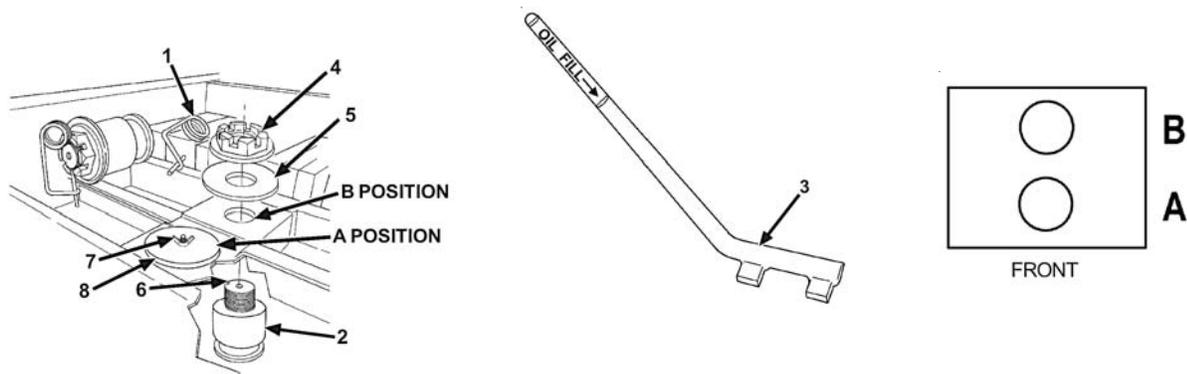


Figure 73. Kingpin Placement

END OF WORK PACKAGE

CLEANING

**WARNING**

After washing the fifth wheel towing device, ensure appropriate breather valve is opened prior to operation of the fifth wheel towing device. Failure to comply may result in death or injury to personnel.

CAUTION

Ensure both breather valves are closed during washing of the fifth wheel towing device. Failure to comply may result in water contamination in hydraulic reservoir.

1. Use a high pressure stream of water to clean the exterior.
2. Use a stiff broom or scrub brush (Item 1, WP 0085) and detergent (Item 4, WP 0085) to remove remaining dirt from exterior.
3. Use a stiff broom or scrub brush (Item 1, WP 0085) and detergent (Item 4, WP 0085) to remove remaining dirt from underside of towing device.

END OF WORK PACKAGE

TM 9-2510-247-13&P

CHAPTER 6

UNIT MAINTENANCE INSTRUCTIONS

UNIT MAINTENANCE INSTRUCTIONS INDEX
WP Sequence No.

UNIT MAINTENANCE INSTRUCTIONS

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Lubrication Instructions	0039 00
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24-Volt Receptacle Replacement	0041 00
12-Volt Receptacle Replacement	0042 00
12-24 Volt Junction Box Replacement	0043 00
Electrical Control Box Maintenance	0044 00
Solenoid Assembly Replacement	0045 00
Remote Control Assembly Replacement	0046 00
24-Volt Tow Light Assembly Repair	0047 00
Fixed Worklight Repair	0048 00
Strobe Light Maintenance	0049 00
Battery/Battery Box Replacement	0050 00
Wiring, Harness/Cable Maintenance	0051 00
Brake System Maintenance	0052 00
Gladhand Replacement	0053 00
Air Brake Protection Valve Replacement	0054 00
Air Brake Fittings Maintenance	0055 00
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Hydraulic Motor Assembly Replacement	0057 00
Hydraulic Safety Valve Replacement	0058 00
Main Valve Assembly Replacement	0059 00
Hydraulic Valve Control Lever Replacement	0060 00
Oil Filter Assembly Replacement	0061 00
Cam Valve Assembly Replacement	0062 00
Hydraulic Cylinder (Main Frame to Mast) Replacement	0063 00
Hydraulic Cylinder (Mast to Boom) Replacement	0064 00
Hydraulic Reservoir Fittings Replacement	0065 00
Boom Extension Cylinder Replacement	0066 00
General Hydraulic System Repair	0067 00
Receiver and Wheel Stop Assembly Replacement	0068 00
Mud Flap Replacement	0069 00
Fender Replacement	0070 00
Tool Box Replacement	0071 00
Mast Frame Assembly Pivot Pin Replacement	0072 00
Center Mast Frame Replacement	0073 00
Bumper Pad/Slip Pad Replacement	0074 00
Transport Leg Assembly Replacement	0075 00
Winches	0076 00
Winches Assembly Replacement	0077 00
Preparation for Storage or Shipment	0078 00

SERVICE UPON RECEIPT

GENERAL

When a new, used, or reconditioned 250M Fifth Wheel Towing Device (FWTD) is first received, determine whether it has been properly prepared for service and is in condition to perform its mission. Follow the service before operation instructions in *Service Before Operation*.

SERVICE BEFORE OPERATION

1. Upon receipt of a new, used, or reconditioned fifth wheel towing device, the receiving organization must see if it has been properly prepared for service and in good condition. Inspect all assemblies, subassemblies, and accessories to insure they are in proper working order. Secure, clean, correctly adjust, and lubricate as needed.
2. Remove all packing and shipping material, such as tape, tiedowns, protective covers, and shipping seals.
3. Remove all Basic Issue Item (BII), Additional Authorization List (AAL), and Component of End Item (COEI) equipment and store properly.
4. If batteries have not been serviced, refer to TM 9-6140-200-14.
5. Service the vehicle in accordance with TM and Unit PMCS.
6. Refer to TM and perform functional checks of all major vehicle systems.

END OF WORK PACKAGE

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

GENERAL

To ensure that the towing device is ready for operation at all times, it must be lubricated and inspected on a regular basis so that defects may be found before they result in serious damage, equipment failure, or injury to personnel. Table 3 contains systematic instructions on lubrications, inspections, adjustments, and corrections to be performed by Unit Maintenance to keep your equipment in good operating condition and ready for its primary mission.

EXPLANATION OF TABLE ENTRIES

1. **Item Number (Item No.) Column.** Numbers in this column are for reference. When completing DA Form 5988 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order you must perform checks and services for the interval listed.
2. **Interval Column.** This column tells you when you must perform the procedure in the procedure column.
 - a. Semiannual procedures must be done once every six months.
 - b. Annual procedures must be done once each year.
3. **Location, Item to Check/Service Column.** This column identifies the location and the item to be checked or serviced.

NOTE

The WARNINGS and CAUTIONS appearing in your PMCS table should always be observed. WARNINGS and CAUTIONS appear before applicable procedures. These WARNINGS and CAUTIONS must be observed to prevent serious injury to yourself and others or to prevent your equipment from being damaged.

4. **Procedure Column.** This column gives the procedure you must perform to check or service the item listed in the Item to Check/Service column to know if the equipment is ready or available for its intended mission or for operation. You must perform the procedure at the time stated in the interval column.
5. **Not Fully Mission Capable if: Column.** Information in this column tells you what fault will keep your equipment from being capable of performing its primary mission. If you make check and service procedures that show faults listed in this column, the equipment is not mission-capable. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

GENERAL PMCS PROCEDURES

1. Always perform PMCS in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry. If any deficiency is discovered, perform the appropriate troubleshooting task in Chapter 4. If any component or system is not serviceable, or if the given service does not correct the deficiency, notify your supervisor.
2. Before performing preventive maintenance, read all the checks required for the applicable interval and prepare all tools needed to make all checks. Have several clean rags (Item 10, WP 0085) handy. Perform ALL inspections at the applicable interval.
 - a. **Keep It Clean.** Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (Item 14, WP 0085) on all metal surfaces. Use detergent (Item 4, WP 0085) and water when you clean rubber, plastic, and painted surfaces.
 - b. **Deterioration, Rust, and Corrosion.**
 - (1) Be alert for deterioration of plastic and rubber materials. Report it to your supervisor.
 - (2) Check metal parts for rust and corrosion. If any bare metal or corrosion exists, clean and apply a light coat of lubricating oil (Item 9, WP 0085). Report it to your supervisor.
 - c. **Bolts, Nuts, and Screws.** Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it.
 - d. **Welds.** Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to your supervisor.
 - e. **Electric Wires and Connectors.** Look for cracked or broken insulation, break wires, and loose or broken connectors. Tighten loose connectors and ensure that the wires are in good condition.
 - f. **Fluid Leakage.** It is necessary for you to know how fluid leakage affects the status of your towing device. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn and be familiar with them, and remember - when in doubt, notify your supervisor.

GENERAL PMCS PROCEDURES - Continued**Leakage Definitions**

Class I	Leakage indicated by wetness or discoloration, but not great enough to form drops.
Class II	Leakage great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage great enough to form drops that fall from the item being checked/inspected.

CAUTION

Operation is allowable with Class I and Class II leakage. WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR. When operating with Class I or Class II leaks, check components more frequently. Class III leaks must be reported immediately to your supervisor. Failure to do this will result in damage to vehicle and/or components.

PMCS INITIAL SETUP**1. General**

- a. This paragraph lists tools, materials, and personnel required for PMCS and lubrication.
- b. No mandatory replacement parts are required while performing unit PMCS.

2. Tools

- a. Drain pan.
- b. General mechanic's tool kit (Item 1, WP 0081, Section III).
- c. Shop equipment, Common No. 1 (Item 2, WP 0081, Section III).
- d. Prime mover, as required for specific tasks.

PMCS INITIAL SETUP - Continued**3. Materials**

- a. Corrosion preventive (Item 3, WP 0085).
- b. Detergent (Item 4, WP 0085).
- c. Lubricating oil, OE/HDO 15W (Item 9, WP 0085).
- d. Rags (Item 10, WP 0085).
- e. Dry cleaning solvent (Item 14, WP 0085).
- f. Sealing compound (Item 12, WP 0085).

4. Personnel

- a. Driver/Operator.
- b. Unit Maintenance Mechanic.

LUBRICATION DATA

Lubricate in accordance with WP 0039.

Table 3. Unit Preventive Maintenance Checks and Services (PMCS) for 250M Fifth Wheel Towing Device (FWTD)

Item No.	Interval	Location Item To Check/ Service	Procedure	Not Fully Mission Capable If:
<p>WARNING</p>  <p>Unless otherwise specified, perform all lubrication and preventive maintenance checks with fifth wheel towing device on level ground and uncoupled. Failure to follow this warning may result in injury or death to personnel.</p> <p>NOTE Perform all Operator PMCS, (WP 0005) as appropriate, while performing Item No. 2 checks. Operate through all hydraulic functions to detect malfunctions.</p>				
1	Semi-annual	Brake Air System	Check all air hoses for leaks, kinks, cracks, and missing mounting clamps.	Leaks, kinks, or cracks evident.
2	Semi-annual	Hydraulic Lines	Check all hydraulic hoses for leaks, kinks, bends, cracks, and missing mounting hardware. Ensure rubber shield around hoses is present and serviceable.	Leaks, kinks, or cracks evident. Shield is missing or unserviceable.
3	Annual	Hydraulic Fluid	Change hydraulic fluid (WP 0056).	
4	Annual Valve	Boom Safety	Position main frame 2 inches (5.1 cm) above a suitable support device. With all power OFF, operate BOOM valve lever to extend and retract positions.	Main frame contacts support device.
5	Annual Valve	Mast Safety	Position main frame 2 inches (5.1 cm) above a suitable support device. With all power OFF, operate MAST valve lever to extend and retract positions.	Main frame contacts support device.
6	Annual	Cam Valve	Fifth wheel towing device in coupling position. MAST EXTEND until cam valve roller contacts cam plate on left boom.	Travel does not stop automatically.

GENERAL MAINTENANCE INSTRUCTIONS

GENERAL

1. These general maintenance instructions contain shop practices and specific methods you must be familiar with to properly maintain the equipment. You should read and understand these practices and methods before performing any maintenance procedures.
2. Before beginning a task, find out how much repair, modification, or replacement is needed to fix the equipment. Sometimes the reason for equipment failure can be seen right away and complete tear down is not necessary. Disassemble equipment only as far as necessary to repair or replace damaged parts.
3. In some cases, a part may be damaged during removal. If the part appears to be good, and other parts behind it are not defective, leave it in place and continue with the procedure. Here are a few simple rules:
 - a. Do not remove dowel pins or studs unless loose, bent, broken, or otherwise damaged.
 - b. Do not remove bearings or bushings unless damaged. If you need to remove them to access parts behind, carefully pull out bearings and bushings.
 - c. Replace all gaskets, lockwashers, self-locking nuts, seals, cotter pins, and preformed packings.
4. The following "Initial Setup" information applies to all maintenance procedures:
 - a. Resources are not listed unless they apply to the procedure.
 - b. "Personnel Required" is listed only if more than one mechanic is required to complete the procedure.
5. All tags and forms attached to the equipment must be checked to learn the reason for removal of equipment from service. Modification Work Orders (MWOs) and Technical Bulletins (TBs) must also be checked for equipment changes and updates.

GENERAL - Continued**WORK SAFETY****WARNING**

No personnel shall perform maintenance above or below the main frame without the main frame being supported at the front by use of a jack stand or the prime mover. Failure to comply may result in death or injury to personnel.

1. Before beginning a procedure, think about the safety risks and hazards to yourself and to others. Wear protective gear such as safety goggles or lenses, safety shoes, rubber apron, or gloves.
2. Before beginning a procedure, ensure that the following conditions have been observed, unless otherwise specified:
 - a. Towing device, if coupled, should be parked on level ground with prime mover parking brake set and chock blocks in place.
 - b. If prime mover is coupled to towing device, engine must be off unless otherwise indicated.
3. Immediately clean up spilled fluids to avoid slipping.
4. When lifting heavy parts, have someone help you. Ensure that lifting equipment or jack is working properly, that it meets weight requirement of part being lifted, and that it is securely fastened to part.
5. Always use power tools carefully.

CLEANING INSTRUCTIONS**WARNING**

Improper cleaning methods and use of unauthorized cleaning liquids or solvents can cause injury or death to personnel and damage equipment. To prevent this, refer to TM 9-247 for further instructions.

After washing the fifth wheel towing device, ensure the appropriate breather valve is opened prior to operation of the fifth wheel towing device. Failure to comply can result in death or injury to personnel.

CAUTION

Ensure both breather valves are closed prior to washing the fifth wheel towing device. Failure to comply could result in water contamination of hydraulic system.

NOTE

Keep it clean. Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Clean as you work and as needed. Use detergent (item 4, WP 008).

CLEANING INSTRUCTIONS - Continued

1. **General.** Cleaning instructions will be the same for the majority of parts and components which make up the equipment. The following applies to all cleaning operations:
 - a. Clean all parts before inspection, after repair, and before assembly.
 - b. Keep hands free of grease which can collect dust, dirt and grit.
 - c. After cleaning, all parts should be covered or wrapped to protect them from dust and dirt. Parts that are subject to rust should be lightly oiled after cleaning (See "Preservation of Parts").

2. **Castings, Forgings, and Machined Metal Parts.**
 - a. Clean inner and outer surfaces with dry cleaning solvent (item 14, WP 0085) and dry with clean rags (item 10, WP 0085).
 - b. Remove grease and accumulated deposits with a scrub brush (item 1, WP 0085).

**WARNING**

Compressed air used for cleaning or drying purposes, or for cleaning restrictions, should never exceed 30 psi (207 kPa). Wear protective clothing (goggles/shield, gloves, etc.) and use caution to avoid injury or death to personnel.

- c. Clear all threaded holes with compressed air to remove dirt and cleaning fluids.

CAUTION

DO NOT wash electrical cable, and flexible hoses with dry cleaning solvent or mineral spirits. Serious damage or destruction of material will result.

3. **Electrical Cables, and Flexible Hoses.** Wash electrical cables, and flexible hoses with a solution of detergent (item 4, WP 0085) and water, and wipe dry with a clean rag (item 10, WP 0085).
4. **General Cleaning Covered by Other Manuals.** Refer to TM 9-247, *Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals*.

PRESERVATION OF PARTS

Unpainted metal parts that will not be installed immediately after cleaning should be covered with a thin coat of lubricating oil (item 9, WP 0085).

PAINTING

On painted areas where paint has been removed, paint in accordance with procedures outlined in TM 43-0139 and TB 43-209.

INSPECTION INSTRUCTIONS**NOTE**

All damaged areas should be marked for repair or replacement.

1. All components and parts must be carefully checked to determine if they are serviceable for use, can be repaired, or must be replaced.
2. Inspect drilled and tapped (threaded) holes for the following:
 - a. Wear, distortion, cracks, and any other damage in or around holes.
 - b. Threaded areas for wear distortion (stretching) and evidence of cross-threading.
3. Inspect metal lines, flexible lines or hoses, and metal fittings and connectors for the following:
 - a. Metal lines for sharp kinks, cracks, bad bends, and dents.
 - b. Flexible lines or hoses for fraying, evidence of leakage, and loose metal fittings or connectors.
 - c. Metal fittings and connectors for thread damage and worn or rounded hex heads.
4. Inspect castings, forgings, and machined metal parts for the following:
 - a. Machined surfaces for nicks, burrs, scoring, grooves, raised metal wear, and other damage.
 - b. Inner and outer surfaces for breaks and cracks.
5. Inspect bearings in accordance with TM 9-214.

DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

Follow these general practices when performing disassembly and assembly procedures:

- a. Keep major components together whenever possible and practical.
- b. Tag hoses, electrical wires, cables, and harnesses to identify them and aid during installation.
- c. Keep related parts together for identification purposes.
- d. Temporarily install attaching hardware such as screws, bolts, washers, and nuts to prevent loss.
- e. Only disassemble to the point of the problem.
- f. Ensure that parts are clean and lubricated before assembly.

LUBRICATION INSTRUCTIONS

Refer to WP 0039 for detailed, illustrated instructions on proper lubrication. Some general practices to remember:

- a. Use the correct lubricant.
- b. Keep lubricants clean.
- c. Clean all fittings prior to lubrication.
- d. Lubricate clean, disassembled, and new parts to prevent rust (WP 0038 00-2 "Preservation of Parts").
- e. If a lubrication fitting will not accept grease, check for dirt or clogged fitting. This may require removal, cleaning, and installation of the fitting. If the fitting is on a hydraulic cylinder and will not accept grease, it may be due to pressure applied by the position of the cylinder. Repositioning the cylinder may resolve the fitting not accepting grease.

APPLICATION OF ADHESIVES

1. **General.** Adhesives are recommended in some tasks to ensure and strengthen seals. The following information describes their correct use and application.
2. **Silicone Sealant.** Silicone sealant (item 11, WP 0085) is used to seal parts against moisture. Use the following instructions when applying:
 - a. Anytime a seal is broken, the part must be thoroughly cleaned to remove any remaining sealing compound and dirt.
 - b. Thoroughly clean surface before applying sealant.
 - c. When applying sealant, ensure that the area is completely covered. Press sealant into and around parts as necessary.
 - d. Silicone sealant will set in 15-30 minutes depending on temperature and humidity.
3. **Loctite Adhesive.** Loctite adhesive (item 12, WP 0085) provides a seal against leakage and a resistance to loosening when used in the assembly of threaded, slip-fitted, or press-fitted parts. Always use grade of Loctite adhesive specified and never use when other retaining means are provided, such as lockwires, lockwashers, lockplates, and fasteners. DO NOT use Loctite adhesive on brass fittings, plugs, or items that need frequent servicing, or when operating temperature exceeds 300°F (149°C). Apply Loctite adhesive as follows:
 - a. Before application, clean threads to remove oil, grease, and metal chips.
 - b. Apply Loctite adhesive to second and third threads. DO NOT apply to first thread to ensure system cleanliness.
 - c. Loctite adhesive will dry in 6-24 hours at room temperature.
 - d. Adjustments for elbows, gages, and valves can be made up to 24 hours after application without affecting the seal.

STANDARD TOOL REQUIREMENTS

1. The following are general practices regarding the use of tools:
 - a. Always use the proper tool kit and tools for the procedure being performed.
 - b. Ensure that tools are clean and lubricated to reduce wear and to prevent rust.
 - c. Keep track of tools. Do not be careless with them.
 - d. Return tools to toolbox when finished with repair or maintenance.
 - e. Return toolboxes and tools to tool storage when not in use.
 - f. Inventory tools before and after each use.
2. Some maintenance tasks may require special or fabricated tools. The "Initial Setup" of the procedure will specify any special or fabricated tools needed to perform that procedure. Use these special tools only for the maintenance procedures for which they are designed or called out. If you are unfamiliar with a required tool, see your supervisor.

TAGGING WIRES AND HOSES

1. Use marker tags (item 15, WP 0085) to identify all electrical wires, lines, and any other parts which may be hard to identify or replace later. Fasten tags to parts during removal by wrapping wire fasteners around or through parts and twisting ends together. Position tags to be out of the way during cleaning, inspection, and repair. Mark tags with a pencil, pen, or marker.
2. Whenever possible, identify electrical wires with the number of the terminal or wire to which it connects. If no markings can be found, tag both wires or wire and terminal, and use the same identifying mark for both. If you cannot tag a wire because it must fit through a small hole or you cannot reach it, write down the description of the wire and the point to which it connects or draw a simple diagram on paper. Be sure to write down enough information so you will be able to properly connect the wires during assembly. If you need to identify a loose wire, look for identifying numbers near the end of the wire, stamped on a permanent metal tag. Compare this number to wire number on the appropriate electrical schematic.
3. Identify lines when you are taking off more than one line at the same time. Mark tags with points to which lines and hoses must be connected. If it is not obvious which end of a line goes where, tag each end of the line.
4. Identify and tag other parts as required by name and installed location.

SOLDERING**CAUTION**

Use low wattage soldering gun when soldering electrical wires, connectors, terminal lugs, and receptacles. High wattage soldering guns may damage parts by overheating.

1. Solder connection must be bright and clean before soldering. Remove dirt and grease with a wire brush (item 2, WP 0085) or a pocket knife. Solder used must be of lead alloy (item 13, WP 0085) with soldering flux (item 5, WP 0085). All wires, parts, and soldering gun must be tinned for good connection and maximum transfer of heat.
2. To prevent overheating damage to electrical parts when soldering and unsoldering connections, hold bare wire, lead, or terminal lug close to soldering point with long roundnose pliers. Pliers act as heat sink and absorb excess heat.

HEAT SHRINKABLE TUBING

Use the heat shrinkable tubing (item 19, WP 0085) to insulate soldered and crimped electrical connections as follows:

- a. Cut desired length of new heat shrinkable tubing twice the length of the connection to be covered.
- b. Slide the heat shrinkable tubing onto the wire and out of the way before making electrical connection.
- c. After making electrical connection, slide heat shrinkable tubing into place over electrical connection.

**WARNING**

DO NOT touch heat shrinkable tubing for at least 30 seconds after heating. Heat shrinkable tubing is hot and will burn you causing serious injury or death.

- d. Hold hot air blow gun 4-5 in. (10.2-12.7 cm) away from heat shrinkable tubing and apply heat for approximately 30 seconds. Stop applying heat as soon as heat shrinkable tubing forms to the shape of the electrical connection.

ELECTRICAL GROUND POINTS

Many electrical problems are the result of poor ground connection. You can ensure that ground connections are good by performing the following steps:



WARNING

Although battery ground cable must be connected in order to test electrical circuit voltage, disconnect battery ground cable from prime mover before performing resistance tests or replacing parts. This will prevent shock to personnel, and damage to parts and equipment.

- a. Remove hardware connecting ground cable terminal lug to ground point.
- b. Clean mounting hardware, ground cable terminal lugs, and ground point with dry cleaning solvent (item 14, WP 0085) and scrub brush (item 1, WP 0085).
- c. Remove any rust with wire brush (item 2, WP 0085).
- d. Look for cracks, loose terminal lugs, and stripped threads. Replace any defective parts.
- e. Install hardware connecting ground cable terminal lug to ground point. Ensure that all hardware is tight.

LINES AND PORTS

To keep dirt from contaminating fluid systems when removing and installing lines, perform the following steps:

- a. Clean fittings and surrounding area before disconnecting lines.
- b. Cover, cap, plug, or tape lines and ports after disconnecting lines. Use cap and plug set on air lines. When these are not available, use hand-carved wooden plugs, clean rags (item 10, WP 0085), duct tape (item 16, WP 0085), or other similar materials to prevent dirt from entering system.
- c. Ensure that new and used parts are clean before installing.
- d. Wait to remove covers, caps, plugs, or tape from lines and ports until just before installing lines.

ANTISEIZE TAPE**CAUTION**

Apply antiseize tape only to pipe threads of male fittings of air system or damage to air valves may result.

When connecting air lines and fittings without compression sleeves or packings, antiseize tape (item 17, WP 0085) may be used to keep connections from leaking. Use as follows:

- a. Ensure that threads are clean and dry.
- b. Start antiseize tape one or two threads from small or leading edge of fitting, joining tape together with an overlap of about 1/8 in. (3.18 mm) for fittings with fine threads. For fittings with coarse threads, tape should be wrapped around threads two or three times.
- c. Tightly wrap antiseize tape in same direction as you would tighten a nut. Tape must be pressed into threads without cutting or ripping.

CAUTION

DO NOT overtighten or use power tools to tighten fittings taped with antiseize tape. Over tightening could damage fitting threads and cause connection to leak.

- d. Using hand tools, tighten fittings.

TUBES AND COMPRESSION FITTINGS

1. Tubes with inverted nuts and compression fittings are designed for one time assembly. Once assembled, they must be replaced as a unit if any parts are found defective. Used parts may not seal properly when used with new ones.
2. Used tube assemblies in good condition can be installed to their original location without leaking.
3. Assemble new tubes, compression sleeves, and inverted nuts as follows:
 - a. Slide inverted nut onto end of tube.
 - b. Slide compression sleeve onto end of tube.
 - c. Repeat previous two steps for other end of tube as required.

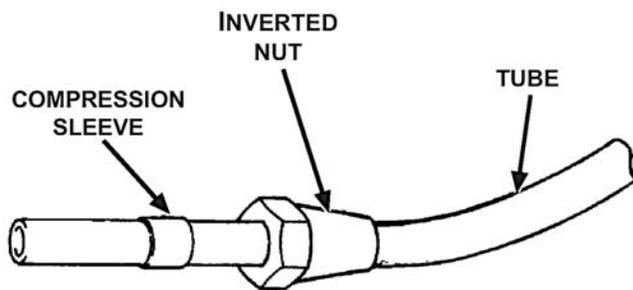


Figure 74. Tube Assembly

4. Install new tube assemblies as follows:
 - a. Insert end of tube as far as it will go into compression fitting to which tube is being installed.
 - b. Twist inverted nut into compression fitting and tighten inverted nut against compression sleeve with open-end wrench. Compression sleeve will clamp down around tube and conform to internal surface of compression fitting and inverted nut.
 - c. Repeat previous two steps for other end of tube as required.

FLUID DISPOSAL**WARNING**

When servicing this vehicle, performing maintenance, or disposing of materials such as engine coolant, transmission fluid, lubricants, battery acids or batteries and CARC paint, consult your Unit/Local Hazardous Waste Disposal Center or safety office for local regulatory guidance. If further information is needed, please contact the Army Environmental Hotline at 1-800-872-3845. Failure to comply may result in injury or death to personnel.

SERVICE REPLACEMENT PARTS AND KITS

Many service replacement parts are available in standard sizes as well as various undersized and/or oversized sizes. Service kits for reconditioning certain parts and service sets, which include all parts necessary to complete a procedure, are also available.

WELDING**CAUTION**

**If welding towing device, it must be uncoupled from prime mover.
Failure to follow this warning may damage electronic components.**

Refer to TC 9-237, Operator's Manual for Welding Theory and Application, for instructions on welding components.

ELECTRICAL REPAIR

Specific electrical system maintenance tasks are covered in WP 0040 through WP 0051 of this manual.

END OF WORK PACKAGE

LUBRICATION INSTRUCTIONS

1. GENERAL

NOTE

These instructions are mandatory.

- a. The 250M Fifth Wheel Towing Device (FWTD) must receive lubrication with approved lubricants at recommended intervals in order to be mission-ready at all times.
- b. The Lubrication Chart shows lubrication points, items to be lubricated, the required lubricants, and recommended intervals for lubrication. Any special lubrication instructions required for specific components are contained in the NOTES section of the chart.
- c. The KEY provides information needed to select the proper lubricant for various temperature ranges and uses, and identifies the capacities and intervals.
- d. Recommended intervals are based on normal conditions of operation, temperature, and humidity. When operating under extreme conditions, lubricants should always be changed more frequently. When in doubt, notify your supervisor.

2. SPECIFIC LUBRICATION INSTRUCTIONS

- a. Keep all lubricants in a closed container and store in a clean, dry place away from extreme heat. Keep container covers clean and do not allow dust, dirt, or other foreign material to mix with lubricants. Keep lubrication equipment clean and ready for use.
- b. Maintain a record of lubrication performed and report any problems noted during lubrication. Refer to DA Pam 738-750 for maintenance forms and procedures to record and report any findings.
- c. Keep all external parts of equipment not requiring lubrication free of lubricants. After lubrication, wipe off excess lubricant to prevent accumulation of foreign matter.

3. ARCTIC PROCEDURE

NOTE

This procedure is to be used from -20°F to -50°F.

As oil viscosity varies with temperatures, it will be required to change the hydraulic fluid to OHA 5606 Arctic hydraulic fluid. Following the oil change procedures (ref: WP 0056) it will be necessary to adjust the hydraulic flow valve for the boom and the mast functions located on the vertical slide section. Turn the control knob of the hydraulic flow valve clockwise to restrict flow; counter-clockwise to increase volume size to obtain 300-800 lbs. system hydraulic pressure while the boom function is lowered with no load attached. In the same way, adjust the mast hydraulic flow valve when the mast is being lowered with no load attached. This may need to be readjusted as necessary as temperatures vary from -50°F to 120°F or when OHA 5606 is replaced with standard hydraulic fluid.

When the fifth wheel towing device is exposed to a temperature increase from -25°F or below to 10°F, the functions should not be left under pressure and it is recommended that each function be operated at 10°F to release pressure created by expansion caused by an increase in temperature.

LUBRICATION CHART**FIFTH WHEEL TOWING DEVICE
250M
(NSN 2510-01-458-8253)**

This Lubrication Chart is for operator/crew (C) and Unit Maintenance (O). Lubrication intervals (on condition or hardtime) are based on normal operation. Lubricate more during constant use and less during inactive periods. Use correct grade of lubricant for seasonal temperature expected.

For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (e.g., longer than usual operating hours, extended idling periods, extreme dust, etc).

Clean area around lubrication points with dry cleaning solvent (Item 19, WP 0085) or equivalent before lubricating equipment. After lubrication, wipe off excess lubricant to prevent accumulation of foreign matter.

Before you start your lubrication service:

ALWAYS

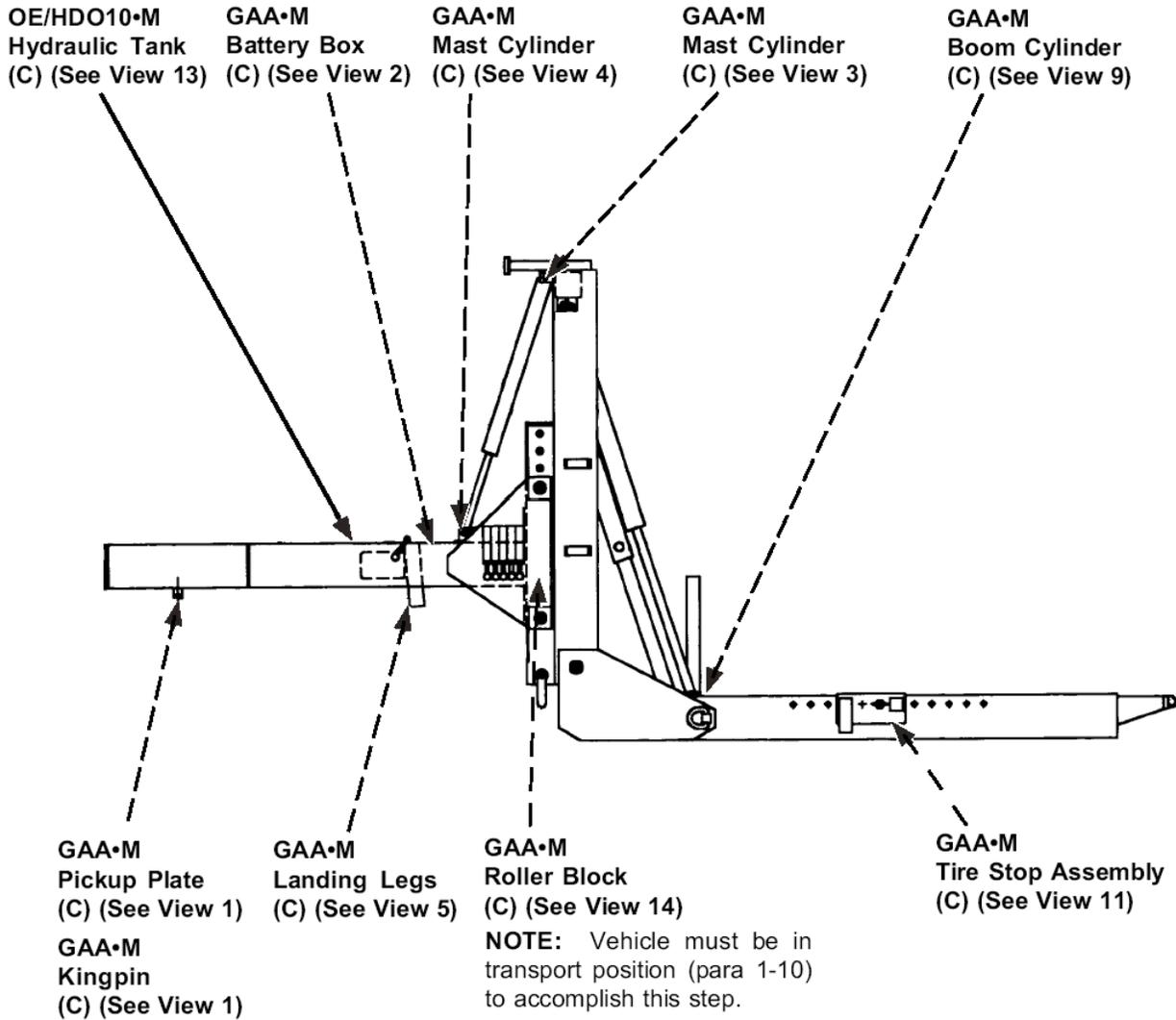
- a. Clean area around lubrication point before lubricating.

NEVER

- a. Use wrong type/grade lubricant.
- b. Use too much lubricant

250M FIFTH WHEEL TOWING DEVICE (FWTD)

LUBRICANT•INTERVAL



NOTE

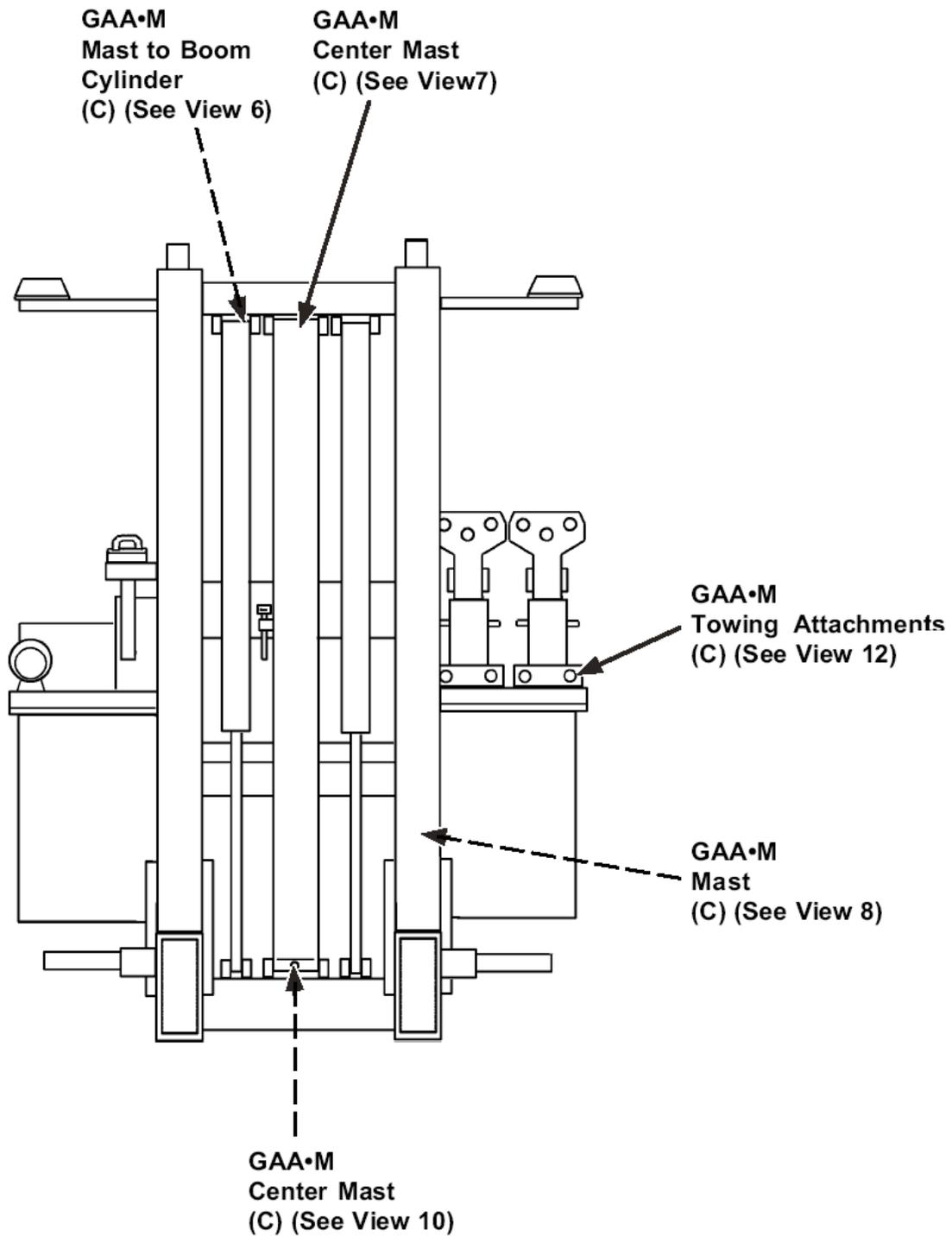
Dotted leader lines indicate that lubrication is required on both sides of the equipment.

All lubrication is done with vehicle in coupling position as shown, except where noted.

INTERVAL	MAN-HOURS
M - Monthly	2.5
A - Annual	2.5

250M FIFTH WHEEL TOWING DEVICE (FWTD)

LUBRICANT INTERVAL



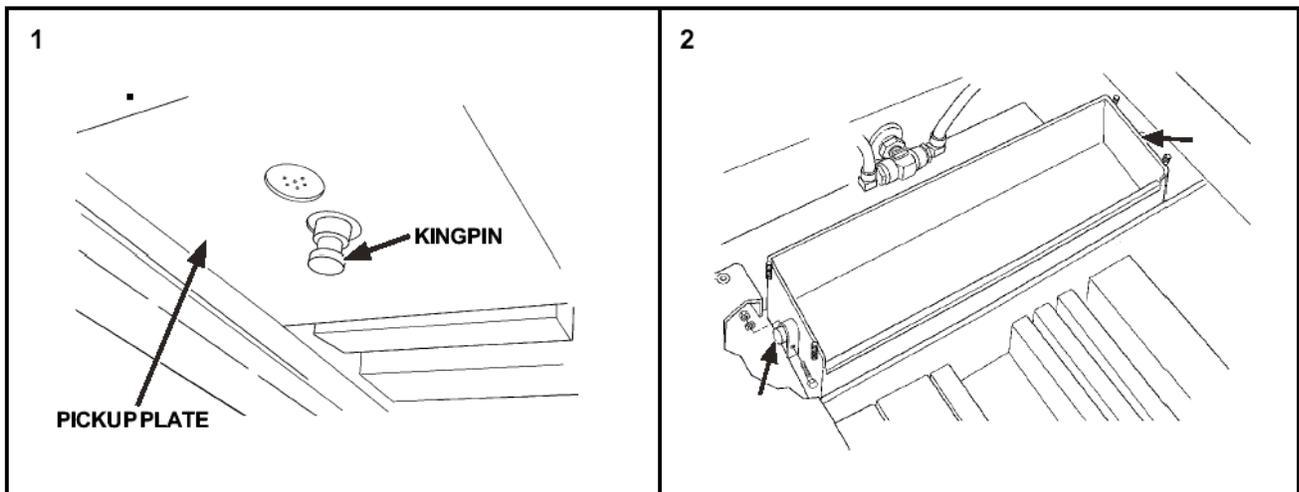
- KEY -

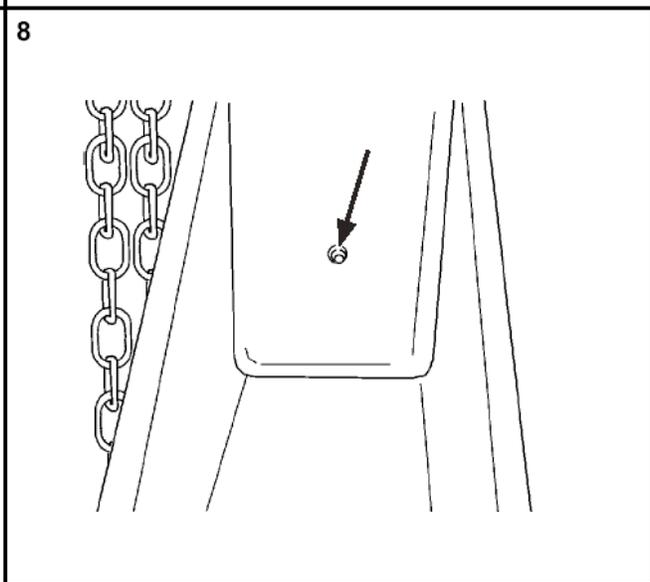
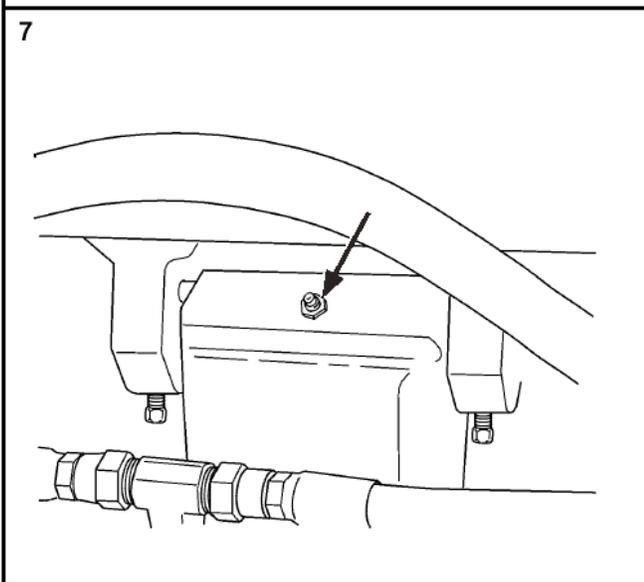
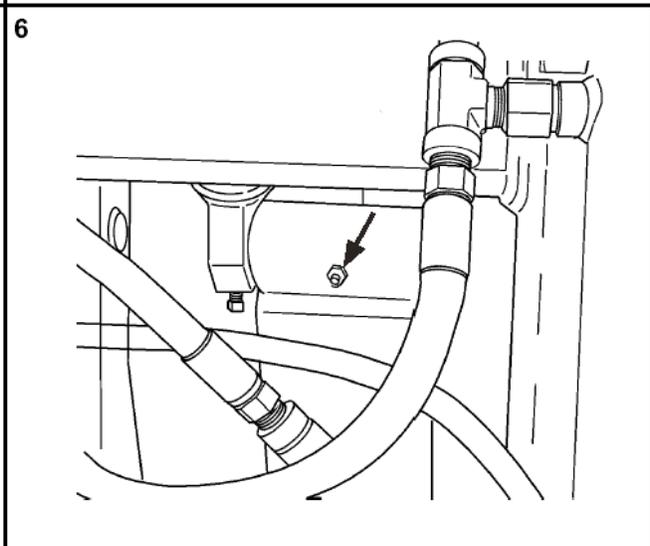
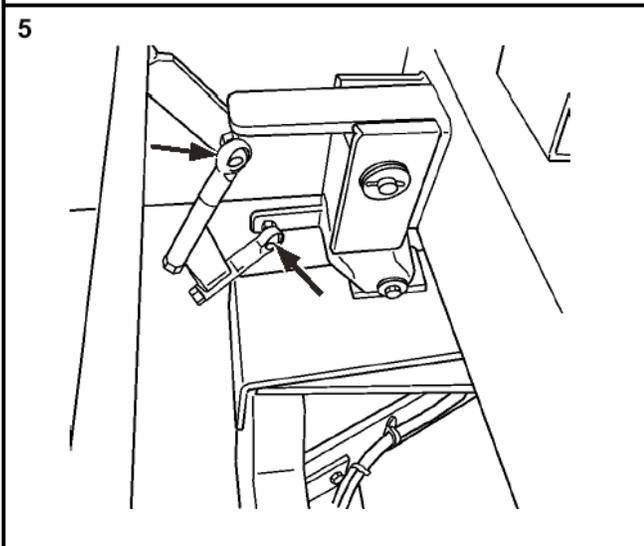
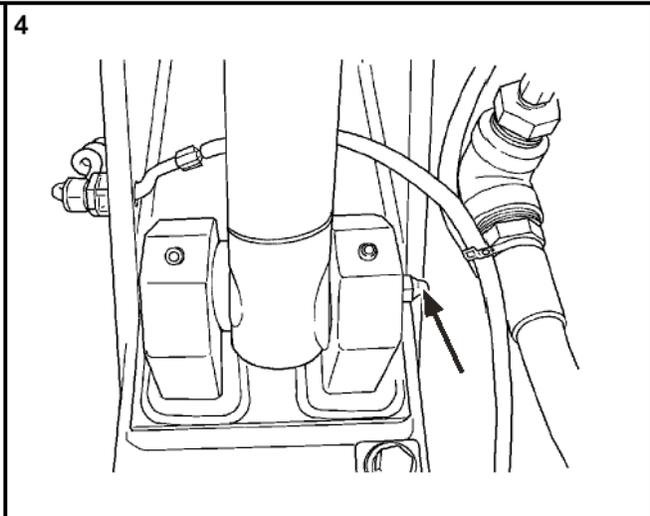
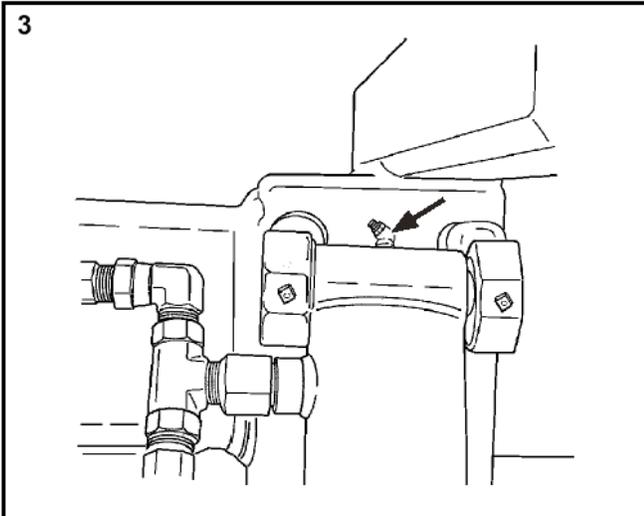
LUBRICANTS	EXPECTED TEMPERATURE*		
	Above +32°F (Above 0°C)	+40°F to -10°F (+4°C to -23°C)	0°F to -65°F (-18°C to -54°C)
GAA (MIL-G-10924) Grease, Automotive and Artillery	GAA	GAA	GAA
OE/HDO Lubricating Oil	15W40	15W40	
OHA 5606 Oil, Hydraulic, Arctic			5606

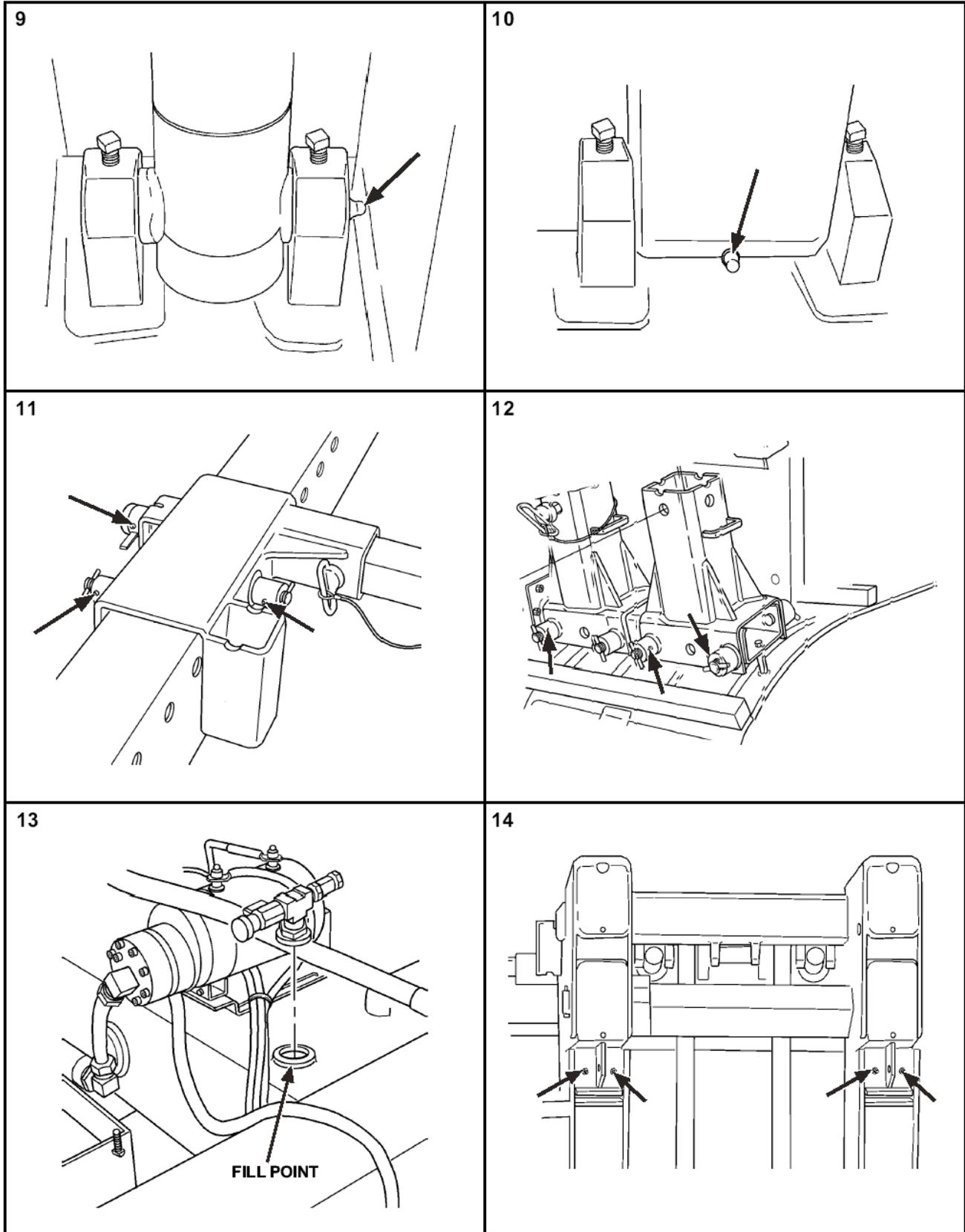
*For Arctic operations, refer to WP 0039 00-1.

NOTES:

1. For operation of semitrailer in protracted cold temperatures below -10°F (-23°C), remove lubricants prescribed in the KEY for temperatures above -10°F (-23°C). Clean parts with drycleaning solvent (Item 19, WP 0085). Relubricate with lubricants specified in the key for temperatures below -10°F (-23°C).
2. In sandy areas, lubricate twice as frequently.







END OF WORK PACKAGE

ELECTRICAL SYSTEM MAINTENANCE**GENERAL****WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

1. The 250M Fifth Wheel Towing Device is equipped with two intervehicular cable receptacles, located on the side and rear of the 12/24 volt junction box.
2. The 12-pin, 24-volt receptacle is located on the side of the 12/24 volt junction box.
3. The 7-pin, 12-volt receptacle is located on the rear of the 12/24 volt junction box.
4. The 250M fifth wheel towing device is also equipped with a work light on the left fender.
5. Refer to wiring schematics (WP 0088) for locating any untagged, disconnected wires.

END OF WORK PACKAGE

24-VOLT RECEPTACLE REPLACEMENT REMOVAL AND INSTALLATION

INITIAL SETUP:

Equipment Conditions

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Disconnect Batteries (WP 0050).

Materials/Parts

- Washer, lock (2) (MS35333-40)
- Tag, Marker (item 15, WP 0085)

Tools/Test Equipment

- Tool Kit, Mechanics General, NSN 5180-00-177-7033
- Shop Equipment, Common No. 2, NSN 4910-00-754-0650

General Safety Instructions

Remove all power to towing device prior to making any repairs on the electrical system.

REMOVAL



WARNING

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

1. Disconnect the receptacle (9) to terminal cable (1) at terminal (2).
2. Remove two nuts (3), two lockwashers (4), one flatwasher (5), one grounding cable (6), two screws (7), and two flat washers (8). Discard lockwashers.
3. Remove receptacle (9) from junction box (10).
4. Pull rubber boot (11) down cable (1) and disconnect wire cable (1) from receptacle (9) by heating wire end to melt solder.

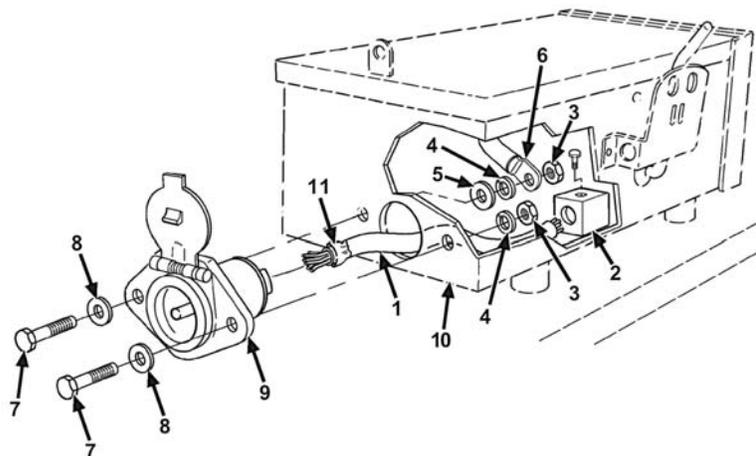


Figure 75. Receptacle Box

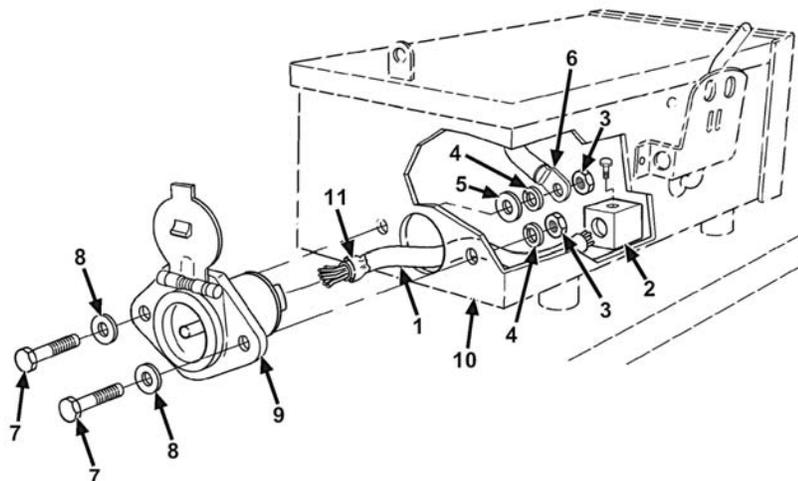
REMOVAL- Continued

Figure 75. Receptacle Box

INSTALLATION

1. Insert wire cable (1) into back of receptacle (9) and attach by soldering cable end to receptacle. After wire end has cooled, pull rubber boot (11) into place over back of receptacle (9).
2. Position receptacle (9) on junction box (10) and secure with two screws (7), flatwashers (8), one flatwasher (5), ground cable (6), two new lockwashers (4), and nuts (3).
3. Connect the receptacle (9) to terminal cable (1) at terminal (2).
4. Connect fifth wheel towing device battery cables (WP 0050).
5. Using a multimeter, switch the 12/24 volt selector switch to 24 volts and check for 24 volt reading at center pin of receptacle.

Follow-on Tasks:

None

END OF WORK PACKAGE

12-VOLT RECEPTACLE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Disconnect batteries (WP 0050).

Materials/Parts

- Marker tags (item 15, WP 0085)
- Washer, lock (2) (MS35333-40)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

NOTE

Mark and tag all wires prior to disconnecting.

There are two 12-volt receptacles, one on 12/24 volt junction box and one on electrical control box. Both are removed the same way.

1. Remove two screws (1), flatwashers (2), lockwashers (3), and nuts (4) and remove receptacle (5). Discard lockwashers.
2. Loosen seven screws (6) and remove wires from receptacle (5).

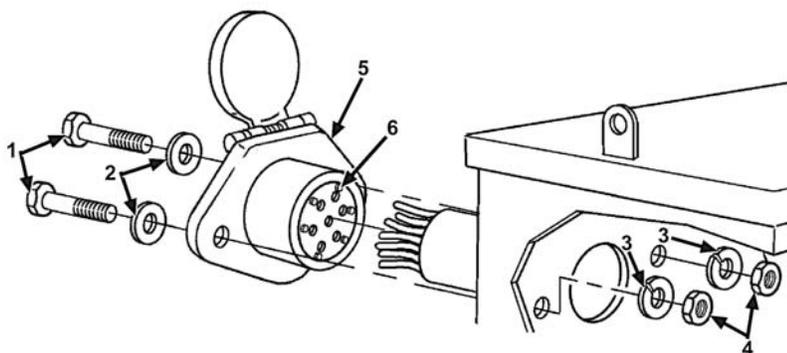


Figure 76. Plug Assembly

INSTALLATION**NOTE**

There are two 12-volt receptacles, one on 12/24 junction box and one on electrical control box. Both are installed the same way.

1. Install wires into receptacle (5) and tighten screws (6).
2. Position receptacle (5) in place and secure with two screws (1), flatwashers (2), new lockwashers (3), and nuts (4).
3. Connect both fifth wheel towing device batteries (WP 0050).
4. Inspect operation of 12-volt system by performing function check using 12-volt tow light bar.

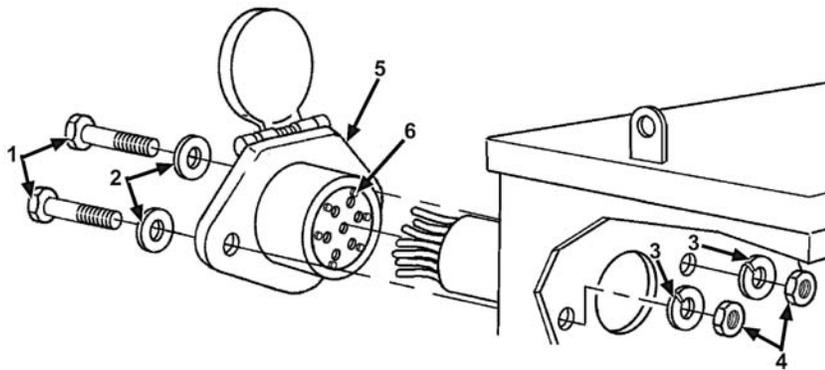


Figure 76. Plug Assembly

Follow-on Tasks:

None

END OF WORK PACKAGE

12-24 VOLT JUNCTION BOX REPLACEMENT. REMOVAL, INSTALLATION

INITIAL SETUP:

Equipment Conditions

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Disconnect batteries (WP 0050).
- 24-volt receptacle removed (WP 0041).
- 12-volt receptacle removed (WP 0042).

Materials/Parts

- Washer, lock (8) (MS35333-40)
- Tag, marker (item 15, WP 0085)
- Wire, tie (item 18, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL



WARNING

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

1. Disconnect five wires (1) from terminals (2).
2. Remove five wires (1), four straight adapter assemblies (3), and one bushing assembly (4) from junction box (5).
3. From underneath fender, remove four nuts (6) and lockwashers (7). Discard lockwashers.
4. Remove junction box (5) from fender.
5. From inside junction box (5), remove four nuts (8) and lockwashers (9). Discard lockwashers.
6. Remove threaded bolts (10).

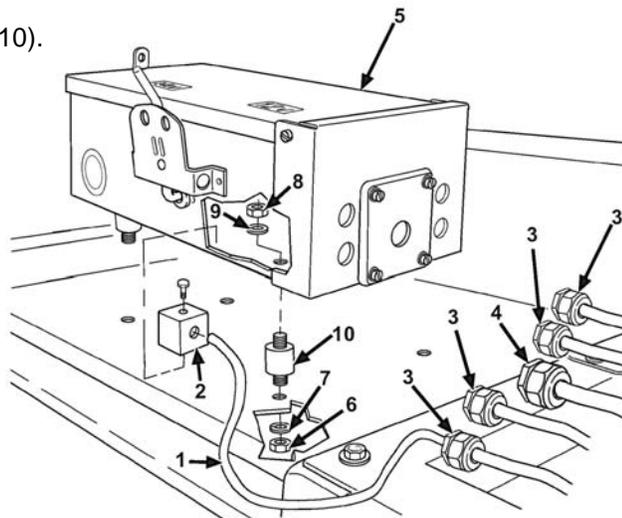


Figure 77. Junction Box Assembly

INSTALLATION

1. Position threaded bolts (10) on junction box (5) and secure with four new lockwashers (9) and nuts (8).
2. Position junction box on fender and secure with four new lockwashers (7) and nuts (6).
3. Insert five wires (1), four straight adapter assemblies (3), and one bushing assembly (4) into junction box (5).
4. Connect five wires (1) to terminals (2).

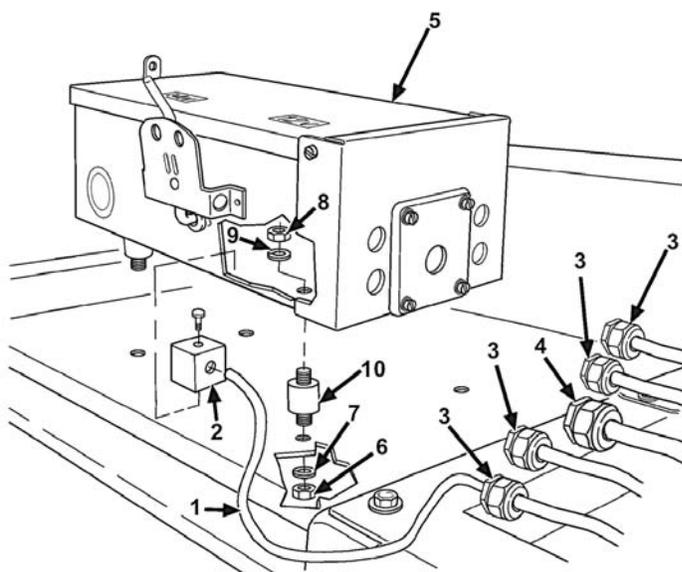


Figure 77. Junction Box Assembly

Follow-on Tasks:

- Install 24-volt receptacle (WP 0041).
- Install 12-volt receptacle (WP 0042).
- Connect batteries (WP 0050).
- Perform functional check of electrical systems.

END OF WORK PACKAGE

**ELECTRICAL CONTROL BOX MAINTENANCE.
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Disconnect batteries (WP 0050).

Materials/Parts

- Washer, lock (4) (MS35333-40)
- Nut, lock (4) (115120)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

NOTE

For repair, remove and replace only those items necessary for the item(s) to be repaired or replaced.

All wires have been removed from the illustration for clarity. Refer to WP 0088 for wiring.

Mark and tag all wires prior to disconnecting.

REMOVAL- Continued

1. Disconnect remote control harness (1).
2. Disconnect junction box to electrical control box harness (2).
3. Disconnect ground cable (3) from control box (4).
4. Disconnect electrical control box to battery cable (5).
5. Disconnect electrical control box to solenoid cable (6).
6. Disconnect strobe light wires (7).
7. Disconnect hydraulic solenoid valve cable (8).
8. Disconnect worklight cable (9).
9. Disconnect blackout control cable (10).

NOTE

ALL CABLES/WIRING REMOVED FOR CLARITY.

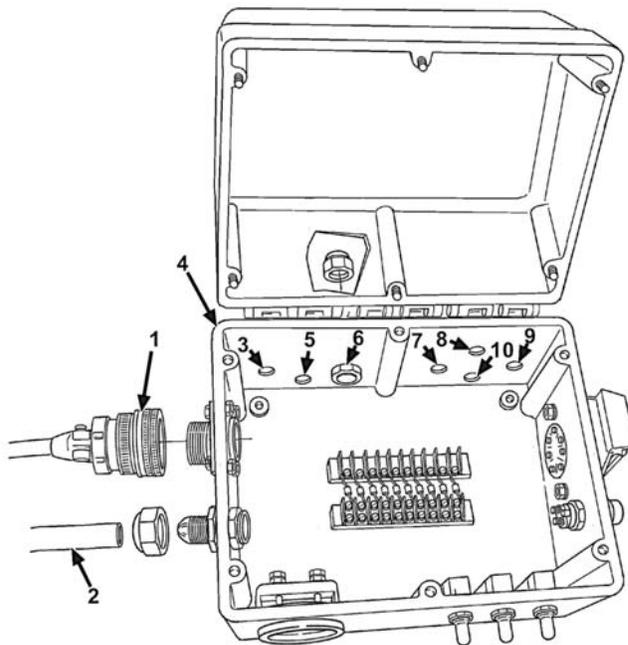


Figure 78. Electrical Control Box

REMOVAL - Continued

**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on electrical system. Failure to do so could cause injury to personnel or damage to equipment.

10. Remove four nuts (11) and lockwashers (12) from fender and electrical control box (13). Discard lockwashers.
11. Remove electrical control box (13) from fender.
12. Remove four threaded bolts (14) from bottom of electrical control box (13).
13. Loosen six screws (15), securing lid to box.
14. Remove nut (16) from bushing (17) and remove bushing from control box.
15. Remove four screws (18) and locknuts (19) from remote control receptacle (20). Discard locknuts.
16. Remove remote control receptacle (20) from control box.
17. Remove seven nuts (21) from straight adapters (22) and remove straight adapters from control box.

NOTE

WIRING REMOVED FOR CLARITY.

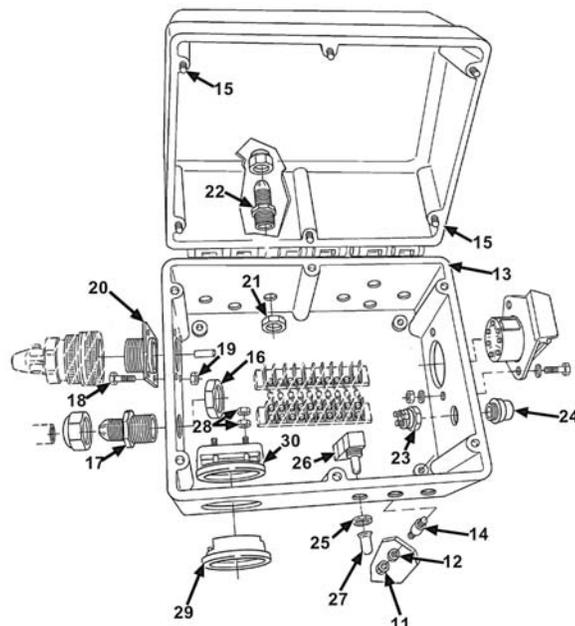


Figure 79. Electrical Control Box

REMOVAL - Continued

18. Loosen nut (23) from push switch (24) and remove push switch from control box.
19. Loosen three nuts (25) and remove three toggle switches (26) and rubber boots (27) from electric control box.
20. Remove four nuts (28) from voltmeter (29) and remove cover (30) from back of voltmeter.

INSTALLATION

1. Position voltmeter (29) on control box (13). Install cover (30) on voltmeter (29) and secure with four nuts (28).
2. Install rubber boots (27) on toggle switches (26).
3. Position toggle switches (26) on control box and secure with nuts (25).
4. Install push switch (24) on control box and secure with nut (23).
5. Position seven straight adapters (22) on control box and secure with nuts (21).
6. Position remote control receptacle (20) on control box and secure with four screws (18) and new locknuts (19).
7. Position bushing (17) on control box and secure with nut (16).
8. Tighten six screws (15), securing lid to box.
9. Install four threaded bolts (14) on bottom of electrical control box (13).
10. Position electrical control box on fender and secure with four new lockwashers (12) and nuts (11).

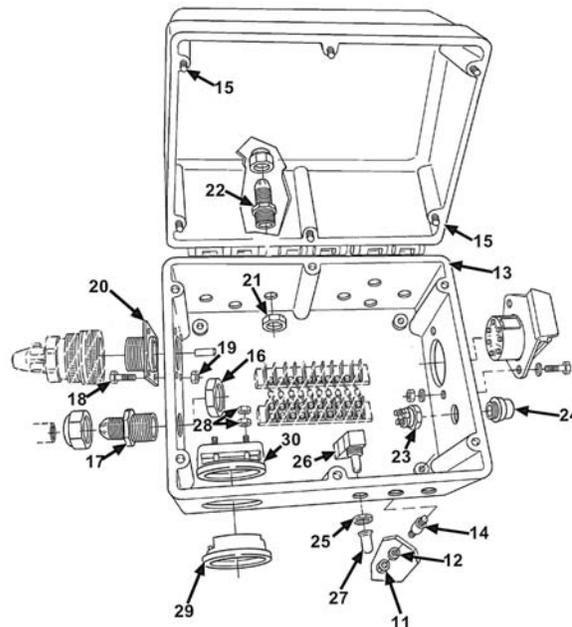


Figure 79. Electrical Control Box

0044 00-4

INSTALLATION - Continued

11. Connect blackout control cable (10).
12. Connect worklight cable (9).
13. Connect hydraulic solenoid valve cable (8).
14. Connect strobe light wires (7).
15. Connect electrical control box to solenoid cable (6).
16. Connect electrical control box to battery cable (5).
17. Connect ground cable (3) to control box (4).
18. Connect junction box to electrical control box harness (2).
19. Connect remote control harness (1).

NOTE

ALL CABLES/WIRING REMOVED FOR CLARITY.

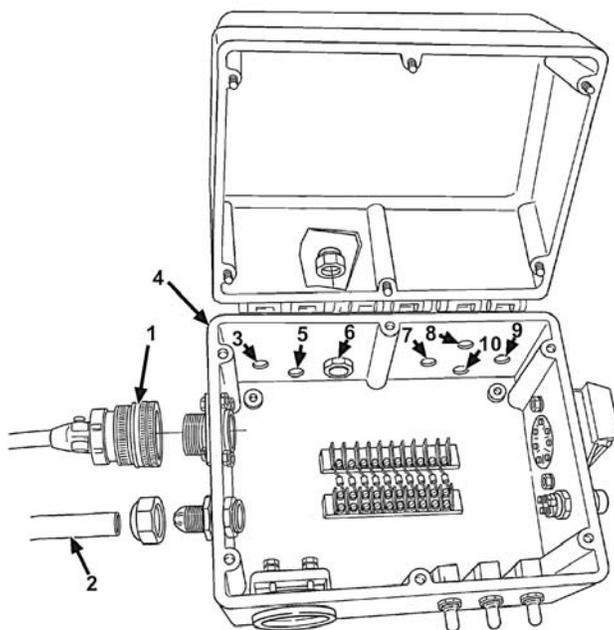


Figure 78. Electrical Control Box

Follow-on Tasks:

- Connect batteries (WP 0050).
- Check for proper operation of electrical control box.

END OF WORK PACKAGE

**SOLENOID ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:

Equipment Conditions

- Fifth Wheel Towing Device in supported coupling configuration or coupled configuration (WP 0002).
- Disconnect batteries (WP 0050).

Materials/Parts

- Washer, lock (3) (ASAB27-1-1950)
- Tag, marker (item 15, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL



WARNING

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to comply may result in injury to personnel or damage to equipment.

NOTE

The following steps are for the removal and installation of the primary and isolated solenoid assemblies. Adjust maintenance steps as required to accommodate required maintenance.

1. Disconnect solenoid to hydraulic motor wire (1) from terminal post (2).
2. Disconnect solenoid to battery wire (3) from terminal post (4).

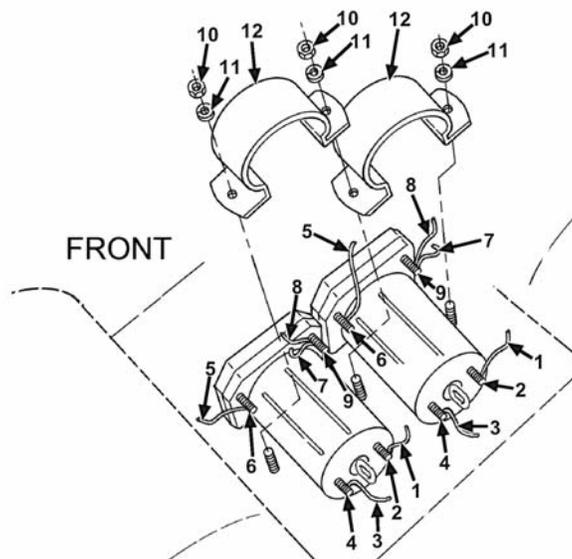


Figure 80. Solenoid Assembly

REMOVAL - Continued

3. Disconnect ground wire (5) from terminal post (6).
4. Disconnect solenoid to control box wire (7) and jumper wire (8) from terminal post (9).
5. Remove nuts (10) and lockwashers (11). Discard lockwashers.
6. Remove mounting bracket (12) from solenoid (13).
7. Remove solenoid (13).

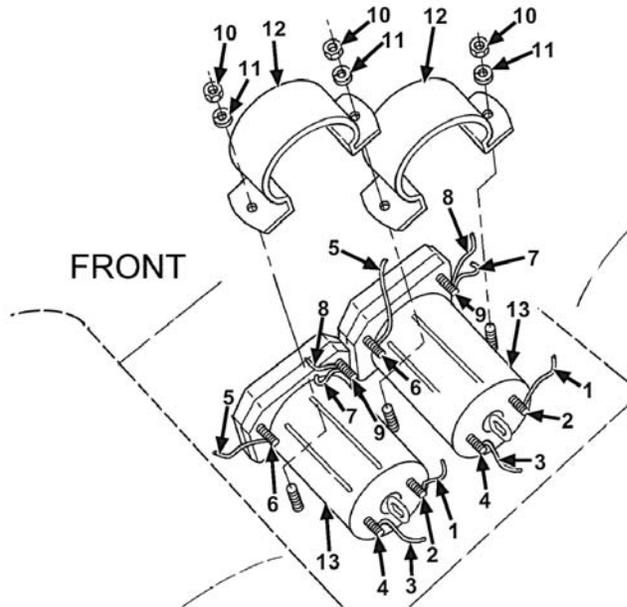


Figure 81. Solenoid Assembly

INSTALLATION

1. Position solenoid (13) and secure with mounting bracket (12), nuts (10), and new lockwashers (11).
2. Connect solenoid to control box wire (7) and jumper wire (8) to terminal post (9).
3. Connect ground wire (5) to terminal post (6).
4. Connect solenoid to battery wire (3) to terminal post (4).
5. Connect solenoid to hydraulic motor wire (1) to terminal post (2). Connect batteries (WP 0050).
6. Turn ELECTRICAL switch to ON. Push motor control button for 2 seconds and release to ensure the solenoids activate the hydraulic motors.

Follow-on Tasks:

None

END OF WORK PACKAGE

REMOTE CONTROL ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in supported coupling configuration or coupled configuration (WP 0002).
- Disconnect batteries (WP 0050).

Materials/Parts

- Tag, marker (item 15, WP 0085)
- Tie, wire (item 18, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

1. Remove remote control connector (1) from electrical control box (2).
2. Remove right side electrical bracket. Reference WP 0070.
3. Remove remote control tether (3) from loop clamps (4) on left and right side of frame.
4. Remove tool box rubber grommet (5).
5. Remove remote control tether (3).

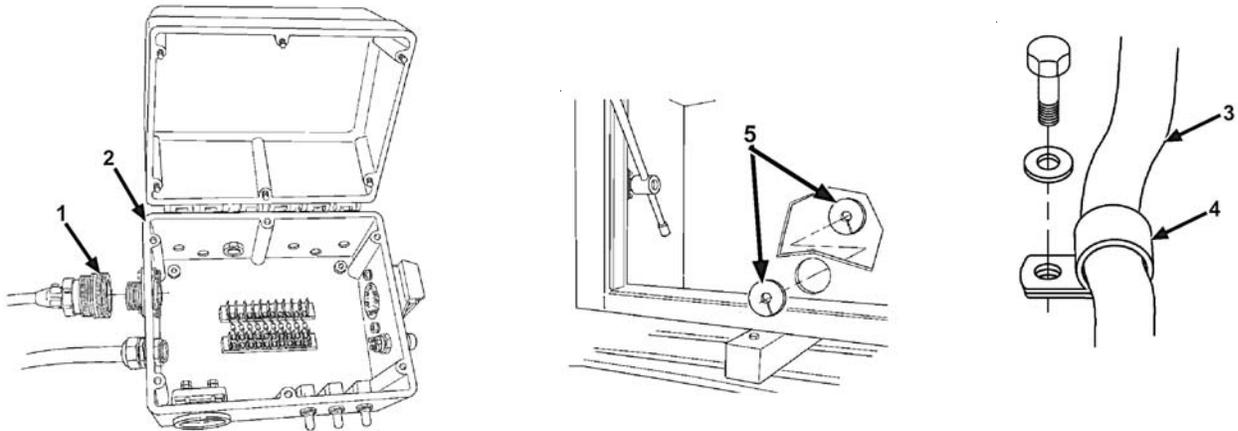


Figure 82. Remote Control Cable Assembly

INSTALLATION

1. Install rubber grommet (5) in tool box.
2. Install remote control tether (3) through grommet (5).
3. Position remote control tether through loop clamps (4) and secure.
4. Install right side electrical bracket . Reference WP 0070.
5. Install remote control connector (1) on electrical control box (2).

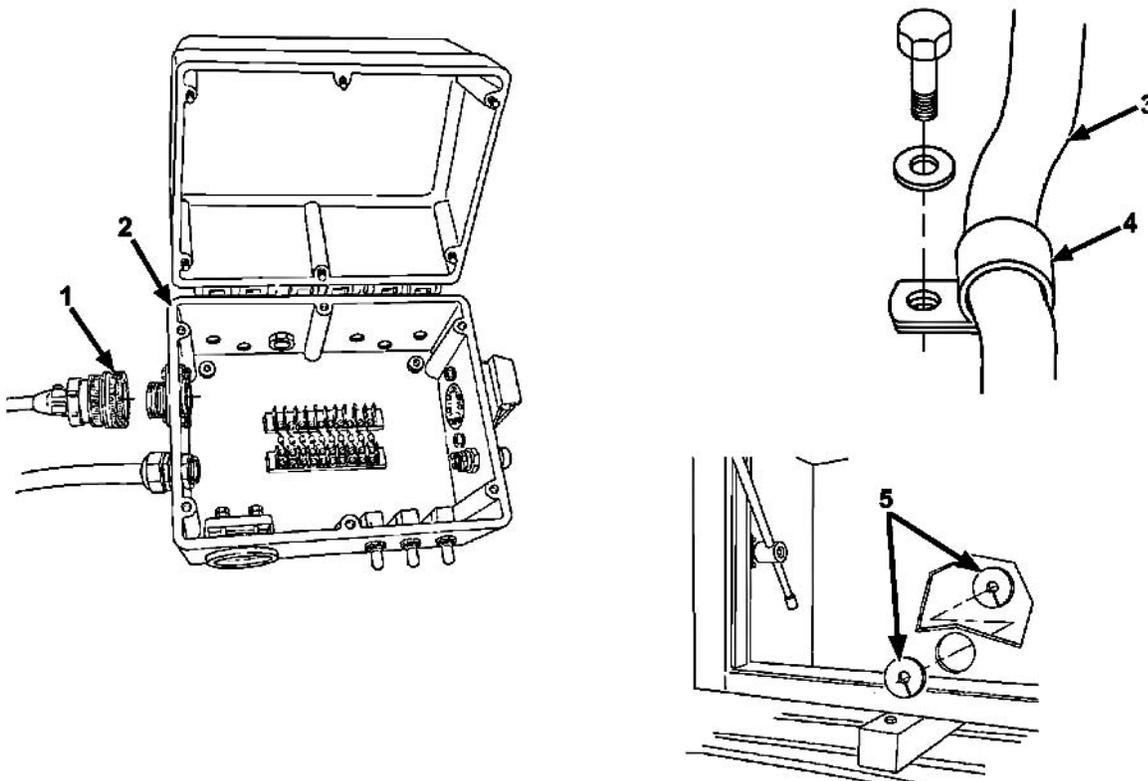


Figure 82. Remote Control Cable Assembly

Follow-on Tasks:

- Connect Batteries (WP 0050).
- Perform operational check of all remote control functions.

END OF WORK PACKAGE

24-VOLT TOW LIGHT ASSEMBLY REPAIR. REMOVAL, INSTALLATION

INITIAL SETUP:**Equipment Conditions**

Tow light assembly removed from tool box.

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

Materials/Parts

- Tags, marker (item 15, Appendix F)
- Ties, wire (item 18, Appendix F)
- Washer, lock (1) (114021)
- Washer, lock (4) (2434)
- Washer, lock (6) (MS35335-35)
- Nut, self-locking (2) (MS17829-5C)

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

1. Remove two locknuts (1), screws (2), and four emergency straps (3). Discard locknuts.

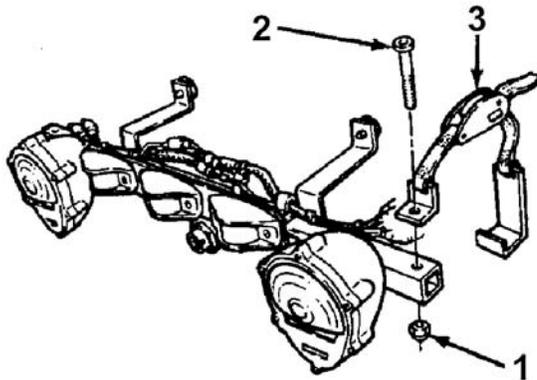


Figure 83. Tow Light Assembly

REMOVAL - Continued**NOTE**

Tag and mark wires before removing.

Cut plastic cable ties as necessary.

2. Disconnect eleven connectors (4) from connectors (5).
3. Push eleven connectors (4) back on wires (6) and remove pins (7) and washers (8).

NOTE

Mark position of ground wire and screw to aid installation.

4. Remove screw (9), lockwasher (10), and connector (11). Discard lockwasher.
5. Remove two ground wires (12) from connector (11).
6. Remove nut (13), lockwasher (14), and connector (15) from tow light tab (16).
7. Remove eight wires (17) from connector (15).
8. Remove eight pins (18) from wires (17). Discard pins.

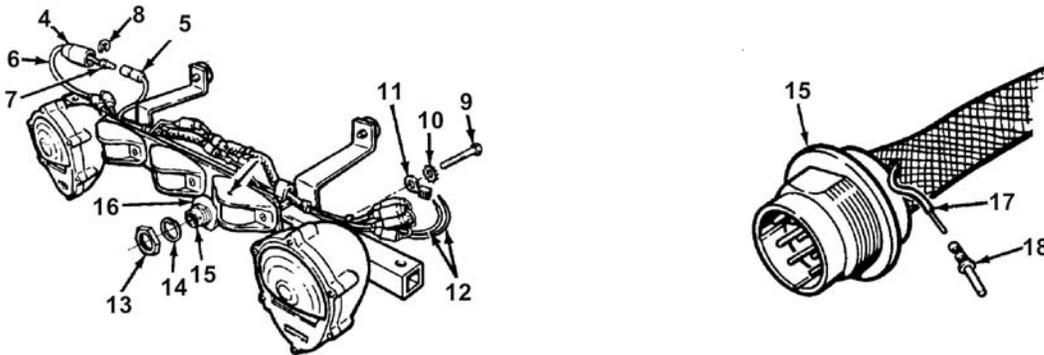


Figure 84. Tow Light Assembly

REMOVAL - Continued

9. Remove two nuts (19), lockwashers (20), screws (21), clips (22), wiring harness (23), and clearance light bracket (24). Discard lockwashers.

NOTE

All three clearance lights are removed the same way.

10. Remove two screws (25), lens (26), and bulb (27) from lampholder (28).
11. Remove four screws (29), lampholder (28), and gasket (30) from clearance light bracket (24).
12. Remove three screws (31), lockwashers (32), and two composite lights (33) from tube (34). Discard lockwashers.
13. Remove two wingnuts (35), washers (36), screws (37), and brackets (38) from tube (34).
14. Remove four screws (39), nuts (40), lockwashers (41), and bumpers (42) from two brackets (38).
15. Remove two screws (43) and bumpers (44) from tube (34).

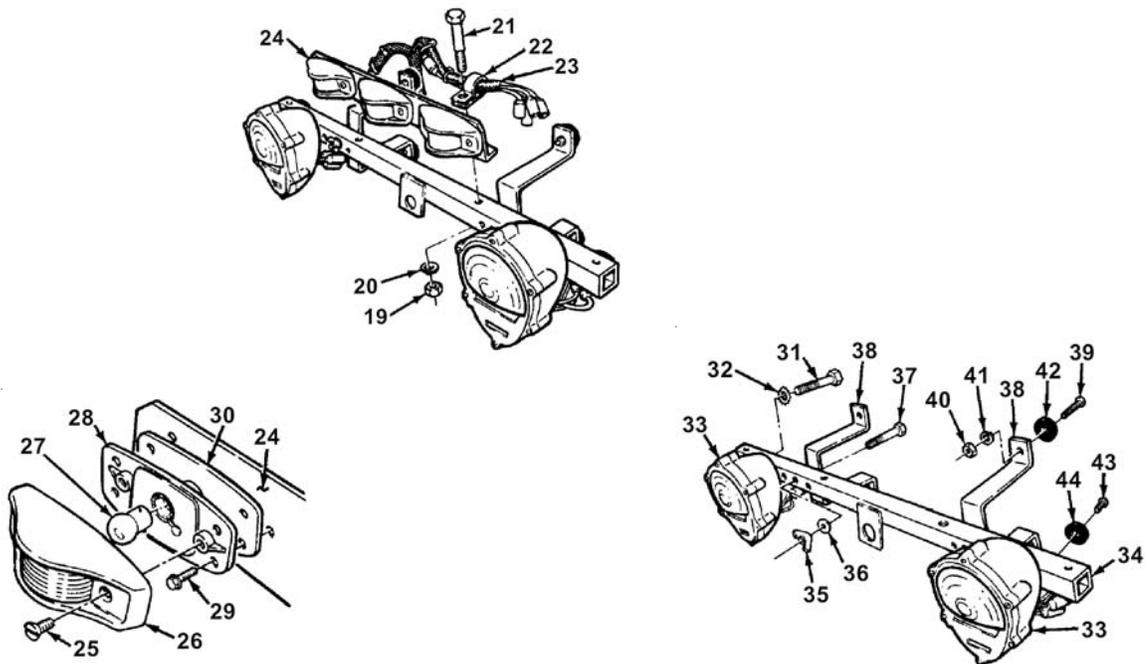


Figure 85. Tow Light Assembly

Composite Taillight Removal

1. Remove four screws (9) and lockwashers (10) from composite taillight bracket (2). Discard lockwashers.
2. Pull four wires (7) from hole (8) until four connectors (6) are showing.

NOTE

Tag and mark wires before disconnecting.

3. Disconnect four wires (7).
4. Push wires (7) back through connectors (6) and remove four C washers (5).
5. Remove two screws (3), lockwashers (4), and composite taillight (1) from composite taillight bracket (2). Discard lockwashers.

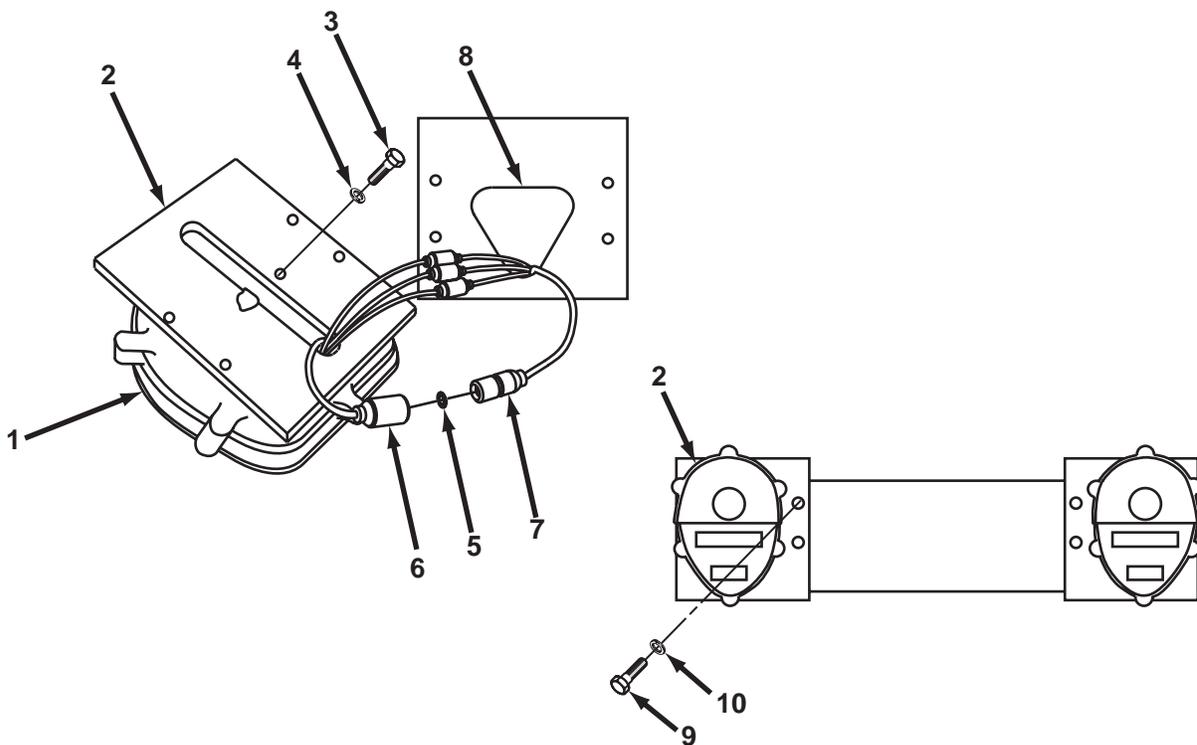


Figure 86. Composite Taillight Assembly

Composite Taillight Installation

1. Install two bumpers (1) on tube (2) with screws (3).
2. Install four bumpers (4) on two brackets (5) with four screws (6), new lockwashers (7), and nuts (8).
3. Install two brackets (5) on tube (2) with screws (9), washers (10), and wingnuts (11).
4. Install two composite lights (12) on tube (2) with three screws (13) and new lockwashers (14).

NOTE

All three clearance lights are installed the same way.

5. Install gasket (15) and lampholder (16) on clearance light bracket (17) with four screws (18).
6. Install bulb (19) and lens (20) in lampholder (16) with two screws (21).
7. Install eight pins (22) on wires (23).
8. Install eight wires (23) in connector (24).

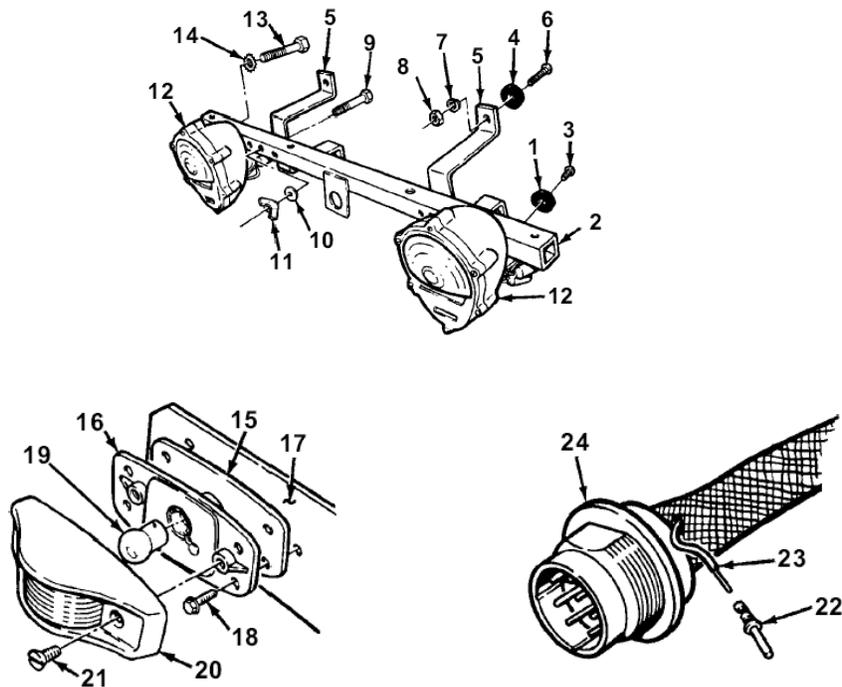


Figure 87. Taillight Assembly

Composite Taillight Installation - Continued

9. Install clearance light bracket (17), wiring harness (25), and clips (26) with two screws (27), new lockwashers (28), and nuts (29).
10. Install connector (30) in tow light tab (31) with new lockwasher (32) and nut (33).
11. Install connector (34) on two ground wires (35).
12. Install connector (34) with screw (36) and new lockwasher (37).
13. Install eleven pins (38) and washers (39) on wires (40).
14. Connect eleven connectors (41) to connectors (42).
15. Install four emergency straps (43) with two screws (44) and new locknuts (45).

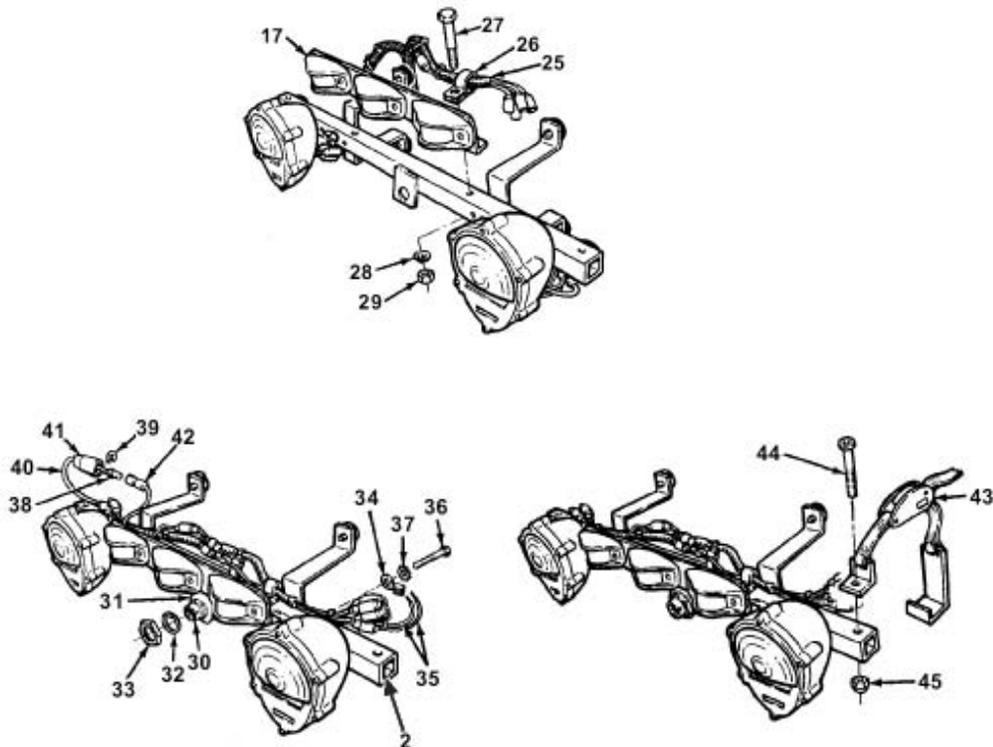


Figure 88. Complete Taillight Assembly

INSTALLATION

1. Install composite light (1) on composite taillight bracket (2) with two screws (3) and new lockwashers (4).
2. Install four washers (5) on wires (6) and connect wires at connectors (7).
3. Push four wires (6) back through hole (8).
4. Install composite taillight bracket (2) with four screws (9) and new lockwashers (10).

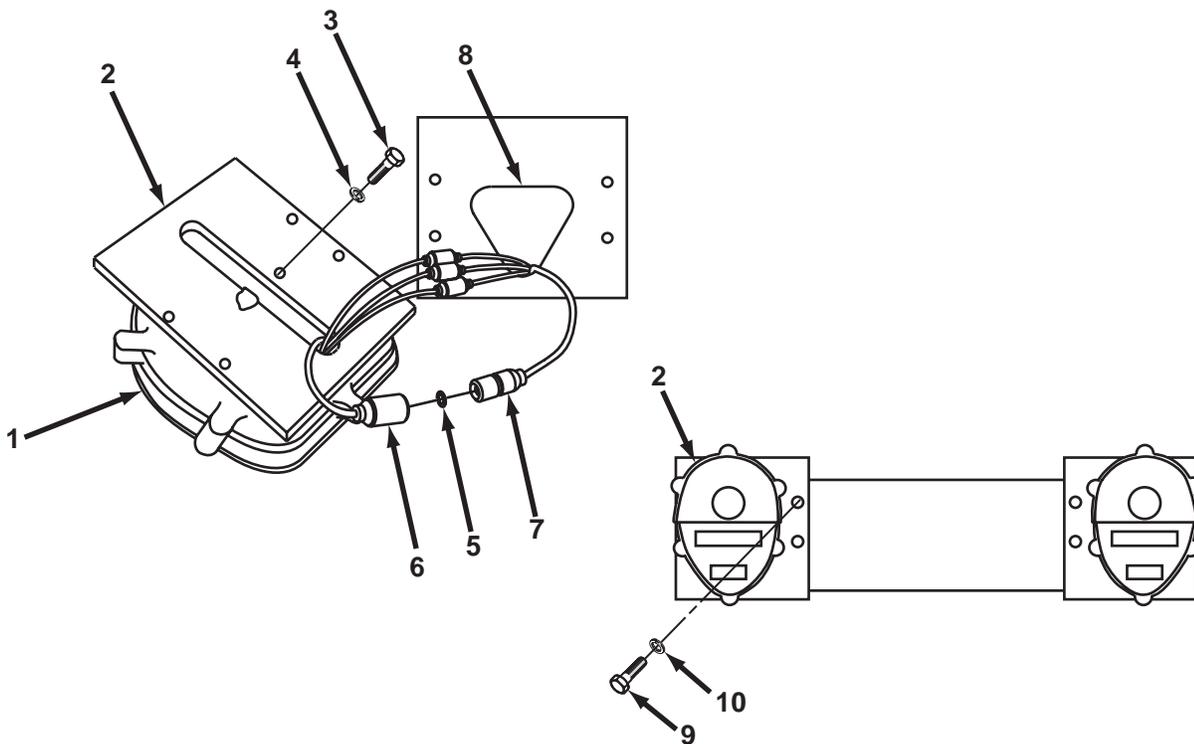


Figure 89. Composite Taillight Assembly

Follow-on Tasks:

Check operation of light functions.

END OF WORK PACKAGE

**FIXED WORKLIGHT REPAIR
REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Batteries disconnected (WP 0050).

Tools/Test Equipment

- Tool Kit, Mechanics General,
NSN 5180-00-177-7033

Materials/Parts

- Washer, lock (1) (MS35333-40)
- Detergent (item 4, WP 0085)

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death to personnel.

1. Remove screw (1), spacer (2), flatwasher (3), and nut (4) from mounting bracket assembly (5).
2. Remove bolt (6), flatwasher (7), flatwasher (8), lockwasher (9), and nut (10). Remove lower mounting bracket (5) from fender. Discard lockwasher.

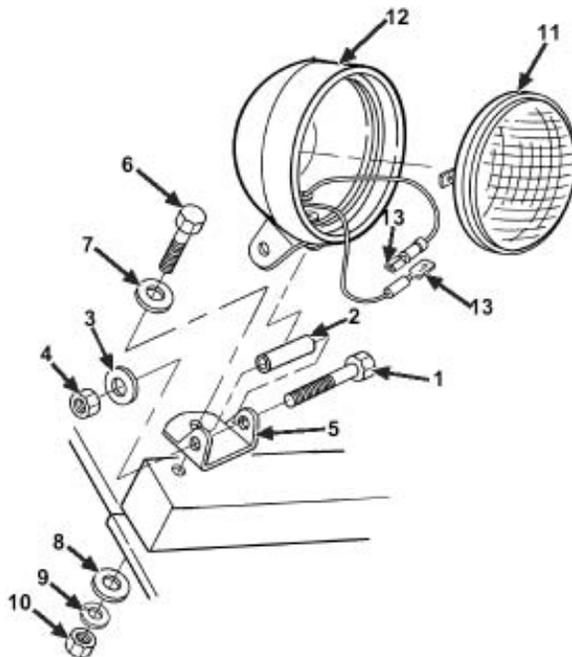


Figure 90. Fixed Worklight Assembly

DISASSEMBLY

1. Apply soap solution to edge of lamp (11) and pry from worklight assembly (12).
2. Disconnect leads (13) from lamp (11).

ASSEMBLY

1. Connect leads (13) to lamp (11).
2. Install lamp (11) into worklight assembly (12).

INSTALLATION

1. Install mounting bracket (5) onto fender with bolt (6), flatwasher (7), flatwasher (8), new lockwasher (9), and nut (10).
2. Install worklighty assembly (12) onto mounting bracket (5) with screw (1), spacer (2), flatwasher (3), and nut (4).

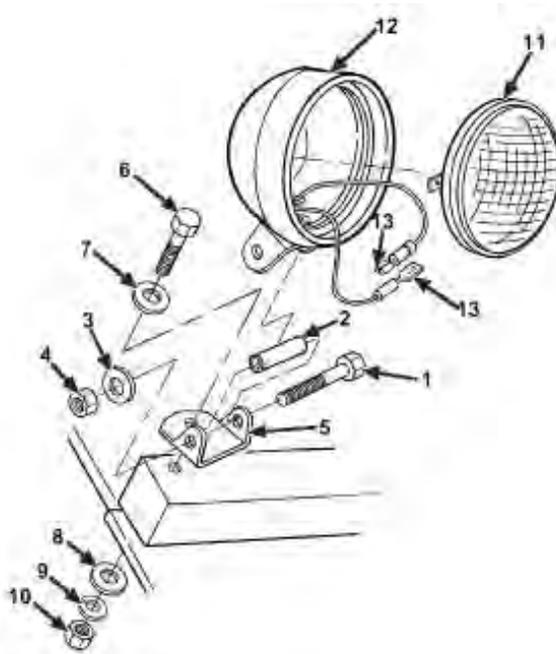


Figure 90. Fixed Worklight Assembly

Follow-on Tasks:

- Connect batteries (WP 0050).
- Check for proper operation of fixed worklight.

END OF WORK PACKAGE

STROBE LIGHT MAINTENANCE REMOVAL, INSTALLATION, REPAIR

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in a convenient configuration.
- Disconnect Batteries (WP 0050).

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

Materials/Parts

- Bulb, halogen (4) (BH-1)
- Washers, lock (3) (1229-S-513-C)

General Safety Instructions

Remove all power to towing device prior to making any repairs on electrical system.

REMOVAL**WARNING**

Remove all power to towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death to personnel.

NOTE

Both strobe light assemblies are removed the same way. Left side shown.

1. Remove four screws (1) from cover (2). Remove cover (2) from baseplate (3).
2. Disconnect strobe light wire (4).

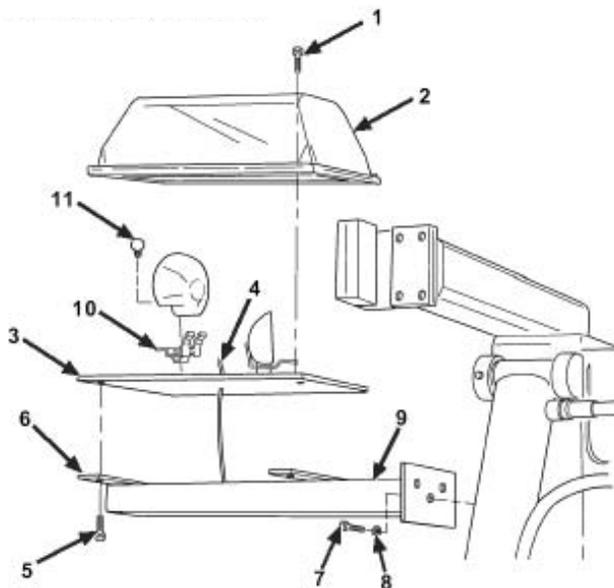


Figure 91. Strobe Light Assembly

REMOVAL**NOTE**

Perform step 3 ONLY IF strobe light assembly is damaged.

3. Remove four screws (5) from base plate mounting brackets (6). Remove strobe light assembly from mounting brackets.

NOTE

Perform step 4 ONLY IF mounting bracket is damaged.

4. Remove three screws (7) and lockwashers (8) from mounting bracket (9). Remove mounting bracket (9) from mast assembly. Discard lockwashers.

NOTE

DO NOT touch bulb with bare hands. Body oil may shorten the operating life of the bulb.

Use gloves (item 6, Appendix F) or a rag (item 10, WP 0085) when handling bulbs.

BULB REMOVAL

1. Remove four screws (1) from cover (2). Remove cover from base plate (3).
2. Remove bulb securing clip (10) and bulb (11).

BULB INSTALLATION

1. Install bulb (11) and secure with bulb securing clip (10).
2. Position cover (2) on base plate (3) and secure with four screws (1).

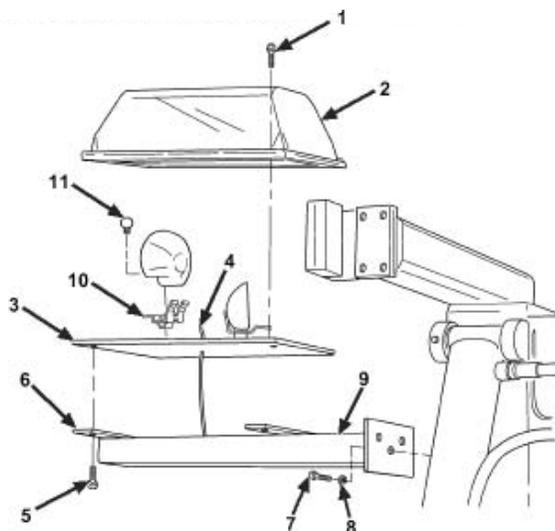


Figure 91. Strobe Light Assembly

INSTALLATION**NOTE**

Both strobe light assemblies are installed the same way. Left side shown.

Perform step 1 ONLY IF mounting bracket was removed.

1. Feed strobe light wire (4) through mounting bracket (9). Position mounting bracket (9) on mast assembly and secure with three screws (7) and new lockwashers (8).

NOTE

Perform step 2 ONLY IF strobe light assembly was removed.

2. Position strobe light assembly on base plate mounting brackets (6) and secure with four screws (5).
3. Connect strobe light wire.
4. Position cover (2) on baseplate (3) and secure with four screws (1).

RETRACTABLE CORD REPAIR

1. Remove quick disconnect (1) from wire connector (2).
2. Pull wire connector (2) through frame and remove wire connector (2) and insulation sleeving (3) from wire.
3. Separate two parts of quick disconnect (1) and remove retractable cord (4).

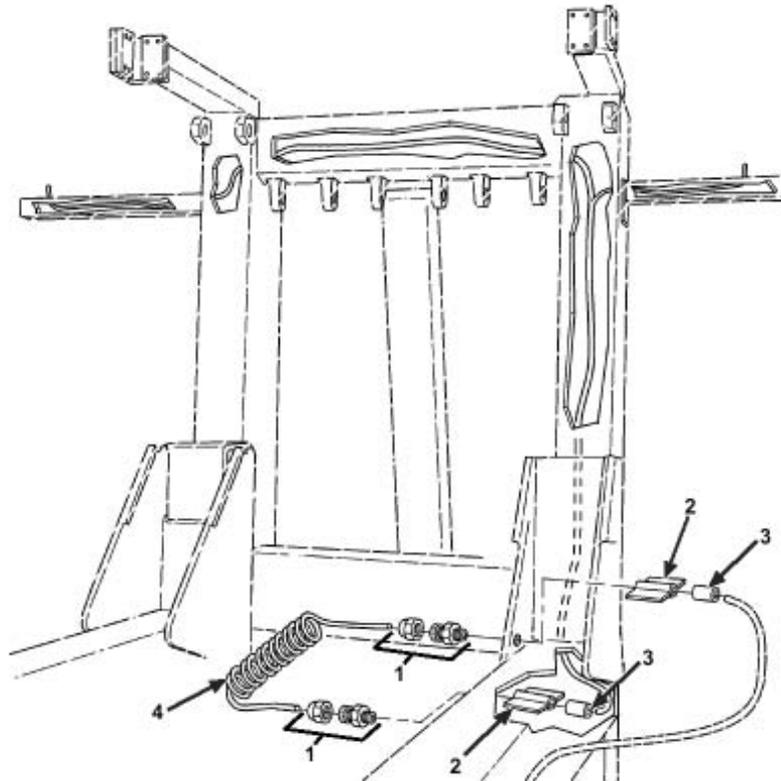


Figure 92. Retractable Cord Assembly

Follow-on Tasks:

- Connect Batteries (WP 0050).
- Check for proper operation of strobe light.

END OF WORK PACKAGE

BATTERY/BATTERY BOX REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Equipment Conditions:

Parked on level ground.

Materials/Parts:

- Nut, lock (2) (MS17828-4C)
- Tag, marker (item 15, WP 0085)

Tools/Test Equipment:

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions:

Remove all power to towing device prior to disconnecting batteries.

BATTERY REMOVAL



WARNING

Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine stopped. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury or death to personnel can result.

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in death or injury to personnel.

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

Battery box is not a step. Stepping on battery box can cause it to swivel, causing injury or death to personnel.

1. Remove four wing nuts (1) from battery box lid (2) and remove lid (2).

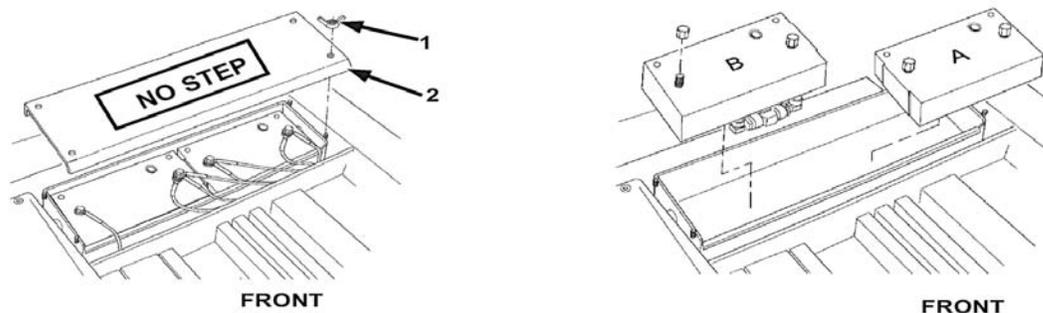


Figure 93. Battery Box

BATTERY REMOVAL - Continued**CAUTION**

Battery negative (-) ground cables must be removed prior to positive (+) cables.

2. Remove negative (-) nylon stud nuts (6 and 7) and remove two cables (8) from Battery A and one cable (8) from Battery B.
3. Remove positive (+) nylon stud nuts (3 and 4) and remove two cables (5) from Battery A and three cables (5) from Battery B.
4. Replace stud nuts on batteries and lift batteries from battery box.

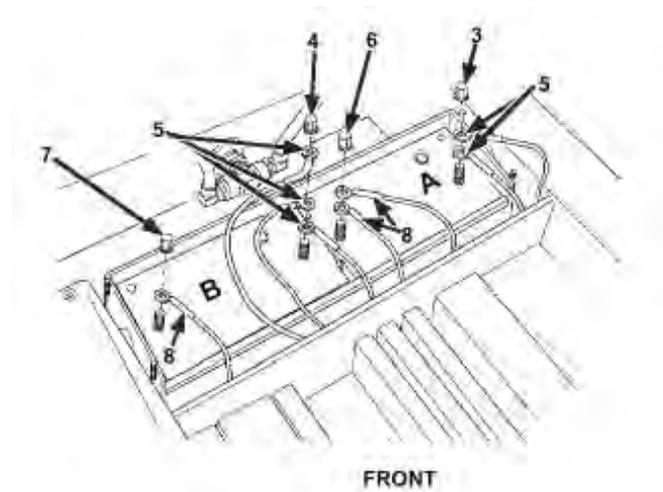


Figure 94. Battery Box Assembly

BATTERY INSTALLATION

1. Position batteries in battery box.
2. Position three cables (5) on positive (+) nylon stud of Battery B, and two cables (5) on positive (+) stud of Battery A. Secure with nylon stud nuts (3 and 4).
3. Position one cable (8) on negative (-) nylon stud of Battery B and two cables (8) on negative (-) stud of Battery A. Secure with nylon stud nuts (6 and 7).
4. Position lid (2) on battery box and secure with four wing nuts (1).
5. On electrical control box, switch ELECTRIC toggle to ON position.
6. Ensure electrical power is on by viewing the voltage meter or by pushing the push switch on the electrical control box for approximately 2 seconds, activating the hydraulic pump.
7. On electrical control box, switch ELECTRIC toggle to OFF position.

BATTERY INSTALLATION - Continued**WARNING**

Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine stopped. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury to personnel can result.

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in injury or death to personnel.

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

BATTERY BOX REMOVAL

1. Remove protective strip (1) from battery box (2).
2. Remove two screws (3) and locknuts (4) from battery box (2). Discard locknuts.
3. Remove battery box from frame.

BATTERY BOX INSTALLATION

1. Position battery box (2) on frame with the recessed leading edge of the battery box facing forward and secure with two screws (3) and new locknuts (4). Ensure battery box will swing.
2. Install protective strip (1) on battery box.

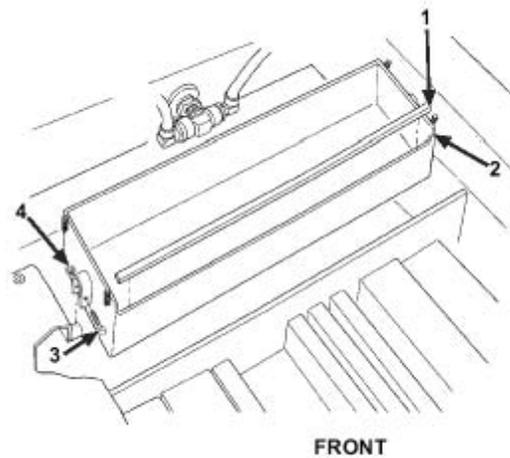


Figure 95. Battery Box

Follow-on Tasks:

- Check battery box for freedom of movement.
- Check electrical power at electrical control box.

END OF WORK PACKAGE

**WIRING HARNESS/CABLE MAINTENANCE
REMOVAL, REPLACEMENT, REPAIR, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Parked on level ground.

Tools/Test Equipment

- Tool Kit, Mechanics General, NSN 5180-00-177-7033
- Shop Equipment, Common Set No. 1, NSN 4910-00-754-0654

Materials/Parts

Tie, plastic (item 19, WP 0085)

General Safety Instructions

Remove all power to towing device prior to making any repairs on the electrical system.

**WARNING**

Remove all power to fifth wheel towing device prior to making any repairs on the electrical system. Failure to do so may result in serious injury or death.

NOTE

Wiring harnesses can be replaced or repaired depending on the type of damage. Broken wires can be spliced and sealed with heat shrink tubing or electrical tape.

See WP 0038 00-6 (tagging wires and hoses), WP 0038 00-7 (soldering), WP 0038 00-7 (heat shrinkable tubing), and WP 0038 00-8 (electrical ground points) for general wiring harness maintenance instructions.

There are three loop clamps securing the wiring harnesses.

REMOVAL

Remove screw (1) and washer (2) from loop clamp (3). Remove loop clamp from wiring harness.

REPLACEMENT/REPAIR

Wiring harnesses are not ordinarily removed except if they need to be replaced. Badly damaged wiring harnesses must be replaced. Wiring harness connections must be tightly attached and connected. See wiring schematics (WP 0088) for additional information.

INSTALLATION

Position loop clamp (3) around wiring harness and secure with screw (1) and washer (2).

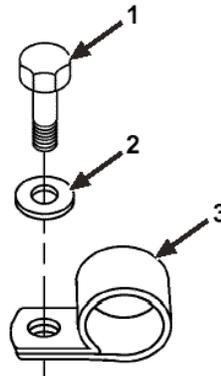


Figure 96. Loop Clamp

Follow-on Tasks:

Check electrical system for proper operation.

END OF WORK PACKAGE

**BRAKE SYSTEM MAINTENANCE
GENERAL, REPLACEMENT, REPAIR**

GENERAL**WARNING**

Air under 100 psi pressure is used in the operation of the air brake system. Serious injury or death can result if precautions are not taken.

1. The following paragraphs cover procedures for testing, removal, disassembly, assembly and installation of gladhand assembly, relay valve, and air lines. These paragraphs also cover cleaning, inspection and repair of air lines.
2. The service brakes are straight air type with automatic break-away protection. When the semitrailer brake system is properly connected to the service brake system of the towed vehicle, the towing vehicle brake pedal operates the brakes on both vehicles.

END OF WORK PACKAGE

**GLADHAND REPLACEMENT.
REMOVAL, CLEANING, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Equipment Conditions:**

Fifth Wheel Towing Device in coupling configuration.

Tools/Test Equipment:

- Tool Kit, Mechanics General, NSN 5180-00-177-7033
- Shop Equipment, Common No. 1 NSN 4910-00-754-0654

Materials/Parts:

- Packing ring (213630)
- Washer, lock (4) (MS35333-40)
- Drycleaning solvent (item 14, WP 0085)
- Rags (item 10, WP 0085)
- Brush, scrub (item 2, WP 0085)
- Thread sealing compound

General Safety Instructions:

None

REMOVAL**NOTE**

All gladhands are removed the same way. Service gladhand shown.

1. Remove dummy coupling (1) from gladhand (2).
2. Remove two screws (3), arm lock (4), and chain assembly (5) from gladhand (2).
3. Remove gladhand (2) from tank fitting (6).
4. Remove retaining nut (7) from tank fitting (6). Remove tank fitting from mounting bracket (8).
5. Remove two screws (9), flatwashers (10), lockwashers (11), and nuts (12). Remove mounting bracket (8) from fender. Discard lockwashers.

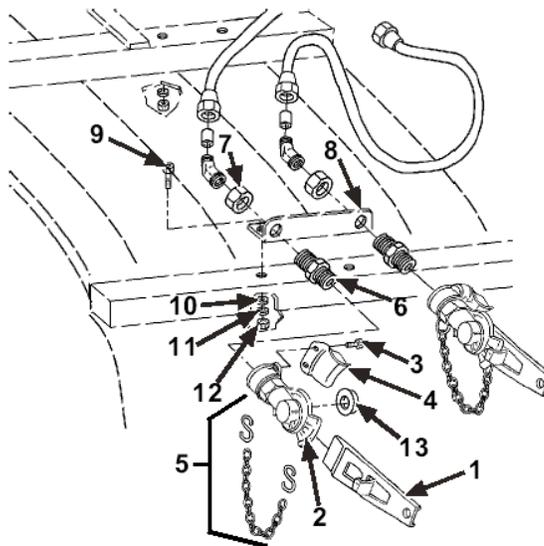


Figure 97. Gladhand Assembly

**WARNING**

Drycleaning solvent MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. The use of protective gloves and goggles is suggested. Use in well ventilated areas. Keep away from open flames and other sources of ignition.

CLEANING

1. Clean mud and dirt from all exposed surfaces with water and a brush.
2. Remove grease with drycleaning solvent and a clean rag.

INSPECTION AND REPLACEMENT

1. Inspect gladhand for damaged threads, cracks, dents, holes, and warps.
2. Replace defective gladhand.
3. Remove packing ring (13) and check for wear and deterioration.

PACKING RING INSTALLATION

1. Clean packing ring groove in gladhand.
2. Partially collapse ring with fingers and insert one side of ring flange into groove.
3. Push ring into place. Face of ring must lie flat with no twist or bulge.

INSTALLATION

1. Position mounting bracket (8) on fender and secure with two screws (9), flatwashers (10), new lockwashers (11), and nuts (12).
2. Install tank fitting (6) in mounting bracket (8) and secure with retaining nut (7).
3. Screw gladhand (2) onto tank fitting (6).
4. Position arm lock (4) and chain assembly (5) onto gladhand and secure with two screws (3).
5. Install dummy coupling (1) on gladhand (2).

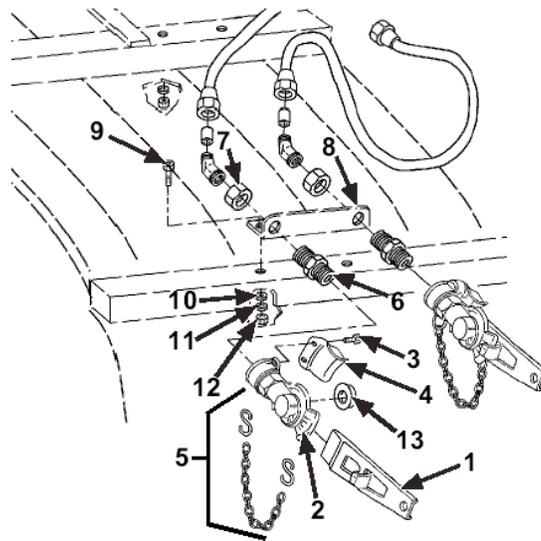


Figure 97. Gladhand Assembly

Follow-on Tasks:

Check for air leaks.

END OF WORK PACKAGE

**AIR BRAKE PROTECTION VALVE REPLACEMENT
REMOVAL, CLEANING, INSPECTION, INSTALLATION, LEAKAGE TEST**

INITIAL SETUP:**Equipment Conditions**

Air lines removed (WP 0055).

Materials/Parts

- Washer, lock (4) (MS35333-40)
- Drycleaning solvent (item 14, WP 0085)
- Rags (item 10, WP 0085)
- Brush, scrub (item 1, WP 0085)
- Thread Seal Compound

Tools/Test EquipmentTool Kit, Mechanics General,
NSN 5180-00-177-7033**General Safety Instructions**

None

REMOVAL

1. Remove two screws (1), lockwashers (2), nuts (3), and protection valve (4) from mounting bracket (5). Discard lockwashers.
2. Remove two screws (6), flatwashers (7), lockwashers (8), and nuts (9) from mounting bracket (5). Discard lockwashers.
3. Remove mounting bracket from fender.

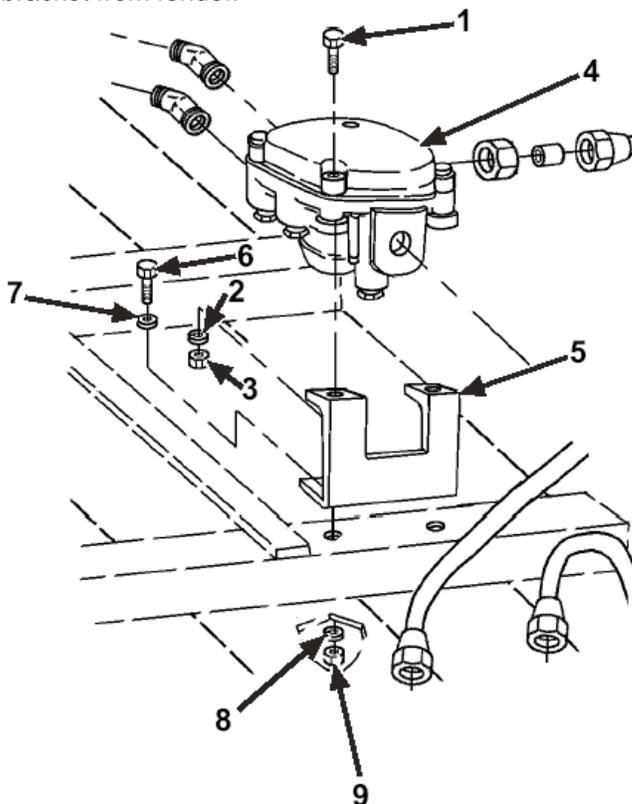


Figure 98. Air Brake Protection Valve Assembly

**WARNING**

Drycleaning solvent MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. The use of protective gloves and goggles is suggested. Use in well ventilated areas. Keep away from open flames and other sources of ignition.

CLEANING

1. Clean mud and dirt from all exposed surfaces with water and a brush.
2. Remove grease with drycleaning solvent and a clean rag.

INSPECTION

1. Inspect protection valve for damaged threads, cracks, dents, holes, and warps.
2. Replace defective protection valve.
3. Inspect mounting bracket for cracks, breaks, and warps.
4. Replace defective mounting bracket.

INSTALLATION

1. Position mounting bracket (5) on fender and secure with two screws (6), flatwashers (7), new lockwashers (8), and nuts (9).
2. Position protection valve (4) onto mounting bracket (5) and secure with two screws (1), new lockwashers (2), and nuts (3).

LEAKAGE TEST

1. With air brake system connected, apply a solution of detergent and water to protection valve and connections. No leakage is permitted.
2. With brake system fully pressurized, disconnect gladhands tagged EMERGENCY from prime mover. Make sure towed vehicle brakes apply automatically.
3. Repeat step 2 for gladhands from towed vehicle.

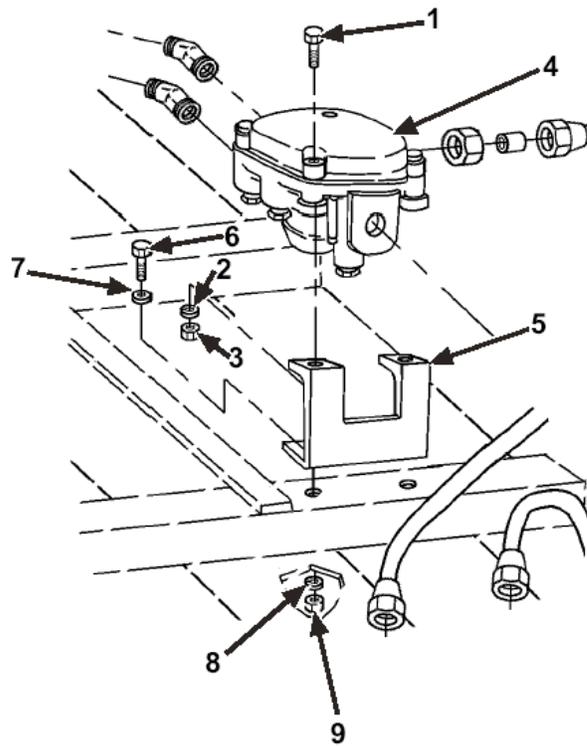


Figure 98. Air Brake Protection Valve Assembly

Follow-on Tasks:

None

END OF WORK PACKAGE

**AIR BRAKE FITTINGS MAINTENANCE
REMOVAL, INSPECTION, REPLACEMENT/REPAIR, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Parked on level ground.
- Gladhands Removed (WP 0053).

Materials/Parts

- Tape, antiseizing (item 17, WP 0085)
- Tie, wire (item 18, WP 0085)
- Tubing, non-metallic
- Insert (8) (414506C1)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

REMOVAL**CAUTION**

**Failure to cap or plug hose connections to prevent contamination
may result in damage to equipment.**

NOTE

Air hoses are not ordinarily removed except if they need to be replaced.

1. Remove gladhand retaining nut (1) from straight adapter (2) or 45° fitting (3).

NOTE

Gladhand connections on prime mover side have straight adapters.

Gladhand connections on towed vehicle side have 45° fittings.

Perform step 2a for prime mover side and step 2b for towed vehicle side.

- 2a. Remove straight adapter (2) from air hose (4) and remove insert (5). Discard insert.

- 2b. Remove 45° compression fitting (3) from air hose (4) and remove insert (5). Discard insert.

NOTE

Tag brake hoses and connection points prior to disconnecting.

Note location of plastic cable ties prior to removal.

Remove plastic cable ties as required.

Air hoses are not ordinarily removed except if they need to be replaced.

REMOVAL - Continued

3. Remove screw (6), flatwasher (7), loop clamp (8), spacer (9), loop clamp (8), lockwasher (10), flatwasher (11), and nut (12) from frame. Discard lockwasher.
4. Remove loop clamps (8) from hoses (4).
5. Remove two hoses (4) from 45° fittings (13). Remove insert (5). Discard insert.
6. Remove two 45° fittings (13) from reducer (14).
7. Remove two reducers (14) from air brake protection valve (15).
8. Remove hose (4) from straight adapter (16). Remove insert (5). Discard insert.
9. Remove straight adapter (16) from air brake protection valve (15).
10. Remove brass bushing (17) and hose (4) from air brake protection valve (15). Remove insert (5). Discard insert.

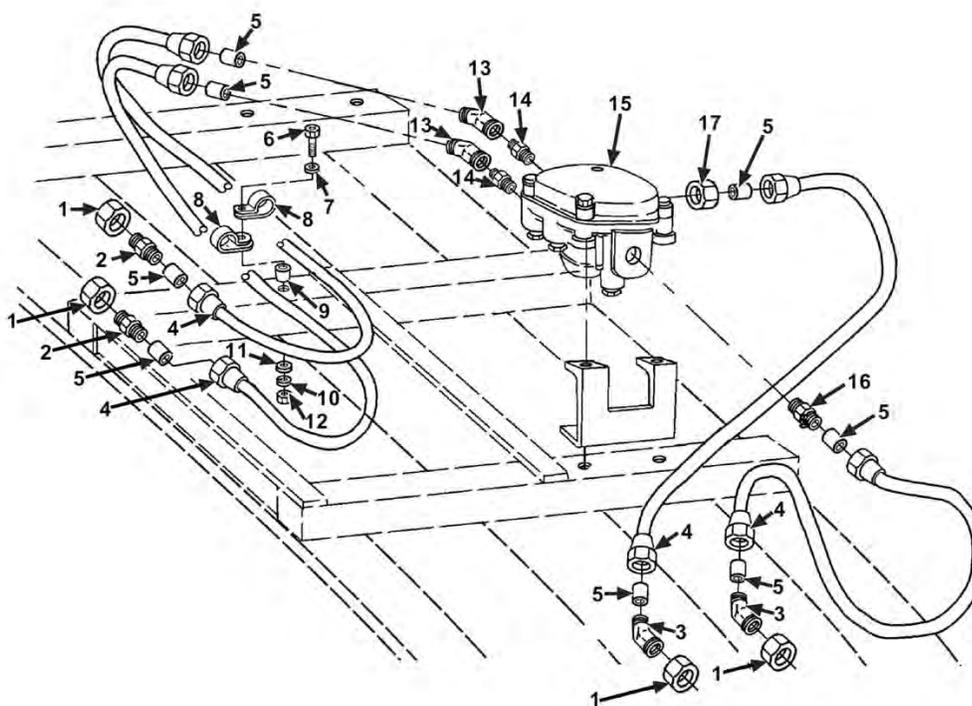


Figure 99. Air Brake Fittings Assembly

INSPECTION AND REPLACEMENT OR REPAIR**NOTE**

Damaged air hoses that may fail must be replaced.

- (1) Inspect brake air hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts.
- (2) Replace damaged hoses.

INSTALLATION**CAUTION**

DO NOT remove caps or plugs from hoses until installation. Removing caps or plugs may result in contamination of brake system and damage to equipment.

NOTE

Apply thread sealing compound to threads before connecting.

Install plastic cable ties as required.

Air hoses must be tightly attached and connected.

1. Install brass bushing (17) on air brake protection valve (15).
2. Install new insert (5) into hose (4) and install hose onto brass bushing (17).
3. Install straight adapter (16) on air brake protection valve (15).
4. Install new insert (5) into hose (4) and install hose onto straight adapter (16).
5. Install reducer (14) on air brake protection valve (15).
6. Install two 45° fittings (13) on reducer (14).
7. Install new insert (5) into hose (4) and install hoses onto 45° fittings (13).
8. Position loop clamps (8) on hoses (4) and secure with screw (6), flatwasher (7), spacer (9), flatwasher (11), new lockwasher (10), and nut (12).

NOTE

Gladhand connections on prime mover side have straight adapters.

Gladhand connections on towed vehicle side have 45° fittings.

9. Install new insert (5) into air hose (4) and install onto straight adapter (2).
10. Install new insert (5) into air hose (4) and install onto 45° compression fitting (3).
11. Install nut (1) onto straight adapter (2) and 45° compression fitting (3).

INSTALLATION - Continued

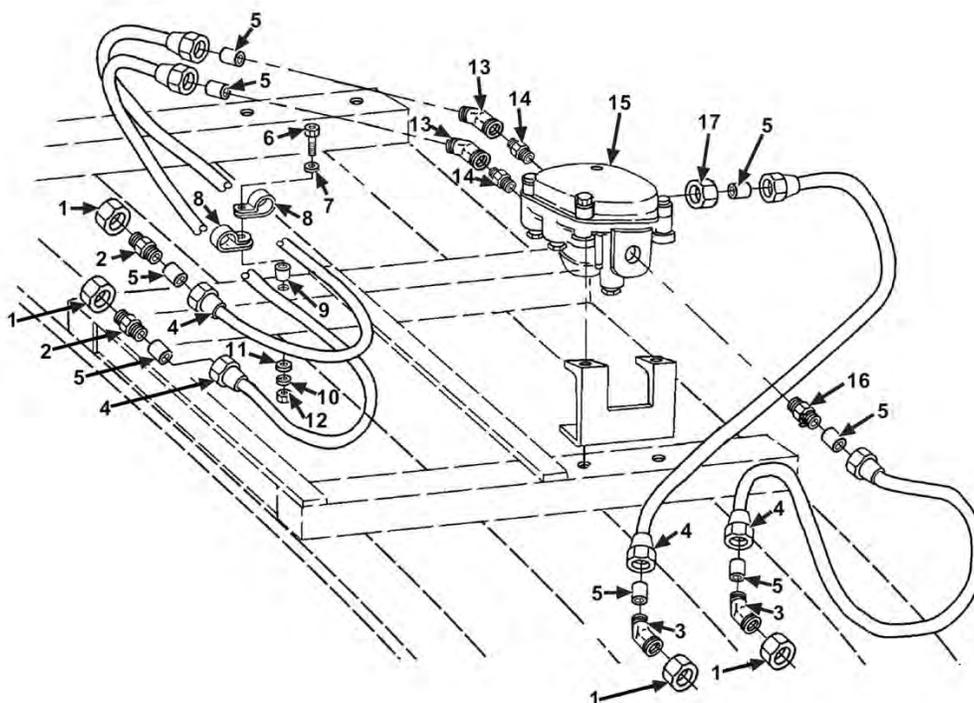


Figure 99. Air Brake Fittings Assembly

Follow-on Tasks:

- Install gladhands (WP 0053).
- Check air brake systems for leaks.

END OF WORK PACKAGE

GENERAL HYDRAULIC SYSTEM REPAIR METHODS

GENERAL HYDRAULIC SYSTEM REPAIR**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

While operating or performing maintenance on any hydraulic systems, never place personnel or equipment in a potentially hazardous position (i.e., between moving parts or under hydraulic supported equipment). Failure to comply may result in injury or death to personnel.

GENERAL HYDRAULIC SYSTEM REPAIR - Continued**CAUTION**

Always clean around fittings before disconnecting or connecting hoses or fittings. Ensure area is clean before installing hydraulic components. Failure to comply may result in damage to equipment.

Cover, cap, or plug all openings, ports, and tube or hose ends when they are disconnected. Failure to comply may result in damage to equipment.

Ensure you couple only fittings designed to be coupled with each other. Never depend on trial and error. Just because two fittings will screw together is no guarantee that the connection will not leak. See illustrations of fitting types in this chapter. Failure to comply may result in damage to equipment.

Fittings must be installed and hand-tightened. If a fitting cannot be handtightened, it may be cross-threaded or have damaged threads. Use wrench only for final tightening. Failure to comply may result in damage to equipment.

Do not use Teflon tape as a sealer on any fittings. It can separate from the fittings and cause control valves, relief valves, and actuators to become contaminated and fail.

It is possible to install a male National Pipe Thread (NPT) into a female straight thread, but the fitting will leak. Learn to recognize the very slight taper which an NPT has. Do not attempt to connect NPT and female straight threads.

Do not apply sealant to the first threads of NPT fittings. If sealant enters the hydraulic system, it may cause components to fail.

When connecting NPTs, care must be exercised. If overtightened, the female pipe thread will split. Replace it. If a connection leaks, disconnect and apply thread sealant. Reconnect the threads and snug up with an open-end wrench. Failure to comply may result in damage to equipment.

Be careful when installing preformed packings. Sharp threads can nick the packing, causing it to leak. If fitting leaks, check packing for nicks or cuts and replace if necessary.

Do not overtighten a flareless connection. Observe torque values in appendix for hydraulic fittings. Overtightening can cause leakage, requiring replacement of entire tube assembly.

When connecting a hose to a fitting, always use two wrenches. Use one wrench to turn the swivel nut onto the fitting, and use another wrench to keep the hose from rotating. If the hose rotates, it can loosen the other end of the hose or loosen the fitting at the other end.

GENERAL HYDRAULIC SYSTEM REPAIR - Continued

The following information is provided to familiarize personnel with the various types of hydraulic fittings. Refer to this section and the warning and cautions on the previous pages when working on hydraulic systems.

1. National Pipe Thread (NPT) is commonly found in hydraulic systems. It differs from other fittings because it is tapered. In order to obtain a proper seal with this thread, you must use a sealant. The sealant should be applied to the male fitting.

CAUTION

Do not apply sealant to the leading edge or the first thread of hydraulic fitting or sealant may get into the hydraulic system and contaminate it. Failure to comply may result in damage to equipment.

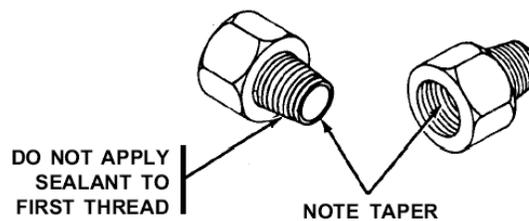


Figure 100. National Pipe Thread (NPT)

2. An O-ring (preformed packing) boss has a straight thread. The seal for this termination is a preformed packing that fits at the top of the threads on the male fitting. This packing is squeezed into the extra space at the top of the threads of the female fitting and seals the connection. The installed packing must be free of nicks and cuts to seal properly. If packing is nicked or cut, it must be replaced.

CAUTION

Do not apply sealant to the leading edge or the first thread of hydraulic fitting or sealant may get into the hydraulic system and contaminate it. Failure to comply may result in damage to equipment.

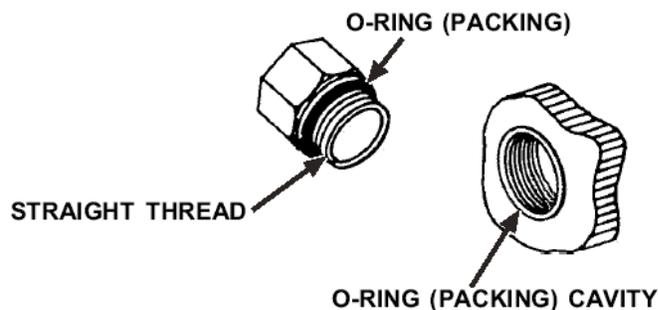


Figure 101. O-Ring (Packing) Boss

GENERAL HYDRAULIC SYSTEM REPAIR - Continued

3. A flareless fitting uses a straight thread. The female fitting contains a ferrule that couples with a cavity in the male fitting. Use recommended torque values in WP 0087 to tighten nut. If this fitting is overtightened, the ferrule will be deformed and the fitting will leak.



Figure 102. Flareless Fitting

INSTALLATION OF ADJUSTABLE FITTINGS

1. Apply light weight oil (OE/HDO-10) to O-ring (preformed packing).

CAUTION

Packing must be positioned fully into groove and not on threads. Failure to comply may result in damage to equipment.

2. Gently push backup washer and O-ring all the way into groove.
3. Turn locknut down until locknut contacts backup washer.
4. Install fitting on boss until backup washer contacts face of boss.
5. Position fitting to desired position by backing out fitting up to one full turn. Hold fitting in desired position and tighten locknut.
6. Connect tube to fitting after fitting is properly positioned and tightened.

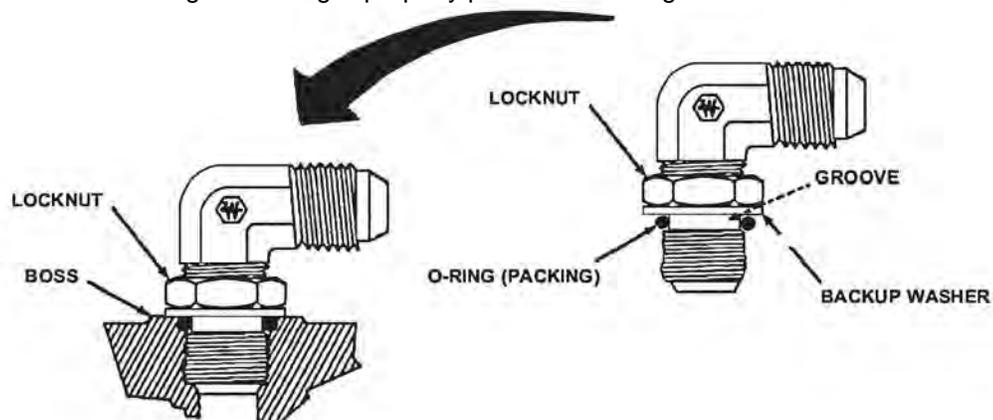


Figure 103. Adjustable Fittings

RELIEVE HYDRAULIC PRESSURE

1. Remove electrical control box cover from electrical control box and switch ELECTRIC toggle to OFF position (WP 0005).
2. Using the hydraulic valve control levers, EXTEND AND RETRACT all hydraulic cylinders and winch.

CHARGE HYDRAULIC SYSTEM

1. On electrical control box, switch ELECTRIC toggle to ON position.
2. Using the hydraulic valve control levers, FULLY EXTEND and RETRACT all hydraulic cylinders and exercise winch.
3. Visually inspect hydraulic system component(s), hose(s), and connection(s) related to the maintenance task for evidence of leaking fluid.
4. If leaking fluid is found, perform necessary (required) maintenance and repeat steps 1 through 3.
5. On electrical control box, switch ELECTRICAL toggle to OFF position.

PURGE AND FILL HYDRAULIC SYSTEM**WARNING**

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

CAUTION

Hydraulic system contains approximately 18 gal (68L) of hydraulic oil. An adequate container must be used to maintain purged fluid.

1. Fold COUPLED fifth wheel towing device onto prime mover using transport configuration steps (1) through (9) (WP 0007). Do not remove pivot pins.
2. Remove plug and drain reservoir (Figure 115, WP 0065).
3. Loosen hydraulic hose from straight adapter on main valve assembly (Figure 107, WP 0059).
4. Remove hydraulic hose from elbow on reservoir (Figure 115, WP 0065).
5. Tighten hydraulic hose to straight adapter on main valve assembly (Figure 107, WP 0059).

NOTE

Reinstall drain plug prior to filling reservoir.

6. Remove fill port plug. COMPLETELY fill reservoir with new oil (see WP 0039). Ensure return line is draining into a suitable container. Loosely replace fill port plug.
7. MAST EXTEND mast to vertical position and remove pivot pin. Repeat step 6. MAST RETRACT and lower mast until lower arrow is approximately 4 inches (101.6mm) below main frame (WP 0008, step 11). Repeat step 6.

PURGE AND FILL HYDRAULIC SYSTEM - Continued

8. BOOM EXTEND boom to 45°. Repeat step 6.
9. BOOM EXTEND until cylinder is fully extended. Repeat step 6.
10. BOOM RETRACT until boom is level to ground. MAST RETRACT until boom is flat on ground.
11. Fully EXTEND LEFT OUT until boom extension is fully extended. Repeat step 6.
12. Fully EXTEND RIGHT OUT until boom extension is fully extended. DO NOT repeat step 6.
13. If needed, add new oil to reservoir. DO NOT fill past full mark on dipstick.
14. Operate winch (WP 0012) until new oil cycles through return hose and into container.
15. Loosen hydraulic hose from straight adapter on main valve assembly (Figure 107, WP 0059, item 7).
16. Connect hydraulic hose to elbow on reservoir (Figure 115, WP 0065, item 5).
17. Tighten hydraulic hose to straight adapter on main valve assembly (Figure 107, WP 0059 item 7).
18. UNCOUPLE fifth wheel towing device from prime mover and place into OIL FILL configuration. (Figure 104, WP 0056 00-7).
19. With fifth wheel towing device in oil fill configuration (Figure 104, WP 0056 00-7), check oil level. Add new oil as necessary.

PURGE AND FILL HYDRAULIC SYSTEM - Continued

20. Couple fifth wheel towing device to prime mover and fold coupled towing device onto prime mover using TRANSPORT CONFIGURATION steps (1) through (9) (WP 0007). DO NOT remove pivot pins.
21. Return fifth wheel towing device to oil fill configuration Figure 104. Check oil level. Add new oil as necessary.

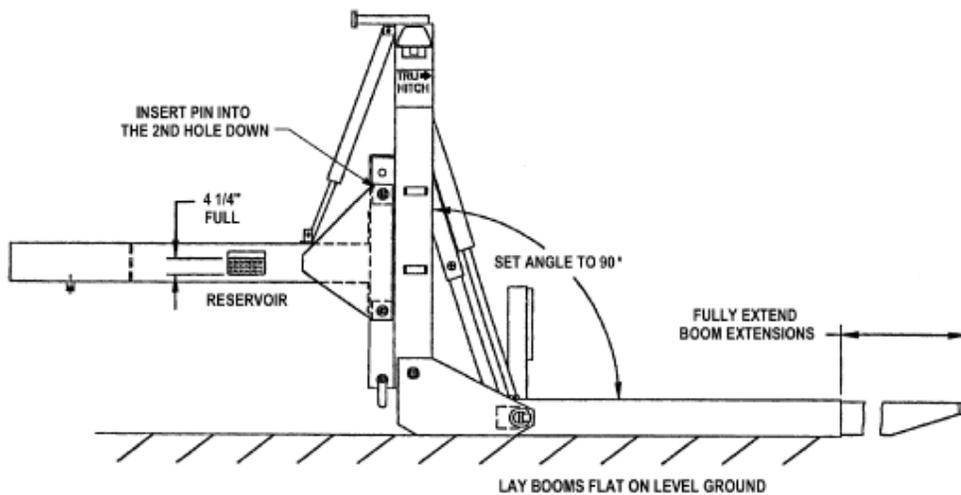


Figure 104. Hydraulic System

NOTE

Use kingpin wrench as hydraulic reservoir dipstick.

END OF WORK PACKAGE

**HYDRAULIC MOTOR ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Disconnect batteries (WP 0050).
- Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

- Washer, lock (4) (M326-3)
- Washer, lock (4) (MS35333-046)
- Sealant, (item 11, WP 0085)

Tools/Test Equipment

- Tool Kit, Mechanics General, NSN 5180-00-177-7033
- Tool Kit Common No. 1, NSN 4910-00-754-0654

General Safety InstructionsNone

REMOVAL OF PRIMARY MOTOR**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions and hydraulic tank relief valve is slowly loosened to relieve pressure. Failure to comply may result in severe injury to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

No maintenance shall be performed on top of or below the main frame without the proper support under the front of the main frame. Failure to follow this warning may result in injury or death to personnel

REMOVAL OF PRIMARY MOTOR - Continued**NOTE**

There are two hydraulic motors - primary (3) and isolated (11).

The solenoid to primary motor wire must be removed from primary motor prior to removal.

1. Loosen two mounting bolts (1).
2. Remove solenoid to motor wire (2) from primary motor (3).
3. Disconnect hose from elbow (4) on primary motor (3).
4. Disconnect two straight adapters (5).
5. Remove two screws (6), lockwashers (7), and flatwashers (8) from bracket (9) on primary motor (3). Discard lockwashers.
6. Loosen two screws (10) and remove primary motor (3) from bracket.

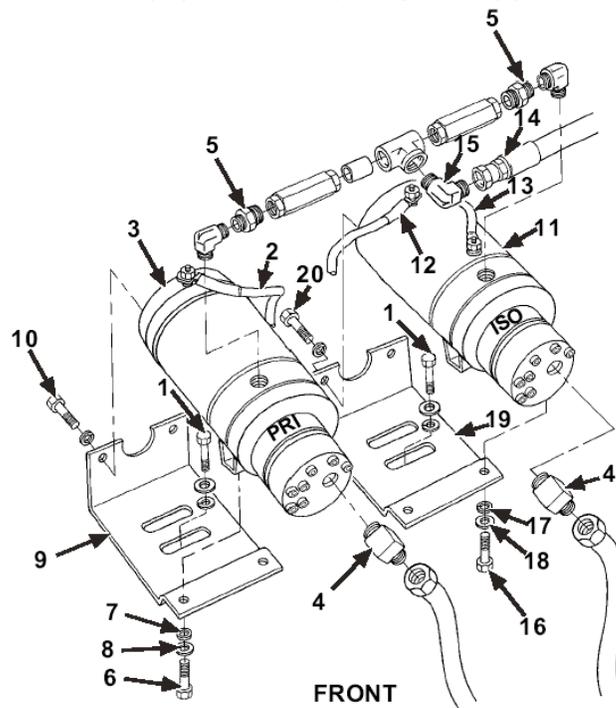


Figure 105. Hydraulic Motor Assembly

REMOVAL OF ISOLATED MOTOR**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions and hydraulic tank relief valve is slowly loosened to relieve pressure. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

No personnel shall perform maintenance above or below the main frame without the main frame being supported at the front by use of a jack stand or the prime mover. Failure to comply may result in injury or death to personnel.

NOTE

There are two hydraulic motors - primary (3) and isolated (11).

The solenoid to isolated motor wire and ground wire must be removed from isolated motor prior to removal.

1. Loosen two mounting bolts (1) on primary motor (3) and two mounting bolts (1) on isolated motor (11).
2. Remove solenoid to motor wire (12) and ground wire (13) from isolated motor (11).
3. Disconnect hose from elbow (4) on isolated motor (11).
4. Remove hose (14) from elbow (15) on isolated motor (11).
5. Disconnect two straight adapters (5).
6. Remove two screws (16), lockwashers (17), and flatwashers (18) from bracket (19) on isolated motor (11). Discard lockwashers.
7. Loosen two screws (20) and slide primary and isolated motors to allow for removal of isolated motor from bracket.

INSTALLATION OF PRIMARY MOTOR

1. Position primary motor (3) on bracket (9) and tighten two screws (10).
2. Install two screws (6), new lockwashers (7), and flatwasher (8) onto bracket (9) and primary motor (3).
3. Connect two straight adapters (5).
4. Install hose onto elbow (4) on primary motor (3).
5. Install solenoid to motor wire (2) onto primary motor (3).
6. Tighten two mounting bolts (1).

INSTALLATION OF ISOLATED MOTOR

1. Slide primary and isolated motors into position and tighten two screws (20).
2. Install two screws (16), new lockwashers (17), and flatwashers (18) onto bracket (19) and isolated motor (11).
3. Connect two straight adapters (5).
4. Install hose (14) onto elbow (15) on isolated motor (11).
5. Connect hose onto elbow (4) on isolated motor (11).
6. Install solenoid to motor wire (12) and ground wire (13) onto isolated motor (11).
7. Tighten two mounting bolts (1) on primary motor (3) and two mounting bolts (1) on isolated motor (11).

INSTALLATION OF ISOLATED MOTOR - Continued

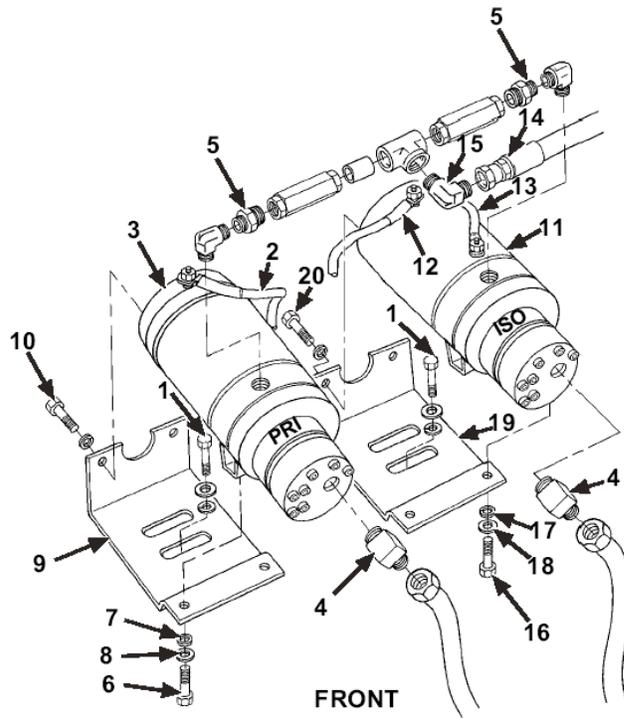


Figure 105. Hydraulic Motor Assembly

Follow-on Tasks:

- Connect batteries (WP 0050).
- Test motor assembly connections for leaks (WP 0056 00-5).

END OF WORK PACKAGE

**HYDRAULIC SAFETY VALVE REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Towing device in storage configuration (WP 0002).
- Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

Sealant, (item 11, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

None

REMOVAL**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions and hydraulic tank relief valve is slowly loosened to relieve pressure. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

CAUTION

Always clean around fittings before disconnecting or connecting hoses or fittings. Ensure area is clean before installing hydraulic components. Failure to comply may result in damage to equipment.

Cover, cap, or plug all openings, ports, and tube or hose ends when they are disconnected. Failure to comply may result in damage to equipment.

Ensure you couple only fittings designed to be coupled with each other. Never depend on trial and error. Just because two fittings will screw together is no guarantee that the connection will not leak. See illustrations of fitting types in this chapter. Failure to comply may result in damage to equipment.

Fittings must be installed and hand-tightened. If a fitting cannot be hand-tightened, it may be cross-threaded or have damaged threads. Use wrench only for final tightening. Failure to comply may result in damage to equipment.

REMOVAL - Continued**NOTE**

There are two safety valves. Both valves are removed the same way.

Maintenance personnel must note the position of all parts prior to removal to ease the installation process.

The upper safety valve controls the mast functions and the lower safety valve controls the boom functions.

1. Remove hydraulic hoses from tee fitting (1).
2. Remove hydraulic hose from elbow (2).
3. Remove hydraulic hoses from bottom of safety valve (3).
4. Remove 1 1/2 inch (38.1 mm) screw (4) from safety valve (3) and bracket (5).
5. Remove 2 1/2 inch (63.5) screw (6) from safety valve (3) and bracket (5).
6. Remove safety valve (3) from bracket (5).
7. Remove tee fitting (1) from globe valve (7).
8. Remove globe valve (7) from straight adapter (8).
9. Remove straight adapter (8) from safety valve (3).
10. Remove elbow (2) from check valve (9).
11. Remove check valve (9) from safety valve (3).

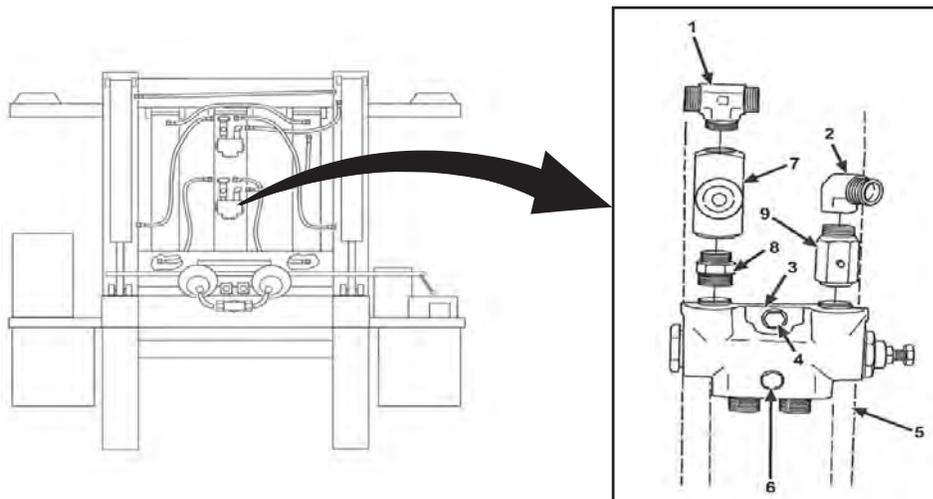


Figure 106. Hydraulic Safety Valve Assembly

INSTALLATION**NOTE**

There are two safety valves. Both valves are installed the same way.

Use sealing compound on all threads before installing fittings.

1. Install check valve (9) to safety valve (3).
2. Install elbow (2) to check valve (9).
3. Install straight adapter (8) to safety valve (3).
4. Install globe valve (7) to straight adapter (8).
5. Install tee fitting (1) to globe valve (7).
6. Position safety valve (3) on bracket (5) and install 2 1/2 inch (63.5 mm) screw (6) through lower position on safety valve and mast.
7. Install 1 1/2 inch (38.1 mm) screw (4) through upper position on safety valve and mast.
8. Install hydraulic hoses on safety valve.

INSTALLATION - Continued

9. Install hydraulic hoses on elbow (2).
10. Install hydraulic hoses on tee fitting (1).

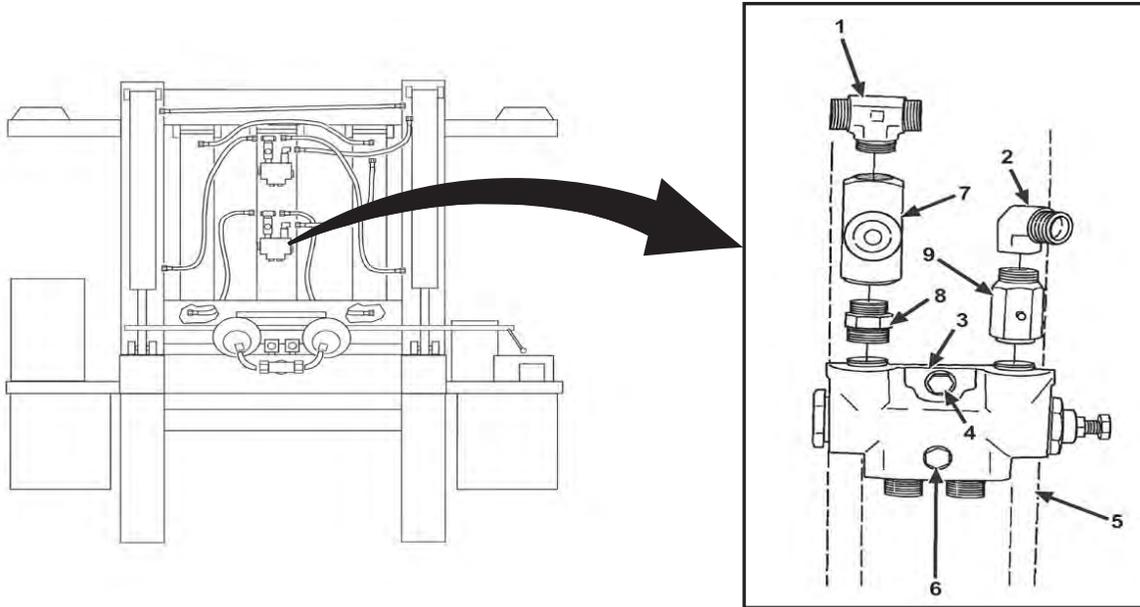


Figure 106. Hydraulic Safety Valve Assembly

Follow-on Tasks:

- Charge hydraulic system (WP 0056 00-5).
- Adjust the flow valves as required (WP 0004).

END OF WORK PACKAGE

**MAIN VALVE ASSEMBLY MAINTENANCE
REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Hydraulic pressure relieved (WP 0056).
- Disconnect batteries (WP 0050 00-5).
- Remove valve control levers.

Tools/Test Equipment

- Tool Kit, Mechanics General,
NSN 5180-00-177-7033
- Tool Kit, Common No. 1
NSN 4910-00-754-0654

Materials/Parts

- Washer, lock (2) (12387272-45)
- Sealing Compound (Item 12, WP 0085)
- Hydraulic fluid (Item 15, WP 0085)
- Rags (Item 28, WP 0085)
- Dry cleaning solvent (Item 31, WP 0085)
- Five lockwashers
- Eighteen preformed packings

Personnel Required: 3**General Safety Instructions**

Have a suitable container available to catch spilled hydraulic fluid.

REMOVAL**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions and hydraulic tank relief valve is slowly loosened to relieve pressure. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

CAUTION

Always clean around fittings before disconnecting or connecting hoses or fittings. Ensure area is clean before installing hydraulic components. Failure to comply may result in damage to equipment.

Cover, cap, or plug all openings, ports, and tube or hose ends when they are disconnected. Failure to comply may result in damage to equipment.

Fittings must be installed and hand-tightened. If a fitting cannot be handtightened, it may be cross-threaded or have damaged threads. Use wrench only for final tightening. Failure to comply may result in damage to equipment.

Do not use Teflon tape as a sealer on any fittings. It can separate from the fittings and cause control valves, relief valves, and actuators to become contaminated and fail.

Do not apply sealant to the first threads of NPT fittings. If sealant enters the hydraulic system, it may cause components to fail.

REMOVAL - Continued**CAUTION**

When connecting a hose to a fitting, always use two wrenches. Use one wrench to turn the swivel nut onto the fitting, and use another wrench to keep the hose from rotating. If the hose rotates, it can loosen the other end of the hose or loosen the fitting at the other end.

NOTE

Tag all hoses and fittings prior to disconnecting to ease installation.

Hydraulic hoses must be capped and/or plugged when disconnecting to prevent contamination of hydraulic system.

1. Disconnect ten hydraulic hoses (3) from elbows (4).
2. Loosen swivel nut at opposite end of hydraulic hose (5).
3. Disconnect hydraulic hose (5) from tee pipe (6)
4. Disconnect hydraulic hose (7) from straight adapter (8).
5. Remove screw (9) and ground wire (10) from main valve assembly.
6. Remove two screws (1) from solenoid cover (2) and remove solenoid cover (2) from main valve assembly.

NOTE

Tag all electrical wires prior to disconnecting to ease installation.

7. Disconnect all wires from solenoids.
8. Remove straight adapter (8) from main valve assembly (13).
9. Remove plug (17) from main valve assembly (13).
10. Remove ten elbows (4) from main valve assembly (13).
11. Remove four flow restrictor valves and springs (18) from main valve ports (19).
12. Remove two screws (11) and lockwashers (12). Discard lockwashers.
13. Remove main valve assembly (13) from frame.
14. Remove pressure gauge (14) from straight adapter (15).
15. Remove straight adapter (15) from tee pipe (6).

REMOVAL - Continued

16. Remove tee pipe (6) from straight adapter (16).
17. Remove straight adapter (16) from main valve assembly (13).

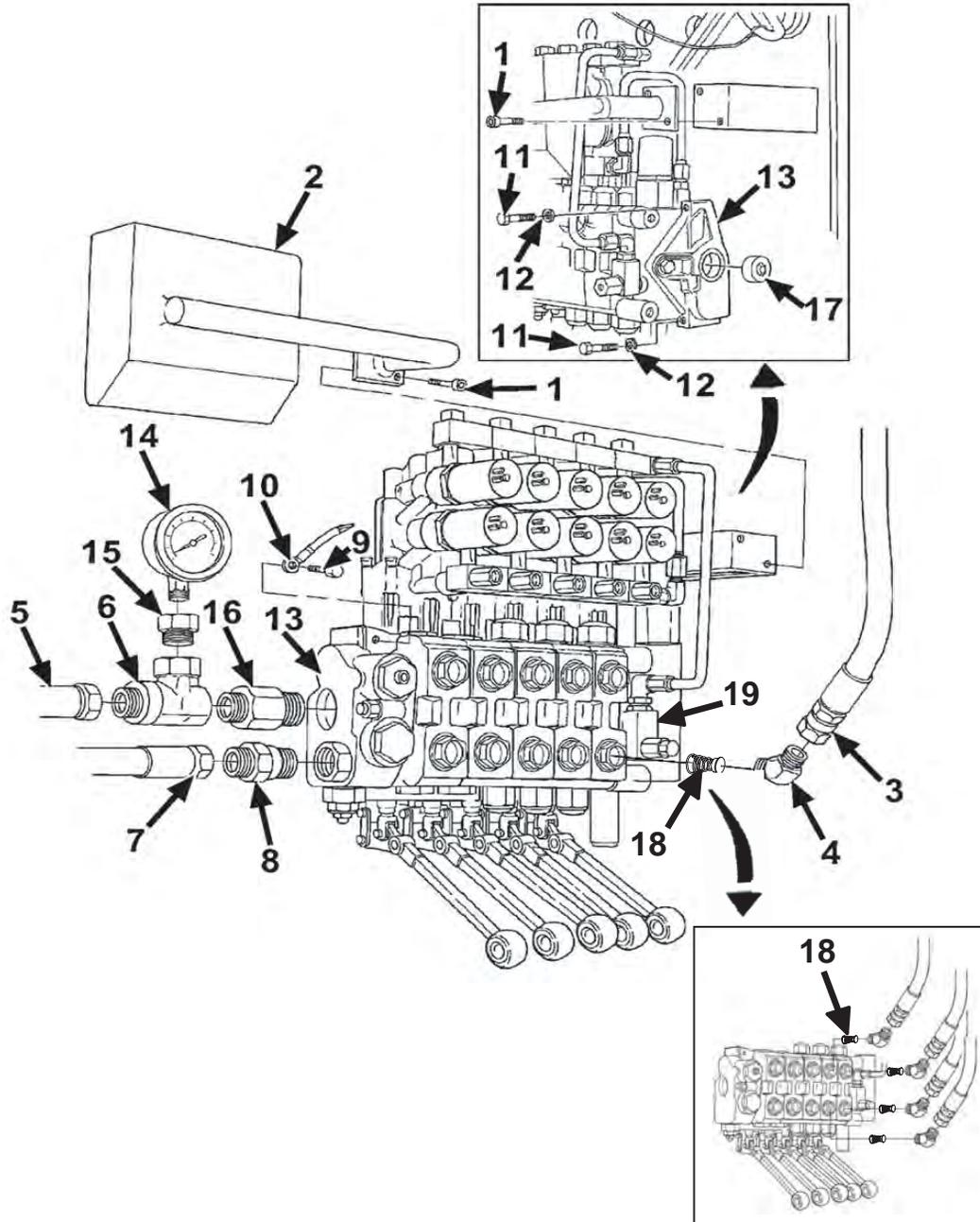


Figure 107. Hydraulic Control System

SOLENOID REMOVAL**NOTE**

Tag all electrical wires prior to disconnecting to ease installation.

1. Disconnect electrical connectors (1) from eleven solenoids (2).
2. Remove solenoids (2) from main valve assembly.

SOLENOID INSTALLATION

1. Install solenoids (2) in main valve assembly.
2. Connect electrical connectors (1) to solenoids (2).

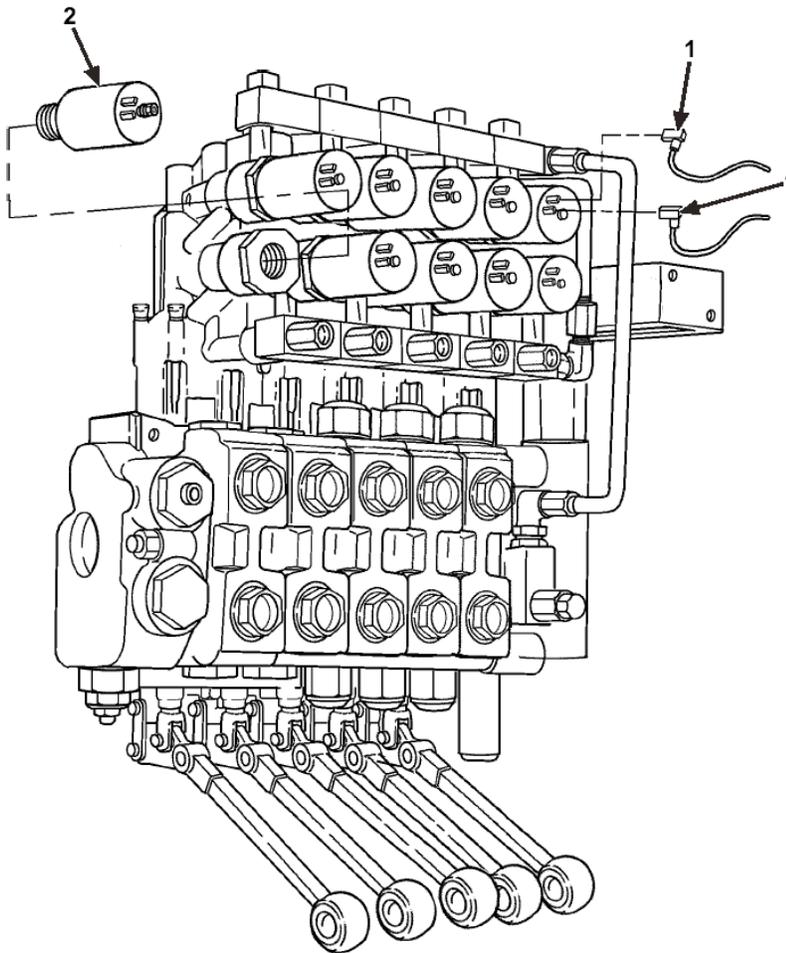


Figure 108. Main Valve Assembly

INSTALLATION**NOTE**

Hydraulic hoses must not be uncapped and/or unplugged until ready to connect to prevent contamination of hydraulic system.

Use sealing compound on all threads before installing fittings.

1. Install straight adapter (16) to main valve assembly (13).
2. Install tee pipe (6) to straight adapter (16).
3. Install straight adapter (15) to tee pipe (6).
4. Install pressure gauge (14) to straight adapter (15).
5. Install main valve assembly (13) to frame.
6. Install two screws (11) and new lockwashers (12).
7. Install four flow restrictor valves and springs (18) to main valve parts (19).
8. Install ten elbows (4) to main valve assembly (13).
9. Install plug (17) to main valve assembly (13).
10. Install straight adapter (8) to main valve assembly (13).
11. Connect all wires to solenoids.
12. Install two screws (1) to solenoid cover (2) and install solenoid cover (2) to main valve assembly.
13. Install screw (9) and ground wire (10) to main valve assembly.
14. Install hydraulic hose (7) to straight adapter (8).

INSTALLATION - Continued

15. Connect hydraulic hose (5) to tee pipe (6).
16. Tighten swivel nut at opposite end of hydraulic hose (5).
17. Connect ten hydraulic hoses (3) to elbows (4).

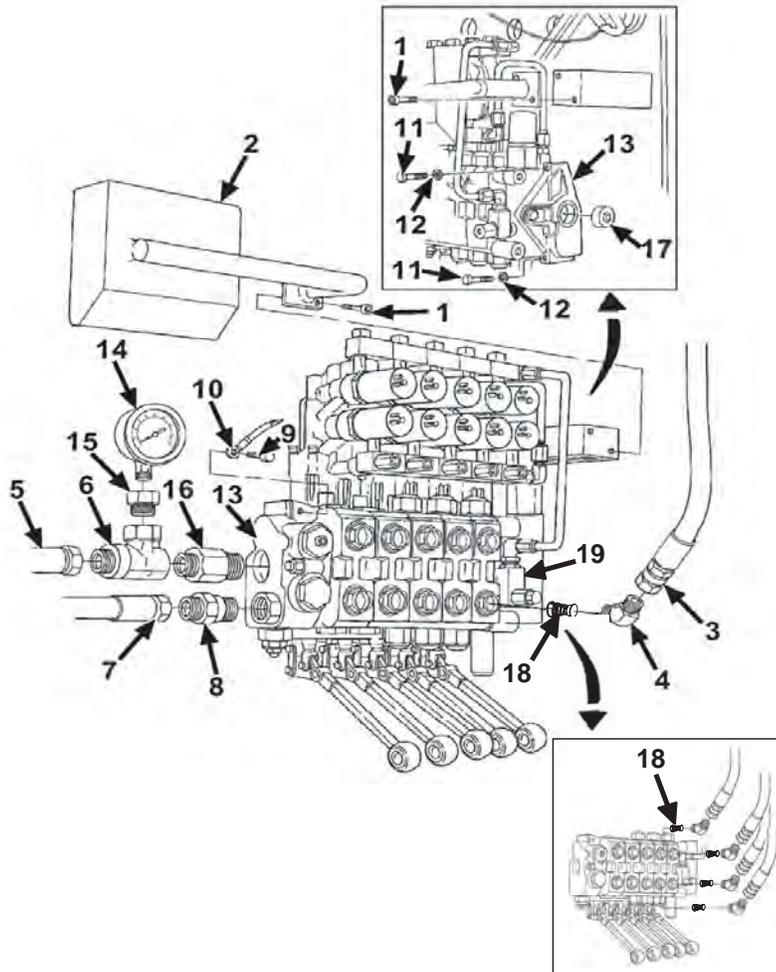


Figure 107. Hydraulic Control Assembly

Follow-on Tasks:

- Replace handles
- Connect batteries (WP 0050).
- Charge hydraulics (WP 0056 00-5).
- Check hydraulic fluid level (WP 0056 00-5).

END OF WORK PACKAGE

**HYDRAULIC VALVE CONTROL LEVER REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in coupling configuration (WP 0002).

Materials/Parts

Spring, retaining (15) (1105-1)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

None

REMOVAL**NOTE**

Handles can only be removed from left to right.

1. Remove retaining pin (1) and pin (2).
2. Remove retaining pins (3) and connecting links (4) and (5).
3. Remove control lever (6).

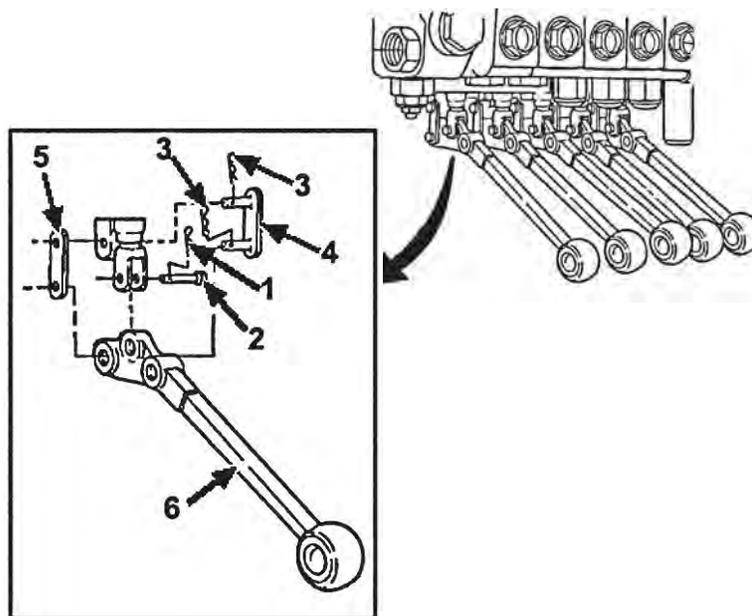


Figure 109. Hydraulic Control Lever

INSTALLATION**NOTE**

Handles can only be replaced from right to left.

1. Install control lever (6).
2. Install connecting links (4) and (5) and retaining pins (3).
3. Install retaining pin (1) and pin (2).

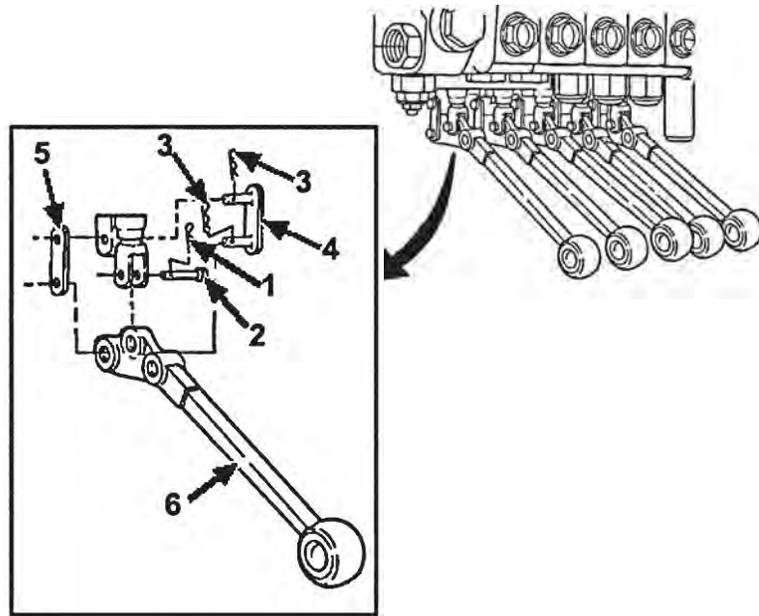


Figure 109. Hydraulic Control Lever

Follow-on Maintenance:

Check for proper operation

END OF WORK PACKAGE

**OIL FILTER ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

Washer, lock (2) (MS35333-40)

Tools/Test EquipmentTool Kit, Mechanics General,
NSN 5180-00-177-7033**General Safety Instructions**None

REMOVAL**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions and hydraulic tank relief valve is slowly loosened to relieve pressure. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

REMOVAL - Continued**NOTE**

Tag all hoses prior to disconnecting.

1. Remove hydraulic hose from tube to boss connector (1).
2. Remove hydraulic hose from multiple connector (2).
3. Remove tube to boss connector (1) from oil filter assembly (3).
4. Remove multiple connector (2) from oil filter assembly (3).
5. Remove oil filter assembly (3) from bracket (6) by removing two screws (4) and lockwashers (5) from bracket (6) and oil filter assembly (3). Discard lockwashers.

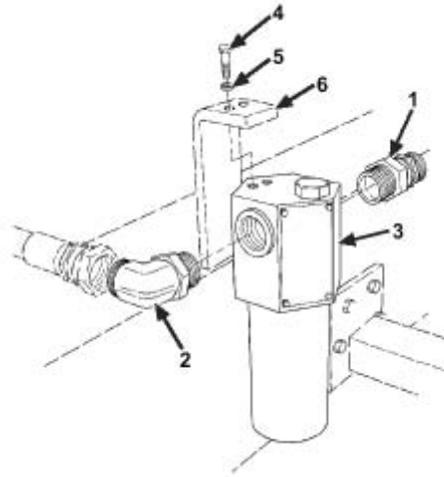


Figure 110. Oil Filter Assembly

NOTE

Use sealing compound on all threads before installing fittings.

INSTALLATION

1. Position oil filter assembly (3) on bracket (6) and secure with two screws (4) and new lockwashers (5).
2. Install multiple connector (2) to oil filter assembly (3).
3. Install tube to boss connector (1) to oil filter assembly (3).
4. Connect hydraulic hose to multiple connector (2).
5. Connect hydraulic hose to boss connector (1).

FILTER REMOVAL

1. Remove protective cover (1) from oil filter assembly.
2. Remove filter (2) from assembly.
3. Remove o-ring (3) from filter (2).
4. Discard o-ring and filter.

FILTER INSTALLATION

1. Install new o-ring (3) onto new filter (2).
2. Install filter (2) into assembly.
3. Install protective cover (1).

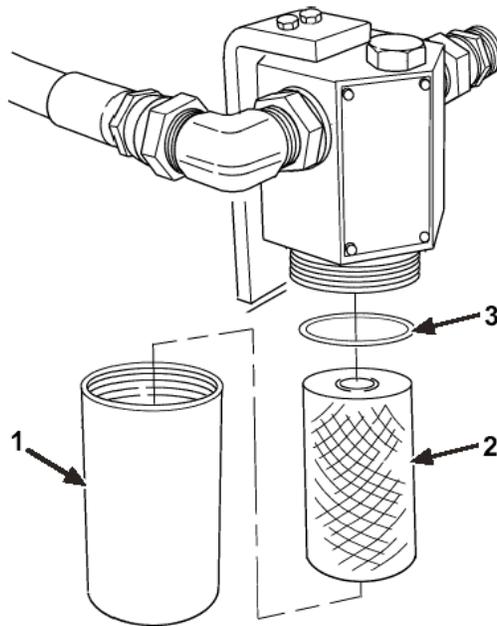


Figure 111. Oil Filter Assembly

Follow-on Tasks:

- Charge hydraulic system (WP 0056 00-5).
- Check oil level (see illustration, WP 0056 00-5).

END OF WORK PACKAGE

**CAM VALVE ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

Nut, self-locking (4) (90045A453)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

None

REMOVAL**WARNING**

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

NOTE

Hydraulic hose must be capped and/or plugged when disconnected to prevent contamination.

Tag all hoses prior to disconnecting.

REMOVAL - Continued

1. Remove hydraulic hose (1) from elbow (2).
2. Remove hydraulic hose (3) from straight adapter (4).
3. While relieving tension on spring (9), remove four screws (5), washers (6), and locknuts (7) from cam valve (8). Discard locknuts.
4. Remove cam valve (8) from mast.
5. Remove spring (9) from cam valve (8).
6. Remove elbow (2) from cam valve (8).
7. Remove straight adapter (4) from cam valve (8).

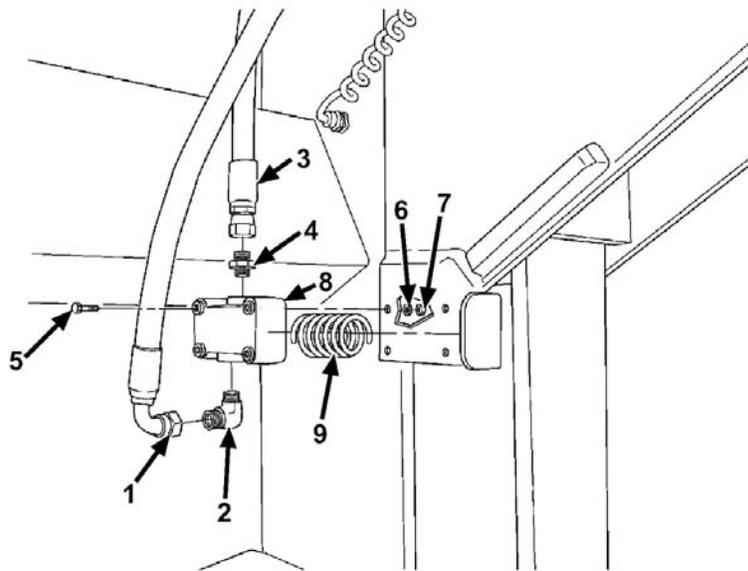


Figure 112. Cam Valve Assembly

INSTALLATION**NOTE**

Use sealing compound on all threads before installing fittings.

1. Install straight adapter (4) on cam valve (8).
2. Install elbow (2) on cam valve (8).
3. Install spring (9) on cam valve (8).
4. While applying tension to spring (9), position cam valve (8) on mast and secure with four screws (5), washers (6), and new locknuts (7).
5. Install hydraulic hose (3) to straight adapter (4).
6. Install hydraulic hose (1) to elbow (2).

Follow-on Tasks:

- Charge hydraulics (WP 0056 00-5).
- Check oil level (illustration, WP 0056 00-5).

END OF WORK PACKAGE

HYDRAULIC CYLINDER (MAIN FRAME TO MAST) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in
Storage Configuration B (WP 0002)
Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

Pin, retaining, upper (2) (1036-1)
Pin, retaining, lower (2) (1035-1)
Tie, wire (item 18, WP 0085)
Tag, marker (item 15, WP 0085)
Sealing compound (item 12, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033
A suitable lifting device for 48 lbs (21.8 kg)

Personnel Required: 2**General Safety Instructions**

None

REMOVAL**WARNING**

Ensure hydraulic protection valve is open (breather switch inline with breather) prior to operating hydraulics. Failure to comply could cause injury or death to personnel or damage to equipment.

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

While operating or performing maintenance on any hydraulic systems, never place personnel or equipment in a potentially hazardous position (i.e., between moving parts or under hydraulic supported equipment). Failure to comply may result in injury or death to personnel.

NOTE

All hydraulic hoses must be capped and/or plugged when disconnecting to prevent contamination of hydraulic system.

Cut plastic ties as needed. Note location of plastic ties and hydraulic hoses prior to removal.

The following procedures are for the removal of the main frame to mast cylinders. Adjust maintenance steps performed to accommodate the required maintenance.

REMOVAL - Continued

1. Remove hydraulic hose from elbow (1).
2. Remove hydraulic hose from tee fitting (2) and upper safety valve (12).
3. Remove hydraulic hoses from elbows (3).
4. Remove hydraulic hose (4) from cylinder (5).
5. Remove tee fitting (2) from straight adapter (6).
6. Remove straight adapter (6) from cylinder (7).
7. Remove elbows (3) from cylinders (5 and 7).
8. Loosen two screws (8) and remove retaining pin (9).
9. Using a suitable lifting device and two personnel, lower cylinder assembly (5 or 7) to mast. It may be necessary to release some pressure from the cylinder to allow the cylinder to collapse enough to clear the mounts.
10. Loosen two screws (10) and remove retaining pin (11).
11. Remove cylinder assembly.
12. Repeat steps 8 through 11 for remaining main frame to mast cylinder assembly.

INSTALLATION

1. Using a suitable lifting device and two personnel, position bottom of cylinder assembly in bracket and secure with retaining pin (11).
2. Tighten two screws (10).
3. Raise cylinder assembly and install retaining pin (9).
4. Tighten two screws (8).
5. Repeat steps 1 through 4 for remaining main frame to mast cylinder assembly.

NOTE

Use sealing compound on all threads before installing fittings.

All hydraulic hoses must not be recapped and/or unplugged until connecting to prevent contamination of hydraulic system.

Replace plastic ties as needed.

INSTALLATION - Continued

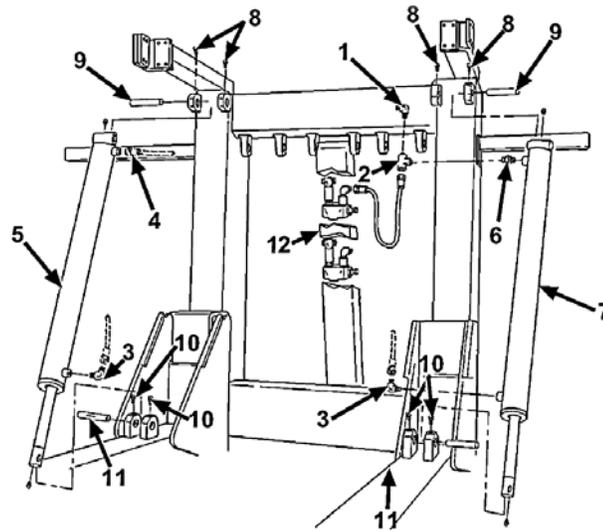


Figure 113. Hydraulic Cylinder (Main Frame to Mast)

6. Install elbows (3) on cylinders (5 and 7).
7. Install straight adapter (6) on cylinder (7).
8. Install tee fitting (2) on straight adapter (6).
9. Install elbow (1) on tee fitting (2).
10. Install hydraulic hose (4) on cylinder(5).
11. Install hydraulic hoses on elbows (3).
12. Install hydraulic hose on tee fitting (2) and upper safety valve (12).
13. Install hydraulic hose on elbow (1).

Follow-on Tasks:

- Charge hydraulics (WP 0056 00-5).
- Check reservoir fluid levels and adjust level as required (WP 0056 00-5).

END OF WORK PACKAGE

**HYDRAULIC CYLINDER (MAST TO BOOM) REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in loading configuration (WP 0002).
Hydraulic pressure relieved (WP 0056 00-5).

Materials/Parts

None

Personnel Required: 2

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033
A suitable lifting device for 115 lbs (53 kg)

General Safety Instructions

None

REMOVAL**WARNING****HYDRAULICS**

Ensure hydraulic protection valve is open (breather switch in line with breather) prior to operating hydraulics. Failure to comply could cause injury or death to personnel or damage to equipment.

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

NOTE

Hydraulic hoses should be capped and/or plugged when disconnecting to prevent contamination of hydraulic system.

The following procedures are for removal of both mast to boom cylinders. Adjust maintenance steps as necessary to achieve required maintenance.

REMOVAL - Continued

1. Disconnect hydraulic hose from elbow (1).
2. Disconnect two hydraulic hoses from tee fitting (2).
3. Disconnect hydraulic hoses from elbows (3 and 4).
4. Loosen two lower retaining pin screws and remove the lower retaining pin from the center mast frame (WP 0073, steps 3 and 4). Rotate center mast frame to the rear until the boom cylinder upper retaining pin has clearance to be removed.
5. Loosen two screws (5) and remove retaining pin (6).
6. Using a suitable lifting device, lower cylinder assembly (7) to boom. It may be necessary to release some pressure from the cylinder to allow the cylinder to collapse enough to clear the mast upper frame.
7. Loosen two screws (8) and remove retaining pin (9).
8. Remove cylinder assembly (7) from towing device.
9. Repeat steps 4 through 7 for remaining cylinder assembly (10).
10. Remove tee fitting (2) from straight adapter (11).
11. Remove straight adapter (11) from cylinder assembly (7).
12. Remove elbow (3) from cylinder assembly (7).
13. Remove elbow (1) from cylinder assembly (10).
14. Remove elbow (4) from cylinder assembly (10).

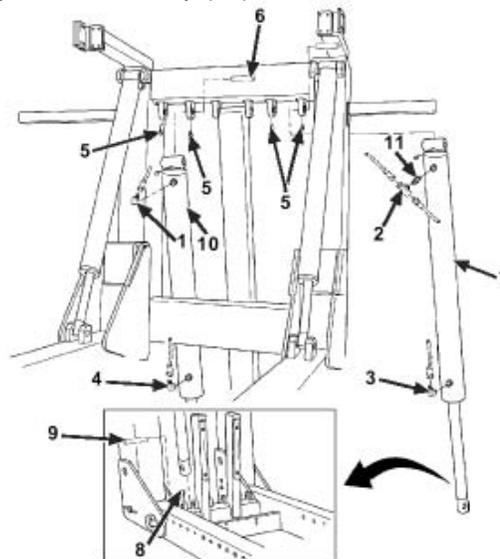


Figure 114. Hydraulic Cylinder (Mast to Boom)

INSTALLATION**NOTE**

Use sealing compound on all threads before installing fittings.

1. Install elbow (4) on cylinder assembly (10).
2. Install elbow (1) on cylinder assembly (10).
3. Install elbow (3) on cylinder assembly (7).
4. Install straight adapter (11) on cylinder assembly (7).
5. Install tee fitting (2) on straight adapter (11).
6. Using a suitable lifting device, position bottom of cylinder assembly (7) on boom and secure with retaining pin (9) and tighten two screws (8).
7. Raise cylinder assembly (7) to mast and secure with retaining pin (6) and tighten two screws (5).
8. Repeat steps 6 and 7 for remaining cylinder assembly (10).
9. Rotate center mast frame forward and install lower mast retaining pin in center mast and tighten two lower retaining pin screws (WP 0073, steps 1 and 2).
10. Connect hydraulic hoses to elbows (3 and 4).
11. Connect two hydraulic hoses to tee fitting (2).
12. Connect hydraulic hose to elbow (1).

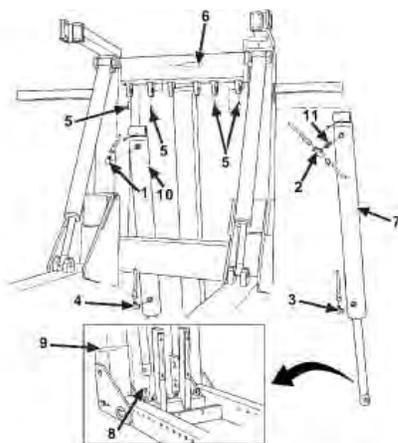


Figure 114. Hydraulic Cylinder (Mast to Boom)

Follow-on Tasks:

- Charge hydraulics (WP 0056 00-5).
- Check reservoir fluid level and adjust level as required (WP 0056 00-5).

END OF WORK PACKAGE

**HYDRAULIC RESERVOIR FITTINGS REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Hydraulic pressure relieved (WP 0056 00-5).
- Hydraulic reservoir drained (WP 0056 00-5).

Materials/Parts

Sealing compound (item 12, WP 0085)

Tools/Test EquipmentTool Kit, Mechanics General,
NSN 5180-00-177-7033**General Safety Instructions**None

REMOVAL**WARNING**

High pressure is present in the 250M Fifth Wheel Towing Device hydraulic system. Do not disconnect any hydraulic system component unless hydraulic system pressure has been relieved. Ensure each hydraulic control lever is moved several times through all positions. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in bowl area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

CAUTION

Hydraulic hoses must be capped and/or plugged when disconnected to avoid contamination.

REMOVAL - Continued

1. Remove hydraulic motor hose (1) from compression fitting (2).
2. Remove compression fitting (2) from tee fitting (3).
3. Remove tee fitting (3) from hydraulic reservoir (4).
4. Remove hose from elbow (5) and remove elbow (5) from hydraulic reservoir (4).
5. Remove pressure relief valve assembly (6) from top of hydraulic reservoir (4).
6. Remove breather (7) from tee fitting (8).
7. Remove pressure relief valve (9) from tee fitting (8).
8. Remove tee fitting (8) from straight adapter (10).
9. Remove straight adapter (10) from bushing (11).
10. Remove pressure relief valve assembly (6) from bottom of hydraulic reservoir (4).
11. Remove elbow fitting (12) from breather (7).
12. Remove drain plug (13) from hydraulic reservoir (4).

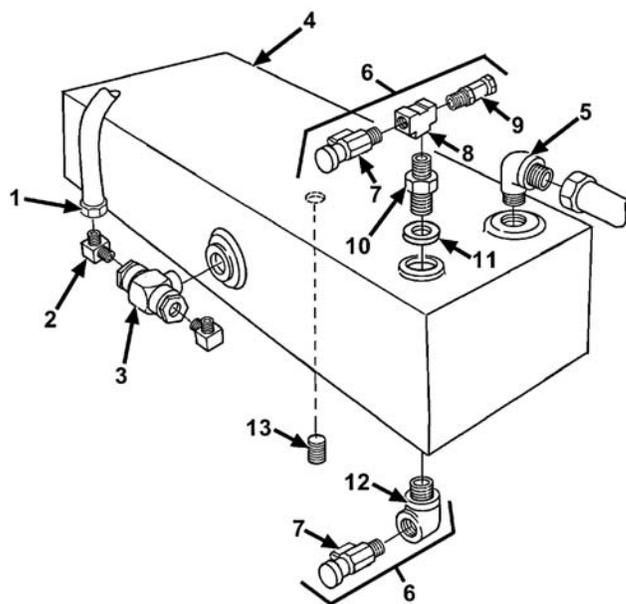


Figure 115. Hydraulic Reservoir Fittings Assembly

INSTALLATION**CAUTION**

Hydraulic hoses must NOT be uncapped and/or unplugged until ready to make connection.

NOTE

Use sealing compound on all threads before installing fittings.

1. Install drain plug (13) in hydraulic reservoir (4).
2. Install breather (7) on elbow fitting (12).
3. Install pressure relief valve assembly (6) on bottom of hydraulic reservoir (4).
4. Install bushing (11) on straight adapter (10).
5. Install tee fitting (8) on straight adapter (10).
6. Install pressure relief valve (9) on tee fitting (8).
7. Install breather (7) on tee fitting (8).
8. Install pressure relief valve assembly (6) on top of hydraulic reservoir (4).

INSTALLATION - Continued

9. Install elbow (5) on hydraulic reservoir (4) and install hose on elbow (5).
10. Install tee fitting (3) on hydraulic reservoir (4).
11. Install compression fittings (2) on tee fitting (3).
12. Install hydraulic motor hose (1) on compression fitting (2).

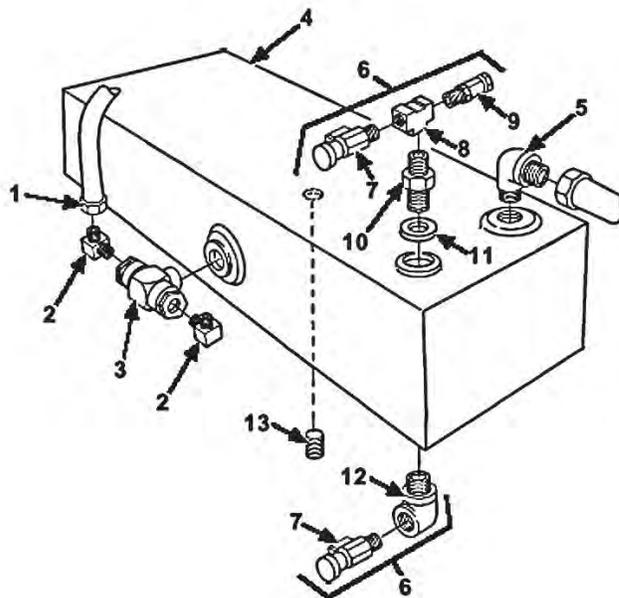


Figure 115. Hydraulic Reservoir Fittings Assembly

Follow-on Tasks:

- Fill hydraulic reservoir (WP 0056 00-5).
- Charge hydraulic system (WP 0056 00-5).
- Test hydraulic system for leaks (WP 0056 00-5).

END OF WORK PACKAGE

**BOOM EXTENSION CYLINDER REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:

Equipment Conditions

Hydraulic pressure relieved (WP 0056 00-5).
Fifth Wheel Towing Device in storage configuration (WP 0002).

Materials/Parts

Pin, roll (4) (98296A255)
Sealant, (item 11, WP 0085)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033
Cylinder Alignment Tool (supplied with cylinder)

Personnel Required: 2

General Safety Instructions

None

REMOVAL

1. BOOM RETRACT to raise boom to approximately 45° angle to allow for removal of slip pad.

NOTE

Use adequate support to prevent accidental collapse of boom.

Place rubber blocks under mast for support.

Mark hoses prior to removal.

Hydraulic hoses must be capped and/or plugged when disconnected to avoid contamination.

Cylinder alignment tool will aid in removal of retaining pin.

2. Remove four screws (1) from bottom of boom and remove slip pad (2).
3. BOOM EXTEND to lower boom to ground.

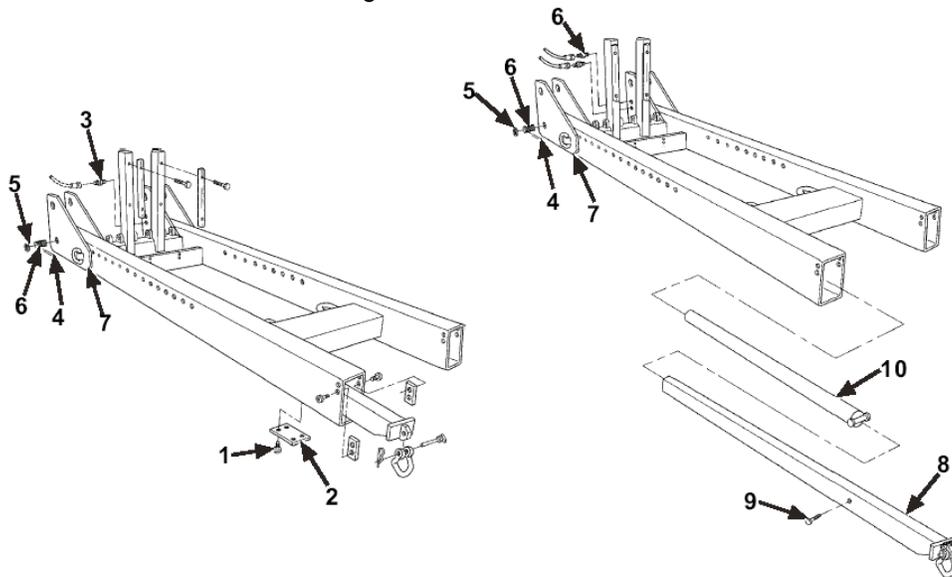


Figure 116. Boom Extension Cylinder Assembly

REMOVAL - Continued

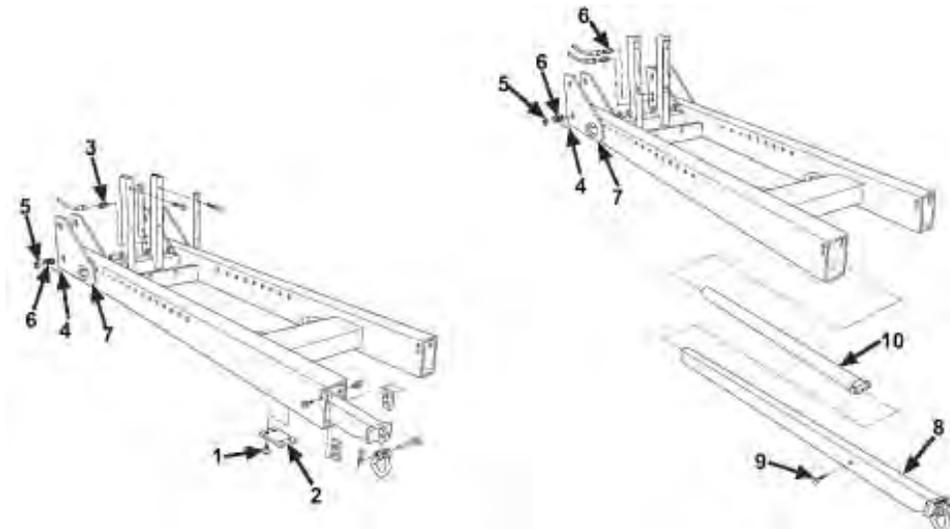


Figure 116. Boom Extension Cylinder Assembly

**WARNING**

With power off, position control levers to the EXTEND and RETRACT positions to relieve hydraulic pressure before removing hoses. Failure to comply may result in severe injury or death to personnel.

Spilled hydraulic oil is very slippery. Be careful when entering or working in area. Wipe up any spilled oil immediately. Failure to comply may result in severe injury or death to personnel.

4. Remove hydraulic hoses from two fittings (3).
5. Remove fittings (3) from cylinder.
6. Remove one roll pin (4) and flatwasher (5) from retaining pin (6). Discard roll pin.
7. Remove retaining pin (6) from boom extension assembly (7).

CAUTION

Boom extension assemblies are heavy and require the aid of an assistant to remove/install.

8. Remove boom extension (8) from boom.
9. Remove two screws (9) from boom extension (8) and remove cylinder (10) from boom extension (8).

INSTALLATION**CAUTION**

Boom extension assemblies are heavy and require the aid of an assistant to remove/install.

1. Install cylinder (10) in boom extension (8) and secure with two screws (9).
2. Install boom extension (8) in boom and secure with retaining pin (6), new roll pin (4), and flatwasher (5).
3. Using the cylinder alignment tool, align cylinder to install fittings (3).
4. Install retaining pin (6) through boom extension assembly (7) and secure with flatwasher (5) and new retaining pin (4).
5. Install hydraulic hoses on two fittings (3).
6. BOOM RETRACT to raise boom to approximately 45° angle to allow for installation of slip pad.
7. Position slip pad (2) and secure with four screws (1).

Follow-on Tasks:

Charge hydraulics (WP 0056 00-5).

END OF WORK PACKAGE

GENERAL HYDRAULIC SYSTEM REPAIR

GENERAL

This section provides information for performing Unit level body repairs on the 250M fifth wheel towing device.

END OF WORK PACKAGE

RECEIVER AND WHEEL STOP ASSEMBLY REPLACEMENT

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in coupling configuration (WP 0002).

Tools/Test Equipment

None

Materials/Parts

- Pins, split (4) (98296A255)
- Pins, split (4) (98296A559)

Personnel Required 2**General Safety Instruction**

None

NOTE

There is a driver side and a passenger side receiver. Both are removed the same way.

REMOVAL

1. Remove spring pin (1) from hitch pin (2) and remove hitch pin (2) and wheel stop (3) from receiver (4).
2. Remove split pins (5) from tee bolts (6) and (7).
3. Remove tee bolts (6) and (7) by turning in toward receiver (4).
4. Lift handle (8) and remove receiver (4) from boom.

REMOVE WHEEL STOP HANDLE

1. Remove split pin (9) from rod (10).
2. Remove handle (8) from wheel stop handle assembly.

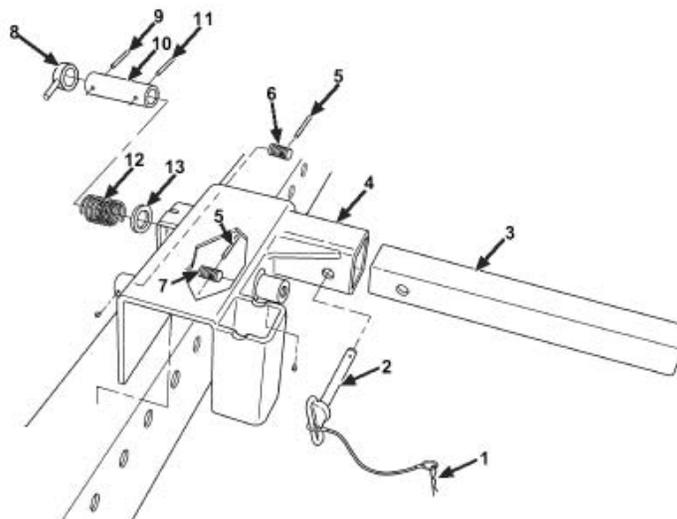


Figure 117. Receiver and Wheel Stop

REMOVAL WHEEL STOP HANDLE - Continued

- (3) Remove split pin (11) from rod (10).
- (4) Remove rod (10) from wheel stop handle assembly and spring (12).
- (5) Remove spring (12) and washer (13) from wheel stop handle assembly.

INSTALL WHEEL STOP HANDLE

- (1) Position spring (12) and washer (13) in wheel stop handle assembly.
- (2) Install rod (10) through wheel stop handle assembly and spring (12) and secure with split pin (11).
- (3) Position handle (8) on wheel stop handle assembly and secure with split pin (9).

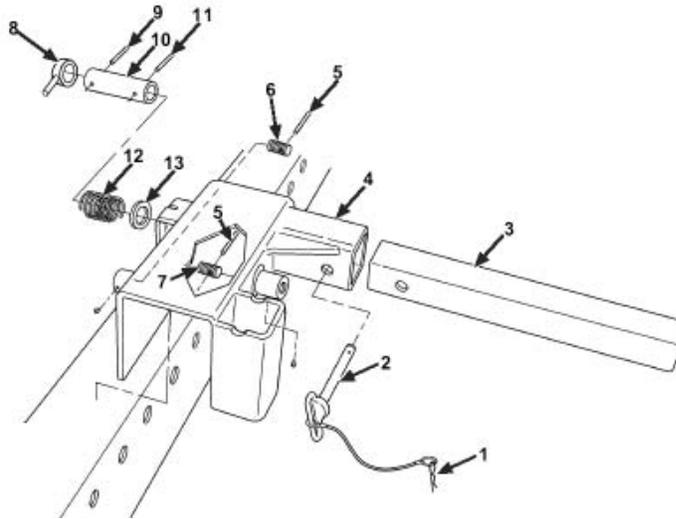


Figure 117. Receiver and Wheel Stop

INSTALLATION**NOTE**

There is a driver side and a passenger side receiver. Both are installed the same way.

- (1) Position receiver (4) on boom and lock handle (8).
- (2) Install tee bolt (7) and tee bolt (6) on receiver (4).
- (3) Install split pins (5) onto tee bolts (6) and (7).
- (4) Position wheel stop (3) on receiver (4) and secure with spring pin (1) and hitch pin (2).

Follow-on Tasks:

Check for proper operation.

END OF WORK PACKAGE

**MUD FLAP REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions:**

Fifth Wheel Towing Device in coupling configuration (WP 0002).

Materials/Parts:

Washer, Lock (7) (MS35333-40)

Tools/Test Equipment:

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions:

None

REMOVAL

1. Remove nuts (3), five flatwashers (1), and lockwashers (2) from underneath fender (4). Discard lockwashers.
2. Loosen screws (6) and remove mudflap (5).
3. Repeat steps 1 and 2 for remaining side mudflap mounting hardware.

INSTALLATION

1. Position mud flap (5) on fender (4).
2. Line up holes on mudflap (5) with screws (6) in mounting bracket (7).
3. Secure with flatwashers (1), new lockwashers (2), and nuts (3).
4. Repeat step 1 through 3 for remaining mud flap.

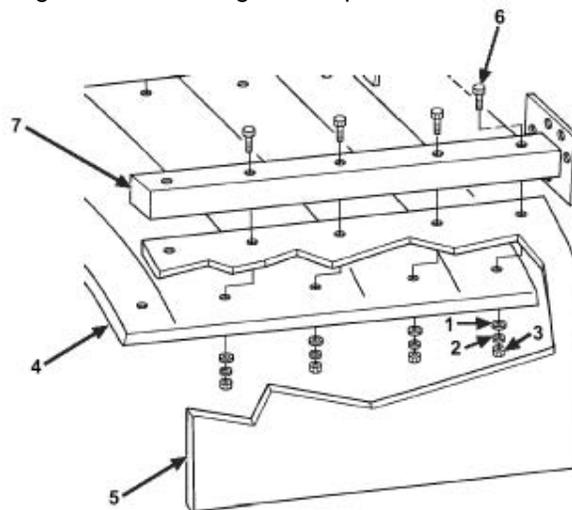


Figure 118. Mud Flap Assembly

Follow-on Tasks:

None

END OF WORK PACKAGE

**FENDER REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions:**

- Fifth Wheel Towing Device in coupled configuration (WP 0002).
- Gladhand assembly removed if required (WP 0053).
- Air brake hoses removed if required (WP 0055).
- Air brake protection valve removed if required (WP 0054).
- 12/24 volt junction box removed if required (WP 0043).
- Electric control box removed if required (WP 0044).
- Worklight assembly removed if required (WP 0047).
- Tool box removed if required (WP 0071).
- Tow bar assembly removed if required (WP 0009).

Materials/Parts:

Washer, Lock (15) (MS35333-40)

Tools/Test Equipment:Tool Kit, Mechanics General,
NSN 5180-00-177-7033**General Safety Instructions:**None

FENDER REMOVAL**NOTE**

Note location of mounting hardware prior to removal.

1. Remove nuts (3), lockwashers (2), and flatwashers (1) from underneath fender (4). Discard lockwashers.
2. Drop fender from mounting brackets.

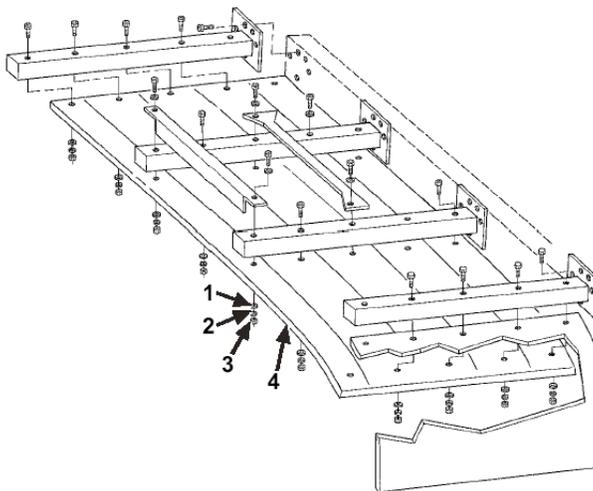


Figure 119. Fender with Mounting Brackets

FENDER MOUNTING BRACKET REMOVAL

1. Remove five bolts (1) from mounting bracket (2) and remove mounting bracket from frame (3).
2. Repeat step 2 for remaining mounting brackets.

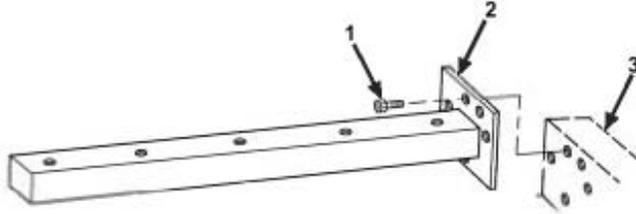


Figure 120. Fender Mounting Bracket

FENDER MOUNTING BRACKET INSTALLATION

1. Position mounting bracket (2) on frame (3) and secure with five bolts (1).
2. Repeat step 1 for remaining mounting brackets.

FENDER INSTALLATION

Position fender to mounting brackets. Secure fender (4) using bolts (5), flat washers (1), new lockwashers (2), and nuts (3).

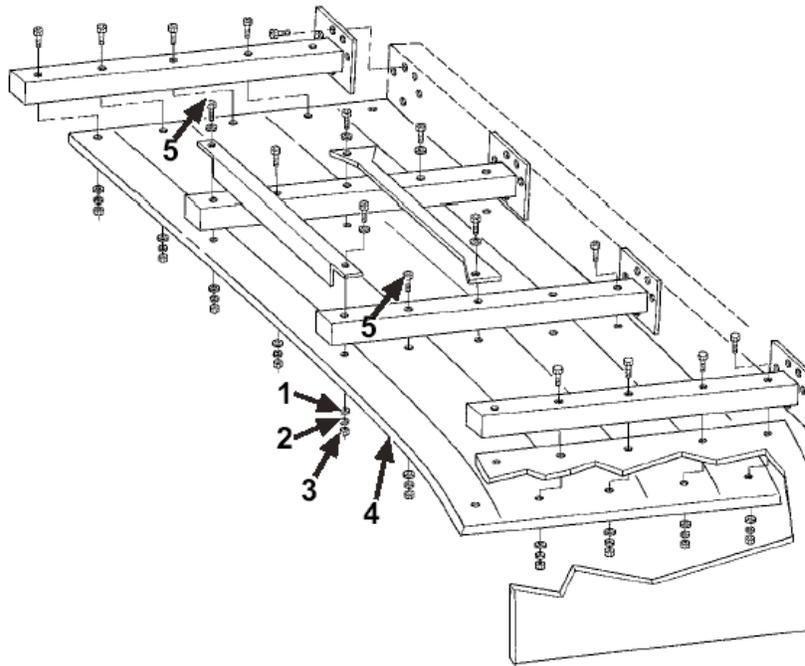


Figure 119. Fender with Mounting Brackets

Follow-on Tasks:

- Install tow bar assembly if removed (WP 0008).
- Install tool box if removed (WP 0071).
- Install worklight assembly if removed (WP 0047).
- Install electric control box if removed (WP 0044).
- Install 12/24 volt junction box if removed (WP 0043).
- Install air brake protection valve if removed (WP 0054).
- Install air brake hoses if removed (WP 0055).
- Install gladhand assembly if removed (WP 0053).
- Test air brake assembly for leaks if required (WP 0054).

END OF WORK PACKAGE

**TOOL BOX REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Parked on level ground.

Tools/Test Equipment

- Tool Kit, Mechanics General, NSN 5180-00-177-7033
- Shop Equipment, Common Set No. 1, NSN 4910-00-754-0654

Materials/Parts

- Washer, lock (16) (MS35333-40)
- Plastic strip (31 inches)(MS200SER-8-31)
- Weather strip (13 inches) (93695K-13)

General Safety Instructions

CARC paint debris may be hazardous during removal. Use extreme care when cutting or grinding on metal surfaces.

REMOVAL



WARNING
CARC PAINT

CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

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.

DO NOT let skin or eyes come in contact with CARC paint. Always wear protective equipment (gloves, ventilation mask, safety goggles, etc.).

DO NOT use CARC paint without adequate ventilation. Failure to comply may result in death or injury to personnel.

NEVER weld or cut CARC-coated materials. Failure to comply may result in death or injury to personnel.

DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use. Failure to comply may result in death or injury to personnel.

BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected. Failure to comply may result in death or injury to personnel.

1. Remove six screws (1), flatwashers (2), flatwashers (3), lockwashers (4), and nuts (5), securing tool box (6) to fender. Discard lockwashers.
2. Remove tool box from fender.
3. Remove weather strip (7) from tool box door (8). Discard weather strip.
4. Repeat step 3 for remaining tool box door.

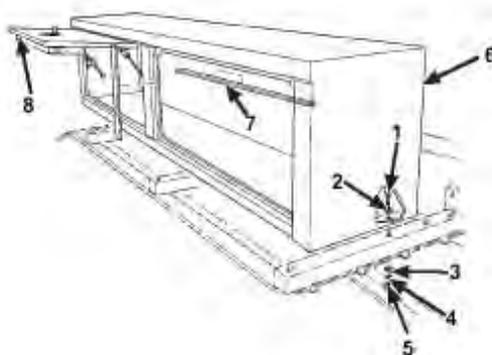


Figure 121. Tool Box

HINGE ASSEMBLY REMOVAL

1. Remove 1 inch screw (1), lockwasher (2), and nut (3) from hinge mounting bracket (4) and tool box door (5). Discard lockwasher.
2. Remove 3/4 inch screw (6), lockwasher (2), and nut (3) from hinge mounting bracket (4) and tool box door (5). Discard lockwasher.
3. Remove weather strip (7) from tool box. Discard weather strip.
4. Remove two screws (8), lockwashers (9), and nuts (10) from hinge mounting bracket (4) and tool box. Discard lockwashers.
5. Remove hinge assembly from tool box.
6. Repeat steps 1 through 5 for remaining hinge assemblies.

HINGE ASSEMBLY INSTALLATION

1. Position hinge mounting bracket (4) on tool box and secure with two screws (8), new lockwashers (9), and nuts (10).
2. Install new weather strip (7).
3. Position hinge mounting bracket (4) on tool box door (5) and secure with 3/4 inch screw (6), 1 inch screw (1), new lockwashers (2), and nuts (3).
4. Repeat steps 1 through 3 for remaining hinge assemblies.

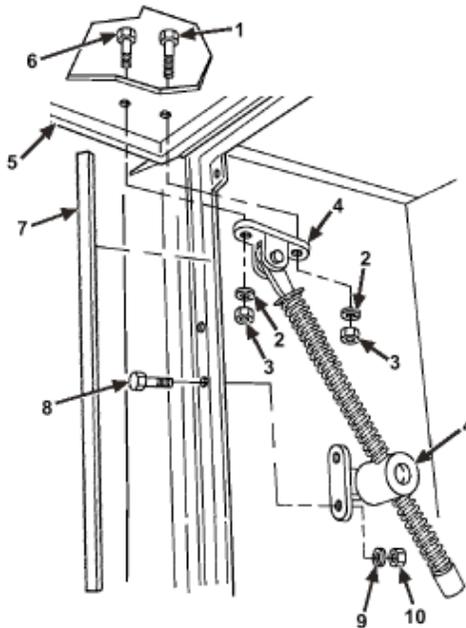


Figure 122. Hinge Assembly for Tool Box

INSTALLATION

1. Install new weather strip (7).
2. Repeat step 1 for remaining tool box door (8).
3. Position tool box (6) on fender and secure with six screws (1), flatwashers (2), flatwashers (3), new lockwashers (4), and nuts (5).

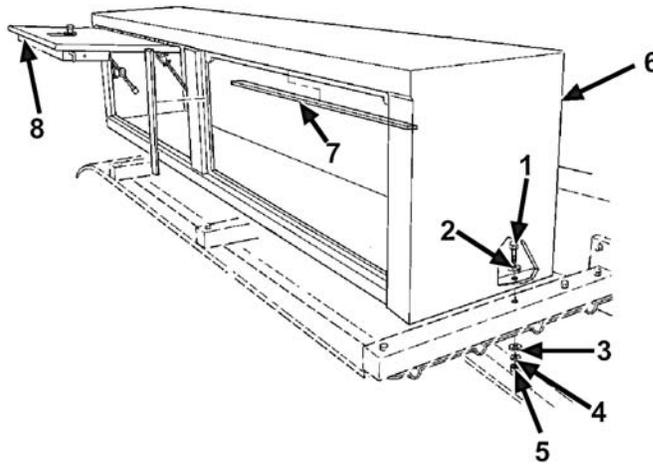


Figure 121. Tool Box

Follow-on Tasks:

None.

END OF WORK PACKAGE

MAST FRAME ASSEMBLY PIVOT PIN REPLACEMENT

INITIAL SETUP:**Equipment Conditions:**

Fifth Wheel Towing Device in storage configuration (WP 0002).

Materials/Parts:

Nut, self-locking (4) (MS17830-6C)

Personnel Required: 2

Tools/Test Equipment :

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions:

None

REMOVAL**NOTE**

There are two mast frame assembly pivot pins. Both are removed the same way.

1. Remove two screws (1) and locknuts (2) from pivot pin (3).
2. Remove pivot pin (3) from mast frame (4) and boom assembly (5).

INSTALLATION

1. Position boom assembly (5) on mast frame (4) to align holes and insert pivot pin (3).
2. Secure pivot pin (3) with two screws (1) and new locknuts (2).

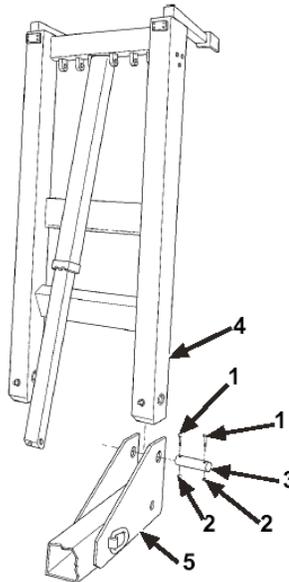


Figure 123. Pivot Pin Replacement Assembly

Follow-on Tasks:

None.

END OF WORK PACKAGE

**CENTER MAST FRAME REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

- Fifth Wheel Towing Device in coupling configuration (WP 0002).
- Safety valves removed (WP 0058).

Materials/Parts

None

Personnel Required: 2

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

When removing/installing heavy components, use appropriate lifting device and/or the aid of an assistant to prevent injury.

REMOVAL**WARNING**

To avoid personal injury, use a hoist or get assistance when lifting components that weigh more than 50 lbs (23 kg).

1. Loosen two screws (1) and remove retaining pin (2).
2. Lower center mast (3) to boom.
3. Loosen two screws (4) and remove retaining pin (5).
4. Remove center mast (3) from frame.

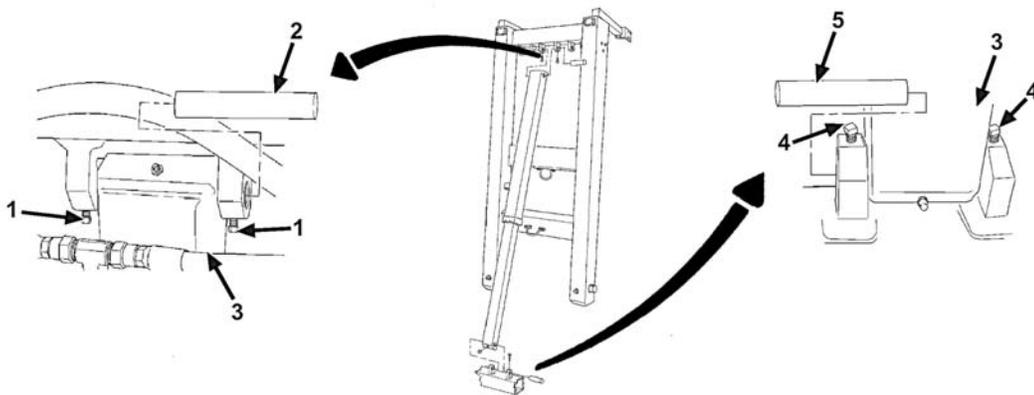


Figure 124. Center Mast Frame

INSTALLATION

1. Position lower portion of center mast (3) on frame and insert retaining pin (5).
2. Tighten two screws (4).
3. Raise center mast to align top portion with frame.
4. Insert retaining pin (2) and tighten two screws (1).

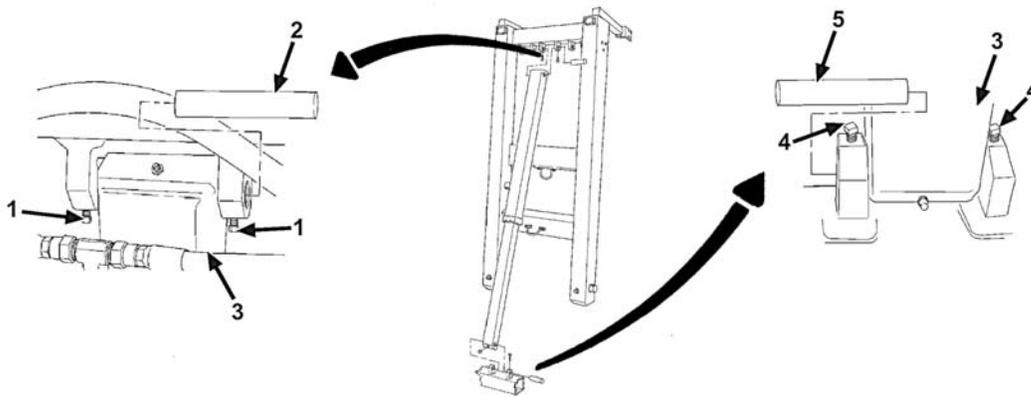


Figure 124. Center Mast Frame

Follow-on Tasks:

None.

END OF WORK PACKAGE

**BUMPER PAD, SLIP PAD REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in storage configuration (WP 0002).

Materials/Parts

None

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

None

BUMPER PAD REMOVAL

1. Remove two screws (1) from bumper pad (2) and remove bumper pad from boom assembly (3).
2. Repeat for remaining bumper pad.

BUMPER PAD INSTALLATION

1. Position bumper pad (2) on boom assembly (3) and secure with two screws (1).
2. Repeat for remaining bumper pad.

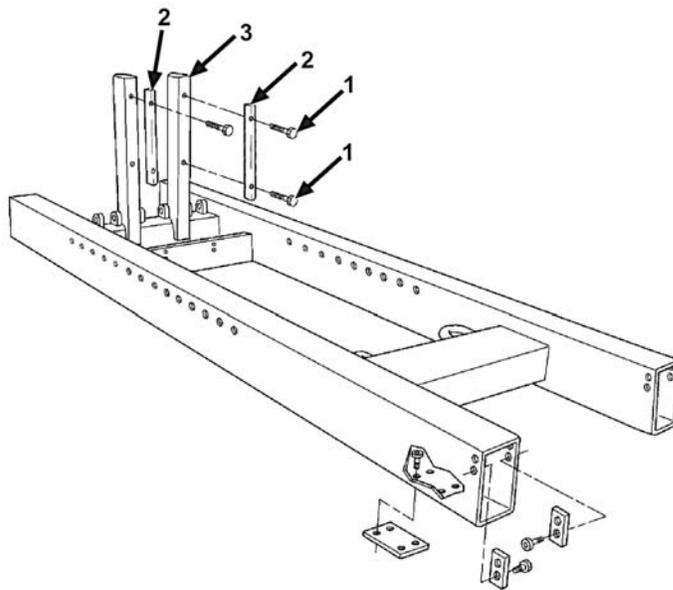


Figure 125. Bumper Pad

SLIP PAD REMOVAL**NOTE**

All slip pads are removed/installed the same way.

Remove four screws (1) and remove slip pad (2) from frame.

SLIP PAD INSTALLATION

Position slip pad (2) on frame and secure with four screws (1).

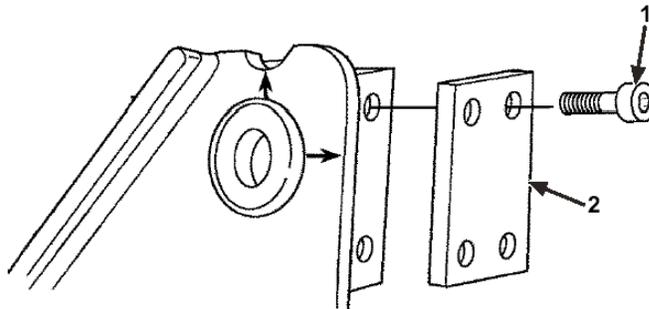


Figure 126. Slip Pad

Follow-on Tasks:

None.

END OF WORK PACKAGE

**TRANSPORT LEG ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION**

INITIAL SETUP:**Equipment Conditions**

Fifth Wheel Towing Device in coupling configuration (WP 0002).

Materials/Parts

- Pin, spring (9) (98296A255)
- Washer, lock (4) (12290S-513-C)
- Nut, self-locking (4) (MS4913/1-8FG5C)

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

General Safety Instructions

None

REMOVAL**NOTE**

Removal and installation steps may be adjusted to accommodate the required maintenance task.

1. Remove screw (1), lockwasher (2), and flatwasher (3) from mounting bracket (4) and remove mounting bracket (4) from transport leg bar (5).
2. Repeat step 1 for remaining mounting bracket.
3. Remove transport leg assembly from fifth wheel towing device.
4. Remove ball knob (6) from handle (7).
5. Remove screw (8) and spring pin (9) and remove handle (7) from transport leg bar (5). Discard spring pin.
6. Remove spring pin (10) and flatwasher (11) from retaining pin (12). Discard spring pin.
7. Remove retaining pin (12) from leg frame (13) and support foot (14). Remove support foot (14) from leg frame (13).

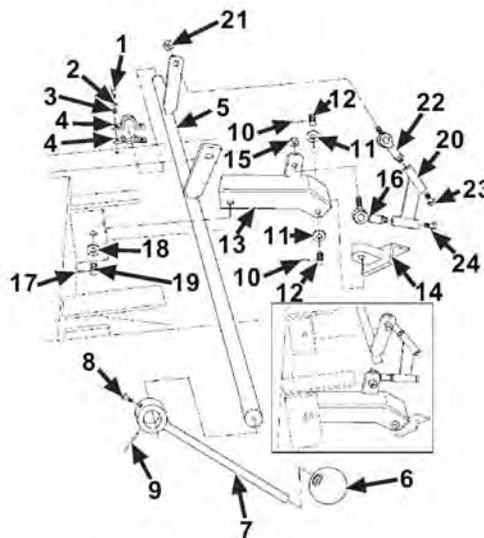


Figure 127. Transport Leg Assembly

REMOVAL - Continued

8. Repeat steps 6 and 7 for remaining support foot.
9. Remove nut (15) from ball end bolt (16). Discard nut.
10. Remove spring pin (17) and flat washer (18) from retaining pin (19). Discard spring pin.
11. Remove leg frame (13) from center link (20) and frame.
12. Repeat steps 10 and 11 for remaining leg frame.
13. Remove locknut (21) from ball end bolt (22). Discard locknut.
14. Remove center link (20) from transport leg bar (5).
15. Repeat steps 13 and 14 for remaining center link.
16. Remove 4.5 inch (114.3mm) screw (23) and 3 inch (76.2 mm) screw (24) from center link (20). Remove center link.

INSTALLATION

1. Position ball end bolt (22) on transport leg bar (5) and secure with new nut (21).
2. Position ball end bolt (16) on leg frame (13) and secure with new nut (15).
3. Repeat steps 1 and 2 for remaining ball end bolts.
4. Position leg frame (13) on frame and secure with retaining pin (19), flatwasher (18), and new spring pin (17).
5. Repeat step 4 for remaining leg frame.
6. Position support foot (14) on leg frame (13) and secure with retaining pin (12), flatwasher (11), and new spring pin (10).
7. Repeat step 6 for remaining support foot.
8. Position transport leg bar (5) on frame.
9. Position center link (20) on ball end bolt (22) and secure with 4.5 inch (114.3 mm) screw (23).
10. Position center link (20) on ball end bolt (16) and secure with 3 inch (76.2 mm) screw (24).

**WINCHES
GENERAL REPAIR, REPLACEMENT**

GENERAL REPAIR**WARNING****WINCHES**

All personnel must stand clear during winching operations. A snapped cable or shifting load could cause injury or death to personnel.

Ensure cable is properly mounted on rear winch shaft before operating reel. Failure to do so may result in injury to personnel.

WIRE ROPE

Wire rope can become frayed or contain broken wires. Wear heavy leather palmed work gloves when handling wire rope. Frayed or broken wires can injure hands.

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through glove and cut hand.

HEAVY COMPONENTS

To avoid personal injury, use a hoist or get assistance when lifting components that weigh more than 50 lbs (23 kg).

Some personnel may have difficulty operating the FWTD because of heavy components. Use additional personnel when necessary and always use caution when operating to prevent injury or death to personnel.

END OF WORK PACKAGE

WINCH ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:**Equipment Conditions**

- Coupled to prime mover (WP 0006 00-5).
- Fifth Wheel Towing Device in loading configuration (WP 0002).
- Remove winch cable (WP 0077).

Tools/Test Equipment

Tool Kit, Mechanics General,
NSN 5180-00-177-7033

Materials/Parts

- Gloves, protective (item 6, WP 0085)
- Sealing Compound (item 12, WP 0085)
- Sealant (item 11, WP 0085)

Personnel Requirements: 2**General Safety Instructions**

Winch assembly weighs approximately 120 lbs (54.4kg). Use caution when lifting.

REMOVAL**WARNING****WINCHES**

All personnel must stand clear during winching operations. A snapped cable or shifting load could cause injury or death to personnel.

Ensure cable is properly mounted before operating reel. Failure to do so may result in injury to personnel.

If winch cable has to be cut to remove winch assembly, wrap cut end of cable in tape and secure loose end of cable to prevent it from swinging free during winch assembly removal. Failure to follow this warning could result in injury to personnel.

WIRE ROPE

Wire rope can become frayed or contain broken wires. Wear heavy leather palmed work gloves when handling wire rope. Frayed or broken wires can injure hands.

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through glove and cut hand.

HEAVY COMPONENTS

To avoid personal injury, use a hoist or get assistance when lifting components that weigh more than 50 lbs (23 kg).

Winch assembly weighs approximately 120 lbs (54.4kg). Use caution when removing and handling to prevent injury or death to personnel and damage to equipment.

REMOVAL - Continued

1. With towing device coupled to prime mover, BOOM RETRACT to upright position.
2. Remove eight screws (1) from winch bracket (2).
3. BOOM EXTEND to lower boom to ground.
4. Relieve hydraulic pressure (WP 0056 00-5).

CAUTION

To prevent contamination of hydraulic system, cap and/or plug hydraulic lines and ports after disconnecting lines.

NOTE

Mark hydraulic hoses prior to disconnecting.

5. Disconnect both winch hydraulic hoses.
6. Remove two elbows (3) from winch motor (4).
7. Remove four screws (5) from winch bracket (2) and winch assembly (6).
8. Lift winch assembly (6) from bracket (2).

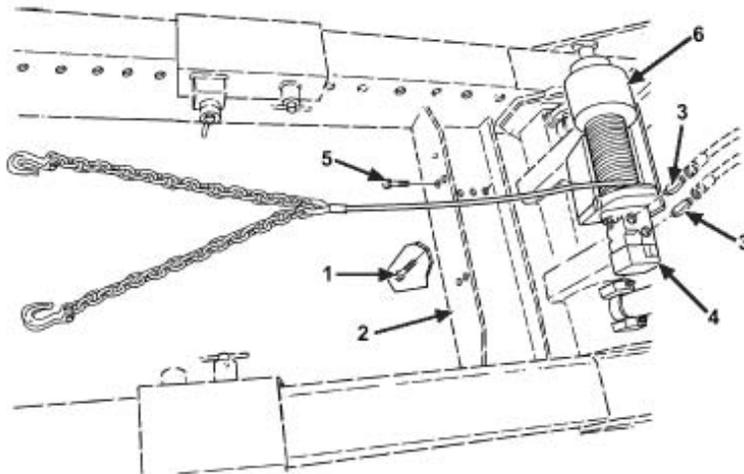


Figure 128. Winch Assembly

INSTALLATION

1. Position winch assembly (6) in bracket (2).

CAUTION

To prevent contamination of hydraulic system, DO NOT remove caps and/or plugs from hydraulic lines and ports until ready to connect.

2. Install four screws (3) on winch bracket (2) and winch assembly (4).
3. Install two elbows (5) on winch motor (6).
4. Connect both winch hydraulic hoses.
5. Charge hydraulics (WP 0056 00-5).
6. BOOM RETRACT to bring boom to upright position.
7. Install eight screws (1) on winch bracket (2).

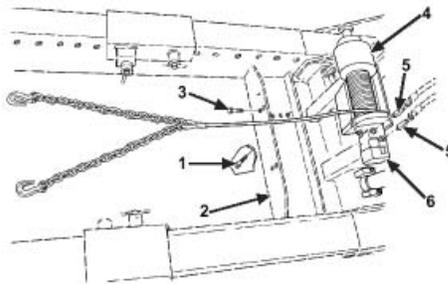


Figure 128. Winch Assembly

CABLE ASSEMBLY REMOVAL**WARNING**

If winch cable has to be cut to remove winch assembly, wrap cut end of cable in tape and secure loose end of cable to prevent it from swinging free during winch assembly removal. Failure to follow this warning could result in injury or death to personnel.

CAUTION

To prevent contamination of hydraulic system, cap and/or plug hydraulic lines and ports after disconnecting lines.

CABLE ASSEMBLY REMOVAL - Continued**NOTE**

If winch is inoperative, it can be removed only by cutting the cable.

Use a suitable container to catch fluid draining from hoses and fittings. Wipe up any spillage with a rag.

1. If winch can be operated, play out winch cable (1). If winch cannot be operated to play out winch cable, cut cable (1) close to hex screw (2).

NOTE

Cable drum can be set up for clockwise or counterclockwise installation of winch cable. To aid in installation, make note of cable anchor slot used to secure cable on winch drum.

2. Remove hex screw (2) and winch cable (1). Remove cable (1) from around hex screw (2), and pull cable (1) from winch (3).

CABLE ASSEMBLY INSTALLATION

1. Install cable (1) through cable anchor slot and around hex screw (2). Firmly seat hex screw (2) in cable anchor slot of winch (3).
2. Reel in winch cable.

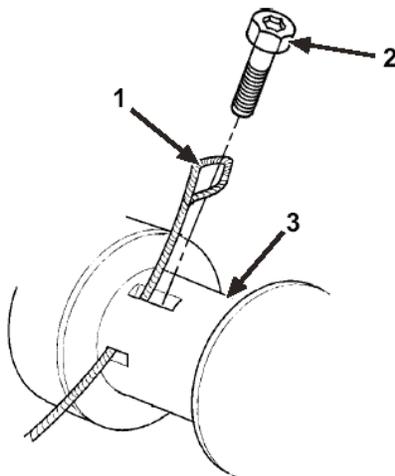


Figure 129. Cable Assembly

Follow-on Tasks:

- Test hydraulic system for leaks (WP 0056 00-5).
- Check hydraulic fluid level (WP 0056 00-5).
- Check winch for proper operation (WP 0013).

END OF WORK PACKAGE

PREPARATION FOR STORAGE OR SHIPMENT

GENERAL

1. This chapter contains requirements and procedures for administrative storage of equipment that is issued to and in use by Army activities worldwide.
2. The requirements specified herein are necessary to maintain equipment in administrative storage in such a way as to achieve the maximum readiness condition.
3. Equipment that is placed in administrative storage should be capable of being readied to perform its mission within one 24-hour period, or as otherwise may be prescribed by the approving authority. Before equipment is placed in administrative storage, a current Preventive Maintenance Checks and Services (PMCS) should be completed and deficiencies corrected.
4. Report equipment in administrative storage as prescribed for all reportable equipment.
5. Perform inspections, maintenance services, and lubrication as specified herein.
6. Records and reports to be maintained for equipment in administrative storage are those prescribed by DA Pam 738-750 for equipment in use.
7. A 10% variance is acceptable on time used to determine the required maintenance actions.
8. Accomplishment of applicable PMCS, as mentioned throughout this chapter, will be on a semiannual basis.

DEFINITION OF ADMINISTRATIVE STORAGE

The placement of equipment in administrative storage can be for short periods of time when a shortage of maintenance effort exists. Items should be ready for use within the time factors as determined by the directing authority. During the storage period, appropriate maintenance records will be kept.

PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE**1. Storage Site**

- a. Select the best available site for administrative storage. Separate store equipment from equipment in use. Conspicuously mark the area "Administrative Storage".
- b. Covered space is preferred.
- c. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well drained, and free of vegetation.

2. Storage Plan

- a. Store equipment so as to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.
- b. Take into consideration environmental conditions, such as extreme heat or cold; high humidity; blowing sand, dust, or loose debris; soft ground; mud; heavy snows; or any combination thereof, and take adequate precautions.
- c. Establish a fire plan and provide for adequate fire fighting equipment and personnel.

3. Maintenance Services and Inspections.

- a. Maintenance Services. Prior to storage, perform the next scheduled PMCS.
- b. Inspection. Inspect and approve the equipment prior to storage. Do not place nonmission-capable equipment in storage.

4. Correction of Shortcomings and Deficiencies. Correct all shortcomings and deficiencies prior to storage, or obtain a deferment from the approving authority.**5. Lubrication.** Lubricate equipment in accordance with WP 0039.

PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE - Continued**6. General Cleaning, Painting, and Preservation.****CAUTION**

DO NOT direct water under pressure against unsealed electrical systems of any exterior opening. Failure to follow this caution may result in damage to equipment.

- a. Cleaning. Clean the equipment of dirt, grease, and other contaminants, but do not use vapor degreasing.
- b. Painting. Remove rust and damaged paint by scraping, wire brushing, sanding, or buffing. Sand to a smooth finish and spot paint as necessary (TB 43-0209).
- c. Preservation. After cleaning and drying, immediately coat unpainted metal surfaces with oil or grease, as appropriate.

NOTE

Place a piece of barrier material between desiccant bags and metal surfaces.

Air circulation under draped covers reduces deterioration from moisture or heat.

- d. Weatherproofing. Sunlight, heat, moisture (humidity), and dirt tend to accelerate deterioration. Close and secure all openings except those required for venting and draining. Seal openings to prevent the entry of rain, snow, or dust. Insert desiccant when complete seal is required. Place equipment, and provide blocking or framing, to allow for ventilation and water drainage.

7. Place FWTD in shipping/storage configuration per WP 0021.

CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE

1. **Maintenance Services.** After equipment has been placed in administrative storage, inspect, service, and exercise as specified herein.
2. **Inspection.** Inspection will usually be visual and must consist of at least a walk around examination of all equipment to detect any deficiencies. Inspect equipment in open storage weekly and equipment in covered storage monthly. Inspect all equipment immediately after any severe storm or environmental change. The following are examples of things to look for during a visual inspection:
 - a. Oil leaks.
 - b. Condition of preservatives, seals, and wraps.
 - c. Corrosion or other deterioration.
 - d. Missing or damaged parts.
 - e. Water in compartments.
 - f. Any other readily recognizable shortcomings or deficiencies.
3. **Repair During Administrative Storage.** Keep equipment in an optimum state of readiness. Accomplish the required services and repairs as quickly as possible. Whenever possible, perform all maintenance on-site.
4. **Exercising.** Exercise equipment in accordance with Table 4, Exercise Schedule, and the following instructions.
 - a. **Equipment Major Exercise.** Depreserve equipment by removing only that material restricting exercise. Perform all BEFORE operational checks. While exercising, and when it is safe and convenient, operate all other functional components and perform all DURING and AFTER operational checks.
 - b. **Scheduled Services.** Scheduled services will include inspection per subparagraph b and will be conducted in accordance with WP 0037, Unit Preventive Maintenance Checks and Services (PMCS). Lubricate in accordance with instructions in WP 0039.
 - c. **Corrective Action.** Immediately take action to correct shortcomings and deficiencies noted. Record inspection and exercise results on DA Form 2404 or DA Form 5988E. Record and report all maintenance actions on DA Form 2407. After exercising, restore the preservation to the original condition. Replenish lubricants used during exercising and note the amount on DA Form 2408.

CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE - Continued

Table 4. Exercise Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12
Scheduled Services						X						
Hydraulic Fluid Change											X	

5. **Rotation.** Rotate items in accordance with any rotational plan that will keep the equipment in an operational condition and reduce the maintenance effort.

REMOVAL OF EQUIPMENT FROM ADMINISTRATIVE STORAGE

1. **Activation.** Restore the equipment to normal operating condition in accordance with the instructions contained in Chapter 6, WP 0036.
2. **Servicing.** Resume the maintenance service schedule in effect at the commencement of storage or service the equipment before the scheduled dates in order to produce a staggered maintenance workload.

PREPARATION OF EQUIPMENT FOR SHIPMENT

1. Refer to FM 55-21, TM 55-2200-001-12, and TM 743-200-1 for additional instructions on processing, storage, and shipment of materiel.
2. Equipment that has been removed from storage for shipment does not have to be reprocessed if they will reach their destination within the administrative storage period. Reprocess only if inspection reveals any corrosion or if anticipated in-transit weather conditions make it necessary.
3. When a piece of equipment is received and has already been processed for domestic shipment, as indicated on DD Form 1397, it does not have to be reprocessed for storage unless corrosion and deterioration are found during the inspection upon receipt. List on SF Form 364 all discrepancies found because of poor preservation, packaging, packing, marking, handling, loading, storage, or excessive preservation. Repairs that cannot be handled by the receiving unit must have tags attached listing needed repairs. A report of these conditions will be submitted by the unit commander for action by an ordnance maintenance unit.

END OF WORK PACKAGE

TM 9-2510-247-13&P

CHAPTER 7

**DIRECT SUPPORT
MAINTENANCE INSTRUCTIONS**

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS INDEX

WP Sequence No.

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
General Maintenance Instructions 0079 00

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

GENERAL

All direct support maintenance tasks identified in the Maintenance Allocation Chart (MAC) WP 0081 are conducted by the manufacturer.

END OF WORK PACKAGE

TM 9-2510-247-13&P

CHAPTER 8

SUPPORTING INFORMATION

SUPPORTING INFORMATION INDEX

WP Sequence No.

SUPPORTING INFORMATION

References	0080 00
MAC Chart Introduction	0081 00
RPSTL Introduction	0082 00
Cross-Reference Indexes	0083 00
Components of End Item (COEI) and Basic Issue Items (BI) Lists	0085 00
Additional Authorization List	0086 00
Expendable and Durable Items List	0087 00
Illustrated List of Manufactured Items	0088 00
Torque Values for Threaded Fasteners	0089 00
Schematics	0090 00
Authorized Vehicle Combinations	0091 00

REFERENCES

SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual, and that apply to the operation and maintenance of the 250M Fifth Wheel Towing Device (FWTD).

PUBLICATION INDEX

DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

FORMS

Refer to DA Pam 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms.

Equipment Inspection and Maintenance Worksheet	DA Form 2404
Equipment Log Assembly (Records)	DA Form 2408
Maintenance Request	DA Form 2407
Preventive Maintenance Schedule and Record	DA Form 5988
Processing and Deprocessing Record for Shipment, Storage and Issue of Vehicles and Spare Engines	DD Form 1397
Product Quality Deficiency Report	SF Form 368
Recommended Changes to Equipment Technical Publications	DA Form 2028-2
Recommended Changes to Publications and Blank Forms	DA Form 2028
Report of Discrepancy (ROD)	SF Form 364

FIELD MANUALS

Basic Cold Weather Manual	FM 31-70
Chemical and Biological Contamination Avoidance	FM 3-3
Field Behavior of NBC Agents (Including Smoke and Incendiaries)	FM 3-6
First Aid for Soldiers	FM 21-11
Manual for Wheeled Vehicle Driver	FM 21-305
Chemical and Biological Decontamination	FM 3-5
Chemical and Biological Protection	FM 3-4
Northern Operations	FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0°F to -65°F)	FM 9-207
Operational Terms and Symbols	FM 101-5-1
Railway Operating and Safety Rules	FM 55-21
Visual Signals	FM 21-60
Desert Operations	FM 90-3
Rigging Techniques	FM 5-125

TECHNICAL BULLETINS

Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materiel Handling Equipment	TB 43-209
Corrosion Prevention and Control, Including Rustproofing Procedures for Tactical Vehicles and Trailers	TB 43-0213
Equipment Improvement Report and Maintenance Digest for Tank, Automotive, Armament, and Chemical Equipment	TB 43-0001-62-1
Safety Inspection and Testing of Lifting Devices	TB 43-0142

TECHNICAL MANUALS

Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals	TM 9-247
Painting Instructions for Army Materiel	TM 43-0139
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	TM 750-244-3
Transportability Guide for Application of Blocking, Bracing, and Tiedown Materials for Rail Transport	TM 55-2200-001-12
Storage and Materials Handling	TM 743-200-1
Lead ACID Storage Battery	TM 9-6140-200-14
Inspection, Care, and Maintenance of Antifriction Bearings	TM 9-214

OTHER PUBLICATIONS

Army Medical Department Expendable/Durable Items	CTA 8-100
Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)	CTA 50-970
Fuels and Lubricants Standardization Policy for Equipment Design, Operation, and Logistic Support	AR 70-12
Functional Users Guide for the Army Maintenance Management System	DA PAM 738-750
Military Standard Abbreviations for Use on Drawings, Specifications Standards, and in Technical Documents	MIL-STD-12D
Prevention of Motor Vehicle Accidents	AR 385-55
Operations Circular Welding Theory and Application	TC 9-237

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION**1. THE ARMY MAINTENANCE SYSTEM MAINTENANCE ALLOCATION CHART (MAC)**

- a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance system concept.
- b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit - includes two subcolumns, C (Operator/Crew) and O (Unit) Maintenance

Direct Support - includes an F subcolumn.

General Support - includes an H subcolumn.

Depot - includes a D subcolumn.

- c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.
- d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

2. MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

- a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).
- b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item/end item and comparing those characteristics with prescribed standards.
- c. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.
- d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specific parameters.
- e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
- f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

2. MAINTENANCE FUNCTIONS - Continued

- g. Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing onto position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
- h. Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3rd position code of the SMR code.
- i. Repair.** The application of maintenance services¹ including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.
- j. Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in the appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
- k. Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

- a. Column (1) - Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.
- b. Column (2) - Component/Assembly.** Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.
- c. Column (3) - Maintenance Function.** Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph 2).

-
- 1. Services - Inspect, test, service, adjust, align, calibrate, and/or replace.
 - 2. Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).
 - 3. Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/function group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).
 - 4. Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

3. EXPLANATION OF COLUMNS IN THE MAC - Continued

NOTE

When a complete replace or repair task performed at higher level maintenance includes lower level maintenance tasks (equipment condition/follow-on tasks), the lower level work time figures in the MAC must be added to the higher level work time shown in the MAC to determine the total to accomplish that maintenance function.

- d. Column (4) - Maintenance Level.** Column 4 specified each level of maintenance authorized to perform each function listed in Column 3, by indicating a work time required (expressed as . manhours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time designations for the various maintenance levels are as follows:

C - Operator or Crew Maintenance
O - Unit Maintenance
F - Direct Support Maintenance
L - Specialized Repair Activity (SRA)⁵
H - General Support Maintenance
D - Depot Maintenance

- e. Column (5) - Tools and Test Equipment Reference Code.** Column 5 specifies, by code those common tool sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to Tools and Test Equipment in Section III.
- f. Column (6) - Remarks.** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

5. This maintenance level is not included in Section II, column (4) of the MAC. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, column (4), and an associated reference code is used in the "Remarks" column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

4. EXPLANATION OF COLUMNS IN TOOLS AND TEST EQUIPMENT REQUIREMENTS, SECTION III

- a. Column (1) - Tool or Test Equipment Reference Code.** The tool or test equipment reference code correlates with a code used in the MAC, Section II, column (5).
- b. Column (2) - Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.
- c. Column (3) - Nomenclature.** Name or identification of the tool or test equipment.
- d. Column (4) - National Stock Number.** The National Stock Number of the tool or test equipment.
- e. Column (5) - Tool Number.** The manufacturer's part number, model number, or type number.

5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

- a. Column (1) - Remarks Code.** The code recorded in Section II, column (6).
- b. Column (2) - Remarks.** This column, along with the related codes, clarifies maintenance and inspection functions by different MOS involved in maintaining some components.

Section II. MAINTENANCE ALLOCATION CHART FOR FIFTH WHEEL TOWING DEVICE

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks
			Unit		DS	GS	Depot		
			C	O	F	H	D		
06	Electrical System								
0608	24 Volt Receptacle	Replace		1.0				1, 2, 3	
	12 Volt Receptacle	Replace		0.5				1, 2	
	12-24 Volt Junction Box	Replace		2.0				1, 2	
	Electrical Control Box	Replace		1.0				1, 2	
		Repair		2.0				1, 2	
	Solenoid Assembly	Replace		1.0				1, 2	
Remote Control	Replace		0.8				1, 2		
0609	24 Volt Tow light	Replace		0.5				1, 2	
		Repair		1.0				1, 2	
	Fixed Worklight	Replace		0.5				1, 2	
		Repair		0.5				1, 2	
Strobe Light	Replace		0.5				1, 2		
	Repair		1.0				1, 2		
0612	Battery Box/ Battery	Replace		1.0				1, 2	
0613	Wiring Harness/ Cable	Replace		1.0				1, 2	
		Repair		1.0				1, 2	
12	Brakes								
1208	Gladhands	Service	0.2					1	
		Replace		1.0				1	
	Air Brake Protection Valve	Replace		1.0				1	
	Air Brake Fittings	Replace		1.0				1	
Repair			1.0				1		

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks
			Unit		DS	GS	Depot		
			C	O	F	H	D		
15	Frame, Towing Attachments, Drawbar, and Articulation								
1503	Towbar Assembly	Inspect Service Replace	0.1 0.2 0.8						
	King Pin Inspect	Service Replace	0.2 0.2 0.5						
	Receiver and Wheel Stop Assembly	Replace	0.8				1		
18	Body, Cab, Hood, and Hull								
1802	Mud Flaps	Replace		0.8				1	
	Fender	Replace		1.5				1	
1808	Tool Box	Inspect Replace	0.2 2.0					1, 2	
1812	Main Frame Assembly	Inspect Replace			0.2				2
	Mast Frame Assembly	Inspect Replace			0.2				2
	Boom Assy.	Inspect Replace			0.2				2
	Mast Frame Pivot Pin	Replace		1.0				1	
	Center Mast Frame	Replace		1.0				1	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks
			Unit		DS	GS	Depot		
			C	O	F	H	D		
20	Slip Pad	Replace		0.4				1	
	Bumper Pad	Replace		0.6				1	
	Transport Leg Assembly	Replace		1.5				1	
2001	Hoist, Winch, Capstan, Windlass, Power Control Unit, and Power Takeoffs								
	Winch	Replace		1.0				1	
24	Cable Assembly	Replace		0.5				1	
	Hydraulic and Fluid Systems								
2401	Motor Assembly	Replace		1.0				1	
2402	Safety Valve	Replace		1.0				1	
	Main Valve	Replace Repair		2.0				1	2
2406	Valve Control Levers	Replace Repair		0.8 0.8				1 1	
	Hoses and Fittings	Replace Repair		4.0 2.5				1, 2 1, 2	
2407	Oil Filter	Replace		0.3				1	
	Cam Valve	Replace		0.8				1	
	Main Frame to Mast Cylinder	Replace		1.0				1	
2408	Mast to Boom Cylinder	Replace		1.0				1	
	Boom Extensions Cylinder	Replace		2.0				1, 2, 4	1
2408	Reservoir and Fittings	Replace		1.0					1

Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

(1) Tool or Test Equipment Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National Stock Number	(5) Tool Number
1	O	Tool Kit, General Mechanics	5180-00-177-7033	
2	O	Shop Equipment, Common No. 1	4910-00-754-0654	
3	O	Shop Equipment, Common No. 2	4910-00-754-0650	
4	O	Tool, Cylinder Alignment		(1BZD4) 1084-1

Section IV. REMARKS

Reference Code	Remarks
1	The cylinder alignment tool, (1BZD4) 1084-1, is supplied with each cylinder when shipped to the unit.
2	Contractor logistics support. Component/assembly goes to manufacturer for repair.

END OF WORK PACKAGE

REPAIR PARTS AND SPECIAL TOOLS LISTS (RPSTL)

SECTION I. INTRODUCTION**1. SCOPE**

This RPSTL lists and authorizes spares and repair parts, special tools, special Test, Measurement and Diagnostic Equipment (TMDE), and other special support equipment required for performance of Unit and Direct support maintenance of the 250M Fifth Wheel Towing Device (FWTD). It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

2. GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages:

- a. Repair Parts List Work Package.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts shall be listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for repairable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
- b. Special Tools List Work Package.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue [BOI] information in the DESCRIPTION AND USABLE ON CODE [UOC] column). Tools that are components of common tool sets and/or Class VII are not listed.
- c. Cross Reference Indexes Work Package.** There are two cross-reference indexes work packages in this RPSTL: The National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The NSN Index work package refers you to the figure and item number. The P/N Index work package refers you to the figure and item number.

3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE

- a. Item No. [Column (1)].** Indicates the number used to identify items called out in the illustration.

3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE - Continued

b. SMR Code [Column (2)]. The SMR code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:

<u>Source Code</u>	<u>Maintenance Code</u>	<u>Recoverability Code</u>
<u>xx</u>	<u>xx</u>	<u>x</u>
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.
		5th position: Who determines disposition action on unserviceable items.

* complete repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "repair" function in a use/user environment in order to restore serviceability to a failed item.

c. Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

<u>Source Code</u>	<u>Application/Explanation</u>
PA PB PC PD PE PF PG	Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code.

NOTE

Items coded PC are subject to deterioration.

KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
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MO-Made at unit level MF-Made at DS level MH-Made at GS level ML-Made at SRA MD-Made at depot	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND UOC column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
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3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE - Continued

<p>AO-Assembled by unit/AVUM level AF-Assembled by DS/AVIM level AH-Assembled by GS level AL-Assembled by SRA AD-Assembled by depot</p>	<p>Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.</p>
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<u>Source Code</u>	<u>Application/Explanation</u>
XA	Do not requisition an "XA" coded item. Order the next higher assembly (refer to NOTE below).
XB	If an item is not available from salvage, order it using the CAGE Code and P/N.
XC	Installation drawings, diagrams, instruction sheets, field services drawings; identified by manufacturer's P/N.
XD	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGE Code and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA".

d. Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

- (1) **THIRD POSITION.** The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE - Continued

<u>Maintenance Code</u>	<u>Application/Explanation</u>
C	Crew or operator maintenance done within unit maintenance.
O	Unit level maintenance can remove, replace, and use the item.
F	Direct support maintenance can remove, replace, and use the item.
H	General support maintenance can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot can remove, replace, and use the item.

- (2) **FOURTH POSITION.** The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

<u>Maintenance Code</u>	<u>Application/Explanation</u>
O	Unit is the lowest level that can do complete repair of the item.
F	Direct support is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE - Continued

- e. **Recoverability Code.** Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

<u>Recoverability Code</u>	<u>Application/Explanation</u>
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
O	Reparable item. When uneconomically repairable, condemn and dispose of the item at the unit level.
F	Reparable item. When uneconomically repairable, condemn and dispose of the item at the direct support level.
H	Reparable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

- f. **NSN [Column (3)].** The NSN for the item is listed in this column.
- g. **CAGEC [Column (4)].** The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.
- h. **Part Number [Column (5)].** Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE - Continued

- i. **Description and Usable on Code (UOC) [Column (6)].** This column includes the following information:
- (1) The federal item name, and when required, a minimum description to identify the item.
 - (2) P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
 - (3) Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
 - (4) The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.
- j. **QTY [Column (7)].** The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

4. EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGE FORMAT AND COLUMNS

a. National Stock Number (NSN) Index Work Package.

- (1) STOCK NUMBER COLUMN. This column lists the NSN in National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN.

NSN
 (e.g., 5385-01-574-1476)
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

- (2) FIG. COLUMN. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.
- (3) ITEM COLUMN. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. Part Number (P/N) Index Work Package.

P/Ns in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

- (1) PART NUMBER COLUMN. Indicates the P/N assigned to the item.
- (2) FIG. COLUMN. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.
- (3) ITEM COLUMN. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

5. SPECIAL INFORMATION

- a. **Usable on Code:** 2TD.
- b. **Fabrication Instructions.** Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in Appendix G.
- c. **Index Numbers.** Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index work packages and the bulk material list in the repair parts list work package.

6. HOW TO LOCATE REPAIR PARTS

a. When NSNs or P/Ns Are Not Known:

- (1) Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.
- (2) Find the figure covering the functional group or the subfunctional group to which the item belongs.
- (3) Identify the item on the figure and note the number(s).
- (4) Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

b. When NSN Is Known:

- (1) If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.
- (2) Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

c. When P/N Is Known:

- (1) If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.
- (2) Look up the item on the figure in the applicable repair parts list work package. Verify that the item is the one you are looking for.

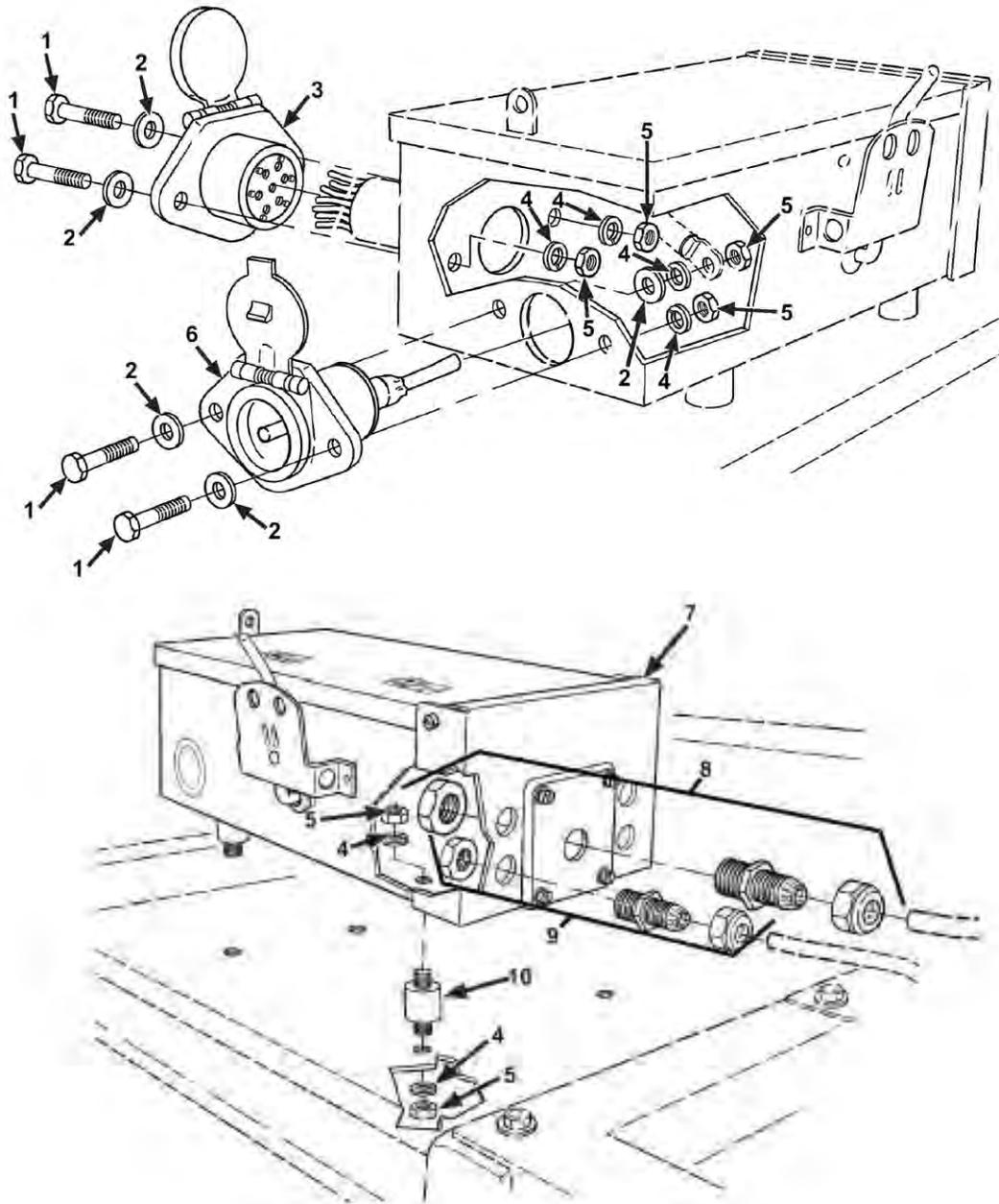


Figure 1. 12/24 Volt Junction Box

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 06 ELECTRICAL SYSTEMS GROUP 0608 MISCELLANEOUS ITEMS FIG. 1 12/24 VOLT JUNCTION BOX	
1	PAOZZ	5305002253843	80204	B1821BH025C100N	SCREW,CAP,HEXAGON H 1/4 DIA X 20 UNC X 1 INCH LONG	4
2	PAOZZ	5310006858308	04773	125-10497-07	WASHER,FLAT 1/4 DIA HOLE	5
3	PAOZZ	5935012114434	26697	JP0-0031	CONNECTOR,RECEPTACL	1
4	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK 1/4 DIA HOLE1	11
5	PAOZZ	5310000115120	24617	115120	NUT,PLAIN,HEXAGON 1/4 DIA X 20 UNC.	12
6	PAOZZ	5935014943538	1BZD4	1092-1	CONNECTOR,RECEPTACL 24 V	1
7	XDOZZ		1BZD4	9003-1	BOX,JUNCTION,12/24	1
8	PAOZZ	5975014816824	39428	69915K55	BUSHING,STRAIN REL 3/4 INCH	1
9	PAOZZ	4730014818114	39428	69915K53	ADAPTER,STRAIGHT,PI 1/2 INCH	4
10	XDOZZ		1BZD4	1056-1	BOLT,THREADED 1/4 DIA X 20 UNC X 1/2 INCH LONG BOTH ENDS	4

END OF FIGURE

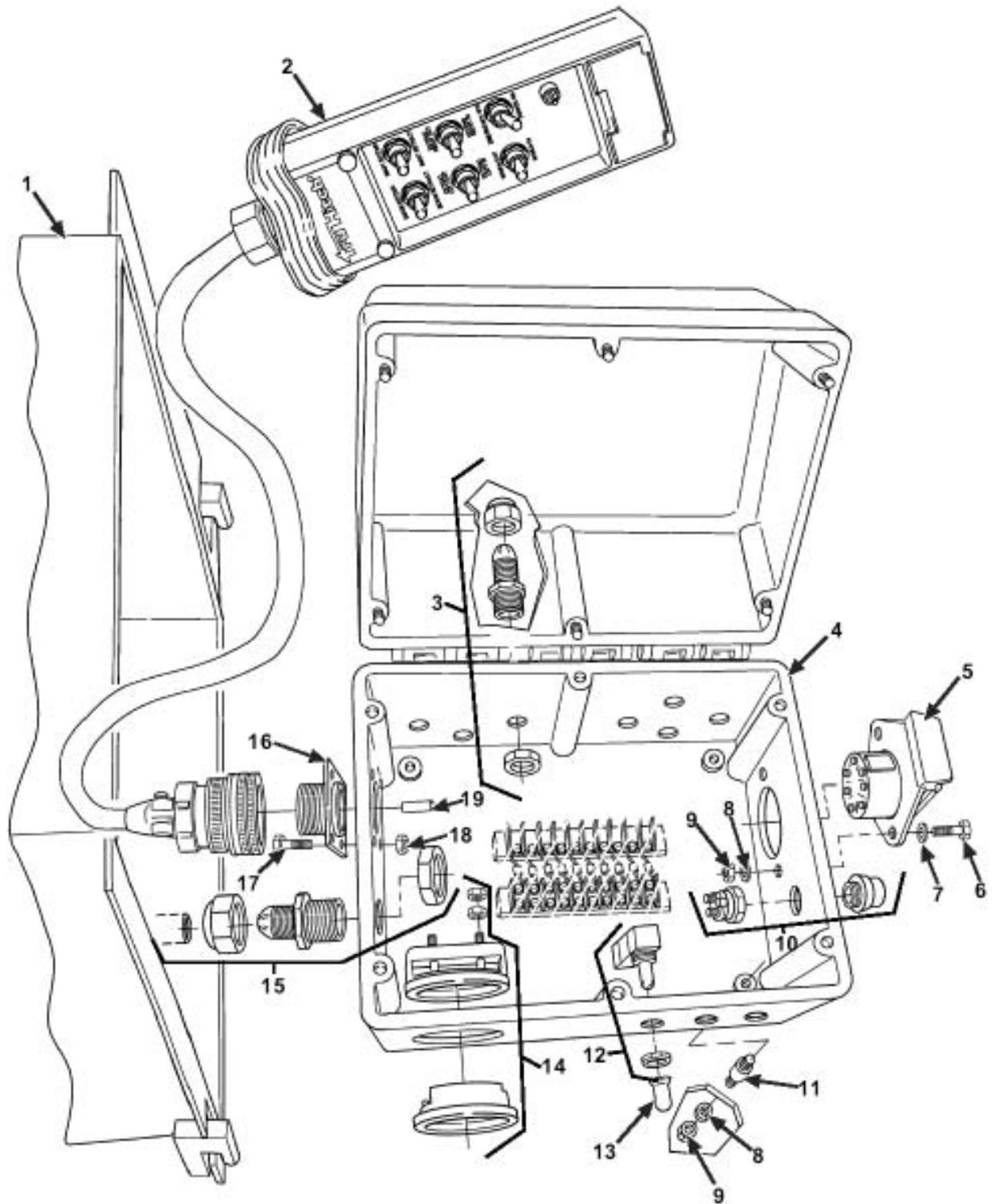


Figure 2. Electrical Control Box

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0608 MISCELLANEOUS ITEMS FIG. 2 ELECTRICAL CONTROL BOX						
1	XDOZZ		1BZD4	1022-1	COVER,ELECTRICAL CONTROL BOX	1
2	PAOZZ	6110014995311	1BZD4	02795	CONTROL,ROTARY SWIT WITH TETHER	1
3	PAOZZ	4730014818114	39428	69915K53	ADAPTER,STRAIGHT 1/2 INCH	6
4	XDOZZ		1BZD4	1083-1	BOX,ELECTRICAL CONT	1
5	PAOZZ	5935012114434	26697	JP0-0031	CONNECTOR,RECEPTACL	1
6	PAOZZ	5305002253843	80204	B1821BH025C100N	SCREW,CAP,HEXAGON H 1/4 DIA X 20 UNC X 1 INCH LONG	2
7	PAOZZ	5310006858308	04773	125-10497-07	WASHER,FLAT 1/4 DIA HOLE	2
8	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK 1/4 DIA HOLE	6
9	PAOOZ	5310000115120	24617	115120	NUT,PLAIN,HEXAGON 1/4 DIA X 20 UNC	6
10	PAOZZ	5930000080514	77326	24-353	SWITCH,PUSH	1
11	XDOZZ		1BZD4	1056-1	BOLT,THREADED 1/4 DIA X 20 UNC X 1/2 INCH LONG BOTH ENDS	4
12	PAOZZ	5930015021048	1BZD4	02765	SWITCH,TOGGLE	3
13	PAOZZ	5930014963656	1BZD4	1071-1	BOOT,RUBBER	3
14	PAOZZ	6625015022946	1BZD4	02870	VOLTMETER	1
15	PAOZZ	5975014816824	39428	69915K55	BUSHING,STRAIN RELI 3/4 INCH	1
16	PAOZZ	5935009415436	19207	7974634	CONNECTOR,RECEPTACL	1
17	PAOZZ	5305009846221	96906	MS35206-234	SCREW,MACHINE 6/32 DIA X 32 UNC X 1 INCH LONG	4
18	PAOZZ	5310011005145	32770	403-09081-01	NUT,PLAIN,ASSEMBLED 6/32 DIA X 32 UNC	4
19	PAOZZ	5935011484523	71468	031-0560-161	SOCKET,CRIMP	20

END OF FIGURE

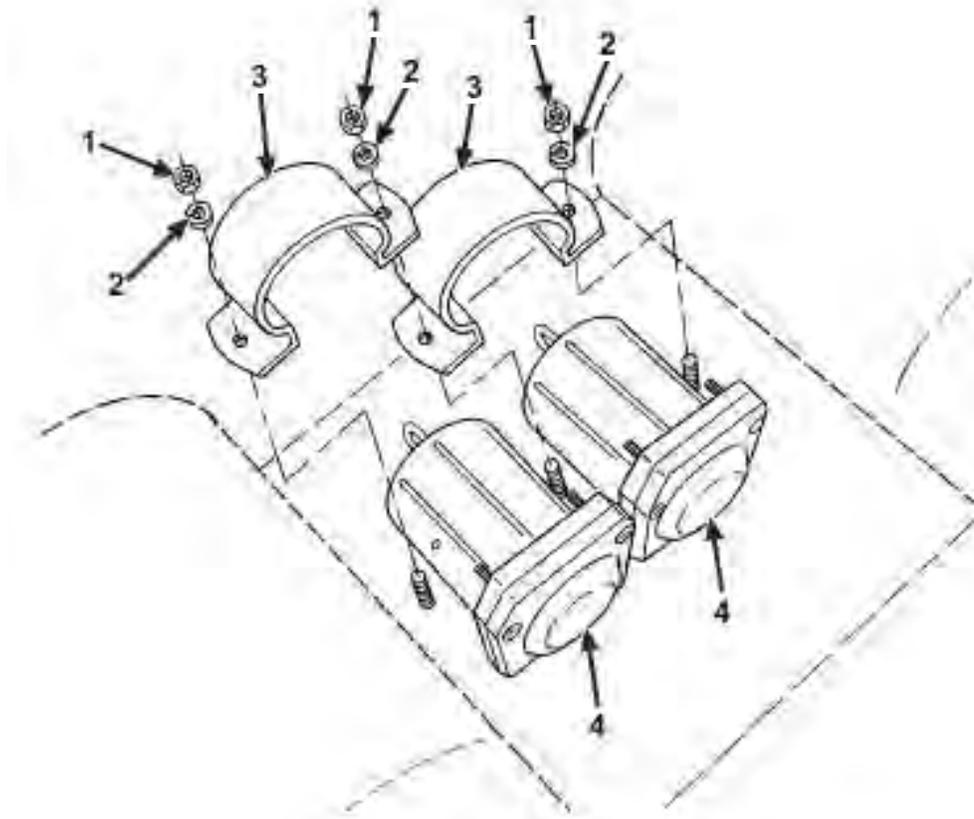


Figure 3. Solenoid Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 0608 MISCELLANEOUS ITEMS FIG. 3 SOLENOID ASSEMBLY	
1	PAOZZ	5310002747758	96906	MS35649-286N	NUT,PLAIN,HEXAGON 10/32 DIA X 32 UNC	3
2	PAOZZ	5310002090971	80204	ASAB27-1-1950 HEAVYSERIES	WASHER,LOCK 10/32 DIA HOLE	3
3	XDOZZ		1BZD4	1013-1	BRACKET,MOUNTING	2
4	PAOZZ	5945014970549	1BZD4	1064-1	SOLENOID,ELECTRICAL	2
					END OF FIGURE	

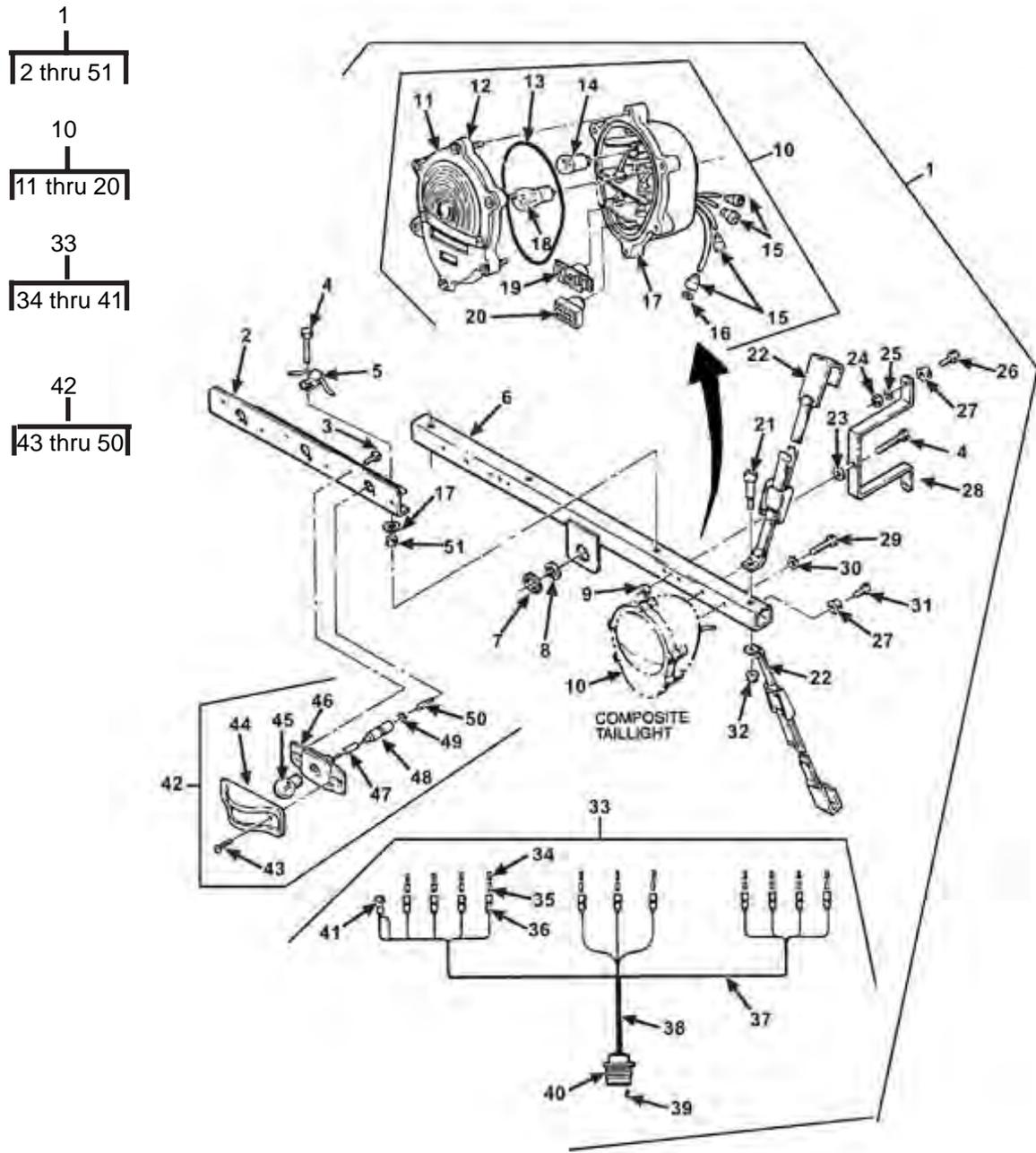


Figure 4. 24 Volt Towlight Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0609 LIGHTS FIG. 4 24 VOLT TOW LIGHT ASSEMBLY						
1	PAOOO	6220012178316	45152	1462290U	TOWLIGHT ASSEMBLY	1
2	PGOZZ	5340012273483	45152	1462270	.BRACKET,ANGLE	1
3	PAOZZ	5305007578122	96906	MS51851-64	.SCREW,TAPPING	6
4	PAOZZ	5305002693217	80205	MS90725-67	.SCREW,CAP,HEXAGON H	2
5	PAOZZ	5340007255280	96906	MS21333-125	.CLAMP,LOOP	2
6	PFOZZ	5340012722729	45152	1462260W	.BRACKET,MOUNTING	1
7	PAOZZ	5310010867725	11139	114020-90	.NUT,PLAIN,HEXAGON 1 1/2 DIA X 18 UNEF X 2 INCHES LONG	1
8	PAOZZ	5310010810798	11139	114021	.WASHER,LOCK 1 1/2 DIA HOLE	1
9	PAOZZ	5310011095292	45152	2447HX	.NUT,PLAIN,WING	2
10	PAOOO	6220010934439	96906	MS52125-2	.STOP LIGHT-TAILLIGH	2
11	PAOZZ	6220012103225	19207	11639538-1	..LENS,LIGHT	1
12	PAOZZ	5342013558732	5A910	11639537	..DOOR,ACCESS	1
13	PAOZZ	5331004620907	19207	11639519-2	..O-RING	1
14	PAOZZ	6240000193093	58536	A52463-1-09	..LAMP,INCANDESCENT	1
15	PAOZZ	5935005729180	19207	8338566	..SHELL,ELECTRICAL CO	4
16	PAOZZ	5310008338567	19207	8338567	..WASHER,SLOTTED	4
17	PAOZZ	6220011634900	19207	11639522	..BODY	1
18	PAOZZ	6240014473779	81348	A-A-52463-B10	..LAMP,INCANDESCENT	1
19	PAOZZ	6220012842709	19207	12360850-1	..LIGHT,MARKER,CLEARA	1
20	PAOZZ	6220013874250	19207	12360850-2	..LIGHT,MARKER,CLEARA	1
21	PAOZZ	5305009409445	80205	NS51975-23	.SCREW,SHOULDER 5/16 DIA X 18 UNC X 2 1/2 INCHES LONG	2
22	PGOZZ	5340012279471	45152	1462340	.STRAP,WEBBING	4
23	PAOZZ	5310000806004	96906	MS27183-14	.WASHER,FLAT 3/8 DIA HOLE	2
24	PAOZZ	5310010822058	11939	93602345	.NUT,PLAIN,HEXAGON 3/16 DIA X 24 UNC	4
25	PAOZZ	5310007755139	35510	2434	.WASHER,LOCK 3/16 DIA HOLE	4
26	PAOZZ	5305009846212	96906	MS35206-265	.SCREW,MACHINE 3/16 DIA X 24 UNC X 3/4 INCHES LONG	4
27	PAOZZ	5340006005937	70485	832	.BUMPER,NONMETALLIC	6
28	PAOZZ	5340012276808	45152	1462280	.STRAP,RETAINING	2
29	PAOZZ	5305007829489	80204	B1821BHO38C200N	.SCREW,CAP,HEXGON H 3/8 DIA X 16 UNC X 2 INCHES LONG	4
30	PAOZZ	5310002090786	96906	MS35335-33	.WASHER,LOCK 1/4 DIA HOLE	8
31	PAOZZ	5305010619674	45152	2467-H	.SCREW,TAPPING	2
32	PAOZZ	5310002453424	96906	MS17829-5C	.NUT,SELF-LOCKING,HE 5/16 DIA X 18 UNC	2
33	PAOOO	5995012225497	45152	1462310U	.WIRING HARNESS,BRAN	1
34	PAOZZ	5940003996676	19207	8338564	..TERMINAL SET,QUICK	11
35	PAOZZ	5970008338562	19207	8338562	..INSULATOR,BUSHING	11
36	PAOZZ	5935008338561	19207	8338561	..SHELL,ELECTRICAL CO	11
37	MOOZZ		81851	50010013O3S-16	..SLEEVING,TEXTILE,EL MAKE FROM SLEEVING,TEXTILE,ELECTRICAL,P/N 50010013, 16 INCHES LONG	1
38	MOOZZ		81851	50010013O3S-4	..SLEEVING,TEXTILE,EL MAKE FROM SLEEVING,TEXTILE,ELECTRICAL,P/N 50010013, 4 INCHES LONG	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0609 LIGHTS						
FIG. 4 24 VOLT TOW LIGHT ASSEMBLY						
39	PAOZZ	5999010856244	45152	EE-101241	..CONTACT,ELECTRICAL	8
40	PAOZZ	5935010841942	45152	EE-101253	..CONNECTOR,RECEPTACL	1
41	PAOZZ	5940001139826	96906	MS25036-114	..TERMINAL,LUG	1
42	PAOOO	6220007261916	96906	MS35423-2	..LIGHT,MARKER,CLEARA	3
43	PAOZZ	5305009576272	96906	MS35190-269	..SCREW,MACHINE 3/16 DIA X 24 UNC X 3/8 INCHES LONG	1
45	PAOZZ	6240000190877	58536	A52463-1-08	..LAMP,INCANDESCENT	1
46	PAOZZ	6220007299295	96906	MS35422-1	..LIGHT,MARKER,CLEARA	1
47	PAOZZ	9905008933570	81349	M43436/1-3	..BAND,MARKER	1
48	PAOZZ	5935005729180	19207	8338566	..SHELL,ELECTRICAL CO	1
49	PAOZZ	5310008338567	19207	8338567	..WASHER,SLOTTED	1
50	PAOZZ	5999000572929	19204	572929	..CONTACT,ELECTRICAL	1
51	PAOZZ	5310006559544	96906	MS35690-604	..NUT,PLAIN,HEXAGON 3/8 DIA X 16 UNC	2

END OF FIGURE

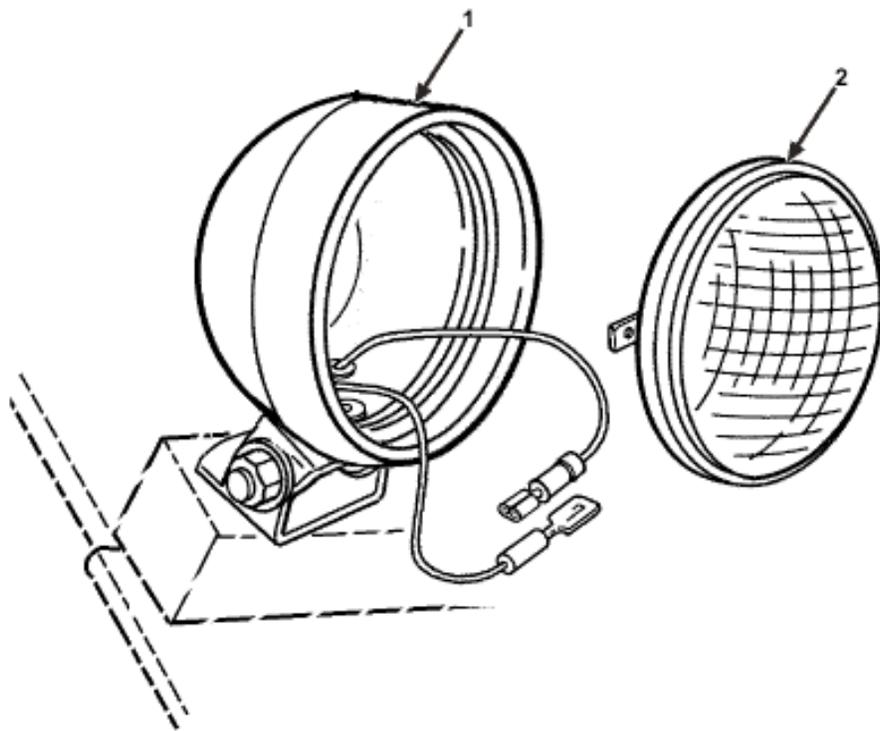


Figure 5. Fixed Worklight

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 0609 LIGHTS FIG. 5 FIXED WORKLIGHT	
1	PAOOO	6220014959757	1BZD4	1076-1	LIGHT,UTILITY VEHIC	1
2	PAOZZ	6240015022530	0TWA7	B-4411	.LAMP,INCANDESCENT 12V,PART OF P/N 1076-1	1
					END OF FIGURE	

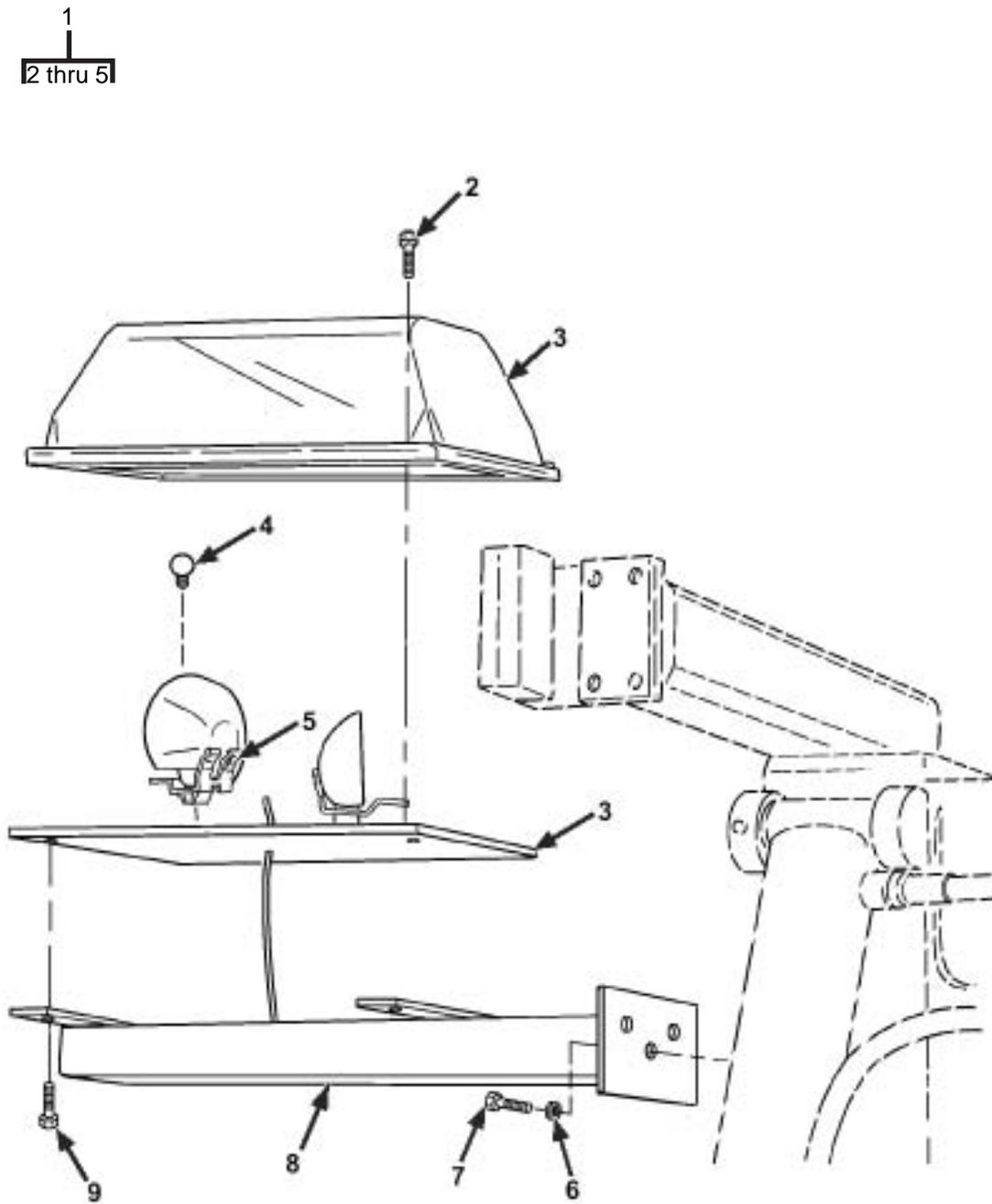


Figure 6. Strobe Light Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
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GROUP 0609 LIGHTS
FIG. 6 STROBE LIGHT ASSEMBLY

1	PAOOO	6220015022419	0TWA7	LP15A	LIGHT,STROBE 12 V	2
2	PAOZZ	5305009887603	80205	MS16995-27	.SCREW,MACHINE PART OF P/N LP15A	8
3	PAOZZ	6220015027230	0TWA7	5005008	.COVER,PLASTIC PART OF P/N LP15A	2
4	PAOZZ	6240015022421	0TWA7	BH-1	.BULB,HALOGEN 55W	4
5	XDOZZ		0TWA7	LP15AA-3	.CLIP,BULB RETAINING, PART OF P/N LP15A	4
6	PAOZZ	5310013894257	96906	M535338-046	WASHER,LOCK 3/8 DIA HOLE	6
7	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	6
8	XDOZZ		1BZD4	1039-1	BRACKET,MOUNTING	2
9	PAOZZ	5305009844981	96906	MS35206-224	SCREW,MACHINE 1/8 DIA X 32 UNC X 1 INCH LONG	8

END OF FIGURE

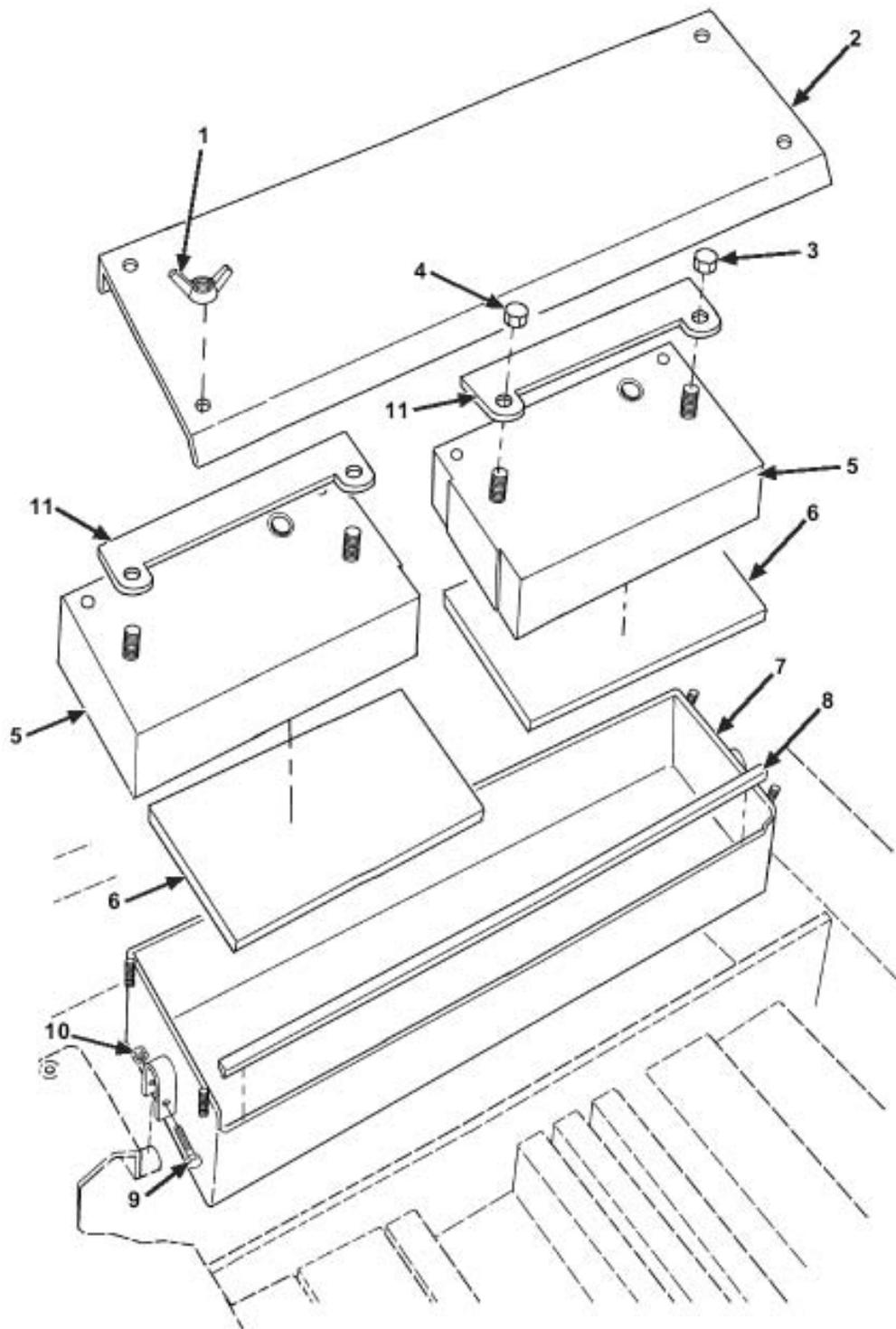


Figure 7. Battery Box Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0812 BATTERIES, STORAGE FIG 7 BATTERY BOX ASSEMBLY						
1.	PAOZZ	5310011835514	96906	MS51468-03	NUT, PLAIN, WING, 5/16 DIA	4
2.	XDOZZ		1BZD4	1049-1	LID, BATTERY BOX	1
3.	PAOZZ	5310015019194	1BZD4	1068-1	NUT PLASTIC RED	2
4.	PAOZZ	5310015019196	1BZD4	1069-1	NUT, PLASTIC BLACK	2
5.	PAOZZ	6140014327882	20038	HC-31D	BATTERY, STORAGE	2
6.	PAOZZ	5340014962171	1BZD4	00775	PAD, CUSHIONING	2
7.	XDOZZ		1BZD4	1048-1	BOX, BATTERY, STEEL	1
8.	MOOZZ		39428	8451A62-26	NONMETALLIC CHANNEL MAKE FROM NONMETALLIC CHANNEL P/N 8451A62 28 INCHES LONG	1
9.	PAOZZ	5305000712511	80204	B1821BH025C200N	SCREW, CAP, HEXAGON H ¼ DIA X 20 UNC X 2 ¼ INCHES LONG	2
10.	PAOZZ	5310000310930	96906	MS17828-4C	NUT, SELF LOCKING HE ¼ DIA X 20 UNC	2
11.	PAOZZ	5120014984965	1BZD4	1127-1	CARRIER, STORAGE BATTERY	1
END OF FIGURE						

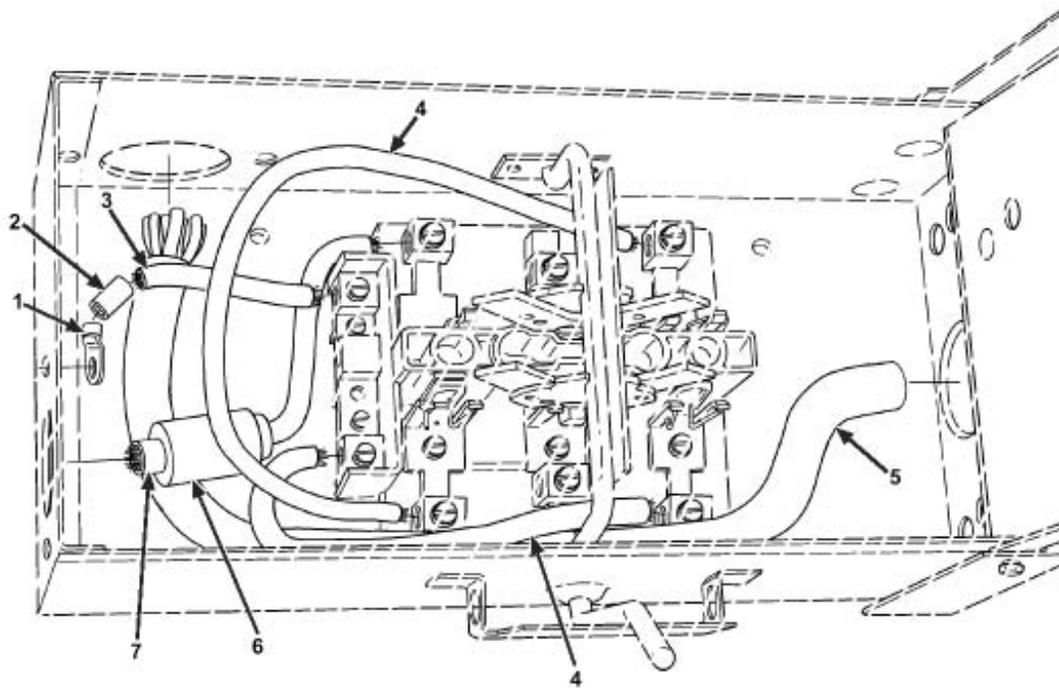


Figure 8 (1 of 9). Chassis Wiring Harness

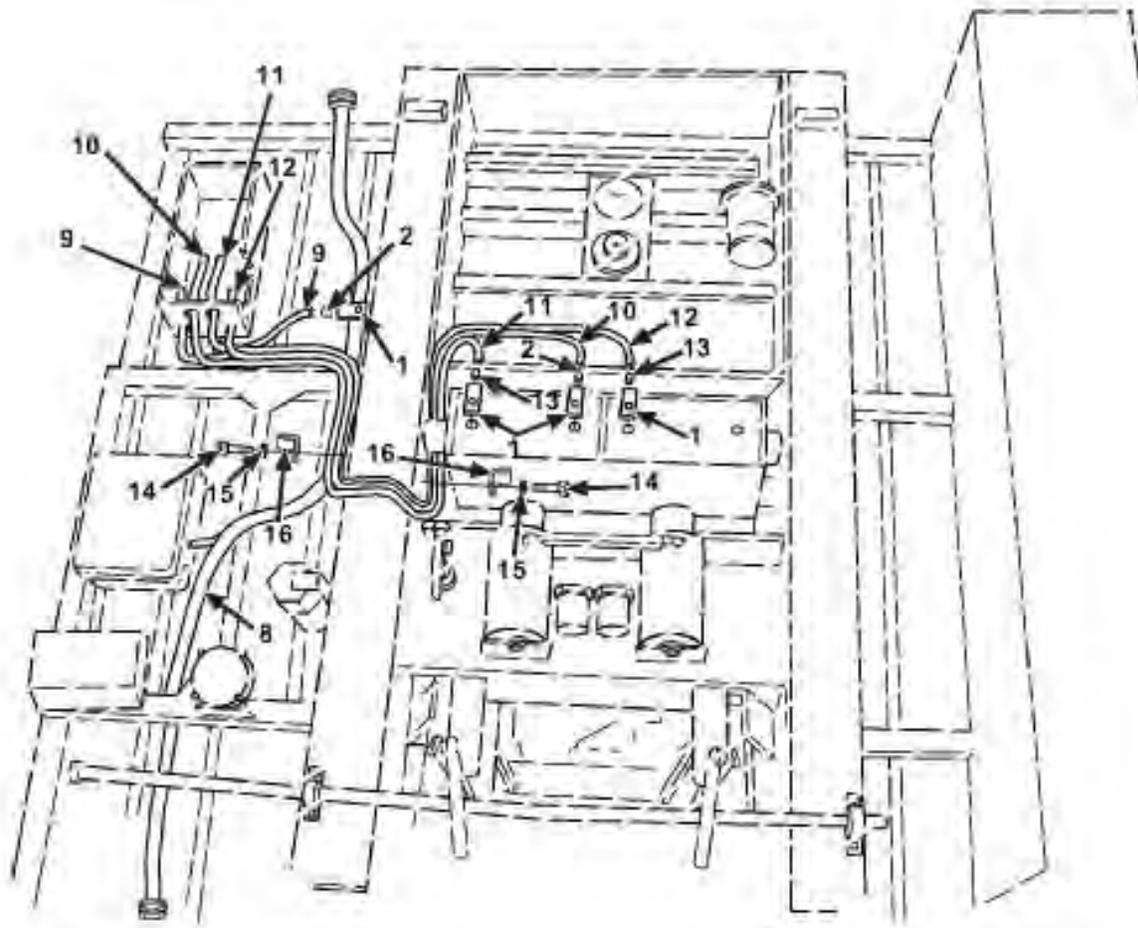


Figure 8 (2 of 9). Chassis Wiring Harness

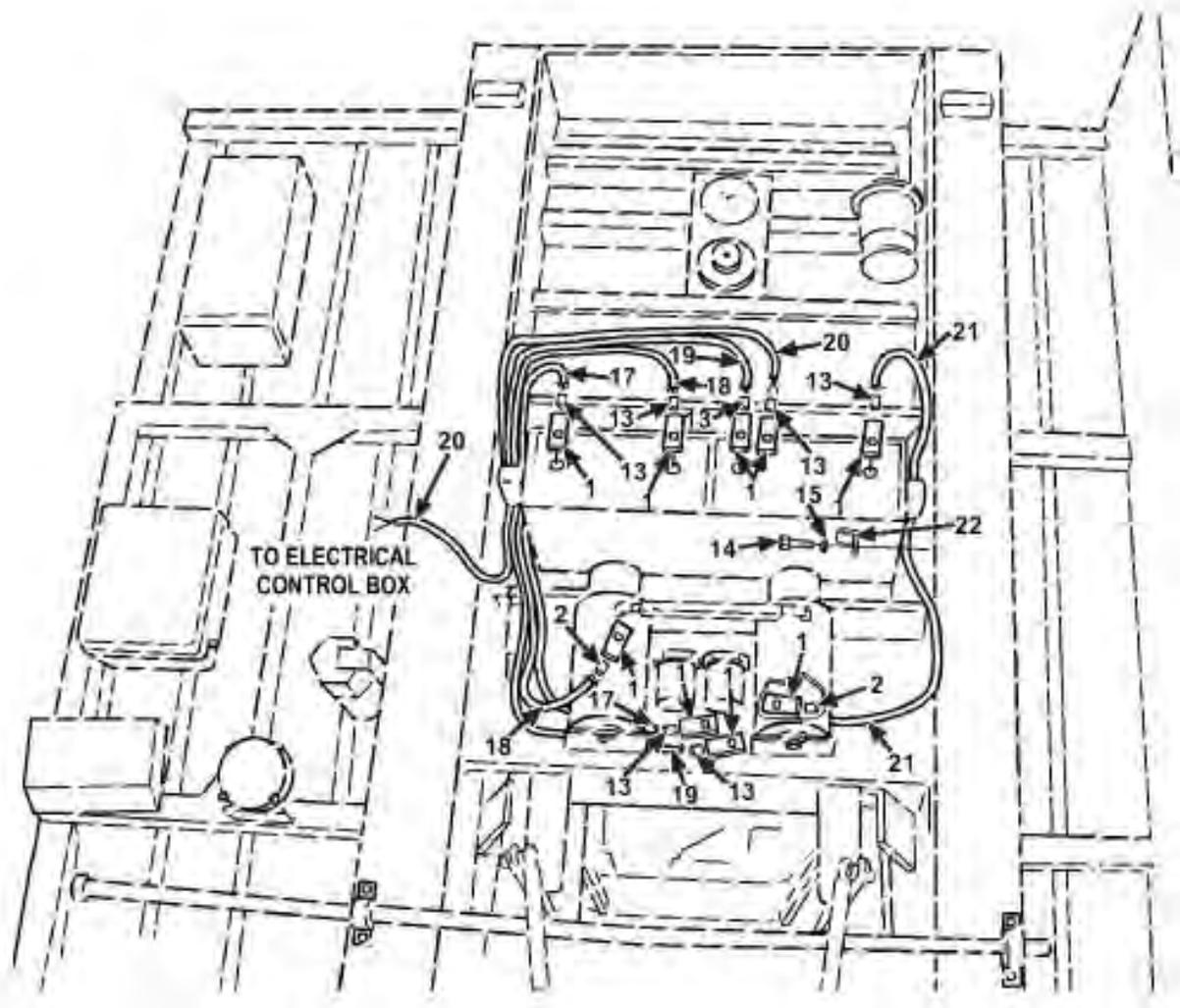


Figure 8 (3 of 9). Chassis Wiring Harness

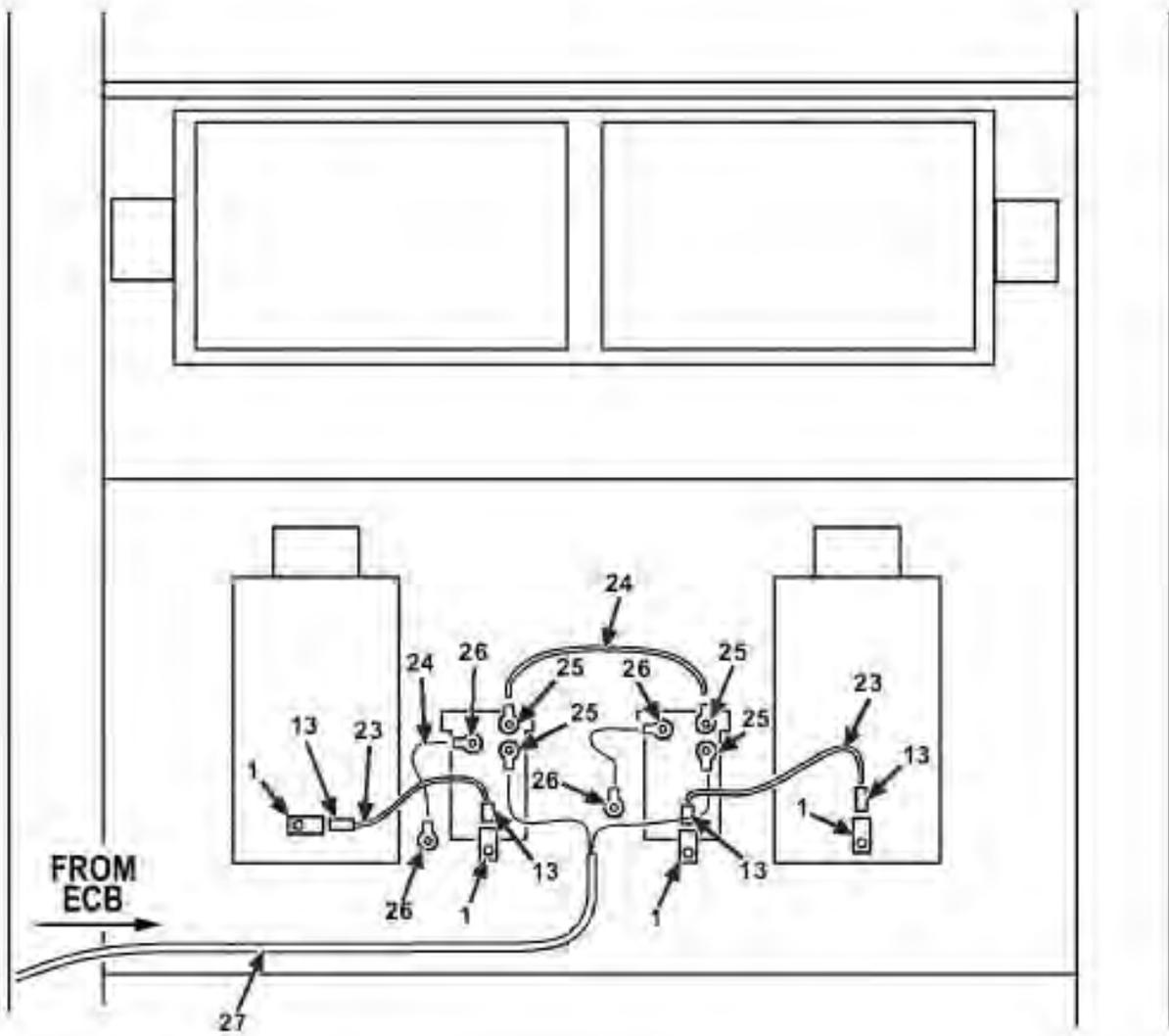


Figure 8 (4 of 9). Chassis Wiring Harness

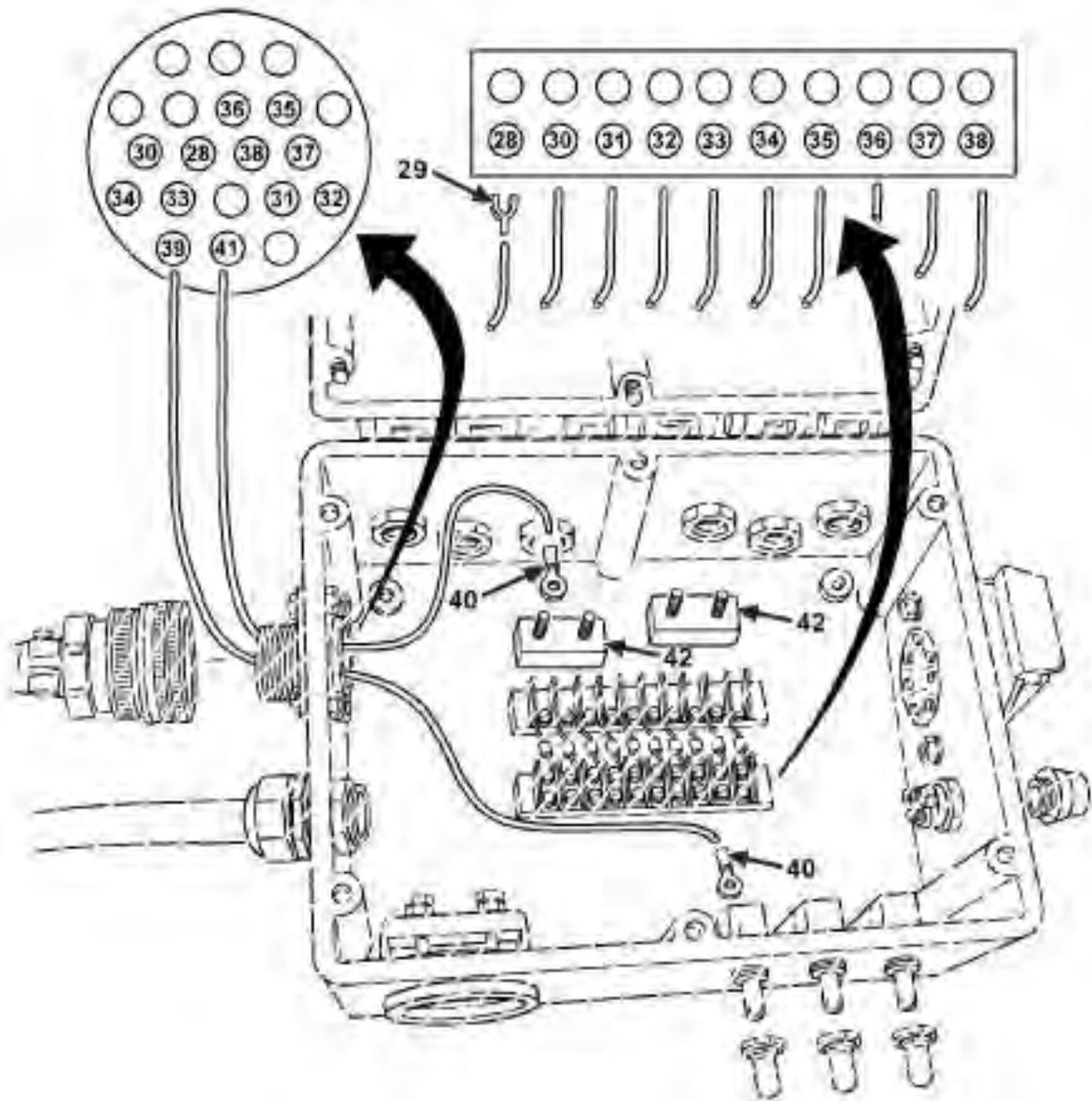


Figure 8 (5 of 9). Chassis Wiring Harness

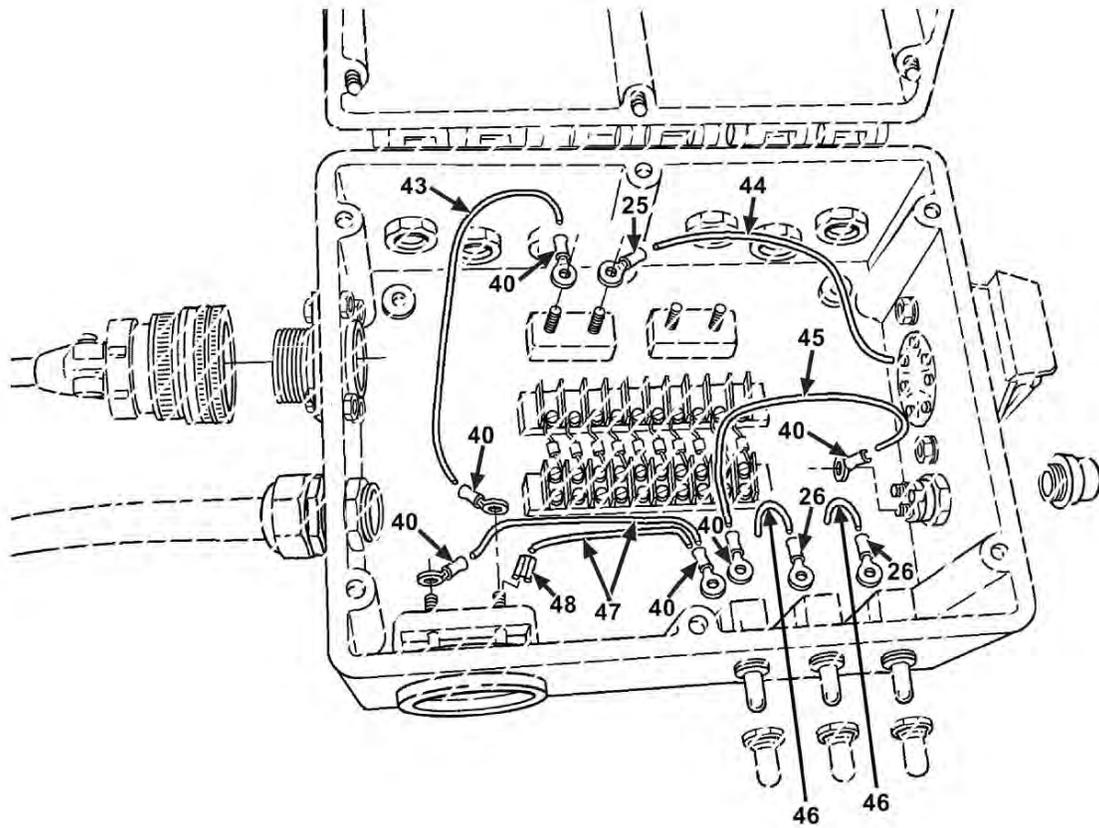


Figure 8 (6 of 9). Chassis Wiring Harness

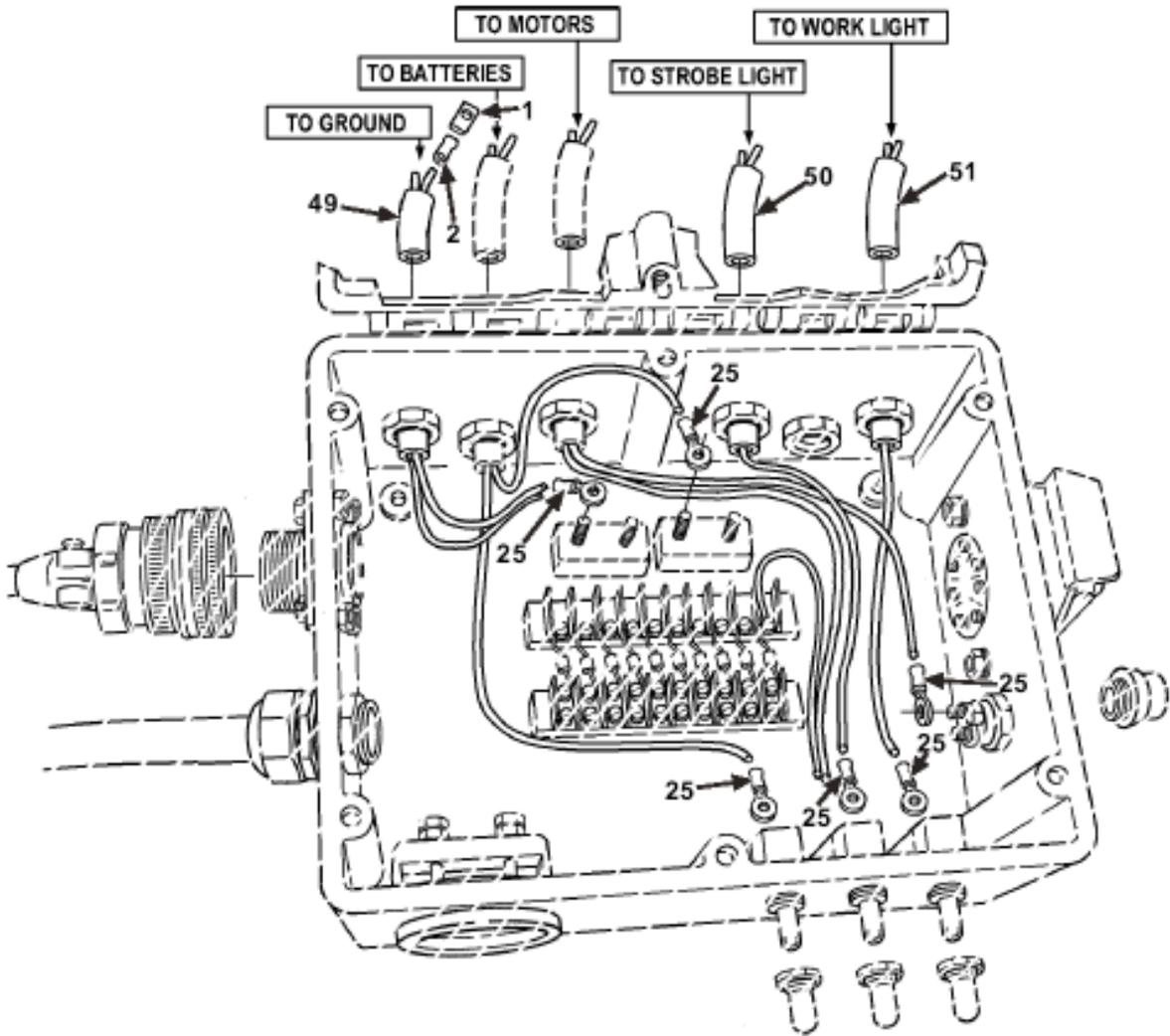


Figure 8 (7 of 9). Wiring Harness

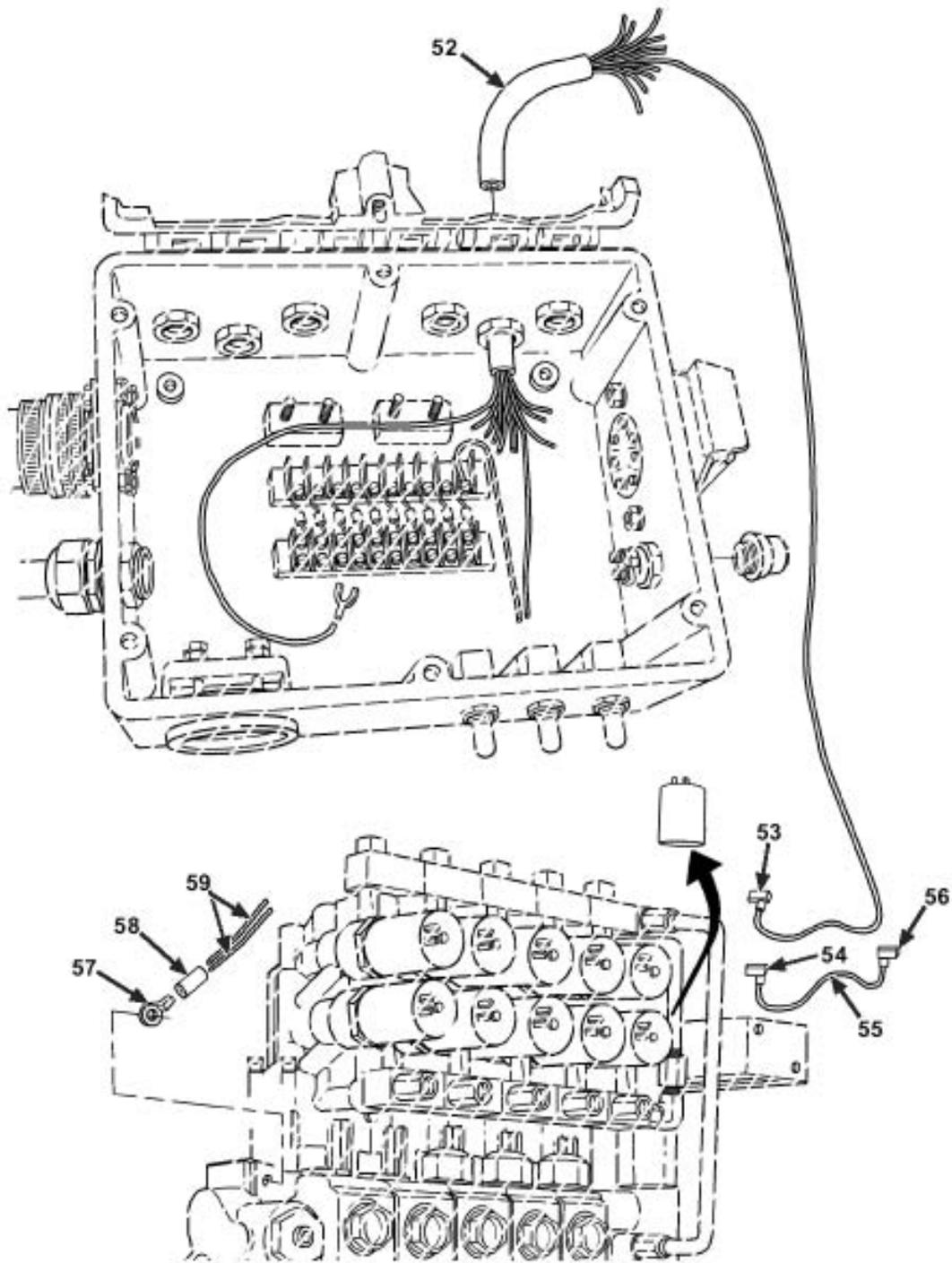


Figure 8 (8 of 9). Wiring Harness

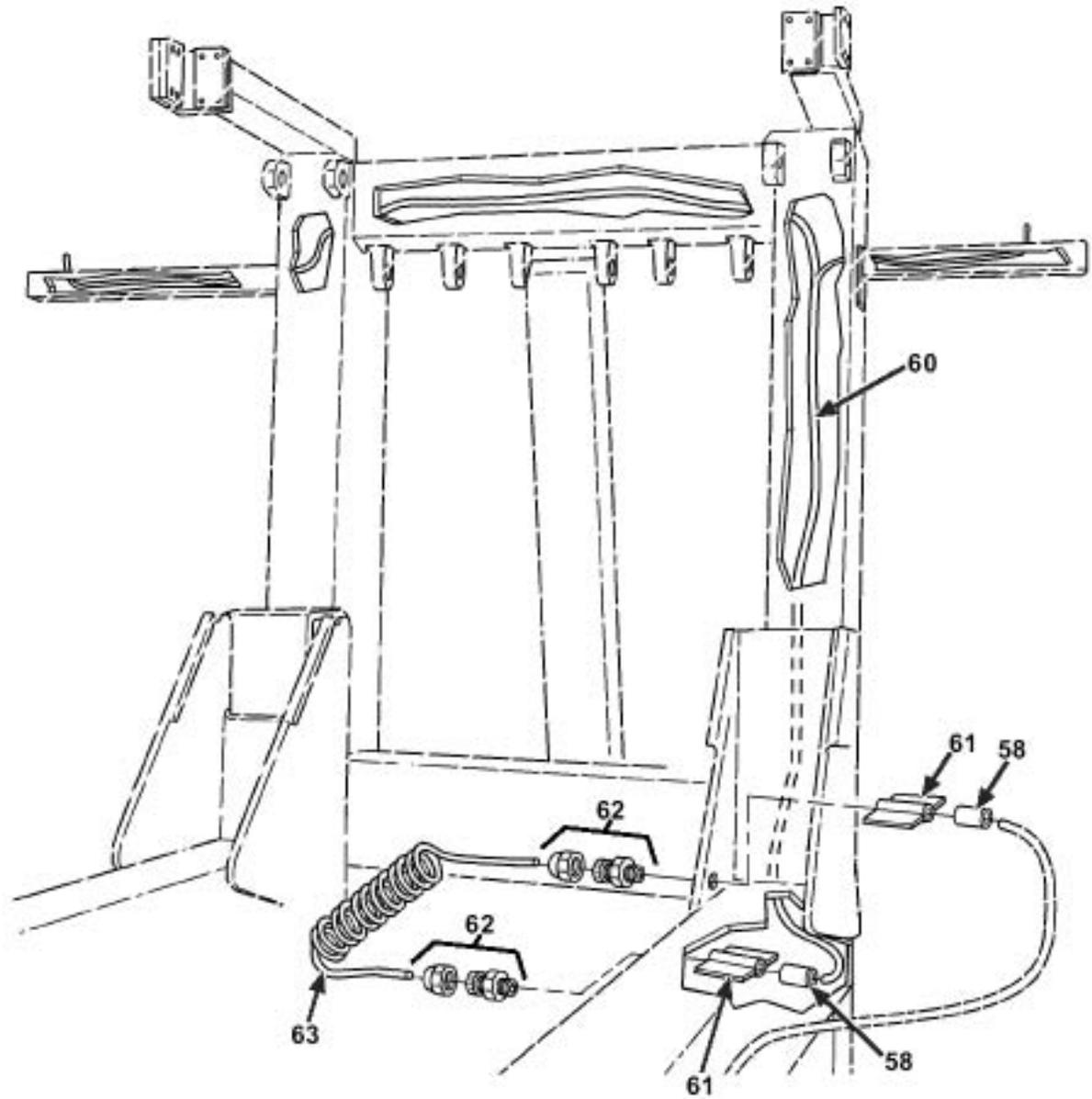


Figure 8 (9 of 9). Wiring Harness

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS FIG. 8 CHASSIS WIRING HARNESS						
1	PAOZZ	5940001422212	83298	1100363-2	TERMINAL,LUG	18
2	MOOZZ		81349	M23053/10-004-2	INSULATION SLEEVING MAKE FROM INSULATION SLEEVING,ELECTRICAL, P/N M23010-004-0 1/2 BLACK X 2 INCHES LONG	8
3	MOOZZ		81348	QQ-W-343-5	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 5 INCHES LONG	1
4	MOOZZ		81348	QQ-W-343-18	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 18 INCHES LONG	2
5	MOOZZ		81348	JC30-63	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL, P/N THW06CF7-10TPJ 63 INCHES LONG	1
6	PAOZZ	5975013148107	06721	B205010	BOOT,DUST AND MOIST	1
7	MOOZZ		81348	QQ-W-343-8	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 8 INCHES LONG	1
8	MOOZZ		1BZD4	1085-1	HARNESS,BLACKOUT JU MAKE FROM WIRE ELECTRICAL,P/N QQW343E04G1B, 11 INCHES LONG	1
9	MOOZZ		81348	QQ-W-343-37	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 37 INCHES LONG	1
10	MOOZZ		81348	QQ-W-343-80	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 80 INCHES LONG	1
11	MOOZZ		81348	QQ-W-343-70	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 70 INCHES LONG	1
12	MOOZZ		81348	QQ-W-343-90	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 90 INCHES LONG	1
13	MOOZZ		81349	M23053/12-2	INSULATION SLEEVING MAKE FROM INSULATION SLEEVING,ELECTRICAL, P/N M23053/12-106-2 1/2 RED X 2 INCHES LONG	8
14	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	3
15	PAOZZ	5310010739803	19200	12279371-1	WASHER,FLAT 3/8 DIA HOLE	2
16	PAOZZ	5340006803261	96906	MS21919WH48	CLAMP,LOOP 3 INCHES DIA	2
17	MOOZZ		81348	QQ-W-343-40	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 40 INCHES LONG	1
18	MOOZZ		81348	QQ-W-343-45	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 45 INCHES LONG	1

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES(UOC)	(7) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS FIG. 8 CHASSIS WIRING HARNESS						
19	MOOZZ		81348	QQ-W-343-47	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 47 INCHES LONG	1
20	MOOZZ		81349	2SJ-12-65	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL, P/N M24643- 06U0, 65 INCHES LONG	1
21	MOOZZ		81348	QQ-W-343-36	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G1B, 36 INCHES LONG	1
22	PAOZZ	5340000814718	96906	MS9349-04	CLAMP,LOOP 1/2 INCH DIA	1
23	MOOZZ		81348	QQ-W-343-10	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N QQW343E04G18, 10 INCHES LONG	2
24	MOOZZ		81349	2SJ-12-4	CABLE,POWER,ELECTRI MAKE FROM CABLE POWER,ELECTRICAL, P/N M2564 3143-06U0, 4 INCHES LONG	3
25	PAOZZ	5940011292678	81349	M7928/4-112	TERMINAL,LUG YELLOW EYELET	11
26	PAOZZ	5940001138179	96906	MS25036-107	TERMINAL,LUG BLUE EYELET	66
27	MOOZZ		81349	2SJ-12-60	CABLE,POWER,ELECTRICAL MAKE FROM CABLE,POWER,ELECT, P/N 2SJ-12, 60 INCHES LONG	1
28	MOOZZ		81349	M76MWPC-10	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M76MWPC1619A1, 10 INCHES LONG, BROWN	1
29	PAOZZ	5940012582108	00779	52412	TERMINAL,LUG RED OPEN SLOTTED	20
30	MOOZZ		81348	JC580-10 1/2	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N J-C-580TFF6CF116TUJ, 10 1/2 INCHES LONG	1
31	MOOZZ		81349	M81381-11	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M81381/7-16-6, 11 INCHES LONG	1
32	MOOZZ		81349	M5086-11 1/2	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-16-60, 11 1/2 INCHES LONG	1
33	MOOZZ		81349	M16878/4BJE-12	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/4BJE3, 11 1/2 INCHES LONG	1
34	MOOZZ		81349	M5086-12 1/2	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-16-30, 11 1/2 INCHES LONG	1
35	MOOZZ		81349	M22759-13	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M22759/34-16-4, 13 INCHES LONG	1
36	MOOZZ		81349	M16878/1BJE-	WIRE,ELECTRICAL MAKE FROM WIRE, 13 1/2 ELECTRICAL, P/N M16878/1BJE80, 13 1/2 INCHES LONG	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS FIG. 8 CHASSIS WIRING HARNESS						
37	MOOZZ		81348	JC580-14	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N J-C-580TFF6CF1/16 TUJ5, 14 INCHES LONG	1
38	MOOZZ		81349	M5086-14 1/2	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-16-19, 14 1/2 INCHES LONG	1
39	MOOZZ		81349	M16878/5BJE-14	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/5BJE2, 14 INCHES LONG	1
40	PAOZZ	5940000426317	00779	34148	TERMINAL,LUG RED EYELET	8
41	MOOZZ		81349	M16878/4BJE-8	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/4BJE0, 11 1/2 INCHES LONG	1
42	PAOZZ	5925012068136	75915	813040	CIRCUIT BREAKER 40 AMP	2
43	MOOZZ		81349	M16878/4BJE-16	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/4BJE0, 16 INCHES LONG	1
44	MOOZZ		81349	M5086-7	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-10-9, 7 INCHES LONG	1
45	MOOZZ		81349	M16878/5BJE-7	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/5BJE2, 7 INCHES LONG	2
46	MOOZZ		81349	M16878/5BKE-8	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/5BKE0, 8 INCHES LONG	2
47	MOOZZ		81349	M16878/6BFE-6	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M16878/6BFE0, 6 INCHES LONG	2
48	PAOZZ	5940008049184	96906	MS27429-2	TERMINAL,QUICK DISC	1
49	MOOZZ		81349	2SJ-12-36	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL, P/N M24643/ 43-06U0, 36 INCHES LONG	1
50	MOOZZ		81349	2SJ-12-40	CABLE,POWER,ELECTRI MAKE FROM CABLE, POWER,ELECTRICAL, P/N M24643/43-06U0, 40 INCHES LONG	1
51	MOOZZ		81349	2SJ-12-48	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL P/N M24643/ 43-06U0, 48 INCHES LONG	1
52	MOOZZ		81349	C0-12MGF-76	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL, P/N C0-12MGF (12/18)0685 76 INCHES LONG	1
53	PAOZZ	5940011412881	14726	S05360SF	TERMINAL,QUICK DISC PINK FLAG	11
54	PAOZZ	5940011696391	14726	S05363SF	TERMINAL,QUICK DISC BLUE FLAG	2
55	MOOZZ		81349	M5086/1-3	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-12-0, 3 INCHES LONG	3

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 0613 HULL OR CHASSIS WIRING HARNESS						
FIG. 8 CHASSIS WIRING HARNESS						
56	PAOZZ	5935014968429	60592	533-25NLB	TERMINAL,QUICK DISC YELLOW FLAG	9
57	PAOZZ	5940001138183	98410	C530-56	RING CONNECTING	1
58	MOOZZ		81349	M23053/10-002-2	INSULATION SLEEVING MAKE FROM INSULATION SLEEVING,ELECTRICAL, P/N M23053/10-002-0 1/4 BLACK X 2 INCHES LONG	1
59	MOOZZ		81349	M5086/1-20	WIRE,ELECTRICAL MAKE FROM WIRE, ELECTRICAL, P/N M5086/1-12-0, 20 INCHES LONG	2
60	MOOZZ		81349	2SJ-12-163	CABLE,POWER,ELECTRI MAKE FROM CABLE,POWER,ELECTRICAL, P/N M24643 /43-06U0 163 INCHES LONG	1
61	PAOZZ	5940015022111	60592	B31WN	CONNECTOR,WIRE	2
62	PAOZZ	5975014970117	39428	69915K51	BUSHING,STRAIN RELI 3/8 INCH	2
63	PAOZZ	6150014976831	39428	7088K11	CORD,ELECTRICAL	1

END OF FIGURE

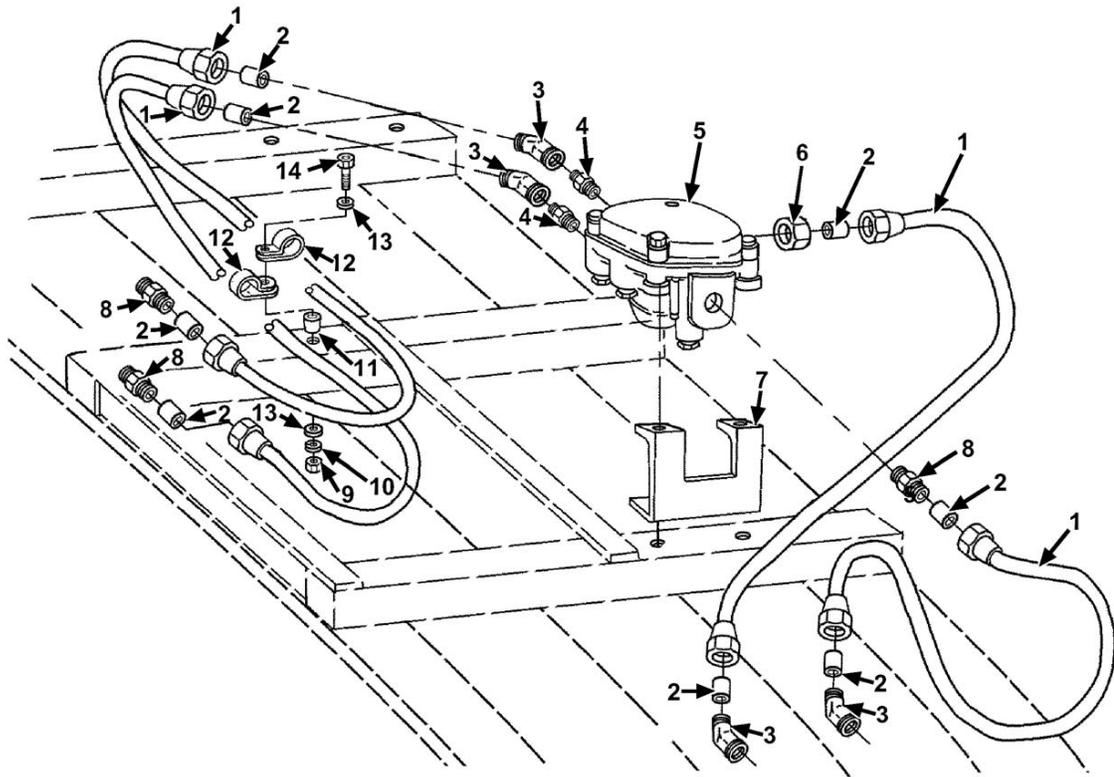


Figure 9. Air Brake System

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 12 BRAKES GROUP 1208 AIR BRAKE SYSTEM FIG. 9 AIR BRAKE SYSTEM	
1	MOOZZ		29510	417200C2-32	TUBING, NONMETALLIC MAKE FROM TUBING, NONMETALLIC, P/N 417200C2, 32 INCHES LONG	1
1	MOOZZ		29510	417200C2-34	TUBING, NONMETALLIC MAKE FROM TUBING, NONMETALLIC, P/N 417200C2, 34 INCHES LONG	1
1	MOOZZ		29510	417200C2-56	TUBING, NONMETALLIC MAKE FROM TUBING, NONMETALLIC, P/N 417200C2, 56 INCHES LONG	2
2	PAOZZ	4730010663363	89346	414506C1	INSERT, TUBE FITTING THREE PIECES	8
3	PAOZZ		1BZD4	1073-1	FITTING, COMPRESSION	4
4	PAOZZ	4730002000257	19207	7390150	REDUCER, PIPE	2
5	PAOZZ	2530010958752	06853	281865	VALVE, RELAY, AIR PRE	1
6	PAOZZ		1BZD4	00870	BUSHING, BRASS	1
7	XDOZZ		1BZD4	1026-1	BRACKET, REG VALVE	1
8	PAOZZ	4730001423076	81343	8-6 120102BA	ADAPTER, STRAIGHT PI	3
9	PAOZZ	5310000115120	24617	115120	NUT, PLAIN, HEXAGON 1/4 DIA X 20 UNC	1
10	PAOZZ	5310005501130	96906	MS35333-40	WASHER, LOCK 1/4 DIA HOLE	1
11	XDOZZ		1BZD4	1102-1	SPACER	1
12	PAOZZ	5340004044101	75272	COV1313	CLAMP, LOOP	2
13	PAOZZ	5310006858308	81348	FFW92	WASHER, FLAT 1/4 DIA HOLE	2
14	PAOZZ	5305000712519	80204	B1821BH025C400N	SCREW, CAP, HEXAGON H 1/4 DIA X 20 UNC X 4 INCHES LONG	1

END OF FIGURE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1208 AIR BRAKE SYSTEM						
FIG. 10 GLADHANDS						
1	PAOZZ	4730002449848	28548	5228623	NIPPLE,TANK	4
2	PAOZZ	5310002206668	06853	204000	.NUT,PLAIN,HEXAGON1	
3	XAOZZ		06853	2021945	.REDUCER,PIPE	1
4	XDOZZ		1BZD4	1027-1	BRACKET,MOUNTING	2
5	PAOZZ	4730005950083	58536	A52484-1	COUPLING HALF,QUICK SUPPLIED WITH BLUE AND RED ARM LOCK	4
6	PAOZZ	5305011638191	06853	240407	.SCREW,ASSEMBLED WAS	2
7	PAOZZ	4730011061757	06853	240233	.ARM,LOCK,HOSE COUPL	1
8	PAOZZ	5330000902128	06853	213630	.PACKING,PREFORMED	1
9	XAOZZ		06853	243655	.BODY,COUPLING,QDISC	1
10	PAOZZ	2530002703878	19207	7338409	DUMMY COUPLING, AUTO	4
11	XAOZZ		06853	213605	.COUPLING BODY	1
12	PAOZZ	4030001029687	06853	235646	.HOOK,CHAIN,S	2
13	PAOZZ	4010005519921	19207	7366032	.CHAIN ASSEMBLY,SING	1

END OF FIGURE

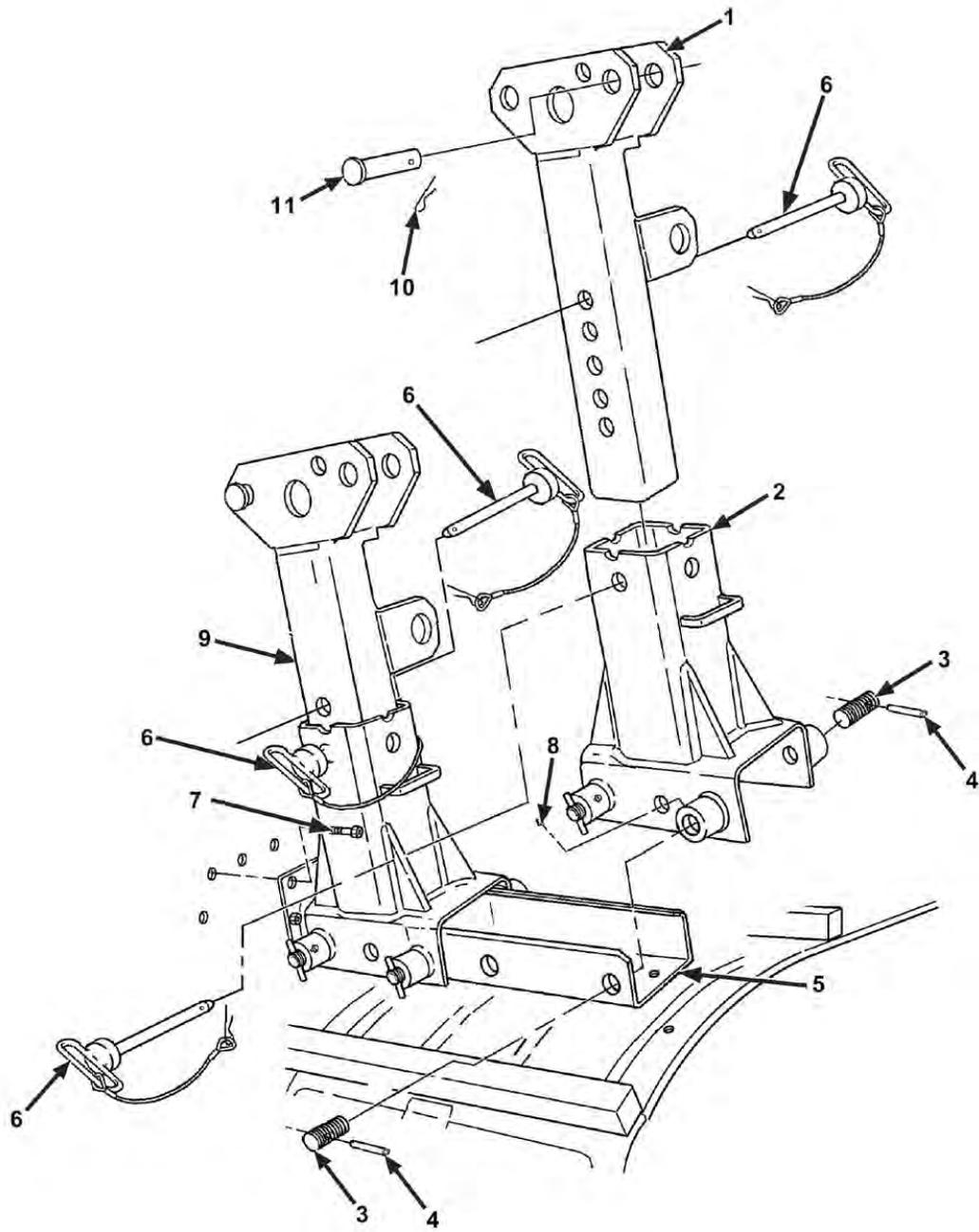


Figure 11. Tow Bar Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 15 FRAME, TOWING ATTACHMENTS						
GROUP 1503 PINTLES AND TOWING ATTACHMENTS						
FIG. 11 TOW BAR ASSEMBLY						
1	XDOZZ		1BZD4	1015-1	ATTACHMENT,TOWBAR RIGHT SIDE	1
2	XDOZZ		1BZD4	1014-1	RECEIVER,TOWBAR ATT	2
3	PAOZZ	5306014956997	1BZD4	1042-1	BOLT,TEE,TOWBAR	8
4	PAOZZ	5315014966348	39428	98296A548	PIN,SPRING	8
5	XDOZZ		1BZD4	1030-1	FRAME,TOWBAR MOUNTI	1
6	PAOZZ	5315014979960	1BZD4	02545	PIN,STRAIGHT HEADED	4
7	PAOZZ	5305009640691	80204	B1821BH038C150D	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 1/4INCHES LONG	7
8	XDOZZ		0ATA2	2001	FITTING,GREASE	8
9	XDOZZ		1BZD4	1020-1	ATTACHMENT,TOWBAR LEFT SIDE	1
10	PAOZZ	5315011334382	39428	98296A556	PIN,SPRING PART OF ITEM 10	2
11	PAOZZ	2540015015365	1BZD4	02560	PIN,PINTLE	2

END OF FIGURE

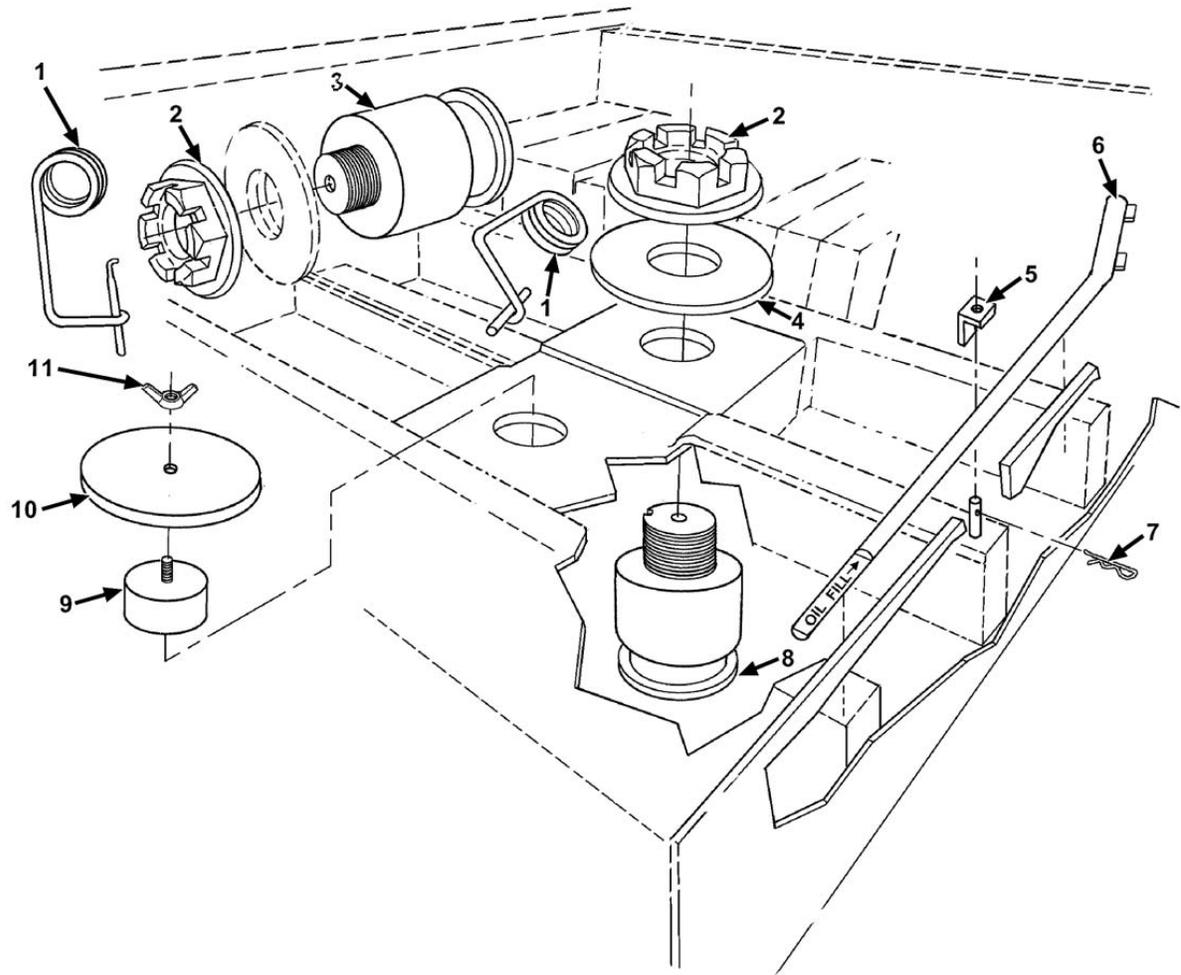


Figure 12. Kingpin Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 15 FRAME, TOWING ATTACHMENETS GROUP 1503 PINTLES AND TOWING ATTACHMENTS FIG. 12 KINGPIN ASSEMBLY	
1	PAOZZ	5315014960452	1BZD4	XB-T-360	PIN,SPRING	2
2	PAOZZ	5310015002707	74410	XA0404	NUT,PLAIN,CASTELLAT	2
3	PAOZZ	2510014964441	74410	XA0409	KINGPIN,FIFTH WHEEL 3 1/2 INCHES	1
4	PAOZZ	5325014960432	74410	XA0403	RING,HOUSING,INTERC	1
5	PAOZZ	5340014964055	1BZD4	1099-1	BRACKET,ANGLE	1
6	PAOZZ	5120015071183	1BZD4	1081-1	KINGPIN WRENCH	1
7	PAOZZ	5315014960426	1BZD4	02240	PIN,RETAINING	1
8	PAOZZ	2510014961811	74410	XA0411	KINGPIN,FIFTH WHEEL 2 INCHES	1
9	PAOZZ	5510014961818	74410	XB0360	PLUG,WOOD	1
10	PAOZZ		74410	XA-T-653-6	CAP,PROTECTIVE,DUST	1
11	PAOZZ	5310014981951	74410	XB0418	NUT,PLAIN,WING	1

END OF FIGURE

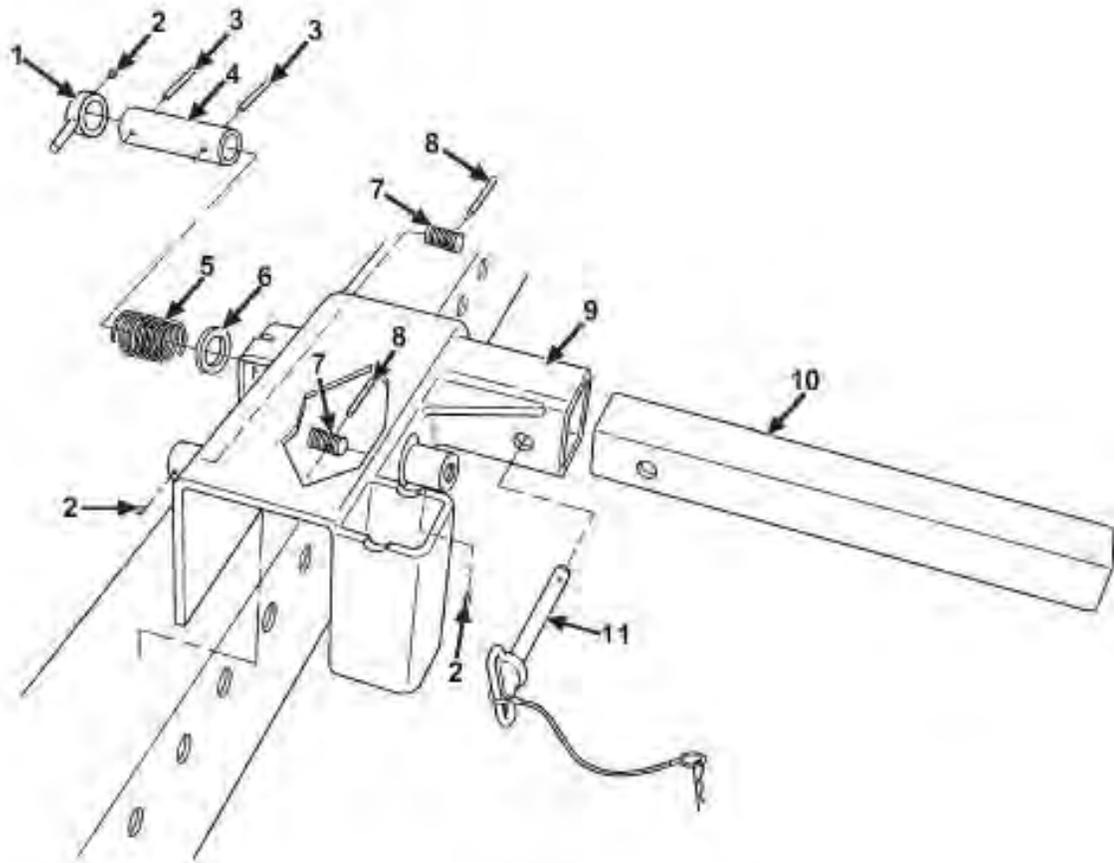


Figure 13. Receiver and Wheelstop Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1503 PINTLES AND TOWING ATTACHMENTS FIG. 13 RECEIVER AND WHEELSTOP ASSEMBLY						
1	PAOZZ	5340014961903	1BZD4	1054-1	HANDLE,MANUAL CONTR	2
2	XDOZZ		0ATA2	2001	FITTING,GREASE	6
3	PAOZZ	5315012823483	39428	98296A255	PIN,SPRING	4
4	PAOZZ	5315014960453	1BZD4	1057-1	PIN,STRAIGHT,HEADLE	2
5	PAOZZ	5360014960434	1BZD4	1058-1	SPRING,HELICAL,COMP	2
6	PAOZZ	5310010132395	98523	A200151C007	WASHER,FLAT 3/4 DIA HOLE	2
7	PAOZZ	5306014957002	1BZD4	1040-1	BOLT,TEE,HEAD	4
8	PAOZZ	5315011334382	39428	98296A559	PIN,SPRING	4
9	XDOZZ		1BZD4	1053-1	RECEIVER ASSEMBLY LEFT SIDE	1
9	XDOZZ		1BZD4	1052-1	RECEIVER ASSEMBLY RIGHT SIDE	1
10	XDOZZ		1BZD4	1041-1	WHEEL STOP	2
11	PAOZZ	5315014984029	1BZD4	02540	PIN,STRAIGHT HEADED	2

END OF FIGURE

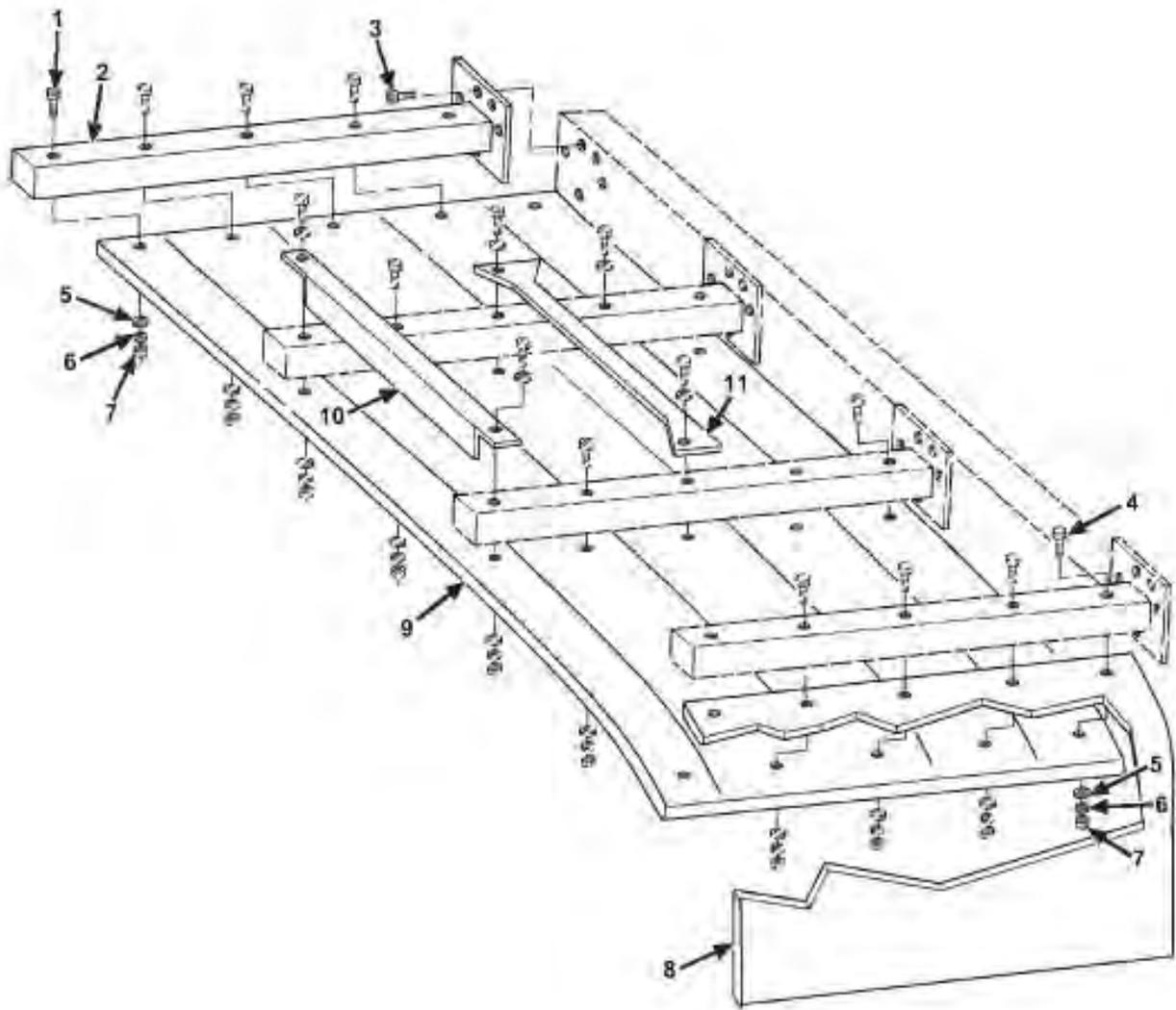


Figure 14. Fenders and Mud Flaps

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 18 BODY, CAB, HOOD, AND HULL GROUP 1802 FENDERS, RUNNING BOARDS WITH MOUNTING AND ATTACHING PARTS FIG. 14 FENDERS AND MUDFLAPS	
1	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	40
2	XDOZZ		1BZD4	1055-1	BRACKET,FENDER MOUN	8
3	PAOZZ	5305002907156	96906	MS35311-18	SCREW,CAP,HEXAGON H 1/4 DIA X 20 UNC X 3 INCHES LONG	25
4	PAOZZ	5305000712513	80204	B1821BH025C250N	SCREW,CAP,HEXAGON H 1/4 DIA X 20 UNC X 2 1/2 INCHES LONG	15
5	PAOZZ	5310006858308	04773	125-10497-07	WASHER,FLAT 1/4 DIA HOLE	51
6	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK 1/4 DIA HOLE	40
7	PAOZZ	5310000115120	24617	115120	NUT,PLAIN,HEXAGON 1/4 DIA X 20 UNC.	40
8	PAOZZ	2540014965769	1BZD4	1063-1	GUARD,SPLASH	2
9	XDOZZ		1BZD4	034-01559	FENDER	2
10	XDOZZ		1BZD4	1023-1	BRACKET,ELECTRIC MT LEFT SIDE	1
11	XDOZZ		1BZD4	1024-1	BRACKET,ELECTRIC MT RIGHT SIDE	1

END OF FIGURE

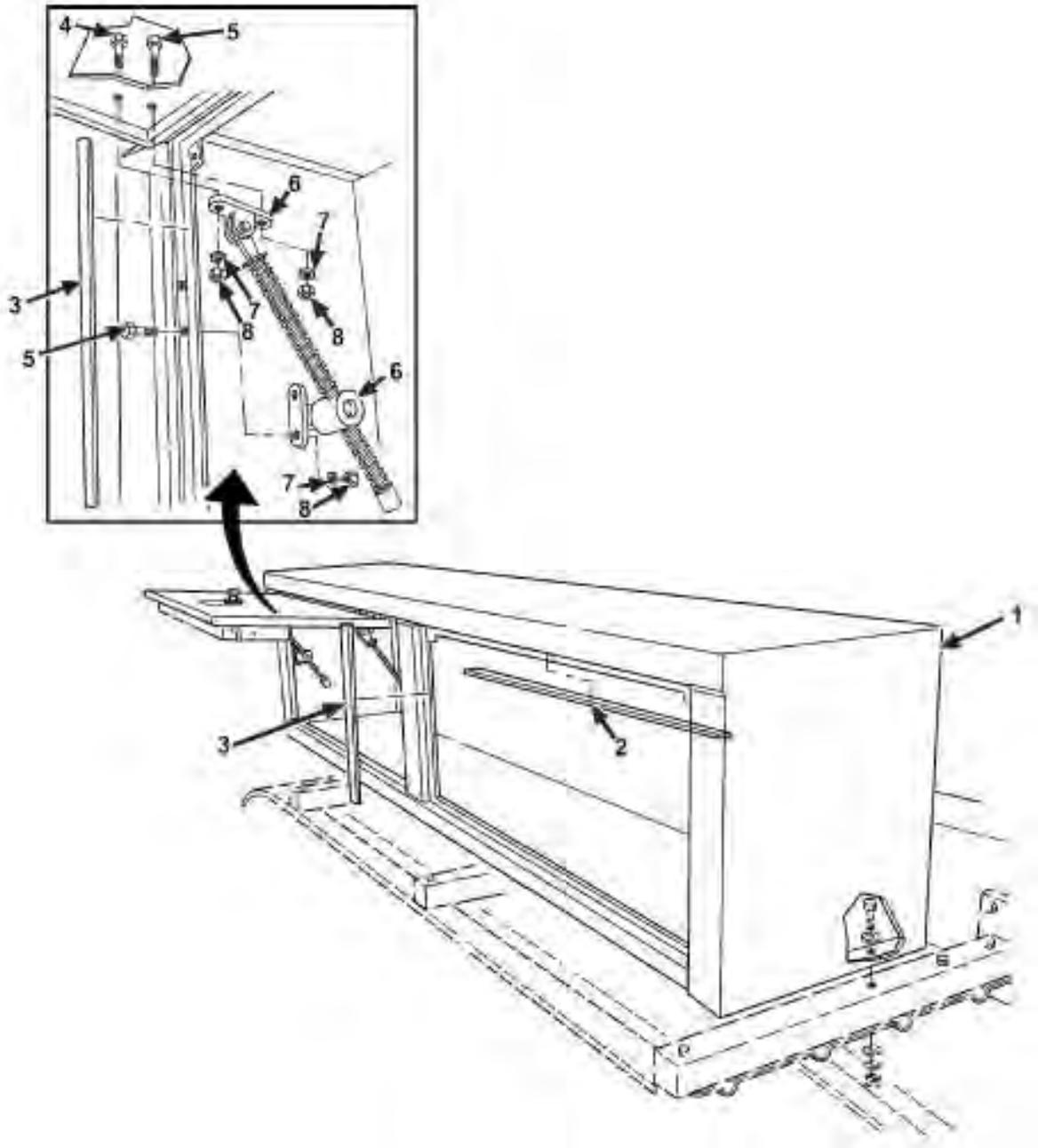


Figure 15. Tool Box

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1808 STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, CABLE REELS, HOSE REELS, ETC. FIG. 15 TOOL BOX	
1	PAOZZ	2540014966004	1BZD4	1095-1	BOX,ACCESSORIES,STO	1
2	MOOZZ		99806	M200SER-8-31	PLASTIC STRIP MAKE FROM PLASTIC STRIP, P/N M200SERIES1X1-8 31 INCHES LONG	4
3	MOOZZ		39428	93695K-13	WEATHER STRIP MAKE FROM WEATHER STRIP, P/N 93695K62, 13 INCHES LONG.	4
4	PAOZZ	5305001090282	12020	1726-1610	SCREW,MACHINE 1/4 DIA X 20 UNC X 3/4 INCHES LONG	4
5	PAOZZ	5305010782010	82366	530-50031	SCREW,MACHINE 1/4 DIA X 20 UNC X 1 INCH LONG	12
6	PAOZZ	2590014965997	1BZD4	1059-1	BRACKET,VEHICUL,COM	4
7	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK 1/4 DIA HOLE	16
8	PAOZZ	5310000131245	21450	131245	NUT,SELF-LOCKING,HE 1/4 DIA X 20 UNC	16
END OF FIGURE						

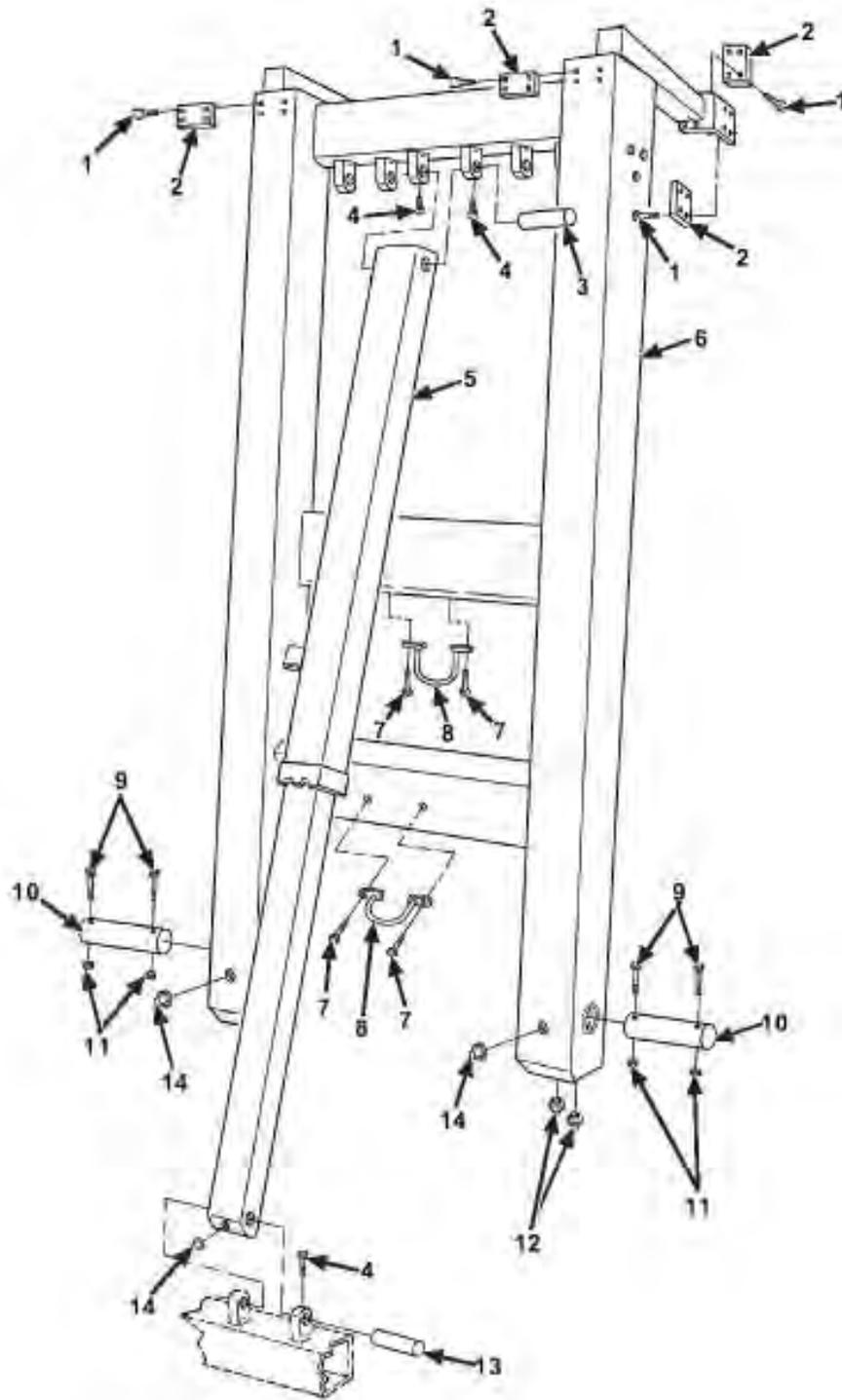


Figure 16. Mast Frame Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1812 SPECIAL PURPOSE BODIES FIG. 16 MAST FRAME ASSEMBLY	
1	PAOZZ	5305009835346	96906	MS16997-78	SCREW,CAP,SOCKET HE 5/16 DIA X 18 UNC x 3/4 INCHES LONG	24
2	PAOZZ	5340014964081	1BZD4	02440	PAD,SLIP	6
3	PAOZZ	5315014962280	1BZD4	1038-1	PIN,STRAIGHT,HEADLE	1
4	XDOZZ		1BZD4	1062-1	SCREW,SQUARE HEAD	4
5	XDOZZ		1BZD4	1051-1	FRAME,CENTER MAST	1
6	XDFLL		1BZD4	1088-1	FRAME,MAST ASSEMBLY	1
7	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	4
8	PAOZZ		1BZD4	1061-1	CLAMP,LOOP HOSE RETAINING	2
9	PAOZZ	5305007813927	80204	B1821BH038C350N	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 3 1/2 INCHES LONG	4
10	PAOZZ	5315014960454	1BZD4	1043-1	PIN,STRAIGHT,HEADLE	2
11	PAOZZ	5310000506646	96906	MS17830-6C	NUT,SELF-LOCKING,HE 3/8 DIA X 16 UNC	4
12	XDOZZ		0ATA2	2023	FITTING,GREASE	4
13	PAOZZ	5315014958282	1BZD4	1037-1	PIN,STRAIAGHT,HEADLE	1
14	XDOZZ		0ATA2	2001	FITTING,GREASE	4

END OF FIGURE

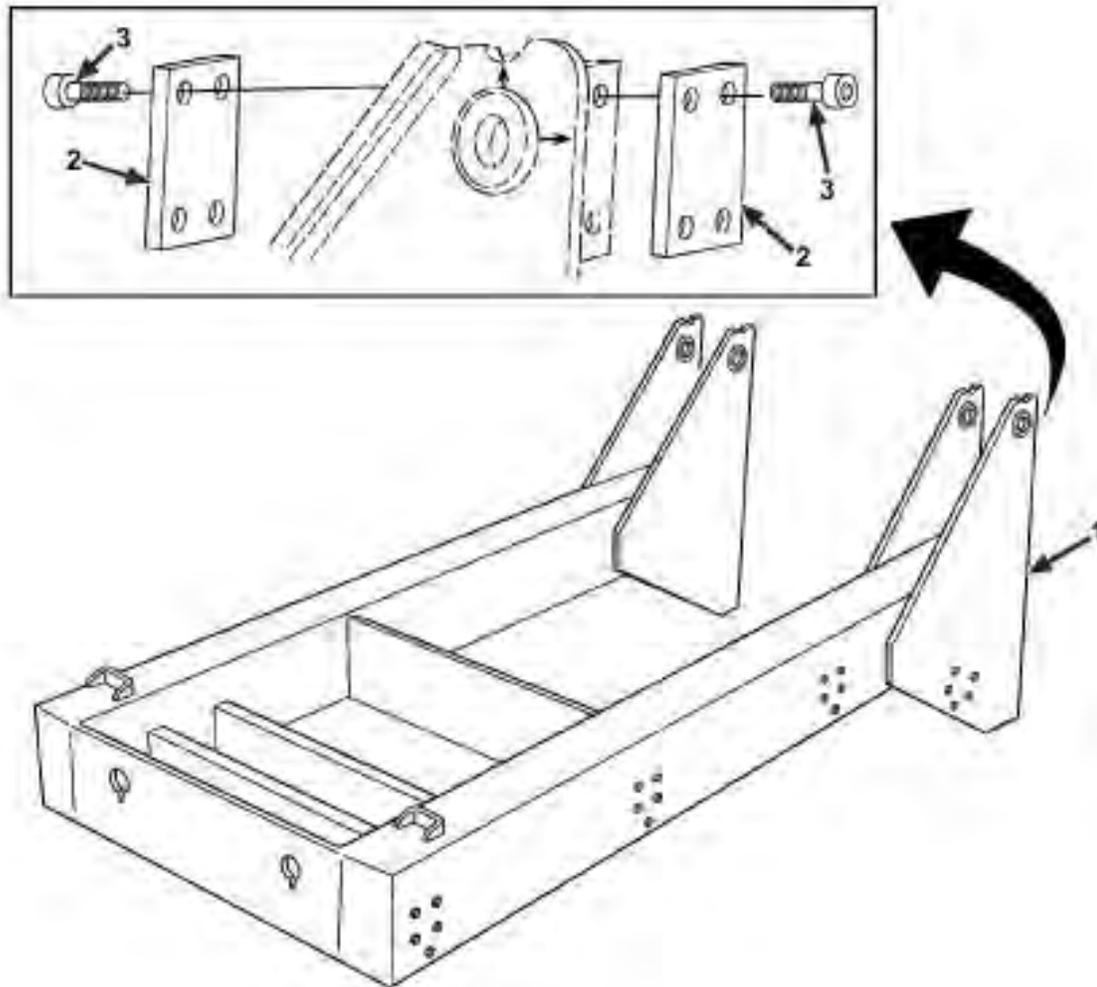


Figure 17. Main Frame Assembly

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(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1812 SPECIAL PURPOSE BODIES	
					FIG. 17 MAIN FRAME ASSEMBLY	
1	XDFLL		1BZD4	1090-1	FRAME,MAIN ASSEMBLY	1
2	PAOZZ	5340014964081	1BZD4	02440	PLATE,MOUNTING	16
3	PAOZZ	5315009835346	1BZD4	1038-1	SCREW,CAP,SOCKET HE 5/16 DIA X 18	64
					UNC X 3/4 INCHES LONG	

END OF FIGURE

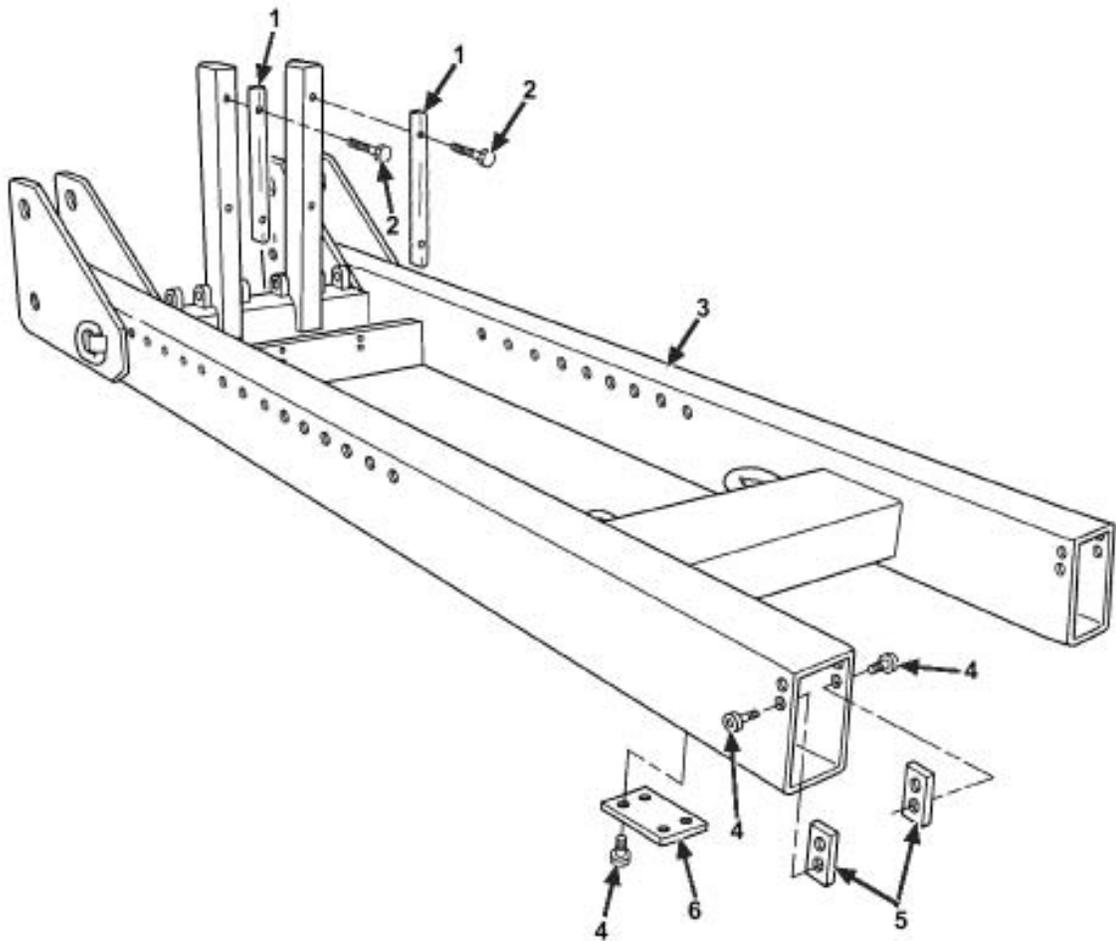


Figure 18. Boom Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1812 SPECIAL PURPOSE BODIES FIG. 18 BOOMASSEMBLY						
1	PAOZZ	5340014964093	1BZD4	1077-1	BUMPER, NONMETALLIC	2
2	PAOZZ	5305014315149	45152	2196790	SCREW, CAP, SOCKET HE 3/8 DIA X 16 UNC X 1 1/4 INCHES LONG	4
3	XDFLL		1BZD4	1089-1	FRAME, BOOM ASSEMBLY	1
4	PAOZZ	5305009835346	96906	MS16997-78	SCREW, CAP, SOCKET HE 5/16 DIA X 18 UNC X 3/4 INCHES LONG	16
5	PAOZZ	5340015023308	1BZD4	1060-1	PAD, RETAINING	4
6	PAOZZ	5340014964081	1BZD4	1006-1	PLATE, MOUNTING	2
END OF FIGURE						

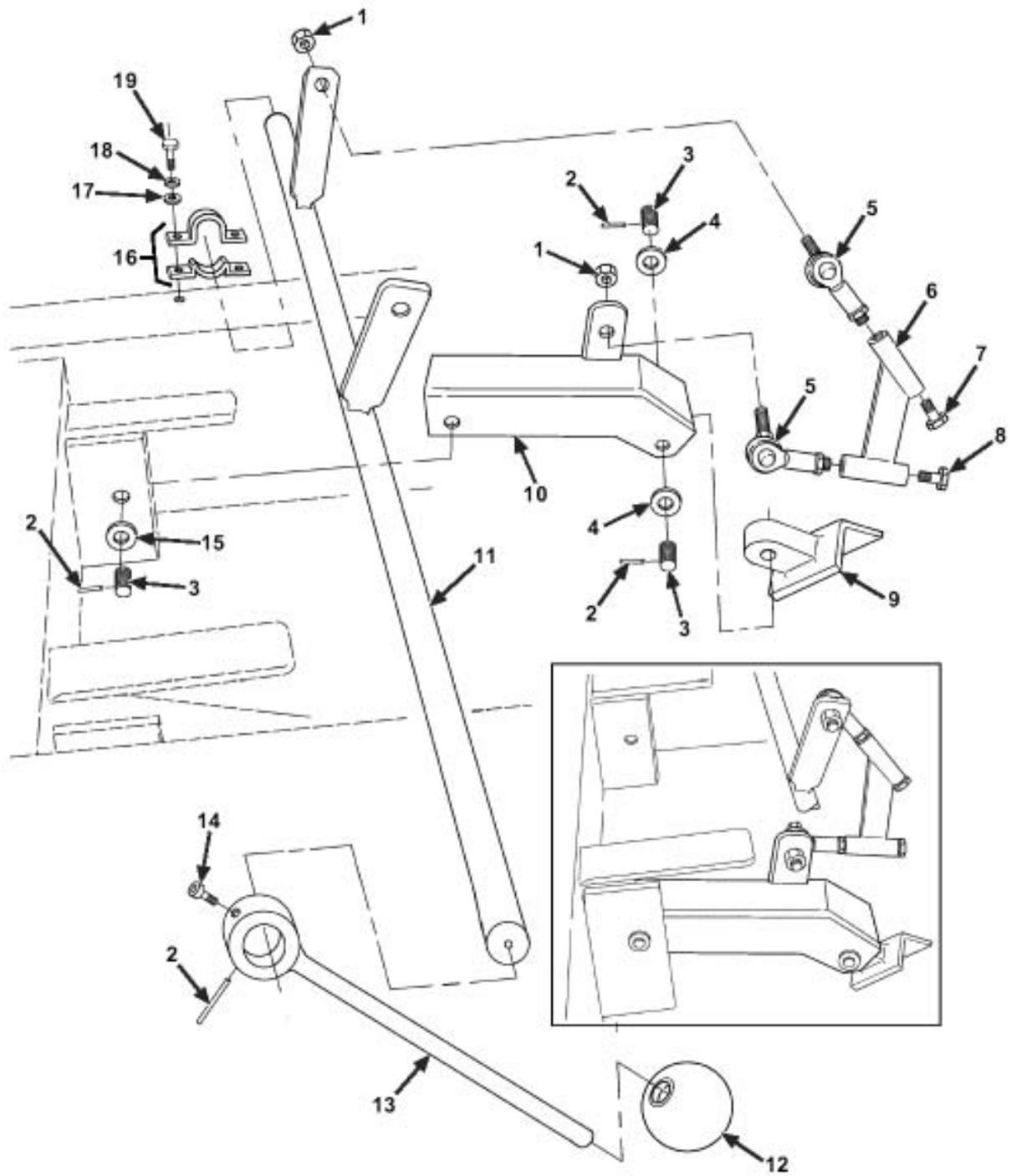


Figure 19. Transport Leg Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1812 SPECIAL PURPOSE BODIES FIG. 19 TRANSPORT LEG ASSEMBLY						
1	PAOZZ	5310008775795	96906	21044N8	NUT,SELF-LOCKING,HE 1/4 DIA X 20 UNC	4
2	PAOZZ	5315012823483	39428	98296A255	PIN,SPRING	9
3	PAOZZ	5315014962299	1BZD4	1031-1	PIN,RETAINING UPPER SECTION	2
3	PAOZZ	5315014962317	1BZD4	1032-1	PIN,RETAINING LOWER SECTION	2
4	PAOZZ	5310014981892	1BZD4	1066-1	WASHER,FLAT 3/4 DIA HOLE	4
5	PAOZZ	5340015023323	1BZD4	02650	BOLT,BALL END	4
6	PAOZZ	3040014957880	1BZD4	1029-1	CONNECTING LINK,ROD	2
7	PAOZZ	5305007195274	96906	MS90727-125	SCREW,CAP,HEXAGON H 1/2 DIA X 20 UNC X 4 1/2 INCHES LONG	2
8	PAOZZ	5305007195243	80204	B1821	BH050F300N SCREW,CAP,HEXAGON H 1/2 DIA X 20 UNC X 3 INCHES LONG	2
9	PAOZZ	3040014957628	1BZD4	1028-1	BRACKET,EYE,ROTATIN LEFT SIDE	2
10	XDOZZ		1BZD4	1046-1	FRAME,LEG LEFT SIDE	1
10	XDOZZ		1BZD4	1047-1	FRAME,LEG RIGHT SIDE	1
11	PAOZZ	2540014970751	1BZD4	1044-1	BAR,TRANSPORT LEG	1
12	PAOZZ	5355014412838	99862	CL-4-PPK-4	KNOB	1
13	PAOZZ	5340014964114	1BZD4	1045-1	HANDLE,MANUAL CONTR	1
14	PAOZZ	5305009835346	96906	MS16997-78	SCREW,CAP,SOCKET HE 5/16 DIA X 18 UNC X 3/4 INCHES LONG	1
15	PAOZZ	5310004699202	14541	FS11P	WASHER,FLAT 3/4 DIA HOLE	4
16	PAOZZ	3130014970388	39428	5913K44	BEARING,UNIT,BALL	2
17	PAOZZ	5310010739803	19200	12279371-1	WASHER,FLAT 3/8 DIA HOLE	4
18	PAOZZ	5310013894257	96906	MS35338-046	WASHER,LOCK 3/8 DIA HOLE	4
19	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	4

END OF FIGURE

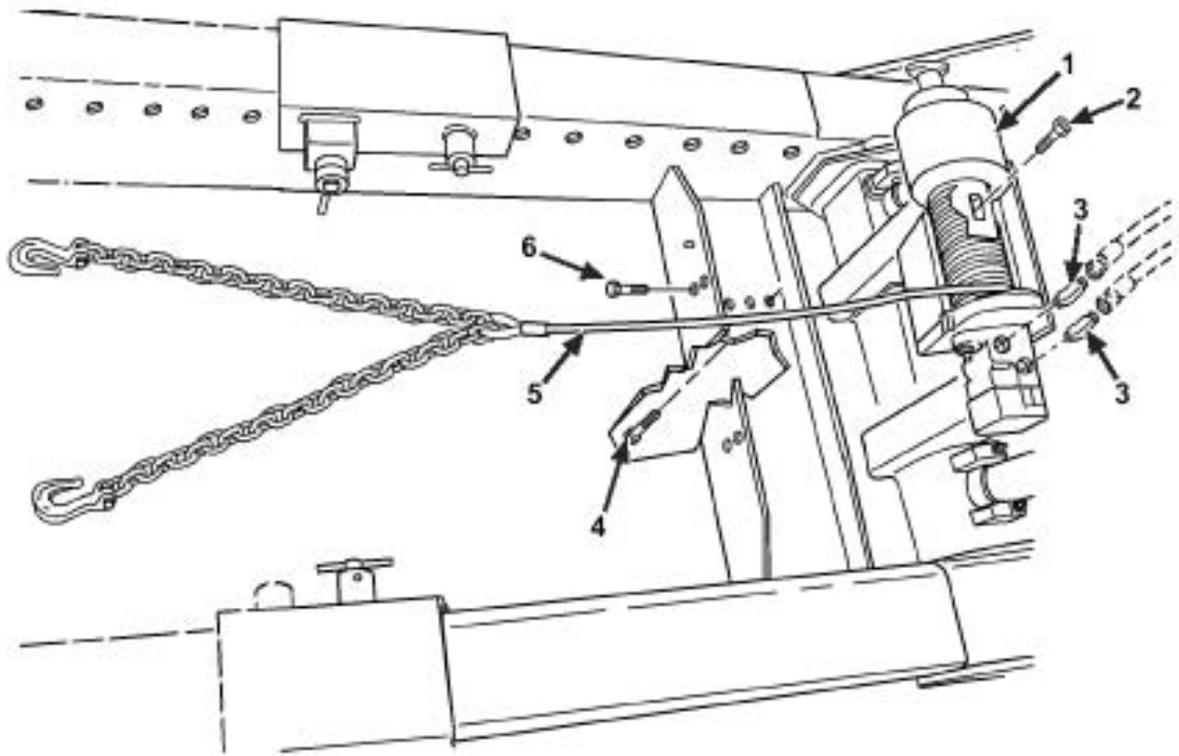


Figure 20. Winch Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
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GROUP 20 HOIST,WINCH, CAPSTAN, WINDLASS,
POWER CONTROL UNIT, AND POWER TAKE-OFF
GROUP 2001 HOIST, CAPSTAN, WINDLASS,
CRANE OR WINCH ASSEMBLY
FIG. 20 WINCH ASSEMBLY

1	XDOZZ		60287	1878	WINCH, HYDRAULIC OPE	1
2	PAOZZ	5305014958188	1BZD4	1103-1	SET SCREW	1
3	PAOZZ	4730009747313	96906	MS51527-A10	ELBOW, TUBE TO BOSS	2
4	PAOZZ	5305012726543	81495	1200-59	SCREW, CAP, HEXAGON H 3/8 DIA X	16
					UNC X 1 INCH LONG	8
5	XDOZZ		0GRF0	WA WLC3840	CABLE, WINCH W/CHAIN	1
6	PAOZZ	5305007252317	80204	B1821BH038C150N	SCREW, CAP, HEXAGON H 3/8 DIA X 16 UNC X 1 1/2 INCHES LONG	4

END OF FIGURE

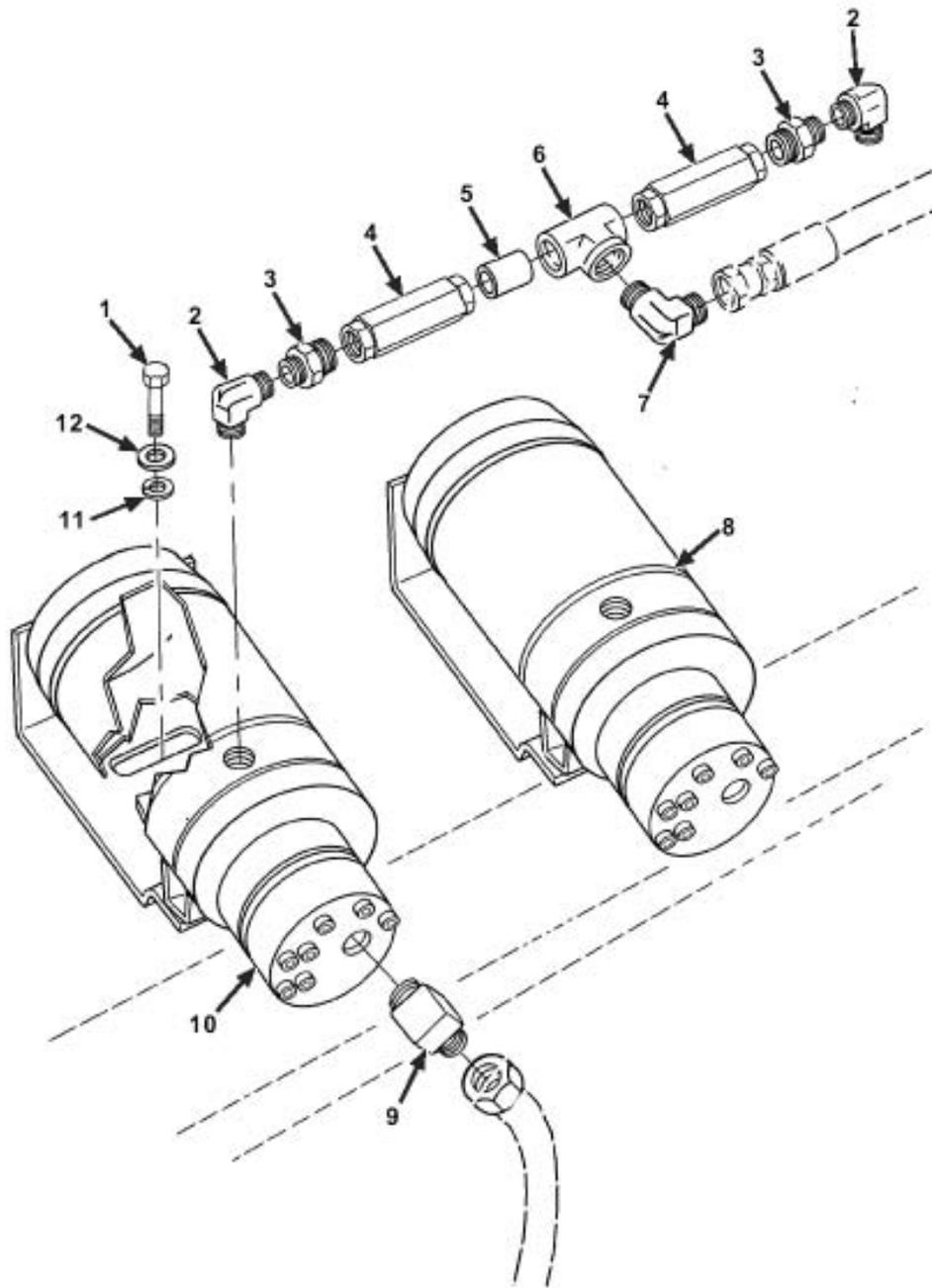


Figure 21. Hydraulic Motor Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 24 HYDRAULIC AND FLUID SYSTEMS GROUP 2401 PUMP AND MOTOR FIG. 21 HYDRAULIC MOTOR ASSEMBLY	
1	PAOZZ	5305012726543	81495	1200-59	SCREW,CAP,HEXAGON H 3/8 DIA X 16 UNC X 1 INCH LONG	4
2	PAOZZ	4730001856837	98441	8 CTXS-S	ELBOW,PIPE TO TUBE	2
3	PAOZZ	4730014419417	30780	8F650X-SS	ADAPTER,STRAIGHT,TU	2
4	PAOZZ	4820015022001	1BZD4	02845	VALVE,CHECK	2
5	PAOZZ	4730005344140	98441	8F50HAO-SS	UNION,TUBE	1
6	PAOZZ	4730014976338	98441	8AOG5JG5-S	TEE,STRAIGHT,THREAD	1
7	PAOZZ	4730004898198	59257	10-8SA6	ELBOW,TUBE TO BOSS	1
8	PAOZZ	2540014943530	1BZD4	1087-1	MOTOR,HYDRAULIC ISO	1
9	PAOZZ	4730015027273	1BZD4	02000	FITTING,COMPRESSION	2
10	PAOZZ	2540014943529	1BZD4	1086-1	MOTOR,HYDRAULIC PRI	1
11	PAOZZ	5310013894257	96906	MS35338-046	WASHER,LOCK 3/8 DIA HOLE	4
12	PAOZZ	5310010739803	19200	12279371-1	WASHER,FLAT 3/8 DIA HOLE	4

END OF FIGURE

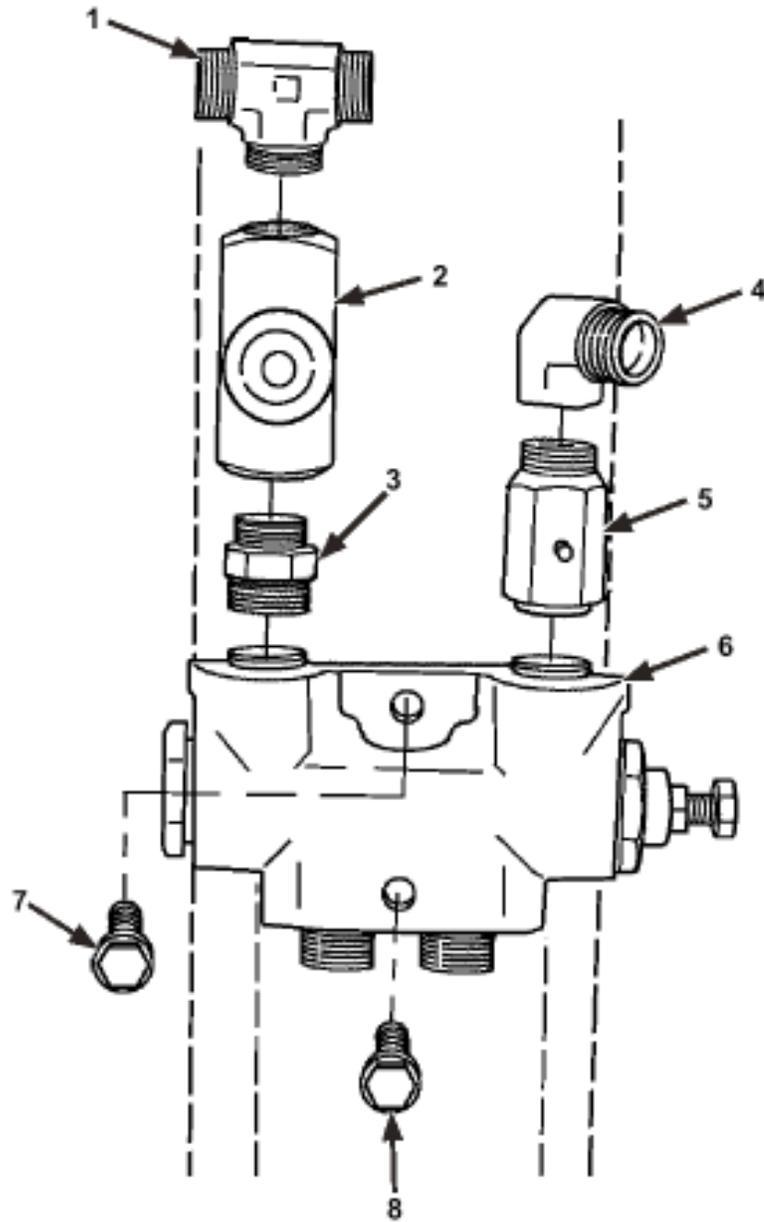


Figure 22. Hydraulic Safety Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 2402 MANIFOLD AND/OR CONTROL VALVES FIG. 22 HYDRAULIC SAFETY VALVE	
1	PAOZZ	4730013345719	30327	845-FS-08X08	TEE,TUBE	2
2	PAOZZ	4820010757224	09990	N-800-S	VALVE,GLOBE	2
3	PAOZZ	4730011255179	81343	8-8 140137S	NIPPLE,PIPE	2
4	PAOZZ	4730002293402	81343	8-8 140237C	ELBOW,PIPE	2
5	PAOZZ	4820015021995	1BZD4	02840	VALVE,CHECK	2
6	PAOZZ	4820015022006	1BZD4	02855	VALVE,SAFETY 4 PORTS	2
7	PAOZZ	5305002829646	96906	MS35311-38	SCREW,CAP,HEXAGON H 5/16 DIA X 18 UNC X 1 1/2 INCHES LONG	2
8	PAOZZ	5305002829607	8B865	5/16-18 UNC-2A	SCREW,CAP,HEXAGON H 5/16 DIA X 18 X 2-1/2 UNC X 2 1/2 INCHES LONG	2

END OF FIGURE

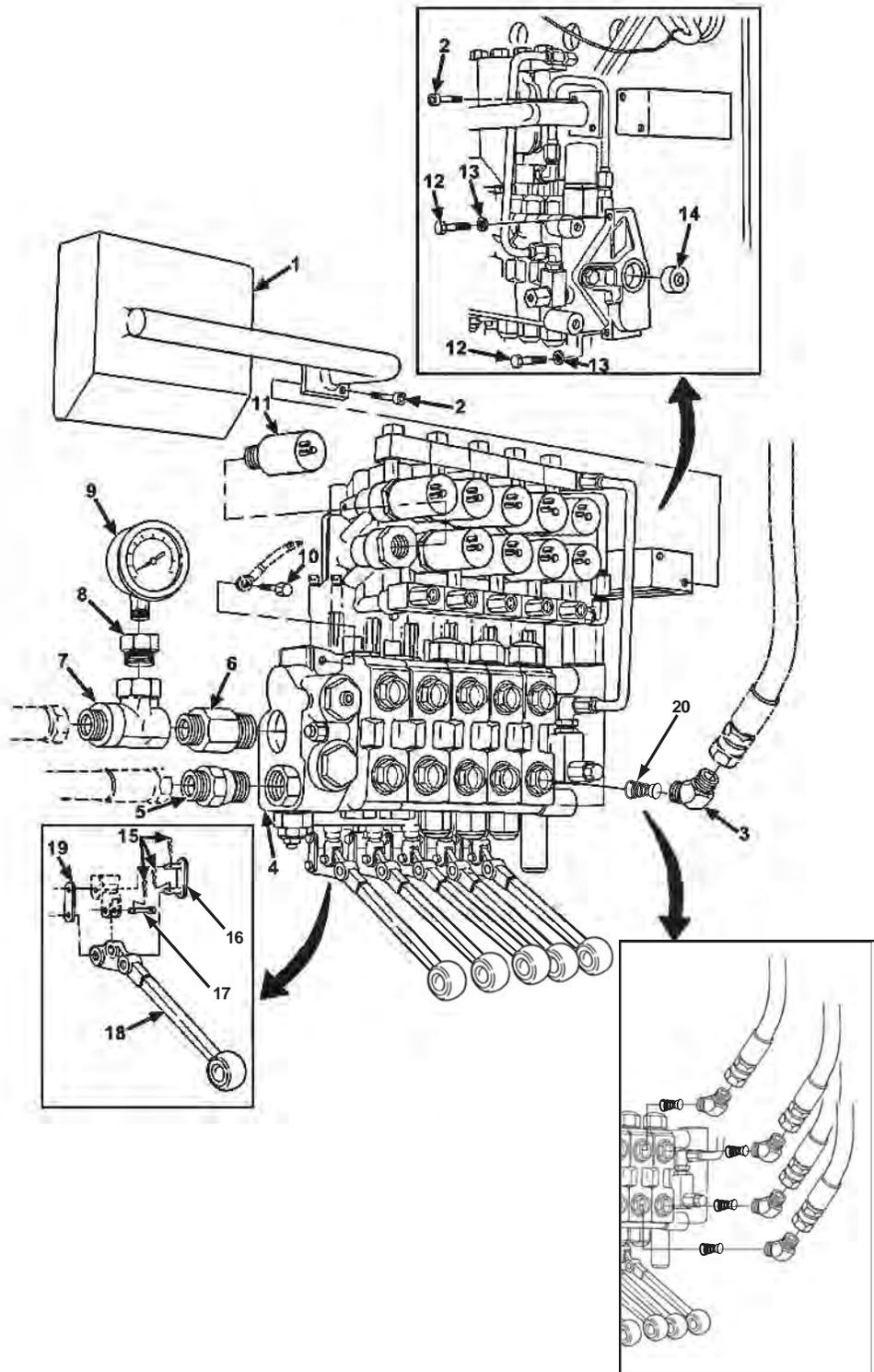


Figure 23. Main Valve Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2402 MANIFOLD AND/OR CONTROL VALVES						
FIG. 23 MAIN VALVE ASSEMBLY						
1	PAOZZ	5340014962166	1BZD4	1082-1	COVER,ACCESS	1
2	PAOZZ	5305009835346	96906	MS16997-78	SCREW,CAP,SOCKET HE 5/16 DIA X 18	2
					UNC X 3/4INCH LONG	
3	PAOZZ	4730003858795	81343	10-10 070320C	ELBOW,TUBE TO BOSS	10
4	PAOFL	4730014963695	1BZD4	02505	MANIFOLD,ASSEM,HYDR	1
5	PAOZZ	4730013263049	30780	0507-12-12	ADAPTER,STRAIGHT,PI	1
6	PAOZZ	4730004070509	30780	12-3/4F50G-S	ADAPTER,STRAIGHT,PI	1
7	PAOZZ	4730007572910	81343	12-12-12	TEE,PIPE	1
				140424C		
8	PAOZZ	4730010505756	30780	3/4X1/4PRT-S	ADAPTER,STRAIGHT,PI	1
9	PAOZZ	6685014968423	1BZD4	1078-1	GAUGE,PRESSURE,DIAL	1
10	PAOZZ	5305008195108	96906	MS35313-44	SCREW,CAP,HEXAGON H 5/16 DIA X 18	
					UNC X 3 INCHES LONG	1
11	PAOZZ	5945014958071	1BZD4	1075-1	SOLENOID,ELECTRICAL	11
12	PAOZZ	5305002829607	8B865	5/16-18 UNC-2A	SCREW,CAP,HEXAGON H 5/16 DIA X 18	
				X 2-1/2	UNC X 2 1/2 INCHES LONG	2
13	PAOZZ	5310013782903	19207	12387272-45	WASHER,LOCK 5/16 DIA HOLE	2
14	PAOZZ	5365004069320	98441	12HP50NS	PLUG,MACHINE THREAD	1
15	PAOZZ	5315014958223	1BZD4	1105-1	PIN,COTTER	15
16	PAOZZ	5340014958298	1BZD4	1106-1	PIN,STRAIGHT,HEADED	5
17	PAOZZ	5315014958164	1BZD4	1107-1	PIN,RETAINING SINGLE POST	5
18	PAOZZ	5340014961906	1BZD4	1104-1	LEVER,MANUAL,CONTRO	5
19	PAOZZ	5340014961897	1BZD4	1108-1	PLATE,MOUNTING	5
20	PAOZZ		1BZD4	02640	RESTRICTOR	4

END OF FIGURE

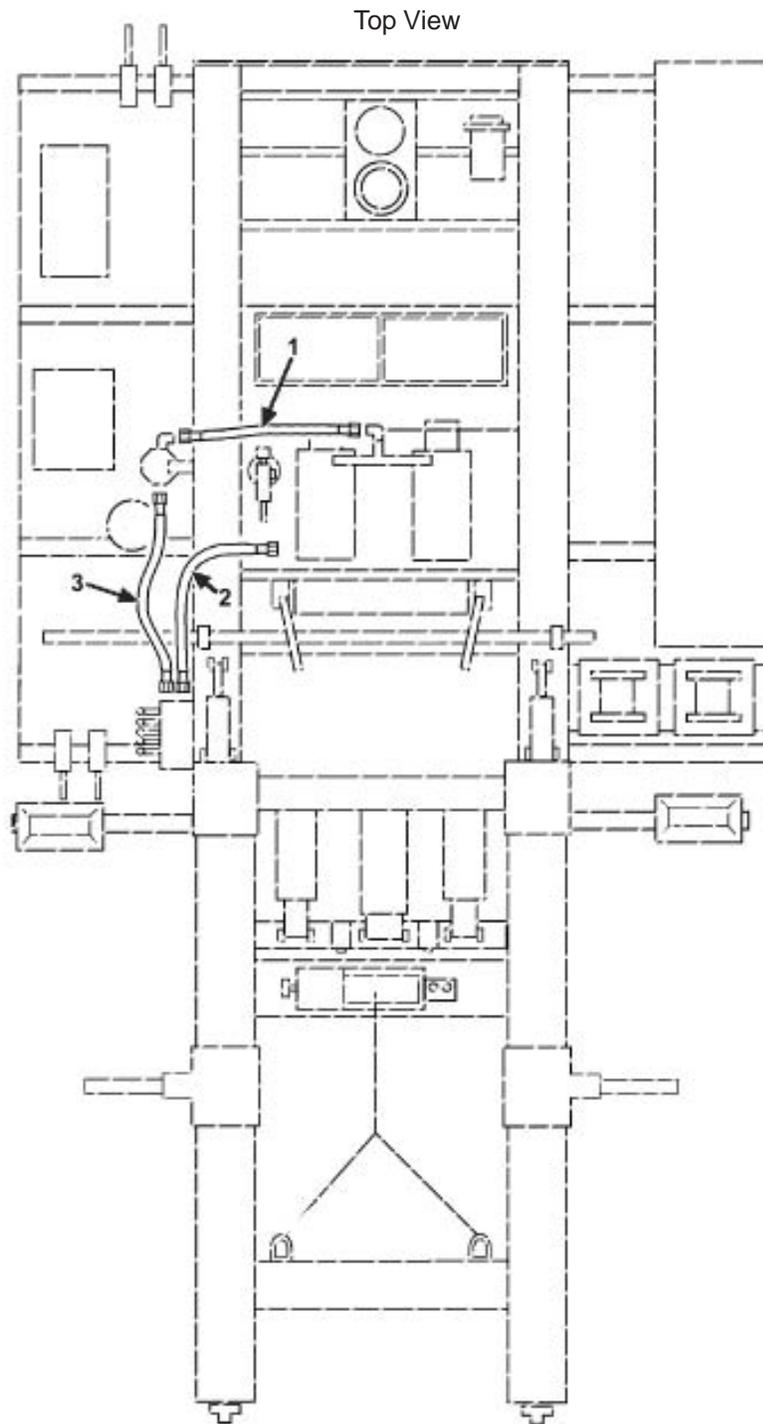


Figure 24 (1 of 5). Hydraulic Hoses and Fittings

Front View

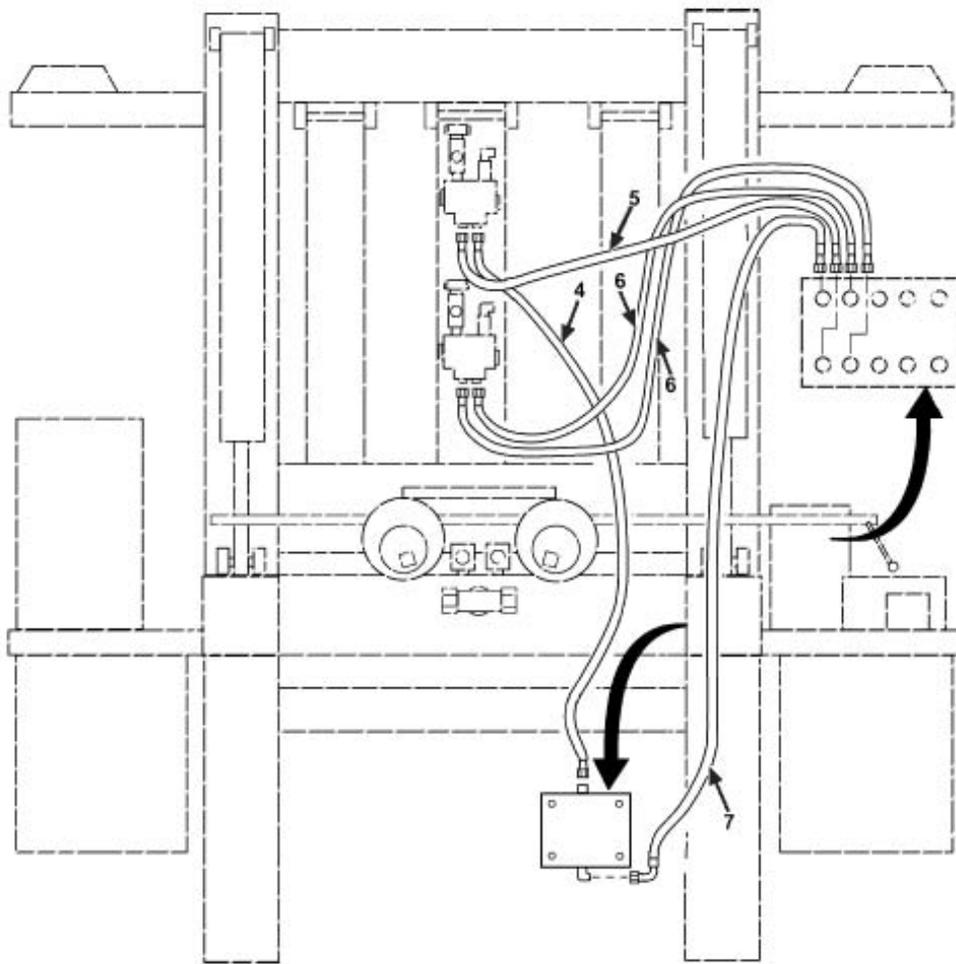


Figure 24 (2 of 5). Hydraulic Hoses and Fittings

Top View

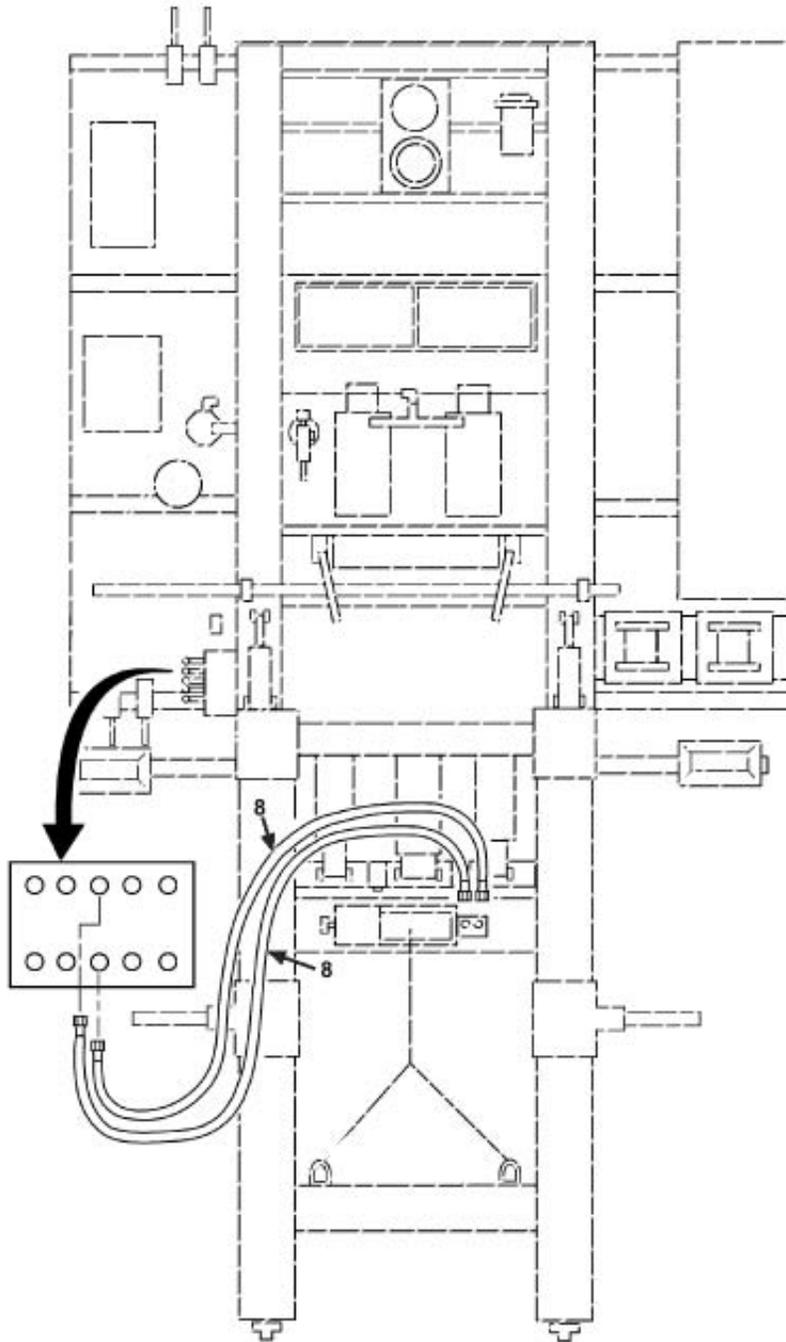


Figure 24 (3 of 5). Hydraulic Hoses and Fittings

Top View

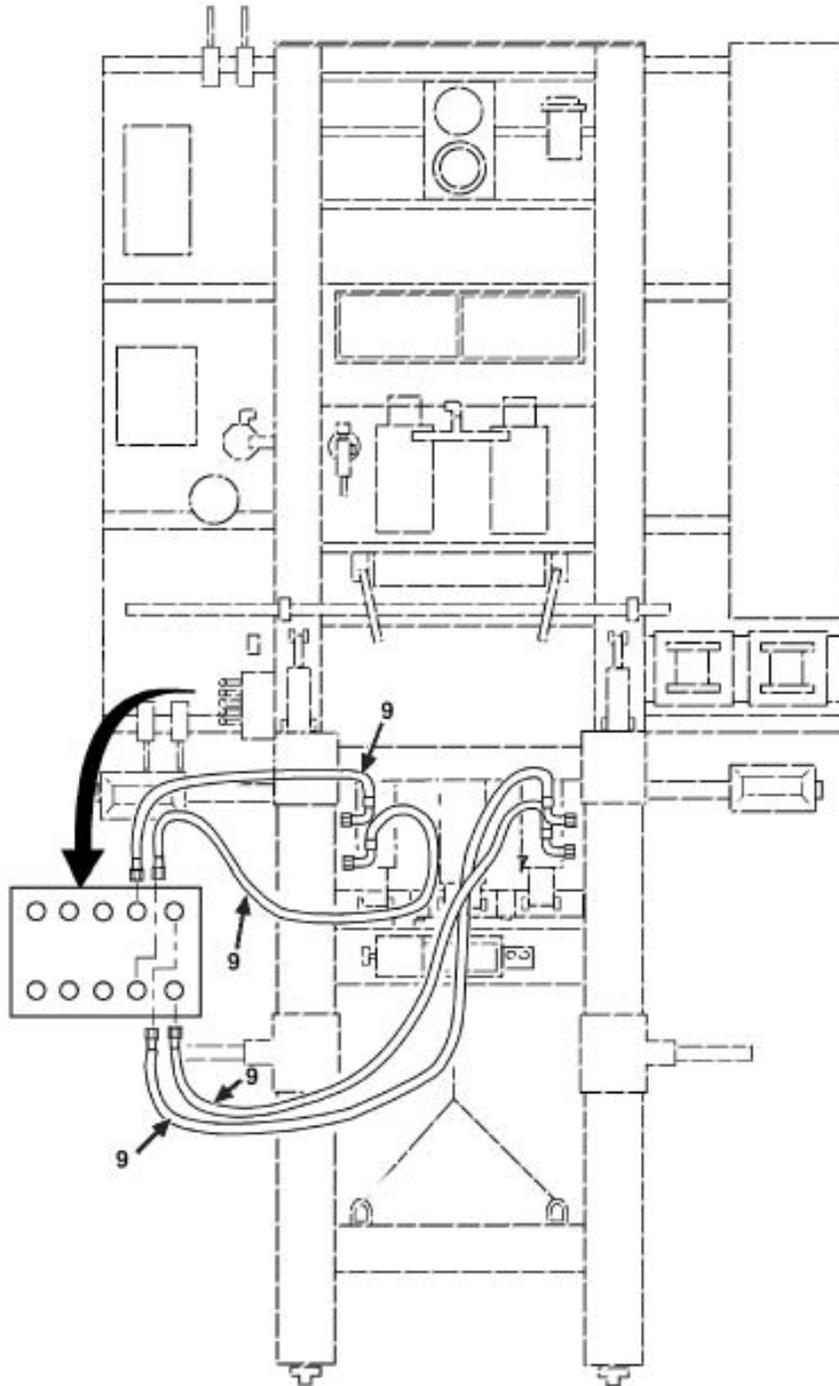


Figure 24 (4 of 5). Hydraulic Hoses and Fittings

Front View

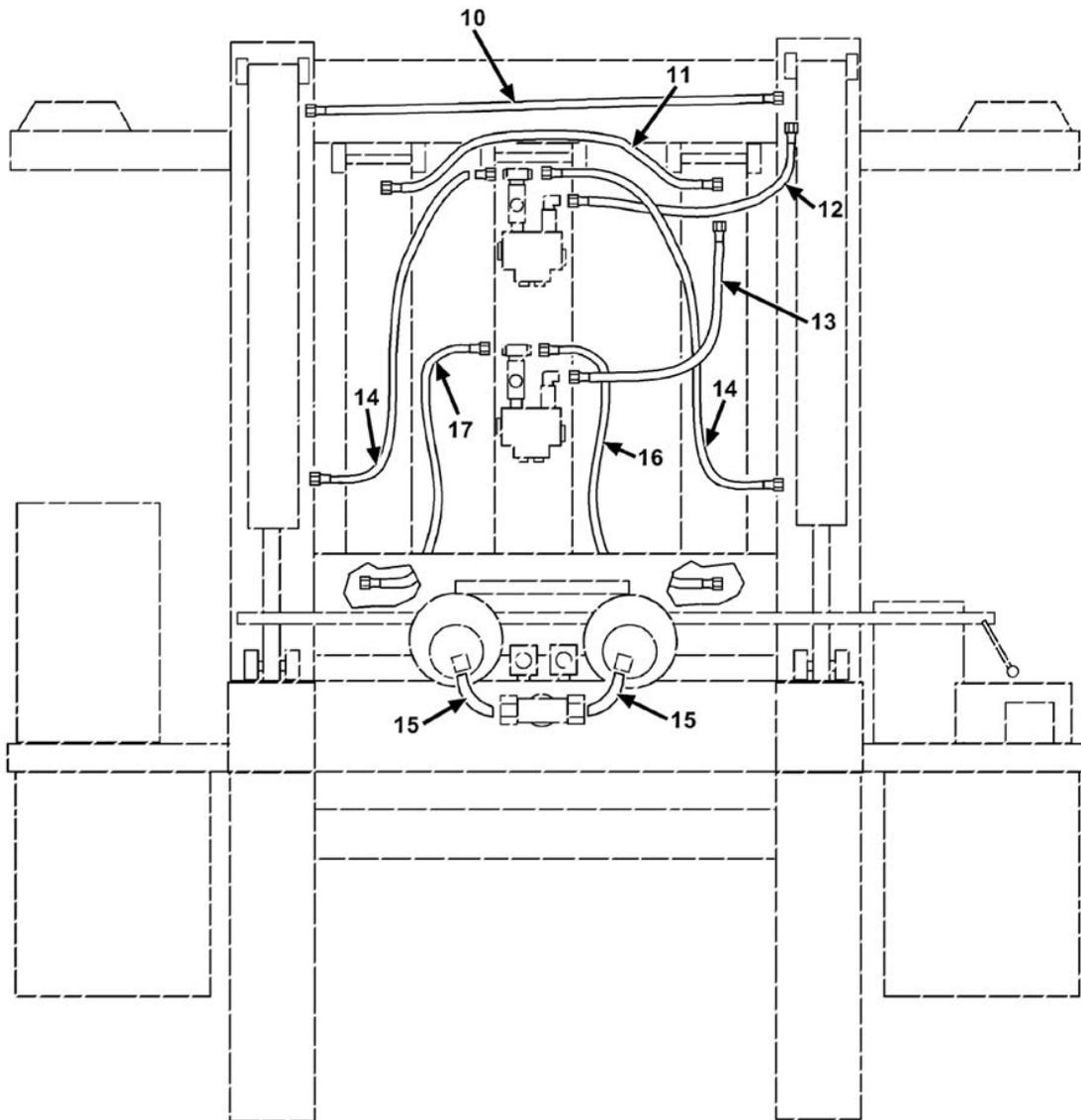


Figure 24 (5 of 5). Hydraulic Hoses and Fittings

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 24 HYDRAULIC HOSES AND FITTINGS						
1	PAOZZ	4720014966037	1BZD4	01126	HOSE ASSEMBLY,NONME	1
2	PAOZZ	4720014964914	1BZD4	01124	HOSE ASSEMBLY,NONME	1
3	PAOZZ	4720014965327	1BZD4	01125	HOSE ASSEMBLY,NONME	1
4	PAOZZ	4720014966067	1BZD4	01123	HOSE ASSEMBLY,NONME	1
5	PAOZZ	4720014963775	1BZD4	01110	HOSE ASSEMBLY,NONME	1
6	PAOZZ	4720014964523	1BZD4	01111	HOSE ASSEMBLY,NONME	2
7	PAOZZ	4720014961588	1BZD4	01109	HOSE ASSEMBLY,NONME	1
8	PAOZZ	4720014964550	1BZD4	01112	HOSE ASSEMBLY,NONME	2
9	PAOZZ	4720014970042	1BZD4	01114	HOSE ASSEMBLY,NONME	4
10	PAOZZ	4720014964647	1BZD4	01118	HOSE ASSEMBLY,NONME	1
11	PAOZZ	4720014966466	1BZD4	01115	HOSE ASSEMBLY,NONME	1
12	PAOZZ	4720014966337	1BZD4	01117	HOSE ASSEMBLY,NONME	1
13	PAOZZ	4720014966429	1BZD4	01116	HOSE ASSEMBLY,NONME	1
14	PAOZZ	4720014966001	1BZD4	01121	HOSE ASSEMBLY,NONME	2
15	MOOZZ		89346	417202C2-7	HOSE,NONMETALLIC MAKE FROM HOSE, P/N 417202C2,7 INCHES LONG	2
16	PAOZZ	4720014966048	1BZD4	01119	HOSE ASSEMBLY,NONME	1
17	PAOZZ	4720014970107	1BZD4	01120	HOSE ASSEMBLY,NONME	1

END OF FIGURE

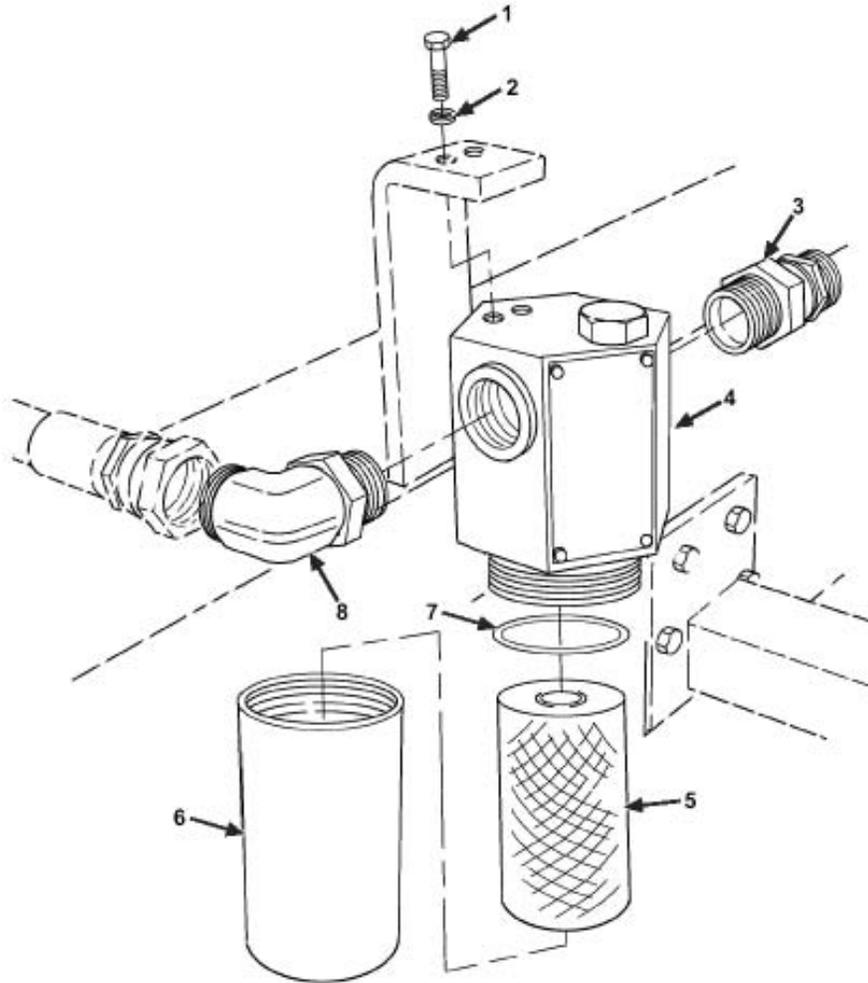


Figure 25. Oil Filter Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 25 OIL FILTER ASSEMBLY	
1	PAOZZ	5305002253843	80204	B1821BH025C100N	SCREW,CAP,HEXAGON H 1/4 DIA X 20 UNC X 1 INCH LONG	2
2	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK 1/4 DIA HOLE	2
3	PAOZZ	4730014570813	30780	12 F50X-S	CONNECTOR,TUBE TO O	1
4	PAOZZ	2940014970073	1BZD4	02145	FILTER BODY,FLUID	1
5	PAOZZ	2940014970077	1BZD4	02146	FILTER,ELEMENT FLUI	1
6	PAOZZ	2940014970092	1BZD4	02147	COVER,FLUID FILTER	1
7	PAOZZ	5331014965156	1BZD4	02148	O-RING	1
8	PAOZZ	4730013948793	98441	12C50X-S	CONNECTOR,MULTIPLE	1

END OF FIGURE

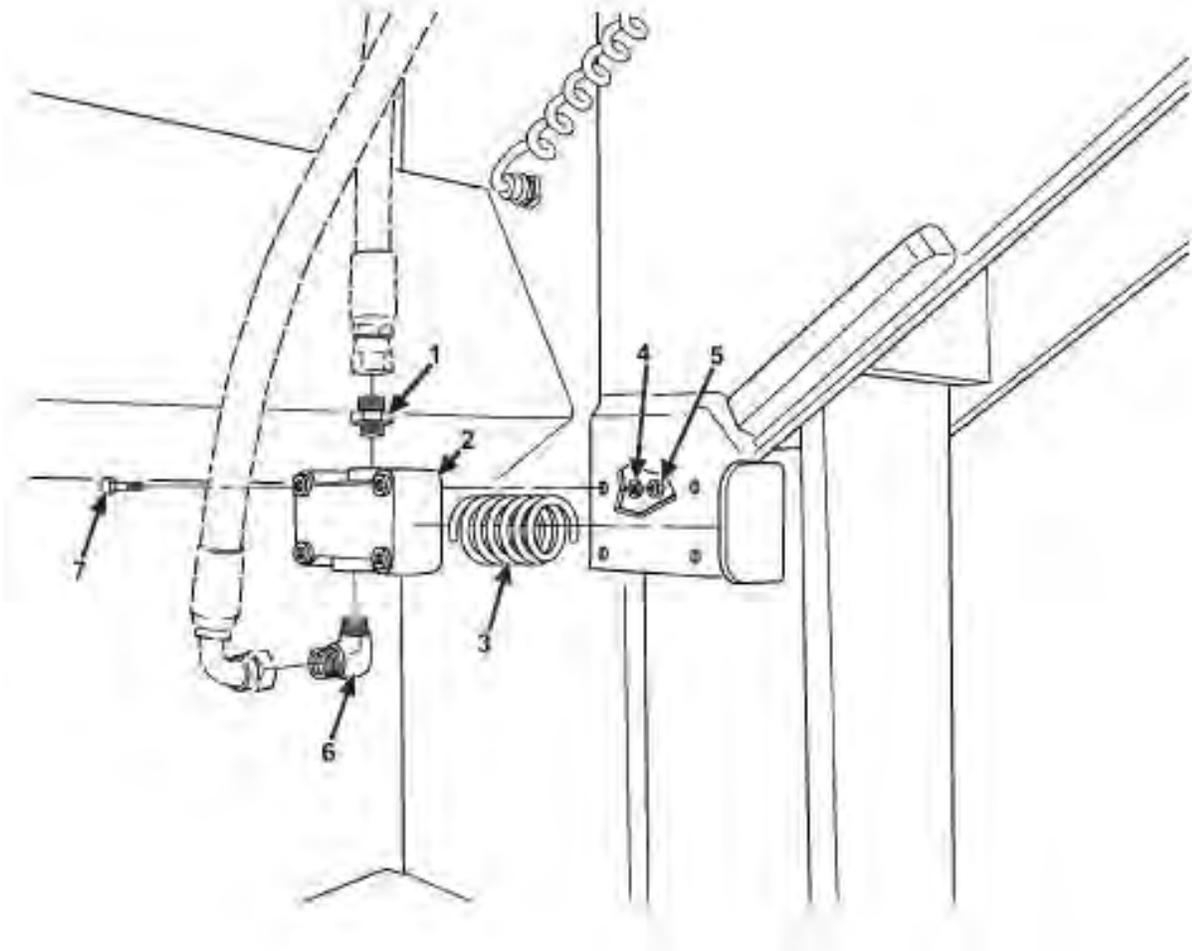


Figure 26. Cam Valve Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 2406 STRAINERS, FILTERS, LINES AND FITTINGS, ETC. FIG. 26 CAM VALVE ASSEMBLY	
1	PAOZZ	4730004418700	96906	MS51500A8-4	ADAPTER,STRAIGHT,PI	1
2	PAOZZ	4820014958070	1BZD4	1025-1	VALVE,SAFETY RELIEF	1
3	PAOZZ	5360014960436	1BZD4	1065-1	SPRING,HELICAL,COMP	1
4	PAOZZ	5310013088205	96906	MS27183-48	WASHER,FLAT 5/16 DIA HOLE	4
5	PAOZZ	5310014674644	39428	90045A453	NUT,SELF-LOCKING,HE 5/16 DIA X 18 UNC	4
6	PAOZZ	4730008443308	96906	MS51504A8-4	ELBOW,PIPE TO TUBE	1
7	PAOZZ	5305005804786	27192	11-1625	SCREW,SHOULDER 5/16 DIA X 18 UNC X 1 3/4 INCHES LONG	4

END OF FIGURE

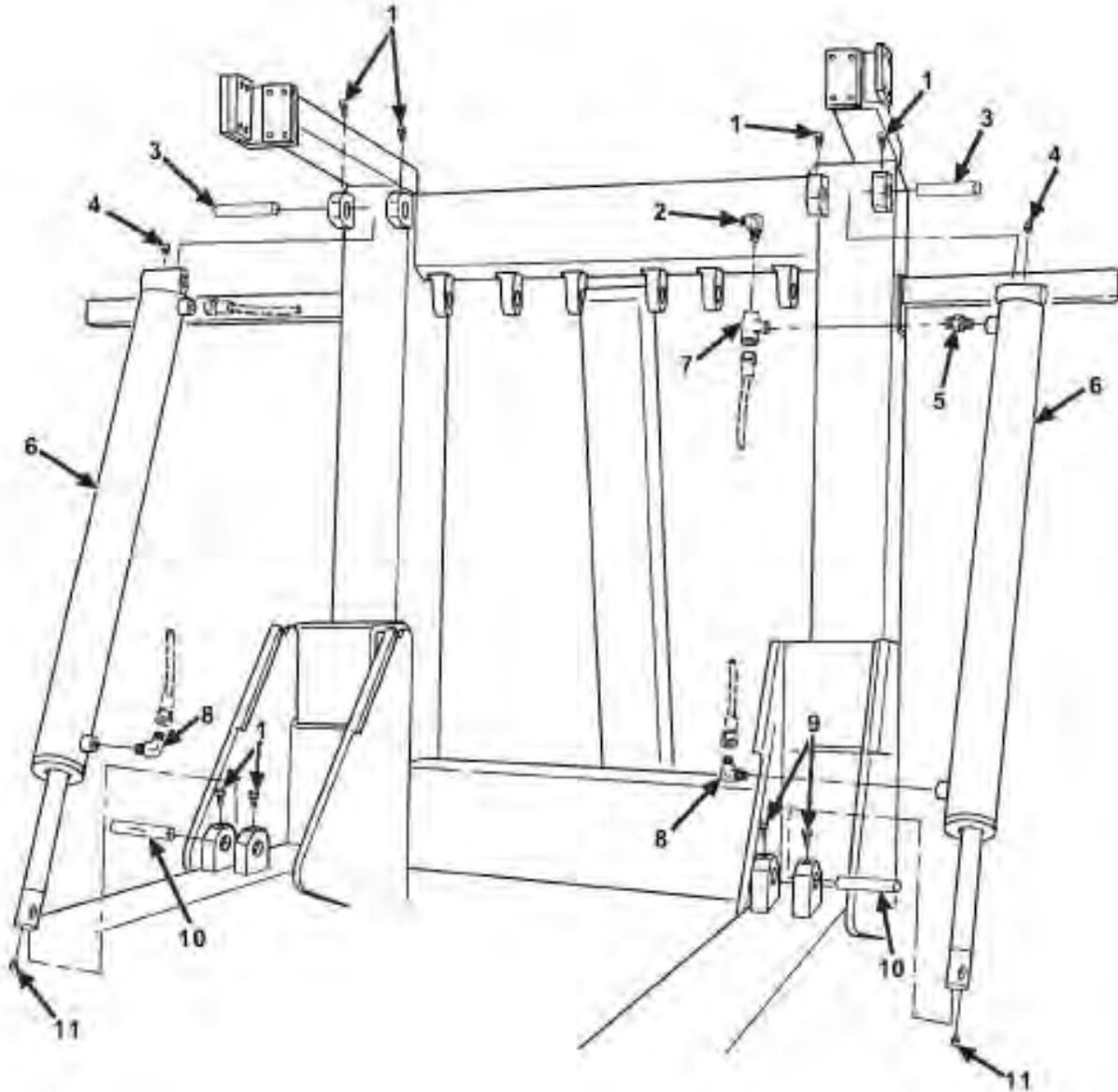


Figure 27. Main Frame to Mast

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2407 HYDRAULIC CYLINDERS FIG. 27 MAIN FRAME TO MAST						
1	PAOZZ		1BZD4	1062-1	SCREW,SQUARE HEAD	6
2	PAOZZ	4730003594717	81343	8-8 140230CA	ELBOW,PIPE	1
3	PAOZZ	5315014962322	1BZD4	1036-1	PIN,STRAIGHT,HEADLE UPPER	2
4	XDOZZ		0ATA2	2006	FITTING,GREASE 45 DEGREE	2
5	PAOZZ	4730011269758	98441	8-1/2F50G-S	ADAPTER,STRAIGHT,PI	1
6	PAOZZ	3040014959856	1BZD4	02040	CYLINDER,ASSEMBLY,A MAIN FRAME TO MAST FRAME	2
7	PAOZZ	4730011036840	30780	1/2 MMS-S	TEE,PIPE	1
8	PAOZZ	4730000513731	01276	2068-8-8S	ELBOW,PIPE TO BOSS	2
9	PAOZZ	5305014958170	1BZD4	1067-1	SET SCREW	2
10	PAOZZ	5315014963062	1BZD4	1035-1	PIN,STRAIGHT,HEADLE LOWER	2
11	XDOZZ		0ATA2	2001	FITTING,GREASE	2

END OF FIGURE

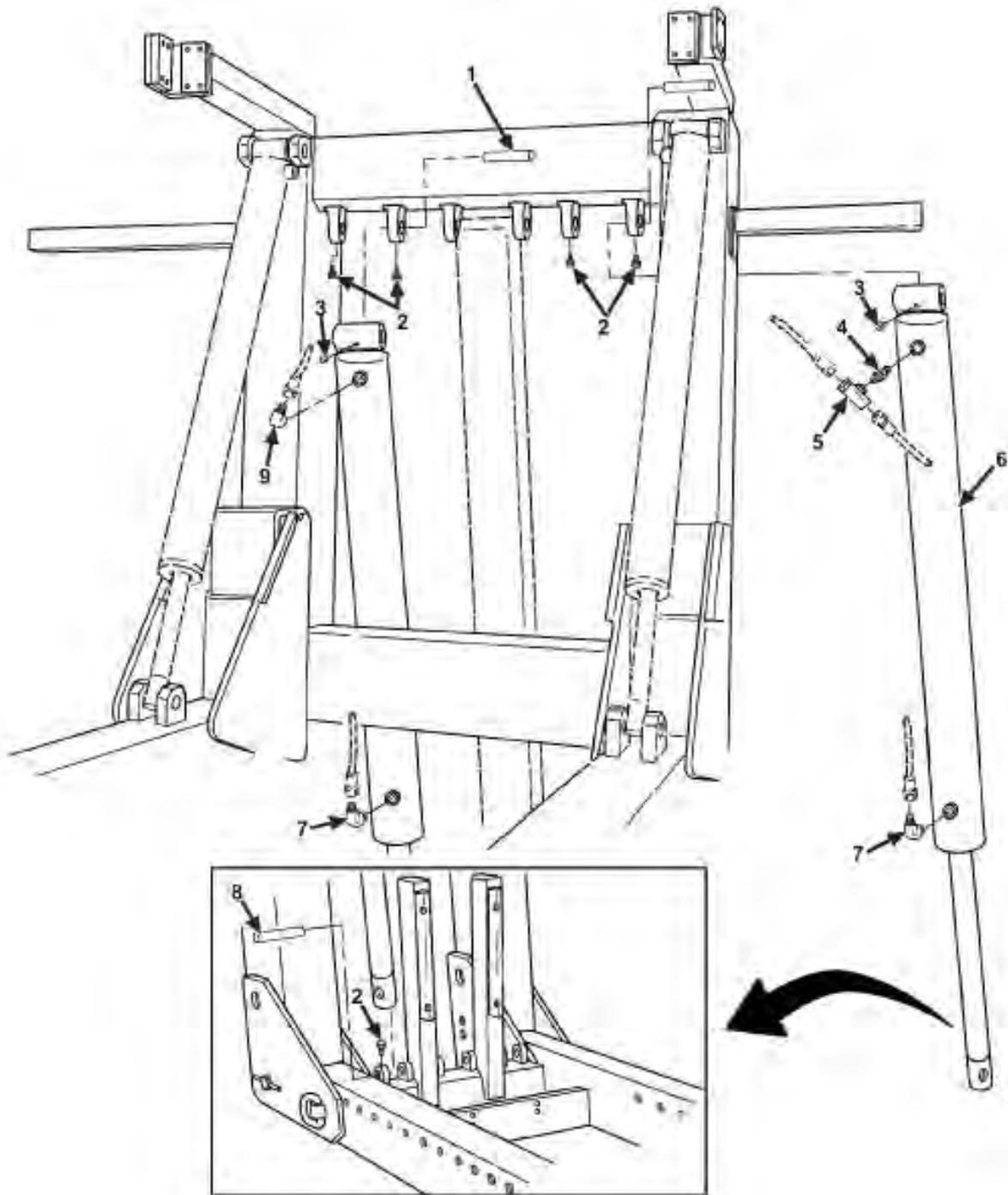


Figure 28. Mast to Boom

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2407 HYDRAULIC CYLINDERS FIG. 28 MAST TO BOOM						
1	PAOZZ	5315014962436	1BZD4	1033-1	PIN,STRAIGHT,HEADLE UPPER,6.75 X 1.50 INCHES	2
2	XDOZZ		1BZD4	1062-1	SCREW,SQUARE HEAD 5/16-18NC,SQ. HD.	8
3	XDOZZ		0ATA2	2001	FITTING,GREASE	4
4	PAOZZ	4730011269758	98441	8-1/2F50G-S	ADAPTER,STRAIGHT,PI	1
5	PAOZZ	4730011036840	30780	1/2 MMS-S	TEE,PIPE	1
6	PAOZZ	3040014952850	1BZD4	02055	CYLINDER,ASSEMBLY,A MAST FRAME TO BOOM	2
7	PAOZZ	4730000513731	01276	2068-8-8S	ELBOW,PIPE TO BOSS	2
8	PAOZZ	5315014963057	1BZD4	1034-1	PIN,STRAIGHT,HEADLE LOWER,5.00 X 1.50 INCHES	2
9	PAOZZ	4730008225609	96906	MS51527A8	ELBOW,TUBE TO BOSS.....	1
END OF FIGURE						

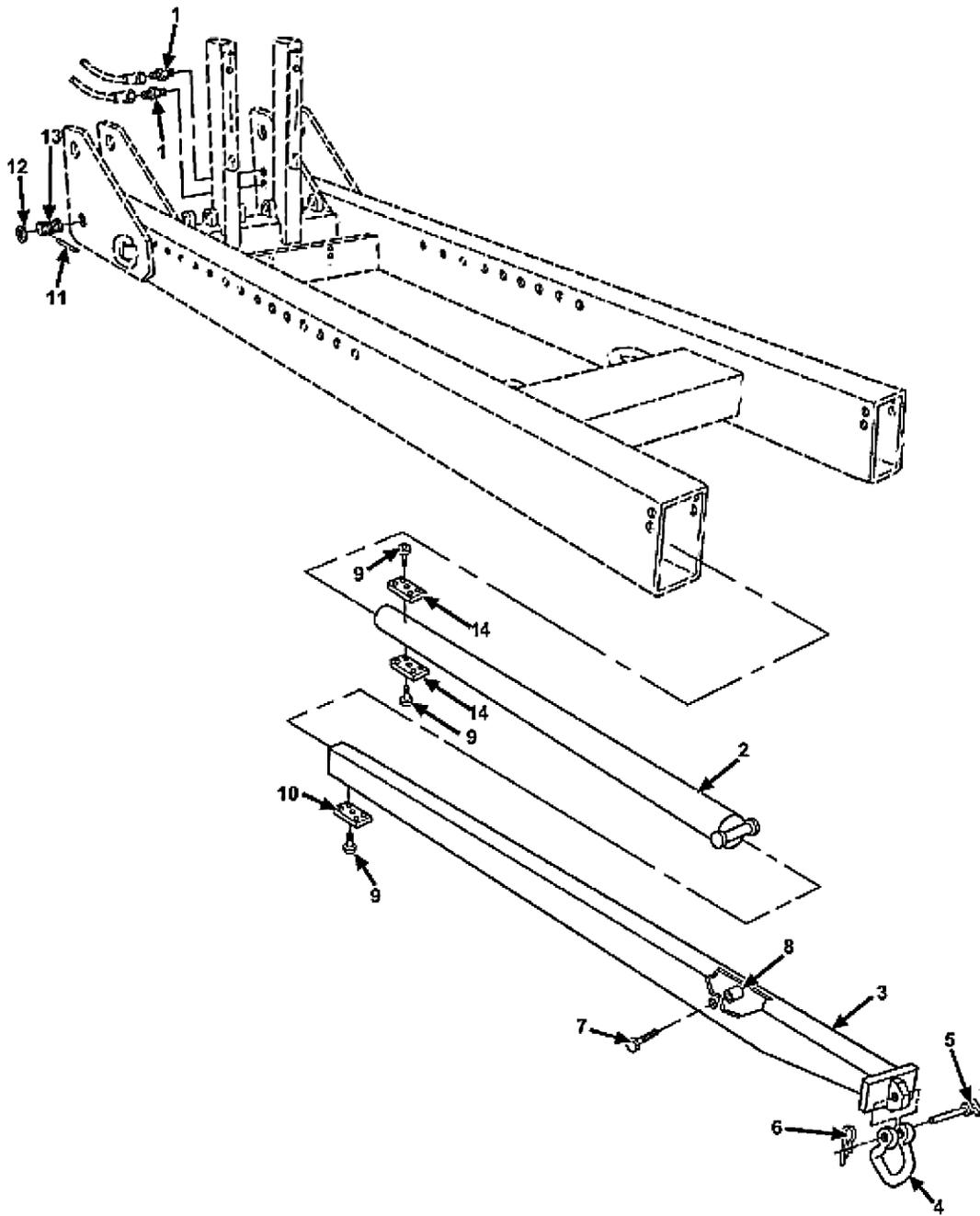


Figure 29. Boom Extensions

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2407 HYDRAULIC CYLINDERS FIG. 29 BOOM EXTENSIONS						
1	PAOZZ	4730004358015	81343	8-8070122C	ADAPTER,STRAIGHT,TU	4
2	PAOZZ	3040014952848	1BZD4	02065	CYLINDER,ASSEMBLY,A	2
3	XDOZZ	1BZD4 1137-1			CYLINDER CASE	2
4	PAOZZ	2540014967132	1BZD4	1079-1	COUPLER,DRAWBAR,RIN	2
5	PAOZZ	5315014963059	1BZD4	1080-1	PIN,CLEVIS	1
6	PAOZZ	5315008781994	80205	MS16562-87	PIN,SPRING	2
7	PAOZZ	5305014958137	1BZD4	1091-1	SCREW,MACHINE	4
8	XDOZZ		1BZD4	6007-1	PIN,RETAINING	2
9	PAOZZ	5305009835346	96906	MS16997-78	SCREW,CAP,SOCKET HE 5/16 DIA X 18 UNC X 3/4 INCHES LONG	24
10	PAOZZ	5340014964081	1BZD4	1007-1	PAD, SLIP	2
11	PAOZZ	5315012823483	39428	98296A255	PIN,SPRING	4
12	PAOZZ	5310014981892	1BZD4	1074-1	WASHER,FLAT	4
13	PAOZZ	5315014962435	1BZD4	1010-1	PIN,STRAIGHT,HEADLE	2
14	PAOZZ		1BZD4	6009-1	PAD, SLIP	4

END OF FIGURE

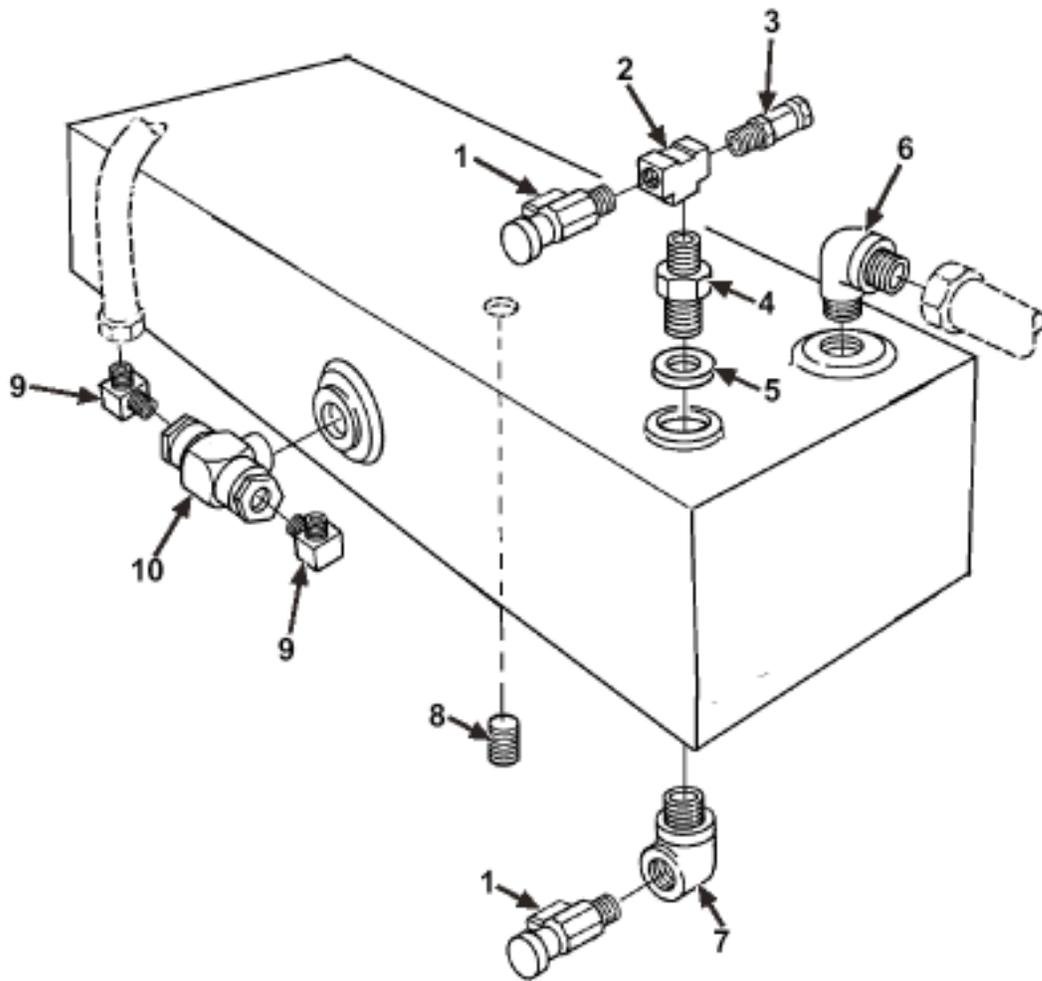


Figure 30. Reservoir and Fittings

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 2408 LIQUID TANKS OR RESERVOIRS FIG. 30 RESERVOIR AND FITTINGS						
1	PAOZZ	2520004467518	89346	91916R91	BREATHER	2
2	PAOZZ	4730002777331	21450	444530	TEE,PIPE	1
3	PAOZZ	4820014946076	89346	4772K6	VALVE,RELIEF,PRESSU	1
4	PAOZZ	4730002221838	81346	B687R-39B	NIPPLE,PIPE	2
5	PAOZZ	4730014963143	1BZD4	1070-1	BUSHING,PIPE 1 1/4 X 3/8 INCH	1
6	PAOZZ	4730002784822	81343	6-6 130239B	ELBOW,PIPE	1
7	PAOZZ	4730014964148	1BZD4	1072-1	ELBOW,PIPE TO TUBE	1
8	PAOZZ	4730010651817	89346	586049C1	PLUG,PIPE,MAGNETIC	8
9	PAOZZ	5340014964081	1BZD4	02000	FITTING,COMPRESSION	2
10	PAOZZ	4730013158250	7H066	C3609X16	TEE,PIPE	1

END OF FIGURE

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 95 GROUP 9501 BULK MATERIEL FIG. BULK ITEMS (NOT ILLUSTRATED)						
1	PAOZZ	5970011752052	81851	5001001303S	SLEEVING,TEXTILE,EL	V
2	PAOZZ	9390014697255	39428	8451A62	NONMETALLIC CHANNEL	V
3	PAOZZ	5970000083295	81349	M23053/10-004-0	INSULATION SLEEVING	V
4	PAOZZ	6145000236778	58536	AA59551-E04G1B	WIRE,ELECTRICAL	V
5	PAOZZ	5970014818421	81349	M23053/12-106-2	INSULATION SLEEVING	V
6	PAOZZ	6145012027748	81349	M24643/43-06U0	CABLE,POWER,ELECTRI	V
7	PAOZZ	6145002950806	81349	M76MWPC1619A1	WIRE,ELECTRICAL	V
8	PAOZZ	6145008548211	81348	J-C-580TFF6CF 1/16TUJ	WIRE,ELECTRICAL	V
9	PAOZZ	6145003435767	81349	M81381/7-16-6	WIRE,ELECTRICAL	V
10	PAOZZ	6145010990050	81349	M5086/1-16-60	WIRE,ELECTRICAL	V
11	PAOZA	6145006006173	81349	M22759/11-16-3	WIRE,ELECTRICAL	V
12	PAOZZ	6145010994741	81349	M5086/1-16-30	WIRE,ELECTRICAL	V
13	PAOZZ	6145014560311	81349	M22759/34-16-4	WIRE,ELECTRICAL	V
14	PAOZZ	6145013812385	81349	M16878/1BJE80	WIRE,ELECTRICAL	V
15	PAOZZ	6145011046028	81348	J-C-580TFF6CF1/ 16TUJ5	WIRE,ELECTRICAL	V
16	PAOZZ	6145012361935	81349	M5086/1-16-19	WIRE,ELECTRICAL	V
17	PAOZA	6145010910241	81349	M22759/9-16-2	WIRE,ELECTRICAL	V
18	PAOZA	6145006006052	81349	M22759/11-16-0	WIRE,ELECTRICAL	V
19	PAOZZ	6145001779527	81349	M5086/1-10-9	WIRE,ELECTRICAL	V
20	PAOZZ	6145010910239	81349	M22759/9-14-0	WIRE,ELECTRICAL	V
21	PAOZA	6145000825172	81349	M16878/6BFE0	WIRE,ELECTRICAL	V
22	PAOZZ	6145000236923	81349	C0-12MGF(12/18)0 685	CABLE,POWER,ELECTRI	V
23	PAOZZ	6145000443579	81349	M5086/1-12-0	WIRE,ELECTRICAL	V
24	PAOZZ	5970004704575	81349	M23053/10-002-0	INSULATION SLEEVING	V
25	PAOZZ	4720012898293	29510	417200C2	TUBING,NONMETALLIC	V
26	PAOZZ	9330009122707	99806	M200SERIES1X1-8	PLASTIC STRIP,PRESS	V
27	PAOZZ	5640014624252	39428	93695K62	WEATHER STRIP	V
28	PAOZZ	4720013477388	89346	417202C2	HOSE,NONMETALLIC	V

END OF FIGURE

CROSS-REFERENCE INDEXES WORK PACKAGE
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6145-00-003-9527	BULK	19	4730-00-278-4822	30	6
5930-00-008-0514	2	10	5305-00-282-9607	22	8
5970-00-008-3295	BULK	3	5305-00-282-9607	23	12
5310-00-011-5120	1	5	5305-00-282-9646	22	7
5310-00-011-5120	2	9	5305-00-290-7156	14	3
5310-00-011-5120	9	9	6145-00-295-0806	BULK	7
5310-00-011-5120	14	7	6220-00-299-7426	4	44
5310-00-013-1245	15	8	6145-00-343-5767	BULK	9
6240-00-019-0877	4	45	4730-00-359-4717	27	2
6240-00-019-3093	4	14	4730-00-385-8795	23	3
6145-00-023-6778	BULK	4	5940-00-399-6676	4	34
6145-00-023-6923	BULK	22	5340-00-404-4101	9	12
5310-00-031-0920	7	10	5365-00-406-9320	23	14
5940-00-042-6317	8	40	4730-00-407-0509	23	6
6145-00-044-3579	BULK	23	4730-00-435-8015	29	1
5310-00-050-6646	17	11	4730-00-441-8700	26	1
4730-00-051-3731	27	8	2520-00-446-7518	30	1
4730-00-051-3731	28	7	5331-00-462-0907	4	13
5999-00-057-2929	4	50	5310-00-469-9202	19	15
5305-00-071-2511	7	9	5970-00-470-4575	BULK	24
5305-00-071-2513	14	4	4730-00-489-8198	21	7
5305-00-071-2519	9	14	4730-00-534-4140	21	5
5310-00-080-6004	4	23	5310-00-550-1130	1	4
5340-00-081-4718	8	22	5310-00-550-1130	2	8
6145-00-082-5172	BULK	21	5310-00-550-1130	9	10
5330-00-090-2128	10	8	5310-00-550-1130	14	6
4030-00-102-9687	10	12	5310-00-550-1130	15	7
5305-00-109-0282	15	4	5310-00-550-1130	25	2
5940-00-113-8179	8	26	4010-00-551-9921	10	13
5940-00-113-8183	8	57	5935-00-572-9180	4	15
5940-00-113-9826	4	41	5935-00-572-9180	4	48
5940-00-142-2212	8	1	4730-00-595-0083	10	5
4730-00-142-3076	9	8	5340-00-600-5937	4	27
4730-00-185-6837	21	2	6145-00-600-6052	BULK	18
4730-00-200-0257	9	4	6145-00-600-6173	BULK	11
5310-00-209-0786	4	30	5310-00-655-9544	4	51
5310-00-220-6668	10	2	5340-00-680-3261	8	16
4730-00-222-1838	30	4	5310-00-685-8308	1	2
5305-00-225-3843	1	1	5310-00-685-8308	2	7
5305-00-225-3843	2	6	5310-00-685-8308	9	13
5305-00-225-3843	25	1	5310-00-685-8308	14	5
4730-00-229-3402	22	4	5305-00-719-5243	19	8
4730-00-244-9848	10	1	5305-00-719-5274	19	7
5310-00-245-3424	4	32	5305-00-725-2317	20	6
5305-00-269-3217	4	4	5340-00-725-5280	4	5
2530-00-270-3878	10	10	6220-00-726-1916	4	42
5310-00-274-7758	3	1	6220-00-729-9295	4	46
4730-00-277-7331	30	2	5310-01-086-7725	4	7
4730-00-757-2910	23	7	5305-00-757-8122	4	3

**CROSS-REFERENCE INDEXES WORK PACKAGE
NATIONAL STOCK NUMBER INDEX**

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6145-01-091-0239	BULK	20			
5310-00-775-5139	4	95	6145-01-091-0241	BULK	17
5305-00-781-3927	17	9	6220-01-093-4439	4	10
5305-00-782-9489	4	29	2530-01-095-8752	9	5
5940-00-804-9184	8	48	6145-01-099-0050	BULK	10
5305-00-819-5108	23	10	6145-01-099-4741	BULK	12
4730-00-822-5609	28	9	5310-01-100-5145	2	18
5935-00-833-8561	4	36	4730-01-103-6840	27	7
5970-00-833-8562	43	5	4730-01-103-6840	28	5
5310-00-833-8567	4	16	6145-01-104-6028	BULK	15
5310-00-833-8567	4	49	4730-01-106-1757	10	7
4730-00-844-3308	26	6	5310-01-109-5292	4	9
6145-00-854-8211	BULK	8	4730-01-125-5179	22	3
5310-00-877-5795	19	1	4730-01-126-9758	27	5
5315-00-878-1994	29	6	4730-01-126-9758	28	4
9905-00-893-3570	4	47	5940-01-129-2678	8	25
9330-00-912-2707	BULK	26	5315-01-133-4382	11	10
5305-00-940-9445	4	21	5940-01-141-2881	8	53
5935-00-941-5436	2	16	5935-01-148-4523	2	19
5305-00-957-6272	4	43	6220-01-163-4900	4	17
5305-00-964-0691	11	7	5305-01-163-8191	10	6
4730-00-974-7313	20	3	5940-01-169-6391	8	54
5305-00-983-5346	16	3	5970-01-175-2052	BULK	1
5305-00-983-5346	17	1	5310-01-183-5514	7	1
5305-00-983-5346	18	4	6145-01-202-7748	BULK	6
5305-00-983-5346	19	14	5925-01-206-8136	8	42
5305-00-983-5346	23	2	6220-01-210-3225	4	11
5305-00-983-5346	29	9	5935-01-211-4434	1	3
5305-00-984-4981	6	9	5935-01-211-4434	2	5
5305-00-984-6212	4	26	6220-01-217-8316	4	1
5305-00-984-6221	2	17	5995-01-222-5497	4	33
5305-00-988-7603	6	2	5340-01-227-3483	4	2
5310-01-013-2395	13	6	5340-01-227-6808	4	28
4730-01-050-5756	23	8	5340-01-227-9471	4	22
5305-01-061-9674	4	31	6145-01-236-1935	BULK	16
4730-01-065-1817	30	8	5940-01-258-2108	8	29
4730-01-066-3363	9	2	5340-01-272-2729	4	6
5310-01-073-9803	8	15	5305-01-272-6543	6	7
5310-01-073-9803	19	17	5305-01-272-6543	8	14
5310-01-073-9803	21	12	5305-01-272-6543	14	1
4820-01-075-7224	22	2	5305-01-272-6543	17	7
5305-01-078-2010	15	5	5305-01-272-6543	19	19
5310-01-081-0798	4	8	5305-01-272-6543	20	4
5310-01-082-2058	4	24	5305-01-272-6543	2	1 1
5935-01-084-1942	4	40	5315-01-282-3483	13	3
5999-01-085-6244	4	39	5315-01-282-3483	19	2
5315-01-282-3483	29	11	4730-01-315-8250	30	10
			5315-01-495-8223	23	15

**CROSS-REFERENCE INDEXES WORK PACKAGE
NATIONAL STOCK NUMBER INDEX**

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6220-01-284-2709	4	19	5315-01-495-8282	17	13
4720-01-289-8293	BULK	25	5340-01-495-8298	23	16
5310-01-308-8205	26	4	6220-01-495-9757	5	1
5975-01-314-8107	8	6	3040-01-495-9856	27	6
4730-01-315-8250	30	10	5315-01-496-0426	12	7
4730-01-326-3049	23	5	5325-01-496-0432	12	4
4730-01-334-5719	22	1	5360-01-496-0434	13	5
4720-01-347-7388	BULK	28	5360-01-496-0436	26	3
5342-01-355-8732	4	12	5315-01-496-0452	12	1
5310-01-378-2903	23	13	5315-01-496-0453	13	4
6145-01-381-2385	BULK	14	5315-01-496-0454	17	10
6220-01-387-4250	4	20	4720-01-496-1588	24	7
5310-01-389-4257	6	6	2510-01-496-1811	12	8
5310-01-389-4257	19	18	5510-01-496-1818	12	9
5310-01-389-4257	21	11	5340-01-496-1897	23	19
4730-01-394-8793	25	8	5340-01-496-1903	13	1
5305-01-431-5149	18	2	5340-01-496-1906	23	18
5355-01-441-2838	19	12	5340-01-496-2166	23	1
4730-01-441-9417	21	3	5340-01-496-2171	7	6
6240-01-447-3779	4 1	8	5315-01-496-2280	17	3
6145-01-456-0311	BULK	13	5315-01-496-2299	19	3
4730-01-457-0813	25	3	5315-01-496-2317	19	3
6140-01-457-4260	7	5	5315-01-496-2322	27	3
5640-01-462-4252	BULK	27	5315-01-496-2435	29	13
5310-01-467-4644	26	5	5315-01-496-2436	28	1
9390-01-469-7255	BULK	2	5315-01-496-3057	28	8
5975-01-481-6824	1	8	5315-01-496-3059	29	5
5975-01-481-6824	2	15	5315-01-496-3062	27	10
4730-01-481-8114	1	9	4730-01-496-3143	30	5
4730-01-481-8114	2	3	5930-01-496-3656	2	13
5970-01-481-8421	BULK	5	4730-01-496-3695	23	4
2540-01-494-3529	21	10	4720-01-496-3775	24	5
2540-01-494-3530	21	8	5340-01-496-4055	12	5
5935-01-494-3538	1	6	5340-01-496-4081	16	2
4820-01-494-6076	30	3	5340-01-496-4081	17	2
3040-01-495-2848	29	2	5340-01-496-4081	18	6
3040-01-495-2850	28	6	5340-01-496-4081	29	10
5306-01-495-6997	11	3	5340-01-496-4093	18	1
5306-01-495-7002	13	7	5340-01-496-4114	19	13
3040-01-495-7628	19	9	4730-01-496-4148	30	7
3040-01-495-7880	19	6	2510-01-496-4441	12	3
4820-01-495-8070	26	2	4720-01-496-4523	24	6
5945-01-495-8071	23	11	4720-01-496-4550	24	8
5305-01-495-8137	29	7	4720-01-496-4647	24	10
5315-01-495-8164	23	17	4720-01-496-4914	24	2
5305-01-495-8170	27	9	5331-01-496-5156	25	7
5305-01-495-8188	20	2	4720-01-496-5327	24	3
			2940-01-497-0077	25	3

**CROSS-REFERENCE INDEXES WORK PACKAGE
NATIONAL STOCK NUMBER INDEX**

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
2540-01-496-5769	14	8	6150-01-497-6831	8	63
2590-01-496-5997	15	6	5310-01-498-1892	19	4
4720-01-496-6001	24	14	5310-01-498-1892	29	12
2540-01-496-6004	15	1	5310-01-498-1951	12	11
4720-01-496-6037	24	1	5310-01-498-4029	13	11
4720-01-496-6048	24	16	5120-01-498-4965	7	11
4720-01-496-6067	24	4	5930-01-499-5311	2	2
4720-01-496-6337	24	12	5310-01-500-2707	12	2
5315-01-496-6348	11	4	2540-01-501-5365	11	11
4720-01-496-6429	24	13	5310-01-501-9194	7	3
4720-01-496-6446	24	11	5310-01-501-9196	7	4
2540-01-496-7132	29	4	5930-01-502-1048	2	12
6685-01-496-8423	23	9	4820-01-502-1995	22	5
5935-01-496-8429	8	56	4820-01-502-2001	21	4
4720-01-497-0042	24	9	4820-01-502-2006	22	6
2940-01-497-0073	25	4	5940-01-502-2111	8	61
2940-01-497-0077	25	5	6220-01-502-2419	6	1
4720-01-497-0107	24	17	6240-01-502-2421	6	4
5310-01-500-2707	12	2	6240-01-502-2530	5	5
5975-01-497-0117	8	62	6625-01-502-2946	2	14
3130-01-497-0388	19	16	5340-01-502-3308	18	5
5945-01-497-0549	3	4	5340-01-502-3323	19	5
4730-01-497-6338	21	6	6220-01-502-7230	6	3
5315-01-497-9960	11	6	5120-01-507-1183	12	6
5315-01-133-4382	13	8	4730-01-502-7273	21	9
5340-01-496-4081	29	10			

**CROSS-REFERENCE INDEXES WORK PACKAGE
PART NUMBER INDEX**

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
1BZD4	00775	5340-01-496-2171	7	6
1BZD4	00870		9	6
1BZD4	01109	4720-01-496-1588	24	7
1BZD4	01110	4720-01-496-3775	24	5
1BZD4	01111	4720-01-496-4523	24	6
1BZD4	01112	4720-01-496-4550	24	8
1BZD4	01114	4720-01-497-0042	24	9
1BZD4	01115	4720-01-496-6446	24	11
1BZD4	01116	4720-01-496-6429	24	13
1BZD4	01117	4720-01-496-6337	24	12
1BZD4	01118	4720-01-496-4647	24	10
1BZD4	01119	4720-01-496-6048	24	16
1BZD4	01120	4720-01-497-0107	24	17
1BZD4	01121	4720-01-496-6001	24	14
1BZD4	01123	4720-01-496-6067	24	4
1BZD4	01124	4720-01-496-4914	24	2
1BZD4	01125	4720-01-496-5327	24	3
1BZD4	01126	4720-01-496-6037	24	1
1BZD4	02000	4730-01-502-7273	21	9
1BZD4			30	9
1BZD4	02040	3040-01-495-9856	27	6
1BZD4	02055	3040-01-495-2850	28	6
1BZD4	02065	3040-01-495-2848	29	2
1BZD4	02145	2940-01-497-0073	25	4
1BZD4	02146	2940-01-497-0077	25	5
1BZD4	02147	2940-01-497-0092	25	6
1BZD4	02148	5331-01-496-5156	25	7
1BZD4	02240	5315-01-496-0426	12	7
1BZD4	02505	4730-01-496-3695	23	4
1BZD4	02540	5315-01-498-4029	13	11
1BZD4	02545	5315-01-497-9960	11	6
1BZD4	02560	2540-01-501-5365	11	11
1BZD4	02650	5340-01-502-3323	19	5
1BZD4	02765	5930-01-502-1048	2	12
1BZD4	02795	6110-01-499-5311	2	2
1BZD4	02840	4820-01-502-1995	22	5
1BZD4	02845	4820-01-502-2001	21	4
1BZD4	02855	4820-01-502-2006	22	6
1BZD4	02870	4820-01-502-2946	2	14
71468	031-0560-161	5935-01-148-4523	2	19
1BZD4	034-01559		14	9
30780	0507-12-12	4730-01-326-3049	23	5
30780	1/2 MMS-S	4730-01-103-6840	27	7
30780			28	5
81343	10-10 070320C	4730-00-385-8795	23	3
59257	10-8SA6	4730-00-489-8198	21	7
1BZD4	1007-1	5340-01-496-4081	16	2
1BZD4			17	2

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
1BZD4		5340-01-496-4081	18	6
1BZD4		5340-01-496-4081	29	10
1BZD4	1010-1	5315-01-496-2435	29	13
1BZD4	1013-1		3	3
1BZD4	1014-1		11	2
1BZD4	1015-1		11	1
1BZD4	1020-1		11	9
1BZD4	1022-1		2	1
1BZD4	1023-1		14	10
1BZD4	1024-1		14	11
1BZD4	1025-1	4820-01-495-8070	26	2
1BZD4	1026-1		9	7
1BZD4	1027-1		10	4
1BZD4	1028-1	3040-01-495-7628	19	9
1BZD4	1029-1	3040-01-495-7880	19	6
1BZD4	1030-1		11	5
1BZD4	1031-1	5315-01-496-2299	19	3
1BZD4	1032-1	5315-01-496-2317	19	3
1BZD4	1033-1	5315-01-496-2436	28	1
1BZD4	1034-1	5315-01-496-3057	28	8
1BZD4	1035-1	5315-01-496-3062	27	10
1BZD4	1036-1	5315-01-496-2322	27	3
1BZD4	1037-1	5315-01-495-8282	17	13
1BZD4	1038-1	5315-01-496-2280	17	3
1BZD4	1039-1		6	8
1BZD4	1040-1	5306-01-495-7002	13	7
1BZD4	1041-1		13	10
1BZD4	1042-1	5306-01-495-6997	11	3
1BZD4	1043-1	5315-01-496-0454	17	10
1BZD4	1044-1	2540-01-497-0751	19	11
1BZD4	1045-1	5340-01-496-4114	19	13
1BZD4	1046-1		19	10
1BZD4	1047-1		19	10
1BZD4	1048-1		7	7
1BZD4	1049-1		7	2
1BZD4	1051-1		17	5
1BZD4	1052-1		13	9
1BZD4	1053-1		13	9
1BZD4	1054-1	5340-01-496-1903	13	1
1BZD4	1055-1		14	2
1BZD4	1056-1		1	10
			2	11
1BZD4	1057-1	5315-01-496-0453	13	4
1BZD4	1058-1	5360-01-496-0434	13	5
1BZD4	1059-1	2590-01-496-5997	15	6
1BZD4	1060-1	5340-01-502-3308	18	5
1BZD4	1061-1		17	8
1BZD4	1062-1		17	4

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
1BZD4			27	1
1BZD4			28	2
1BZD4	1063-1	2540-01-496-5769	14	8
1BZD4	1064-1	5945-01-497-0549	3	4
1BZD4	1065-1	5360-01-496-0436	26	3
1BZD4	1067-1	5305-01-495-8170	27	9
1BZD4	1068-1	5310-01-501-9194	7	3
1BZD4	1069-1	5310-01-501-9196	7	4
1BZD4	1070-1	4730-01-496-3143	30	5
1BZD4	1071-1	5930-01-496-3656	2	13
1BZD4	1072-1	4730-01-496-4148	30	7
1BZD4	1073-1		9	3
1BZD4	1074-1	5310-01-498-1892	19	4
1BZD4			29	12
1BZD4	1075-1	5945-01-495-8071	23	11
1BZD4	1076-1	6220-01-495-9757	5	1
1BZD4	1077-1	5340-01-496-4093	18	1
1BZD4	1078-1	6685-01-496-8423	23	9
1BZD4	1079-1	2540-01-496-7132	29	4
1BZD4	1080-1	5315-01-496-3059	29	5
1BZD4	1081-1	5120-01-507-1183	12	6
1BZD4	1082-1	5340-01-496-2166	23	1
1BZD4	1083-1		2	4
1BZD4	1085-1		8	8
1BZD4	1086-1	2540-01-494-3529	21	10
1BZD4	1087-1	2540-01-494-3530	21	8
1BZD4	1088-1		17	6
1BZD4	1089-1		18	3
1BZD4	1090-1		16	1
1BZD4	1091-1	5305-01-495-8137	29	7
1BZD4	1092-1	5935-01-494-3538	1	6
1BZD4	1095-1	2540-01-496-6004	15	1
1BZD4	1099-1	5340-01-496-4055	12	5
27192	11-1625		26	7
83298	1100363-2	5940-00-142-2212	8	1
1BZD4	1102-1		9	11
1BZD4	1103-1	5305-01-495-8188	20	2
1BZD4	1104-1	5340-01-496-1906	23	18
1BZD4	1105-1	5315-01-495-8223	23	15
1BZD4	1106-1	5340-01-495-8298	23	16
1BZD4	1107-1	5315-01-495-8164	23	17
1BZD4	1108-1	5340-01-496-1897	23	19
1BZD4	1127-1	5120-01-498-4965	7	11
1BZD4	1137-1		29	3
11139	114020-90	5310-01-086-7725	4	7
11139	114021	5310-01-081-0798	4	8
24617	115120	5310-00-011-5120	1	5
24617			2	9
24617			9	9

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
24617			14	7
19207	11639519-2	5331-00-462-0907	4	13
19207	11639522	6220-01-163-4900	4	17
5A910	11639537	5342-01-355-8732	4	12
19207	11639538-1	6220-01-210-3225	4	11
30780	12 F50X-S	4730-01-457-0813	25	3
81343	12-12-12 140424C	4730-00-757-2910	23	7
30780	12-3/4F50G-S	4730-00-407-0509	23	6
81495	1200-59	5305-01-272-6543	6	7
81495			8	14
81495			14	1
81495			17	7
81495			19	19
81495			20	4
81495			21	1
19200	12279371-1	5310-01-073-9803	8	15
19200			19	17
19200			21	12
19207	12360850-1	6220-01-284-2709	4	19
19207	12360850-2	6220-01-387-4250	4	20
19207	12387272-45	5310-01-378-2903	23	13
04773	125-10497-07	5310-00-685-8308	1	2
04773			2	7
04773			9	13
04773			14	5
98441	12C50X-S	4730-01-394-8793	25	8
98441	12HP50NS	5365-00-406-9320	23	14
21450	131245	5310-00-013-1245	15	8
45152	1462260W	5340-01-272-2729	4	6
45152	1462270	5340-01-227-3483	4	2
45152	1462280	5340-01-227-6808	4	28
45152	1462290U	6220-01-217-8316	4	1
45152	1462310U	5995-01-222-5497	4	33
45152	1462340	5340-01-227-9471	4	22
12020	1726-1610	5305-00-109-0282	15	4
60287	1878		20	1
0ATA2	2001		11	8
0ATA2			13	2
0ATA2			17	14
0ATA2			27	11
0ATA2			28	3
0ATA2	2006		27	4
06853	2021945		10	3
0ATA2	2023		17	12
06853	204000	5310-00-220-6668	10	2
01276	2068-8-8S	4730-00-051-3731	27	8
01276			28	7
06853	213605		10	11

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
06853	213630	5330-00-090-2128	10	8
45152	2196790	5305-01-431-5149	18	2
06853	235646	4030-00-102-9687	10	12
77326	24-353	5930-00-008-0514	2	10
06853	240233	4730-01-106-1757	10	7
06853	240407	5305-01-163-8191	10	6
35510	2434	5310-00-775-5139	4	25
06853	243655		10	9
45152	2447HX	5310-01-109-5292	4	9
45152	2467-H	5305-01-061-9674	4	31
06853	281865	2530-01-095-8752	9	5
81349	2SJ-12-163		8	60
81349	2SJ-12-36		8	49
81349	2SJ-12-4		8	24
81349	2SJ-12-40		8	50
81349	2SJ-12-48		8	51
81349	2SJ-12-60		8	27
81349	2SJ-12-65		8	20
30780	3/4X1/4PRT-S	4730-01-050-5756	23	8
00779	34148	5940-00-042-6317	8	40
32770	403-09081-01	5310-01-100-5145	2	18
89346	414506C1	4730-01-066-3363	9	2
29510	417200C2	4720-01-289-8293	BULK	25
29510	417200C2-32		9	1
29510	417200C2-34		9	1
29510	417200C2-56		9	1
89346	417202C2	4720-01-347-7388	BULK	28
89346	417202C2-7		24	15
21450	444530	4730-00-277-7331	30	2
89346	4772K6	4820-01-494-6076	30	3
8B865	5/16-18 UNC-2A X 2-1/2	5305-00-282-9607	22	8
8B865			23	12
81851	5001001303S	5970-01-175-2052	BULK	1
81851	5001001303S-16		4	37
81851	5001001303S-4		4	38
0TWA7	5005008		6	3
28548	5228623	4730-00-244-9848	10	1
00779	52412	5940-01-258-2108	8	29
82366	530-50031	5305-01-078-2010	15	5
60592	533-25NLB	5935-01-496-8429	8	56
19204	572929	5999-00-057-2929	4	50
89346	586049C1	4730-01-065-1817	30	8
39428	5913K44	3130-01-497-0388	19	16
81343	6-6 130239B	4730-00-278-4822	30	6
1BZD4	6007-1		29	8
39428	69915K51	5975-01-497-0117	8	62
39428	69915K53	4730-01-481-8114	1	9
		4730-01-481-8114	2	3

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
39428	69915K55	5975-01-481-6824	1	8
39428			2	15
39428	7088K11	6150-01-497-6831	8	63
19207	7338409	2530-00-270-3878	10	10
19207	7366032	4010-00-551-9921	10	13
19207	7390150	4730-00-200-0257	9	4
19207	7974634	5935-00-941-5436	2	16
98441	8 CTXS-S	4730-00-185-6837	21	2
98441	8-1/2F50G-S	4730-01-126-9758	27	5
98441			28	4
81343	8-6 120102BA	4730-00-142-3076	9	8
81343	8-8 070122C	4730-00-435-8015	29	1
81343	8-8 140137S	4730-01-125-5179	22	3
81343	8-8 140230CA	4730-00-359-4717	27	2
81343	8-8 140237C	4730-00-229-3402	22	4
75915	813040	5925-01-206-8136	8	42
70485	832	5340-00-600-5937	4	27
19207	8338561	5935-00-833-8561	4	36
19207	8338562	5970-00-833-8562	4	35
19207	8338564	5940-00-399-6676	4	34
19207	8338566	5935-00-572-9180	4	15
19207			4	48
19207	8338567	5310-00-833-8567	4	16
19207			4	49
30327	845-FS-08X08	4730-01-334-5719	22	1
39428	8451A62	9390-01-469-7255	BULK	2
39428	8451A62-26		7	8
98441	8AOG5JG5-S	4730-01-497-6338	21	6
98441	8F50HAO-SS	4730-00-534-4140	21	5
30780	8F650X-SS	4730-01-441-9417	21	3
1BZD4	9003-1		1	7
39428	90045A453	5310-01-467-4644	26	5
89346	91916R91	2520-00-446-7518	30	1
11939	93602345	5310-01-082-2058	4	24
39428	93695K-13		15	3
39428	93695K62	5640-01-462-4252	BULK	27
39428	98296A255	5315-01-282-3483	13	3
39428			19	2
39428			29	11
39428	98296A548	5315-01-496-6348	11	4
39428	98296A556	5315-01-133-4382	11	10
39428	98296A559	5315-01-133-4382	13	8
81348	A-A-52463-B10	6240-01-447-3779	4	18
98523	A200151C007	5310-01-013-2395	13	6
58536	A52463-1-08	6240-00-019-0877	4	45
58536	A52463-1-09	6240-00-019-3093	4	14
58536	A52484-1	4730-00-595-0083	10	5
58536	AA59551-E04G1B	6145-00-023-6778	BULK	4

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
80204	ASAB27-1-1950 HEA VY SERIES		3	2
0TWA7	B-4411	6240-01-502-2530	5	2
80204	B1821BH025C100N	5305-00-225-3843	1	1
80204			2	6
80204			25	1
80204	B1821BH025C200N	5305-00-071-2511	7	9
80204	B1821BH025C250N	5305-00-071-2513	14	4
80204	B1821BH025C400N	5305-00-071-2519	9	14
80204	B1821BH038C150D	5305-00-964-0691	11	7
80204	B1821BH038C150N	5305-00-725-2317	20	6
80204	B1821BH038C200N	5305-00-782-9489	4	29
80204	B1821BH038C350N	5305-00-781-3927	17	9
80204	B1821BH050F300N	5305-00-719-5243	19	8
06721	B205010	5975-01-314-8107	8	6
60592	B31WN	5940-01-502-2111	8	61
81346	B687R-39B	4730-00-222-1838	30	4
98410	BB-837-06	5940-00-113-8179	8	26
0TWA7	BH-1	6240-01-502-2421	6	4
81349	C0-12MGF(12/18)0685	6145-00-023-6923	BULK	22
81349	C0-12MGF-76		8	52
98410	C530-56	5940-00-113-8183	8	57
7H066	C3609X16	4730-01-315-8250	30	10
99862	CL-4-PPK-4	5355-01-441-2838	19	12
75272	COV1313	5340-00-404-4101	9	12
45152	EE-101241	5999-01-085-6244	4	39
45152	EE-101253	5935-01-084-1942	4	40
14541	FS11P	5310-00-469-9202	19	15
20038	HC-31D-31	6140-01-457-4260	7	5
81348	J-C-580TFF6CF1/16TUJ	6145-00-854-8211	BULK	8
81348	J-C-580TFF6CF1/16TUJ	6145-01-104-6028	BULK	15
81348	JC30-63		8	5
81348	JC580-10 1/2		8	30
81348	JC580-14		8	37
26697	JP0-0031	5935-01-211-4434	1	3
26697			2	5
0TWA7	LP15A	6220-01-502-2419	6	1
0TWA7	LP15AA-3		6	5
81349	M16878/1BJE-13 1/2		8	36
81349	M16878/1BJE80	6145-01-381-2385	BULK	14
81349	M16878/4BJE-12		8	33
81349	M16878/4BJE-16		8	43
81349	M16878/4BJE-8		8	41
81349	M16878/5BJE-14		8	39
81349	M16878/5BJE-7		8	45
81349	M16878/5BKE-8		8	46
81349	M16878/6BFE-6		8	47
81349	M16878/6BFE0	6145-00-082-5172	BULK	21

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
99806	M200SER-8-31		15	2
99806	M200SERIES1X1-8	9330-00-912-2707	BULK	26
81349	M22759-13		8	35
81349	M22759/11-16-0	6145-00-600-6052	BULK	18
81349	M22759/11-16-3	6145-00-600-6173	BULK	11
81349	M22759/34-16-4	6145-01-456-0311	BULK	13
81349	M22759/9-14-0	6145-01-091-0239	BULK	20
81349	M22759/9-16-2	6145-01-091-0241	BULK	17
81349	M23053/10-002-0	5970-00-470-4575	BULK	24
81349	M23053/10-002-2		8	58
81343	M23053/10-004-0	5970-00-008-3295	BULK	3
81349	M23053/10-004-2		8	2
81349	M23053/12-106-2	5970-01-481-8421	BULK	5
81349	M23053/12-2		8	13
81349	M24643/43-06U0	6145-01-202-7748	BULK	6
81349	M43436/1-3	9905-00-893-3570	4	47
81349	M5086-11 1/2		8	32
81349	M5086-12 1/2		8	34
81349	M5086-14 1/2		8	38
81349	M5086-7		8	44
81349	M5086/1-10-9	6145-00-003-9527	BULK	19
81349	M5086/1-12-0	6145-00-044-3579	BULK	23
81349	M5086/1-16-19	6145-01-236-1935	BULK	16
81349	M5086/1-16-30	6145-01-099-4741	BULK	12
81349	M5086/1-16-60	6145-01-099-0050	BULK	10
81349	M5086/1-20		8	59
81349	M5086/1-3		8	55
81349	M76MWPC-10		8	28
81349	M76MWPC1619A1	6145-00-295-0806	BULK	7
81349	M7928/4-112	5940-01-129-2678	8	25
81349	M81381-11		8	31
81349	M81381/7-16-6	6145-00-343-5767	BULK	9
80205	MS16562-87	5315-00-878-1994	29	6
80205	MS16995-27	5305-00-988-7603	6	2
96906	MS16997-78	5305-00-983-5346	16	3
96906			17	1
96906			18	4
96906			19	14
96906			23	2
96906			29	9
96906	MS17828-4C	5310-00-031-0920	7	10
96906	MS17829-5C	5310-00-245-3424	4	32
96906	MS17830-6C	5310-00-050-6646	17	11
96906	MS21044N8	5310-00-877-5795	19	1
96906	MS21333-125	5340-00-725-5280	4	5
96906	MS21919WH48	5340-00-680-3261	8	16
96906	MS25036-114	5940-00-113-9826	4	41
96906	MS27183-14	5310-00-080-6004	4	23

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
96906	MS27183-48	5310-01-308-8205	26	4
96906	MS27429-2	5940-00-804-9184	8	48
80205	MS35190-269	5305-00-957-6272	4	43
96906	MS35206-224	5305-00-984-4981	6	9
96906	MS35206-234	5305-00-984-6221	2	17
96906	MS35206-265	5305-00-984-6212	4	26
96906	MS35311-18	5305-00-290-7156	14	3
96906	MS35311-38	5305-00-282-9646	22	7
96906	MS35313-44	5305-00-819-5108	23	10
96906	MS35333-40	5310-00-550-1130	1	4
96906			2	8
96906			9	10
96906			14	6
96906			15	7
96906			25	2
96906	MS35335-33	5310-00-209-0786	4	30
96906	MS35338-046	5310-01-389-4257	6	6
96906			19	18
96906			21	11
96906	MS35421-2	6220-00-299-7426	4	44
96906	MS35422-1	6220-00-729-9295	4	46
96906	MS35423-2	6220-00-726-1916	4	42
96906	MS35649-286N	5310-00-274-7758	3	1
96906	MS35690-604	5310-00-655-9544	4	51
96906	MS51468-03	5310-01-183-5514	7	1
96906	MS51500A8-4	4730-00-441-8700	26	1
96906	MS51504A8-4	4730-00-844-3308	26	6
96906	MS51527-A10	4730-00-974-7313	20	3
96906	MS51527A8	4730-00-822-5609	28	9
96906	MS51851-64	5305-00-757-8122	4	3
80205	MS51975-23	5305-00-940-9445	4	21
96906	MS52125-2	6220-01-093-4439	4	10
80205	MS90725-67	5305-00-269-3217	4	4
96906	MS90727-125	5305-00-719-5274	19	7
96906	MS9349-04	5340-00-081-4718	8	22
09990	N-800-S	4820-01-075-7224	22	2
81348	QQ-W-343-10		8	23
81348	QQ-W-343-18		8	4
81348	QQ-W-343-36		8	21
81348	QQ-W-343-37		8	9
81348	QQ-W-343-40		8	17
81348	QQ-W-343-45		8	18
81348	QQ-W-343-47		8	19
81348	QQ-W-343-5		8	3
81348	QQ-W-343-70		8	11
81348	QQ-W-343-8		8	7
81348	QQ-W-343-80		8	10
81348	QQ-W-343-90		8	12

**CROSS-REFERENCE INDEXES WORK PACKAGE
PART NUMBER INDEX**

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
14726	S05360SF	5940-01-141-2881	8	53
14726	S05363SF	5940-01-169-6391	8	54
0GRF0	WA WLC3840		20	5
74410	XA-T-653-6		12	10
74410	XA0403	5325-01-496-0432	12	4
74410	XA0404	5310-01-500-2707	12	2
74410	XA0409	2510-01-496-4441	12	3
74410	XA0411	2510-01-496-1811	12	8
1BZD4	XB-T-360	5315-01-496-0452	12	1
74410	XB0360	5510-01-496-1818	12	9
74410	XB0418	5310-01-498-1951	12	11

END OF WORK PACKAGE

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

SECTION I. INTRODUCTION**1. SCOPE**

This work package lists Components of End Item (COEI) and Basic Issue Items (BII) for the 250M Fifth Wheel Towing Device (FWTD) to help you inventory items required for safe and efficient operation.

2. GENERAL

The COEI and BII Lists are divided into the following sections:

- a. **Section II. Components of End Item.** This listing is for informational purposes only and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.
- b. **Section III. Basic Issue Items.** These are the minimum essential items required to place the towing device in operation, to operate it, and to perform emergency repairs. BII must be with the towing device during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of end item.

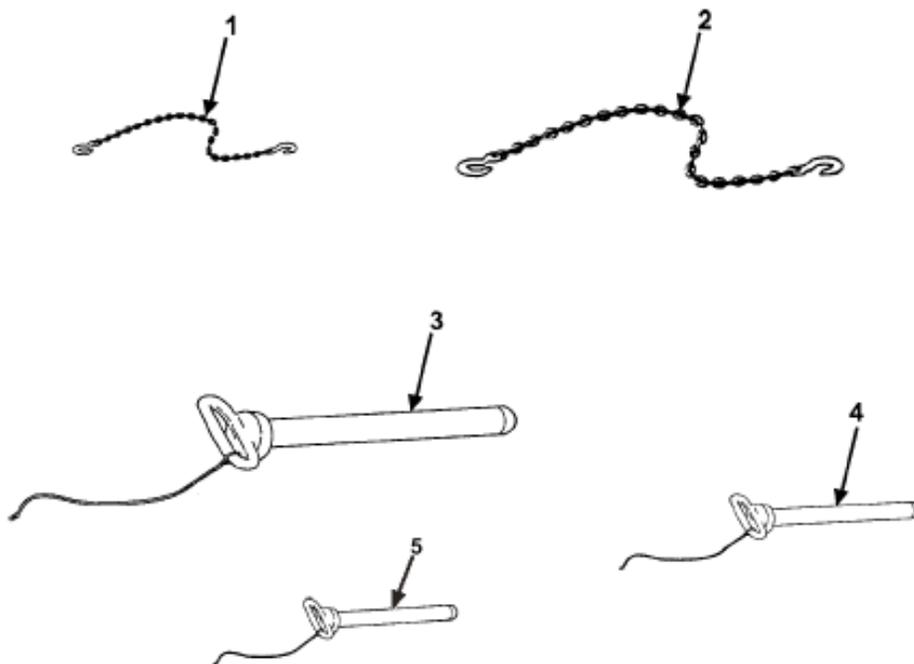
3. EXPLANATION OF COLUMNS

Below is an explanation of columns found in the tabular listings:

- a. **Column (1) - Illustration Number (Illus Number).** This column indicates the number of the illustration that shows the item.
- b. **Column (2) - National Stock Number.** Indicates the National Stock Number (NSN) assigned to the item and will be used for requisitioning purposes.
- c. **Column (3) - Description, CAGEC, and Part Number,** identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the CAGEC (Commercial and Government Entity Code) (in parentheses) and the part number.
- d. **Column (4) - Usable on Code.** When applicable, gives the code if the item needed is not the same for different models of equipment.
- e. **Column (5) - Unit of Issue (U/I).** Indicates how the item is issued for the National Stock Number shown in Column (2).
- f. **Column (6) - Quantity Required (Qty/Rqd).** Indicates the quantity of the item authorized to be used with the equipment.

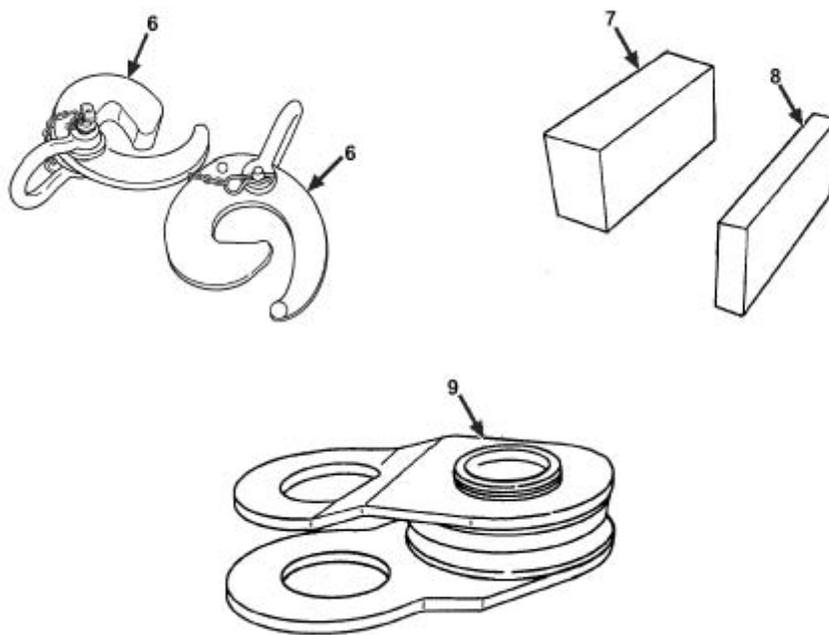
SECTION II. COMPONENTS OF END ITEM

No components of end item have been assigned to the 250M Fifth Wheel Towing Device (FWTD).

SECTION III. BASIC ISSUE ITEMS

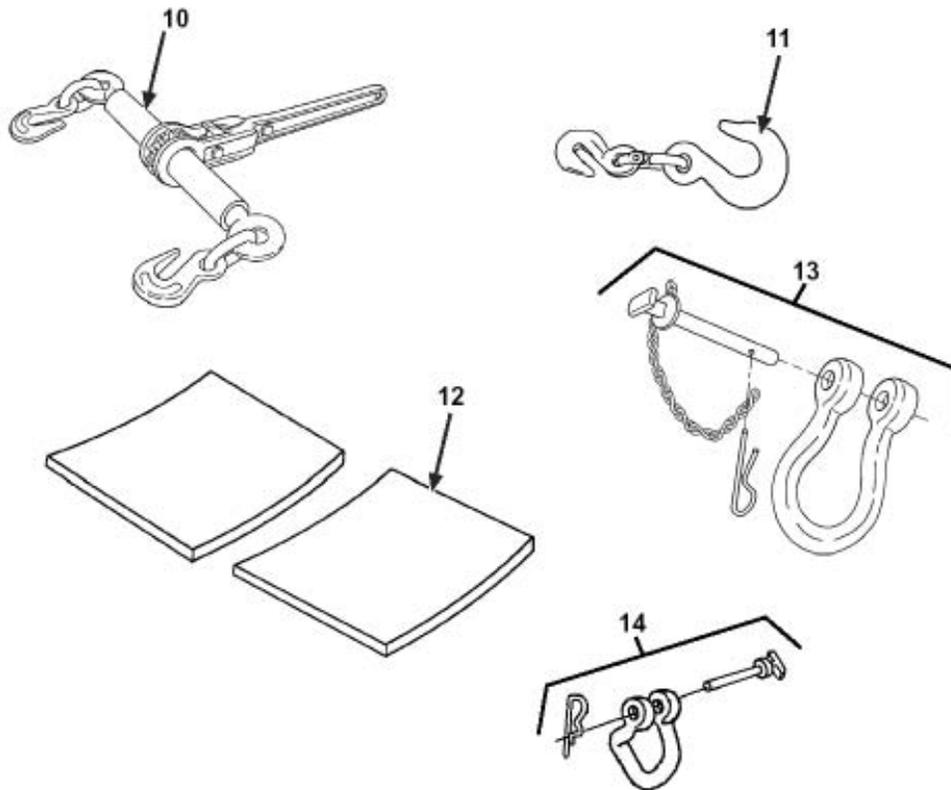
(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
1	4010-01-502-2010	CHAIN ASSEMBLY, 3/8 INCH (1BZD4) 1128-1		EA	2
2	4010-01-502-2008	CHAIN ASSEMBLY, 1/2 INCH (1BZD4) 1129-1		EA	2
3	5315-01-502-2507	PIN, PIVOT, 1 1/4" x 8 1/2" (1BZD4) 02535		EA	3
4	5315-01-497-9960	PIN, STRAIGHT HEADED 3/4" x 6" (1BZD4) 02545		EA	4
5	5315-01-498-4029	PIN, STRAIGHT HEADED 3/4" x 4" (1BZD4) 02540		EA	2

SECTION III. BASIC ISSUE ITEMS - Continued



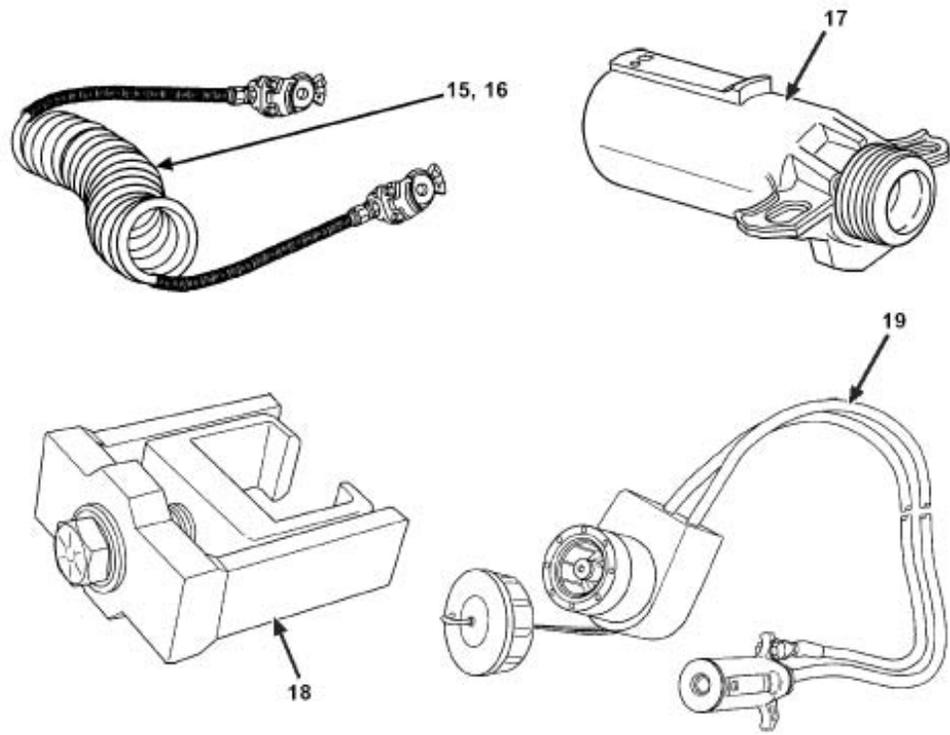
(1) Ilus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
6	4030-01-501-9637	FRAME, HOOK (1BZD4) 1130-1		EA	2
7		BLOCK, RUBBER, 4 INCH (1BZD4) 00785		EA	4
8		BLOCK, RUBBER, 2 INCH (1BZD4) 00790		EA	4
9	3940-01-502-2517	BLOCK, PULLEY (60287) 7750A		EA	1

SECTION III. BASIC ISSUE ITEMS (Continued)



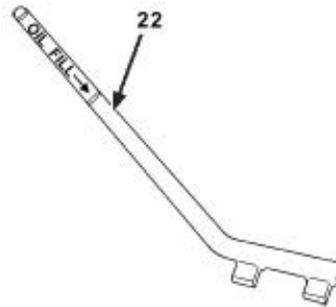
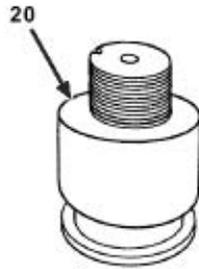
(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
10	3390-01-213-1746	LOAD BINDER (27410) R-45		EA	2
11	4030-01-502-1985	HOOK, CARGO (1BZD4) 1131-1		EA	2
12	5340-01-496-2171	BELTING, 3-PLY (1BZD4) 00775		EA	2
13	5315-01-502-2510	CLEVIS ASSEMBLY (1BZD4) 1136-1		EA	4
14	5340-01-502-3320	CLEVIS AND U-BOLT (1BZD4) 1079-2		EA	2

SECTION III. BASIC ISSUE ITEMS - Continued



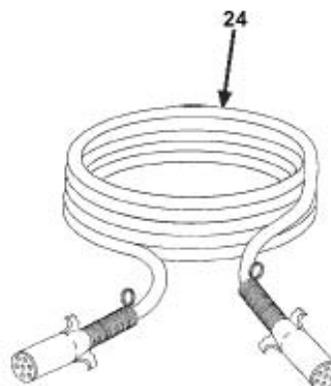
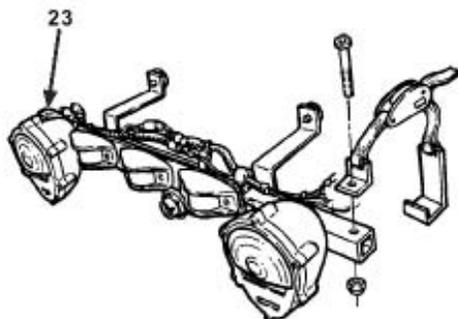
(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
15	4720-01-502-2108	HOSE ASSEMBLY, NONMETALLIC (1BZD4)1133-1		EA	1
16	4720-01-502-2123	HOSE ASSEMBLY, NONMETALLIC (1BZD4) 1132-1		EA	1
17	5935-01-502-2014	PLUG, DUMMY (1BZD4) 1135-1		EA	1
18		PULLER, MECHANICAL (1BZD4) 1018-1		EA	1
19	6150-01-502-2043	CABLE, ASSEMBLY, POWER (1BZD4) 1094-1		EA	1

SECTION III. BASIC ISSUE ITEMS - Continued



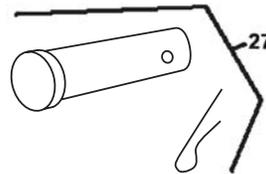
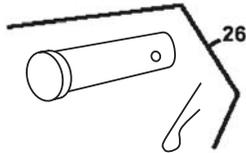
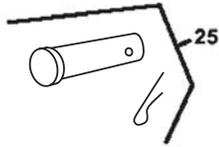
(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
20	2510-01-496-4441	KINGPIN, 3 1/2 INCHES (74410) XA0409		EA	1
21	2510-01-496-1811	KINGPIN, 2 INCHES (74410) XA0411		EA	1
22		WRENCH, SPANNER (1BZD4) 1081-1		EA	1

SECTION III. BASIC ISSUE ITEMS - Continued



(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
23	6220-01-217-8316	LIGHT BAR, 24 VOLT (45152) 1462290U		EA	1
24		CABLE, ASSEMBLY, POWER 24 VOLT, 70 FT (1BZD4) 00805		EA	1

SECTION III. BASIC ISSUE ITEMS -Continued



(1) Illus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
25	2540-01-502-2031	PIN, STRAIGHT HEADED, 1 INCH, used with 5 Ton (1BZD4) 02530		EA	2
26	2540-01-501-5365	PIN, STRAIGHT HEADED, 1 1/4 INCH, used with FMTV (1BZD4) 02560		EA	2
27	2540-01-502-2034	PIN, STRAIGHT HEADED, 1 1/2 INCH, used with 911, 915, 916, 920, and PLS (1BZD4) 02561		EA	2

END OF WORK PACKAGE

ADDITIONAL AUTHORIZATION LIST

This technical manual lists additional items authorized for the support of the 250M Fifth Wheel Towing Device.

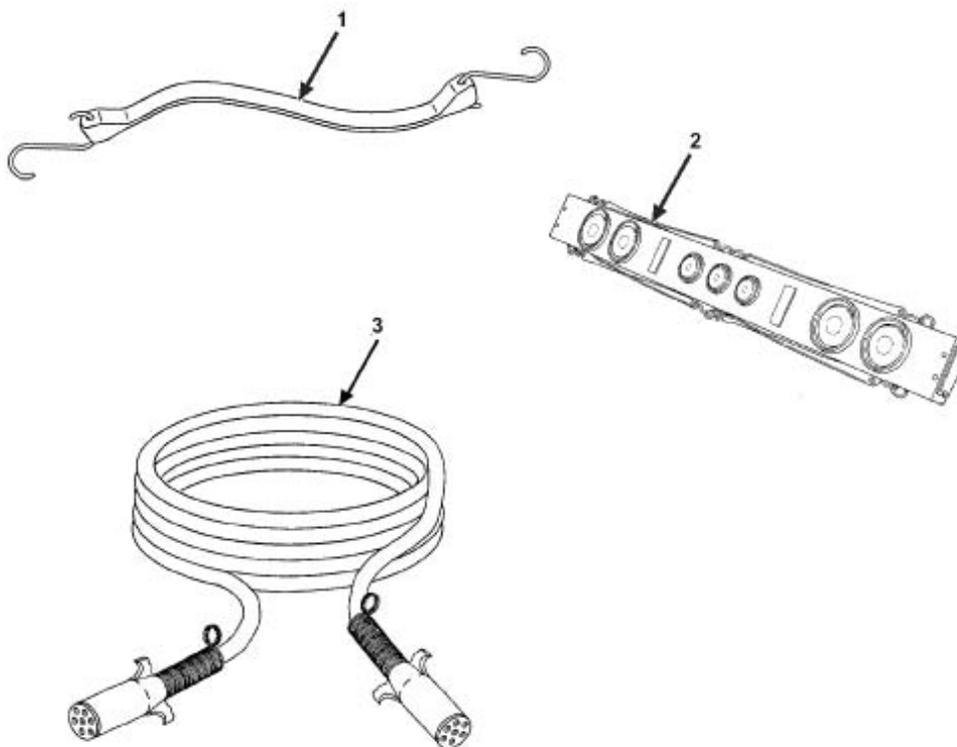
1. GENERAL

This list identifies items that do not have to accompany the 250M Fifth Wheel Towing Device and that do not have to be turned in with it. These items are all authorized by CTA, MTOE, TDA, or JTA.

2. EXPLANATION OF COLUMNS.

- a. **Column (1) - Illustration Number (Illus Number).** This column indicates the number of the illustration that shows the item.
- b. **Column (2) - National Stock Number.** This column indicates the National Stock Number (NSN) assigned to the item and will be used for requisitioning purposes.
- c. **Column (3) - Description, CAGEC, and Part Number,** identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the CAGEC (Commercial and Government Entity Code) (in parentheses) and the part number.
- d. **Column (4) - Usable on Code.** When applicable, gives the code if the item needed is not the same for different models of equipment.
- e. **Column (5) - Unit of Issue (U/I),** indicates how the item is issued for the National Stock Number shown in column (1).
- f. **Column (6) - Quantity Required (Qty/Rqd),** indicates the quantity of the item authorized to be used with the equipment.

ADDITIONAL AUTHORIZATION LIST



(1) Ilus Number	(2) National Stock Number	(3) Description (CAGEC) Part Number	(4) Usable On Code	(5) U/I	(6) Qty Rqd
1	3990-01-327-1278	TIEDOWN, CARGO, VEHICLE (OC1E6) CR15A		EA	2
2		TOWLIGHT ASSEMBLY, 12V (1BZD4) 02325		EA	1
3	6150-01-502-2047	CORD, LIGHT, 12V (1BZD4) 1134-1		EA	1

END OF WORK PACKAGE

EXPENDABLE AND DURABLE ITEMS LIST

SECTION I. INTRODUCTION

1. SCOPE

This work package lists expendable and durable items you will need to operate and maintain the 250M Fifth Wheel Towing Device (FWTD). This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/durable Items (Except Medical Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the "Initial Setup" of maintenance paragraphs or narrative instructions to identify the material needed (e.g., Dry cleaning solvent, Item 19, WP 0085).
- b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Unit Maintenance
F - Direct Support Maintenance
H - General Support Maintenance
- c. **Column (3) - National Stock Number.** This is the National Stock Number assigned to the item. Use it to request or requisition the item.
- d. **Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), Part Number.** Indicates the Federal Item Name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number, if applicable.
- e. **Column (5) - Unit of Measure (U/M)/Unit of Issue (U/I).** This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue as shown in the Army Master Data File (AMDF), requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description, (CAGEC), Part Number	(5) U/M UI
1	O	7920-00-061-0038	BRUSH: Scrub (81348) H-B-1490-7-P1	ea
2	O	7920-00-900-3577	BRUSH: Wire (17987) 3577	ea
3	O	8030-01-418-9006	CORROSION PREVENTIVE (09137) WD-40 Box of 12 Aerosol Cans, 9 Ounces Each	oz
4	O	7930-00-282-9699	DETERGENT: General Purpose, Liquid (83421) 1 Gallon Can	gl
5	O	3439-00-255-9935	FLUX: Soldering, TY1 Form A (58536) A-A-51145 1 Pound Can	lb
6	O	8415-00-268-7859	GLOVES: Protective (58536) A-A-50022	pr
7	C	9150-01-197-7693 9150-01-197-7688 9150-01-197-7690 9150-01-197-7689 9150-01-197-7692 9150-01-197-7691	GREASE: Automotive and Artillery, GAA (81349) MIL-G-10924 14 Ounce Cartridge 2 1/4 Ounce Tube 1 3/4 Pound Can 6 1/2 Pound Can 35 Pound Pail 120 Pound Drum	oz oz lb lb lb lb
8	C	9150-00-252-6383 9150-00-223-4134 9150-00-082-7524 9150-00-265-9408	HYDRAULIC FLUID Petroleum Based, Artic (81349) MIL-H-5606 1 Quart Can 1 Gallon Can 10 Gallon Drum 55 Gallon Drum	qt gl dr dr

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST - Continued

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description, (CAGEC), Part Number	(5) U/M UI
9	C	9150-01-422-9346 9150-01-152-4118 9150-01-152-4119	OIL: Lubricating Engine, OE/HDO 15W-40GRADE (81349) MIL-PRF-2104 1 Quart Can 5 Gallon Can 55 Gallon Drum	qt gl dr
10	C	7920-00-205-1711	RAG: Wiping (64067) 50 Pound Bale	lb
11	O	8040-00-833-9563	SEALANT: Adhesive, Silicone Rubber (94833) 52498 5 Ounce Tube	kt
12	O	8030-01-054-0740	SEALING COMPOUND, Locite, 592 (05972) 592-31 5 ounce bottle	bt
13	O	3439-00-247-6921 3439-00-265-7102	SOLDER: Lead Alloy (81348) QQ-S-571 1 Pound Bar 1 Pound Spool/Roll	lb lb
14	O	6850-01-474-2320 6850-01-474-2321	SOLVENT: Dry Cleaning, Type III (81349) MIL-PRF-680 5 Gallon Can 55 Gallon Drum	gl gl
15	O	9905-00-537-8954	TAG: Marker (64067) 50 Each	ea
16	O	5640-00-103-2254	TAPE: Duct, 2 Inch Width (39428) 1791K70 60 Yard Roll	yd
17	O	8030-00-889-3535	TAPE: Antiseize, 1/2 inch width (81755) P5025-2R 260 Inch Roll	ro

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST - Continued

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description, (CAGEC), Part Number	(5) U/M UI
18	O	5975-01-379-4997	TIE WIRE: Strap, Tiedown, Electrical Components, Black Nylon (06383) PLT3S-C-0 100 Each	hd
19	O	5970-00-815-1295	TUBING: Heat Shrinkable (81349) M23053/5-106-0	ft

END OF WORK PACKAGE

ILLUSTRATED LIST OF MANUFACTURED ITEMS

SECTION I. INTRODUCTION**1. SCOPE**

- a. This work package includes complete instructions for making items authorized to be manufactured or fabricated.
- b. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the paragraph which covers fabrication criteria.
- c. All bulk materials needed for manufacture of an item are listed by Part Number and CAGEC or specification number.
- d. Only items requiring complicated manufacturing instructions are illustrated.
- e. No manufactured items list has been assigned to the 250M Fifth Wheel Towing Device (FWTD).

END OF WORK PACKAGE

TORQUE VALUES FOR THREADED FASTENERS

1. SCOPE

This work package lists standard torque values, as shown in Table 5, and provides general information for applying torque. Special torque values and tightening sequences are indicated in the maintenance procedures for applicable components.

2. GENERAL

- a. Always use the torque values listed in Table 5 when the maintenance procedure does not give a specific torque value.
- b. Unless otherwise indicated, standard torque tolerance shall be + 10%.
- c. Torque values listed are based on clean, dry threads. Reduce torque by 10% when engine oil is used as a lubricant. Reduce torque by 20% if new plated capscrews are used.
- d. Capscrews threaded into aluminum may require reductions in torque of 30% or more of Grade 5 capscrew torque. Capscrew threaded into aluminum must also attain two capscrew diameters of thread engagement.

CAUTION

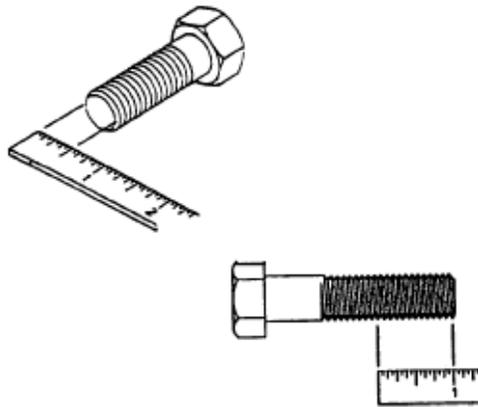
If replacement capscrews are of higher grade than originally supplied, use torque specifications for the original. This will prevent equipment damage due to overtorquing.

3. TORQUE LIMITS

Table 5 lists dry torque limits, which are used on screws that do not have lubricants applied to threads. Table 6 lists wet torque limits, which are used on screws that have high pressure lubricants applied to threads.

4. HOW TO USE TORQUE TABLE

- a. Measure the diameter of the screw to be installed.
- b. Count the number of threads per inch or use a pitch gage.
- c. Under the heading "SIZE" in Table 5, look down the left-hand column until the diameter of screw to be installed is found (there will usually be two lines beginning with the same size).
- d. In the second column under "SIZE", find the number of threads per inch that matches the number of threads counted in step 2.



- e. To find the grade of the screw that is to be installed, match the markings on the head to the correct picture of CAPSCREW HEAD MARKINGS on the table. Manufacturer's marks may vary. These are all SAE Grade No. 5 (3 lines).
- f. Look down the column under the picture found in step 5 until the torque limit in foot-pounds for the diameter and threads per inch of the screw being installed is found.



4. HOW TO USE TORQUE TABLE - Continued

Table 5. Torque Limits for Dry Fasteners

SAE CAPSCREW HEAD MARKINGS



SIZE			TORQUE							
			SAE GRADE No. 1 or 2		SAE GRADE No. 5		SAE GRADE No. 6 or 7		SAE GRADE No. 8	
DIA. (IN.)	THREADS PER INCH	MM	FOOT- POUNDS	N•m	FOOT- POUNDS	N•m	FOOT- POUNDS	N•m	FOOT- POUNDS	N•m
1/4	20	6.35	5	6.78	8.0	10.85	10	13.56	12	16.27
1/4	28	6.35	6	8.14	10.0	13.56	—	—	14	18.98
5/16	18	7.94	11	14.92	17.0	23.05	19	25.76	24	32.52
5/16	24	7.94	13	17.63	19.0	25.76	—	—	27	36.61
3/8	16	9.53	18	24.41	31.0	42.04	34	46.10	44	59.66
3/8	24	9.53	20	27.12	35.0	47.46	—	—	49	66.44
7/16	14	11.11	28	37.97	49.0	66.44	55	74.58	70	94.92
7/16	20	—	30	40.68	55.0	74.58	—	—	78	105.77
1/2	13	12.70	39	52.88	75.0	101.70	85	115.26	105	142.38
1/2	20	—	41	55.60	85.0	115.26	—	—	120	162.78
9/16	12	14.28	51	69.16	110.0	149.16	120	162.72	155	210.18
9/16	18	—	55	74.58	120.0	162.72	—	—	170	230.52
5/8	11	15.88	63	85.43	150.0	203.40	167	226.45	210	284.76
5/8	18	—	95	128.82	170.0	230.52	—	—	240	325.44
3/4	10	19.05	105	142.38	270.0	356.12	280	379.68	375	506.50
3/4	16	—	115	155.94	295.0	400.02	—	—	420	596.52
7/8	9	22.23	160	216.96	375.0	536.62	440	596.64	605	820.38
7/8	14	—	175	237.30	435.0	599.85	—	—	675	915.30
1	8	25.40	235	318.66	590.0	800.04	660	694.96	910	1233.96
1	14	—	250	338.00	660.0	894.96	—	—	990	1342.44
1 1/8	—	25.58	—	—	800.0	1064.80	—	—	1280	1735.70
					880.0	1193.30	—	—	1444	1952.80
1 1/4	—	31.75	—	—	—	—	—	—	1820	2467.90
									2000	2712.00
1 3/8	—	34.93	—	—	1460.0	1979.80	—	—	2300	3227.30
					1680.0	2278.10	—	—	2720	3688.30
1 1/2	—	38.10	—	—	1940.0	2630.60	—	—	3160	4285.00
					2200.0	2963.20	—	—	3560	4827.40

4. HOW TO USE TORQUE TABLE - Continued

Table 6. Torque Limits for Wet Fasteners

SAE CAPSCREW HEAD MARKINGS



SIZE			TORQUE							
			SAE GRADE No. 1 or 2		SAE GRADE No. 5		SAE GRADE No. 6 or 7		SAE GRADE No. 8	
DIA. (IN.)	THREADS PER INCH	MM	FOOT-POUNDS	N•m	FOOT-POUNDS	N•m	FOOT-POUNDS	N•m	FOOT-POUNDS	N•m
1/4	20	6.35	4.9	6.10	7.2	9.76	9.0	12.00	10.8	14.64
1/4	28	6.35	5.4	7.33	9.0	12.20	—	—	12.6	17.08
5/16	18	7.94	9.9	13.34	15.3	22.54	17.1	23.18	21.6	29.27
5/16	24	7.94	11.7	15.87	17.1	23.18	—	—	24.3	32.95
3/8	16	9.53	16.2	21.97	27.9	37.84	30.6	41.49	39.6	53.69
3/8	24	9.53	18.0	24.41	31.5	42.71	—	—	44.1	59.80
7/16	14	11.11	25.2	34.17	44.1	59.80	49.5	67.12	63.0	85.42
7/16	20	—	27.0	36.61	49.5	67.12	—	—	70.2	95.19
1/2	13	12.70	35.1	47.58	67.5	91.53	76.5	103.73	94.5	128.14
1/2	20	—	36.9	50.04	76.5	103.73	—	—	106.0	146.50
9/16	12	14.29	45.9	62.24	99.0	134.24	108.0	146.45	139.5	189.16
9/16	18	—	45.5	67.12	106.0	146.45	—	—	153.0	207.47
5/8	11	15.88	56.7	76.89	135.0	183.06	150.3	203.80	189.0	256.28
5/8	18	—	85.5	115.94	153.0	207.47	—	—	216.0	296.90
3/4	10	19.05	94.5	128.14	243.0	329.51	252.0	341.71	337.5	457.65
3/4	16	—	103.5	140.35	265.5	360.20	—	—	378.0	536.87
7/8	9	22.23	144.0	195.26	355.5	482.06	396.0	536.98	544.5	738.34
7/8	14	—	157.5	213.57	391.5	530.87	—	—	607.5	823.77
1	8	25.40	211.5	286.79	531.0	720.04	594.0	805.46	819.0	1110.56
1	14	—	225.0	305.10	594.0	805.46	—	—	891.0	1208.20
1-1/8	—	25.58	—	—	720.0	976.32	—	—	1152.0	1562.13
1-1/8	—	—	—	—	792.0	1073.97	—	—	1296.0	1757.52
1-1/4	—	31.75	—	—	—	—	—	—	1638.0	2221.11
1-1/4	—	—	—	—	—	—	—	—	1800.0	2440.80
1-3/8	—	34.93	—	—	1314.0	1781.82	—	—	2142.0	2904.57
1-3/8	—	—	—	—	1512.0	2050.29	—	—	2448.0	3319.47
1-1/2	—	38.10	—	—	1746.0	2367.54	—	—	2844.0	3856.50
1-1/2	—	—	—	—	1980.0	2684.88	—	—	3204.0	4344.66

5. TIGHTENING METAL FASTENERS

When torquing a fastener, select a torque wrench whose range (Table 7) fits the required torque value. A torque wrench is most accurate from 25 percent to 75 percent of its stated range. A torque wrench with a stated range of 0 to 100 will be most accurate from 25 to 75 foot pounds. The accuracy of readings will decrease as you approach 0 foot-pounds or 100 foot-pounds. The ranges in Table 7 are based on this principle.

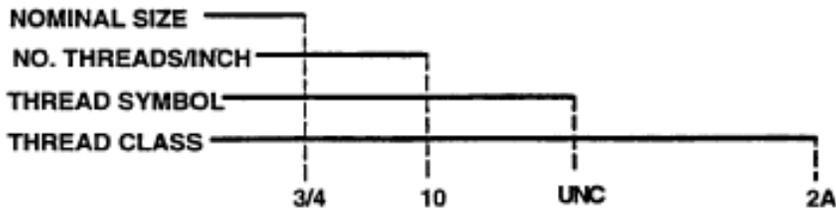
5. TIGHTENING METAL FASTENERS - Continued

Table 7. Torque Ranges	
STATED RANGE	MOST EFFECTIVE RANGE
0-600 lb-ft (0-813.60 Nm) 0-170 lb-ft (0-230.52 Nm) 15-75 lb-ft (61.02-101.70 Nm)	150-450 lb-ft (203.40-610.20 Nm) 44-131 lb-ft (59.67-177.64 Nm) 30-60 lb-ft (40.68-81.36 Nm)

6. FASTENER SIZE AND THREAD PATTERN

Threaded fasteners are categorized according to diameter of the fastener shank. Thread styles are divided into broad groups, the two most common being coarse (Unified Coarse-UNC) and fine (Unified Fine-UNF). These groups are defined by the number of threads per inch on the bolt shanks. In addition, threads are categorized by thread class (Table 8), which is a measure of the degree between threads of bolt or screw (external threads) and threads of the attaching nut or tapped hole (internal threads of the attaching nut or tapped hole) (internal threads). The most common thread class for bolts and screws is Class 2.

Table 8. Thread Classes and Description		
EXTERNAL	INTERNAL	INTERNAL
1A	1B	LOOSE FIT
2A	2B	MEDIUM FIT
3A	3B	CLOSE FIT



NOTE: Unless followed with -LH (e.g., 3/4-10 UNC-2A-LH), threads are right-hand.

7. FASTENER GRADE

In addition to being classified by thread type, thread fasteners are also classified by material. The most familiar fastener classification system is the SAE grading system (Table 9).

Table 9. SAE Screw and Bolt Markings	
SCREWS	BOLTS
<p>SAE GRADE 2 NO MARKING</p> <p>SAE GRADE 3 2 RADIAL DASHES 180° APART</p> <p>SAE GRADE 5 3 RADIAL DASHES 120° APART</p>	<p>SAE GRADE 6 4 RADIAL DASHES 90° APART</p> <p>SAE GRADE 7 5 RADIAL DASHES 72° APART</p> <p>SAE GRADE 8 6 RADIAL DASHES 60° APART</p>

Markings on Hex Locknuts

GRADE A - No Marks
 GRADE B - 3 Marks
 GRADE C - 6 Marks

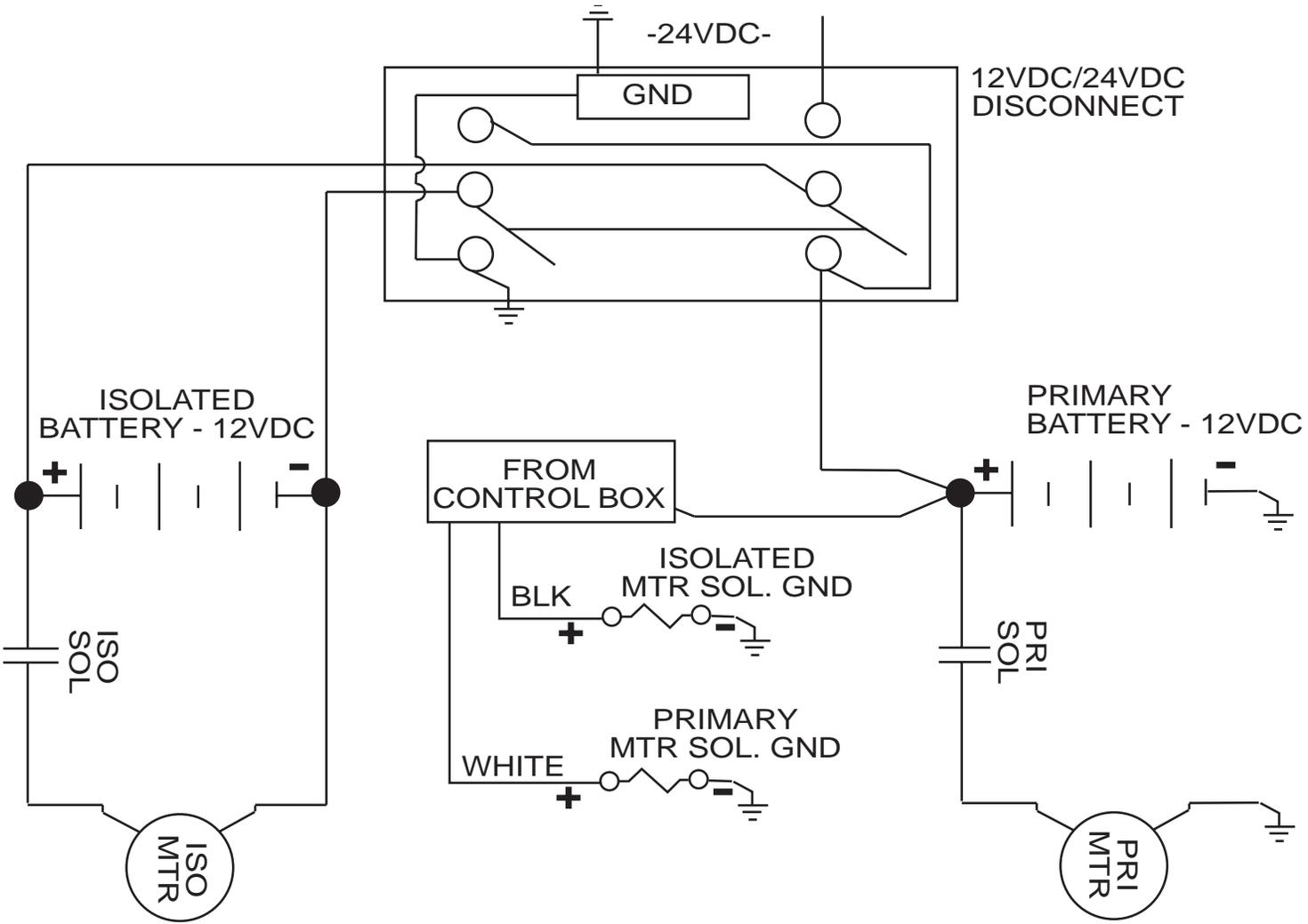
GRADE A - No Marks
 GRADE B - Letter B
 GRADE C - Letter C

GRADE A - No Notches
 GRADE B - One Notch
 GRADE C - Two Notches

END OF WORK PACKAGE

SCHEMATICS

This work package contains electrical and hydraulic schematic. Refer to these schematics when performing electrical or hydraulic troubleshooting.



Electrical Schematic (1 of 3)

0090 00-2

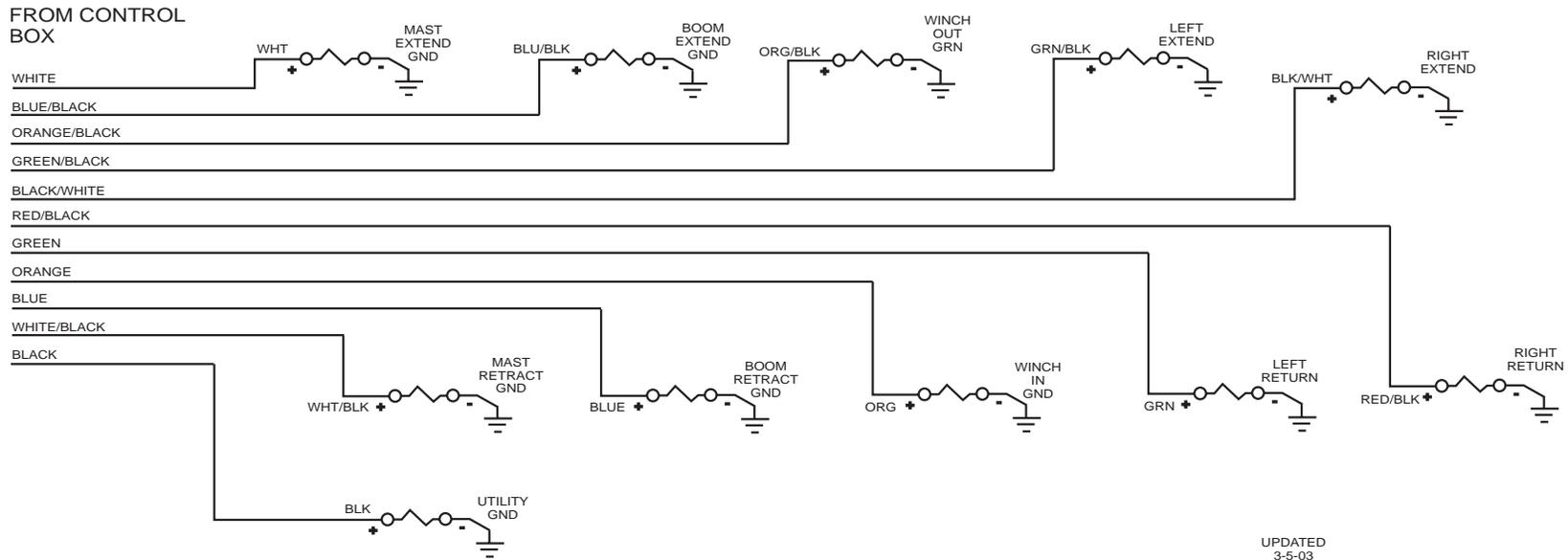
TM 9-2510-247-13&P

0090 00

Electrical Schematic (3 of 3)

0090 00-4

FROM CONTROL BOX

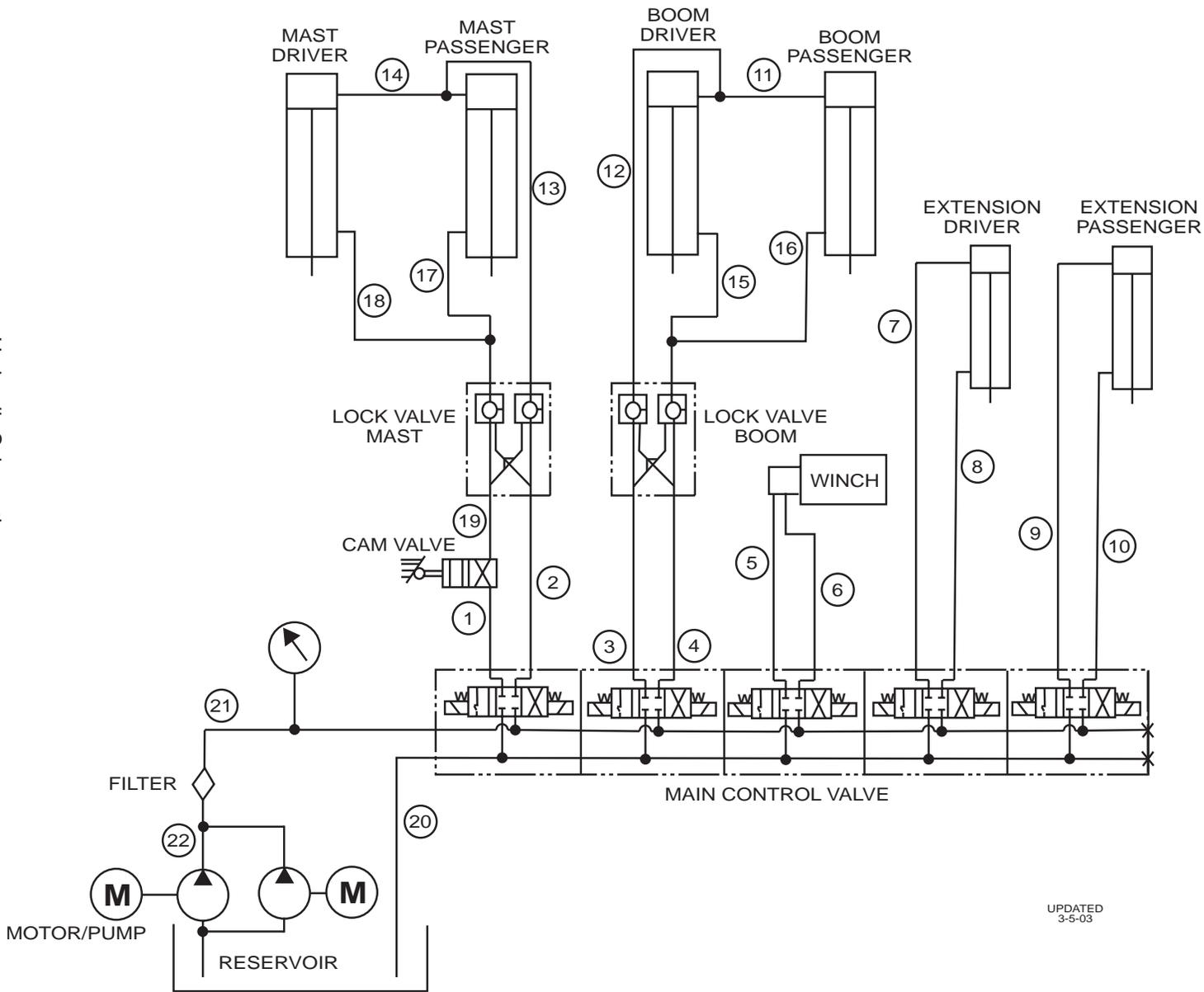


UPDATED 3-5-03

TM 9-2510-247-13&P

0090 00

Hydraulic Schematic



AUTHORIZED VEHICLE COMBINATIONS

SCOPE

This work package lists the authorized towed vehicle combinations for use with the Fifth Wheel Towing Device (FWTD) and the size and location of the connection holes on the tow bar assembly.

AUTHORIZED PRIME MOVERS/TOWED VEHICLES**WARNING**

Total towed weight (towed vehicle and/or trailer and payload) cannot exceed the figures in the Maximum Allowed Towed Load column in the following chart. Failure to follow this warning could result in serious injury or death.

**WARNING**

M1074 and M1075 (PLS Series) can only be transported with no payload. Failure to follow this warning could result in serious injury or death.

NOTE

Vehicle weights can be found on the vehicle data plate or operator's manual.

NOTE

Refer to the prime mover operator's manual for authorized vehicle combinations.

AUTHORIZED VEHICLE COMBINATIONS - Continued

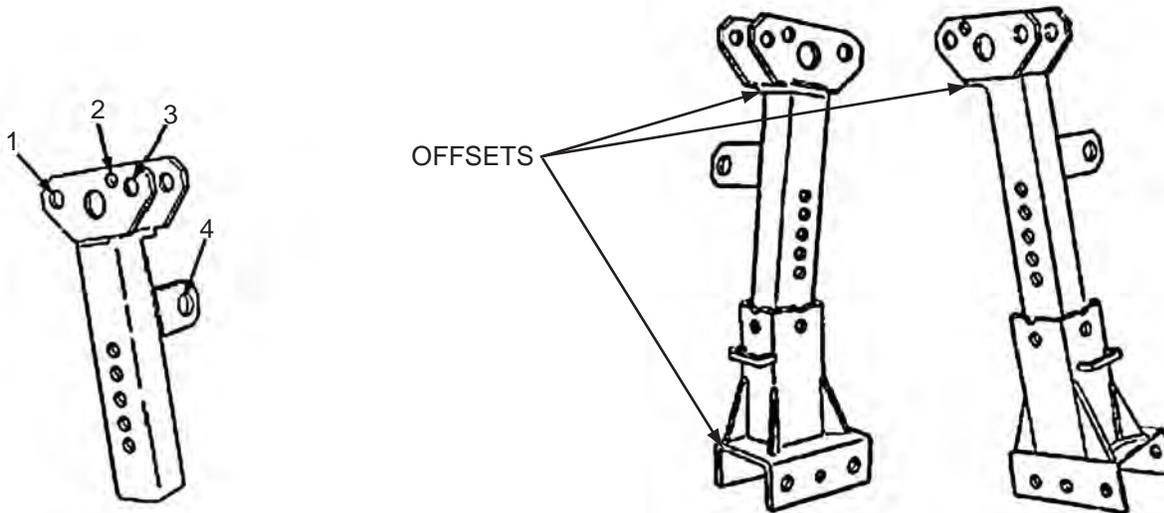
Prime Mover	Authorized Towed Vehicles	Gross Combination Weight Rating (GCWR)
* M915, A1, A2, A3, A4	M915s, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	105,000 lbs. 47,641 kg
M916,A1,A2,A3	M915s, M916s, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	120,000 lbs. 54,446 kg
M920	M915s, M916s, M920, M931 and M932 Models, FMTV Series, PLS Series, M1070	120,000 lbs. 54,446 kg
M931	M911, M915s, M916s, M920, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	59,589 lbs. 27,036 kg
M932	M911, M915s, M916s, M920, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	59,742 lb 27,106kg
M818	M818, M931 and M932 Models, M915, FMTV Series, M1070	57,665 lbs. 26,164 kg
M1088 (FMTV)	M911, M915s, M916s, M920, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	80,775 lbs. 36,649 kg
M911	M911, M915s, M916s, M920, M818, M931 and M932 Models, FMTV Series, PLS Series, M1070	120,000 lbs. 54,446 kg
M983	M911, M915s, M916s, M920, M818, M931 and M932 Models, M983, FMTV Series, PLS Series, M1070	100,000 lbs 45,372 kg

* Special Connection PLS with M915 located in WP 0010 00.

TOWBAR ASSEMBLY POSITIONING

When using towbar assemblies for loading the towed vehicle, refer to the diagram below for proper towbar pin size and location.

TOWED VEHICLE	PIN SIZE	LOCATION #
M818	1 1/2 inch	1
M911, Truck, Prime Mover, 8X6	1 1/2 inch	1
M915 Series, Truck Tractor Line Haul, 6X4	1 1/4 inch	1
M916, Truck, Light Equipment Transporter (LET), 6X6	1 1/2 inch	4
M920	1 1/2 inch	1
M939 Series (M931 & M932 Models)	1 inch	2
M983 HEMTT	1 1/4 inch	3
M1088 FMTV Series	1 1/4 inch	3
M1074/1075 PLS	1 1/2 inch	1
M1070 HETS	1 1/2 inch	1



NOTE

The towbar assemblies are built with the top and bottom pieces offset so they can be rotated to match the spacing between the front towing eyes.

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By Order of the Secretary of the Army:

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
3-193		2	
3-227			

Step No. 1 says to connect LH 4 SPNSN Unit-8 hose from where to what? It is also not identified.

Procedure is continued from another page, but cap is not removed - add step to procedure.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBERS

Doe, John, CPL 755-1313

SIGN HERE:

CPL John Doe

SAMPLE

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Commander
U.S. Army Tank-automotive and Armaments Command
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Rock Island, IL 61299-7630

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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 = 1,000 Millimeters = 39.37 Inches
 1 Kilometer = 1,000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces
 1 Kilogram = 1,000 Grams = 2.2 Lb
 1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1,000 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 = 1,000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 ^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

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	1.358
Pounds Per Square 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
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621

