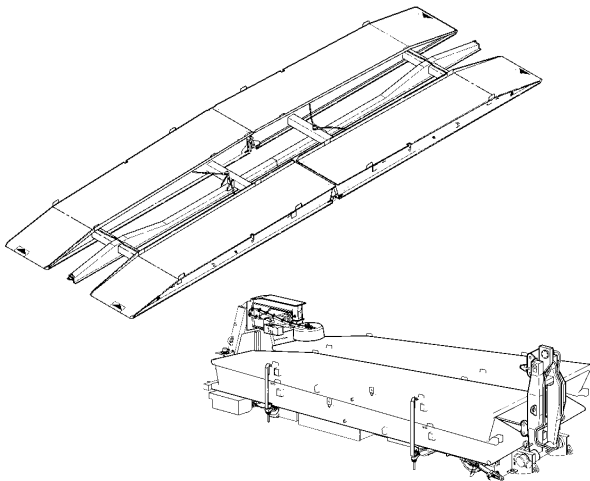


**OPERATOR'S MANUAL**  
**FOR**  
**RAPIDLY EMPLACED**  
**BRIDGE (REB)**

NSN: 5420-01-481-3959



HOW TO USE THIS MANUAL

CHAPTER 1  
GENERAL INFORMATION,  
EQUIPMENT DESCRIPTION, AND  
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CHAPTER 2  
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COMPONENTS OF END ITEM (COEI)  
AND BASIC ISSUE ITEMS (BII) LISTS

ADDITIONAL AUTHORIZATION LIST  
(AAL)

EXPENDABLE/DURABLE SUPPLIES  
AND MATERIALS LIST

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

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**  
**AUGUST 2006**



## **WARNING SUMMARY**

### **EXHAUST GASES CAN KILL**

Permanent brain damage or death may result from exhaust gas exposure. When the Common Bridge Transporter (CBT) engine or LPU (Launch Power Unit) engine is operated, the following precautions must be taken to ensure crew safety:

1. Do not operate CBT engine or LPU engine in an enclosed area.
  2. Do not idle CBT engine with vehicle windows closed.
  3. Be alert at all times for exhaust odors.
  4. Be alert for exhaust poisoning symptoms, they are:
    - Headache
    - Dizziness
    - Sleepiness
    - Loss of muscular control
  5. If you see a person with exhaust poisoning symptoms:
    - Remove person from area.
    - Maintain persons body temperature (i.e., keep them warm when the weather is cold and keep them cool when the weather is hot).
    - Make the person comfortable, keep them at rest.
    - Perform artificial respiration, if necessary.\*
    - Notify a medic.
- \*For artificial respiration procedures, refer to FM 4-25.11.
6. **BE AWARE**, the field protective mask and ambulance Nuclear-Biological-Chemical (NBC) system does not protect personnel against exhaust gas poisoning.

**THE BEST DEFENSE AGAINST EXHAUST GAS POISONING IS ADEQUATE VENTILATION.**

## **WARNING SUMMARY (Contd)**

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to comply may result in injury to personnel.

Improper cleaning methods and use of unauthorized cleaning solvents may result in injury to personnel and damage to equipment.

Skysol 100 cleaning solvent is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use. Failure to comply may result in injury or death to personnel.

Contact with Skysol 100 cleaning solvent may cause skin irritation. Use chemical-resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity. Failure to comply may result in injury to personnel.

Accidental or intentional introduction of liquid contaminant's into the environment is in violation of state, federal, and military regulation. Refer to Army POL (WP 0001 00) for information concerning storage, use, and disposal of these liquids. Failure to comply may result in damage to environment and health of personnel.

Water is discharged from pump nozzle under extreme pressure. Avoid cleaning in direction of personnel; mud, small rocks, and debris may fly up and injury to personnel may result.

Wire rope may be frayed. Wear heavy leather gloves when handling wire rope. Do not run hands on rope when applying cleaning solvent or lubricant. Failure to comply may result in injury to personnel.

All non-essential personnel must stand at least 30 ft (9 m) away from truck and bridge during launch and retrieval operations. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Do not perform maintenance on equipment while in operation. Do not allow vehicles on bridge while performing operator maintenance. Failure to comply may result in injury or death to personnel or damage to equipment.

Operation of a deadlined CBT or REB without preliminary inspection prior to performing troubleshooting procedures may result in damage to equipment or injury to personnel.

Do not crawl under or place hands or arms under pallet when positioning dunnage under pallet. Failure to comply may result in serious injury or death to personnel.

## **WARNING SUMMARY (Contd)**

Prior to and during any load or unload cycle, all non-essential personnel must stay clear of Load Handling System (LHS) and pallet, or serious injury or death to personnel may result.

Trailer wheels must be chocked during transfer operations, or serious injury or death to personnel may result.

Ensure trailer air system is charged before beginning transfer, or trailer locks may not engage properly. Serious injury or death to personnel could result.

Ensure one ground guide is present during all vehicle crossings. Failure to comply may result in damage to equipment or possible injury or death to personnel.

When backing CBT to edge of bank, assistant will ensure rear wheels are a safe distance from edge of bank. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Operators must stand clear while lowering supporting cylinders. Failure to comply may result in injury or death to personnel.

A ground guide must be present when maneuvering transporter. Failure to use a ground guide may result in crashing transporter into an obstruction or coming in contact with power lines resulting in damage to equipment or injury or death to personnel.

Prior to performing transporter operations, ensure a site survey is conducted. Failure to meet all site requirements for a given launch method may result in damage to equipment or possible injury or death to personnel.

Do not lift a load greater than rated load capacity of crane or materiel handling to equipment. Failure to comply may result in damage to equipment or possible injury or death to personnel.

The bleed valve on hydraulic line should be used to bleed residual pressure from the line prior to disconnecting. When disconnecting any hydraulic line, open line slowly and protect face; hydraulic oil may spray out due to residual pressure in system.

Do not attempt to launch bridge if slope between near and far bank is greater than 4 ft 3 in. (1.3 m). Failure to comply may result in damage to equipment or possible injury or death to personnel.

The pallet does not have brakes. If maneuvering pallet on an incline or on or off an aircraft ramp, have chocks ready and chock supporting wheels when necessary. Do not walk directly behind pallet when winching pallet up C-130 loading ramp. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Do not operate CBT engine or LPU engine in an enclosed area. Be alert at all times for exhaust odors. Failure to comply may result in injury or death to personnel.

## **WARNING SUMMARY (Contd)**

At no time should any personnel or vehicle of any kind enter the emplaced bridge until the NCOIC has approved the bridge safe for crossing. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Wear safety glasses when using sledge hammer to drive anchoring pins in ground; metal fragments from anchoring pins may result in injury to personnel.

Two personnel are required to remove/install transload roller bar. Failure to comply may result in injury to personnel.

If unloading pallet to ground, ensure pallet hold-down bars, NATO slave cable, and hydraulic hoses are disconnected from CBT. Failure to comply will result in damage to equipment or possible injury or death to personnel.

Hazard to personnel and equipment is increased if bridge is launched into less-than-ideal site. Site must be inspected and prepared to be within the operating limits of the bridge pallet launcher and the bridge. Failure to adequately prepare site could result in damage to equipment or possible injury or death to personnel.

When the NO TRANSIT WHEN LIT indicator is illuminated, the CBT may be maneuvered in the immediate vicinity of the loading/unloading site, but should not be driven on the open road. Failure to comply may result in damage to equipment and possible injury or death to personnel.

CBT will roll backward when loading pallet from ground. All personnel must stand clear. Failure to comply may result in serious injury.

Operators will wear hearing protection during LPU start-up and when performing launch/retrieval operations in close proximity to LPU. Failure to comply may result in injury to personnel.

Ground helicopter connecting ring prior to connecting/disconnecting. Static electricity generated from helicopter will shock personnel and injury or death may result.

Ensure bridge minimum bearing safety setback is observed during helicopter deployment, or damage to equipment or possible injury or death to personnel may result.

Assistant will act as a ground guide when maneuvering Common Bridge Transporter (CBT) and during launch and retrieval operations. Failure to comply may result in damage to equipment and possible injury or death to personnel.

Launch of bridge will only be performed with REB loaded on CBT. Do not attempt to launch bridge from Palletized Load System Trailer (PLST). Failure to comply may result in damage to equipment or possible injury or death to personnel.

Ensure all launch site requirements are met prior to deploying REB. Failure to comply may result in damage to equipment and possible injury or death to personnel.

## **WARNING SUMMARY (Contd)**

The Remote Control Unit (RCU) neck strap should always be worn to prevent accidental operation of control buttons or damage if dropped during launch and retrieval operations. Failure to comply may result in damage to equipment or possible injury to personnel.

CBT will roll forward while unloading pallet to ground. All personnel must stand clear. Failure to comply may result in serious injury.

Ensure pallet stop cylinder is extended prior to performing step 34 or damage to equipment or possible injury or death to personnel may result.

Use of pallet winch for lifting or pulling anything other than the REB is not authorized and may result in damage to equipment and possible injury to personnel.

Always wear leather gloves when handling winch cable. Failure to comply may result in injury to personnel.

Ensure upper coupling lock remote control lever on each side of bridge is fully engaged. Assistant will check opposite side (do not walk under bridge). Do not proceed to next launch function unless both levers are fully engaged. Assistant will manually engage them if necessary. Failure to fully engage both levers may result in lower bridge half falling to ground, and damage to equipment and possible injury or death to personnel may result.

The minimum safety setback for bridge at both far and near shore banks is 20 in. (510 mm) and a SBC of 4.5 ton/ft<sup>2</sup> (450 kN/m<sup>2</sup>). If either end of bridge is not set back 20 in. (510 mm) minimum from edge of gap, move bridge as necessary. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Winch wire rope may contain broken wire strands. Do not handle or pull on wire rope while winch is operating or injury to personnel may result.

All personnel must stand clear of equipment prior to lifting operations or serious injury or death may result.

LHS hook arm is heavy and will fall free when the pallet is moved rearward. Under no circumstances should LHS hook arm be pried free from pallet hook bar by personnel. Failure to comply may result in injury or death to personnel.

Performing this procedure will require the assistance of field maintenance personnel and use of a crane or other lifting device having a lifting capacity of 21,000 lb (9,526 kg). Failure to comply may result in damage to equipment or possible injury or death to personnel.

Bridge must not be launched or retrieved at temperatures below -25.6° F (-32° C). Hydraulic lines can rupture resulting in damage to equipment and possible injury to personnel.

Ensure fastening rods are installed and secure, and there is sufficient overhead clearance to unload pallet or damage to equipment or possible injury or death of personnel may result.

## **WARNING SUMMARY (Contd)**

It may be necessary for operator to stand on fender near exhaust to operate control valves. Exhaust system will be hot. Keep clear of exhaust system or injury to personnel may result. Hydraulic oil may be hot. Exercise caution when disconnecting pallet hydraulic supply hoses; wear gloves and safety glasses. Failure to comply may result in injury to personnel.

When checking/servicing an item, ensure that all attaching/mounting hardware is properly secured. Loose, cracked, broken, or missing hardware may cause equipment failure or injury to personnel.

Check for overhead power lines or other obstructions before attempting operation of the LHS. The LHS reaches a height of 22 ft. 2 in. (6.7 m). Serious injury or death may result from contact with electric power lines.

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system while engine is hot. Fuel can be ignited by contact with hot engine. When working with fuel, post signs that read **NO SMOKING WITHIN 50 FEET OF PALLET.**

Ensure cargo loader has a lifting capacity of 25,000 lb (1,134 Kg) or damage to equipment and injury or death to personnel may result.

To maintain a low center of gravity, the lifting sling must be connected to pallet launch boom lifting eyes and A-frame hook bar only. Failure to comply may result in damage to equipment or injury or death to personnel.

The usable condition of the bridge is not limited to RSLI inspection. If cracks or damage to bridge are noted while performing PMCS, notify field maintenance prior to using bridge. Do not use bridge if any bridge quarter fails RSLI inspection or other cracks or damage is noted while performing PMCS. Failure to comply may result in damage to equipment and possible injury or death to personnel.

Due to the severe overhang of the REB pallet when mounted on the CBT, a rear-end collision by a HMMWV or any comparable vehicle may result in that vehicle under riding the REB pallet. To prevent this, an empty PLST shall be connected to any CBT loaded with the REB pallet during all road marches/convoys. Failure to comply may result in severe injury or death to personnel.

Operating on side slopes can cause payload shift and instability that may result in a rollover. Failure to comply may result in damage to equipment or possible injury or death to personnel.

To minimize the risk of a rollover, avoid steep side slopes. Verify payload is well secured prior to operating on side slopes from 20% to 30%, and keep speed to a minimum, make no sudden steering inputs, and avoid depressions while traversing undulating terrain. Failure to comply may result in vehicle rollover and injury or death to personnel.

To minimize possible loss of control while towing the PLST, the maximum safe speed on paved roads is 35 mph (56 km/h), based on quick lane change testing, 15 mph (24 km/h) on off-road cross country terrain, and 10 mph (16 km/h) on heavily wash boarded areas. Refer to TM 9-2330-385-14 for additional guidance on PLST operation. Failure to comply may result in damage to equipment and possible injury or death to personnel.



CHANGE  
NO. 2

HEADQUARTERS, DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 7 August 2008  
**TECHNICAL MANUAL**

**OPERATOR'S MANUAL**

**FOR**  
**RAPIDLY EMPLACED BRIDGE (REB)**  
**NSN 5420-01-481-3959**

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

**TM 5-5420-280-10, 31 August 2006, is updated as follows:**

1. File this sheet in front of the manual for reference.
2. This change is a result of new procedures for aligning the CBT for bridge retrieval and updating the MLC rating of the bridge.
3. New or updated text is indicated by a vertical bar in the outer margin of the page.
4. Added or changed illustrations are indicated by a vertical bar adjacent to the illustration.
5. Remove old pages and insert new pages as indicated below.

Remove Pages

warning c thru warning f  
A/B blank  
i and ii  
Glossary 1/2 blank  
DA FORM 2028 SAMPLE  
DA FORM 2028s

Insert Pages

warning c thru warning f  
A/B blank  
i and ii  
Glossary 1/2 blank  
DA FORM 2028 SAMPLE  
DA FORM 2028s

6. Replace the following work packages with their revised version.

Work Package Number

WP 0001 00  
WP 0002 00  
WP 0003 00  
WP 0009 00  
WP 0010 00  
WP 0011 00

Work Package Number

WP 0012 00  
WP 0016 00  
WP 0019 00  
WP 0020 00  
WP 0023 00

Work Package Number

WP 0025 00  
WP 0043 00  
WP 0046 00  
WP 0049 00  
WP 0052 00

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.  
*General, United States Army*  
*Chief of Staff*

Official:



JOYCE E. MORROW  
*Administrative Assistant to*  
*the Secretary of the Army*  
0818902

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 256911, requirements for TM 5-5420-280-10.

CHANGE  
NO. 1

HEADQUARTERS, DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 15 January 2008

**TECHNICAL MANUAL**  
**OPERATOR'S MANUAL**  
**FOR**  
**RAPIDLY EMPLACED BRIDGE (REB)**  
**NSN 5420-01-481-3959**

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

**TM 5-5420-280-10, 31 August 2006, is updated as follows:**

1. File this sheet in front of the manual for reference.
2. This change is a result of new safety warnings and procedures for the Remaining Service Life Indicators (RSLI).
3. New or updated text is indicated by a vertical bar in the outer margin of the page.
4. Added or changed illustrations are indicated by a vertical bar adjacent to the illustration.
5. Remove old pages and insert new pages as indicated below.

Remove Pages

Warning e and f  
A/B blank  
i and ii  
Glossary 1/2 blank  
Index 7 and 8

Insert Pages

Warning e and f  
A/B blank  
i and ii  
Glossary 1/2 blank  
Index 7 and 8

6. Replace the following work packages with their revised version.

Work Package Number

WP 0002 00  
WP 0003 00  
WP 0004 00  
WP 0008 00  
WP 0009 00  
WP 0010 00

Work Package Number

WP 0011 00  
WP 0012 00  
WP 0013 00  
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Work Package Number

WP 0017 00  
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WP 0023 00

TM 5-5420-280-10

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Work Package Number

WP 0025 00

WP 0028 00

WP 0029 00

WP 0041 00

Work Package Number

WP 0042 00

WP 0043 00

WP 0044 00

WP 0046 00

Work Package Number

WP 0047 00

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.  
*General, United States Army*  
*Chief of Staff*

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JOYCE E. MORROW  
*Administrative Assistant to*  
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**LIST OF EFFECTIVE PAGES/WORK PACKAGES**

NOTE: The portion of the text or illustration affected by a change is indicated by a vertical line in the outer margins of the page.

Dates of issue for original and changed pages are:

Original     0   31 AUG 06  
 Change     1   15 JAN 08  
 Change     2    7 AUG 08

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 41 AND TOTAL NUMBER OF WORK PACKAGES IS 52 CONSISTING OF THE FOLLOWING:

Page/WP No	*Change No.	Page/WP No	*Change No.	Page/WP No	*Change No.
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warning d and e	.0	WP 0017 00	...1	WP 0046 00	...2
warning f	.2	WP 0018 00	...0	WP 0047 00	...1
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\*Zero in this column indicates original page.



HEADQUARTERS,  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 31 August 2006

**TECHNICAL MANUAL  
OPERATOR'S MANUAL  
FOR  
RAPIDLY EMPLACED  
BRIDGE (REB)**

REB	MODEL	NSN	P/N
Rapidly Emplaced Bridge	M21	5420-01-481-3959	12480471

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <https://aeps.ria.army.mil>. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP / TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is [tacomlcmc.daform2028@us.army.mil](mailto:tacomlcmc.daform2028@us.army.mil). The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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## HOW TO USE THIS MANUAL

### ABOUT YOUR MANUAL

Equipment operators shall familiarize themselves with the format and use of this Technical Manual (TM) prior to operating equipment or performing routine maintenance. Learning how to use this manual will enable personnel to quickly locate information, gain proper knowledge of the equipment, and shorten the time necessary to complete the required procedure.

Features of this TM are:

- a. **Work Package Format** – This TM is organized in Work Packages (WP). Each WP is an independent, stand-alone data unit. The subject title of each WP is assigned a six-digit sequence number. The first four digits of the sequence number identify the WP, and WPs are positioned in the TM in numerical order using the same four digits. The fifth and sixth digits of the sequence number are reserved for numbering WPs added to the TM as part of a future revision. Each WP is page numbered consecutively, after the sequence number, at the bottom of each page. A WP may contain as many as thirty pages.
- b. **Text Design** – Chapter titles are listed on the front cover for quick reference. WP titles and sequence numbers are listed in the Table of Contents at the beginning of each chapter, and in the index. The index is organized by subject, in alphabetical order, with WP sequence and page numbers provided. Task steps and illustrations are located side-by-side on facing pages. Lubrication instructions are included with Preventive Maintenance Checks and Services (PMCS).
- c. **Use of Illustrations** – Illustrations are presented with exploded views, cut-away views, and individual callouts for identification of components and parts. Callouts are numbered in clockwise order starting at the 11 o'clock position.
- d. **Glossary** – A list of abbreviations/acronyms used in this manual is provided in the glossary found at the back of the manual.

### HOW TO USE YOUR MANUAL

The format of this manual is designed to make accessing information quick and easy. The following example is intended as a guide and should be reviewed and put to memory before attempting to use this manual. If you have any questions after reviewing the following example, don't hesitate to ask your supervisor.

**PROBLEM:** You receive a report that states the bridge pallet cannot be maneuvered while on ground or loaded onto the transporter because the bridge pallet support wheels will not maintain their position once lowered.

**SOLUTION:** You must find information on pallet support wheels in the REB manual and perform the necessary troubleshooting tasks to solve the problem.

## HOW TO USE THIS MANUAL (Contd)

### NOTE

If you are trying to find information by subject, a subject index can be found at the back of the book.

1. Go to the Table of Contents and find chapter 3. Turn to WP 0034 00, Introduction to Troubleshooting, and read the information under “General” in Introduction to Troubleshooting.
2. Go to WP 0037 00, Pallet Hydraulic Troubleshooting. In this case, you have a hydraulic system problem. Review the Hydraulic Troubleshooting Symptom Index and look down the list of malfunctions until you identify the heading for bridge pallet wheels will not maintain lowered position.
3. Go to WP 0037 00, malfunction no. 15, Wheel Lifting Cylinders Will Not Lower or Raise, and follow the steps and substeps listed. As you perform steps 5 and 6, you discover that a leak in the pump’s bypass valve is causing pressure loss to the lift cylinders. Now you must notify field maintenance as instructed.
4. When maintenance is allocated at operator’s level, you must perform and complete all instructions as outlined.

# CHAPTER 1

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

### RAPIDLY EMPLACED BRIDGE (REB)

General Information .....	WP 0001 00
Equipment Description .....	WP 0002 00
Equipment Data .....	WP 0003 00
Theory of Operation .....	WP 0004 00



# GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## GENERAL INFORMATION

### SCOPE

This TM contains operator's level instructions for the operation and servicing of the Rapidly Emplaced Bridge (REB). The REB consists of the Bridge and the Pallet (launcher), and is transported and deployed on the Common Bridge Transporter (CBT). Operation includes loading/unloading, launch, crossing, retrieval, and transloading. Servicing includes lubrication, Preventive Maintenance Checks and Services (PMCS), operator troubleshooting, and operator maintenance as allocated by the Maintenance Allocation Chart (MAC). Replacement and repair of REB components are allocated for field maintenance and are not authorized at the operator's level.

**a. Type of Manual** – Operator/crew.

**b. Equipment Names and Model Number** – The REB consists of two major components: the Bridge and the Pallet. Together they are the Rapidly Emplaced Bridge M21. The REB is transported and deployed on the CBT. Refer to figure 1.

**c. Purpose of Equipment** – To provide a means for the U.S. Army's Stryker Brigade Combat Team (SBCT) to rapidly cross unprepared gaps up to 42.6 ft (13 m) in a minimum amount of time, thereby increasing the strategic options for military operations. For depiction of bridge launch, refer to figure 2. The REB facilitates defensive and offensive maneuvers by supporting wheeled and tracked vehicles up to Military Load Classification (MLC) 40 for normal crossings, and MLC 50 for caution crossings.

### **CAUTION**

The REB bridge pallet should not be loaded on M945 or M812 transporters; attempting to load the REB on either vehicle will result in damage to equipment.

**d. Special Inclusions** – This manual includes CBT Load Handling System (LHS) operating procedures and PMCS necessary for operation of the REB.

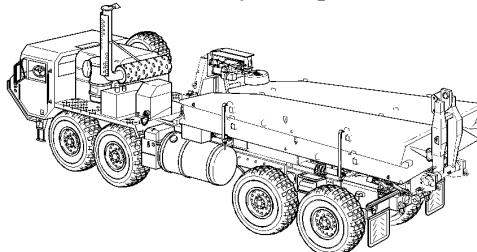
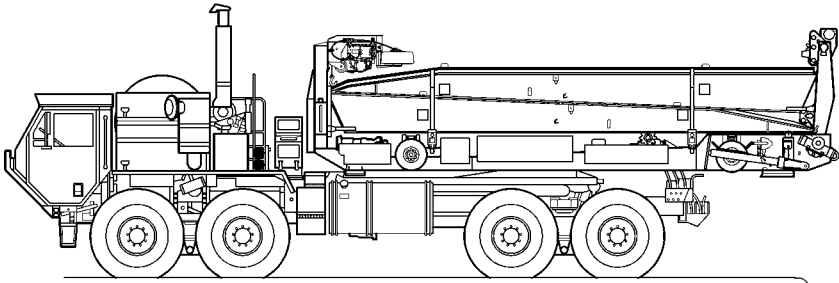
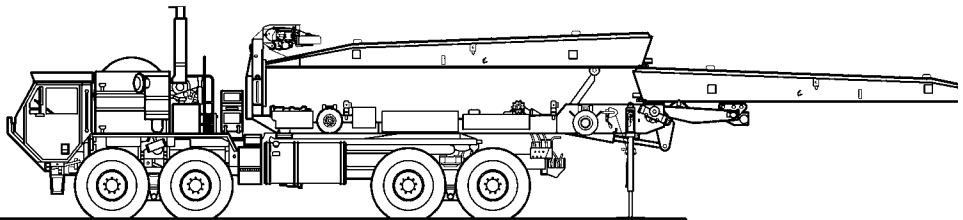


Figure 1. Rapidly Emplaced Bridge on CBT, Typical.

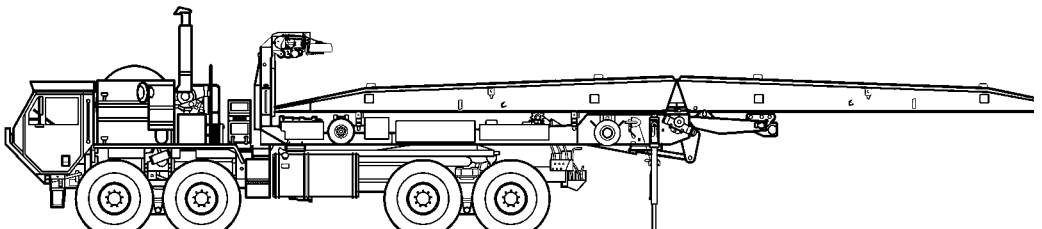
**GENERAL INFORMATION (Contd)**



**CBT LOADED WITH BRIDGE AND BRIDGE PALLET IS  
BACKED INTO POSITION ON NEAR SHORE.**



**PINWHEEL DRIVE UNIT ADVANCES LOWER BRIDGE HALF INTO COUPLING POSITION.**

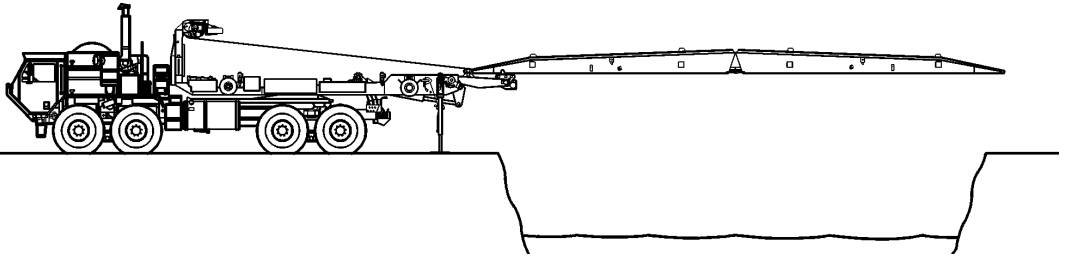


**BRIDGE HALVES ARE COUPLED TOGETHER.**

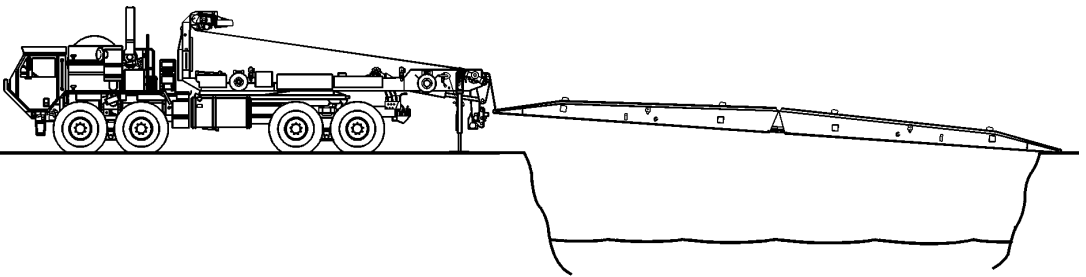
*Figure 2. Depiction of Bridge Launch (1 of 2).*



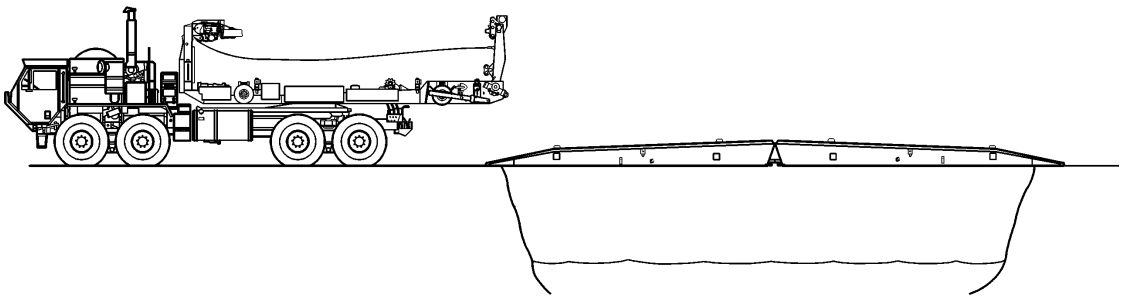
**GENERAL INFORMATION (Contd)**



**PINWHEEL DRIVE UNIT ADVANCES BRIDGE INTO LAUNCHING POSITION.**



**LAUNCH BOOM LOWERS BRIDGE TO FAR SHORE, AND WINCH CABLE LOWERS BRIDGE TO NEAR SHORE.**



**BRIDGE IS DEPLOYED AND CBT IS READY TO MOVE.**

*Figure 2. Depiction of Bridge Launch (2 of 2).*

## GENERAL INFORMATION (Contd)

### MAINTENANCE FORMS, RECORDS, AND REPORTS

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

### REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your bridge equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. The preferred method for submitting a Quality Deficiency Report (QDR) is through the Army Electronic Product Support (AEPS) website under the Electronic Deficiency Reporting System (EDRS). The web address is: <https://aeprs.ria.army.mil>. This is a secured site requiring a password which can be applied for on the front page of the website. If the above method is not available to you, put it on an SF 368, Product Quality Deficiency Report (PQDR), and mail it to us at: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/PQDR MS 267, 6501 E. 11 Mile Road, Warren, MI 48397-5000. We'll send you a reply.

### HAND RECEIPT

There is not a separate Hand Receipt for the REB. For a complete list of end-item-related equipment (i.e., COEI, BII, and AAL) that must be accounted for, refer to WP 0050 00 and WP 0051 00.

### CORROSION PREVENTION AND CONTROL (CPC)

#### **CAUTION**

Whenever the REB has been exposed to seawater (salt water) or any aggressive water or chemicals, it must always be rinsed with fresh water to prevent corrosion. Failure to comply will result in damage to equipment.

#### **NOTE**

Many of the metal fasteners, fittings, and tubing susceptible to corrosion have been coated with an anti-corrosive chemical nickel-plating called "DURNI-COAT" and are marked "durnicoateirt" or "DNC 450 12MY."

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems be reported so corrections and/or improvements can be made to future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation to metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is rusting iron. Corrosion damage in metals can be seen, depending on the metal, in the form of tarnish, surface residue or oxidation, pitting, and perforation.

## GENERAL INFORMATION (Contd)

### CORROSION PREVENTION AND CONTROL (CPC) (Contd)

Plastics, composites, and rubbers will also degrade. Their deterioration is caused by exposure to heat, oxygen, solvents, or light (typically ultraviolet). An example is deteriorated rubber weather stripping. Degradation from excessive exposure of these elements can be seen in the form of shrinkage, hardening, cracks, and breaks.

If a corrosion problem is identified, it should 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.

SF 368 should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

### OZONE DEPLETING SUBSTANCES (ODS)

The continued use of ODS has been prohibited by Executive Order 12856 of 3 August 1993. The use of ODS in Army equipment is prohibited. The bridge does not contain or generate hazardous material. The pallet contains a diesel internal combustion engine.

### ARMY PETROLEUM, OIL, AND LUBRICANTS (POL)

Proper disposal of hazardous waste material is vital to protecting the environment and providing a safe work environment. Materials such as batteries, oils, and antifreeze must be disposed of in a safe and efficient manner.

The following references are provided as a means to ensure that proper disposal methods are followed:

- Technical Guide No. 126 (from the U.S. Army Environmental Hygiene Agency (USAEHA))
- National Environmental Policy Act of 1969 (NEPA)
- Clean Air Act (CAA)
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Emergency Planning and Community Right to Know Act (EPCRA)
- Toxic Substances Control Act (TSCA)
- Occupational Safety and Health Act (OSHA)

The disposal of Army Petroleum, Oils, and Lubricants (POL) products are affected by some of these regulations. State regulations also may apply to POL.

If you are unsure of which legislation affects you, contact state or local agencies for regulations regarding proper disposal of Army POL.

### DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The recommended method of rendering the REB useless is to destroy its coupling mechanism using heavy tools, weapons fire, or explosive charges. Procedures for destruction of Army materiel to prevent enemy use can be found in TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use.

## GENERAL INFORMATION (Contd)

### PREPARATION FOR STORAGE OR SHIPMENT

Refer to WP 0047 00 for limited storage and shipment instructions. Additional information can be found in TM 746-10, Marking, Packing, and Shipment of Supplies and Equipment: General Packaging Instructions for Field Use.

For information on preparing the CBT for storage or shipment, refer to TM 5-5420-234-14&P.

### WARRANTY INFORMATION

The Rapidly Emplaced Bridge (REB) is covered by a warranty. All U.S. Army customers requiring warranty assistance will initiate direct contact through respective unit Warranty Coordinators (WARCOs). WARCOs will submit all warranty claims for non-consumable items, greater than one hundred dollars, to the General Dynamics European Land Systems – Germany (GDELS-G) Point of Contact (POC) identified below. Request all claims be submitted both electronically and telephonically.

REB warranty coverage applies to the following end item:

M21 RAPIDLY EMPLACED BRIDGE 5420-01-481-3959

The REB warranty period of performance provides complete “bumper-to-bumper” coverage for a period of 13 months. Prior to unit handoff, the REB can be placed into storage for up to 9 months without a negative impact to the warranty period. The warranty start date begins at customer handoff, upon the acceptance and signing for the REB. GDELS-G POC is:

General Dynamics European Land Systems – Germany GmbH

Customer Service Department

Barbarossastrasse 30

67655 Kaiserslautern, Germany

Phone: (International operator code) +49(0) 631 3616 309

Fax: +49(0) 631 3616 396

Email: [service@gdels.de](mailto:service@gdels.de)

For warranty information covering the CBT, refer to TB 5-5420-234-15, Warranty Program for the Common Bridge Transporter (CBT).

### LIST OF ABBREVIATIONS/ACRONYMS

Refer to the glossary in the back of this manual for a list of abbreviations/acronyms that appear in this TM. For a list of standard abbreviations, refer to ASME Y14.38.

### QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

**GENERAL INFORMATION (Contd)****SAFETY, CARE, AND HANDLING**

Observe all warnings, cautions, and notes prior to operating and servicing equipment. If uncertain how to perform any operator's procedure, ask your supervisor for assistance.

**METRIC SYSTEM**

All hardware on the REB is metric and will require the use of metric tools.



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# GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## EQUIPMENT DESCRIPTION

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### EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

**The Common Bridge Transporter (CBT) M1977** consists of a modified Heavy Expanded Mobility Tactical Truck (HEMTT) M977 equipped with a Load Handling System (LHS), which together are called the CBT or Transporter.

**The Bridge** is an aluminum welded structure consisting of two bridge halves coupled together at the center. The bridge is light weight, corrosion resistant, torsionally flexible, and strong enough to support MLC 40-wheeled and tracked vehicles under normal crossing conditions. It can also support up to MLC 50-wheeled vehicles under a caution crossing.

The usable free span length of the coupled bridge is 42.6 ft (13 m) with a maximum roadway width of 11 ft (3.4 m). A 2 in. (50 mm) high guard rail on the inside of each deck plate is provided as a guide for vehicle wheel alignment during bridge crossing. Each deck plate is 3 ft 11 in. (1.2 m) wide. Remaining Service Life Indicators (RSLI) are provided to monitor condition of bridge.

The bridge requires the use of the pallet and the Common Bridge Transporter (CBT) for launch and retrieval operations. Launch or retrieval operations require two soldiers, and each can be completed in 10 minutes or less.

The bridge has an anchoring system that may be installed at the discretion of the bridge commander. Anchorage installation and removal time is in addition to launch and retrieval times, and may vary depending on soil composition.

**The Pallet** is a separate removable flatrack that is loaded on the CBT by way of the CBT's Load Handling System (LHS). The pallet contains components making up a launcher, a hydraulic system, an electrical control system, a diesel engine power unit, pallet support wheels, and four tool boxes for stowage of BII.

Should the pallet's launch power unit (LPU) malfunction, hydraulic and electrical power is accomplished by connecting to the CBT. Launch or retrieval operations using the CBT can be completed in approximately 10 minutes each. The pallet can be transloaded to and from the Palletized Load System Trailer (PLST), but cannot launch or retrieve the bridge from the PLST. The REB can be transported by C-130, C-141, C17, or C-5 aircrafts or deployed bridge can be air lifted by CH-47D and CH-53 helicopters.

## EQUIPMENT DESCRIPTION (Contd)

### LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

For the location and a basic description of the major components of the CBT, LHS, pallet, and bridge, locate the desired component by matching its description callout with the corresponding illustration callout on opposite page.

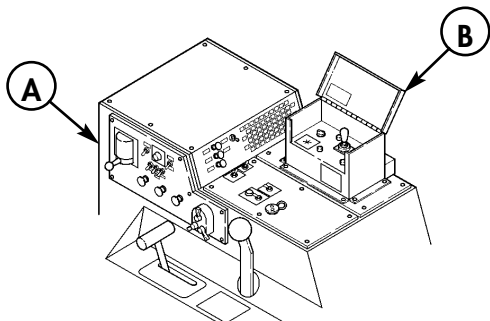
### LHS EQUIPMENT FEATURES

- (A) HEMTT HEATER COMPARTMENT** – The vehicle's console containing HIGH IDLE switch, PTO ENGAGE switch and indicators, and WORK LIGHT switch for LHS operation.
- (B) LHS CAB CONTROL BOX** – The control box (early model CBT) is mounted on heater compartment console, or control panel (late model CBT) mounted on transmission range selector panel, containing switches necessary to operate LHS from inside vehicle cab.
- (C) LHS COMPRESSION FRAME** – The frame mounted on transporter frame that supports LHS main frame, hook arm, hydraulic cylinders, and weight of equipment placed upon it.
- (D) LHS REAR ROLLER ASSEMBLY** – The two horizontal and angled rollers that support, center, and guide pallet frame during loading and unloading operations.
- (E) LHS MAIN FRAME** – The frame connected to LHS compression frame that supports hook arm assembly in conjunction with LHS hydraulic cylinders.
- (F) LHS HOOK ARM ASSEMBLY** – The arm connected to LHS main frame designed to connect to the hook bar on pallet A-frame support for loading, unloading, and transport of pallet.
- (G) REMOTE CONTROL STOWAGE BOX** – This box houses the remote control unit when not in use.
- (H) REMOTE CONTROL UNIT (RCU)** – The hand-held control box containing switches necessary for operation of LHS from outside cab on either side of vehicle.

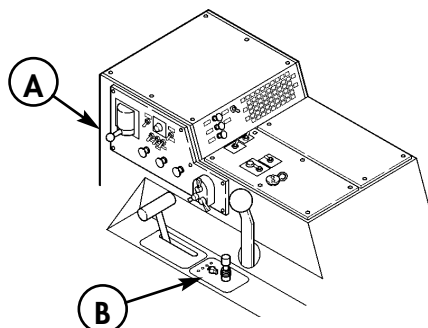


EQUIPMENT DESCRIPTION (Contd)

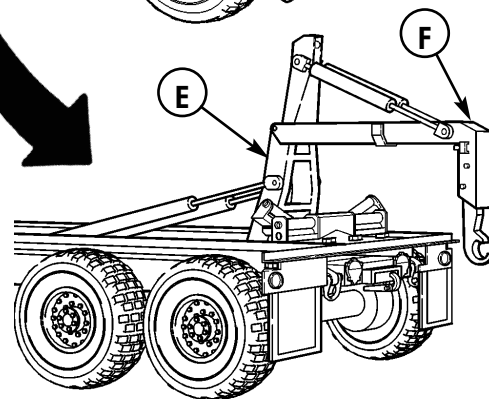
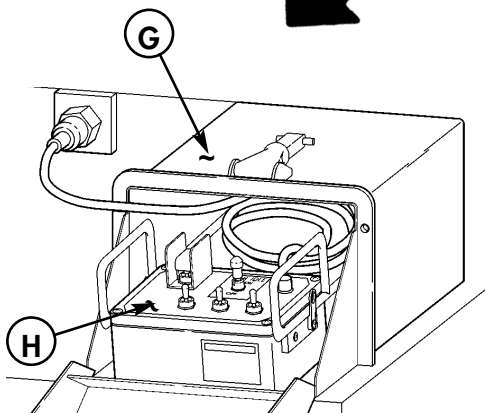
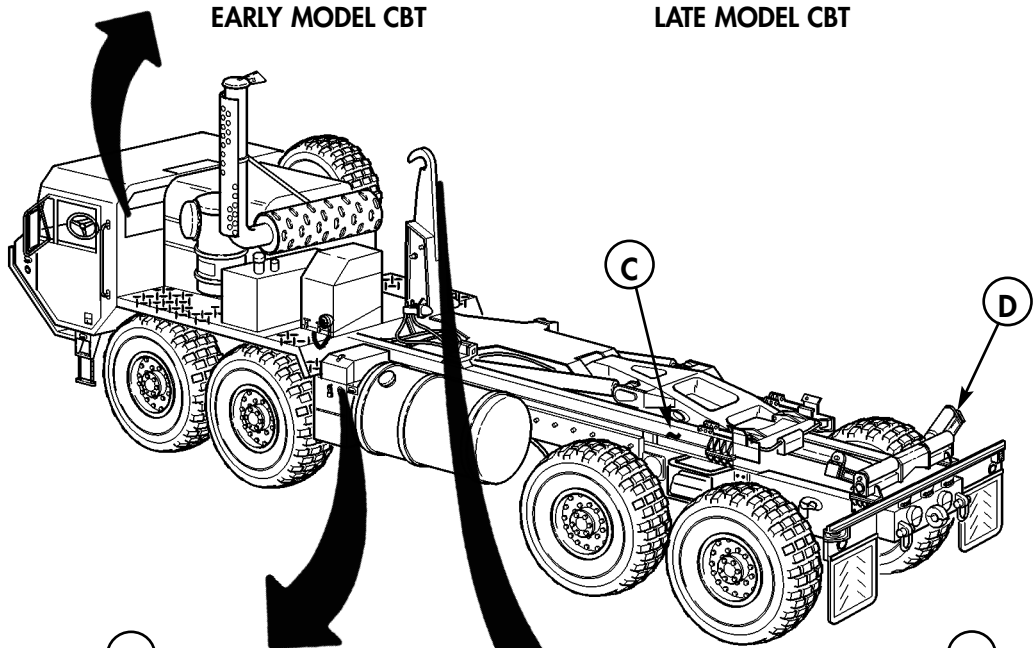
LHS EQUIPMENT FEATURES (Contd)



EARLY MODEL CBT



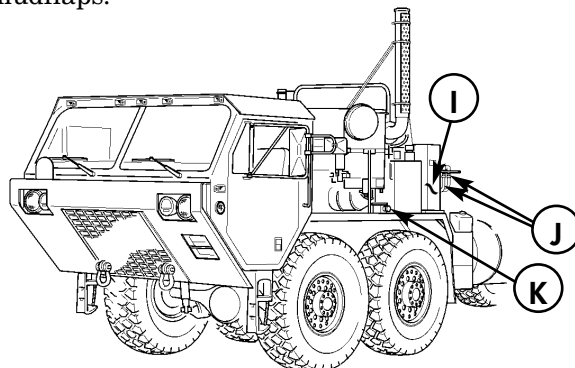
LATE MODEL CBT



## EQUIPMENT DESCRIPTION (Contd)

### LHS EQUIPMENT FEATURES (Contd)

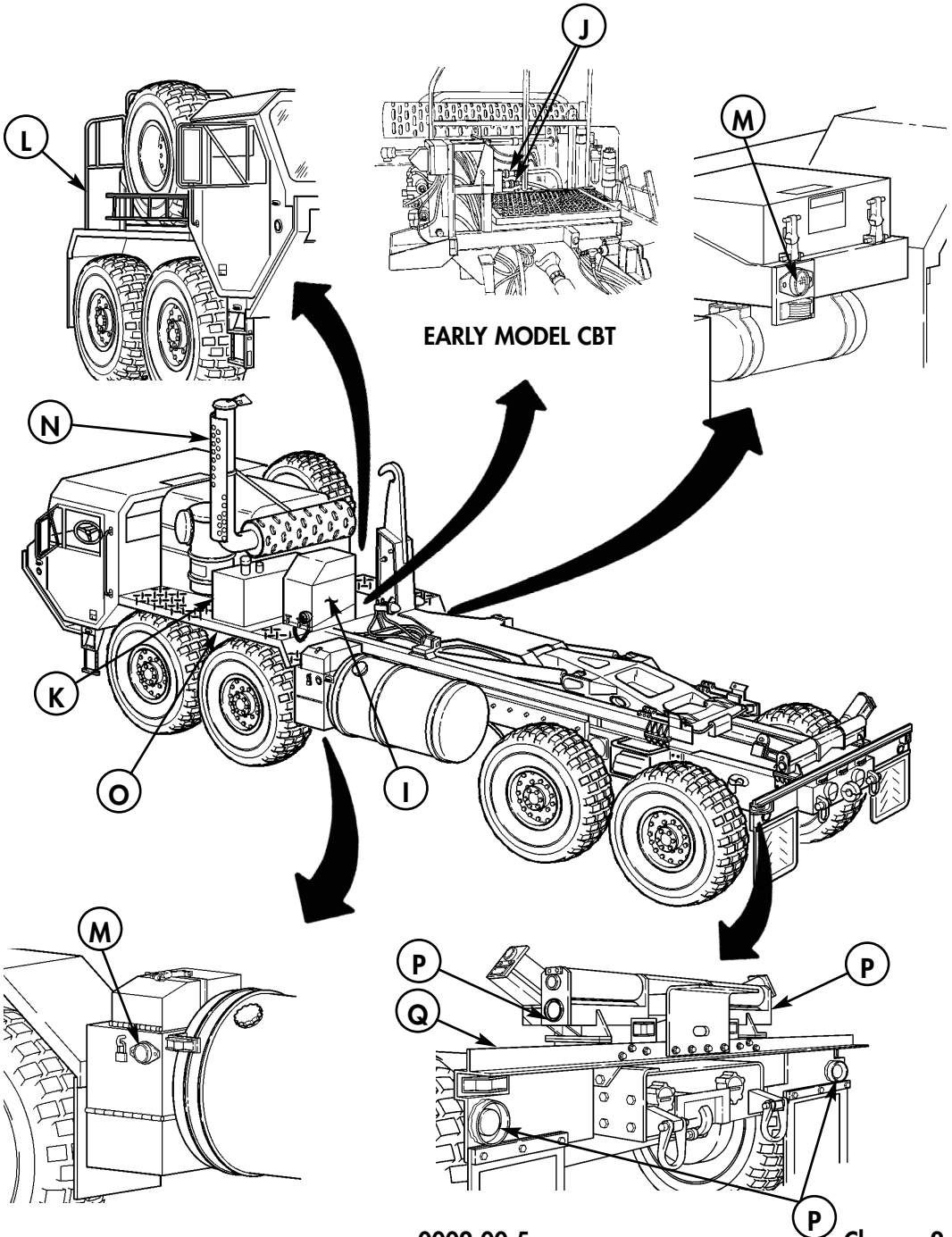
- ① **LHS CABINET ASSEMBLY** – The box mounted on transporter that houses the LHS hydraulic manifold assembly, control valves, and solenoids.
- ② **LHS QUICK-DISCONNECT COUPLINGS** – The two couplings located adjacent to LHS cabinet assembly (late model CBT) or at rear of work platform (early model CBT) that receive hydraulic supply hoses from either the CBT LHS or REB pallet. The REB pallet hydraulic supply hoses are connected to LHS quick-disconnect couplings for emergency back-up power only.
- ③ **NATO SLAVE RECEPTACLE** – The electric power supply receptacle used to supply 24 volts to pallet electrical system for charging pallet batteries or for emergency back-up power.
- ④ **MOUNTING LADDER AND RAILINGS** – The ladder and railings on the CBT provided for safe and easy access to work platform.
- ⑤ **AMBER REFLECTORS** – The amber reflectors located on passenger side battery box and driver's side stowage box.
- ⑥ **EXHAUST EXTENSION ASSEMBLY** – A longer stack and heat shield on transporter exhaust system that raises exhaust above operator work area.
- ⑦ **FENDER SUPPORT ASSEMBLY** – The metal framing added to each fender for increased support of LHS components.
- ⑧ **RED REFLECTORS** – The red reflectors located on each side of rear bumper plate and rear roller assembly.
- ⑨ **REAR BUMPER ASSEMBLY** – The bumper plate mounted on transporter frame and LHS rear roller assembly that supports stop plate, tail lights, reflectors, and mudflaps.



LATE MODEL CBT

EQUIPMENT DESCRIPTION (Contd)

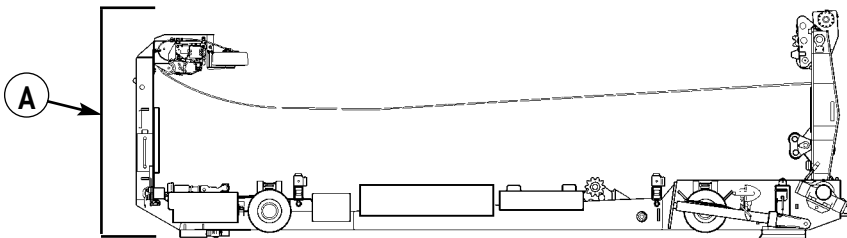
LHS EQUIPMENT FEATURES (Contd)



## EQUIPMENT DESCRIPTION (Contd)

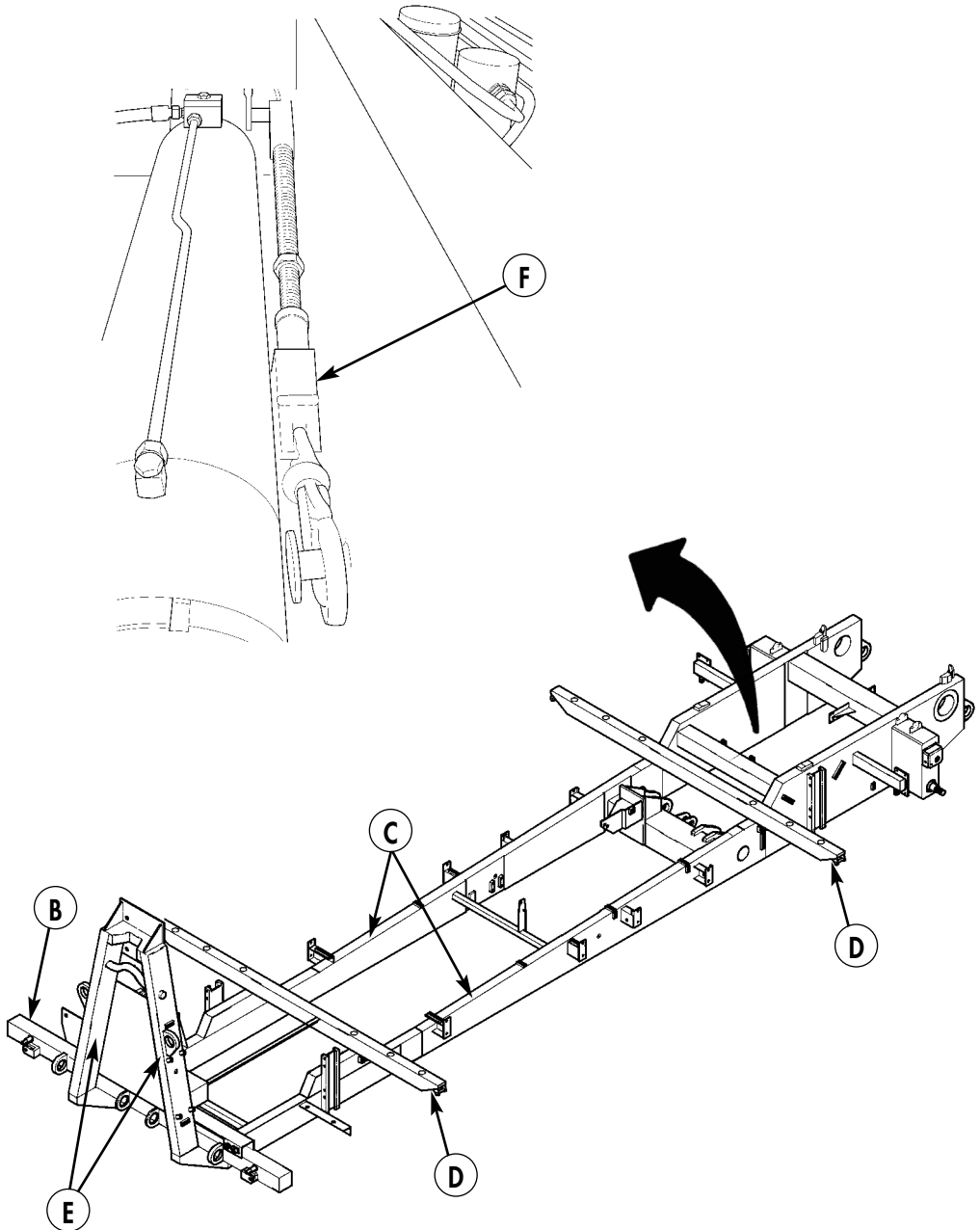
### PALLET EQUIPMENT FEATURES

- (A) **PALLET** – The flatrack that functions as transport pallet and launcher for bridge assembly.
- (B) **PALLET FRAME** – The welded steel structure that supports and contains component parts making up the pallet.
- (C) **LONGITUDINAL GIRDERS** – The two girders of pallet frame that serve as main support members.
- (D) **TRANSVERSE GIRDERS** – The two support girders welded perpendicular to the longitudinal girders that hold four telescoping tubes for spreading/retracting bridge quarters.
- (E) **A-FRAME SUPPORT** – The welded frame member on front end of the longitudinal girders that contains a hook bar for pallet interface with CBT, channel for interface with bridge launch beam, pallet lifting eyes, and supports winch assembly and auxiliary hydraulic oil reservoir.
- (F) **PALLET HOLD-DOWN BARS** – The two bars with hooks, mounted on the longitudinal girders of pallet frame, designed to connect to CBT towing shackles for securing pallet to CBT during transit.



**EQUIPMENT DESCRIPTION (Contd)**

**PALLET EQUIPMENT FEATURES (Contd)**



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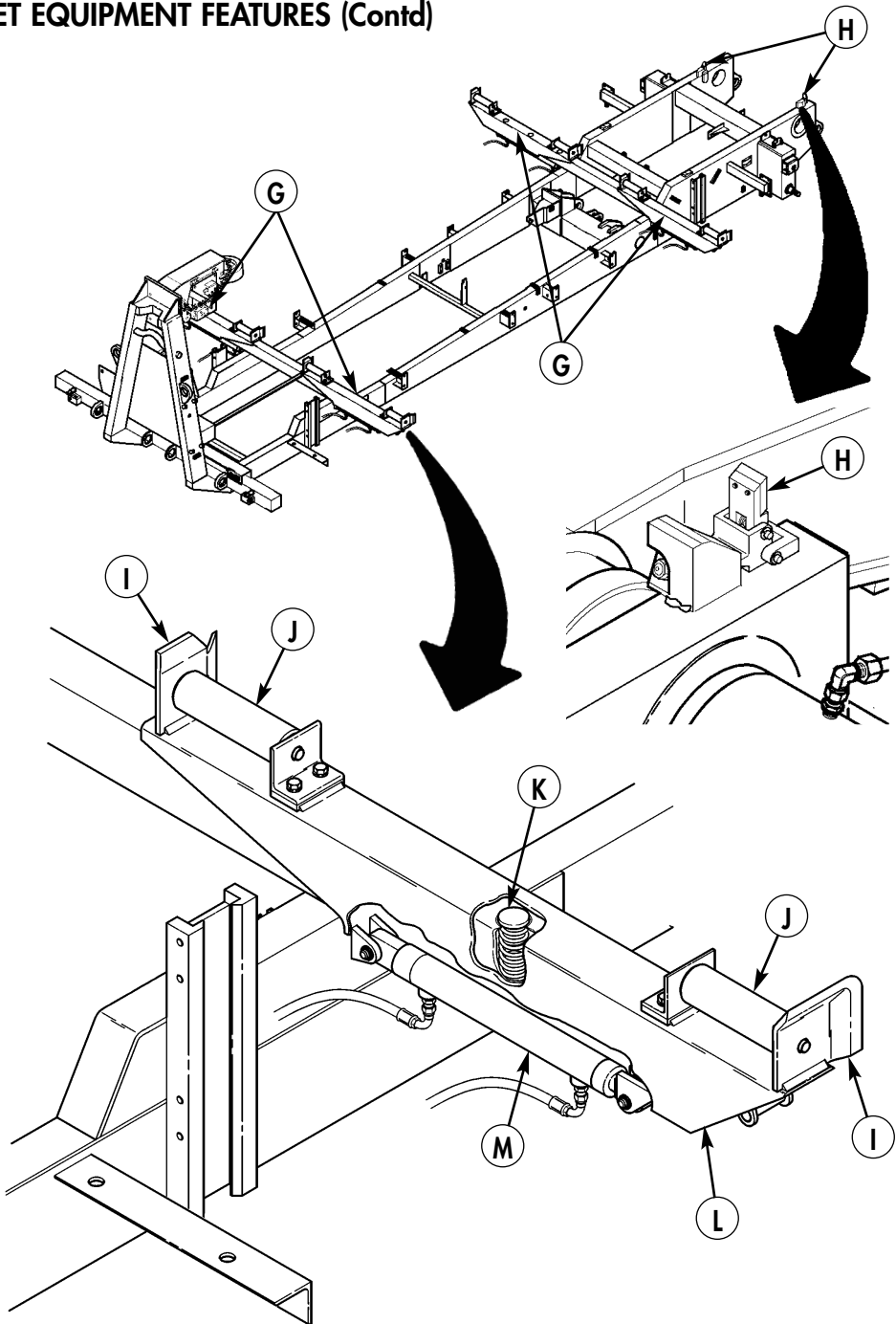
## EQUIPMENT DESCRIPTION (Contd)

### PALLET EQUIPMENT FEATURES (Contd)

- G** **TRANSVERSE HANDLING UNIT** – The two telescopic tubes and rollers on each transverse girder of pallet frame that function to spread bridge quarters to roadway width.
- H** **PALLET BRIDGE REMOTE CONTROL LEVER RELEASE** – The two spring operated trip levers mounted on pallet frame that function to actuate bridge upper coupling locks automatically.
- I** **CARRIER** – The outer mounting bracket on each telescopic tube that functions to align and retain bridge quarter during expanding, retracting, and advancement.
- J** **TRANSPORT ROLLERS** – The two rollers mounted on top of each telescopic tube that support bridge halves when advancing bridge.
- K** **SLIDE PINS** – The spring-loaded round disks positioned on transverse girders that enable telescopic tubes to slide under weight of bridge halves.
- L** **TELESCOPIC TUBE** – One of two tubes on each transverse girder that slide transversely on slide pins by means of separate expanding cylinders.
- M** **EXPANDING CYLINDER** – The hydraulic cylinder on each of the four telescopic tubes.

EQUIPMENT DESCRIPTION (Contd)

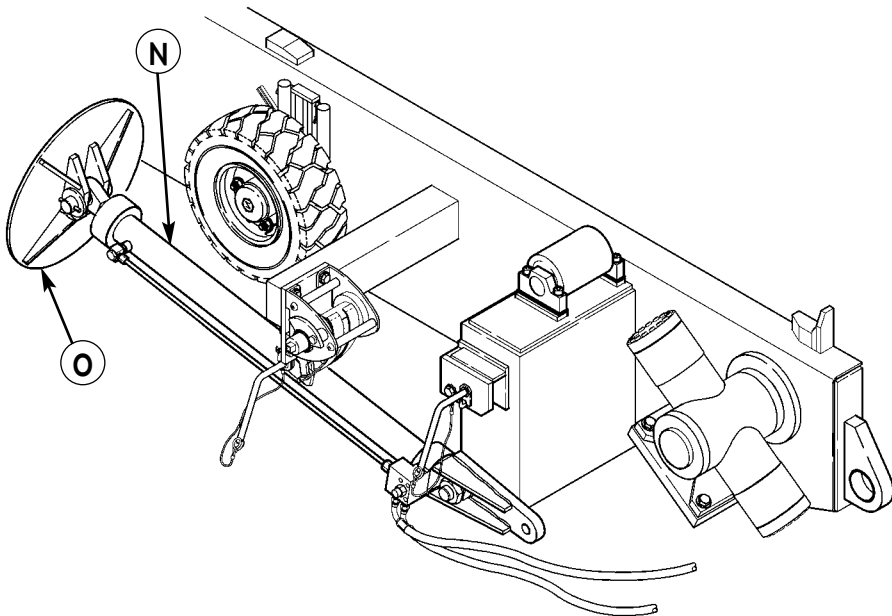
PALLET EQUIPMENT FEATURES (Contd)



## EQUIPMENT DESCRIPTION (Contd)

### PALLET EQUIPMENT FEATURES (Contd)

- (N) SUPPORTING CYLINDERS** – The two supporting cylinders at rear of pallet frame that are lowered to provide additional support during bridge launch and retrieval operations.
- (O) BOTTOM PLATE** – The support plate on piston rod end of each supporting cylinder.
- (P) PALLET STEERING LINKAGE** – The steering levers, bellcranks, and tie rods that connect the pallet front wheel assemblies and enable pallet to be manually steered while on ground.
- (Q) PALLET WHEEL ASSEMBLY** – The four hydraulically lowered wheels that enable the pallet to be maneuvered while on ground.
- (R) LIFTING CYLINDERS** – The two hydraulic cylinders on each of four pallet wheel assemblies.

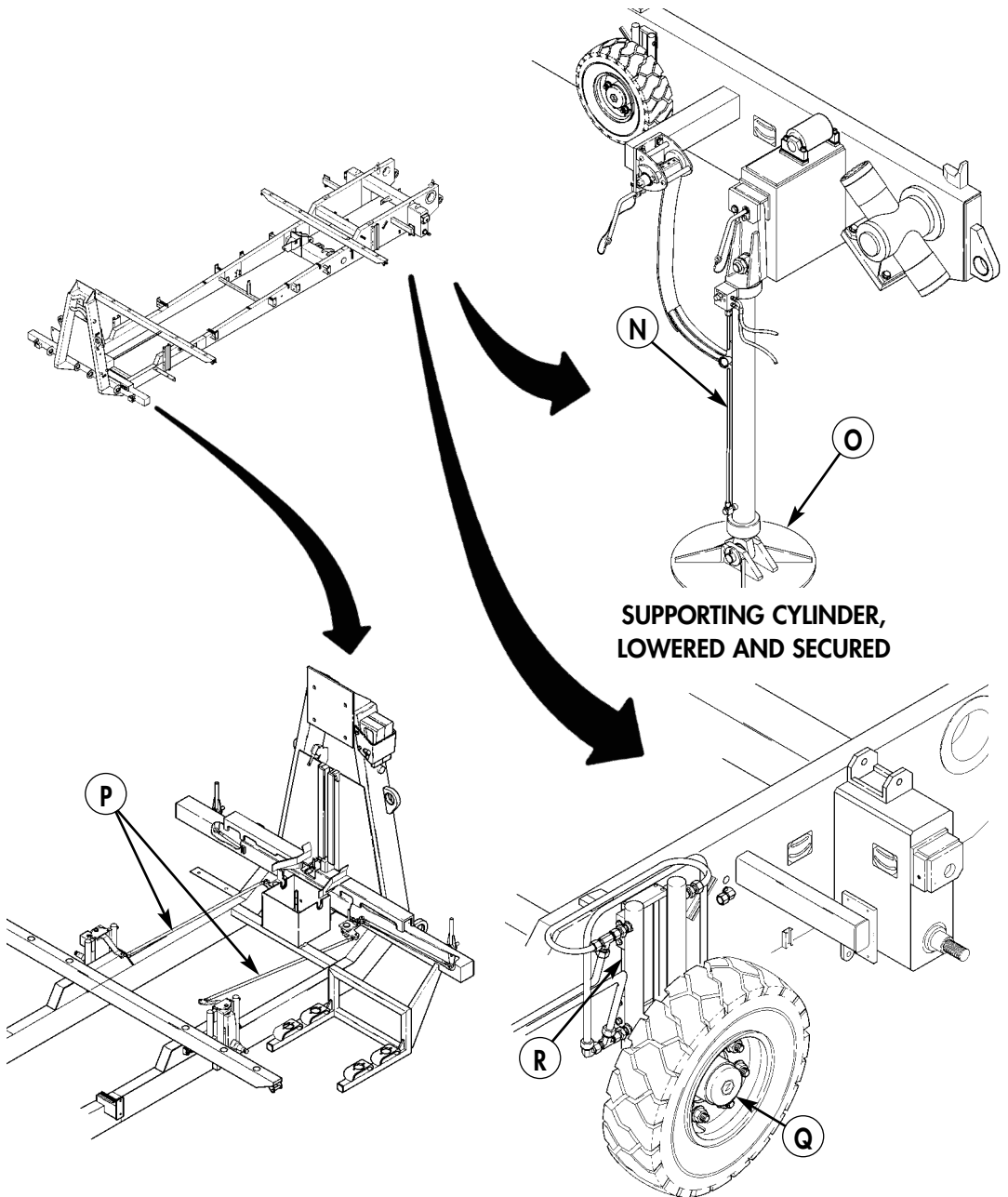


**SUPPORTING CYLINDER, RAISED AND SECURED**



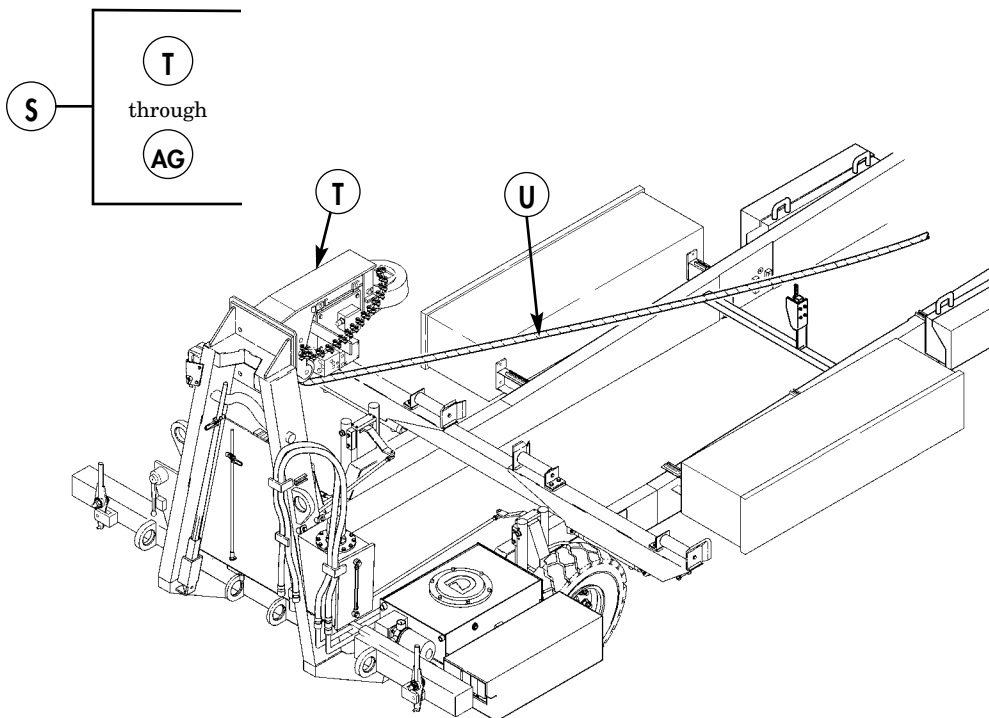
**EQUIPMENT DESCRIPTION (Contd)**

**PALLET EQUIPMENT FEATURES (Contd)**



**EQUIPMENT DESCRIPTION (Contd)****PALLET EQUIPMENT FEATURES (Contd)**

- (S)** **LAUNCHER** – The launch boom, swivel drive, front and rear pinwheel drives, upper and lower rollers, cable guide roller, lower support boom, secondary support boom and rollers, and winch assembly.
- (T)** **WINCH ASSEMBLY** – The hydraulic winch, mounted on A-frame support of pallet, that assists in lifting and supporting bridge during launch and retrieval operations only.
- (U)** **WINCH WIRE ROPE HOOK** – The hook attached to the winch wire rope designed to connect to lifting eye on bridge launch beam and pallet launch boom.

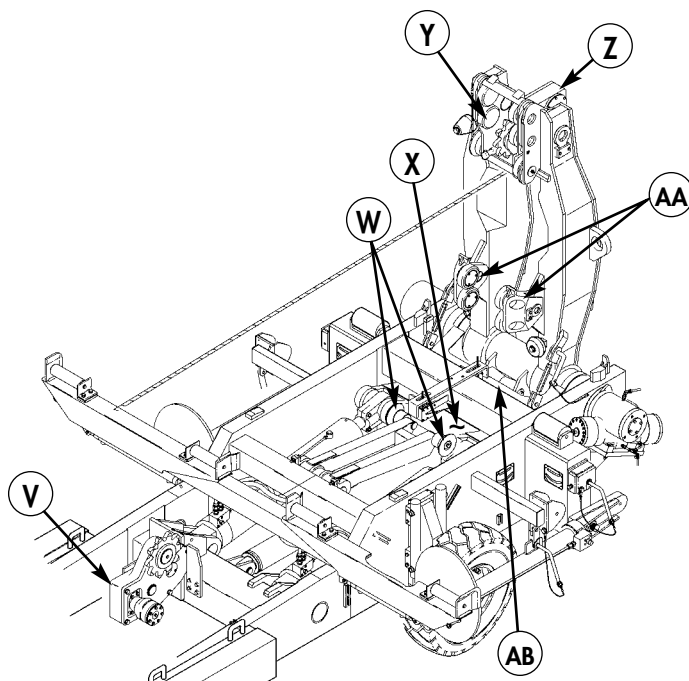


- (V)** **FORWARD PINWHEEL DRIVE** – The drive unit, mounted on pallet frame center crossmember, comprised of a gear box, hydraulic motor, and drive gear.
- (W)** **SECONDARY SUPPORT BOOM ROLLERS** – The two large rollers with tapered centering plates mounted on secondary support boom.

## EQUIPMENT DESCRIPTION (Contd)

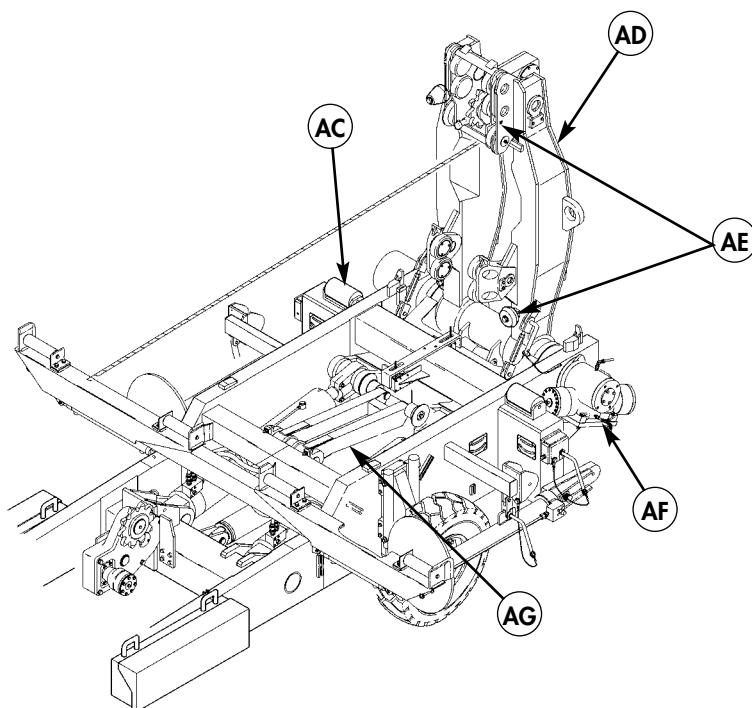
## PALLET EQUIPMENT FEATURES (Contd)

- (X) **LOWER SUPPORT BOOM** – The large structural frame, mounted on bearing shaft below launch boom, that serves to lift launch boom while under load of bridge assembly by means of two large hydraulic cylinders.
- (Y) **LOWER SUPPORT ROLLERS** – The six rollers, mounted on end of launch boom next to rear pinwheel drive, that function to hold bridge along roller contact surfaces of bridge launch beam during launch and retrieval operations.
- (Z) **REAR PINWHEEL DRIVE** – The drive unit, consisting of a gearbox, drive gear, and hydraulic motor located on launch boom next to lower support rollers, that functions to drive and retain bridge assembly during launch and retrieval operations.
- (AA) **UPPER ROLLER BLOCKS** – The two rollers, mounted behind lower support rollers on each side of launch boom, that contact bridge launch beam to provide additional support during launch and retrieval operations.
- (AB) **CABLE GUIDE ROLLER** – The roller on center of launch boom that guides the winch cable during launch and retrieval operations.



**EQUIPMENT DESCRIPTION (Contd)****PALLET EQUIPMENT FEATURES (Contd)**

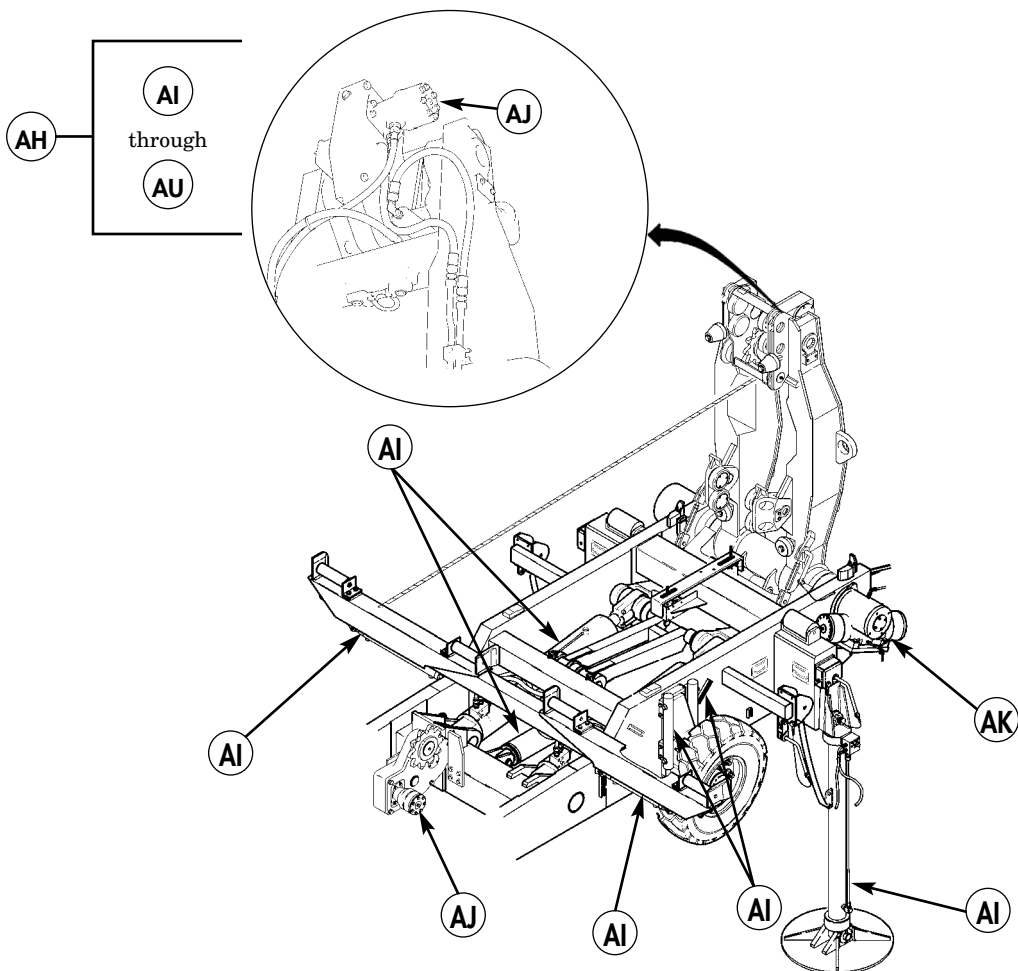
- Ⓐ **BRIDGE SUPPORT ROLLERS** – The roller mounted on top of each supporting cylinder frame member that functions to support bridge.
- Ⓐ **LAUNCH BOOM** – The large structural frame, mounted on bearing shaft at rear of pallet frame, that functions to support bridge assembly during launch and retrieval operations.
- Ⓐ **CONE ALIGNMENT ROLLERS** – The two rollers mounted on lower support rollers frame and two rollers mounted on launch boom adjacent to upper roller blocks, that assist in aligning bridge launch beam during launch and retrieval.
- Ⓐ **SWIVEL DRIVE** – The hydraulic drive unit, located on left rear side of pallet frame, that functions to rotate launch boom under no-load conditions.
- Ⓐ **SECONDARY SUPPORT BOOM** – The support, located at center of pallet frame above lower support boom cylinders, that functions to lift upper bridge half during coupling and uncoupling.



## EQUIPMENT DESCRIPTION (Contd)

## PALLET EQUIPMENT FEATURES (Contd)

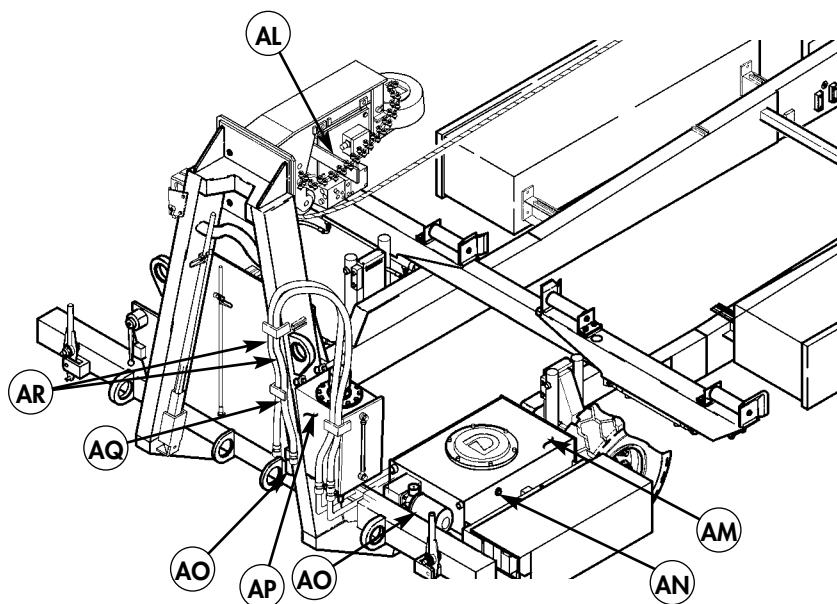
- Ⓐ **HYDRAULIC SYSTEM** – The hydraulic motors, cylinders, control valves, check valves, flow dividers, hydraulic lines, reservoirs, and filters on pallet.
- Ⓐ **HYDRAULIC CYLINDERS** – There are 18 individual cylinders that function to articulate the moving mechanical parts of pallet.
- Ⓐ **PINWHEEL DRIVE HYDRAULIC MOTOR** – The hydraulic motor that powers gearbox on front and rear pinwheel drives by converting hydraulic pressure into mechanical power.
- Ⓐ **HYDRAULIC SWIVEL DRIVE** – The drive unit for launch boom that converts hydraulic pressure to mechanical power.



## EQUIPMENT DESCRIPTION (Contd)

### PALLET EQUIPMENT FEATURES (Contd)

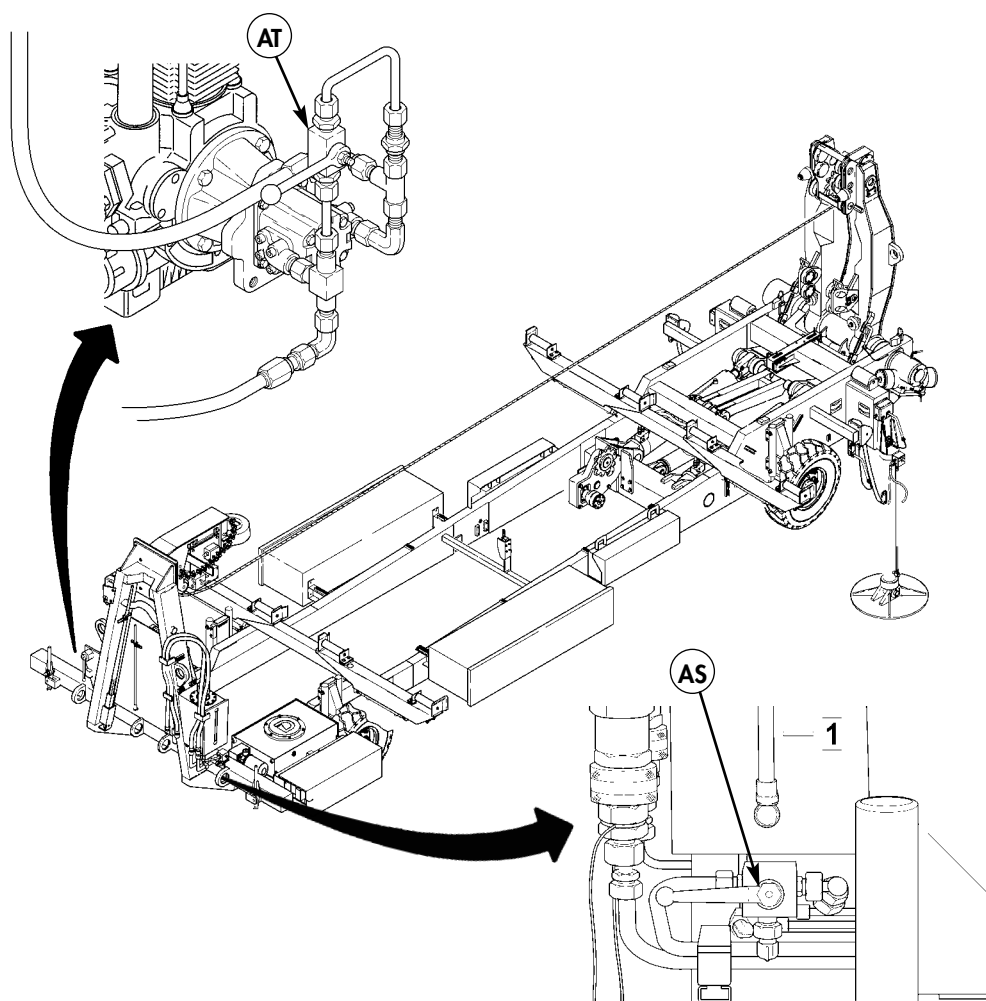
- AL WINCH HYDRAULIC MOTOR** – The motor built into winch assembly that powers pulleys by converting hydraulic pressure to mechanical power.
- AM RESERVOIR** – The tank mounted on side of pallet frame that contains hydraulic oil for operation of pallet hydraulic system and supports main hydraulic manifold and filter.
- AN RESERVOIR SITE GLASS** – The indicator on side of hydraulic reservoir for checking hydraulic oil level.
- AO OIL FILTERS** – The external oil filter mounted on reservoir that filters pallet hydraulic system, and an external oil pre-filter mounted on pallet frame that prevents contamination of pallet's hydraulic system when connected to CBT.
- AP AUXILIARY HYDRAULIC OIL RESERVOIR** – There is a tank mounted on A-frame of pallet that functions to vent pallet hydraulic system and provides a space to contain residual hydraulic oil during operation.
- AQ PRESSURE RELIEF VALVE** – The valve located on pallet A-frame near auxiliary hydraulic oil reservoir.
- AR PALLET HYDRAULIC SUPPLY HOSES** – The two hydraulic hoses of pallet hydraulic system that connect, by means of quick-disconnect couplings, the pallet's engine driven hydraulic pump to the pallet hydraulic system. For emergency back-up power, the pallet hydraulic supply hoses are connected to the CBT's hydraulic pump.



## EQUIPMENT DESCRIPTION (Contd)

## PALLET EQUIPMENT FEATURES (Contd)

- (AS) **TRANSFER VALVE** – The transfer valve, located under the auxiliary hydraulic oil reservoir, that enables hydraulic oil from CBT's hydraulic reservoir to be transferred to the pallet's auxiliary reservoir as required when using CBT back-up power.
- (AT) **HYDRAULIC PUMP AND BYPASS VALVE** – The hydraulic pump mounted on pallet engine that supplies oil under pressure to pallet hydraulic system. The bypass valve, located adjacent to hydraulic pump, directs hydraulic oil to pallet hydraulic system or bypasses pallet hydraulic system.



**EQUIPMENT DESCRIPTION (Contd)****PALLET EQUIPMENT FEATURES (Contd)**

**(AU) CONTROL VALVES** – The distribution system for all pallet hydraulic functions that consist of five single and eight double spool-type valves of which 12 are mounted on hydraulic main manifold and one on crossmember adjacent to forward pinwheel drive. Each control valve is identified by solenoid code KY followed by its assigned number. Solenoid codes are printed on a white band on the electrical lead for each solenoid. Single control valves actuate in one direction only and utilize one solenoid. Double control valves actuate in both directions and utilize two solenoids. Control valves can be manually operated by depressing and holding button on valve. Control valves KY1, KY22, and KY23 can be locked in depressed position. Control valve KY20 does not have a button for manual operation.

**NOTE**

Control valve numbers KY2 and KY3 are no longer used.

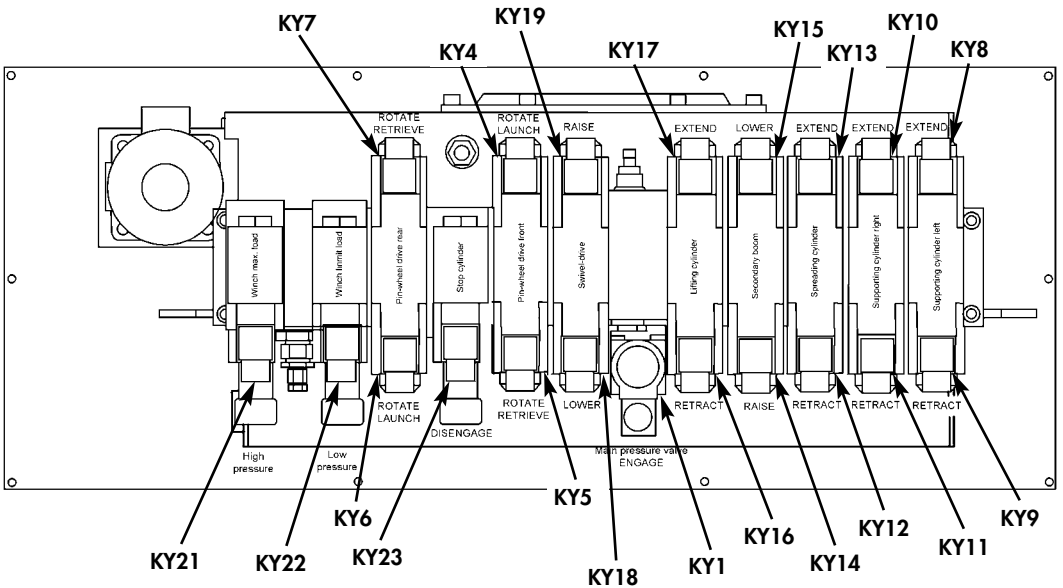
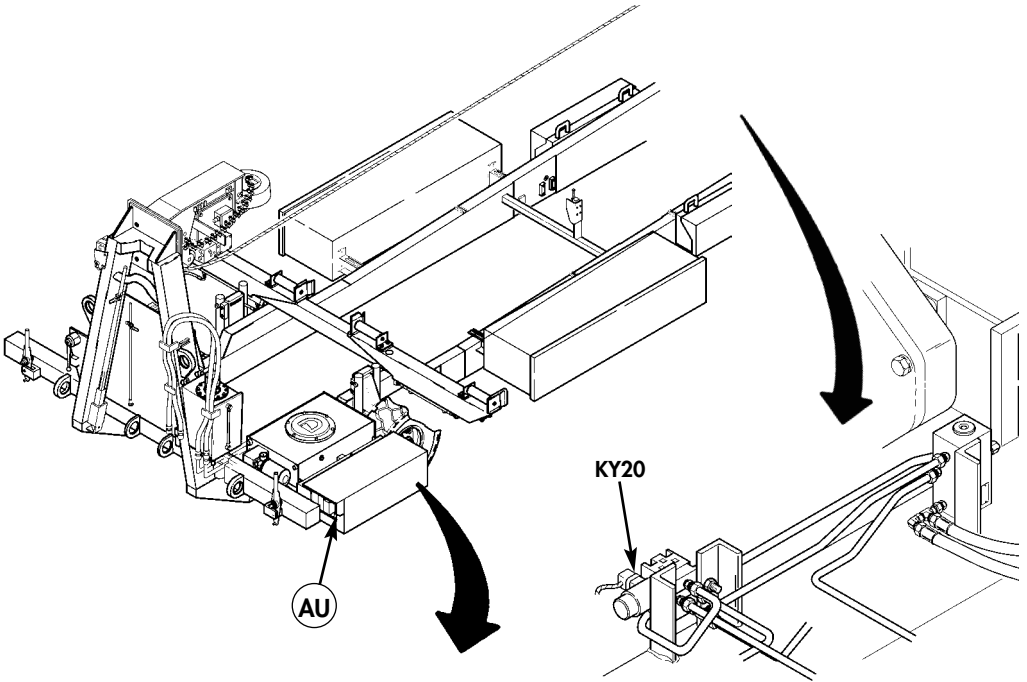
Authorized personnel may manually operate control valves in emergency situations only.

- KY1\*** - Main control valve that supplies hydraulic pressure to hydraulic manifold. KY1 works in conjunction with all other control valves.
  - KY4** - Operates forward pinwheel drive to deploy lower bridge half.
  - KY5** - Operates forward pinwheel drive to retrieve lower bridge half.
  - KY6** - Operates rear pinwheel drive to deploy lower bridge half.
  - KY7** - Operates rear pinwheel drive to retrieve lower bridge half.
  - KY8** - Extends driver's side supporting cylinder to lift pallet.
  - KY9** - Retracts driver's side supporting cylinder to lower pallet.
  - KY10** - Extends passenger side supporting cylinder to lift pallet.
  - KY11** - Retracts passenger side supporting cylinder to lower pallet.
  - KY12** - Operates four transverse handling unit expanding cylinders to retract bridge quarters to travel position.
  - KY13** - Operates four transverse handling unit expanding cylinders to extend bridge quarters to operating width.
  - KY14** - Raises secondary boom.
  - KY15** - Lowers secondary boom
  - KY16** - Retracts lower support boom.
  - KY17** - Extends lower support boom.
  - KY18** - Operates swivel drive to lower launch boom.
  - KY19** - Operates swivel drive to raise launch boom.
  - KY20** - Operates lower support boom in conjunction with KY17 to increase flow rate of hydraulic fluid.
  - KY21\*** - Provides high pressure to winch motor to increase lifting capacity for pay-in and pay-out of wire rope as controlled by remote control unit (RCU) or winch emergency switch. Manually depressing KY21 alone will not pay-in or pay-out wire rope.
  - KY22\*** - Provides low pressure to winch motor for pay-in and pay-out of wire rope as controlled by RCU or winch emergency switch. Manually depressing KY22 alone will not pay-in or pay-out wire rope.
  - KY23\*** - Operates end stop hydraulic cylinder.
- \* Single spool valve.



# EQUIPMENT DESCRIPTION (Contd)

## PALLET EQUIPMENT FEATURES (Contd)



## EQUIPMENT DESCRIPTION (Contd)

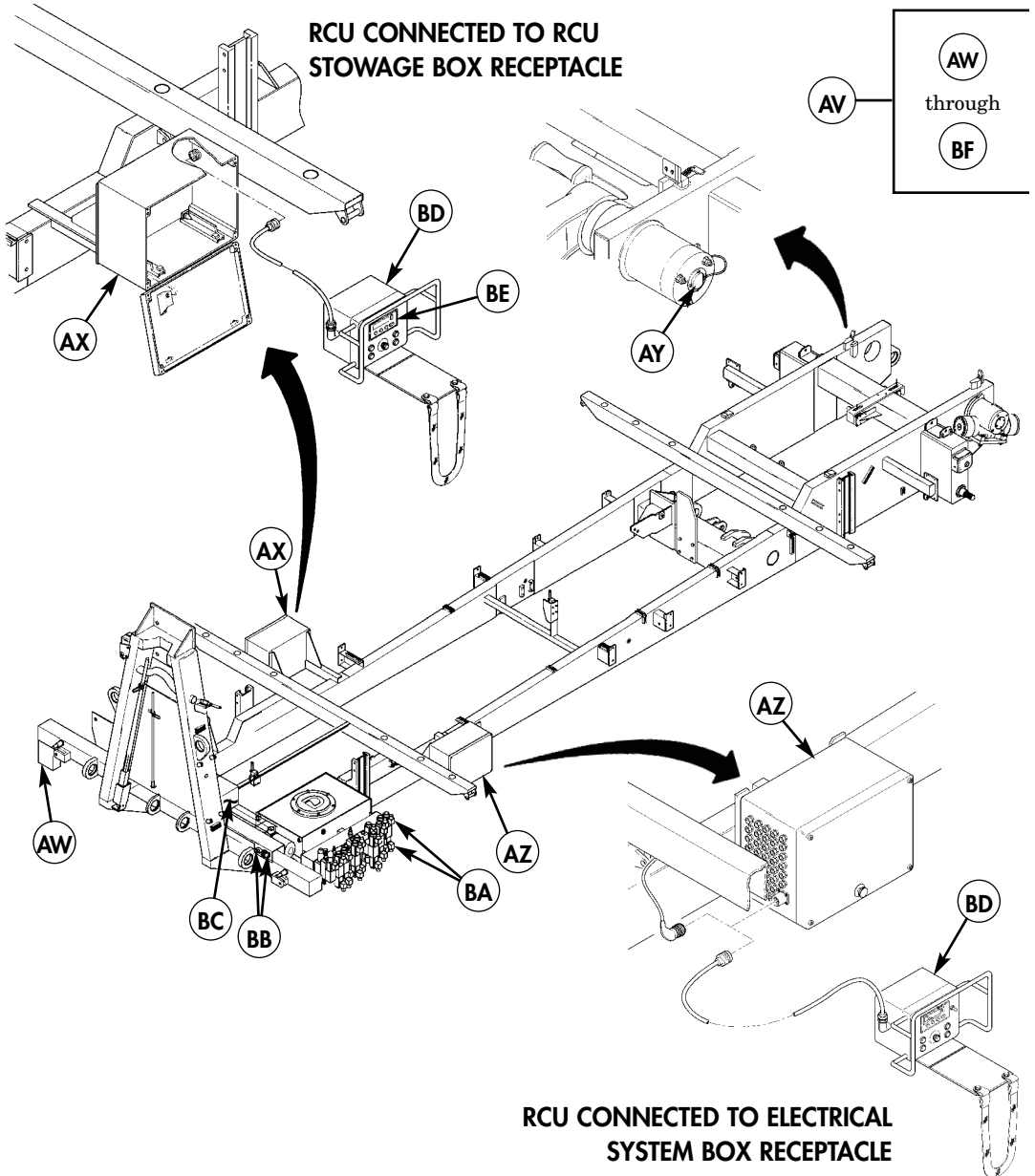
### PALLET EQUIPMENT FEATURES (Contd)

- (AV) **ELECTRICAL SYSTEM** – The SPS control unit, RCU, control valve solenoids, limit switches, power cable, wiring harnesses, battery, 27A generator, and LPU starter motor and control box of pallet.
- (AW) **LPU CONTROL BOX** – The control box, mounted adjacent to LPU, that contains an ignition switch, glow plug indicator, engine oil pressure light, and battery light.
- (AX) **RCU STOWAGE BOX** – There is a metal stowage box, mounted on pallet frame adjacent to LPU, that contains RCU, RCU power cable, and RCU power receptacle. In addition, there is an emergency stop button on front of box door.
- (AY) **POTENTIOMETER** – A variable resistor located on main shaft manifold cover that measures position of launch boom electronically.
- (AZ) **ELECTRICAL SYSTEM BOX** – There is a metal stowage box, mounted on pallet frame adjacent to hydraulic reservoir, that contains two expansion modules, circuit blocks, a circuit breaker, 3 winch relays, 38 bulkheads, and RCU power receptacle. In addition, there is an emergency stop button on front of box door.
- (BA) **CONTROL VALVE SOLENOIDS** – The electric solenoid, mounted on each hydraulic control valve, that functions to actuate the control valve by means of RCU, SPS control unit, and limit switches.
- (BB) **MAIN POWER SWITCH AND NATO SLAVE RECEPTACLE** – The main power switch is a key operated two-position switch used to send 24V from the pallet batteries or and external 24V power source to the pallet electrical system. When operating from an external 24V power source, a standard NATO slave receptacle is provided adjacent to the main power switch.
- (BC) **BATTERY BOX** – The stowage box that holds two batteries located at the center of pallet frame adjacent to A-frame.
- (BD) **REMOTE CONTROL UNIT** – The hand-held control unit from which all pallet launch and retrieval functions are initiated. RCU power cable can be connected to receptacles on either side of pallet.

**EQUIPMENT DESCRIPTION (Contd)**

**PALLET EQUIPMENT FEATURES (Contd)**

- (BE) SPS CONTROL UNIT** – The stored program system built into RCU that controls automatic launch and retrieval functions of pallet by means of RCU.



## EQUIPMENT DESCRIPTION (Contd)

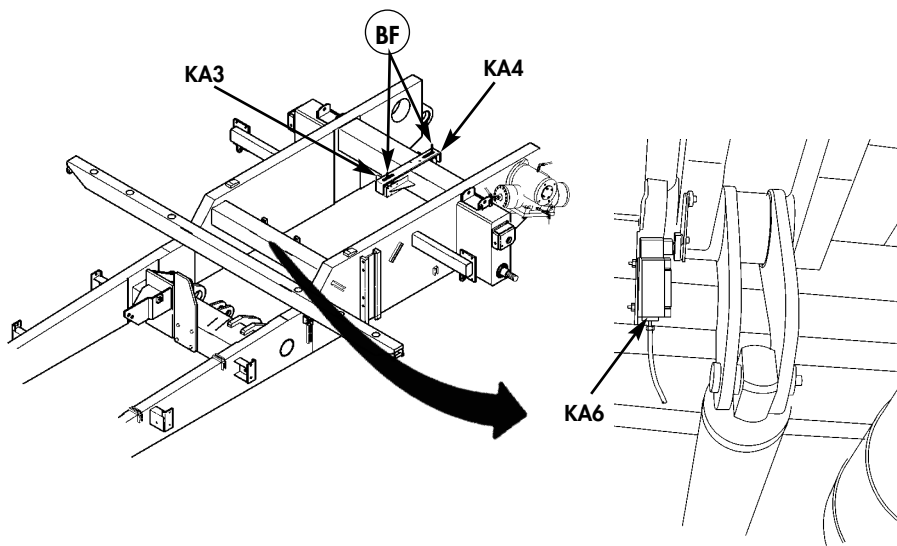
### PALLET EQUIPMENT FEATURES (Contd)

**BF** **LIMIT SWITCHES** – There are seven electrical switches positioned on pallet frame that stop travel of components at set positions by activating control valve solenoids, thereby making launch and retrieval functions automatic. A functional description of each limit switch is listed below:

#### NOTE

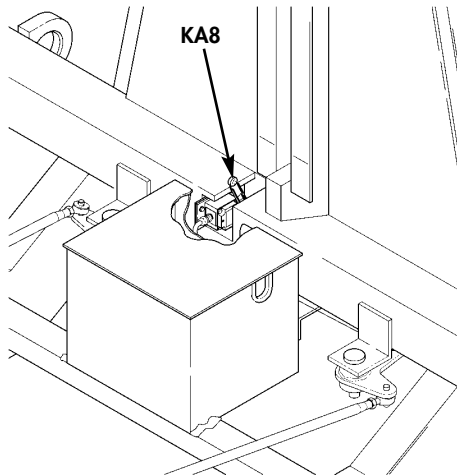
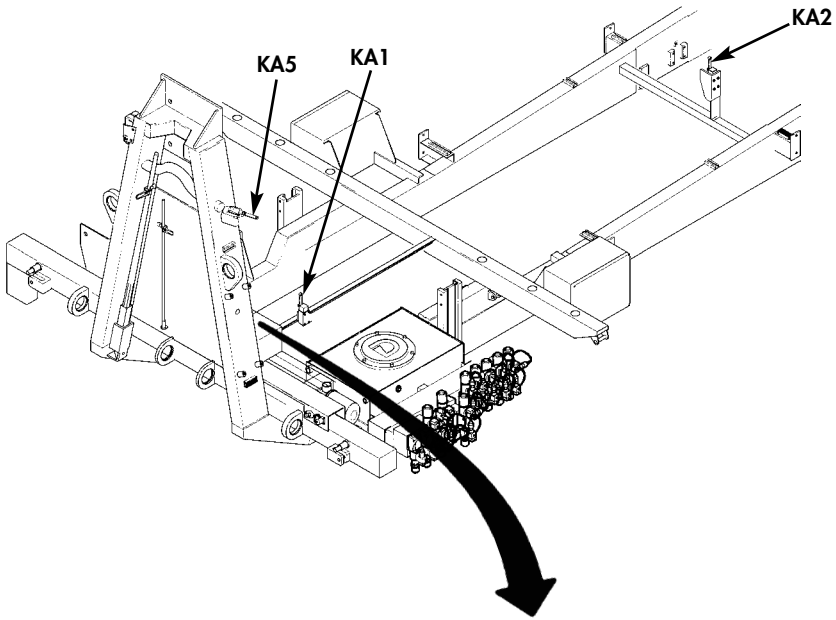
Limit switch number KA7 is no longer used.

- KA1** - During launch, stops lower bridge half when deploying toward rear of pallet, and during retrieval, stops lower bridge half.
- KA2** - During launch, switches forward pinwheel drive to rear pinwheel drive, and during retrieval, switches rear pinwheel drive to forward pinwheel drive.
- KA3** - During launch. Stops lower bridge half at pre-coupling position before raising secondary boom, and during retrieval, stops bridge half before lowering secondary boom.
- KA4** - During launch, stops lower bridge half at coupling position. During retrieval, KA4 and KA3 work together to stop bridge, activate launch boom to raise bridge half to pre-stress upper coupling, which is then stopped by potentiometer, and stop bridge when driven toward pallet A-frame
- KA5** - During launch and retrieval, stops upper bridge half in up position, and stops winch when lifting upper bridge half to up position.
- KA6** - During launch, stops secondary boom and when secondary boom is fully lowered it activates launch boom to go up. During retrieval, stops secondary boom when raised, and activates launch boom to lower.
- KA8** - During retrieval, stops bridge at base of A-frame when driving (retracting), activates winch, then stops winch.



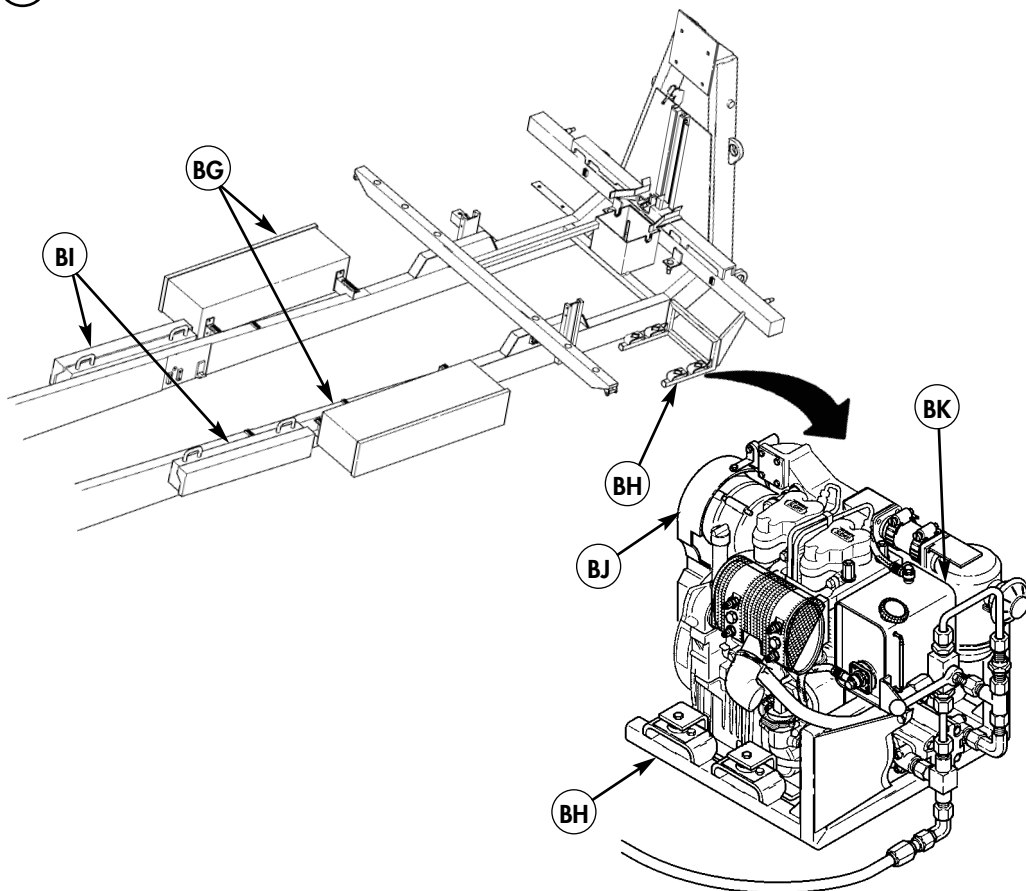
**EQUIPMENT DESCRIPTION (Contd)**

**PALLET EQUIPMENT FEATURES (Contd)**



**EQUIPMENT DESCRIPTION (Contd)****PALLET EQUIPMENT FEATURES (Contd)**

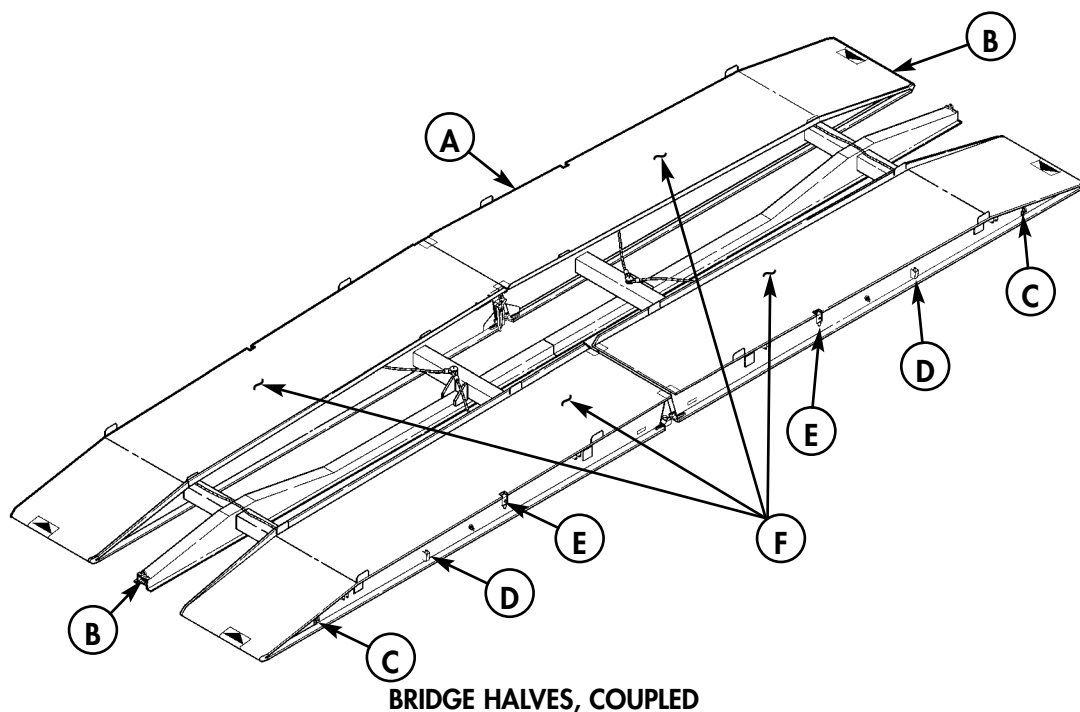
- ⓑ **PALLET TOOL BOXES** – The two metal boxes mounted on pallet frame used for BII stowage.
- ⓑ **LPU SUPPORT** – The welded frame member, located at right front of pallet frame, that supports the LPU.
- ⓑ **ANCHORAGE STOWAGE BOXES** – There are two removable metal boxes mounted on pallet frame for holding anchoring BII. The anchorage storage boxes are installed on bridge prior to deployment by helicopter.
- ⓑ **LAUNCH POWER UNIT (LPU)** – A diesel engine, mounted on support at right front of pallet frame, that powers the pallet's hydraulic and electrical systems.
- ⓑ **FUEL TANK** – The fuel supply tank mounted on LPU support frame.



## EQUIPMENT DESCRIPTION (Contd)

### BRIDGE EQUIPMENT FEATURES

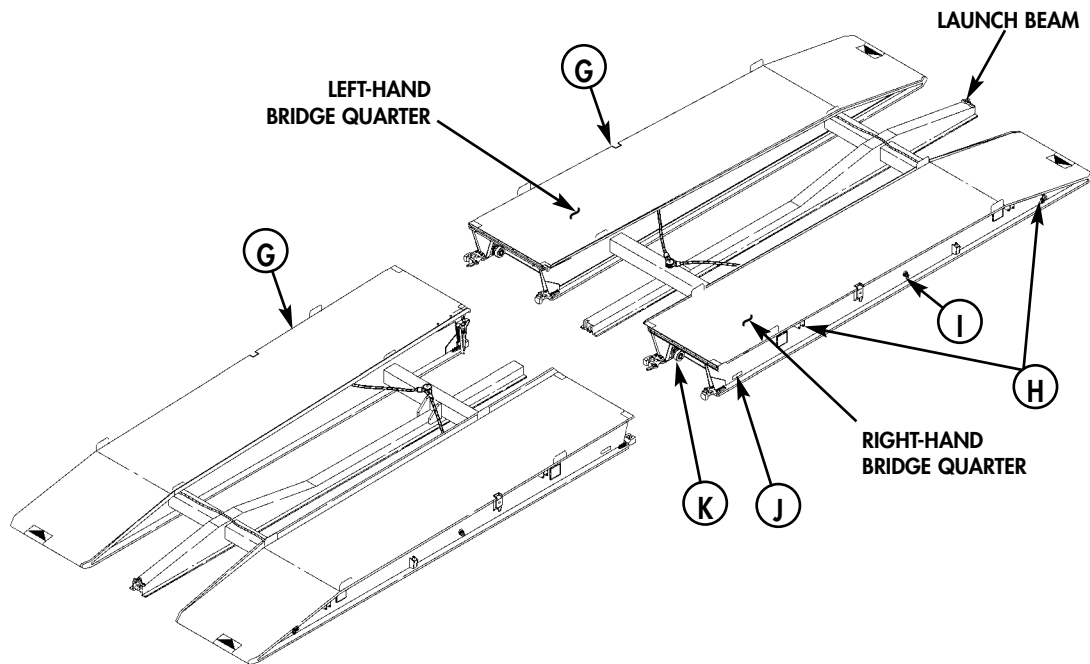
- (A) **BRIDGE ASSEMBLY** – The two bridge halves coupled together.
- (B) **LIFTING EYE** – The hinged eye bracket, mounted on launch beam at each end of bridge assembly, that receives the pallet winch rope hook and functions as a lifting point for bridge.
- (C) **ANCHORING EYE** – The hinged bracket on the side of each bridge quarter used for anchoring bridge.
- (D) **ROADWAY MARKER BRACKET** – The mounting bracket on side of each bridge quarter that holds marker pole designating edge of roadway.
- (E) **HELICOPTER LIFTING RING** – The large ring on side of each bridge quarter used as a lifting point for deploying bridge by helicopter.
- (F) **ROADWAY** – The top road surface of bridge assembly, consisting of a 3-ft 11-in. (1.2-m) wide deck plate on each side.



## EQUIPMENT DESCRIPTION (Contd)

## BRIDGE EQUIPMENT FEATURES (Contd)

- (G) BRIDGE HALF** – An assembly consisting of a left-hand bridge quarter, right-hand bridge quarter, and launch beam.
- (H) HOLD-DOWN BRACKETS** – The two brackets on side of each bridge quarter used for securing bridge halves on pallet with fastening rods.
- (I) SLIDE LOCK** – There is a lock mechanism on each bridge quarter that automatically locks bridge halves when expanded to full roadway width. It is manually unlocked at side of each bridge quarter prior to retracting bridge halves to transport width.
- (J) REMAINING SERVICE LIFE INDICATOR (RSLI)** – A metal plate on each bridge quarter consisting of four fatigue fuses. The condition of the fatigue fuses is used to determine the remaining service life of the bridge.
- (K) SUPPORT WHEELS** – There are four wheels mounted on bottom of each bridge quarter that enable upper bridge half to roll on top of lower bridge half when driving lower bridge half.



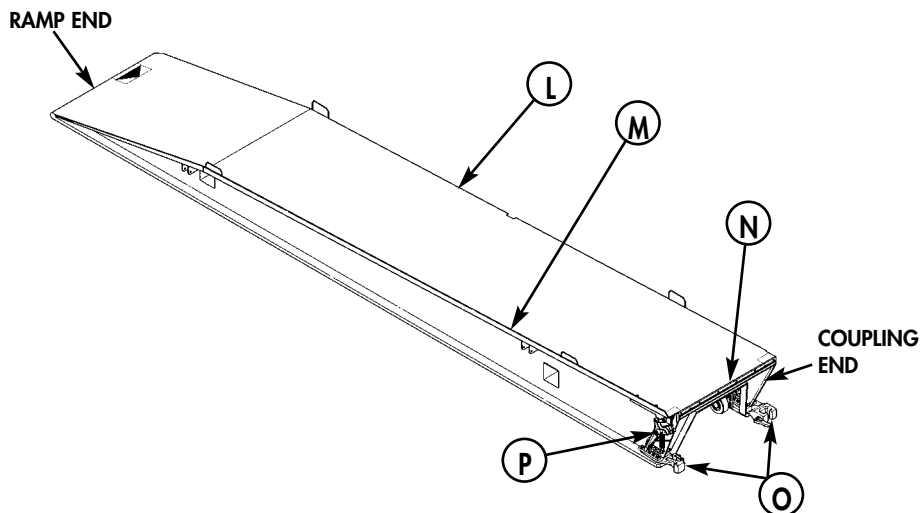
BRIDGE HALVES, UNCOUPLED



## EQUIPMENT DESCRIPTION (Contd)

### BRIDGE EQUIPMENT FEATURES (Contd)

- (L) **BRIDGE QUARTER** – A U-shaped structure having a ramp end, coupling end, and flat deck plate running the length of its top surface.
- (M) **GUARD RAIL AND GUIDES** – A 2 in. (50 mm) high railing welded to the inside edge of deck plate on each bridge quarter that serves to guide vehicles to center when crossing bridge. Two small guides welded to the inside and outside edges of each bridge quarter deck plate that function to align bridge halves during launch and retrieval.
- (N) **CROSSFORCE COUPLING BUMPER** – The steel insert bolted to connecting end of each bridge quarter that functions to align and prevent the coupled bridge assembly from twisting at its center.
- (O) **LOWER COUPLINGS AND HELP LEVERS** – The two steel castings bolted to coupling end of each bridge quarter that function to hold the two bridge halves together at the bottom. Help levers are manually operated during launch and retrieval.
- (P) **UPPER COUPLING** – The lock mechanism, located on coupling end of each left bridge quarter, that functions to hold the two bridge halves together at crossforce coupling bumpers until bridge assembly is emplaced.

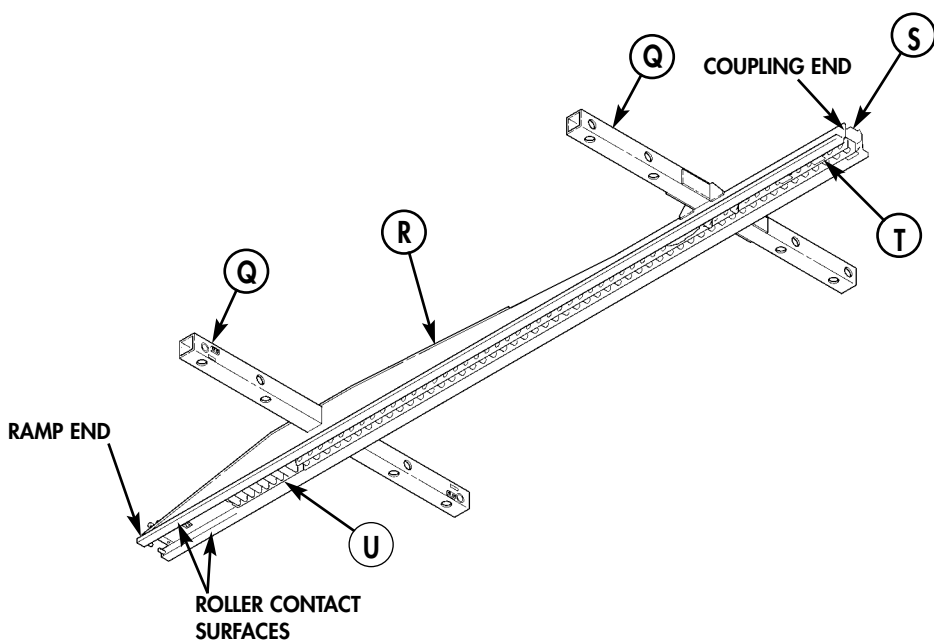


BRIDGE QUARTER, LEFT-HAND SHOWN

## EQUIPMENT DESCRIPTION (Contd)

## BRIDGE EQUIPMENT FEATURES (Contd)

- Q** **SUPPORT TUBES** – The two square tubes welded perpendicular to launch beam that support and permit bridge quarters to slide outward to roadway width and inward to transport width.
- R** **LAUNCH BEAM** – The center support structure of a bridge half.
- S** **BEAM** – A hat-shaped steel support that contains roller contact surfaces and drive pins that interface with pallet launcher. A key-way is provided at the coupling end and a lifting eye at the ramp end.
- T** **DRIVE PINS** – There is a channel bolted to bottom of each launch beam containing 84 round pins and 9 grooves that function to engage with pallet pinwheel drive gears to move bridge on pallet during launch and retrieval.
- U** **RAIL TRACK** – There is a hardened steel rail track bolted to ramp end of launch beam that functions to engage bridge with pallet pinwheel drive gears to move bridge onto pallet at retrieval.



LAUNCH BEAM, BOTTOM VIEW

END OF WORK PACKAGE

Change 2

0002 00-28

# GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### EQUIPMENT DATA

#### EQUIPMENT DIMENSIONS

#### NOTE

For equipment data pertaining to the basic HEMTT vehicle, refer to TM 9-2320-279-10.

Refer to the following tables for specific equipment data.

*Table 1. Common Bridge Transporter (CBT) Data.*

	STANDARD	METRIC
Dimensions and weight (ready for travel)		
Not loaded		
Length .....	33 ft 3 in.	10.2 m
Width .....	8 ft	2.4 m
Height .....	8 ft 4 in.	2.6 m
Curb weight .....	37,240 lb	16,892 kg
GVWR .....	66,000 lb	29,938 kg
Loaded with pallet and bridge		
Length .....	38 ft 6 in.	11.8 m
Width .....	9 ft 2 in.	2.8 m
Height .....	11 ft 8 in.	3.6 m
Weight .....	56,173 lb	25,480 kg
Weight distribution loaded with pallet and bridge		
Weight over front axles .....	20,886 lb	9,460 kg
Weight over rear axles .....	35,274 lb	16,000 kg
PTO hydraulic pump output at 3,000 psi (20,685 kPa) .....	20 gpm	76 lpm
Hydraulic reservoir capacity (with filter) .....	120 qt	114 l
LHS		
Maximum lifting capacity .....	24,000 lb	10,886 kg
Hydraulic system maximum operating pressure ..	3,625 psi	24,994 kPa
Hydraulic system full relief pressure .....	3,100 to 3,300 psi	21,375 to 22,754 kPa
Electric power voltage .....	24 Vdc	

*Table 2. Palletized Load System (PLS) Trailer Data.*

	STANDARD	METRIC
Length .....	24 ft 4 in.	7.5 m
Width .....	8 ft	2.4 m
Height .....	4 ft 11 in.	1.5 m
Curb weight .....	12,994 lb	5,894 kg

**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

*Table 2. Palletized Load System (PLS) Trailer Data (Contd).*

	<b>STANDARD</b>	<b>METRIC</b>
PLS trailer loaded with REB		
Length .....	26 ft 4 in.	8 m
Width .....	110 in.	279 cm
Height .....	12 ft 4 in.	3.8 m
Weight .....	33,739 lb	15,304 kg
GVWR .....	49,500 lb	22,453 kg

*Table 3. Pallet (Empty).*

	<b>STANDARD</b>	<b>METRIC</b>
Length .....	25 ft	7.6 m
Width .....	9 ft 2 in.	2.8 m
Height .....	7 ft	2.2 m
Weight .....	9,526 lb	4,321 kg
Weight distribution		
Weight over front axles .....	3,130 lb	1,420 kg
Weight over rear axles .....	6,437 lb	2,920 kg
Hydraulic system operating pressure .....	3,249 psi	22,402 kPa
Electrical system box circuit breaker .....	16 A	
Electrical system .....	24 Vdc	
Generator output .....	27 A, 28 Vdc	
Number of batteries .....	2 (12 Vdc)	
Hydraulic system capacity (dry) .....	121.5 qt	115 l
Main hydraulic reservoir capacity .....	18.5 gal	70 l
Hydraulic pump output .....	5.3 gpm	20 lpm
	@ 1,200 rpm	
Hydraulic pump capacity .....	300 ft <sup>3</sup>	8.5 m <sup>3</sup>
	per revolution	
Support wheel tire pressure .....	100 psi	690 kPa
LPU engine		
Type .....	.2-cylinder, 4-cycle, air-cooled, direct injection diesel	
Displacement .....	60.8 in. <sup>3</sup>	997 cm <sup>3</sup>
Horsepower .....	21.45 hp	16 kw
Direction of rotation at power take-off end .....	counterclockwise	
Fuel .....	JP8 (same grade as used in CBT)	
Fuel tank capacity .....	0.8 gal	3 l
Oil capacity .....	3.2 qt	3 l
Oil consumption		
(after break-in period) .....	.1% for fuel consumption at full load	
Oil pressure .....	14.5 psi (1 bar) minimum	
Difference between "max" and "min" oil level ....	0.85 qt	0.8 l
Inlet and exhaust valve clearance .....	0.004 in.	0.10 mm
	at 50–86° F (10–30° C)	
Low idle .....	700 rpm	
High idle .....	1,200 rpm	
Weight (includes fuel tank, air cleaner, exhaust muffler, and electric starter) .....	234 lb	106 kg

**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

*Table 4. Bridge Data.*

	<b>STANDARD</b>	<b>METRIC</b>
Length		
Total .....	45 ft 3 in.	13.8 m
Effective (on prepared abutments) .....	42 ft 6 in.	13 m
Width		
Retracted .....	9 ft 2 in.	2.8 m
Expanded .....	11 ft	3.4 m
Width of bridge quarter deck plate .....	3 ft 11 in.	1.2 m
Height .....	1 ft 10 in.	56 cm
Weight .....	10,582 lb	4,800 kg
Normal/Caution Crossing .....	MLC 40/50	
Retrievability .....	either end	

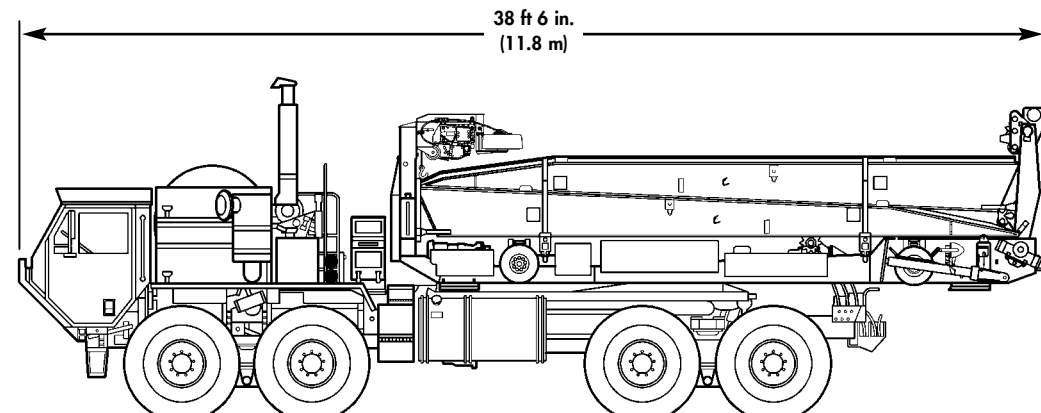
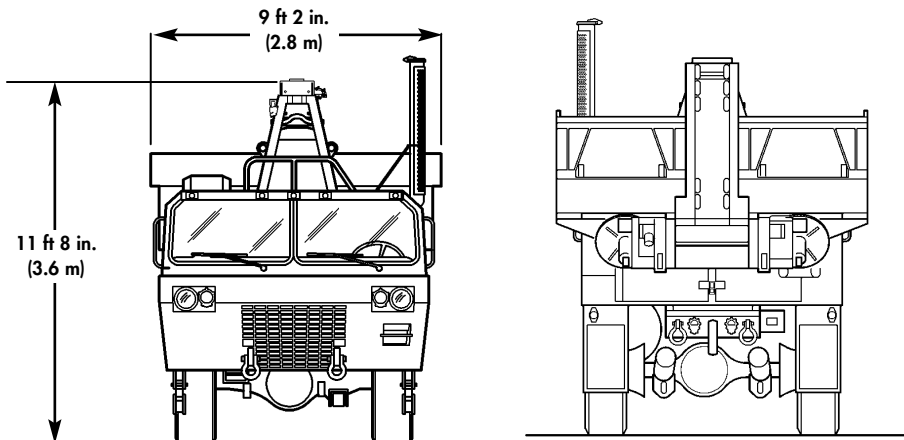
*Table 5. Pallet with Bridge.*

	<b>STANDARD</b>	<b>METRIC</b>
Length .....	25 ft	7.6 m
Width .....	9 ft 2 in.	2.8 m
Height .....	8 ft	2.4 m
Weight .....	20,856 lb	9,460 kg

**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

Dimensions of CBT loaded with REB are detailed below.

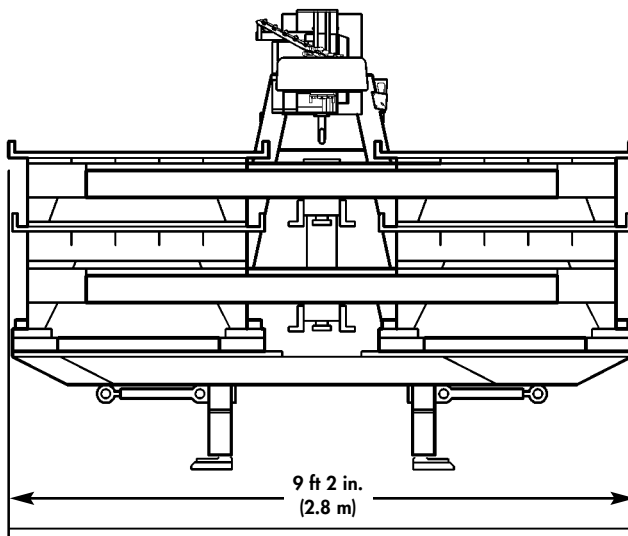


**CBT LOADED WITH PALLET AND BRIDGE**

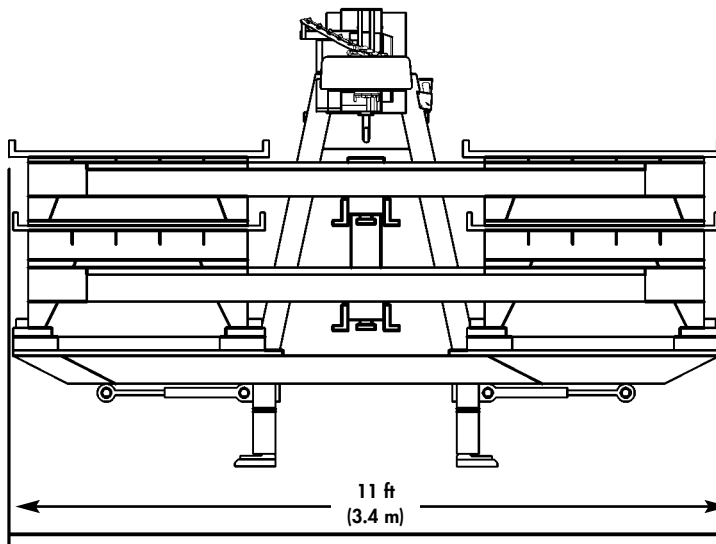
**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

Bridge retracted and expanded dimensions are detailed below.



**BRIDGE, RETRACTED**

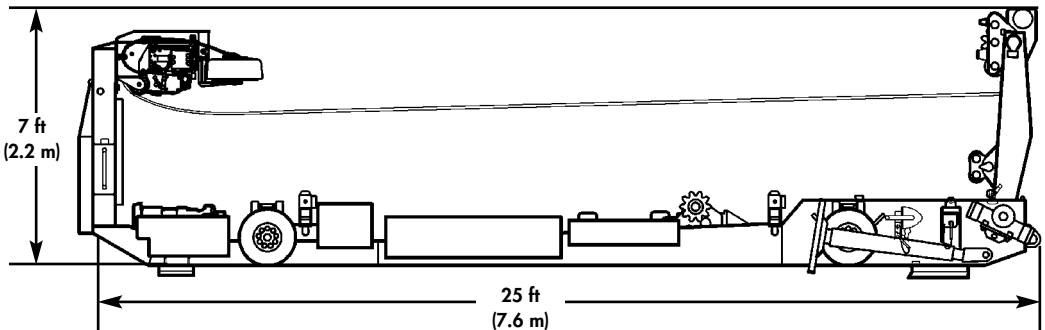
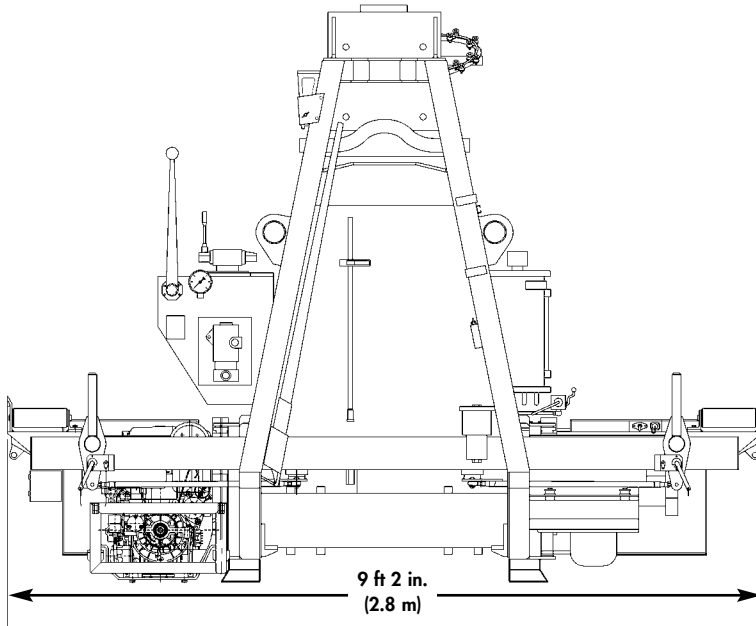


**BRIDGE, EXPANDED**

**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

Pallet dimensions are detailed below.



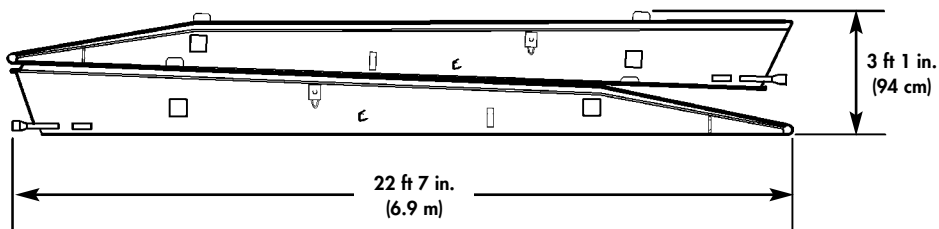
**PALLET**



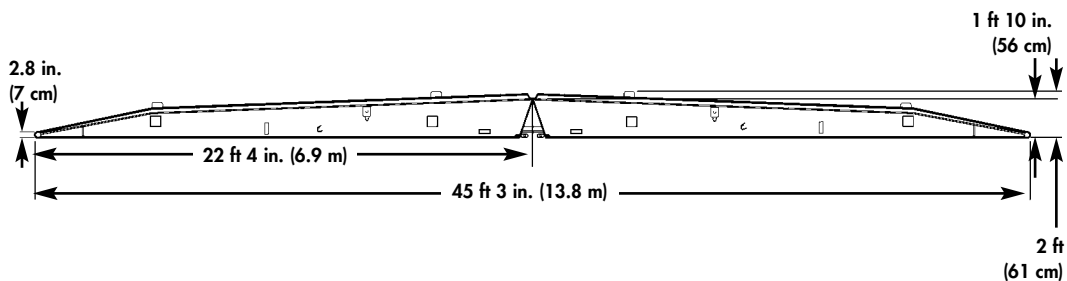
**EQUIPMENT DATA (Contd)**

**EQUIPMENT DIMENSIONS (Contd)**

Coupled and uncoupled bridge dimensions are detailed below.



**BRIDGE, UNCOUPLED**



**BRIDGE, COUPLED**

## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES

Locations and descriptions of data plates and decals found on CBT and REB units are provided under this heading. If any data plate or decal is worn, broken, unreadable, painted over, or missing, it must be replaced; notify your supervisor.

#### **NOTE**

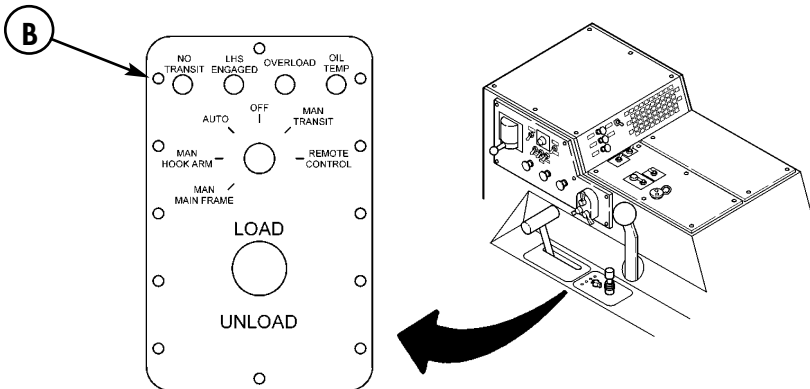
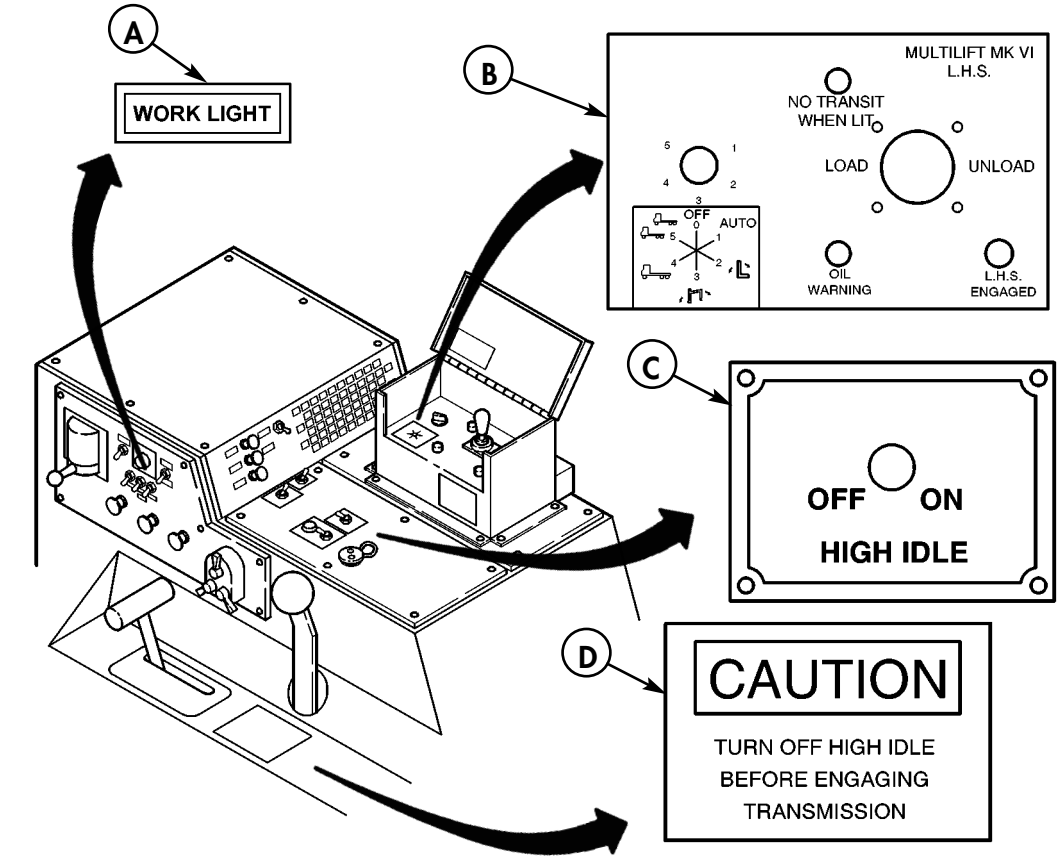
For data plates and decals pertaining to operation of the basic HEMTT vehicle, refer to TM 9-2320-279-10.

### LHS DATA PLATES AND DECALS

- (A) WORK LIGHT** — This decal, located inside cab on side panel of heater compartment, identifies switch for operating LHS work light and spotlight.
- (B) MULTILIFT, MK VI LHS** — This decal, located inside cab on top panel of LHS control box, or on top of shift console on late model CBTs, identifies switches and indicator lights for LHS operation.
- (C) HIGH IDLE** — This data plate, located inside cab on top panel of heater compartment, identifies switch for increasing engine idle speed prior to LHS operation.
- (D) CAUTION (high idle)** — This decal, located inside cab on top of shift console, is a reminder to turn off HIGH IDLE switch before engaging transmission.

EQUIPMENT DATA (Contd)

LOCATION AND DESCRIPTION OF DATA PLATES (Contd)



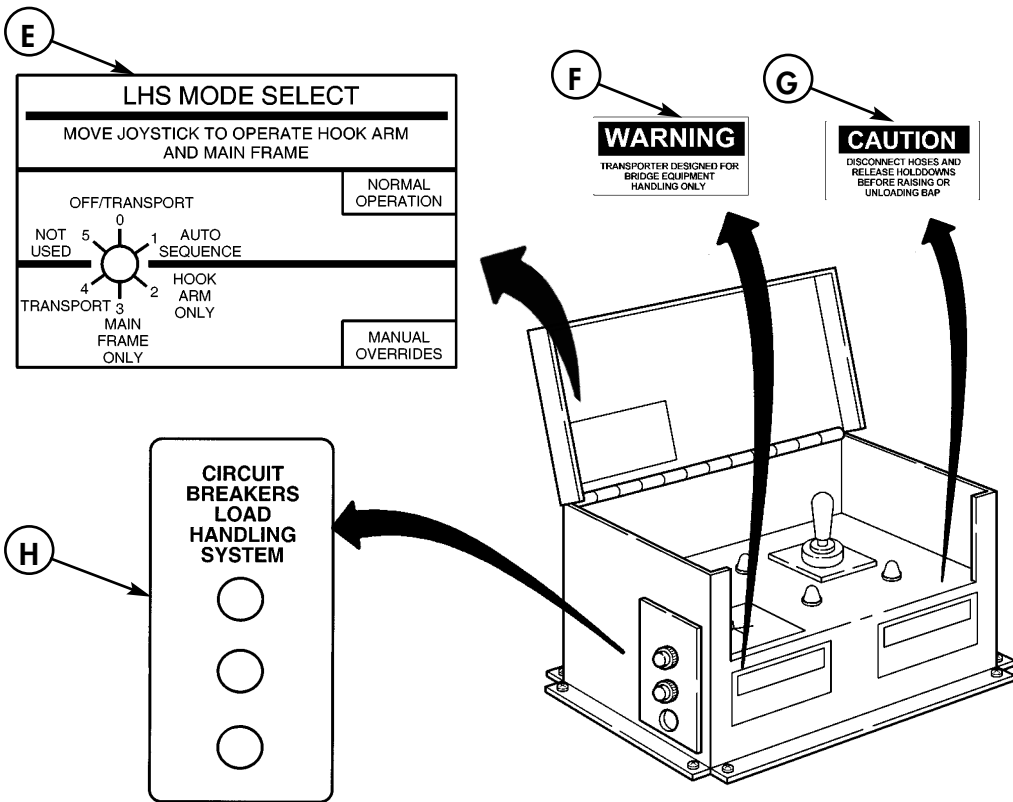
MULTILIFT DATA PLATE, LATE MODEL CBT

**EQUIPMENT DATA (Contd)**

**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**LHS DATA PLATES AND DECALS (Contd)**

- (E) LHS MODE SELECT** — This decal, located inside cab, on LHS control box cover, identifies LHS MODE SELECT switch with numbered functional mode positions and provides instructions for LHS operation.
- (F) WARNING (LHS function)** — This decal, located on side of LHS control box, warns not to use LHS for any function other than lifting palletized loads and bridge equipment.
- (G) CAUTION (disconnect/release before raising/unloading)** — This decal, located on side of LHS control box, cautions operator to ensure pallet and LHS hoses are disconnected and pallet hold-down bars are stowed prior to raising or unloading pallet.
- (H) CIRCUIT BREAKERS** — This decal, located inside cab on side of LHS control box, identifies LHS circuit breakers.



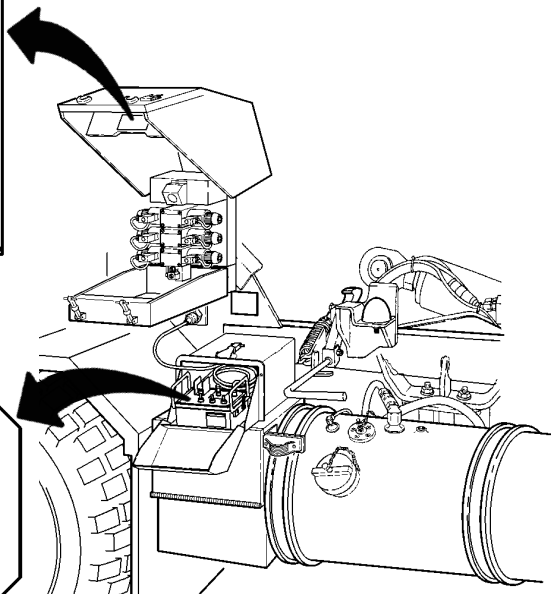
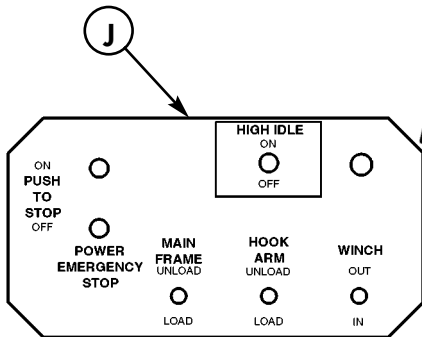
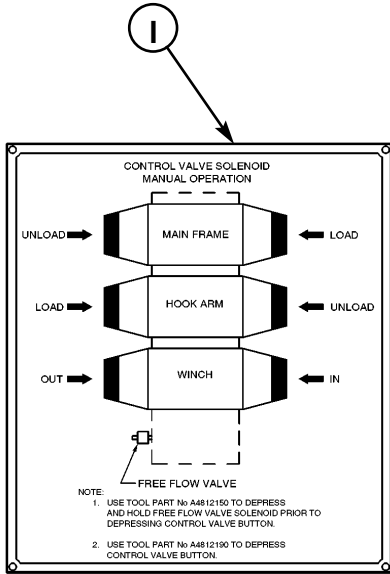
**LHS CONTROL BOX, EARLY MODEL CBT**

**EQUIPMENT DATA (Contd)**

**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**LHS DATA PLATES AND DECALS (Contd)**

- I CONTROL VALVE SOLENOID MANUAL OPERATION** — This data plate, located inside hydraulic manifold cover, identifies control valve buttons and free flow valve, and provides instructions for their manual operation, including use of free flow and solenoid tools.
- J REMOTE CONTROL UNIT (instructions)** — This decal, located on top of RCU, identifies switches and their functions for operation of LHS.

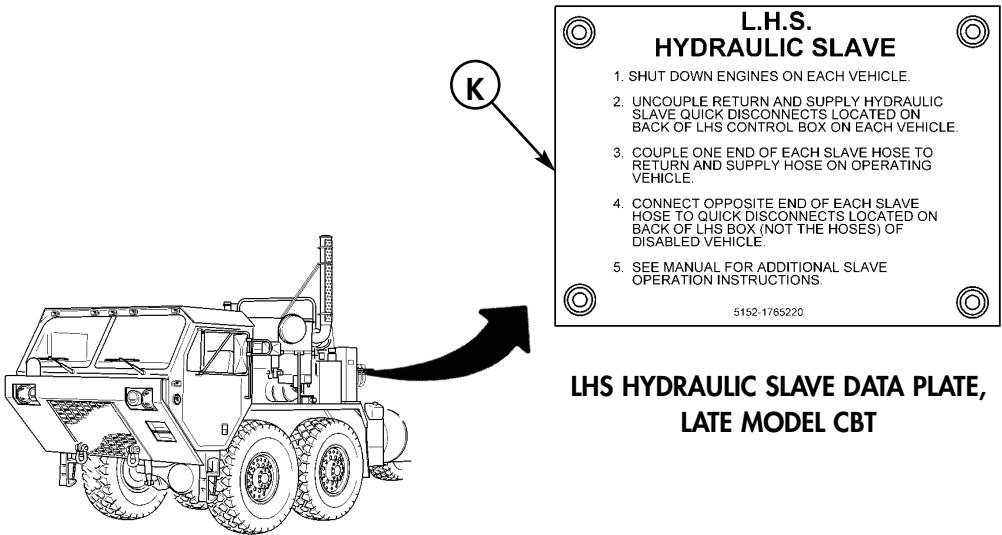


**EQUIPMENT DATA (Contd)**

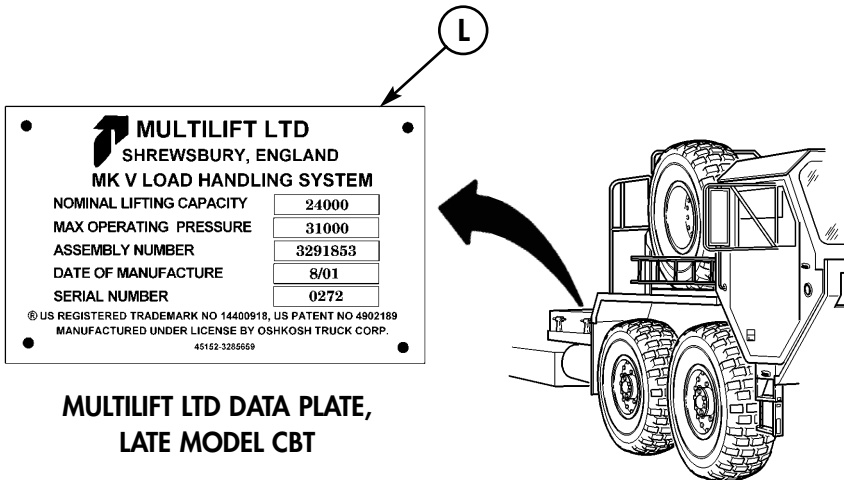
**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**LHS DATA PLATES AND DECALS (Contd)**

- (K) LHS HYDRAULIC SLAVE** — This data plate, located on side of LHS hydraulic control valve cabinet, identifies instructions for slave operation.
- (L) MULTILIFT LTD** — This data plate, located on LHS compression frame, near battery box, identifies lifting capacity, operating pressure, serial number, and or information pertaining to LHS.



**LHS HYDRAULIC SLAVE DATA PLATE,  
LATE MODEL CBT**



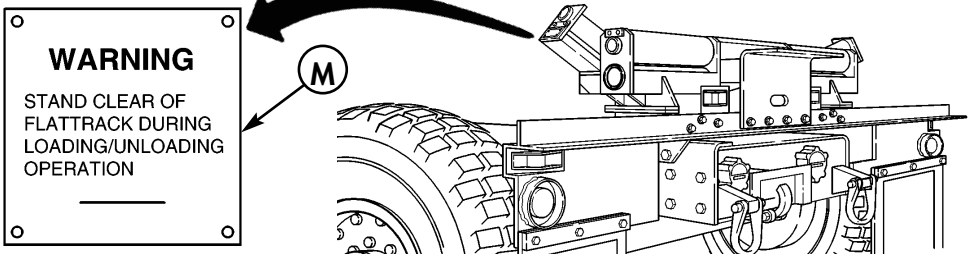
**MULTILIFT LTD DATA PLATE,  
LATE MODEL CBT**

**EQUIPMENT DATA (Contd)**

**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**LHS DATA PLATES AND DECALS (Contd)**

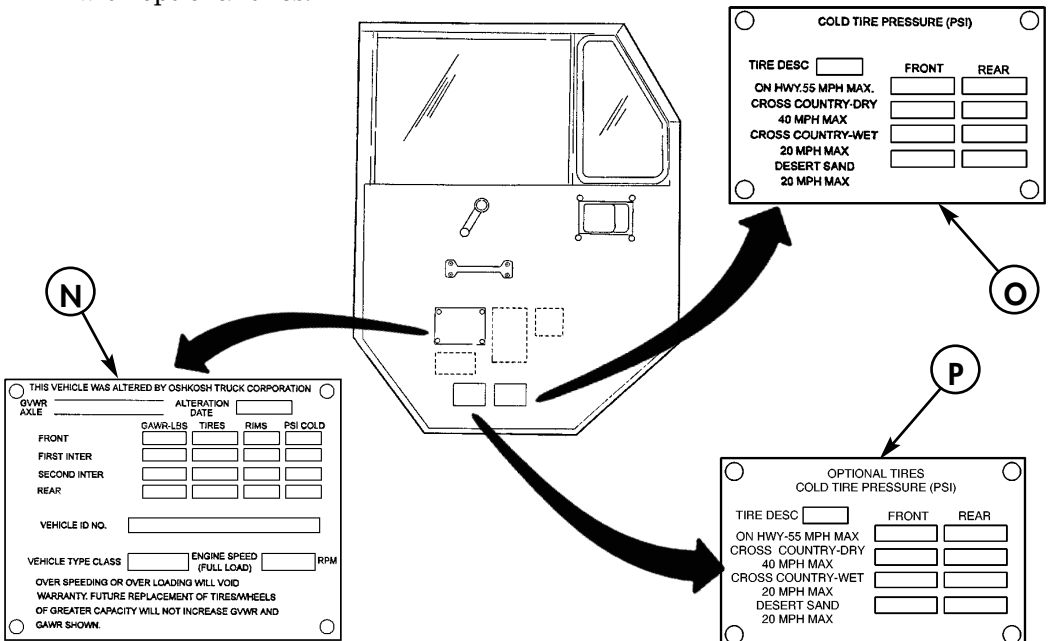
**(M) WARNING (flattrack)** — This data plate, located at each end of rear roller assembly, warns to stand clear of flattrack during loading and unloading operations.



**(N) VEHICLE IDENTIFICATION** — This data plate, located on driver's side door, is manufacturer's identification plate for CBT; it contains CVWR, alteration date, GAWR, tire data, vehicle ID no., type class, engine speed, and warranty information.

**(O) COLD TIRE PRESSURE (PSI)** — This data plate, located on driver's side door, identifies tire psi and maximum speeds for differing terrain.

**(P) OPTIONAL TIRES** — This data plate, located on driver's side door, identifies tire psi and maximum speeds for differing terrain when equipped with optional tires.

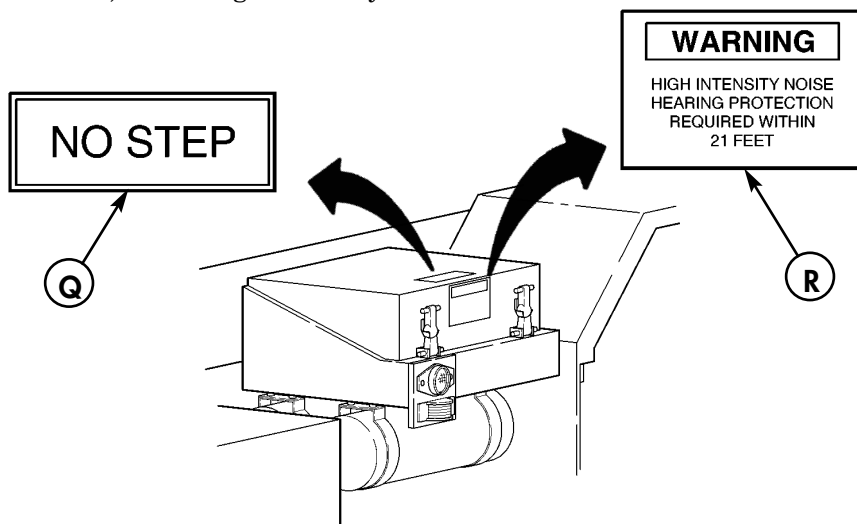


## EQUIPMENT DATA (Contd)

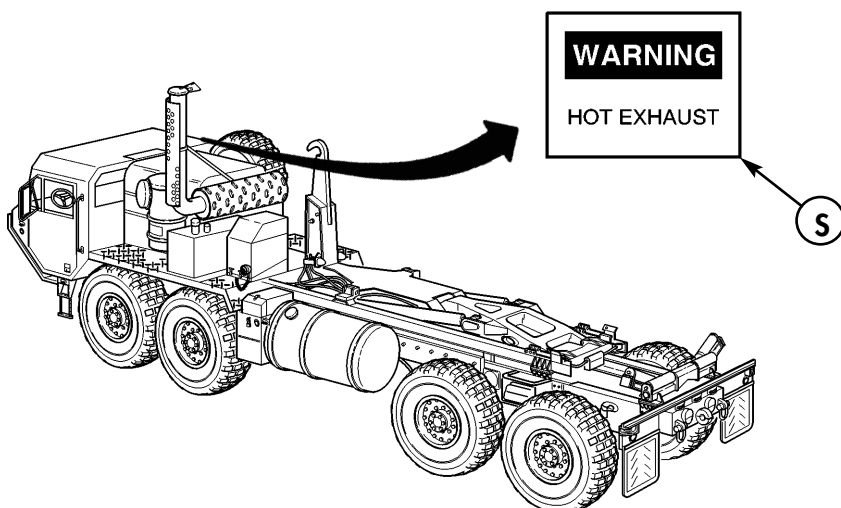
### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### PALLET DATA PLATES AND DECALS (Contd)

- Ⓚ **NO STEP** — This decal is located on top of battery box cover.
- Ⓜ **WARNING (hearing protection)** — This decal, located on battery box cover and engine air cleaner, is a warning requiring hearing protection within 21 ft of vehicle, due to high-intensity noise.



- Ⓢ **WARNING (hot exhaust)** — This decal is located on exhaust extension heat shield.



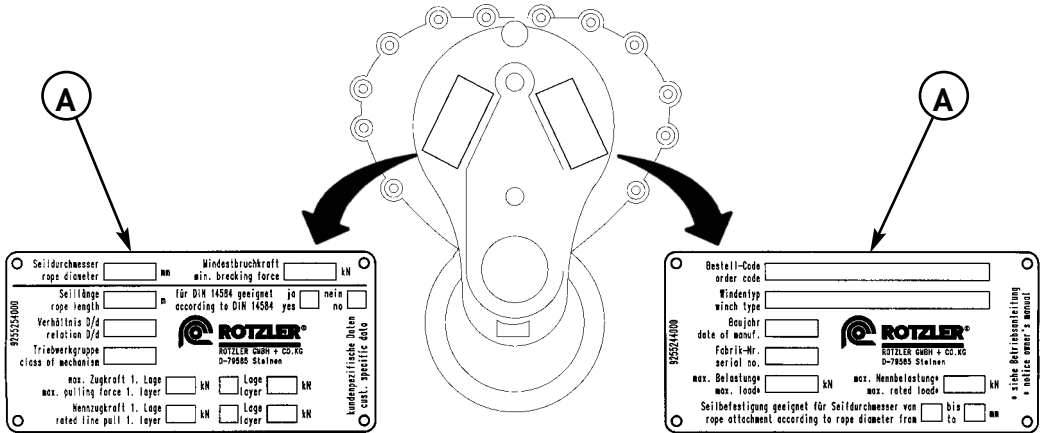


**EQUIPMENT DATA (Contd)**

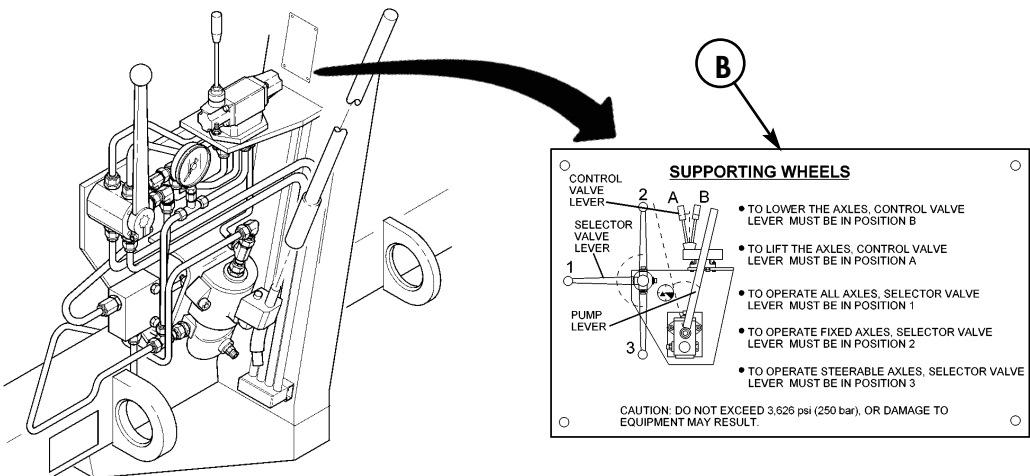
**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**PALLET DATA PLATES AND DECALS (Contd)**

- (A) ROTZLER** — The two data plates, located on side of winch assembly, containing the manufacturer’s identification, model no., serial no., and other information pertaining to the winch.



- (B) SUPPORTING WHEELS** — This decal, located on pallet frame, identifies control valve, selector valve, and pump operating positions for supporting wheels.

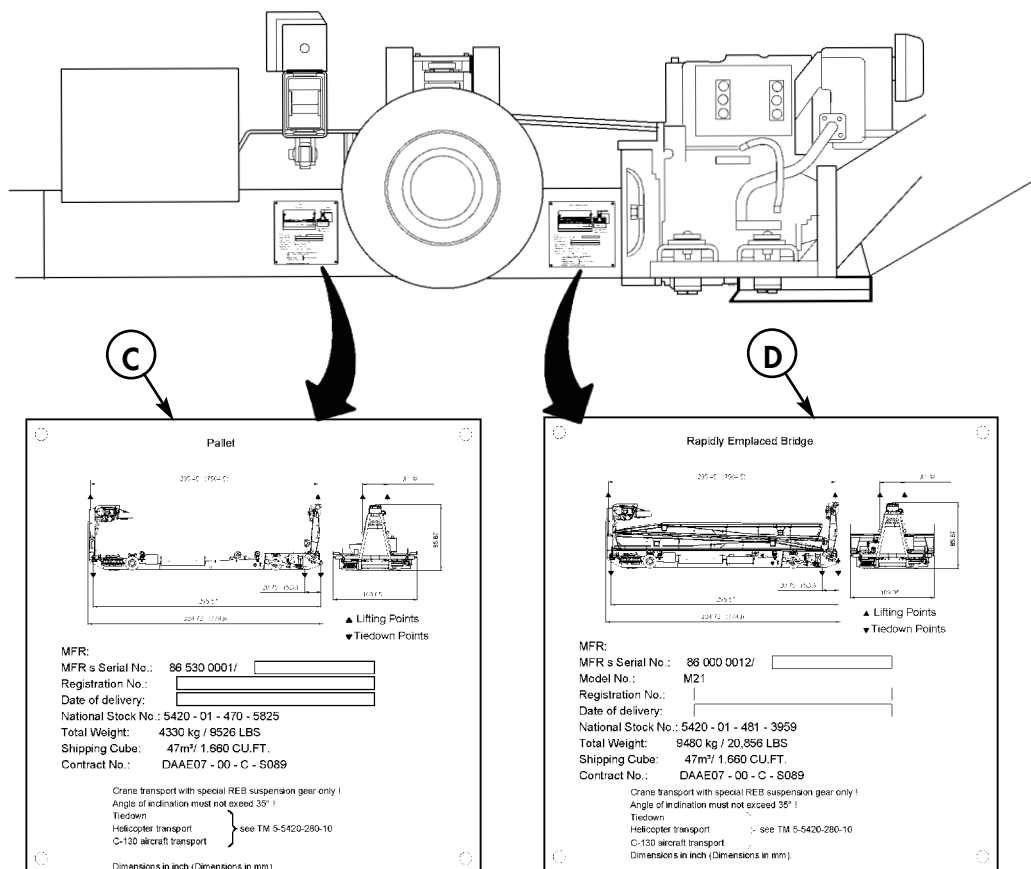


## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### PALLET DATA PLATES AND DECALS (Contd)

- C** **PALLET** — This data plate, located pallet on passenger’s side of pallet frame adjacent to right steering axle, is the manufacturer’s identification plate for pallet. It contains the serial no. and other information pertaining to pallet.
- D** **RAPIDLY EMPLACED BRIDGE** — This data plate, located on passenger side of pallet frame adjacent to right steering axle, is the manufacturer’s identification plate for REB. It contains REB serial number and other information pertaining to REB.

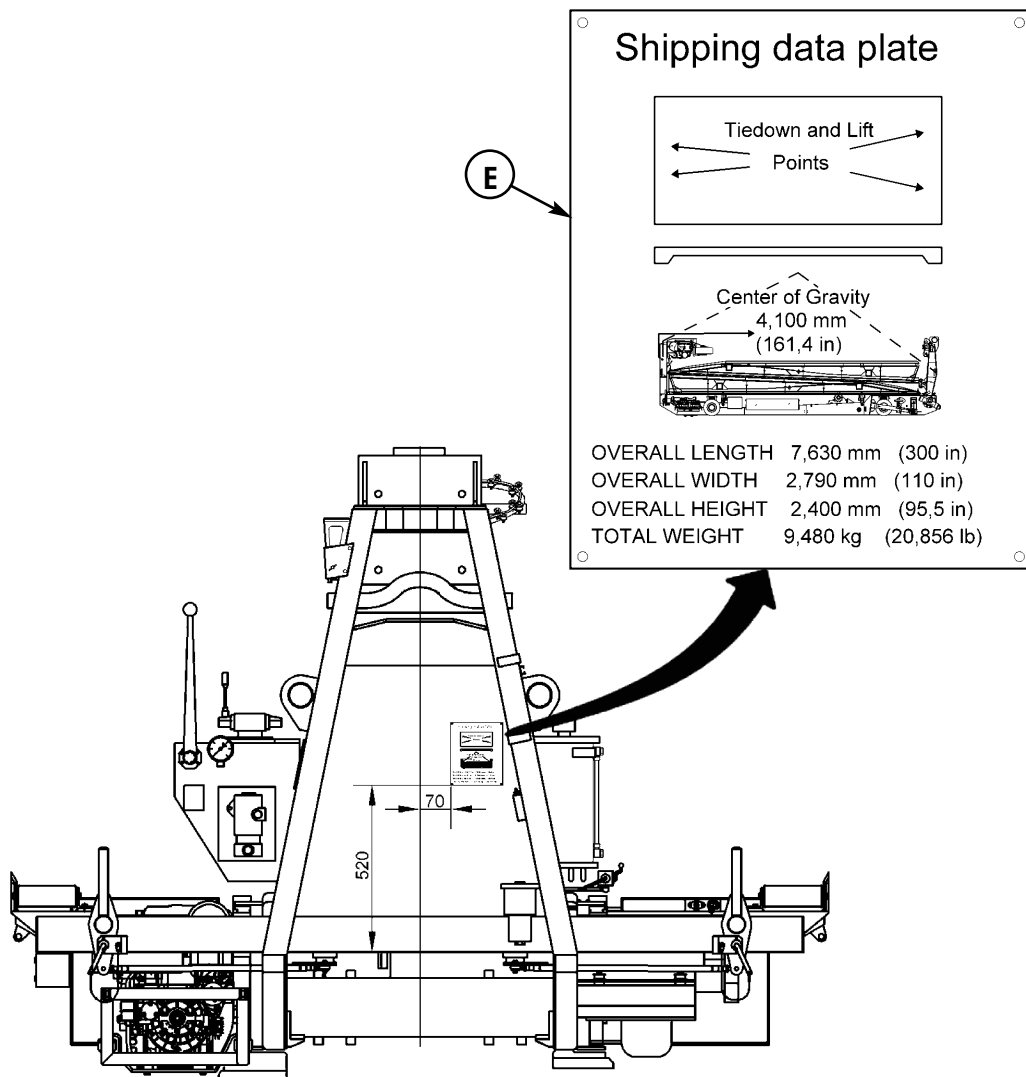


**EQUIPMENT DATA (Contd)**

**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**PALLET DATA PLATES AND DECALS (Contd)**

- (E) SHIPPING DATA PLATE** — This data plate, located on A-frame below the winch, identifies tiedown/lift points, center of gravity, dimensions, and total weight of REB for shipping purposes.

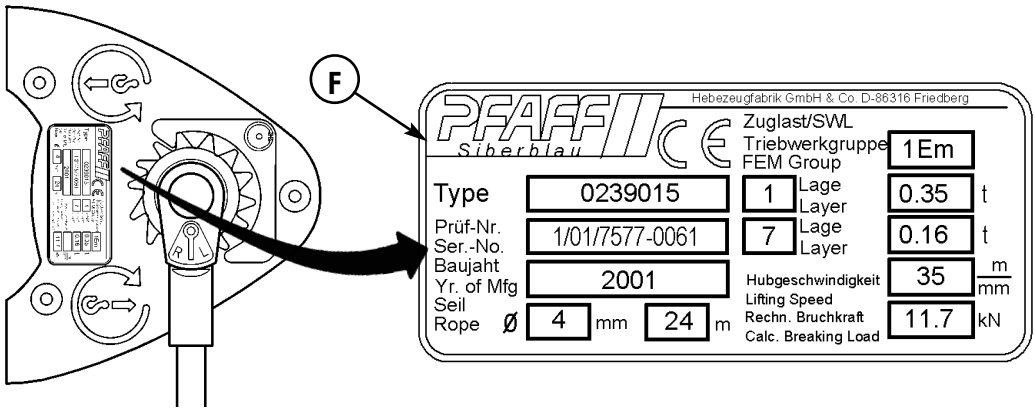


**EQUIPMENT DATA (Contd)**

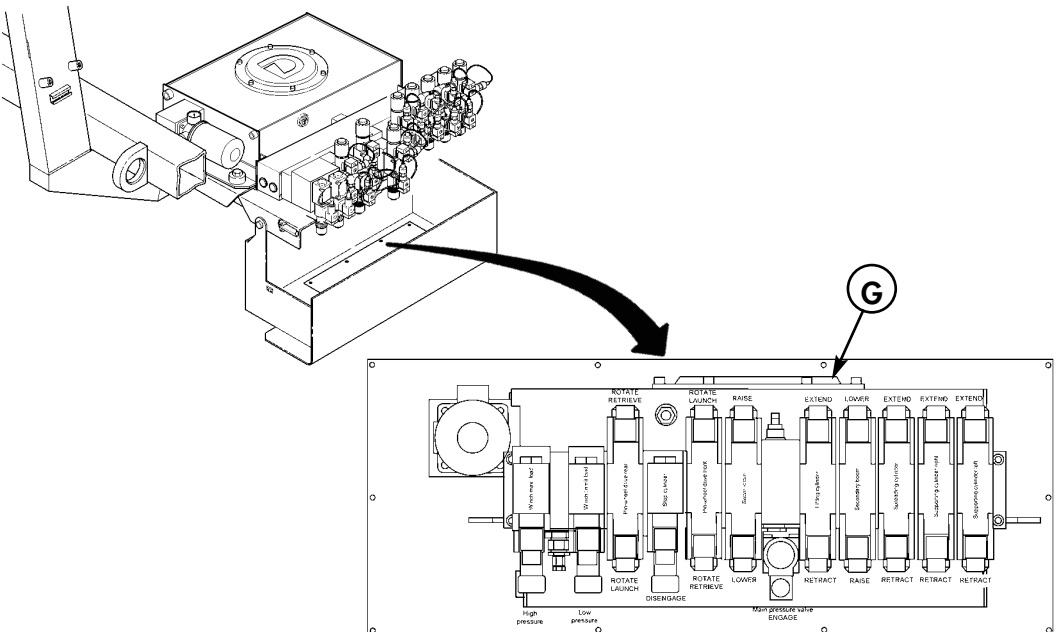
**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**PALLET DATA PLATES AND DECALS (Contd)**

- F** **PFAFF** — This decal, located on side of supporting cylinder hand-operated winch, identifies manufacturer’s data for winch.



- G** **CONTROL VALVE DIAGRAM** — This decal, located inside control valve cover, identifies each hydraulic control valve by solenoid code and number.

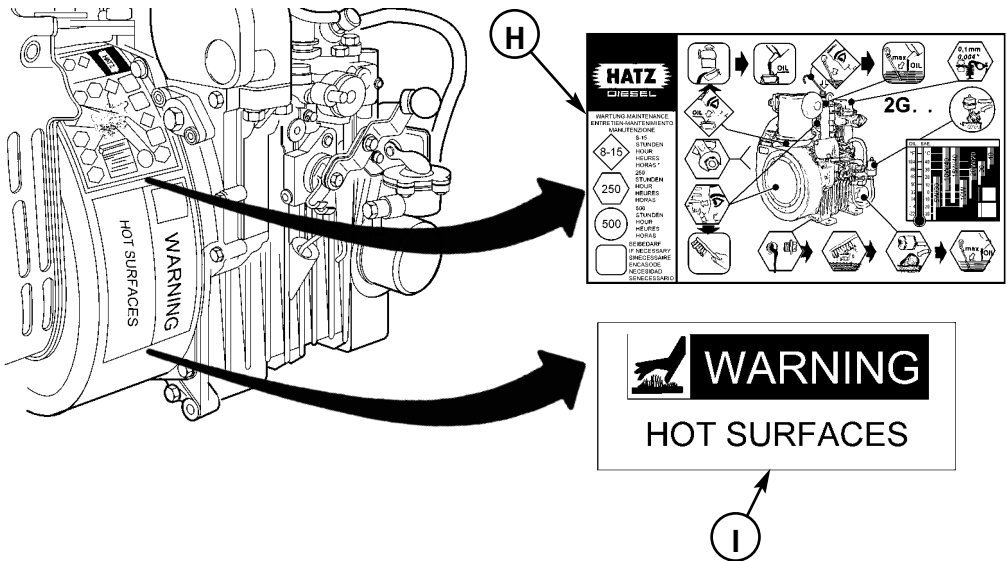


**EQUIPMENT DATA (Contd)**

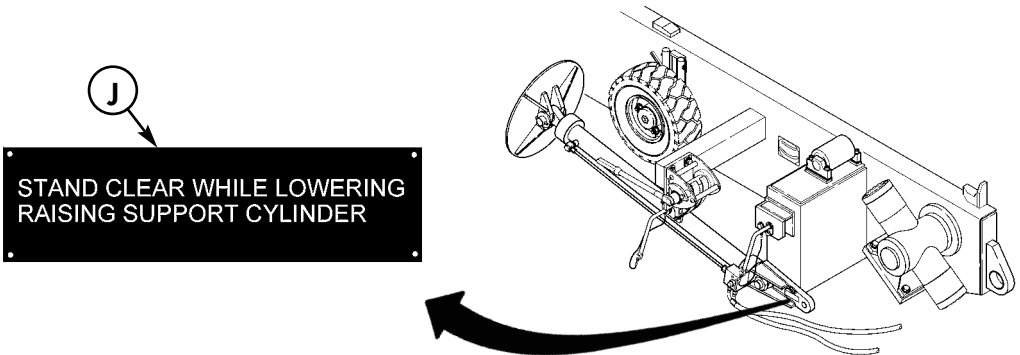
**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**PALLET DATA PLATES AND DECALS (Contd)**

- (H) HATZ DIESEL** — This decal, located on LPU engine flywheel cover, identifies maintenance intervals for HATZ engine.
- (I) WARNING (hot surfaces)** — This decal, located on LPU engine flywheel cover, warns operator to potential hot surfaces of engine.



- (J) STAND CLEAR WHILE LOWERING/RAISING SUPPORT CYLINDER** — This decal, located on each pallet supporting cylinder, alerts operator to stay clear of path the support cylinder travels while manually lowered or raised into position.

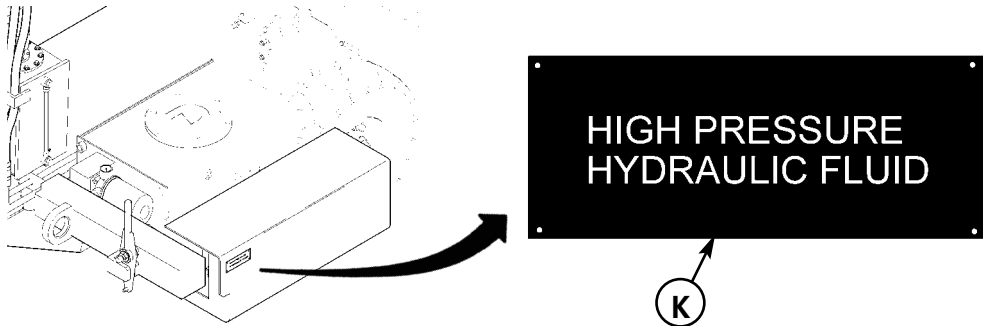


## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### PALLET DATA PLATES AND DECALS (Contd)

- (K) HIGH PRESSURE HYDRAULIC FLUID** — This data plate, located on pallet control valve cover, alerts operator to use caution when operating hydraulic system and when disconnecting or connecting pallet hydraulic hoses.

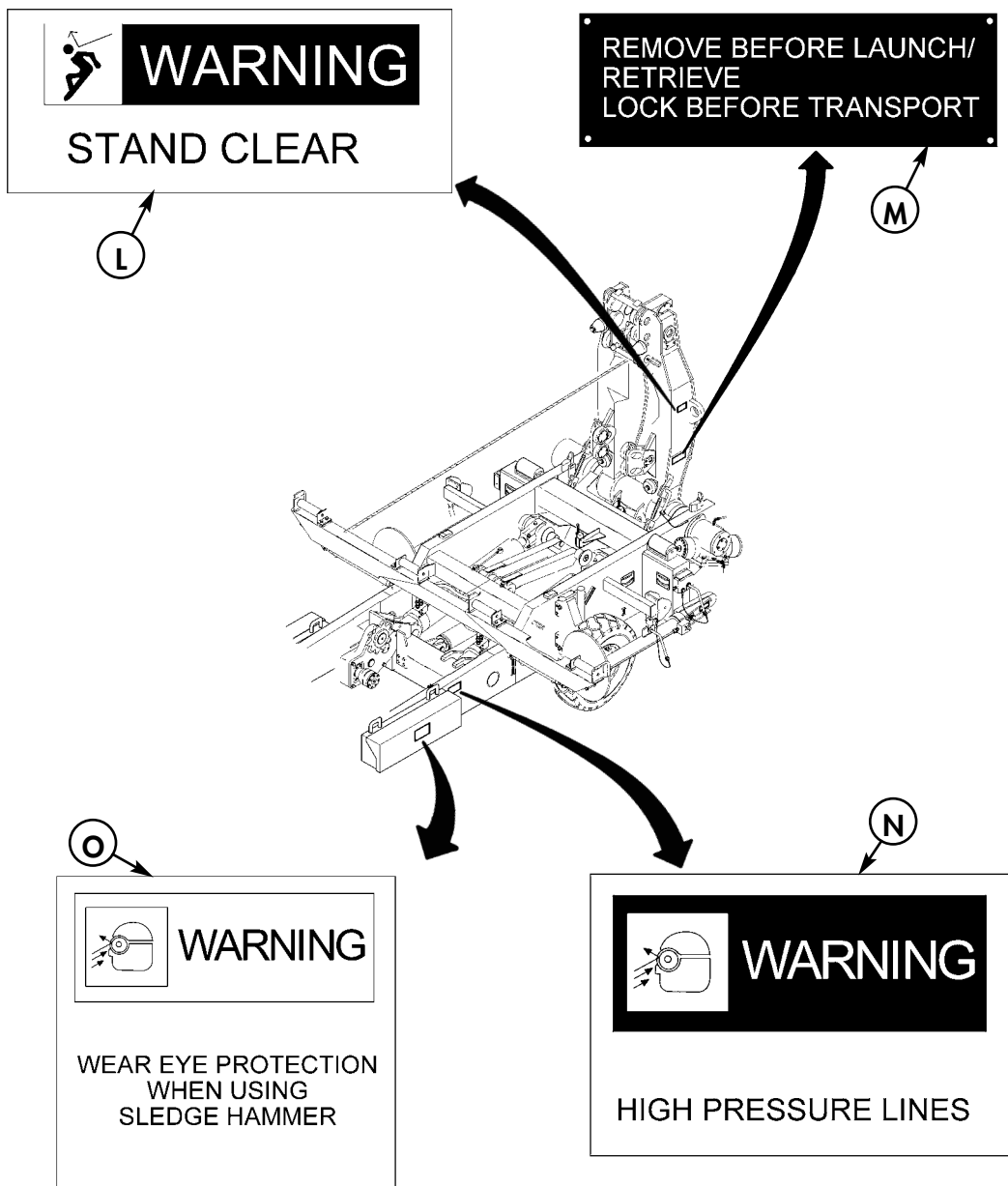


- (L) WARNING (stand clear)** — This decal, located on side of pallet launch boom, warns operators to stand clear of area behind launch boom during launch and retrieval.
- (M) REMOVE BEFORE LAUNCH/RETRIEVE, LOCK BEFORE TRANSPORT** — This data plate, located on side of pallet launch boom, is a reminder to ensure launch boom lock retaining pins are removed before launch or retrieval, and installed before transport.
- (N) WARNING (high pressure lines)** — This decal, located on side of pallet frame adjacent to anchorage stowage box, warns operator and maintenance personnel to avoid contact with hydraulic lines. Eye protection should be worn when disconnecting any hydraulic hose or tube.
- (O) WARNING (wear eye protection)** — This decal, located on each anchorage stowage box, alerts operator to wear eye protection when using BII sledge hammer to install anchoring pins.

**EQUIPMENT DATA (Contd)**

**LOCATION AND DESCRIPTION OF DATA PLATES (Contd)**

**PALLET DATA PLATES AND DECALS (Contd)**

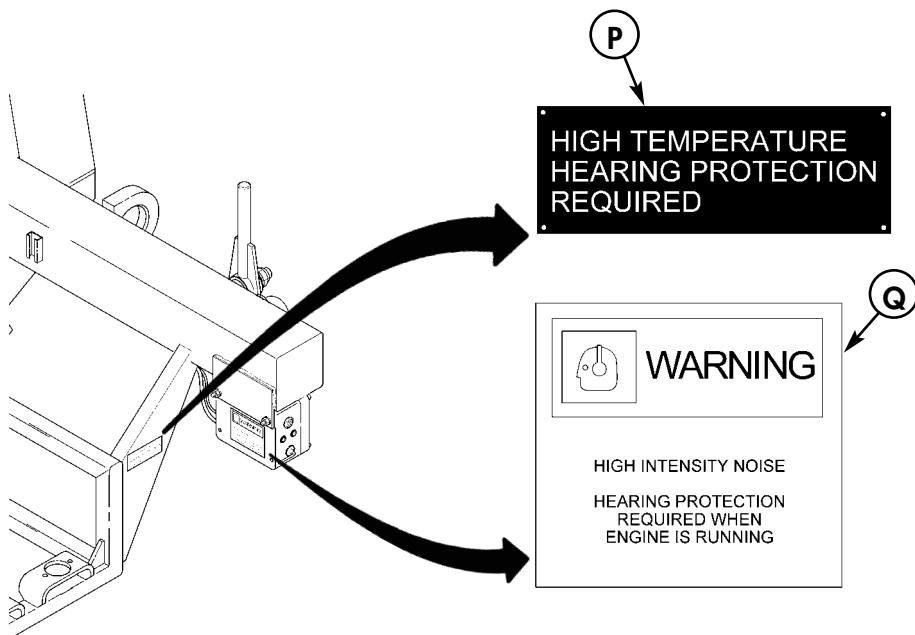


## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### PALLET DATA PLATES AND DECALS (Contd)

- P** **HIGH TEMPERATURE HEARING PROTECTION REQUIRED** — This data plate, located on LPU support, reminds operator of hot engine components and the requirement to wear hearing protection when running LPU engine.
- Q** **WARNING (high intensity noise)** — This decal, located on side of LPU control box, alerts operator to the requirement to wear hearing protection when LPU engine is running.



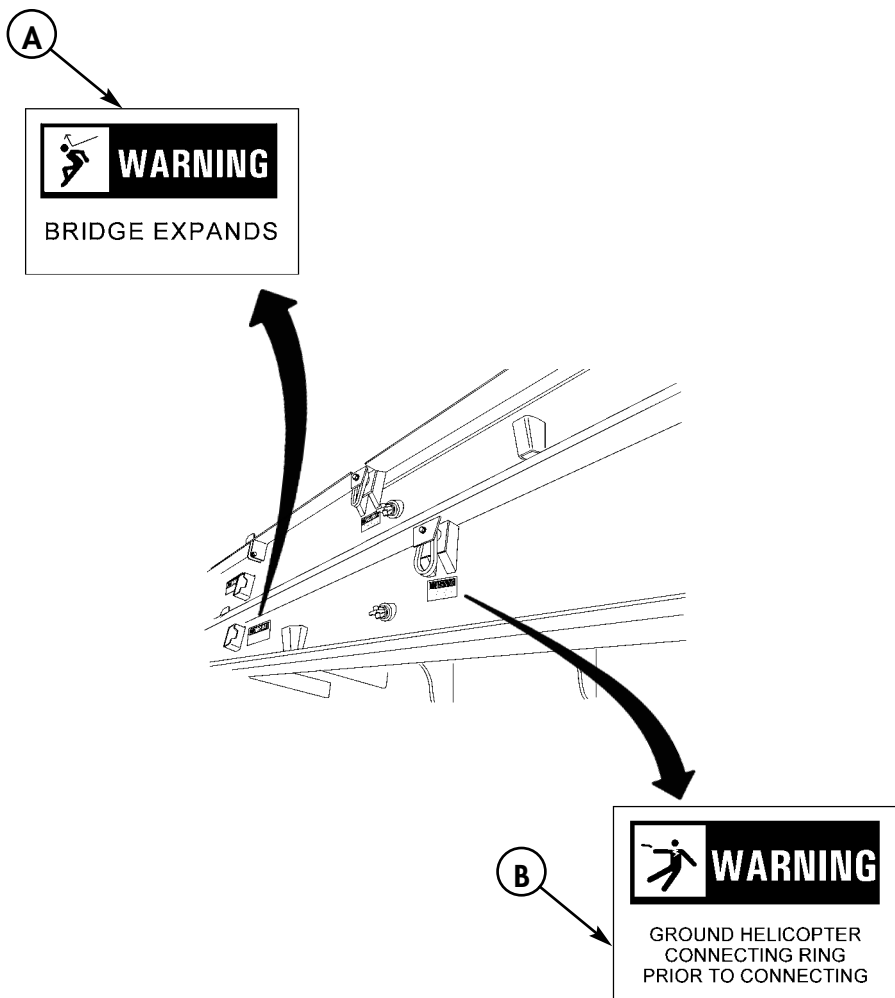


## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### BRIDGE DATA PLATES AND DECALS (Contd)

- (A) **WARNING (bridge expands)** — This decal, located on side of each bridge, alerts operator to keep clear when extending bridge halves to operating width.
- (B) **WARNING (Ground helicopter connecting ring)** — This decal, located on side of each bridge quarter directly below helicopter lifting ring, alerts operator to ensure helicopter connecting ring has been grounded prior to connecting/disconnecting.

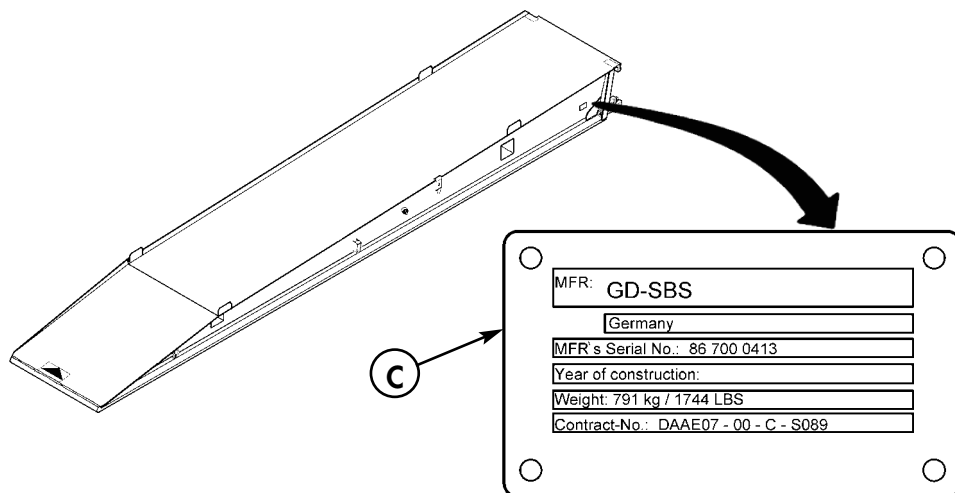


## EQUIPMENT DATA (Contd)

### LOCATION AND DESCRIPTION OF DATA PLATES (Contd)

#### BRIDGE DATA PLATES AND DECALS (Contd)

- Ⓒ **RAPIDLY EMPLACED BRIDGE (REB)** — This data plate, located on side of bridge quarter near lower coupling, is the manufacturer's identification data plate for each bridge quarter.



END OF WORK PACKAGE

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# GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## THEORY OF OPERATION

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### GENERAL

This section explains how components of the REB and CBT work. Functional descriptions of the CBT, pallet, and bridge components and their operation are covered in the following paragraphs.

### FUNCTION OF THE COMMON BRIDGE TRANSPORTER (CBT)

The transporter functions to load/unload and transport the pallet with or without the bridge to and from launch sites, and can also provide emergency back-up hydraulic and electric power to the pallet for bridge launch/retrieval operations. The CBT is a HEMTT equipped with a Load Handling System (LHS). The LHS hydraulic system is powered by way of a PTO-driven pump on the CBT transmission. Control valves within the LHS hydraulic system direct the flow of hydraulic oil to the LHS lift cylinders. A cab-mounted control box and a hand-held Remote Control Unit (RCU) are used to operate the solenoid-actuated control valves necessary for LHS operation. To power the pallet using CBT, the LHS hydraulic hoses are disconnected from the CBT, and the pallet's hydraulic hoses are then connected to the CBT hydraulic pump by way of quick-disconnects. The CBT's slave power cable is connected to North Atlantic Treaty Organization (NATO) slave receptacles on the pallet and CBT.

### FUNCTION OF THE CBT LOAD HANDLING SYSTEM (LHS)

The CBT's LHS is utilized to load and carry the REB pallet (with or without bridge) in the same way it is used for the M1 Flat Rack, M15 Bridge Adapter Pallet (BAP), and M14 Improved Boat Cradle (IBC). The LHS is permanently mounted on the HEMTT frame and contains a lifting arm that is hydraulically raised and lowered by way of the CBT hydraulic and electrical systems. Only the pallet can be carried on the LHS; the bridge or bridge halves alone are not designed to interface with the LHS.

### FUNCTION OF THE PALLET

The Pallet is the launching mechanism and transport frame for the bridge. The Pallet's launcher mechanism couples the two bridge halves together and emplaces them to the ground. Launch and retrieval of the bridge is performed while the pallet is on the CBT only. The pallet has two supporting cylinders that assist in supporting the weight of the bridge on the CBT during launch and retrieval operations. The bridge is intended to be transported on the pallet by the CBT, although once coupled and emplaced, the bridge can be lifted, transported, and emplaced by helicopter. The pallet is designed to be transported on the CBT or the

## THEORY OF OPERATION (Contd)

### FUNCTION OF THE PALLET (Contd)

Palletized Load System Trailer (PLST). The pallet is transloaded from the CBT to the PLST using the CBT LHS. The pallet can be maneuvered on the ground by its own support wheels and steering system. The pallet has a self-contained hydraulic and electrical system powered by a small diesel engine called the Launch Power Unit (LPU).

### FUNCTION OF THE PALLET LAUNCHER MECHANISM

The launcher mechanism is part of the pallet, and is made up of five major components that work together to couple, extend, and emplace the bridge as follows:

- (1) The launch boom functions to hold the bridge by its launch beam during launch and retrieval. The launch boom contains a number of upper and lower support rollers, a pinwheel drive unit, and a brake, which together support and propel the bridge as it is extended and emplaced.
- (2) The lower support boom functions to lift the launch boom under the weight of the bridge as the bridge is coupled, extended, and emplaced. Two large hydraulic cylinders connected to the lower support boom provide the necessary force.
- (3) The pinwheel drive units function to drive and retain the bridge, by means of the bridge launch beam, during launch and retrieval. The gear on each pinwheel drive unit is designed to engage with pins on the bridge launch beam to move the bridge. A hydraulic cylinder, mounted adjacent to the rear pinwheel drive unit, holds the bridge by means of end stop brackets mounted on the bridge launch beam.
- (4) The secondary boom functions to lower the upper bridge half during coupling and lifts the upper bridge half during uncoupling. Two rollers on the secondary boom keep the upper bridge half centered with the lower bridge half for alignment during coupling.
- (5) The winch functions to lower the ramp end of the upper bridge half by its launch beam prior to coupling, and takes control of the bridge after coupling by lowering the bridge to the ground.

### HOW THE BRIDGE IS EMPLACED

In order to launch the bridge, the CBT is positioned on the shore, supporting cylinders are lowered, and the LPU is started. A hand held remote control unit (RCU) is used to operate the pallet launcher mechanism. Within the RCU is an electronic Stored Program System (SPS) containing 22 functional steps required to expand, couple, extend, and emplace the bridge. Each functional step is initiated by the operator and is carried out either automatically by the SPS or manually by the operator. Essentially, the two bridge halves are first expanded to roadway width. Then the lower bridge half is driven out to the rear by the pallet's pinwheel drive units. The upper bridge half is lowered and positioned so that the lower couplings of

## **THEORY OF OPERATION (Contd)**

### **HOW THE BRIDGE IS EMPLACED (Contd)**

both bridge halves are engaged. Then the lower bridge half is tilted toward the upper bridge half until the upper couplings on both bridge halves lock. The coupled bridge is then driven to the rear until the entire length of the bridge is extended over gap (river, gully, or ditch) to be crossed. The pallet launch boom and lower support boom lower far shore end of bridge to ground, and the pallet winch lowers near shore end to ground. Bridge retrieval is performed basically in reverse order.

**END OF WORK PACKAGE**



## CHAPTER 2

### OPERATOR INSTRUCTIONS RAPIDLY EMPLACED BRIDGE (REB)

Description and Use of Operator's Controls and Indicators .....	0005 00
Common Bridge Transporter (CBT) Load Handling System (LHS) Controls and Indicators .....	0006 00
Pallet Controls and Indicators .....	0007 00
Bridge Controls and Indicators .....	0008 00
Location of Basic Issue Item (BII), Components of End Item (COEI), and Additional Authorization List (AAL) Items .....	0009 00
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Unloading Pallet to Ground .....	0014 00
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Deployment by Helicopter .....	0017 00
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Bridge Retrieval .....	0020 00

## CHAPTER 2 (Contd)

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Operation of CBT Back-up Power for Bridge Launch or Retrieval .....	0026 00
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Manually Bypassing Solenoid During Electric Power Loss .....	0030 00
Manually Removing Load During LHS Hydraulic Power Loss .....	0031 00
Preparation for Emergency Manual Removal of Pallet from CBT .....	0032 00
Operation of Special Purpose Kits .....	0033 00



## **OPERATOR INSTRUCTIONS**

**RAPIDLY EMPLACED BRIDGE (REB)**

**NSN 5420-01-481-3959 P/N 12480471**

### **DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS**

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#### **GENERAL**

The following three work packages locate and describe the controls and indicators of the CBT, pallet, and bridge. It is important to learn the name, location, and function of all controls and indicators before attempting to operate the equipment.

#### **PREPARATION FOR USE**

When a REB is received by the using organization, it is the responsibility of the gaining unit to determine whether it has been properly prepared for service by the supplier. It is the responsibility of the officer-in-charge to ensure the bridge is in condition to perform its functions. Maintenance personnel will provide any additional service required to bring the bridge to operating standards. Before using the equipment, the operator must become familiar with the controls and indicators as described in WP 0006 00 through WP 0009 00.

**END OF WORK PACKAGE**



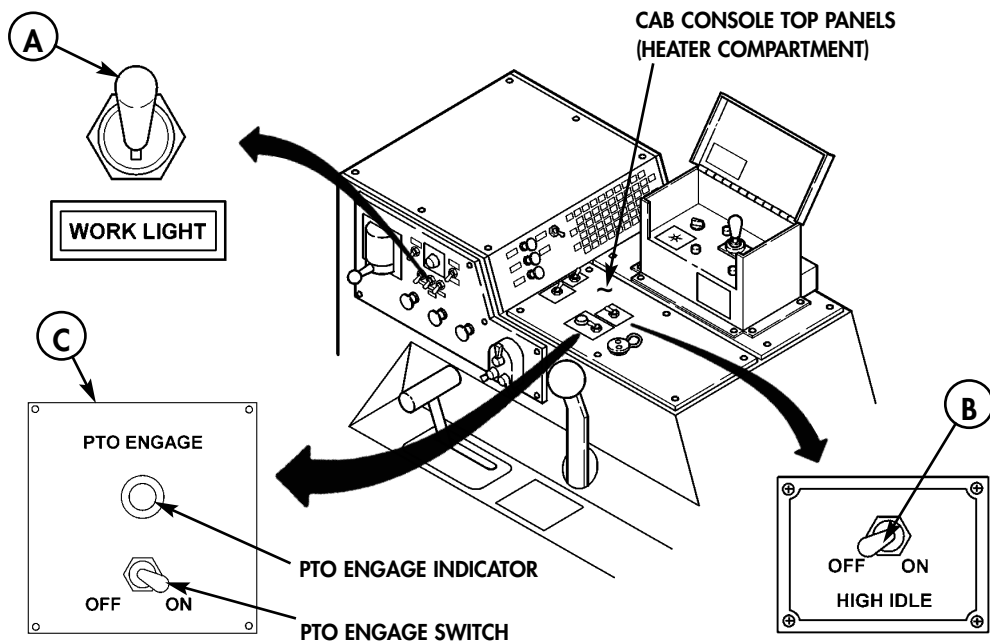
## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS

- (A) WORK LIGHT SWITCH** — There is a WORK LIGHT switch located on side panel to the right of DOMELIGHT switch. Placing WORKLIGHT switch in UP position turns on the work light at the LHS main frame and hand-held spotlight at control valve cabinet.
- (B) HIGH IDLE SWITCH** — There is a HIGH IDLE switch on top panel of cab console (heater compartment), adjacent to PTO ENGAGE switch and indicator. The HIGH IDLE switch is placed in the ON position after PTO is engaged to increase engine idle speed to 1,200 rpm; this is necessary to raise pump hydraulic pressure for LHS operation.
- (C) PTO ENGAGE SWITCH AND INDICATOR** — There is a PTO switch and indicator located on the top panels of cab console (heater compartment) adjacent to HIGH IDLE switch. Prior to operation of LHS, HIGH IDLE switch is left in OFF position with vehicle engine running, and PTO is engaged by moving this switch to ON position. The PTO ENGAGE INDICATOR will light when PTO ENGAGE switch is in ON position.



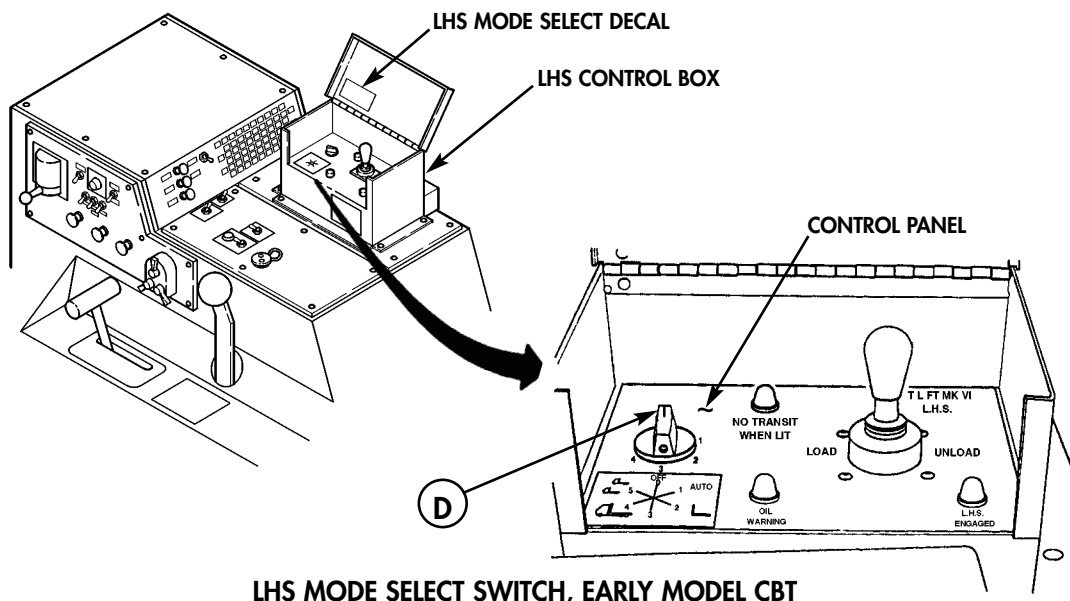
## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

- D LHS MODE SELECT SWITCH** — There is a six-position rotary switch located on LHS cab control box panel on early model CBTs or on transmission range selector panel on late model CBTs. This switch is used to select desired functional mode for LHS operation. The six functional mode positions are indicated on LHS MODE SELECT and cab control panel decals. The knob on LHS MODE SELECT switch is turned to change modes. The switch positions and functions are numbered, and modes are as follows:

### NOTE

The LHS Mode Select switch positions and functions for early model CBTs are listed below.

- 0 OFF/TRANSPORT** — LHS is not operational.
- 1 AUTO SEQUENCE** — Provides automatic operation of LHS during NATO flatrack retrieval.
- 2 HOOK ARM ONLY** — Places hook arm in manual mode for moving hook arm if AUTO mode electric circuit is malfunctioning.
- 3 MAIN FRAME ONLY** — Places main frame in manual mode for moving main frame if AUTO mode electric circuit is malfunctioning.
- 4 TRANSPORT** — Provides for safe travel when AUTO mode electric circuit has failed and HOOK ARM ONLY and MAIN FRAME ONLY positions are being used.
- 5 NOT USED** — Not used.



LHS MODE SELECT SWITCH, EARLY MODEL CBT

## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

### NOTE

The LHS Mode Select switch positions and functions for late model CBTs are listed below.

**OFF** — LHS is not operational.

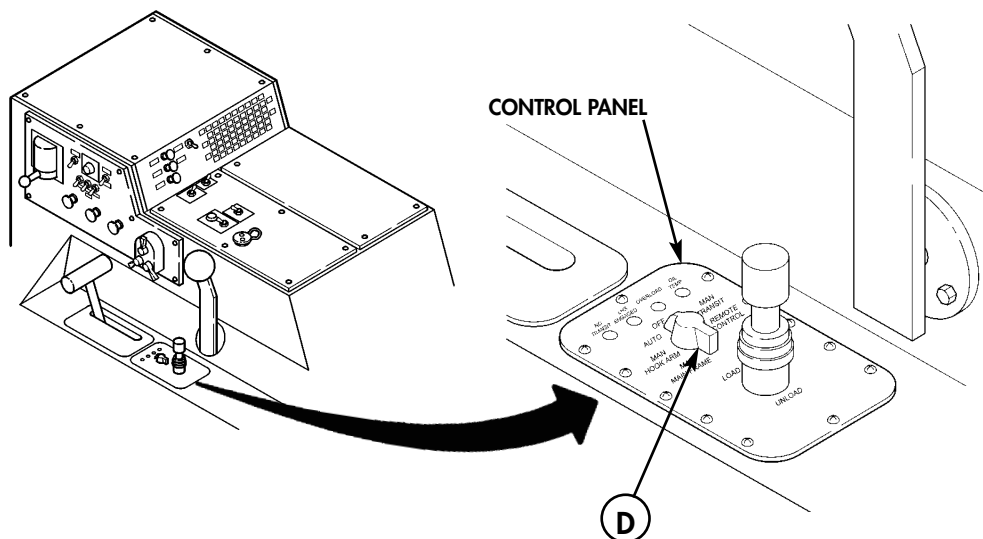
**MAN TRANSIT** — Provides for safe travel when AUTO mode electric circuit has failed and HOOK ARM ONLY and MAIN FRAME ONLY positions are being used.

**REMOTE CONTROL** — Activates hand-held LHS remote control unit.

**MAN MAIN FRAME** — Places main frame in manual mode for moving main frame if AUTO mode electric circuit is malfunctioning.

**MAN HOOK ARM** — Places hook arm in the manual mode for moving hook arm if AUTO mode electric circuit is malfunctioning.

**AUTO** — Provides automatic operation of LHS during NATO flatrack retrieval.



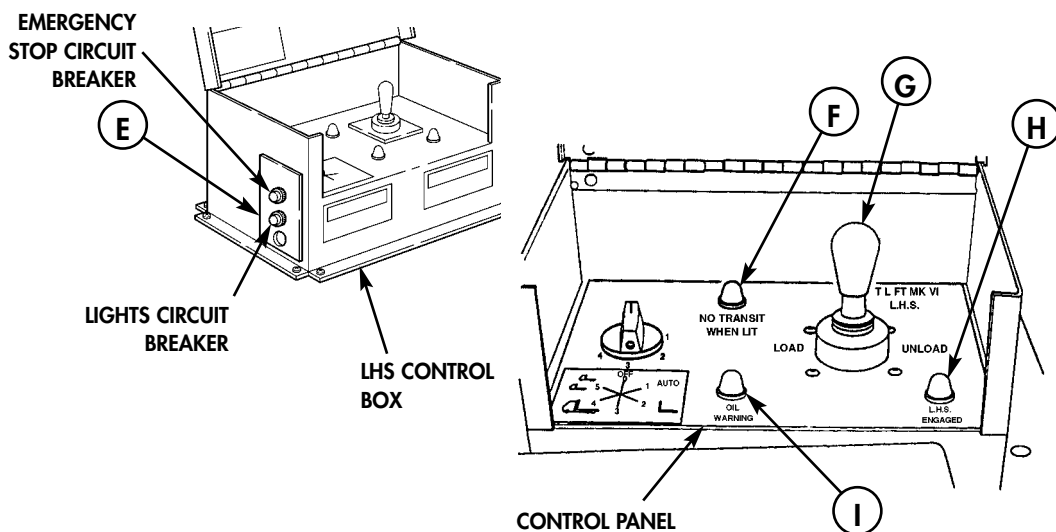
LHS MODE SELECT SWITCH, LATE MODEL CBT

## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

### NOTE

LHS control panel joystick and indicators for early model CBTs are listed below.

- (E) **LHS CIRCUIT BREAKERS** — There are two circuit breakers located on the left side of LHS cab control box on early model CBTs only. The top circuit breaker is an emergency stop that shuts off electrical power to LHS control box. The bottom circuit breaker shuts off electrical power to lights. Reset either circuit breaker by depressing circuit breaker button.
- (F) **NO TRANSIT WHEN LIT INDICATOR** — The indicator on control panel of LHS cab control box that will light when hook arm is not in the completely stowed position. When NO TRANSIT WHEN LIT indicator is lit, CBT should not be driven except to facilitate loading in immediate loading area.
- (G) **JOYSTICK** — There is a single axis joystick adjacent to LHS MODE SELECT switch on LHS cab control box. Move joystick to right or left of center to control movement of LHS components. The function controlled is determined by LHS MODE SELECT switch.
- (H) **LHS ENGAGED INDICATOR** — The indicator on the control panel of LHS cab control box that will light when joystick is used to operate LHS components. This light indicates that pressure to hydraulic system is adequate for LHS operation.
- (I) **OIL WARNING INDICATOR** — The indicator on the control panel that will remain off during normal operation, and will light if LHS hydraulic oil temperature exceeds limits.



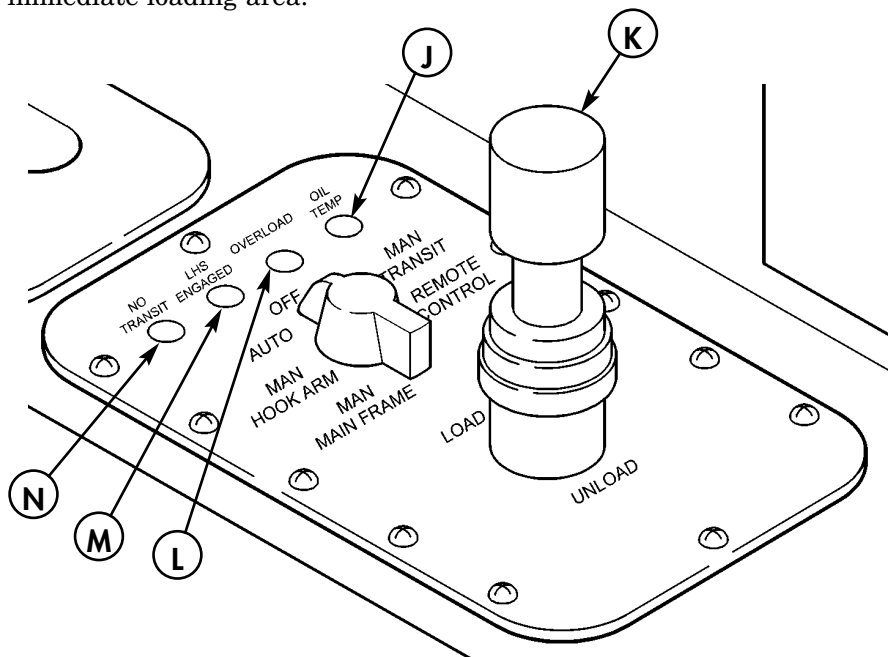
LHS CONTROL PANEL JOYSTICK AND INDICATORS, EARLY MODEL CBT

## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

### NOTE

LHS control panel joystick and indicators for early model CBTs are listed below.

- J OIL TEMP INDICATOR** — The indicator on the LHS control panel that will remain off during normal operation, and will light if LHS hydraulic oil temperature exceeds limits.
- K JOYSTICK** — There is a single axis joystick below LHS MODE SELECT switch on LHS control panel. Move joystick to right or left of center to control movement of LHS components. The function controlled is determined by LHS MODE SELECT switch.
- L OVERLOAD** — The indicator on LHS control panel on late model CBTs only that will light if lifting capacity of LHS is exceeded during LHS operation.
- M LHS ENGAGED INDICATOR** — The indicator on the LHS control panel that will light when joystick is used to operate LHS components. This light indicates that pressure to hydraulic system is adequate for LHS operation.
- N NO TRANSIT** — The indicator on LHS control panel that will light when hook arm is not in the completely stowed position. When NO TRANSIT indicator is lit, CBT should not be driven except to facilitate loading in immediate loading area.



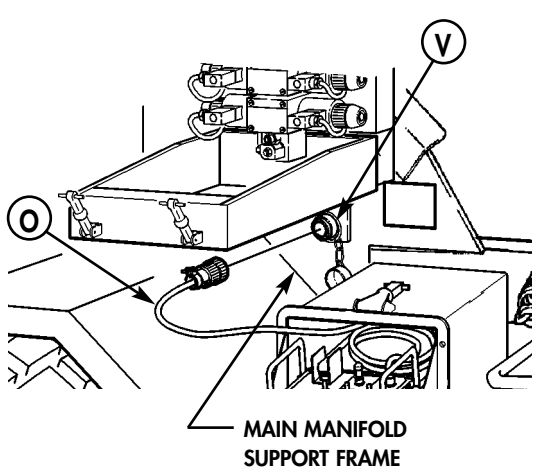
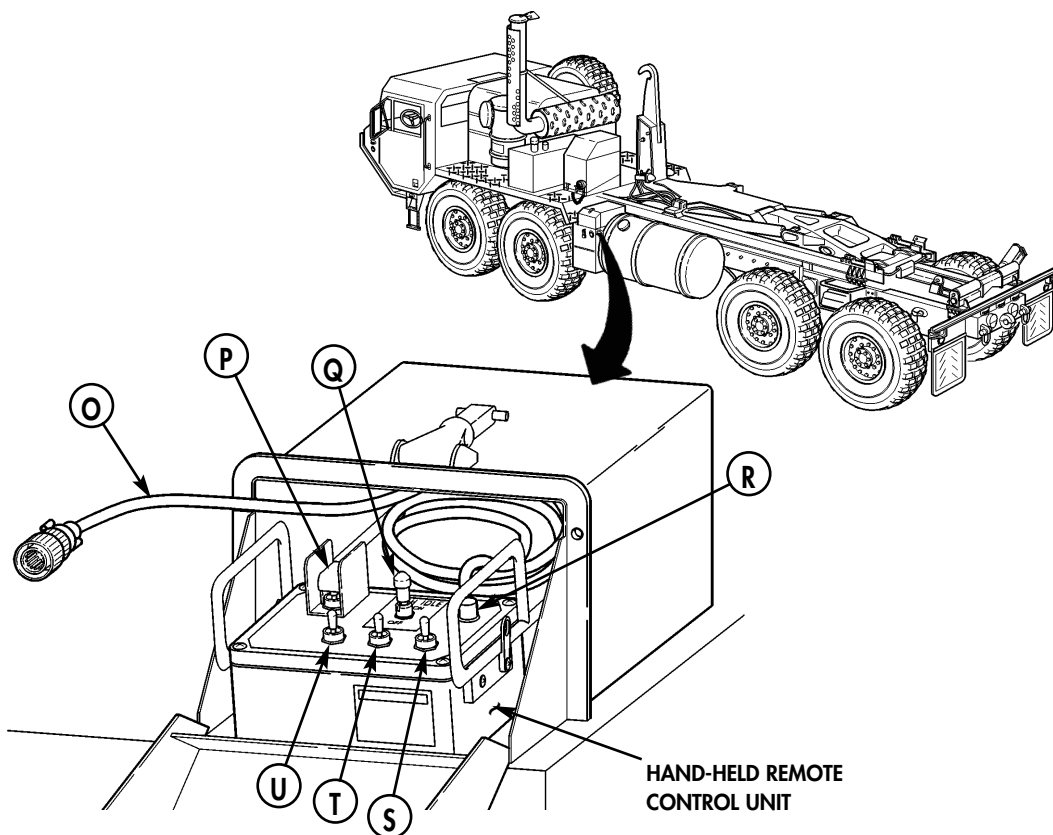
LHS CONTROL PANEL JOYSTICK AND INDICATORS, LATE MODEL CBT

## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

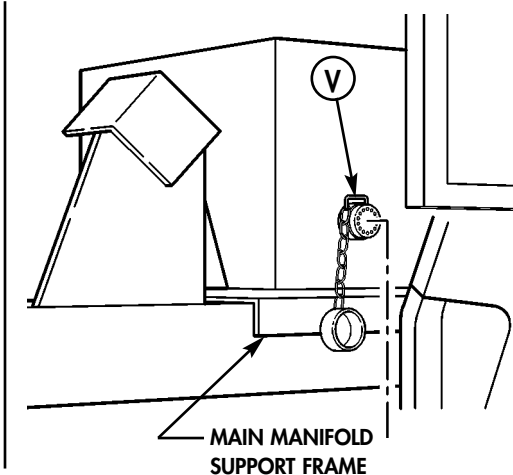
- Ⓞ **RCU CABLE** — The power cable on hand-held RCU designed to connect to LHS receptacle. The cable end with male cannon plug is connected to RCU receptacle and secured by turning collar on cannon plug clockwise until tight.
- Ⓟ **EMERGENCY STOP SWITCH** — The EMERGENCY STOP toggle switch, with guard, is located on control panel of hand-held remote control unit. When pushed down, electrical power to RCU controls is shut off and all functions of LHS stop.
- Ⓠ **HIGH IDLE SWITCH** — The HIGH IDLE switch on the control panel of RCU is placed in ON position to increase engine idle speed to 1,200 rpm for LHS operation. The vehicle's PTO should be engaged prior to increasing engine idle speed.
- Ⓡ **PANEL ILLUMINATION LIGHT** — The light on RCU that illuminates control panel for night operation.
- Ⓢ **WINCH SWITCH** — The WINCH toggle switch on control panel of RCU is for winch operation. Hold switch in OUT position to pay-out winch cable, and release switch to stop winch. Hold switch in IN position to pay-in winch cable, and release switch to stop winch. The winch on REB pallet cannot be operated by the LHS winch switch.
- Ⓣ **HOOK ARM SWITCH** — The HOOK ARM toggle switch on control panel of RCU operates LHS hook arm. Hold switch in UNLOAD position to move hook arm up and toward the rear of vehicle for unloading operations. Release switch to stop hook arm. Hold switch in LOAD position to move hook arm down and in a forward direction when performing loading operations. Release switch to stop hook arm.
- Ⓤ **MAIN FRAME SWITCH** — The MAIN FRAME switch on control panel of RCU operates LHS main frame. Hold switch in UNLOAD position to move main frame up and toward the rear of vehicle for unloading operations. Release switch to stop main frame. Hold switch in LOAD position to move main frame down and toward front of vehicle when performing loading operations. Release switch to stop main frame.
- Ⓥ **LHS RECEPTACLES** — There is an LHS receptacle located on each side of main manifold support frame for operation of RCU from either side of vehicle. The female cannon plug at the opposite end of RCU cable is connected to either LHS receptacle, and is secured by turning collar on cannon plug clockwise until tight.



**COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)**



DRIVER'S SIDE LHS RECEPTACLE AND DUST CAP

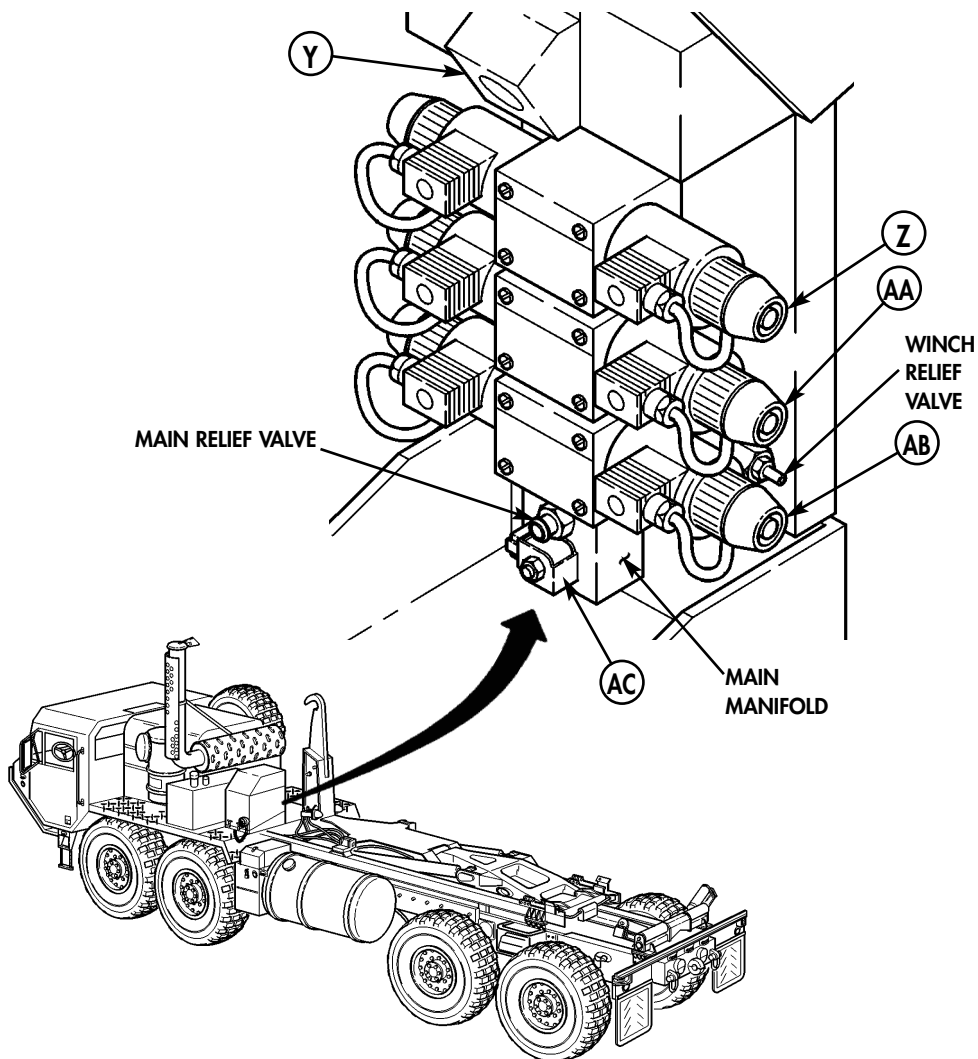
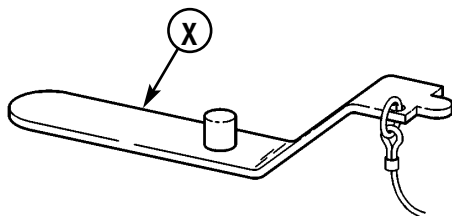
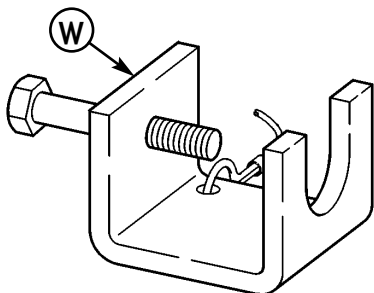


CURB SIDE LHS RECEPTACLE WITH DUST CAP

## COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)

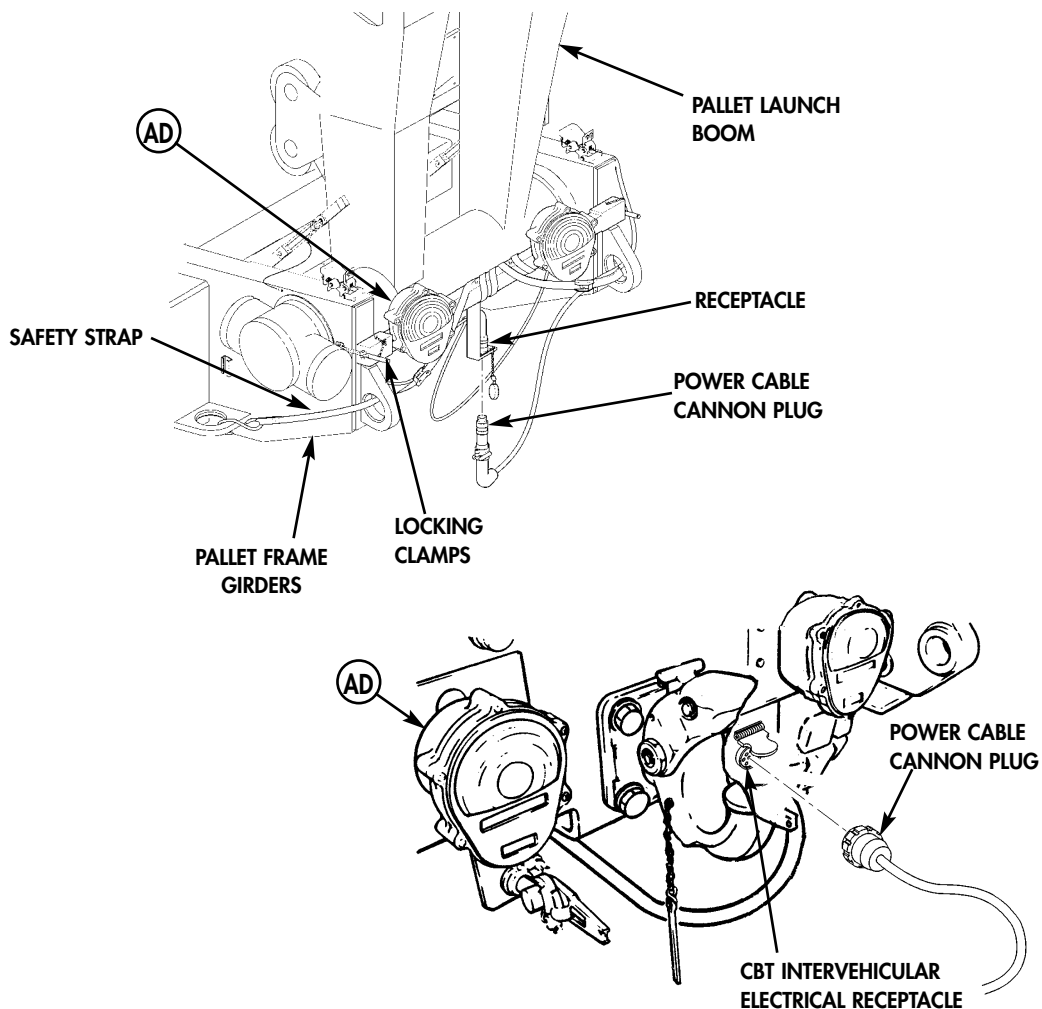
- Ⓜ **FREE-FLOW VALVE TOOL** — This tool, attached to control valve cabinet, is used to manually lock free-flow valve in closed position prior to manual operation of LHS directional control valves.
- Ⓧ **SOLENOID TOOL** — This tool, attached to control valve cabinet, is used to manually depress solenoid buttons on directional control valves for LHS operation.
- Ⓨ **HOUR METER** — The hour meter, if so equipped, is an electric clock mounted on main junction box at top of main manifold support frame. The hour meter records total number of operating hours on LHS hydraulic system for maintenance purposes.
- Ⓩ **MAIN FRAME SOLENOID BUTTONS** — The solenoid button at each end of top directional control valve that opens or closes valve when manually depressed with the aid of the solenoid tool. The top directional control valve on main manifold controls directional flow of hydraulic oil to cylinders to raise and lower LHS main frame. This control valve is intended to be manually operated only when electric power is lost to solenoids.
- ⓐ **HOOK ARM SOLENOID BUTTONS** — The solenoid button at each end of center directional control valve that opens or closes valve when manually depressed with aid of the solenoid tool. The center directional control valve on main manifold controls the directional flow of hydraulic oil to cylinders to raise and lower LHS hook arm. This control valve is intended to be manually operated only when electric power is lost to solenoids.
- ⓑ **WINCH SOLENOID BUTTONS** — The winch solenoid buttons are not used when operating REB pallet off CBT hydraulic system.
- ⓒ **FREE-FLOW VALVE** — The free-flow valve is located on main manifold adjacent to main relief valve, and is electrically activated by a solenoid. When activated, free-flow valve closes to divert fluid pressure to directional control valves for operation of LHS main frame and hook arm. Should electric power to solenoid be interrupted due to a malfunction, this valve must be manually held in closed position with free-flow valve tool.

### COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)



**COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS) CONTROLS AND INDICATORS (Contd)**

**(AD) AUXILIARY LIGHT BAR** — The auxiliary light bar is installed on the pallet frame for over-the-road transport of the REB. To install, position light bar so its mounting brackets contact center of pallet frame girders, and secure with locking clamps and safety strap. Connect power cable cannon plugs to receptacle on light bar and CBT intervehicular electrical receptacle.



END OF WORK PACKAGE

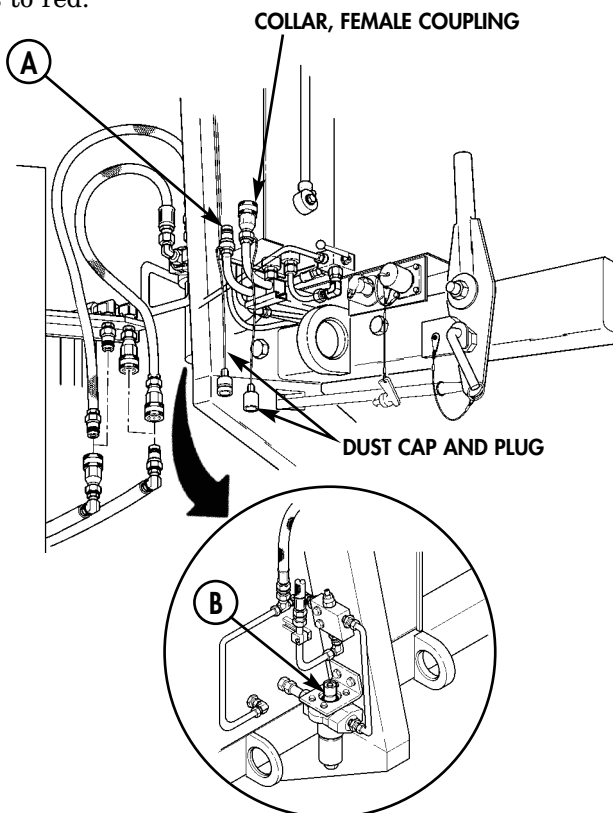
## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

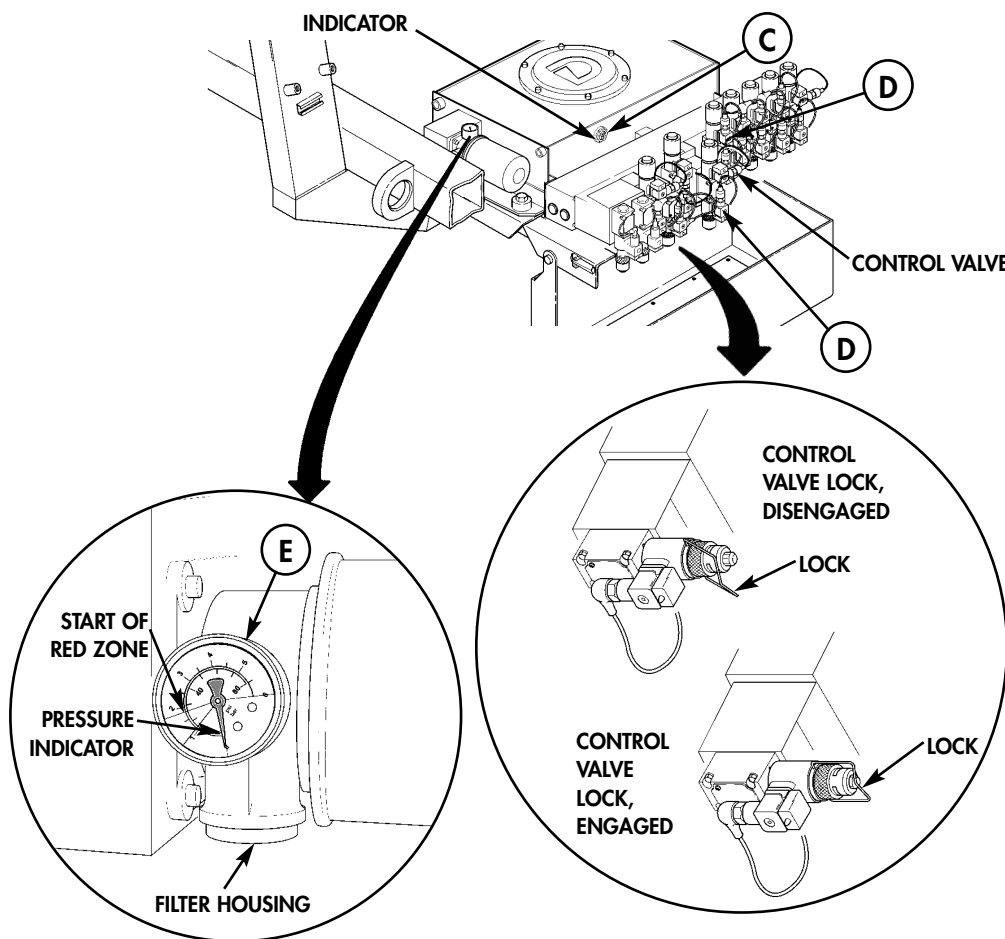
## PALLET CONTROLS AND INDICATORS

- (A) HYDRAULIC SUPPLY HOSES QUICK-DISCONNECT COUPLINGS** — Two pallet hydraulic supply hoses are provided with quick-disconnect couplings to facilitate use of either the pallet LPU or CBT hydraulic pump for emergency back-up power. To disconnect hose, slide collar back on female coupling. To connect hose, push couplings together while holding collar back on female coupling, then release collar. Dust cap and plug are pushed on quick-disconnect couplings when not in use.
- (B) PRE-FILTER INDICATOR** — This indicator is mounted on the pre-filter housing at bottom of pallet A-frame. The filter is good until pressure indicator changes to red.



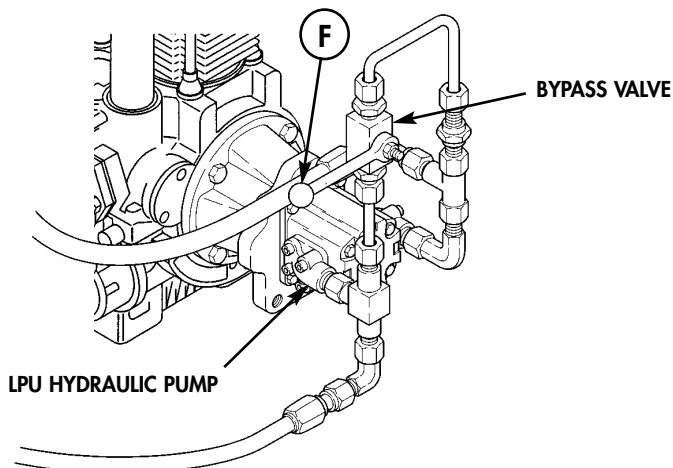
**PALLET CONTROLS AND INDICATORS (Contd)**

- (C) RESERVOIR SITE GLASS** — The oil level in reservoir is read by viewing white indicator through site glass. When oil level in reservoir cannot be seen on white indicator with all hydraulic cylinders retracted, oil must be added.
- (D) CONTROL VALVE BUTTONS** — Control valves have one or two buttons. If it is necessary to manually operate a control valve to carry out a launch or retrieval function, or to relieve residual hydraulic pressure, depress and hold the appropriate control valve button(s) as necessary. Refer to WP 0002 00 for a functional description of each control valve. Control valves KY1, KY22, and KY23 can be held in depressed position by engaging control valve lock on each valve. Control valve KY1 must be locked in depressed position before manually operating all other control valves.
- (E) RESERVOIR FILTER PRESSURE GAUGE** — This pressure gauge is mounted on external oil filter housing at side of pallet hydraulic reservoir. The filter is good until pressure indicator moves into red zone, with LPU operating, as indicated on pressure gauge dial.



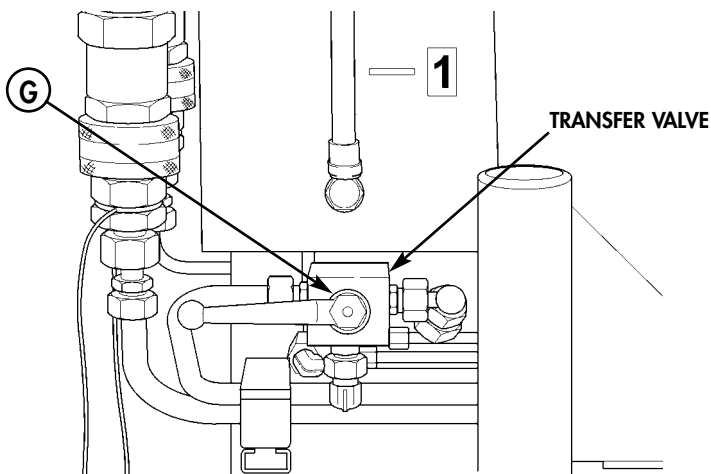
## PALLET CONTROLS AND INDICATORS (Contd)

- F PALLET HYDRAULIC PUMP BYPASS VALVE LEVER** — Prior to starting LPU, determine weight of oil in pallet hydraulic system and its ambient temperature range. Refer to WP 0025 00. To operate, turn lever to open bypass valve; lever should point down. Once LPU engine is running, close bypass valve; lever should point to left. The bypass valve should remain open when operating pallet hydraulic system off CBT hydraulic pump.



**BYPASS VALVE LEVER, CLOSED POSITION SHOWN**

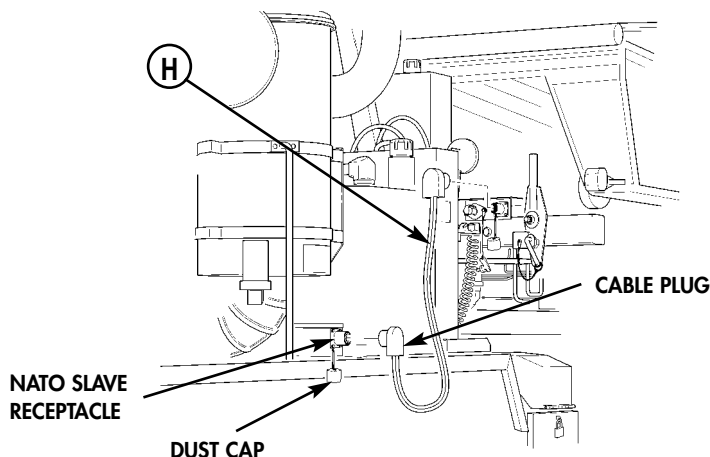
- G TRANSFER VALVE LEVER** — Prior to transferring residual hydraulic oil from CBT hydraulic reservoir to pallet reservoir, turn lever to close transfer valve; lever should point the left. To open transfer valve, turn lever until pointing up. The transfer valve must be in closed position prior to operating LPU or CBT for normal operation of pallet hydraulic system.



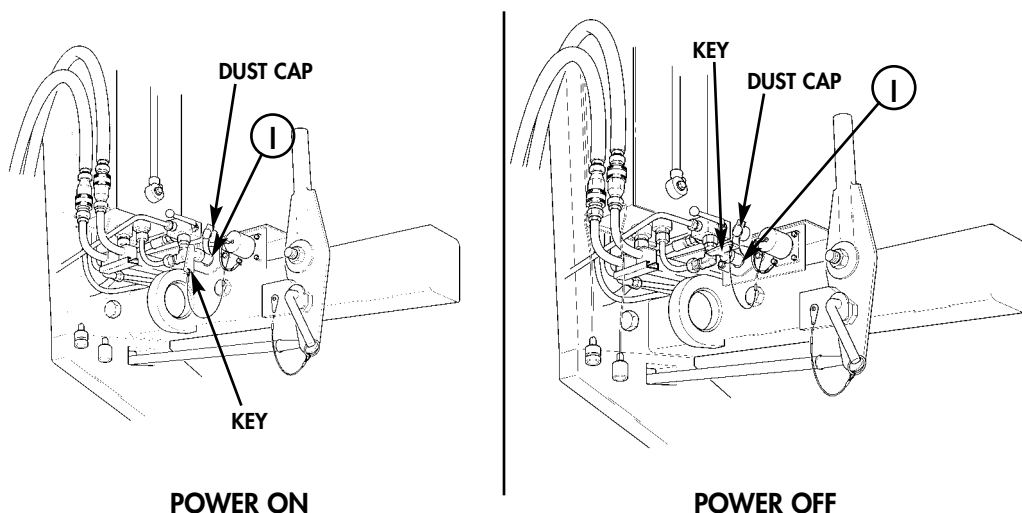
**TRANSFER VALVE LEVER, CLOSED POSITION SHOWN**

## PALLET CONTROLS AND INDICATORS (Contd)

- H** **ELECTRIC POWER SUPPLY CABLE** — When powering pallet electrical system using CBT, the NATO jumper cable is used as a power supply cable. To connect this cable, remove dust cap from NATO slave receptacle and push cable plug on receptacle until seated.



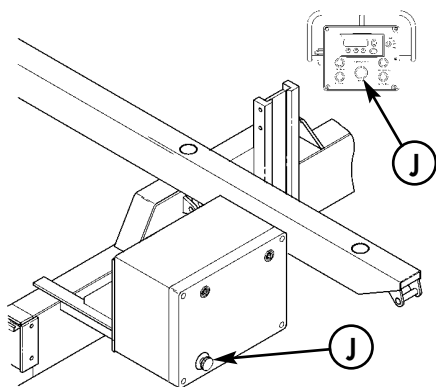
- I** **MAIN POWER SWITCH** — The main power switch connects/disconnects electrical power to pallet electric system from pallet batteries and CBT batteries, whichever are in use. To operate switch, remove dust cap and insert key in switch. Turn key to the right to turn on power. Turn key to the left to shut off power.



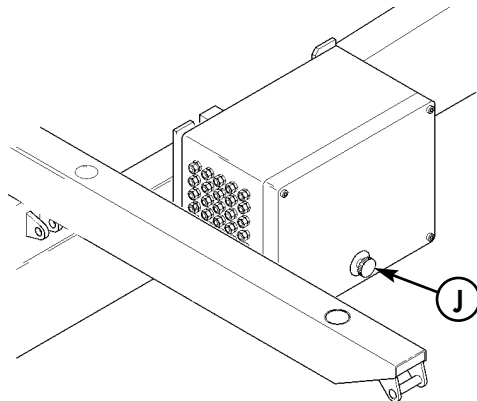


## PALLET CONTROLS AND INDICATORS (Contd)

- J EMERGENCY STOP BUTTONS** — There is a red EMERGENCY STOP button located on front door panel of RCU stowage box, electrical system box, and front panel of RCU. When pushed, all pallet operations will immediately stop. To release, turn button to the right. Once released, there is a 5 second delay for the winch relay to reset.

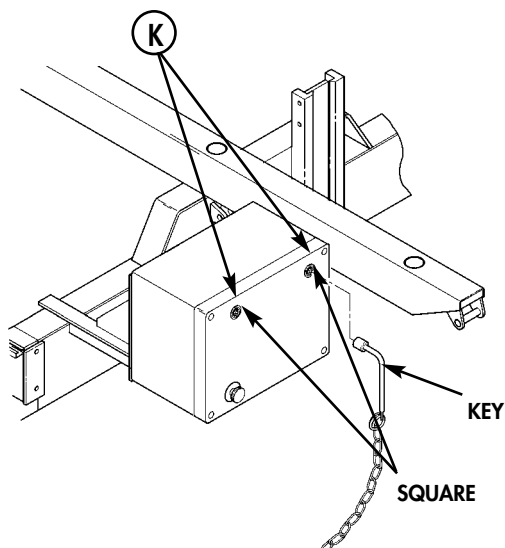


**RCU STORAGE BOX**



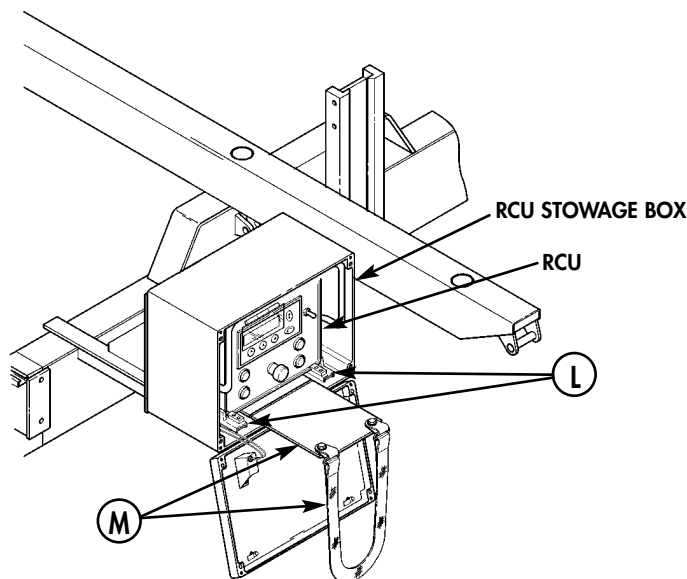
**ELECTRICAL SYSTEM BOX**

- K RCU STOWAGE BOX LOCKS** — There are two locks on the front door of RCU stowage box. To open door, position RCU stowage box key on square and turn key to the left on each lock. To lock door, close door tight against stowage box and turn key to the right on each lock. Key is stowed in adjacent pallet toolbox.



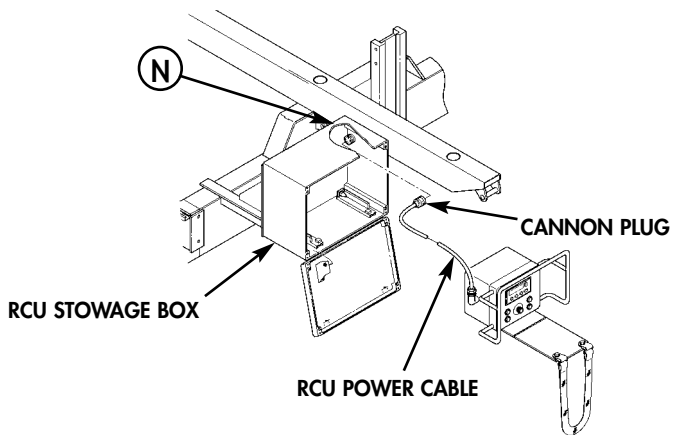
## PALLET CONTROLS AND INDICATORS (Contd)

- (L) RCU HOLD-DOWN BRACKETS** — To remove RCU from its stowage box, push RCU back until it clears two hold-down brackets, then lift it out of stowage box. To secure RCU in stowage box, position RCU in center of box and push RCU back until front of RCU drops down and engages with two hold-down brackets.
- (M) RCU GUARDPLATE AND NECK STRAP** — Once RCU is removed from its stowage box, the neck strap should be immediately worn by operator. The guardplate and neck strap together keep the RCU control panel facing up and level to operator. In addition, the guardplate is intended to prevent operator from accidentally depressing buttons on RCU control panel. The neck strap should always be worn so RCU is not accidentally dropped during launch and retrieval operations.

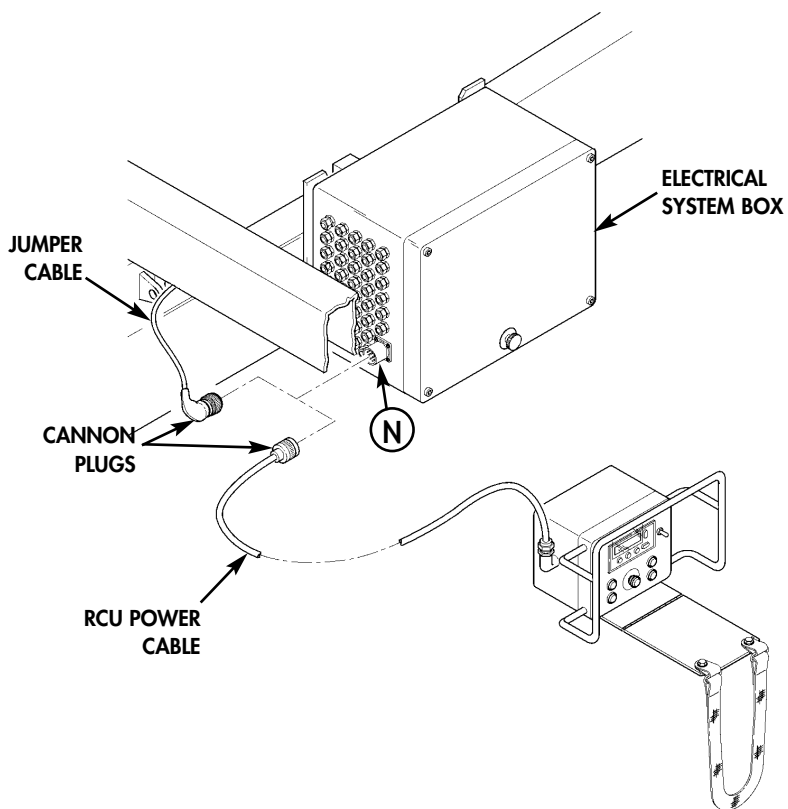


- (N) RCU CANNON PLUG RECEPTACLES** — The RCU can be operated while standing at either side of vehicle. Normally, the RCU power cable will remain connected to receptacle at RCU stowage box, but the operator may work from driver's side of vehicle by connecting RCU power cable to receptacle at pallet electrical system box. To change locations, disconnect RCU power cable from RCU stowage box, disconnect jumper cable from electrical system box, then connect RCU power cable to receptacle on electrical system box. To disconnect cannon plugs, turn collar on cannon plug to the left until loose, then pull cannon plug straight out of receptacle. To connect cannon plugs, line up pins on cannon plug with those on receptacle, push cannon plug in until seated, and turn collar to the right.

### PALLET CONTROLS AND INDICATORS (Contd)



**RCU RECEPTACLE, PASSENGER SIDE**

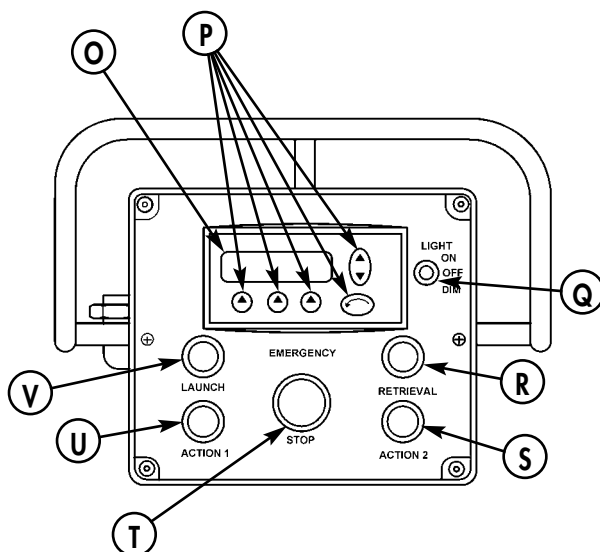


**RCU RECEPTACLE, DRIVER'S SIDE**

## PALLET CONTROLS AND INDICATORS (Contd)

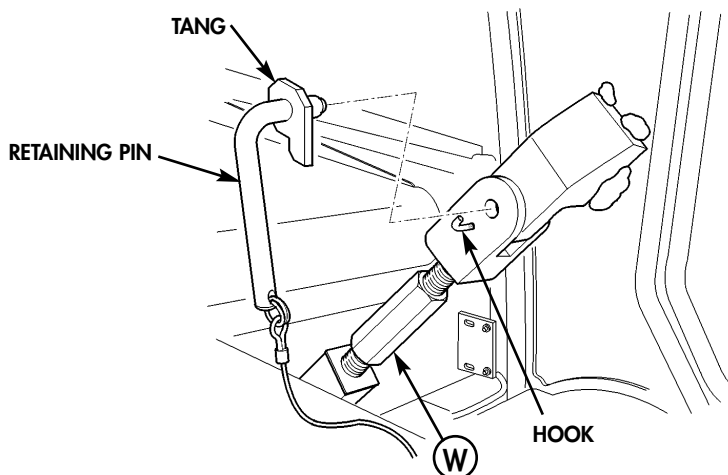
- ① **LIQUID CRYSTAL DISPLAY (LCD) SCREEN** — The Liquid Crystal Display (LCD) screen, located on RCU control panel, displays operating steps for each launch and retrieval function.
- ② **MENU SYSTEM BUTTONS** — There are five buttons, located on LCD panel, used by field level maintenance and the manufacturer to access the Stored Program System (SPS) for maintenance and programming purposes. The operator is authorized to use the menu system buttons for dimming the RCU LCD screen only.
- ③ **CONTROL PANEL BUTTONS LIGHT SWITCH** — This three-position switch is located to the right of LCD screen on RCU control panel. Illuminated control panel buttons can be switched on, dimmed for night operation, or switched off for operation with night vision equipment.
- ④ **RETRIEVAL BUTTON** — This green button is located at center right of RCU panel. Depress this button to view and step into next function on LCD screen. This button indicates the function code and description to be performed.
- ⑤ **ACTION 2 BUTTON** — This blue button is located at bottom right of RCU panel. An action button starts the function. To perform function displayed on LCD screen, depress this button once or hold in depressed position. The operation will either stop automatically when completed or stop when button is released.
- ⑥ **RCU EMERGENCY STOP BUTTON** — This red EMERGENCY STOP button is located at center of RCU control panel. When pushed down, electrical power to RCU controls is shut off, and all operations of pallet will immediately stop. To release, turn button to the right. Once released, there is a 5-second delay for the winch relay to reset.
- ⑦ **ACTION 1 BUTTON** — This blue button is located at bottom left of RCU panel. An action button starts the function. To perform function displayed on LCD screen, depress this button once or hold in depressed position. The operation will either stop automatically when completed or stop when button is released.
- ⑧ **LAUNCH BUTTON** — This green button is located at center left of RCU panel. Depress this button to view and step into next function on LCD screen. This button indicates the function code and description to be performed.

**PALLET CONTROLS AND INDICATORS (Contd)**



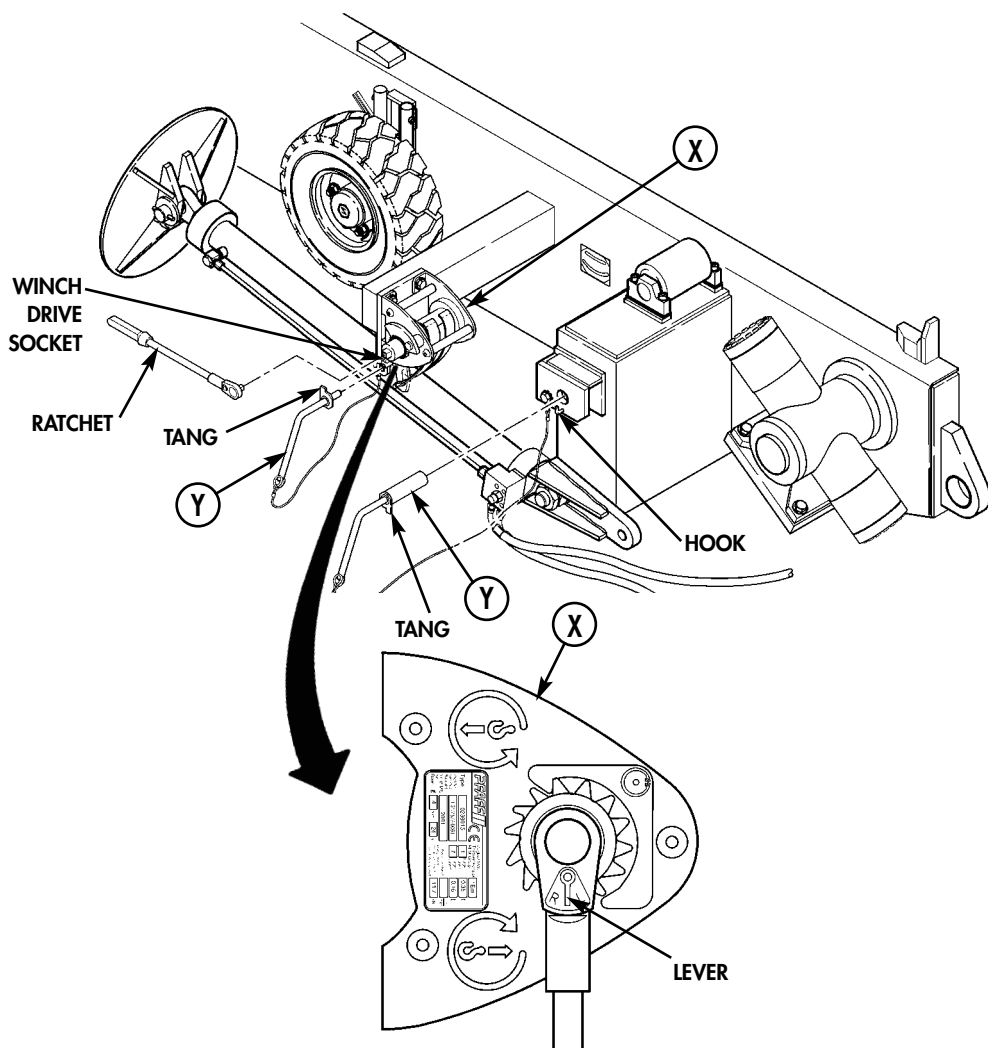
**REMOTE CONTROL UNIT**

**W LAUNCH BOOM LOCKS** — The launch boom must be unlocked prior to operation of pallet, and locked in vertical 90-degree position prior to road travel. To unlock launch boom, turn retaining pin until tang on pin clears hook on clevis, then remove retaining pin from bracket and clevis on each launch boom lock. Adjust length of locks by turning turnbuckle using 1 13/32 in. (36 mm) open end wrench.



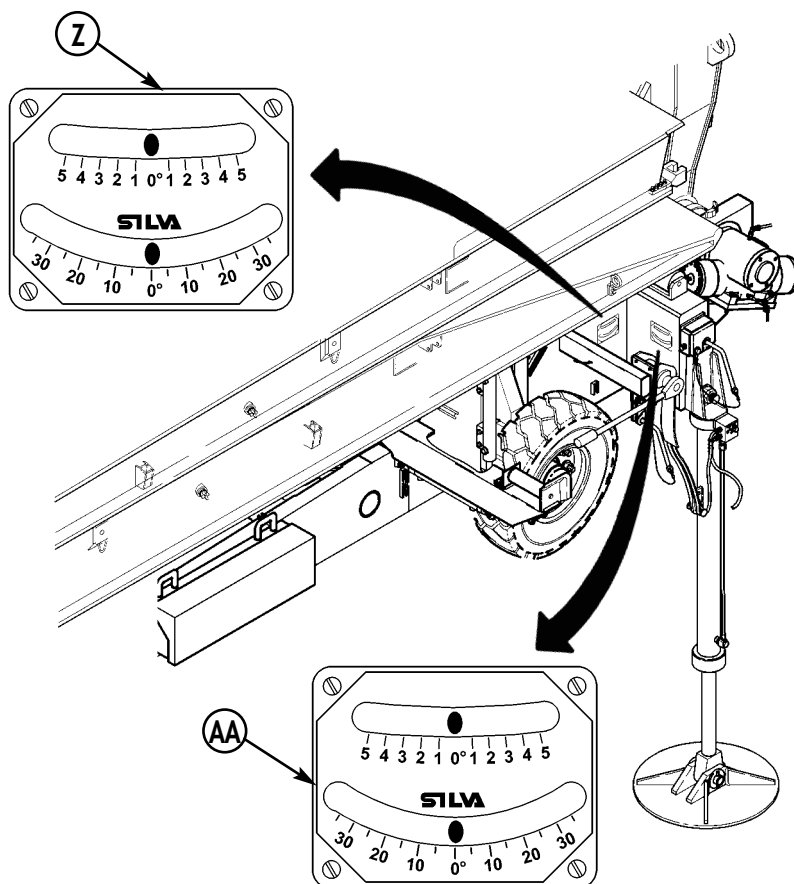
## PALLET CONTROLS AND INDICATORS (Contd)

- (X) **SUPPORTING CYLINDER HAND-OPERATED WINCH** — To operate winch, remove ratchet from tool box and connect it to winch drive socket. To lower supporting cylinder, set rotation direction of ratchet by moving lever to L position, and slowly turn ratchet to the left until weight of cylinder is off winch strap. To raise supporting cylinder, move ratchet lever to R position, and turn ratchet to the right until cylinder is fully raised.
- (Y) **SUPPORTING CYLINDER RETAINING PINS** — The retaining pins are removed by turning pin until tang clears hook or slot in bracket, and pulling pin from hole.



## PALLET CONTROLS AND INDICATORS (Contd)

- Z FRONT-TO-REAR LEVELING GAUGE** — There is a leveling gauge located on the longitudinal girder of pallet at each side of pallet. When pallet is loaded on CBT, it is level from front-to-rear when bubble is centered over 0-degree mark. When pallet is set on level ground, bubble on front-to-rear leveling gauges will read approximately 2-degrees from 0-degree mark.
- AA SIDE-TO-SIDE LEVELING GAUGE** — There is a leveling gauge located on the pallet supporting cylinder frame member at each side of pallet. The pallet is level from side-to-side when bubble is centered over 0-degree mark.



## PALLET CONTROLS AND INDICATORS (Contd)

- (AB) BII TOOLBOX LATCHES** — The latch at each end of pallet toolbox that is opened by pulling lever up and swinging latch off catch.
- (AC) BII TOOLBOX HOLD-DOWN BRACKETS FOR BII** — Each pallet toolbox contains hold-down brackets that secure the required tools for operating REB. Both pallet toolboxes contain the same brackets. The Basic Issue Items (BII) are secured/stowed in pallet toolboxes as follows:

**Ratchet** — Each toolbox contains one ratchet stowed on left side wall of toolbox. The ratchet is used to operate supporting cylinder hand-operated winch. To remove ratchet, pull it from two prongs. Installation is the opposite.

**Fastening rod** — Each toolbox contains two fastening rods stowed on back wall of toolbox. The four fastening rods are used to secure bridge halves on pallet for transport on CBT. To remove fastening rods, remove thumbscrew and hold-down bracket. Then remove fastening rods from mounting brackets.

**Unlocking rod** — Each toolbox contains one unlocking rod stowed in bottom of toolbox. The unlocking rod is used to unlock bridge quarters prior to retracting. To remove unlocking rod, lift up lever, swing latch off catch on both latches, then lift unlocking rod out of toolbox.

**Retrieval positioning aid** — Each toolbox contains one positioning aid stowed next to unlocking rod. The positioning aid is used to position transporter at correct distance from emplaced bridge for retrieval. To remove positioning aid, pull it from prongs and lift it out of toolbox.

**Roadway marker pole** — Each toolbox contains two roadway marker poles stowed in pairs on inside panel of toolbox door. The marker poles are used as visual aids to guide vehicle operator to center of bridge while crossing. To remove marker poles, loosen two thumbscrews, turn hold-down plates, then lift marker poles from mounting brackets.

**Hold-fast** — Each toolbox contains two anchoring hold-fasts. The hold-fasts are used for anchoring bridge prior to crossing. To remove, lift hold-fasts from toolbox; no hold-downs are required.

**Anchoring strap** — Each toolbox contains two anchoring straps. Four anchoring straps are used to anchor the bridge and are also used to secure REB to PLS trailer. To remove, lift anchoring strap from toolbox; no hold-downs are required.

**RCU stowage box key** — The key for opening RCU stowage box locks is stowed on a retaining chain mounted at right corner of passenger side toolbox.

**Transload roller** — Each toolbox contains one transload roller stowed at left bottom corner of toolbox. Transload rollers are left and right-hand in configuration, and are installed on pallet fixed axles with one straight pin and lynch pin each. Retain pins with each roller when not in use. To remove, lift transload roller from toolbox; no hold-downs are required.



## PALLET CONTROLS AND INDICATORS (Contd)

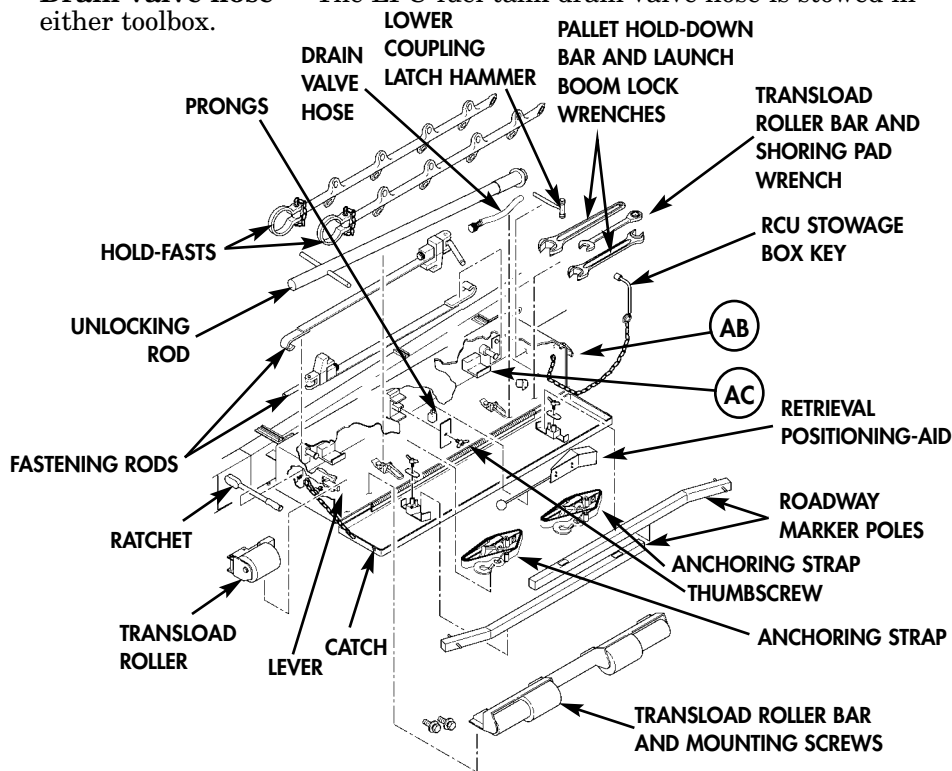
**Transload roller bar and mounting screws** — The transload roller bar and mounting screws can be stowed in either pallet toolbox. The roller bar is installed on pallet lower support boom with two washers and screws prior to transloading pallet to PLS trailer. To remove, lift roller bar from toolbox; no hold-downs are required.

**Pallet hold-down bar and launch boom lock wrenches** — The pallet hold-down bar and launch boom lock wrenches are stowed in each pallet toolbox. The 2 in. (50 mm) wrench is used to hold turnbuckle while jamnut is loosened or tightened with 1 5/8 in. (41 mm) combination wrench. The 1 7/16 in. (36 mm) opposite end of the combination wrench is used for adjusting launch boom lock turnbuckles. No hold-downs are required.

**Lower coupling latch hammer** — Each toolbox contains one soft-nosed hammer used to lock/unlock latch on lower coupling receptacle on each bridge quarter. No hold-down is required.

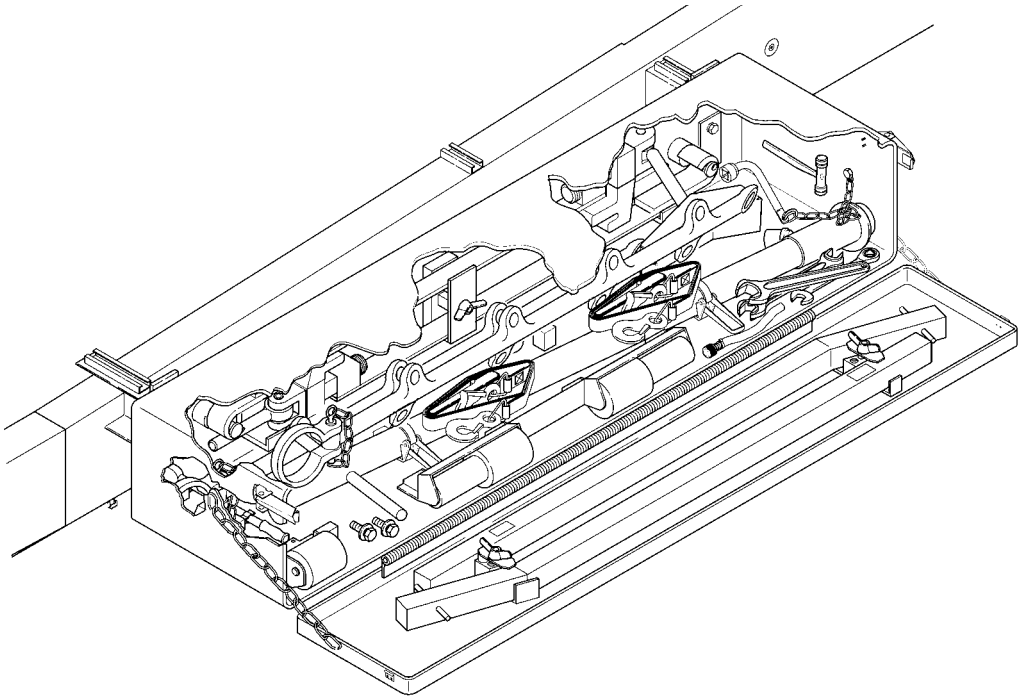
**Transload roller bar and shoring pads wrench** — There is a 3/4 in. (19 mm) wrench stowed in each pallet toolbox that is used to remove/install two transload roller bar mounting screws and four mounting screws on each shoring pad. No hold-down is required.

**Drain valve hose** — The LPU fuel tank drain valve hose is stowed in either toolbox.



TOOLBOX LATCHES AND HOLD-DOWN BRACKETS, BII REMOVED

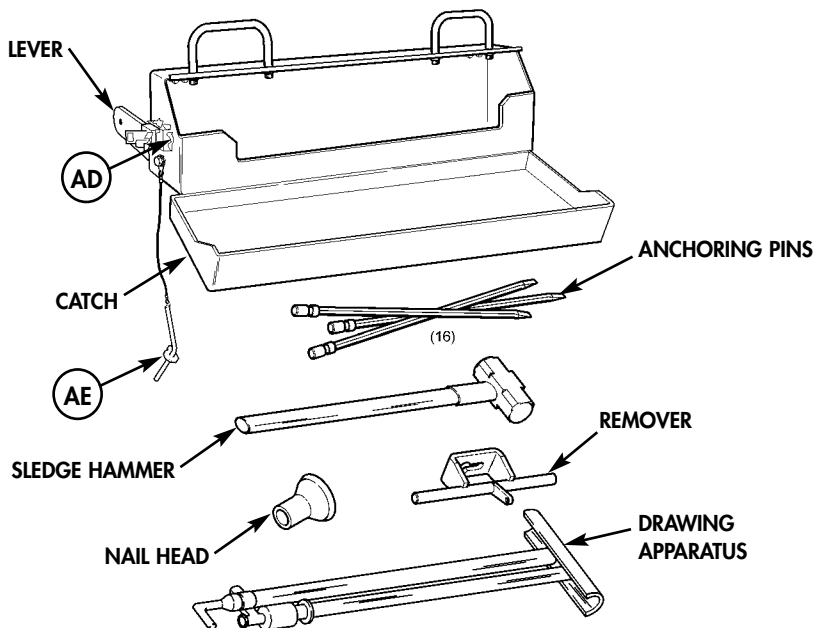
## PALLET CONTROLS AND INDICATORS (Contd)



### TOOLBOX LATCHES AND HOLD-DOWN BRACKETS, BII INSTALLED

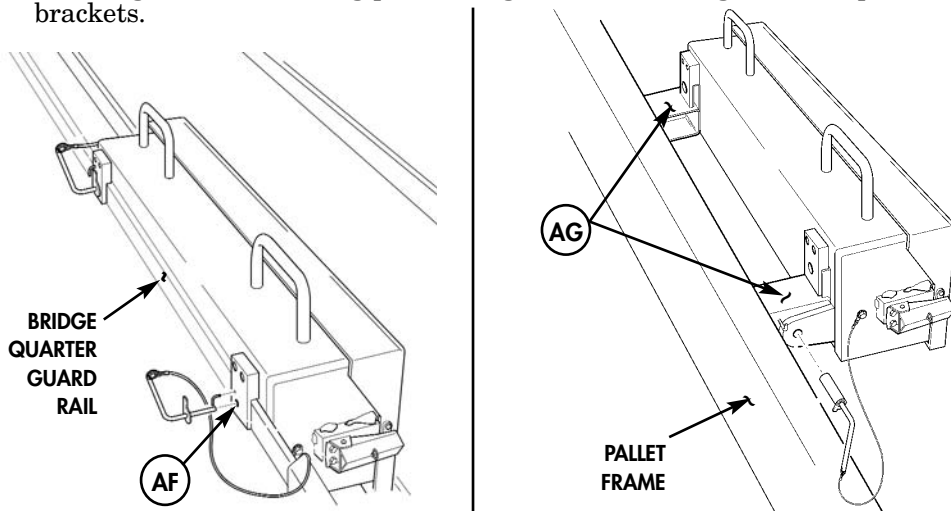
- (AD) **ANCHORAGE STOWAGE BOX LATCHES** — The latch at each end of anchorage stowage box that is opened by pulling lever up and swinging latch off catch.
- (AE) **ANCHORAGE STOWAGE BOX RETAINING PINS** — Each anchorage stowage box has two retaining pins for securing box to either the pallet or bridge. Retaining pins are removed by turning pin until tang clears hook, and then pulling pin from hole. The anchorage stowage box is a Basic Issue Item (BII), and the following BIIs are stowed in it:
- Anchoring pins** — 16 anchoring pins are stowed in bottom of each anchorage stowage box; no hold-downs are required.
- Anchoring pin remover** — Each anchorage stowage box contains one anchoring pin remover. No hold-down is required.
- Sledge hammer** — Each anchorage stowage box contains one sledge hammer. No hold-down is required.
- Drawing apparatus** — Each anchorage stowage box contains one drawing apparatus. No hold-down is required.
- Nail head** — Each anchorage stowage box contains one nail head. No hold-down is required.

**PALLET CONTROLS AND INDICATORS (Contd)**



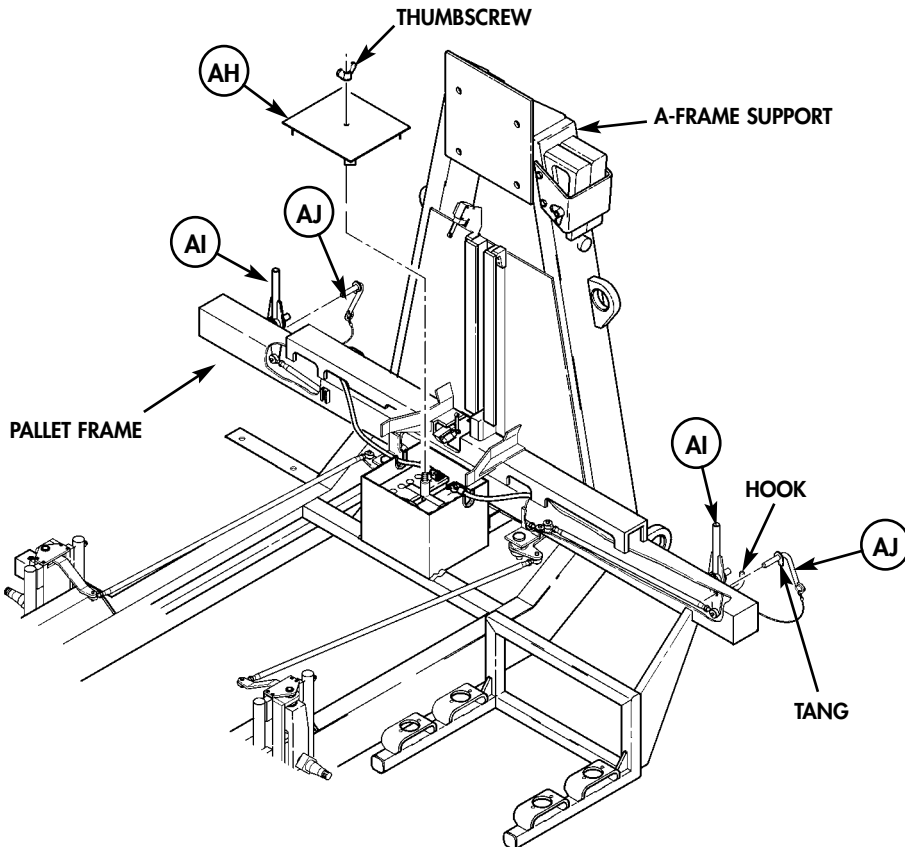
**(AF) BRIDGE GUARD RAIL MOUNTING HOLES FOR ANCHORAGE STORAGE BOX** — the guard rail on each left-hand bridge quarter has two mounting holes for installation of one anchorage storage box. The storage box is secured by inserting its two retaining pins through holes in storage box and guard rail. Storage boxes are installed on deployed bridge for helicopter transport only.

**(AG) PALLET BRACKETS FOR ANCHORAGE STORAGE BOX** — There are two brackets, each having a mounting hole, for supporting one anchorage storage box at each side of pallet frame. The storage box is secured by inserting its two retaining pins through holes in storage box and pallet brackets.



## PALLET CONTROLS AND INDICATORS (Contd)

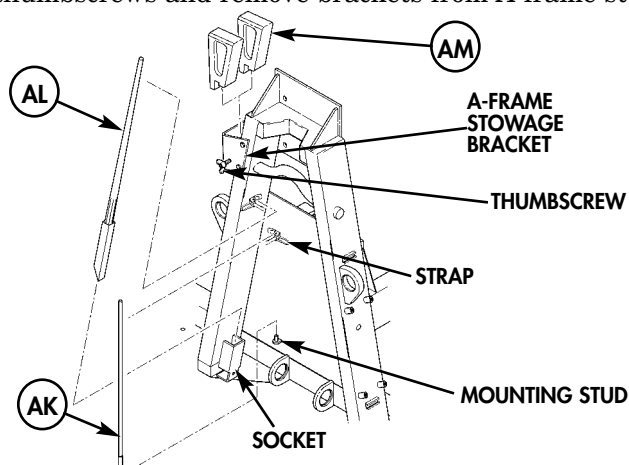
- (AH) **BATTERY BOX COVER** — There is a lid covering the pallet battery box that is removed by removing a thumbscrew. To access the pallet batteries and cables, the bridge must be off the pallet. To visually inspect the plastic terminal lug covers, the battery box cover can be removed with bridge on pallet.
- (AI) **SUPPORTING WHEELS STEERING LEVERS** — Two steering levers are located on front of pallet frame at each side of A-frame support. To steer pallet while maneuvering, pull levers in the desired direction.
- (AJ) **STEERING LEVER RETAINING PINS** — A retaining pin is located on both the right and left steering levers. The retaining pins lock front support wheels in the straight-ahead position. To remove a pin, turn pin until tang on pin clears hook on pallet frame and pull retaining pin from hole.



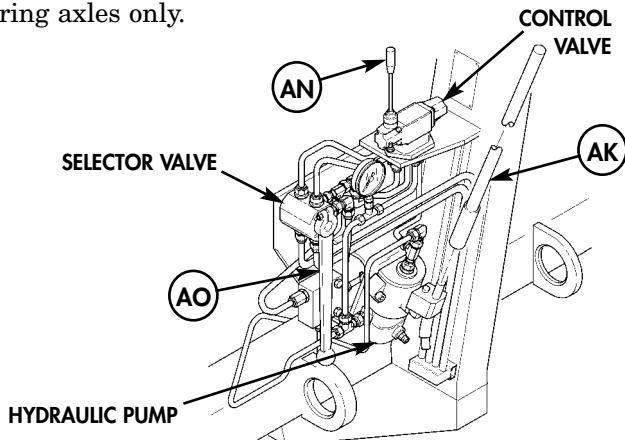
- (AK) **SUPPORTING WHEELS HYDRAULIC PUMP HANDLE** — This removable handle is used as an extension lever to manually operate the hydraulic pump. The pump handle is stowed on A-frame. To remove, release strap and lift handle off mounting stud. To operate pump, slide handle on pump lever and move handle back and forth.

## PALLET CONTROLS AND INDICATORS (Contd)

- (AL) **TANKER BAR** — A tanker bar is located on the pallet A-frame. To remove, release strap and lift tanker bar out of socket. The tanker bar has 30 inch marks used for measurement of REB distance from gap prior to launch.
- (AM) **PALLET LIFTING BRACKETS** — There are two wedge-shaped aluminum brackets placed between the pallet launch boom and the coupling end of bridge half when lifting pallet with a sling. To remove from stowed position, loosen two thumbscrews and remove brackets from A-frame storage bracket.

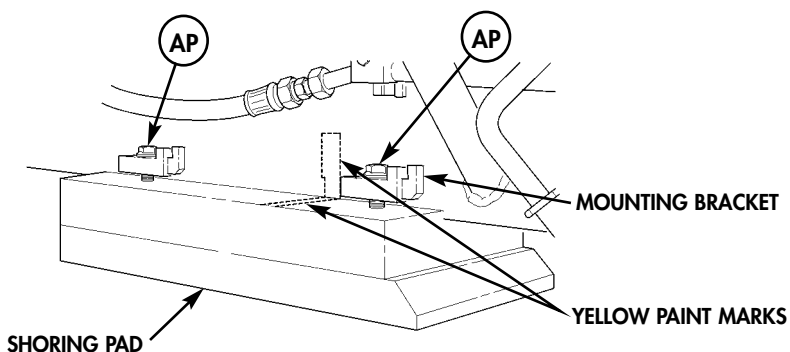


- (AN) **SUPPORTING WHEELS CONTROL VALVE LEVER** — This lever is mounted on the control valve and is used for operation of pallet supporting wheels. To lower pallet, move the control valve lever to B position and operate hydraulic pump. To lift pallet, move control valve lever to A position and operate hydraulic pump.
- (AO) **SUPPORTING WHEELS SELECTOR VALVE LEVER** — This lever is used to move selector valve to its three operating positions. Position 1 operates all axles, position 2 operates fixed axles only, and position 3 operates steering axles only.

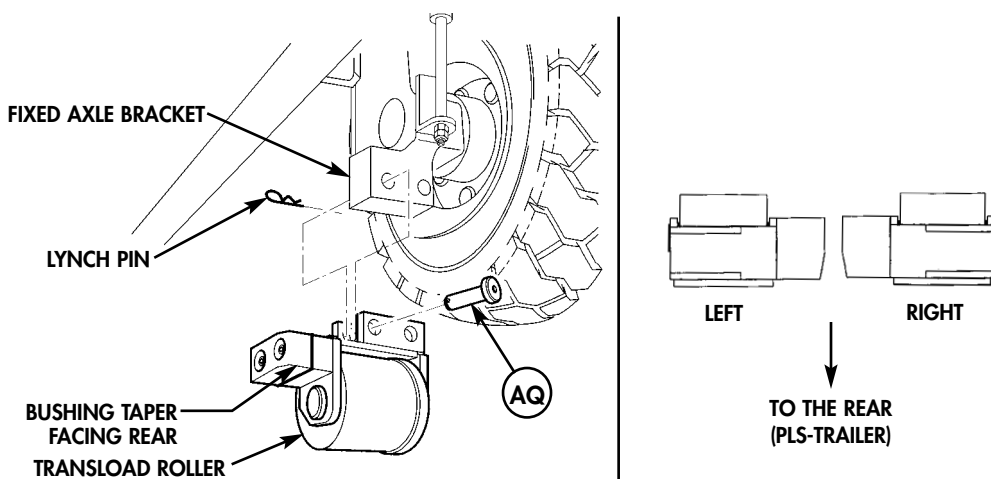


## PALLET CONTROLS AND INDICATORS (Contd)

- (AP) SHORING PAD MOUNTING SCREWS** — There are four mounting screws located on each shoring pad. Shoring pads support pallet when loaded on C-130 aircraft and must be removed prior to transloading pallet to PLST. To remove, loosen four screws with 3/4 in. (19 mm) BII wrench, and slide shoring pad off mounting brackets. When installing, yellow paint marks for left and right pads must line up with yellow paint marks on pallet frame.



- (AQ) TRANSLOAD ROLLER MOUNTING PINS** — There is a left and right-hand transload roller installed on its respective fixed axle bracket prior to transloading pallet to PLS trailer. To install, position transload roller on fixed axle bracket with tapered end of bushing facing to the rear of pallet, and install straight pin and lynch pin on inboard mounting hole only. Transload rollers are normally removed from fixed axle brackets only when unloading pallet to ground. Stow rollers and mounting hardware in pallet toolboxes when pallet is on ground.

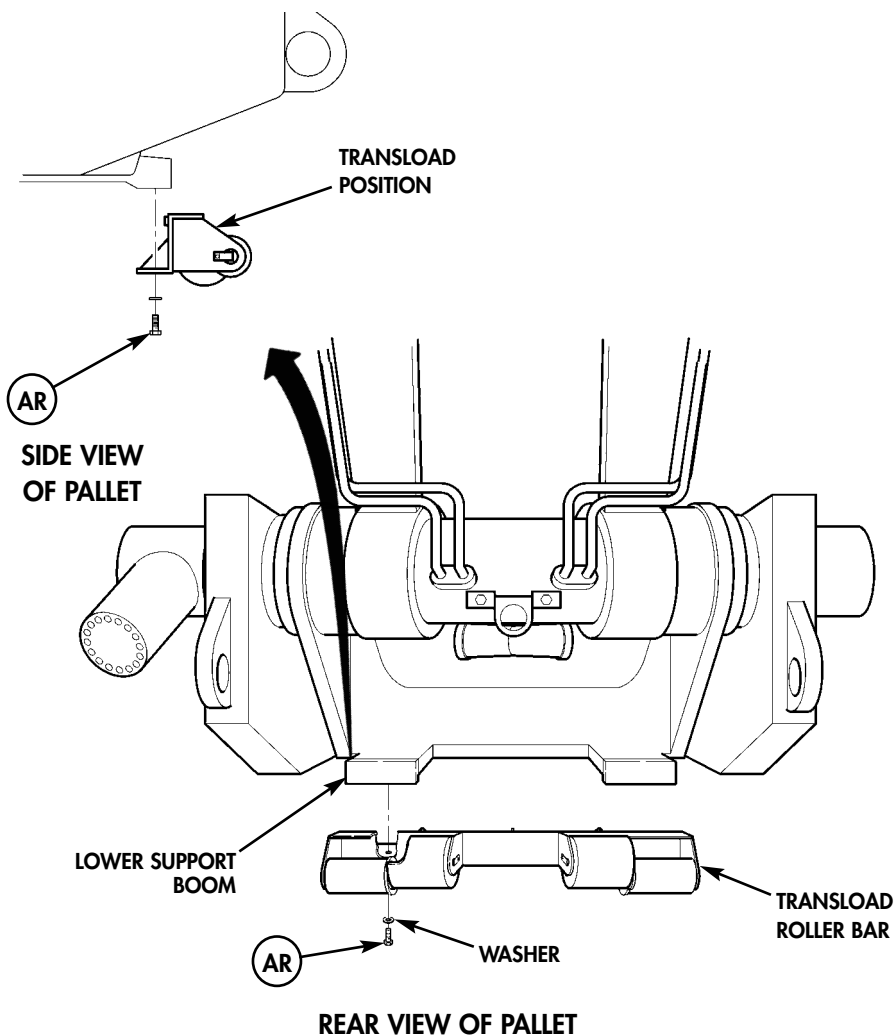


## PALLET CONTROLS AND INDICATORS (Contd)

### **WARNING**

Two personnel are required to remove/install transload roller bar. Failure to comply may result in injury to personnel.

- (AR) **TRANSLOAD ROLLER BAR MOUNTING SCREWS** — The transload roller bar is removed/installed on lower support boom with two mounting screws. Prior to transloading pallet to PLST, transload roller bar is installed on pallet lower support boom in transload position. To install, position transload roller bar on lower support boom, and install two washers and screws using 3/4 in. (19 mm) BII wrench. Remove and stow bar and mounting hardware in either pallet toolbox after transloading pallet to CBT.

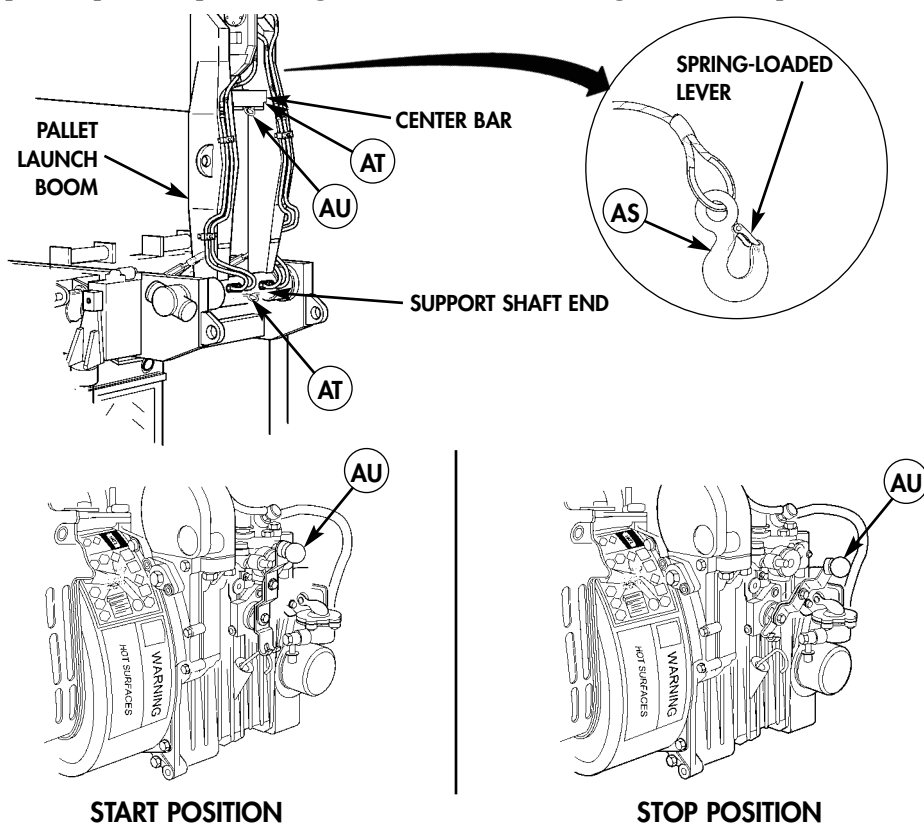


## PALLET CONTROLS AND INDICATORS (Contd)

### **WARNING**

Use of pallet winch for lifting or pulling anything other than the REB is not authorized and may result in damage to equipment and possible injury to personnel.

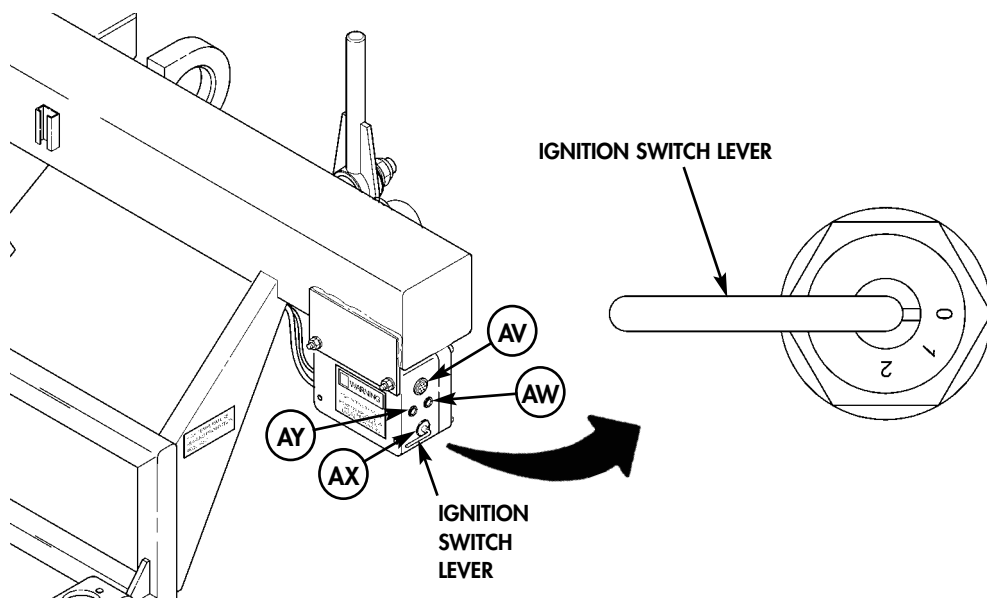
- (AS) **WINCH WIRE ROPE HOOK** — During launch, retrieval, and transport of bridge, the pallet winch wire rope hook remains connected to lifting eye on bridge launch beam. After bridge is lowered to ground, hook is manually disconnected from launch beam lifting eye and then connected to lifting eye on pallet launch boom. To connect hook, depress spring-loaded lever against lifting eye until lifting eye passes into hook and lever closes. To disconnect hook, depress spring-loaded lever until lifting eye can pass out of hook.
- (AT) **PALLET LIFTING EYES** — Use lifting eye at center bar of pallet launch boom to stow pallet winch wire rope hook when bridge is not on pallet. Use lifting eye at support shaft end of pallet launch boom to connect aircraft winch for loading and unloading of pallet.
- (AU) **LPU SPEED CONTROL LEVER** — Prior to starting the LPU engine, the speed control lever is moved to maximum START position; end of lever should point up. To stop LPU engine, turn lever to the right to STOP position.





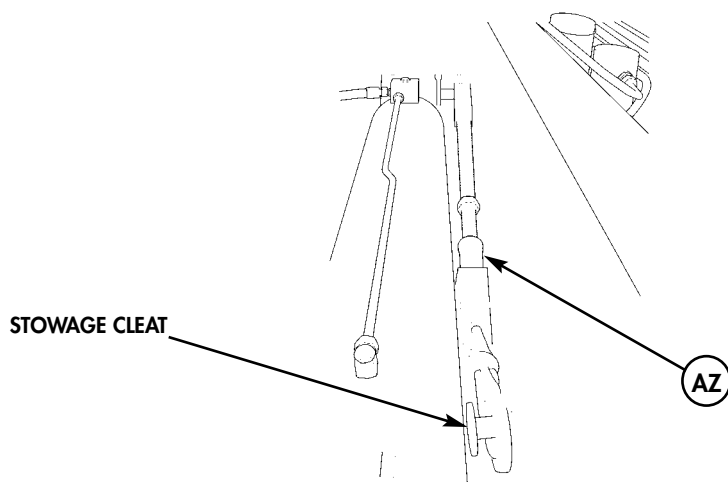
**PALLET CONTROLS AND INDICATORS (Contd)**

- (AV) **GLOW PLUG LIGHT** — The glow plug light is located at top center on LPU control box. This light will come on when ignition switch is held in position 1 for approximately one minute. Once the light glows, LPU diesel engine is preheated and is ready to start.
- (AW) **OIL PRESSURE WARNING LIGHT** — The oil pressure warning light is located to the right of center on LPU control box. This light comes on when pallet main power switch is in ON position, engine stops running, or there is insufficient oil pressure when engine is running.
- (AX) **LPU IGNITION SWITCH** — To operate ignition switch, turn lever to the right. Turn and hold lever in position 1 to operate engine glow plugs. Turn and hold lever in position 2 to crank engine, and release as soon as engine starts running. Lever will return to position 0 automatically once released.
- (AY) **BATTERY CHARGE INDICATOR LIGHT** — The battery charge indicator light is located to the left of center on LPU control box. This light comes on when pallet main power switch is in ON position, engine stops running or battery becomes discharged while engine is running.

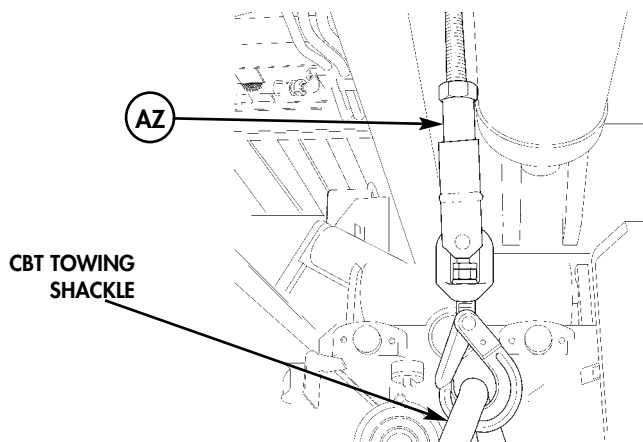
**LPU CONTROL BOX**

## PALLET CONTROLS AND INDICATORS (Contd)

- (AZ) PALLET HOLD-DOWN BAR** — The pallet hold-down bar is lowered from its stowed position by swinging the bar up, depressing the lever on the hook, and removing the hook from the stowage cleat on the longitudinal girder. The hold-down bar is connected to the CBT towing shackle by depressing the lever on the hook until the shackle passes into the hook and the lever closes. The hold-down bar is tightened by turning the turnbuckle to the right using 2 in. (50 mm) BII wrench. When turnbuckle is tight, hold turnbuckle with the same wrench and tighten jamnut by turning it to the left using 1 5/8 in. (41 mm) BII combination wrench.



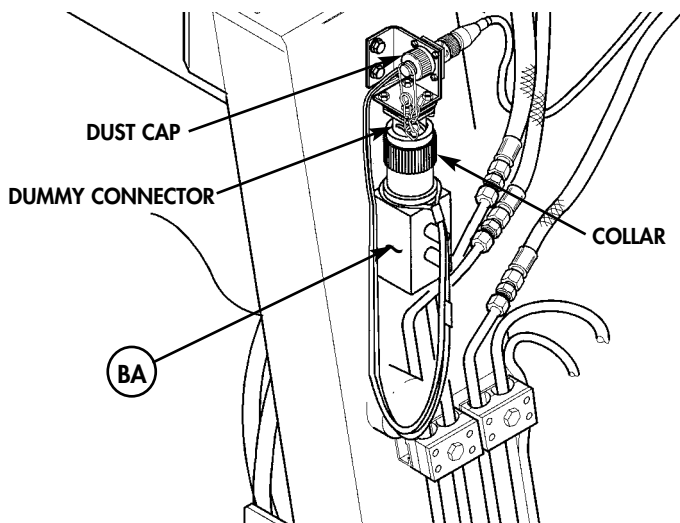
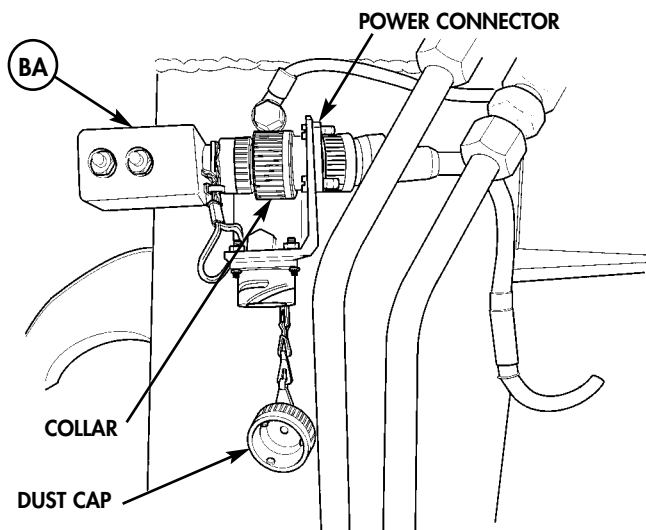
**PALLET HOLD-DOWN BAR, STOWED POSITION**



**PALLET HOLD-DOWN BAR, CONNECTED TO CBT**

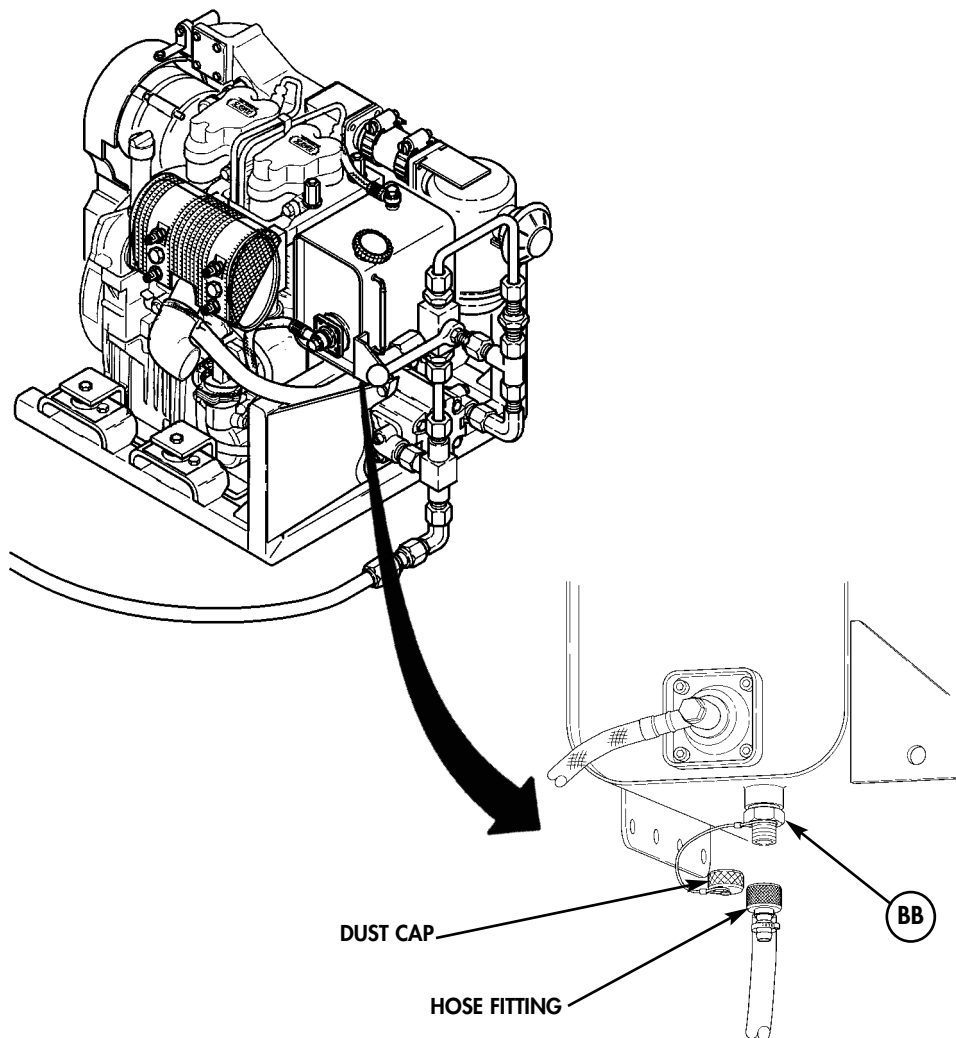
**PALLET CONTROLS AND INDICATORS (Contd)**

- (BA) WINCH EMERGENCY SWITCH** — This switch, mounted at side of pallet A-frame, is used to manually operate pallet hydraulic winch to pay-in or play-out wire rope. To remove switch from power connector or dummy connector, turn collar on switch to the left. To connect switch, remove dust cap, align switch with connector, and turn collar to the right until tight. Control valves KY-1 and KY-21 must be locked in engaged position to operate winch using emergency switch.

**WINCH EMERGENCY SWITCH, STOWED POSITION****WINCH EMERGENCY SWITCH, CONNECTED**

**PALLET CONTROLS AND INDICATORS (Contd)**

- BB** **LPU FUEL TANK DRAIN VALVE** — The fuel must be drained from the LPU prior to loading REB on aircraft. To open valve, remove dust cap and position hose fitting on threaded end of valve. Place opposite end of hose in suitable container, turn hose fitting to the right until fuel flows from valve and hose. Close by turning hose fitting in opposite direction. Remove and stow hose in BII toolbox. Install dust caps.



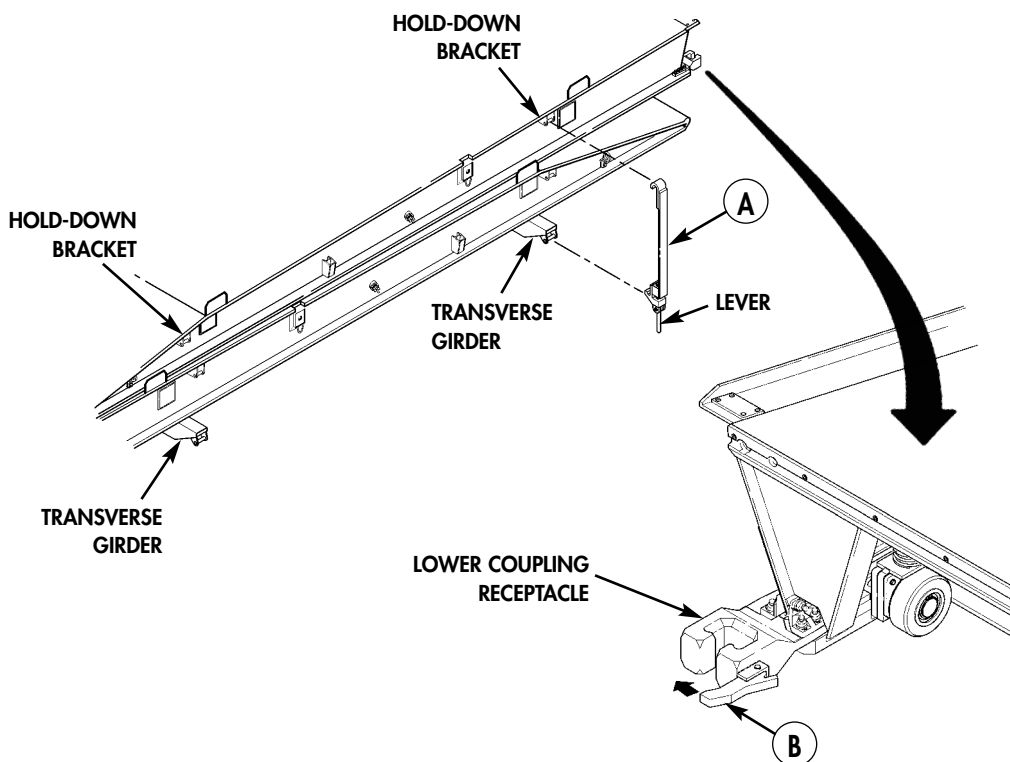
## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

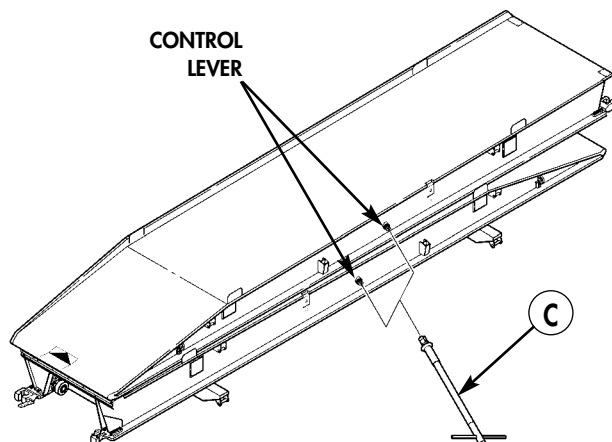
### BRIDGE CONTROLS AND INDICATORS

- (A) FASTENING RODS** — Four fastening rods are used to secure the bridge to the pallet. To adjust length of fastening rod, turn lever to the right to shorten it, and turn lever to the left to lengthen it. The hook end of the fastening rod is connected to the hold-down bracket on the bridge, and the locking end is connected to pin at end of bridge pallet transverse girder. The fastening rod is drawn tight by turning lever to the right.
- (B) LOWER COUPLING RECEPTACLE LEVER** — The lever (coupling help device) on each lower coupling receptacle is manually locked prior to launch of bridge. To place lever in locked position, tap end of lever with soft-nosed BII hammer toward center of coupling receptacle until set in detent. The lever, located on each lower coupling connector, is not manually operated.

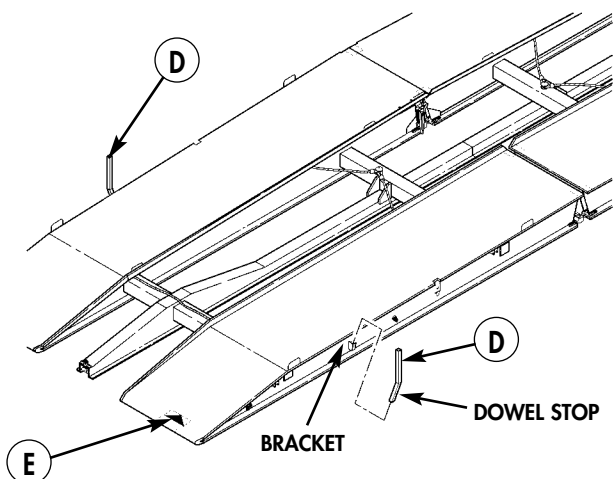


## BRIDGE CONTROLS AND INDICATORS (Contd)

- Ⓒ **UNLOCKING ROD** — Before the bridge halves can be retracted to travel position on pallet, the slide lock on each bridge quarter must be released using the unlocking rod. To unlock slide lock, insert fork end of unlocking rod on control lever, turn unlocking rod to the right for right-hand bridge quarters, and to the left for left-hand bridge quarters.

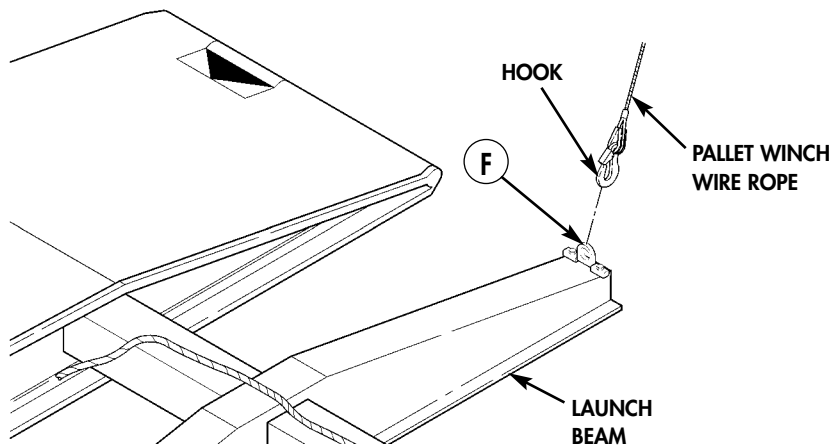


- Ⓓ **ROADWAY MARKER POLES** — There is one marker bracket on each bridge quarter of the coupled bridge. The marker pole is inserted facing up in bridge quarter bracket until dowel stop is against bracket.
- Ⓔ **ROADWAY PAINT MARKINGS** — There is a yellow paint mark on the ramp edge of each bridge quarter used to indicate center of bridge for vehicle operators.

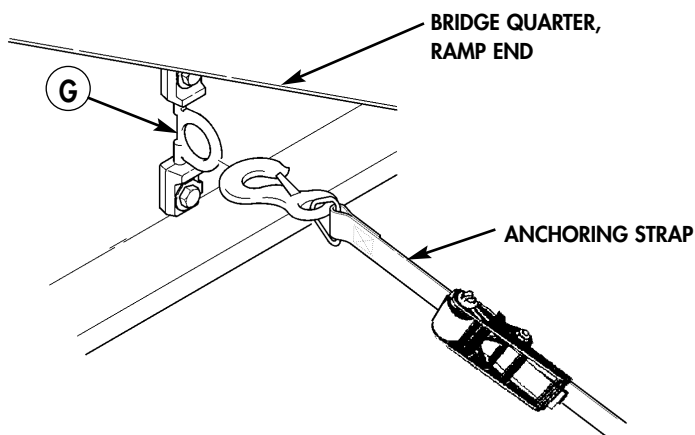


**BRIDGE CONTROLS AND INDICATORS (Contd)**

- F** **LIFTING EYES** — During launch and retrieval operations, the coupled bridge is lifted from either end by connecting hook from pallet winch wire rope to the lifting eye on the end of the bridge launch beam. Open end of hook must face bridge when connected to lifting eye. The launch beam lifting eyes are to be used for lifting the bridge using pallet winch only.

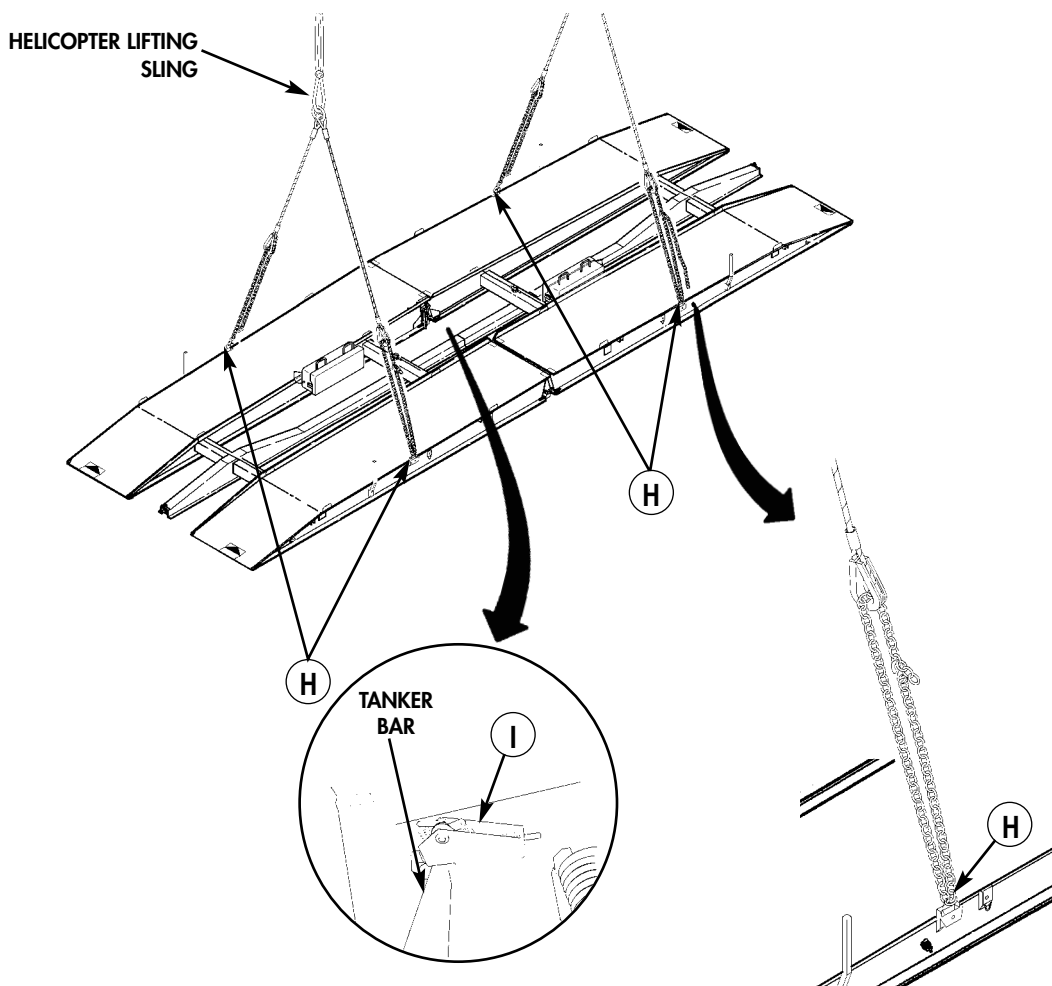


- G** **ANCHORING EYES** — There is an anchoring eye on the outboard side of each bridge quarter at the ramp end. Once the bridge is emplaced over a gap, anchoring straps are connected to the four corners of the bridge at each anchoring eye. The four anchoring eyes are used for bridge anchorage only.



**BRIDGE CONTROLS AND INDICATORS (Contd)**

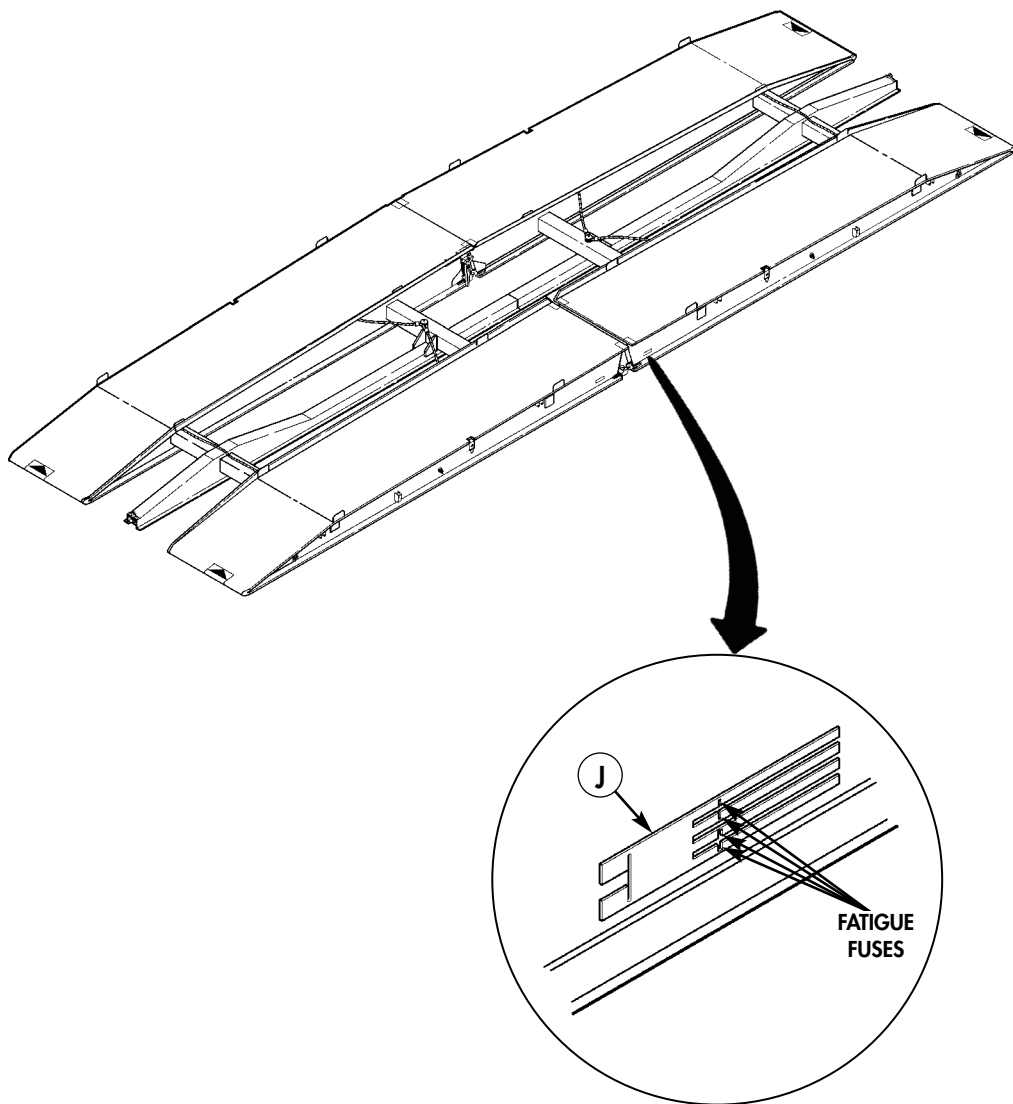
- (H) HELICOPTER LIFTING RINGS** — There is a lifting ring at the center of the outboard side of each bridge quarter. The coupled bridge may be lifted and moved to a new location by connecting a dual-point sling to the four helicopter lifting rings. The four lifting rings are intended for deployment by helicopter only.
- (I) UPPER COUPLING LOCK MECHANISM** — This mechanism is normally engaged and disengaged automatically during launch and retrieval. The lock can be manually released by placing tapered end of BII tanker bar under slot in lock mechanism.





## BRIDGE CONTROLS AND INDICATORS (Contd)

- J** **REMAINING SERVICE LIFE INDICATORS (RSLI)** — The RSLI on each bridge quarter has four fatigue fuses; each fuse is designed to break as the bridge incurs an approximate number of crossings (full-load cycles). When all four fatigue fuses on any RSLI are cracked, the bridge has reached its usable lifespan.





## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## LOCATION OF BASIC ISSUE ITEM (BII), COMPONENTS OF END ITEM (COEI), AND ADDITIONAL AUTHORIZATION LIST (AAL) ITEMS

1. The following items are stowed on pallet or in BII toolboxes:
  - a. Two ratchets for operating supporting cylinder winches (one per toolbox)
  - b. Four marker poles for marking roadway of emplaced bridge (two per toolbox)
  - c. Two unlocking rods for unlocking bridge quarters (one per toolbox)
  - d. Four fastening rods for securing bridge halves to pallet (two per toolbox)
  - e. Two 50 mm wrenches and two 36 mm/41 mm wrenches for tightening pallet hold-down bars and launch boom locks (one each per toolbox)
  - f. Four ratchet straps for anchoring bridge to ground and for tie down of pallet on PLST (two per toolbox)
  - g. Four hold-fasts with shackles for anchoring bridge (two per toolbox)
  - h. Key for opening RCU stowage box. Retained by chain in toolbox adjacent to RCU stowage box.
  - i. Two transload rollers for transloading pallet to PLST. Stowed on fixed axle bracket when pallet is on PLST. Stowed in toolboxes when pallet is unloaded to ground (one per toolbox)
  - j. Transload roller bar for transloading pallet to PLST. Stowed in either BII toolbox.
  - k. Two 19-mm wrenches used for removal and installation of transload roller bar and shoring pads (one per toolbox)
  - l. Two retrieval positioning aids used for positioning CBT prior to retrieval of bridge (one per toolbox)
  - m. Hydraulic pump handle for operating pallet support wheel hydraulic pump (stowed on pallet A-frame)
  - n. Tanker bar for bridge alignment and for measurement of REB distance from gap (stowed on pallet A-frame)
  - o. Two soft-nosed hammers for locking/unlocking lower coupling receptacle lever on each bridge quarter (one per toolbox)
  - p. Two pallet lifting brackets for sling lifting pallet and chocking pallet wheels (stowed on pallet A-frame)
  - q. Drain valve hose for draining LPU fuel tank. Stowed in either toolbox.

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**LOCATION OF BASIC ISSUE ITEM (BII), COMPONENTS OF END ITEM (COEI), AND ADDITIONAL AUTHORIZATION LIST (AAL) ITEMS (Contd)**

2. The following items are stowed in the anchorage stowage boxes:

- a. 32 anchoring pins (16 per anchorage stowage box) for securing hold-fasts
- b. Two sledge hammers and nail head tools for driving in anchoring pins (one per toolbox)
- c. Two removers for removing anchoring pins (one per toolbox)
- d. Two drawing apparatuses for use with removers for removing anchoring pins (one per toolbox)

3. The following items are stowed on the transporter:

- a. Extra North Atlantic Treaty Organization (NATO) electric power cable for powering pallet. Refer to TM 5-5420-234-14&P.
- b. Two hydraulic slave hose assemblies for powering pallet or CBT hydraulic systems from another CBT. Refer to TM 5-5420-234-14&P.

**END OF WORK PACKAGE**

# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### OPERATION UNDER USUAL CONDITIONS

#### GENERAL

Work packages 0010 00 through 0024 00 provide instructions for the transport and operation of pallet and bridge under normal operating conditions. Operator instructions include CBT preparation, site survey requirements, loading/unloading of pallet, and launch/retrieval of bridge. In addition operator instructions include transloading pallet, deployment by helicopter, bridge anchorage, and requirements for crossing the bridge.

#### CBT PREPARATION FOR USE

Operation of CBT and pallet under usual conditions is described in this work package. Operation under unusual conditions is described in WP 0025 00. Prior to operating the CBT, the operator must perform the following:

#### **WARNING**

Due to the severe overhang of the REB pallet when mounted on the CBT, a rear-end collision by a HMMWV or any comparable vehicle may result in that vehicle under riding the REB pallet. To prevent this, an empty PLST shall be connected to any CBT loaded with the REB pallet during all road marches/convoys. Failure to comply may result in severe injury or death to personnel.

- a. Ensure field maintenance has serviced the vehicle; refer to DA Form 2404/5988-E, Equipment Inspection and Maintenance Worksheet.
- b. Perform all operator/crew Before PMCS as listed in WP 0043 00, Table 1.

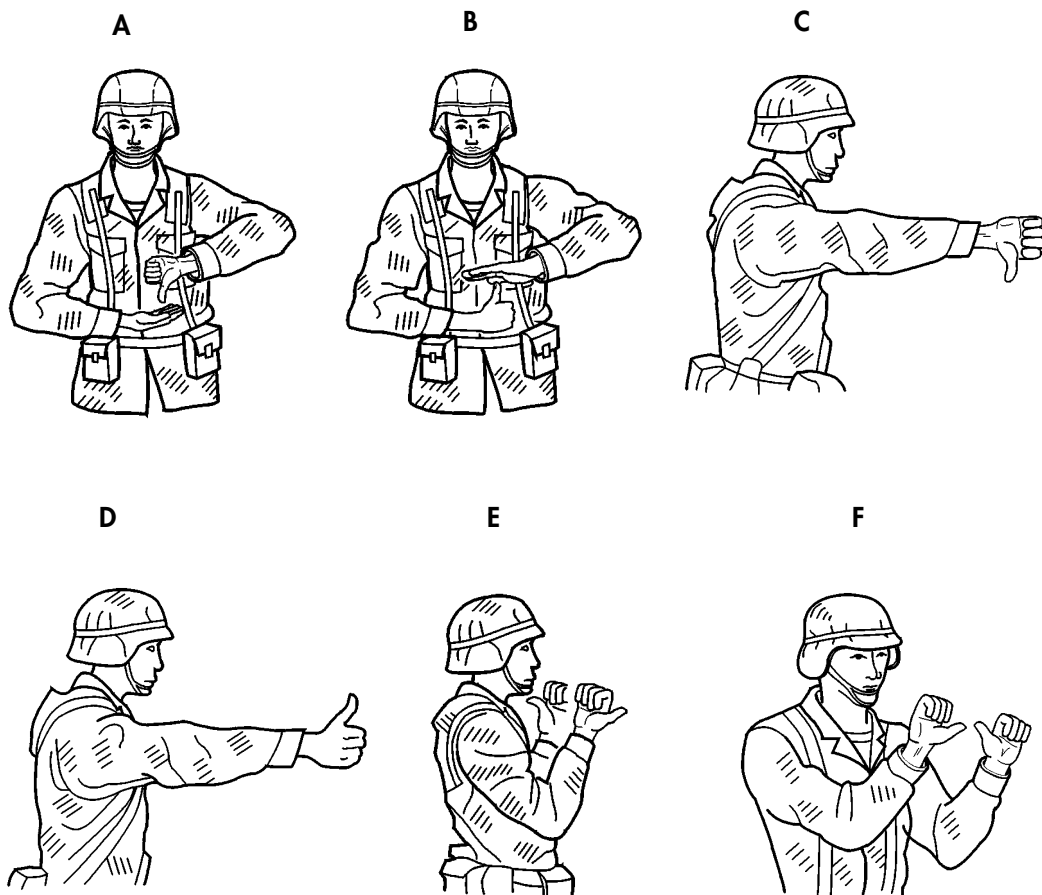
#### **WARNING**

To minimize possible loss of control while towing the PLST, the maximum safe speed on paved roads is 35 mph (56 km/h), based on quick lane change testing, 15 mph (24 km/h) on off-road cross country terrain, and 10 mph (16 km/h) on heavily wash boarded areas. Refer to TM 9-2330-385-14 for additional guidance on PLST operation. Failure to comply may result in damage to equipment and possible injury or death to personnel.

- c. Review the HEMTT vehicle operating instructions prior to driving the CBT. Refer to TM 9-2320-279-10 and TM 5-5420-234-14&P.
- d. Review the proper hand signals for operation of the transporter boom prior to using the LHS. Refer to Hand Signals for LHS Figure in this work package.
- e. Review the REB Equipment Checklist Table in this work package prior to performing all pallet operations.

## OPERATION UNDER USUAL CONDITIONS (Contd)

## CBT PREPARATION FOR USE (Contd)



**A**—Auto unload—make fist with thumb pointing down, touching palm of opposite hand.

**B**—Auto load—make fist with thumb pointing up, touching palm of opposite hand.

**C**—Hook arm unload—make fist with thumb pointing down.

**D**—Hook arm load—make fist with thumb pointing up.

**E**—Main frame unload—make fist with both hands and thumbs pointing outward.

**F**—Main frame load—make fist with both hands and thumbs pointing inward.

*Hand Signals for LHS Figure.*

**OPERATION UNDER USUAL CONDITIONS (Contd)  
CBT PREPARATION FOR USE (Contd)**

*REB Equipment Checklist Table.*

	CONDITION	HYDRAULIC SUPPLY HOSES	PALLET ELECTRIC POWER CABLE	PALLET MAIN POWER SWITCH	TRANSFER VALVE	PALLET PUMP BYPASS VALVE	BRIDGE FASTENING RODS	LAUNCH BOOM	SUP. CYL.	BRIDGE QUARTER SLIDE LOCKS	STEERING AXLES	FIXED AXLES	STEERING LEVERS
1	Load Pallet from Ground	CONNECTED TO PALLET	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	RAISED	LOWERED	LOCKED
2	Unload Pallet to Ground	CONNECTED TO PALLET	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	RAISED	LOWERED	LOCKED
3	Launch of Bridge	CONNECTED TO PALLET	DISCONNECTED	ON	CLOSED	OPEN TO START ENGINE; CLOSE ONCE RUNNING	REMOVED	UNLOCKED	DOWN	N/A*	RAISED	RAISED	LOCKED
4	Bridge Retrieval	CONNECTED TO PALLET	DISCONNECTED	ON	CLOSED	OPEN TO START ENGINE; CLOSE ONCE RUNNING	REMOVED	UNLOCKED	DOWN	UNLOCK PRIOR TO RETRACT	RAISED	RAISED	LOCKED
5	Transport of Pallet on Ground	CONNECTED TO PALLET	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	LOWERED	LOWERED	UNLOCKED
6	Transload Pallet to PLST	CONNECTED TO PALLET	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	RAISED	LOWERED	LOCKED
7	Transload Pallet to CBT	CONNECTED TO PALLET	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	RAISED	LOWERED	LOCKED
8	Operation of CBT for Bridge Launch or Retrieval	CONNECTED TO CBT	CONNECTED	ON	CLOSED	CLOSED	REMOVED	UNLOCKED	DOWN	N/A*	RAISED	RAISED	LOCKED
9	Oil Transfer	CONNECTED TO CBT	DISCONNECTED	OFF	OPEN	CLOSED	N/A*	LOCKED	UP	N/A*	N/A*	RAISED	N/A*
10	Transport Mode	CONNECTED TO CBT	DISCONNECTED	OFF	CLOSED	CLOSED	INSTALLED	LOCKED	UP	N/A*	RAISED	RAISED	LOCKED

N/A\*—NOT APPLICABLE

**OPERATION UNDER USUAL CONDITIONS (Contd)  
CBT PREPARATION FOR USE (Contd)**

*REB Equipment Checklist Table (Contd).*

	CONDITION	TRANSLOAD ROLLERS	TRANSLOAD ROLLER BAR	PALLET HOLD-DOWN BARS	SHORING PADS	BRIDGE COUPLING HELP LEVERS	PLST DRAWBAR TUBE	PLST DRAWBAR EXTENSION	PLST
1	Load Pallet from Ground	REMOVED	REMOVED	STOWED	INSTALLED	N/A*	N/A*	N/A*	DISCONNECTED FROM CBT
2	Unload Pallet to Ground	REMOVED	REMOVED	STOWED	INSTALLED	N/A*	N/A*	N/A*	DISCONNECTED FROM CBT
3	Launch of Bridge	REMOVED	INSTALLED	CONNECTED TO CBT	INSTALLED	LOCKED	N/A*	N/A*	DISCONNECTED FROM CBT
4	Bridge Retrieval	REMOVED	INSTALLED	CONNECTED TO CBT	INSTALLED	UNLOCKED	N/A*	N/A*	DISCONNECTED FROM CBT
5	Transport of Pallet on Ground	REMOVED	REMOVED	STOWED	INSTALLED	N/A*	N/A*	N/A*	N/A*
6	Transload Pallet to PLST	INSTALLED	INSTALLED	STOWED	REMOVED	N/A*	RETRACTED	STOWED	DISCONNECTED FROM CBT
7	Transload Pallet to CBT	INSTALLED	INSTALLED	STOWED	REMOVED	N/A*	RETRACTED	STOWED	DISCONNECTED FROM CBT
8	Operation of CBT for Bridge Launch or Retrieval	REMOVED	INSTALLED	CONNECTED TO CBT	INSTALLED	N/A*	N/A*	N/A*	DISCONNECTED FORM CBT
9	Oil Transfer	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
10	Transport Mode	REMOVED	INSTALLED	CONNECTED TO CBT	INSTALLED	N/A*	EXTENDED	EXTENDED	CONNECTED TO CBT

N/A\* — NOT AVAILABLE

**END OF WORK PACKAGE**

**Change 2**

**0010 00-4**



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# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### TRANSPORTER OPERATIONS SITE SURVEY

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#### **WARNING**

Prior to performing transporter operations, ensure a site survey is conducted. Failure to meet all site requirements for a given launch method may result in damage to equipment or possible injury or death to personnel.

A site survey must be conducted to establish a suitable launch site prior to launching bridge and performing bridging operations. Refer to WP 0012 00, Site Requirements and Layouts. Site selection should be established by reconnaissance. The operator is responsible for observing the following requirements and conditions prior to entering the site with a transporter.

#### **WARNING**

A ground guide must be present when maneuvering transporter. Failure to use a ground guide may result in crashing transporter into an obstruction or coming in contact with power lines, resulting in damage to equipment or injury or death to personnel.

- a. A ground guide is required to assist the operator when maneuvering the transporter and while performing launch and retrieval operations.
- b. The launch site ground surface should be firm and clear of any obstructions, such as low hanging trees or power lines.
- c. The overhead clearance above loading/unloading areas must be at least 22 ft, 2 in. (6.7 m).

#### **WARNING**

Operating on side slopes can cause payload shift and instability that may result in a rollover. Failure to comply may result in damage to equipment or possible injury or death to personnel.

To minimize the risk of a rollover, avoid steep side slopes. Verify payload is well secured prior to operating on side slopes from 20% to 30%, and keep speed to a minimum, make no sudden steering inputs, and avoid depressions while traversing undulating terrain. Failure to comply may result in vehicle rollover and injury or death to personnel.

**TRANSPORTER OPERATIONS SITE SURVEY (Contd)**

- d. The river bank side-to-side slope should be no greater than a 4.5-degree angle as determined by checking the side-to-side leveling gauge on the pallet frame.

**WARNING**

Do not attempt to launch bridge if slope between near and far bank is greater than 4 ft, 3 in. (1.3 m). Failure to comply may result in damage to equipment or possible injury or death to personnel.

- e. The slope between near and far shore banks should be no greater 4 ft 3 in. (1.3 m).

**WARNING**

If unloading pallet to ground, ensure pallet hold-down bars, NATO slave cable, and hydraulic hoses are disconnected from CBT. Failure to comply will result in damage to equipment or possible injury or death to personnel.

- f. If unloading pallet to ground at launch site, ensure pallet hold-down bars, NATO slave cable, and hydraulic hoses are disconnected from CBT and secured in their stowed positions.

**WARNING**

Due to the severe overhang of the REB pallet when mounted on the CBT, a rear-end collision by a HMMWV or any comparable vehicle may result in that vehicle under riding the REB pallet. To prevent this, an empty PLST shall be connected to any CBT loaded with the REB pallet during all road marches/convoys. Failure to comply may result in severe injury or death to personnel.

To minimize possible loss of control while towing the PLST, the maximum safe speed on paved roads is 35 mph (56 km/h), based on quick lane change testing, 15 mph (24 km/h) on off-road cross country terrain, and 10 mph (16 km/h) on heavily wash boarded areas. Refer to TM 9-2330-385-14 for additional guidance on PLST operation. Failure to comply may result in damage to equipment and possible injury or death to personnel.

**CAUTION**

The PLST cannot be towed behind the CBT loaded with a REB pallet unless the PLST is equipped with the drawbar extension kit, and both the drawbar extension and drawbar tube assembly are in their extended positions. Refer to TM 9-2330-385-14. Failure to comply will result in damage to equipment.

- g. If transporting REB pallet on CBT, with or without bridge, connect an empty PLST to CBT prior to all road marches/convoys. Refer to TM 9-2320-385-14.

**END OF WORK PACKAGE**

# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### SITE REQUIREMENTS AND LAYOUTS

Site selection for bridging operations depends on several factors and is usually a compromise of tactical and technical requirements. Determining if the desired site location is suitable for the construction of a bridge is essential to the success and safety of the bridge company. A careful survey of the proposed bridge site should be made by reconnaissance, not the operator/crew. However, the operator/crew must understand and observe the site requirements when performing bridge operations.

- 1. Tactical Requirements** — The ability of the US Army to cross a river, gully, or ditch quickly and efficiently is critical. Where conditions warrant a crossing, and no other method of crossing a gap quickly is available to advance army forces, the REB will be used. Site selection is the result of a commander's strategic decision based on tactical requirements.
  - a. Bridging site preparation.** Where tactically and strategically possible, undertake a preliminary study and site selection checks to determine the proposed location of the bridge prior to marking out the site.
  - b. Preliminary study.** Carry out intelligence gathering and reconnaissance of the proposed bridge location.
  - c. Intelligence gathering.** Refer to intelligence studies and reports, maps, aerial photographs, and personal aerial reconnaissance. If possible, seek the advice of friendly local civilians.
  - d. Site reconnaissance.** Reconnaissance is required to:
    - (1) Select suitable site.
    - (2) Select the bridge centerline.
    - (3) Measure the gap, bank heights, and bank transverse and longitudinal slopes.
  - e. Hasty reconnaissance.** This is carried out where it is not possible to take measurements with instruments and where access to the far bank is not possible. Make best estimates of span and bank heights.
  - f. Deliberate reconnaissance.** Deliberate reconnaissance should always be carried out where possible, following standard practice. Measure the gap by triangulation using an instrument or by a tape. Determine the relative bank heights by means of a suitable instrument.

## SITE REQUIREMENTS AND LAYOUTS (Contd)

**2. Site Requirements** — Site selection is a critical step in performing a crossing, and the requirements are generally based on equipment limitations. Crossing sites are generally characterized as assault, or bridging, with each having its own set of requirements.

- a. An assault site is selected for the following characteristics:
  - (1) Enemy forces are weak, the terrain on the friendly shore provides concealment from enemy observation, and there is room for the assault to be supported by overmatching fire.
  - (2) Adequate crossing routes exist to and from the gap at its narrowest point.
  - (3) Firm banks permit rapid crossing at multiple points along the gap.
- b. All bridge sites require the following characteristics:
  - (1) The site should be located where there are established road networks on both sides of the gap.
  - (2) The site should be located at a narrow point along the gap, free of obstructions that would impede operations.
  - (3) The site should have firm banks on both sides.
  - (4) Near and far shores must have a reasonably flat and even surface and be a minimum of 11 ft (3.4 m) wide and 40 in. (1 m) long.
  - (5) The site should have a slope between near and far shores no greater than 4 ft 3 in. (1.3 m).

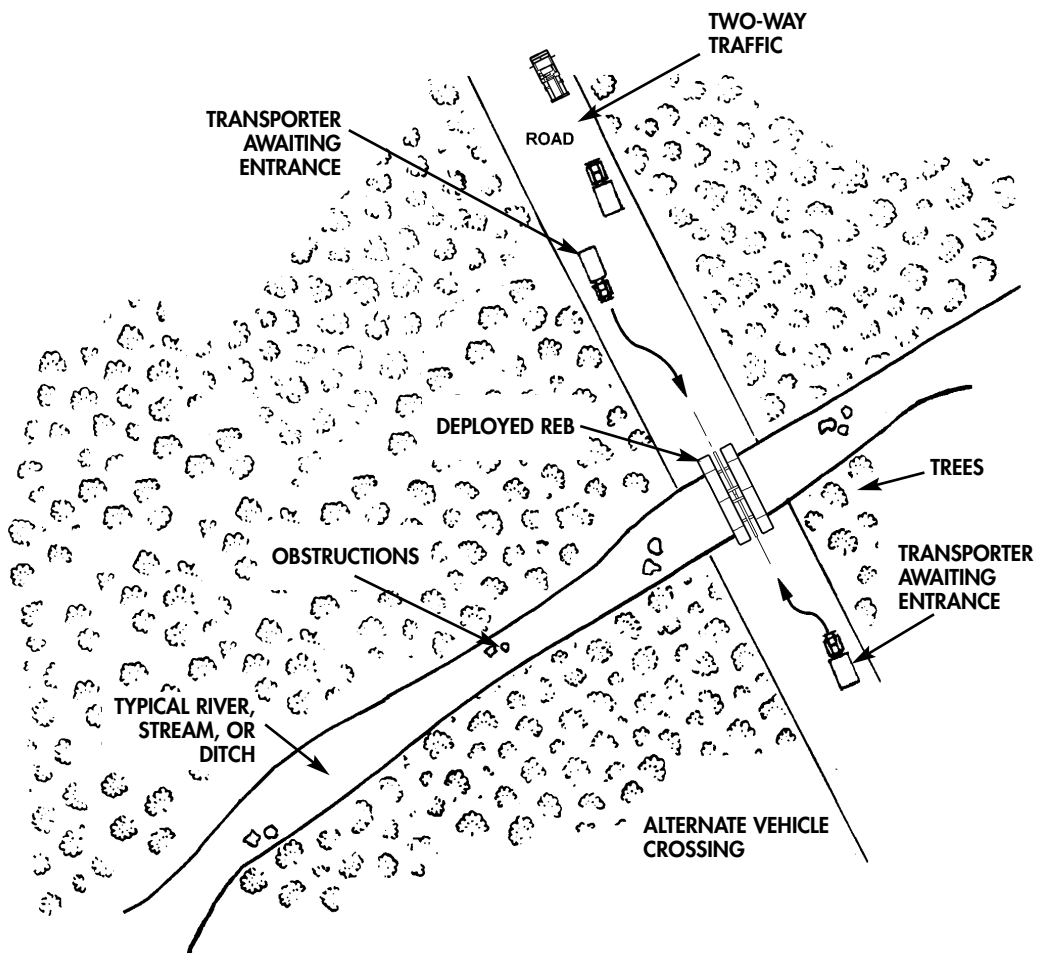
### **WARNING**

Operating on side slopes can cause payload shift and instability that may result in a rollover. Failure to comply may result in damage to equipment or possible injury or death to personnel.

To minimize the risk of a rollover, avoid steep side slopes. Verify payload is well secured prior to operating on side slopes from 20% to 30%, and keep speed to a minimum, make no sudden steering inputs, and avoid depressions while traversing undulating terrain. Failure to comply may result in vehicle rollover and injury or death to personnel.

- (6) The side slope difference between near and far shores is not greater than 1 in 20 (5%).
  - (7) The area to be bridged between far and near shores must be clear of obstructions to a depth of 9 in. (23 cm).
- 3. Site Layout Requirements** — Bridge assembly sites require two way access roads to areas for parking, preparation of equipment, and routing of personnel and vehicle traffic. Site conditions will determine the location of bridging sites and the location of access roads to them. Single or multi-launch sites are established depending on how quickly the advancing forces are directed to make a crossing. When establishing a site layout, refer to figures 1 and 2 for examples. Refer to FM 5-34, Engineer Field Manual, for additional information on site requirements and layouts.

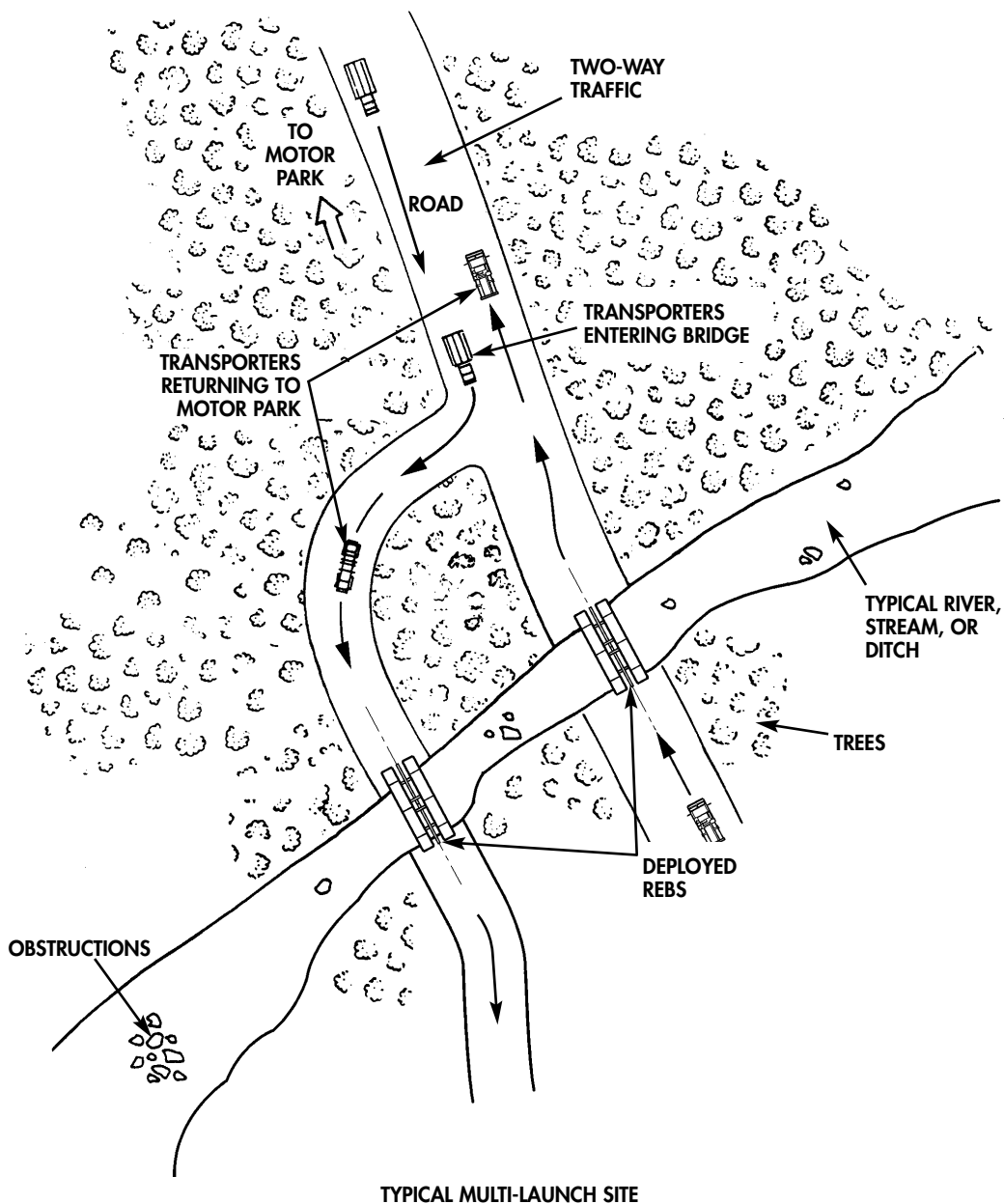
**SITE REQUIREMENTS AND LAYOUTS (Contd)**



**TYPICAL SINGLE LAUNCH SITE**

*Figure 1. Bridge Assembly Site Layout for Single Launch Site.*

**SITE REQUIREMENTS AND LAYOUTS (Contd)**



*Figure 2. Bridge Assembly Site Layout for Multi-Launch Site.*

**SITE REQUIREMENTS AND LAYOUTS (Contd)**

**4. Site Parameters** — Carry out further checks on arrival at the proposed location to ascertain the site suitability for bridge deployment. Although not exhaustive, consider the following factors:

**a. Access routes.**

Tie in the access routes at both ends of the bridge where possible to the existing main road network to reduce preparation and maintenance.

**b. Shores.**

Ensure near and far shores should be approximately of equal height. Operations are possible provided the difference in shore height does not exceed 4 ft 3 in. (1.3 m). Refer to figures 3 and 4 to determine the difference in near and far shore heights. The shores at the expected bearing points of the bridge should have a Soil Bearing Capacity (SBC) of 4.5 ton/ft<sup>2</sup> (450 kN/m<sup>2</sup>). Refer to table 1 for the SBC of various soil types. The ground bearing capacity should have a minimum SBC of 4.5 ton/ft<sup>2</sup> (450 kN/m<sup>2</sup>). (Additional grillage<sup>1</sup> is required if softer shores are to be used.)

**c. Anchorage.**

Installation of bridge anchorage is recommended but not required for all soil descriptions listed in table 1 below. Conditions such as SBC of launch site at far and near shores and local weather conditions should be taken into account when determining whether to install anchorage. The installation of bridge anchorage will be at the discretion of the NCOIC.

**d. Shore Heights.**

The far shore should not be more than 4 ft 3 in. (1.3 m) or (10%) higher or lower than that of the near shore when measured from the projection of the near shore slope. Refer to figures 3 and 4.

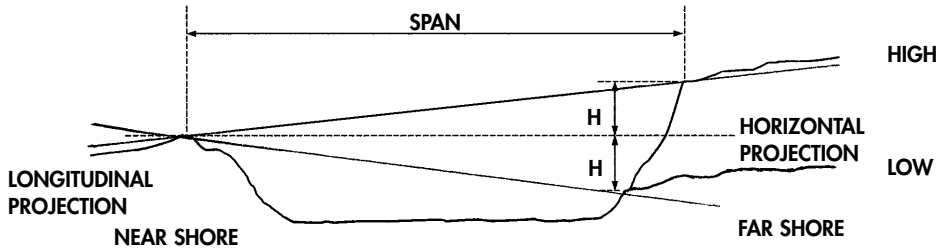
*Table 1. Examples of Soil Bearing Capacities (SBC).*

SOIL DESCRIPTION	SBC-TON/FT <sup>2</sup>	KN/M <sup>2</sup>
Hardpan overlaying rock	12	1290
Very compact sandy gravel	10	1075
Loose gravel and sandy gravel, compact sand and gravelly sand, very compact sand-inorganic silt soils	6	645
Hard, dry, consolidated clay	5	537
Loose coarse to medium sand, medium compact fine sand	4	430
Compact sand clay	3	322
Loose, fine sand, medium compact sand-inorganic silt soils	2	215
Firm or stiff clay	1.5	161
Loose, saturated sand-clay soils, medium soft clay	1	107

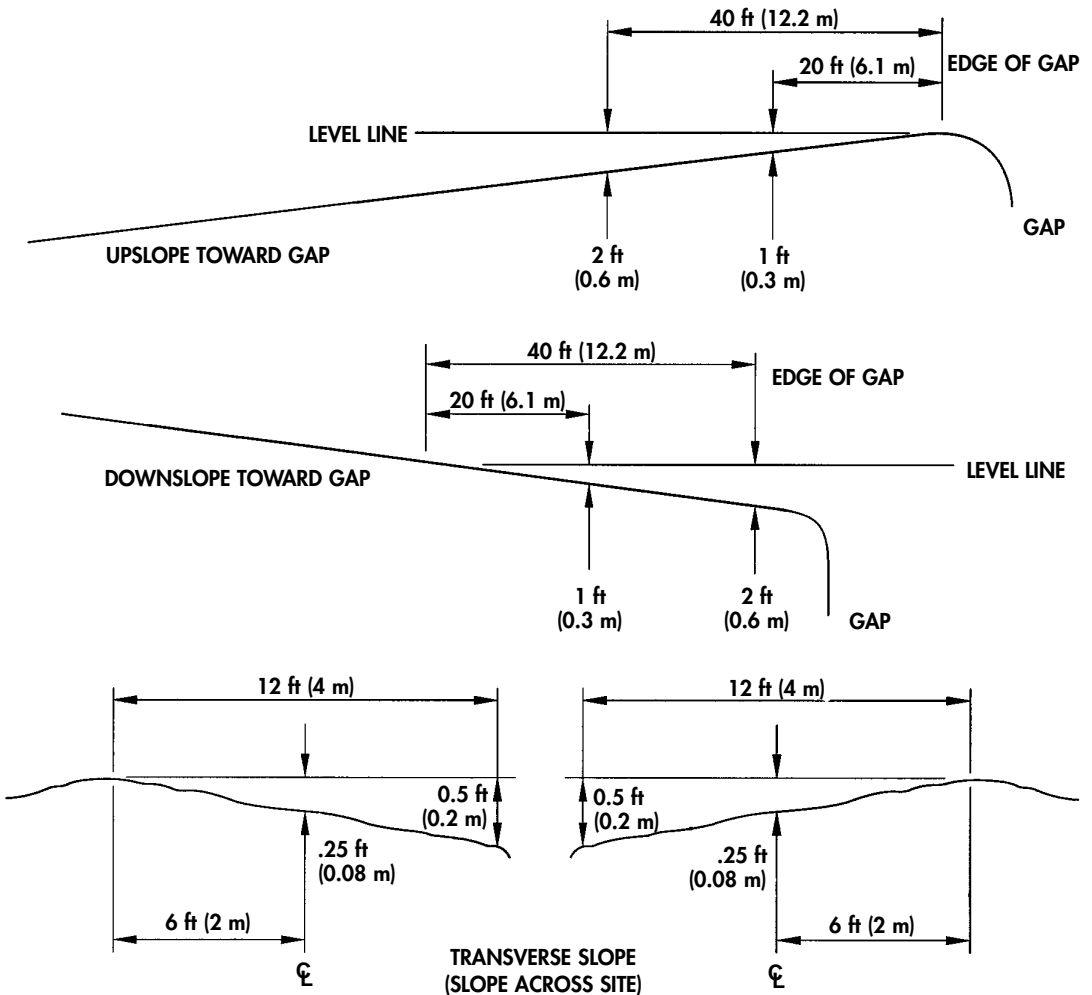
<sup>1</sup> Grillage – Framework of beams and crossbeams built as a foundation for building on soft ground.

**SITE REQUIREMENTS AND LAYOUTS (Contd)**

**d. Shore Heights (Contd).**



*Figure 3. Shore Height Measurement.*



*Figure 4. Shore Slope Measurement.*



## SITE REQUIREMENTS AND LAYOUTS (Contd)

### e. Construction Site.

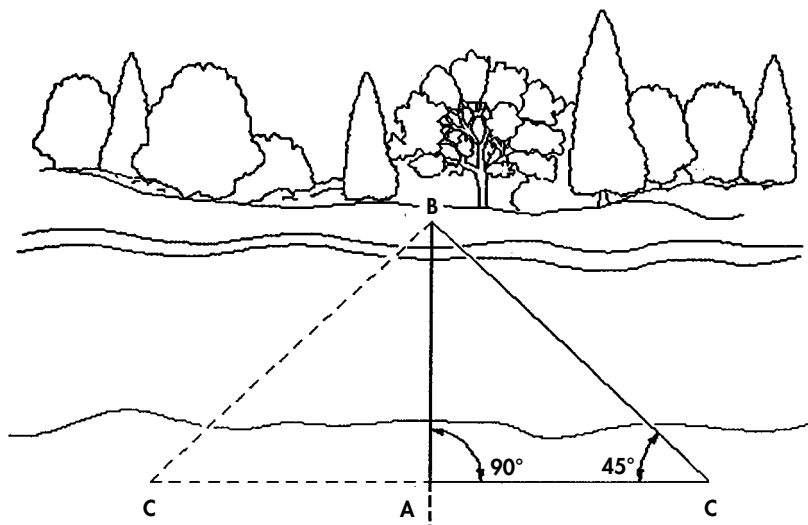
Ensure the area can accommodate a normal construction site of 20 ft (6.1 m) in width by 42 ft (12.8 m) in length to edge of gap. Deployment is possible on more restricted sites but construction times are increased.

### f. Span Measurement.

Stand at a point on the near shore (point A) of the proposed bridge centerline (refer to figure 5), and select an object (point B) on the far shore (also positioned on the centerline).

Use a compass and record the bearing of the selected object (point B) along the proposed bridge centerline (the azimuth). Move up or down the near shore on a line at a right angle (90 degrees) to the azimuth until a point C is reached where the bearing of the selected object (point B) equals the azimuth bearing plus or minus 45 degrees.

Use a tape to measure the distance between points A and C along the near shore (which equals the distance between points A and B – the gap) to determine the gap dimension.



PROPOSED BRIDGE CENTERLINE

*Figure 5. Span Measurement.*

## SITE REQUIREMENTS AND LAYOUTS (Contd)

### g. Local Weather Conditions.

Ensure the strength and direction of prevailing winds will not hamper deployment or usage of the bridge. The deployment should not commence in wind speeds in excess of 33 mph (15 m/sec). Ensure that heavy rainfall will not cause problems on the launch site or cause a rise in the water levels when crossing rivers, streams, etc.

- 5. Launch Condition Requirements** — Shore conditions are used to determine the crossing site. Perform the following procedure if the desired launch site is uneven and would inhibit launching the bridge otherwise.

### **WARNING**

Hazard to personnel and equipment is increased if bridge is launched into less-than-ideal site. Site must be inspected and prepared to be within the operating limits of the bridge pallet launcher and the bridge. Failure to adequately prepare site could result in damage to equipment or possible injury or death to personnel.

### **CAUTION**

A rack launch, where far and rear shore banks are side-to-side and slopes are opposite each other, should be avoided. Uneven ground can cause bridge to twist. Excessive twist (more than (10%) can permanently damage bridge.

### **NOTE**

Bridge (with no load) will settle to its maximum safe limits without lifting. If any corner of bridge lifts from ground or is not fully supported by ground, perform steps 1 through 4.

- (1) Grade or fill entire site until grade is 10% or less.
- (2) Grade or fill entire site until side slope is 5% or less.
- (3) Remove large stones and fill in low spots until launch and retrieval areas are reasonably flat.
- (4) After launching bridge, but before load is applied, check below bridge to ensure that area between near and far shores is clear of obstructions to a depth of 9 in. (23 cm). Bridge will bend (deflect) downward to a negative camber when load is applied and must not contact any solid object.

**END OF WORK PACKAGE**

## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

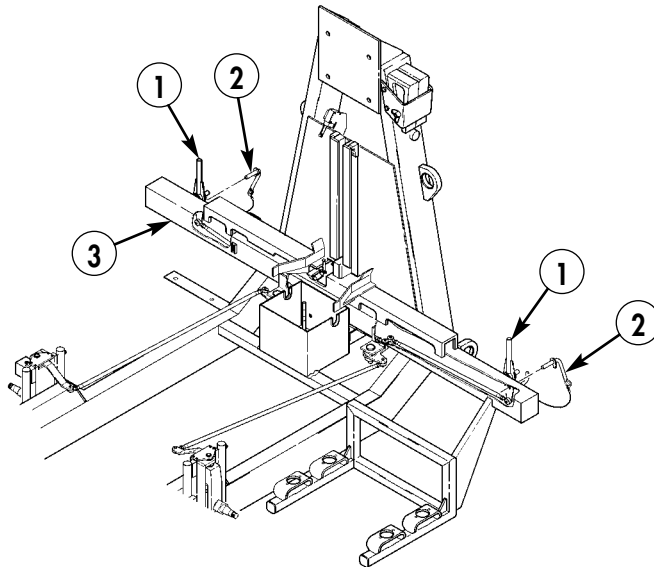
## LOADING PALLET FROM GROUND

### NOTE

During all transporter operations, the CBT operator will drive and be responsible for the operation of the LHS by means of the cab and remote control boxes. The assistant will act as a ground guide, be responsible for directing the operator by using hand signals, and assist the operator as needed.

Perform step 1, below, if pallet support wheel steering levers are not locked in the straight-ahead position.

1. Move steering levers (1) right or left until retaining pins (2) can be inserted through holes in steering levers (1) and pallet frame (3). Then install retaining pins (2).



## LOADING PALLET FROM GROUND (Contd)

### **CAUTION**

Failure to raise steering axles prior to loading bridge pallet on transporter may result in damage to equipment.

Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (235 bar). If pressure on gage reaches 3,626 psi (250 bar), stop and check for obstructions, such as support wheel retaining pins inadvertently left in place. Do not exceed 3,626 psi (250 bar), or damage to equipment may result.

### **NOTE**

Perform step 2 if the steering and fixed axles are in the lowered position.

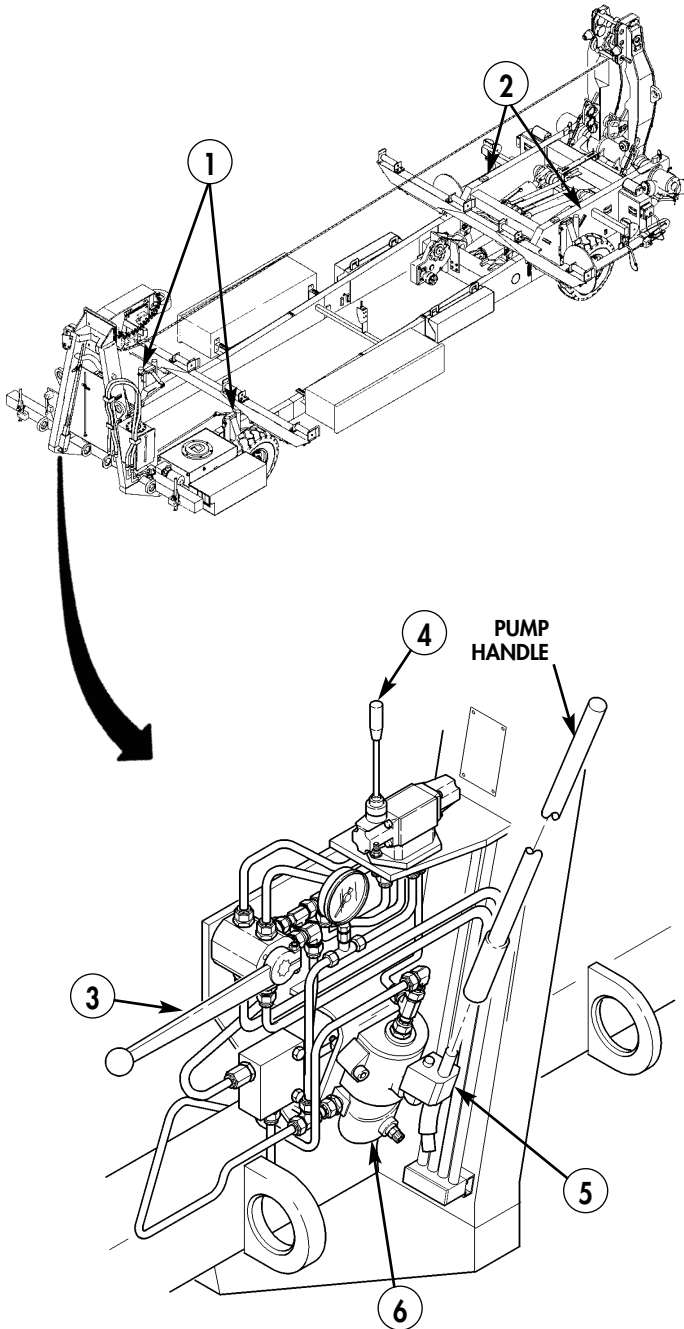
2. Raise steering axles (1) and fixed axles (2) as follows:
  - (a) Position selector valve lever (3) in POSITION 1 or pointing left of center, and move control valve lever (4) to position A or left of center.
  - (b) Install pump handle on pump lever (5), and operate hydraulic pump (6) until steering axles (1) and fixed axles (2) are fully raised. Remove and stow pump handle.

### **CAUTION**

Prior to loading pallet from ground, ensure transload roller bar has been removed from pallet lower support boom or damage to equipment may result.

3. Remove transload roller bar from lower support boom. Refer to WP 0007 00.
4. Stow transload roller bar and mounting hardware in either pallet toolbox. Refer to WP 0007 00.

LOADING PALLET FROM GROUND (Contd)



## LOADING PALLET FROM GROUND (Contd)

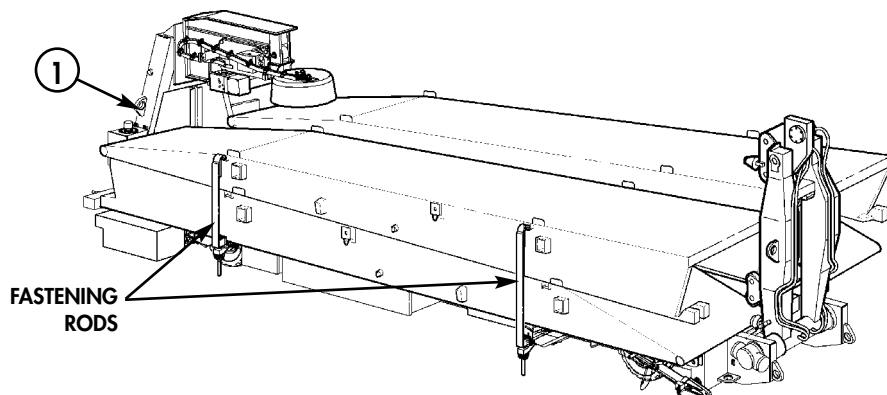
### **CAUTION**

If the bridge halves are on the pallet, do not attempt to load the pallet from the ground without the fastening rods installed. Failure to comply may result in damage to equipment.

### **NOTE**

Perform step 5 if bridge halves are on pallet.

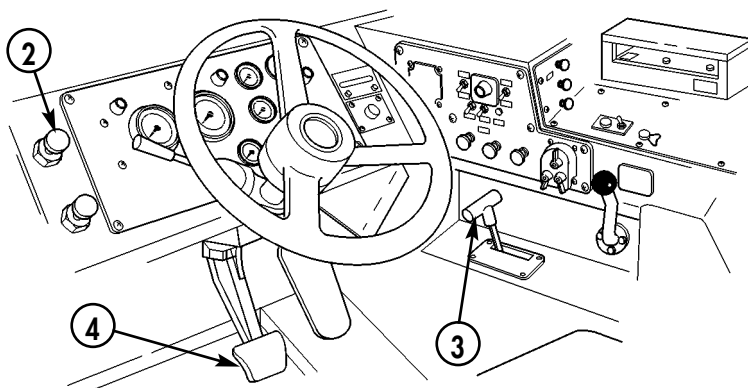
5. Install two fastening rods on each side of pallet (1) or, if fastening rods are installed, ensure that they are properly tightened. Refer to WP 0008 00.



### **CAUTION**

Assistant will act as a ground guide when backing up CBT and during operation of the LHS. Failure to comply may result in damage to equipment.

6. Back up CBT so that rear of vehicle is directly in line with pallet and approximately 5 to 6 ft (1.5 to 1.8 m) away. Apply service brake (4), move transmission selector lever (3) to N (neutral), and pull PARKING BRAKE control (2) out.



## LOADING PALLET FROM GROUND (Contd)

### **WARNING**

All non-essential personnel must stand a minimum of 15 ft (4.6 m) away from truck and bridge during loading operations. Failure to comply may result in injury or death to personnel.

### **NOTE**

Operator will perform steps 7 through 21 using LHS cab controls.

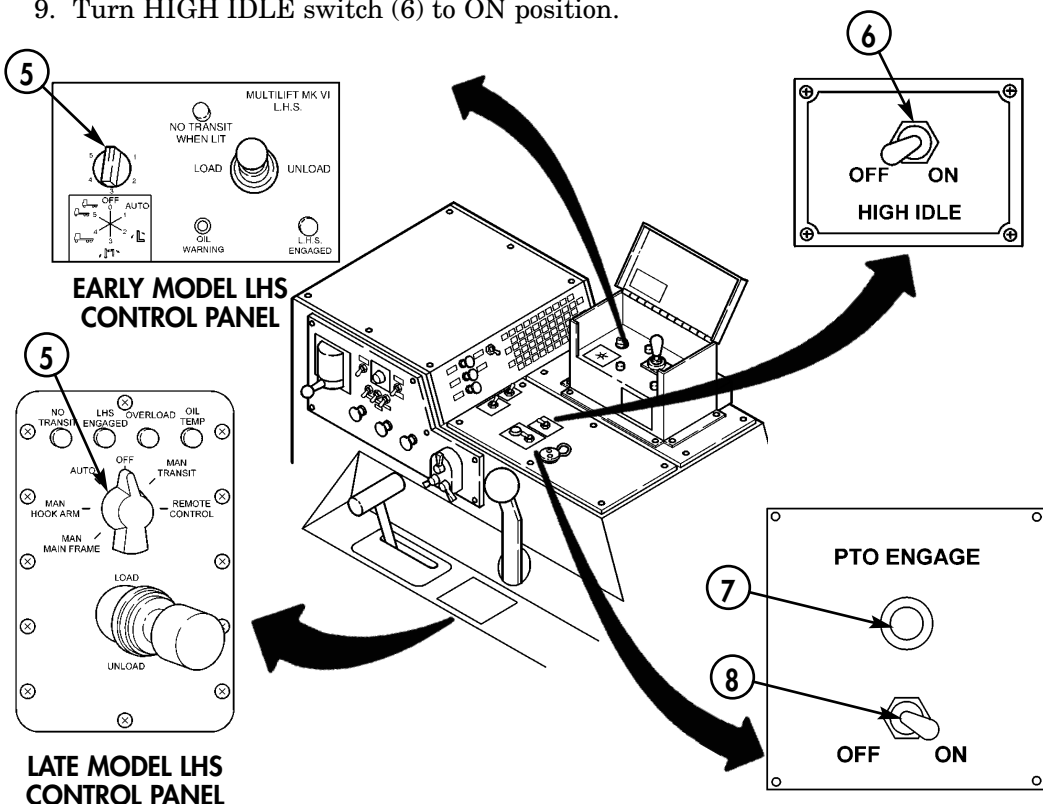
Ensure LHS RCU emergency stop switch is in the ON position if RCU is connected to LHS receptacle; cab LHS controls will not function otherwise.

- Turn LHS MODE SELECT switch (5) to No. 1 (AUTO SEQUENCE) position.

### **CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission or the LHS.

- With HIGH IDLE switch (6) in OFF position, turn PTO ENGAGE switch (8) to ON position. The PTO ENGAGE indicator (7) will light.
- Turn HIGH IDLE switch (6) to ON position.



## LOADING PALLET FROM GROUND (Contd)

### NOTE

The LHS ENGAGED indicator will light up whenever the joystick is held in the LOAD or UNLOAD position.

10. Hold joystick (2) in UNLOAD position until end of LHS hook arm (5) is below pallet hook bar (4), then release joystick (2). The NO TRANSIT WHEN LIT indicator (1) will light.
11. Turn HIGH IDLE switch (3) to OFF position.

### CAUTION

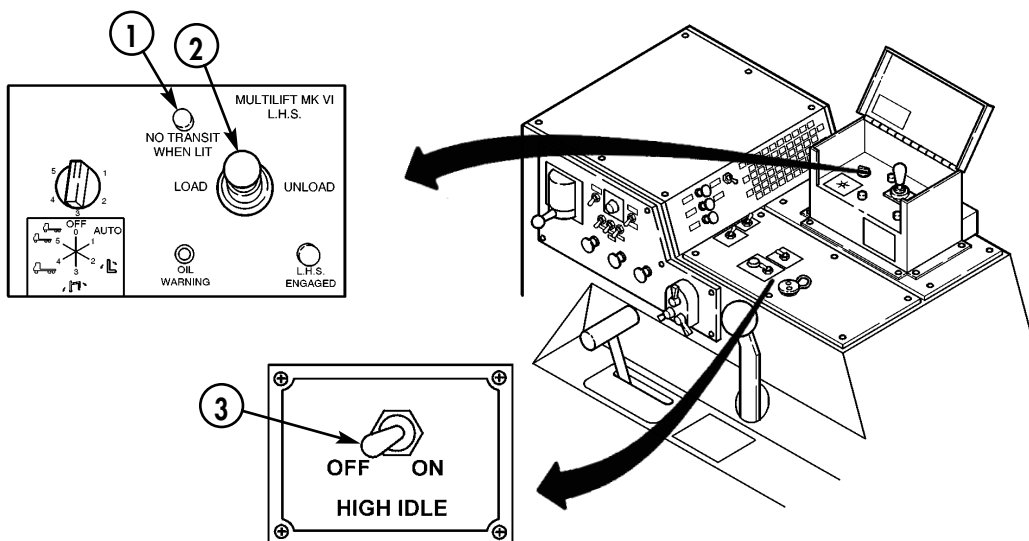
Ensure that HIGH IDLE switch is in OFF position prior to putting vehicle transmission in gear, or damage to transmission may result.

12. Back up CBT until end of hook arm (5) is centered directly under pallet hook bar (4), apply service brake (8), move transmission selector lever (7) to N (neutral), and pull parking brake control (6) out.

### CAUTION

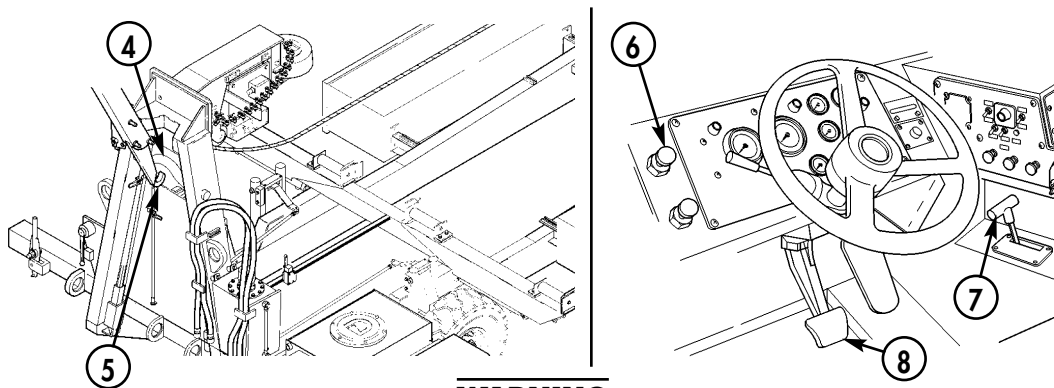
If hook end of LHS hook arm is not properly connected to pallet hook bar, assistant must immediately signal operator to stop the loading procedure. Move CBT forward and repeat steps 7 through 12, or damage to equipment may result.

13. Hold joystick (2) in LOAD position until LHS hook arm (5) is fully connected to pallet hook bar (4), then release joystick (2).
14. Turn HIGH IDLE switch (3) to ON position.





## LOADING PALLET FROM GROUND (Contd)

**WARNING**

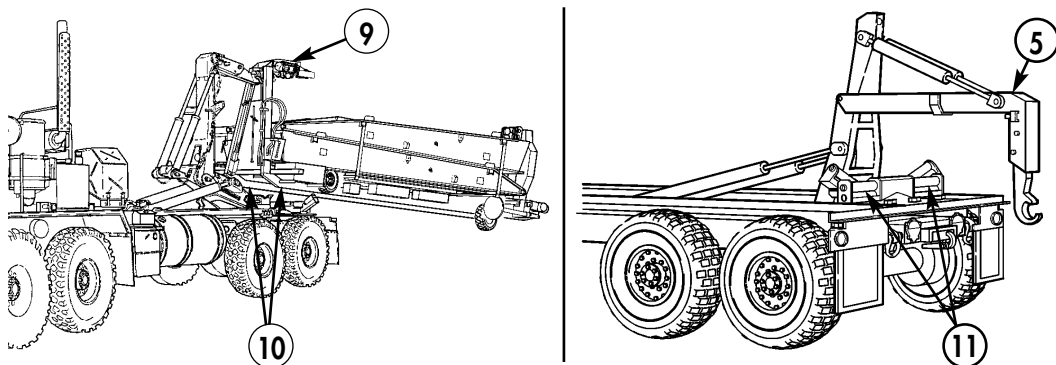
When the NO TRANSIT WHEN LIT indicator is illuminated, the CBT may be maneuvered in the immediate vicinity of the loading/unloading site, but should not be driven on the open road. Failure to comply may result in damage to equipment and possible injury or death to personnel.

CBT will roll backward when loading pallet from ground. All personnel must stand clear. Failure to comply may result in serious injury.

**NOTE**

When loading the pallet, line up the pallet girders with the LHS rear rollers. It may become necessary to steer the transporter straight under the pallet as it is lifted from the ground.

15. Push PARKING BRAKE control (6) in, and take foot off service brake (8).
16. Hold joystick (2) in LOAD position until pallet girders (10) contact LHS rear rollers (11) and pallet (9) clears ground. Release joystick (2), and pull PARKING BRAKE control (6) out.
17. Hold joystick (2) in LOAD position until LHS hook arm cylinders are approximately 6 in. (15.2 cm) exposed, then release joystick (2).



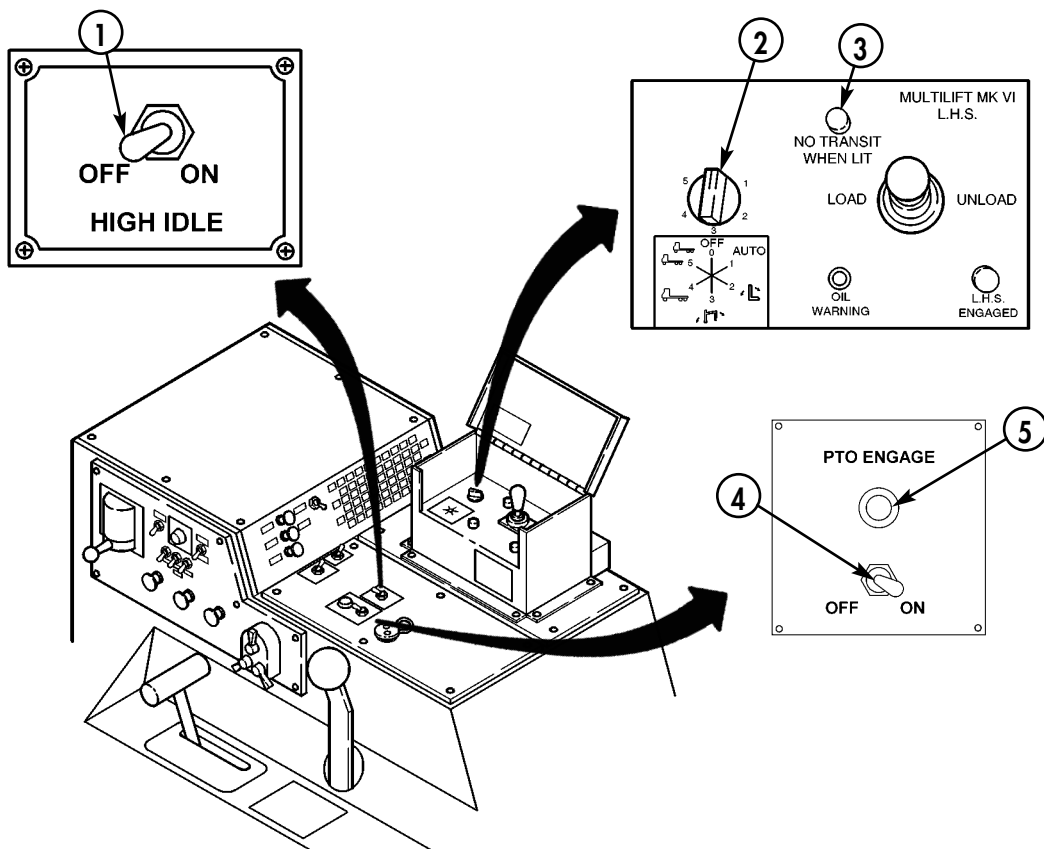
## LOADING PALLET FROM GROUND (Contd)

18. Turn HIGH IDLE switch (1) to OFF position.
19. Repeat step 17 until pallet LHS hook arm is fully stowed and NO TRANSIT WHEN LIT indicator light (3) is off.
20. Turn PTO ENGAGE switch (4) to OFF position. PTO ENGAGE indicator light (5) should go out.

### **CAUTION**

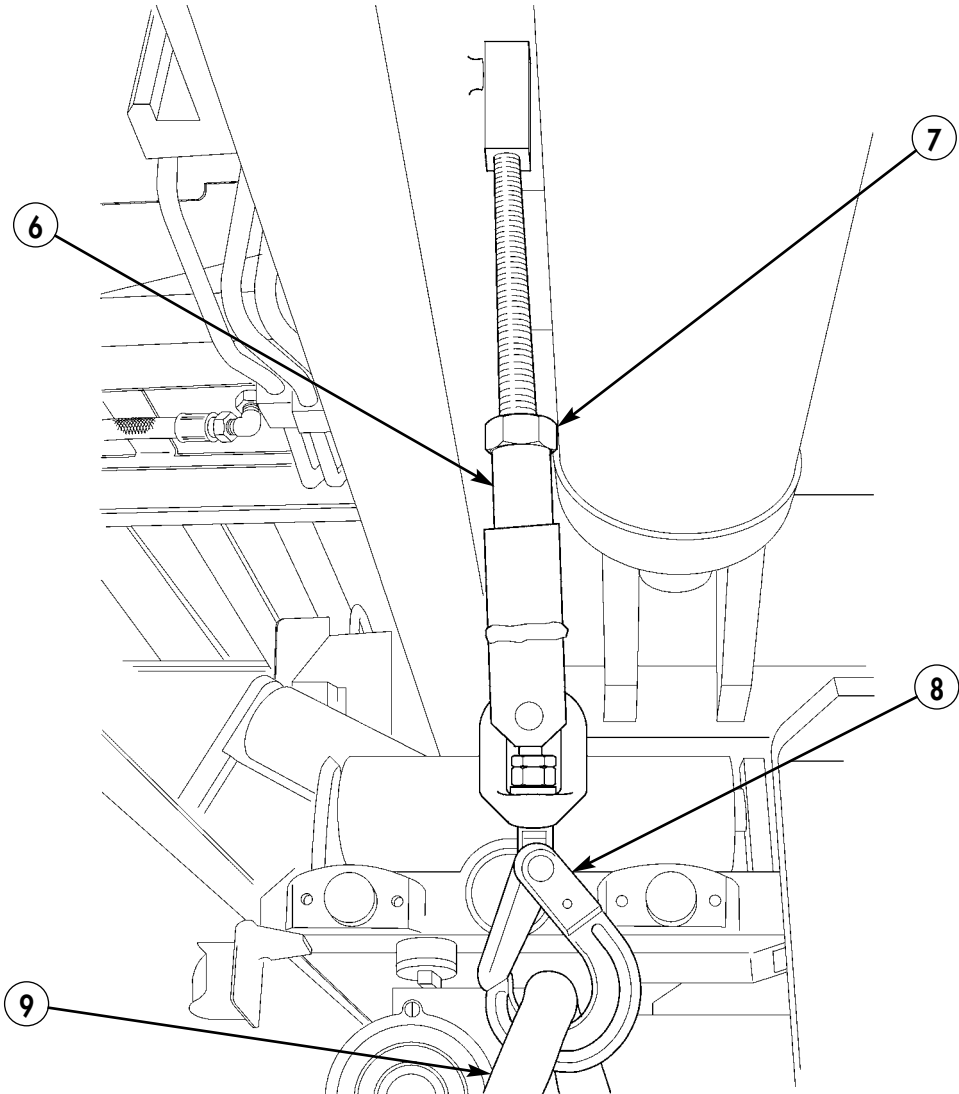
The LHS select switch must be in the 0 (OFF/TRANSPORT) position prior to road travel, or damage to LHS main frame and hook arm cylinders may result.

21. Turn LHS MODE SELECT switch (2) to 0 (OFF/TRANSPORT) position.



**LOADING PALLET FROM GROUND (Contd)**

22. Remove two pallet hold-down bars (6) from stowed position, and connect hook (8) on each hold-down bar (6) to CBT towing shackles (9). Tighten both hold-down bars (6) and jamnuts (7).



23. Install two transload rollers on fixed axles. Refer to WP 0007 00.

**END OF WORK PACKAGE**



# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### UNLOADING PALLET TO GROUND

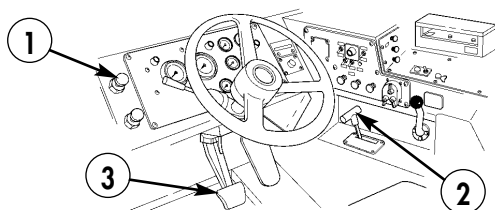
#### **CAUTION**

Assistant will act as ground guide when maneuvering the Common Bridge Transporter (CBT) and during operation of the LHS. Failure to comply may result in damage to equipment.

#### **NOTE**

During all transporter operations, the CBT operator will drive and be responsible for the operation of the Load Handling System (LHS) by means of the cab and remote control boxes. The assistant will act as a ground guide, be responsible for directing the operator by using hand signals, and assist the operator as needed.

1. Position CBT so that rear of vehicle is approximately 16 ft (4.9 m) in front of where pallet is to set on ground. Apply service brake (3), move transmission selector lever (2) to N (neutral), and pull PARKING BRAKE control (1) out.



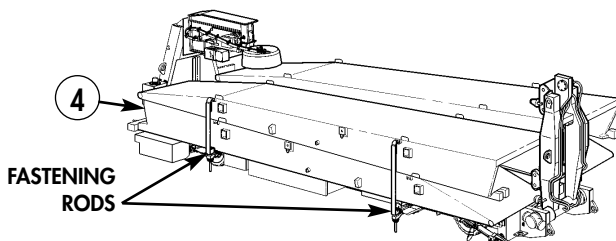
#### **CAUTION**

If bridge halves are on pallet, do not attempt to unload pallet to ground without the fastening rods installed. Failure to comply may result in damage to equipment.

#### **NOTE**

Perform step 2 if bridge is on pallet and fastening rods are not installed.

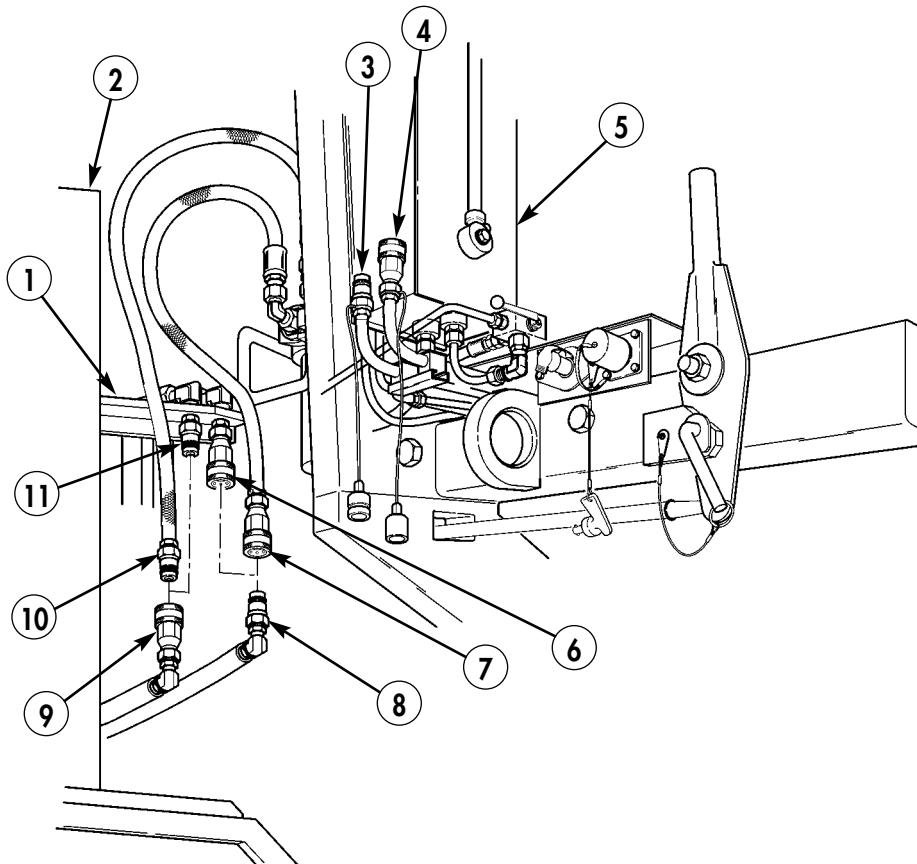
2. Install two fastening rods on each side of bridge (4) or, if fastening rods are installed, ensure they are properly tightened. Refer to WP 0008 00.



**UNLOADING PALLET TO GROUND (Contd)****NOTE**

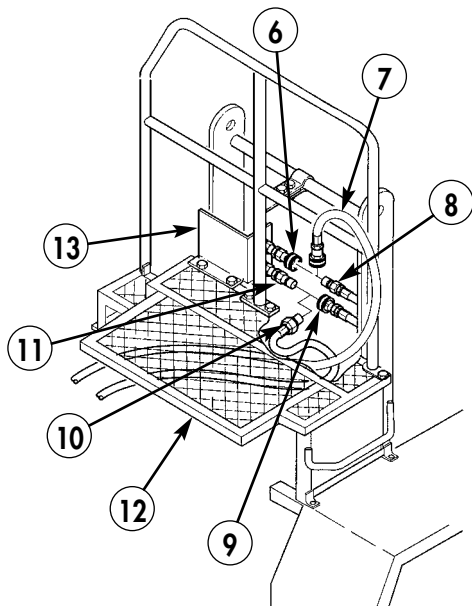
Perform steps 3 through 5 if pallet hydraulic supply hoses are connected to CBT.

3. Disconnect pallet hydraulic hoses (7) and (10) from CBT hydraulic pump hoses (8) and (9), located adjacent to LHS cabinet assembly (2) on late model CBTs, or at rear of work platform (12) on early model CBTs.
4. Connect CBT hydraulic pump hoses (8) and (9) to LHS hydraulic supply quick-disconnect couplings (6) and (11), located on bracket (1) on late model CBTs or bracket (13) on early model CBTs.
5. Connect pallet hydraulic supply hoses (7) and (10) to pallet hydraulic quick-disconnect couplings (3) and (4), located on pallet A-frame adjacent to auxiliary reservoir (5).



**LHS COUPLINGS,  
LATE MODEL CBT**

**UNLOADING PALLET TO GROUND (Contd)**

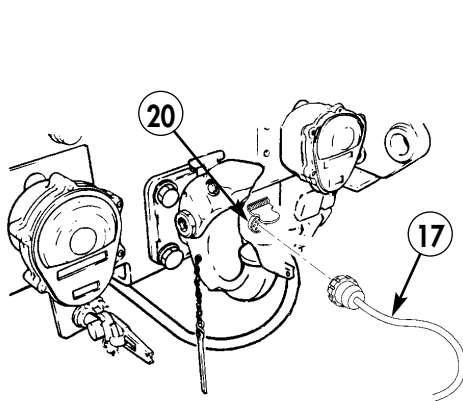
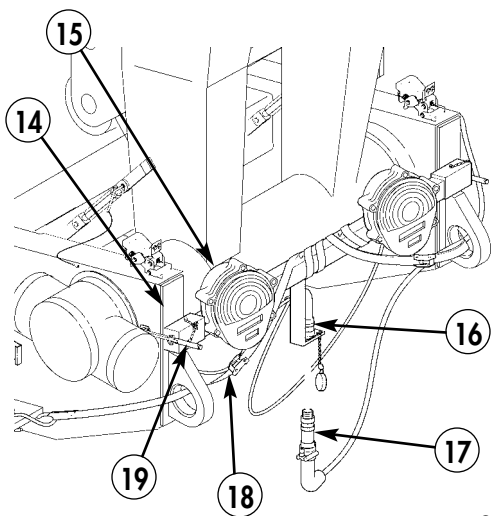


**LHS COUPLINGS, EARLY MODEL CBT**

**NOTE**

Perform steps 6 and 7 if auxiliary light bar is installed.

6. Disconnect power cable (17) from auxiliary light bar connector (16) and CBT electrical connector (20).
7. Remove auxiliary light bar (15) from two pallet frame girders (14) by removing safety strap (18) and releasing two locking clamps (19).



**UNLOADING PALLET TO GROUND (Contd)****CAUTION**

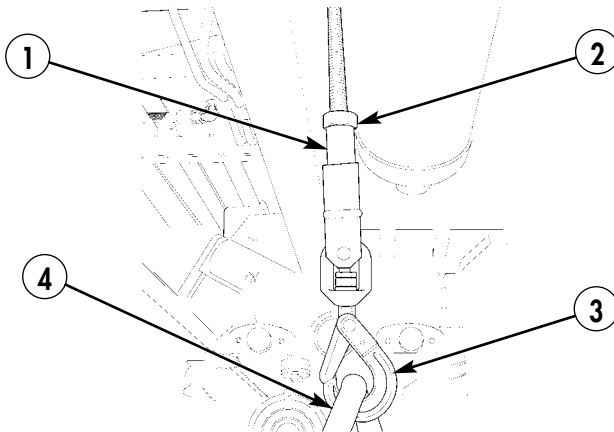
Ensure transload rollers and transload roller bar have been removed from pallet prior to unloading pallet to ground. Failure to comply may result in damage to equipment.

8. Remove two transload rollers from fixed axles and stow in pallet toolboxes. Refer to WP 0007 00.

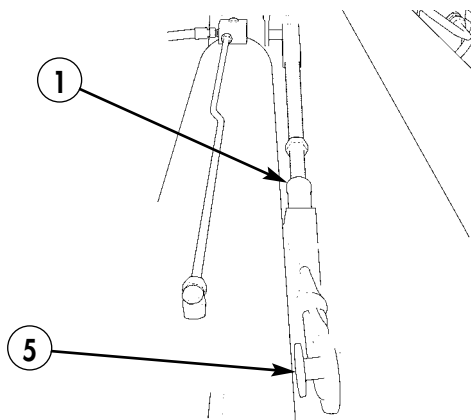
**NOTE**

Perform step 9 if transload roller bar is installed on lower support boom.

9. Remove transload roller bar from lower support boom and stow in either pallet toolbox. Refer to WP 0007 00.
10. Loosen jamnut (2) and hold-down bar (1) on both sides of pallet, and disconnect hooks (3) from CBT towing shackles (4).



11. Place both hold-down bars (1) in stowed position on pallet cleats (5).





## UNLOADING PALLET TO GROUND (Contd)

### **CAUTION**

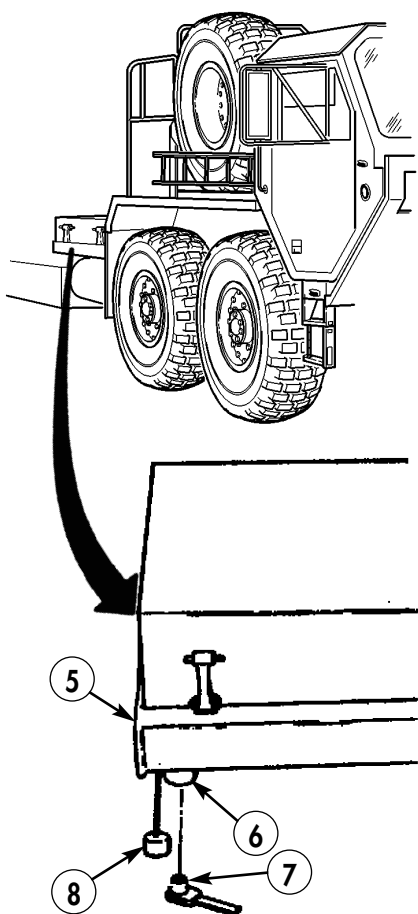
Ensure electrical connectors on slave receptacle and cannon plug are free of dirt, sand, or debris, or damage to equipment may result.

### **NOTE**

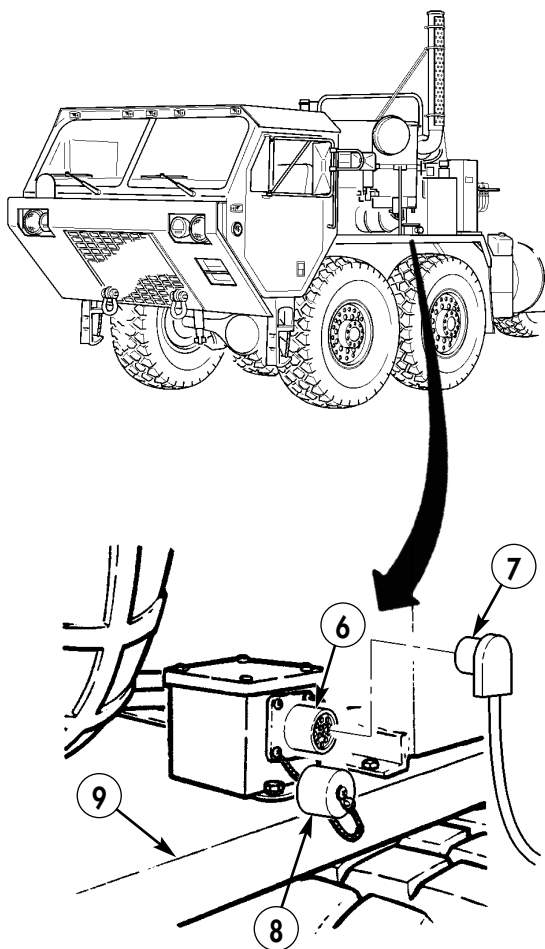
Perform step 12 if the pallet electrical power cable is connected to NATO slave receptacles on CBT and pallet.

NATO slave receptacle may be located on either the battery box or the left front fender of CBT.

12. Disconnect power cable (7) from NATO slave receptacle (6), located on CBT battery box (5) or fender (9), and install dust cap (8) on receptacle (6).



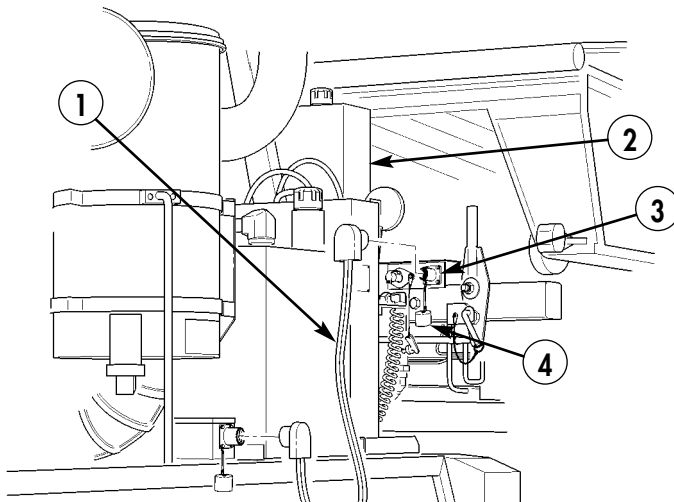
SLAVE RECEPTACLE,  
BATTERY BOX LOCATION



SLAVE RECEPTACLE,  
LEFT FRONT FENDER LOCATION

## UNLOADING PALLET TO GROUND (Contd)

13. Disconnect power cable (1) from NATO slave receptacle (3), located on pallet adjacent to auxiliary reservoir (2), and install dust cap (4) on receptacle (3).

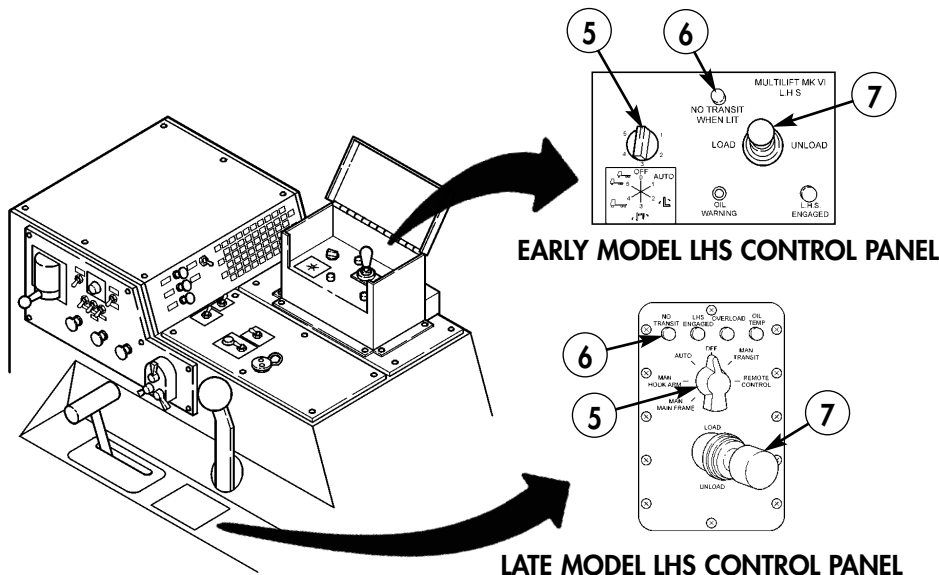


**NOTE**

Operator will perform steps 14 through 28 using LHS control box.

Ensure LHS RCU emergency stop switch is in the ON position if RCU is connected to LHS receptacle; cab LHS controls will not function otherwise.

14. Turn LHS MODE SELECT switch (5) to No. 1 (AUTO SEQUENCE) position.



## UNLOADING PALLET TO GROUND (Contd)

### **CAUTION**

HIGH IDLE switch must be in OFF position prior to engaging PTO. Failure to comply may result in damage to vehicle transmission or LHS.

15. With HIGH IDLE switch (10) in OFF position, turn PTO ENGAGE switch (8) to ON position. PTO ENGAGE indicator (9) will light.
16. Turn HIGH IDLE switch (10) to ON position.

### **WARNING**

When NO TRANSIT WHEN LIT indicator is illuminated, CBT may be maneuvered in the immediate vicinity of loading/unloading site, but should not be driven on the open road. Failure to comply may result in damage to equipment and possible injury or death to personnel.

All non-essential personnel must stand a minimum of 15 ft (4.6 m) away from pallet and bridge during unloading operations. Failure to comply may result in injury or death to personnel.

Do not crawl under or place hands or arms under pallet when positioning dunnage under pallet. Failure to comply may result in serious injury or possible death to personnel.

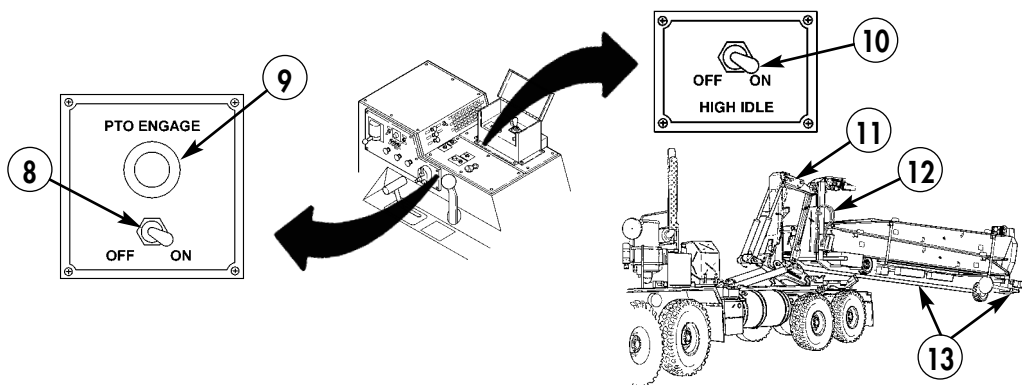
### **NOTE**

The LHS ENGAGED indicator will light up when joystick is held in the LOAD or UNLOAD position.

Placing dunnage under bridge pallet frame is recommended if pallet will be stowed on ground for an extended period of time.

It may be necessary to momentarily lower fixed axles in order to remove retaining pins.

17. Hold joystick (7) in UNLOAD position until LHS hook arm (11) moves pallet (12) rearward, and longitudinal girders of pallet (12) contact ground. The NO TRANSIT WHEN LIT indicator (6) will light.



## UNLOADING PALLET TO GROUND (Contd)

### **WARNING**

CBT will roll forward when unloading pallet to ground. All personnel must stand clear. Failure to comply may result in serious injury.

### **CAUTION**

Ensure CBT is in neutral and parking brake is released to allow transporter to roll forward when unloading pallet.

Failure to comply may result in damage to equipment.

18. Release parking brake by pushing in PARKING BRAKE control (6) and take foot off service brake (8).
19. Hold joystick (5) in UNLOAD position until front end of pallet is approximately 1 ft (2.5 cm) from ground, then release joystick (5).
20. Turn HIGH IDLE switch (9) to OFF position.
21. Hold joystick (5) in UNLOAD position until front end of pallet rests on ground. Release joystick (5) and set parking brake by pulling out PARKING BRAKE control (6).

### **CAUTION**

Ensure HIGH IDLE switch is in OFF position prior to placing vehicle transmission in gear, or damage to transmission may result.

### **NOTE**

If LHS hook arm does not disengage, drive CBT forward 2 in. (5 cm) and repeat step 19.

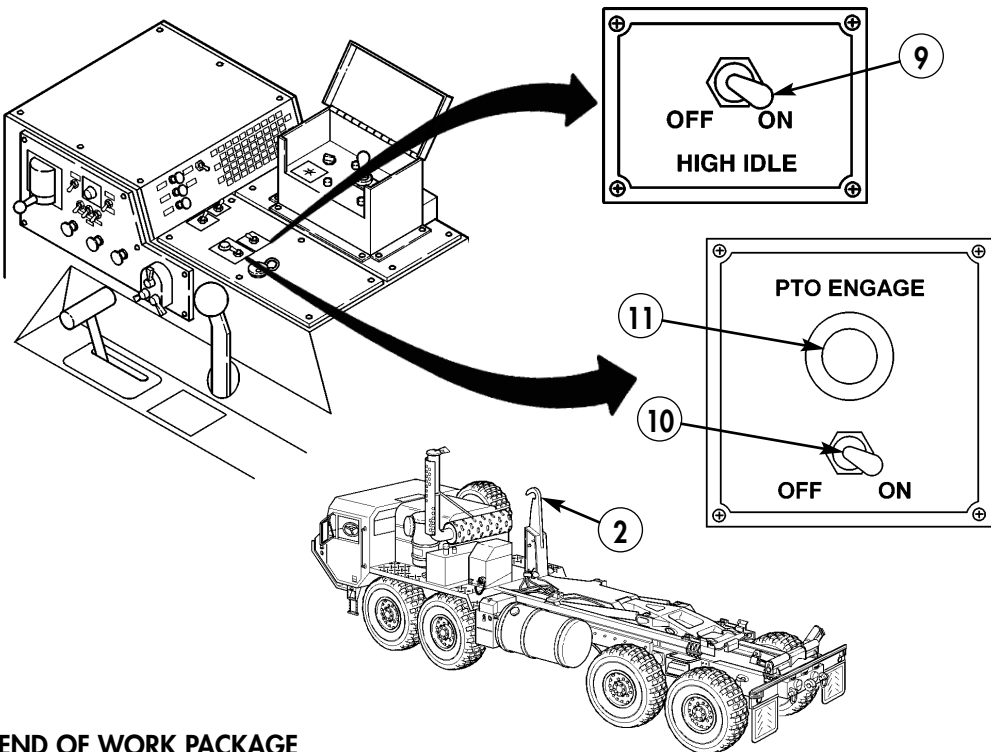
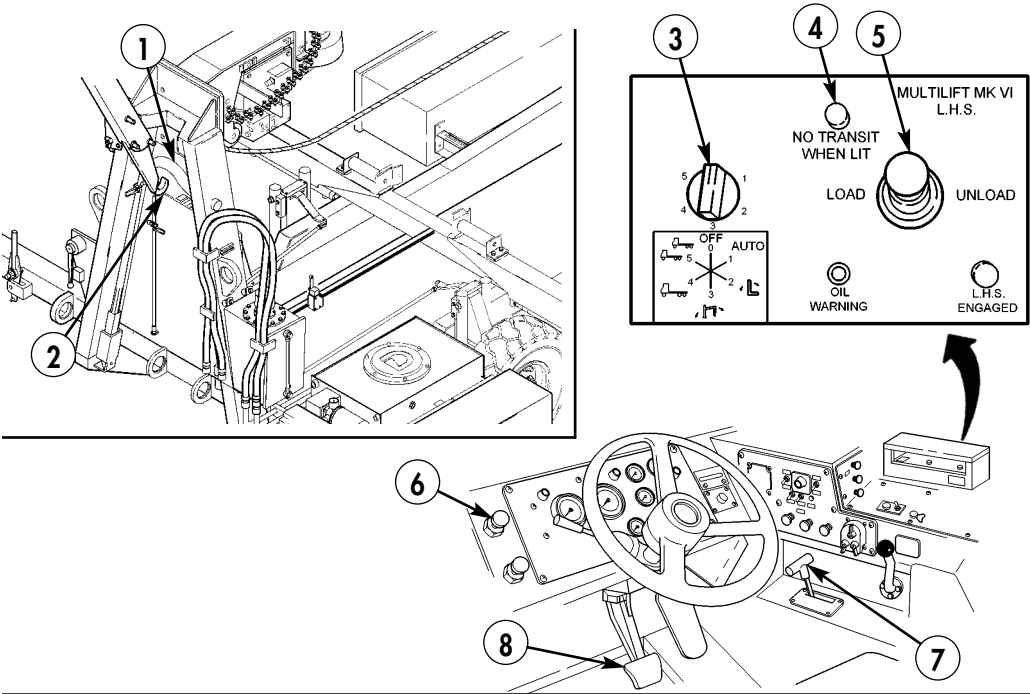
22. Hold joystick (5) in UNLOAD position until end of LHS hook (2) is fully disconnected from pallet hook bar (1).
23. Push PARKING BRAKE control (6) in and drive CBT forward 5 ft (1.5 m), apply service brake (8), move transmission selector lever (7) to N (neutral), and set parking brake by pulling PARKING BRAKE control (6) out.
24. Turn HIGH IDLE switch (9) to ON position.
25. Hold joystick (5) in LOAD position until LHS hook arm (2) is fully stowed and NO TRANSIT WHEN LIT indicator (4) is off.
26. Turn HIGH IDLE switch (9) to OFF position.
27. Turn PTO ENGAGE switch (10) to OFF position. PTO ENGAGE indicator (11) should go off.

### **CAUTION**

The LHS mode select switch must be in the 0 (OFF/TRANSPORT) position prior to road travel, or damage to LHS main frame and hook arm cylinders may result.

28. Turn LHS MODE SELECT switch (3) to 0 (OFF/TRANSPORT) position.
29. If pallet will be transported on ground, perform WP 0022 00.

### UNLOADING PALLET TO GROUND (Contd)



END OF WORK PACKAGE



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### OPERATION OF LPU FOR BRIDGE LAUNCH OR RETRIEVAL

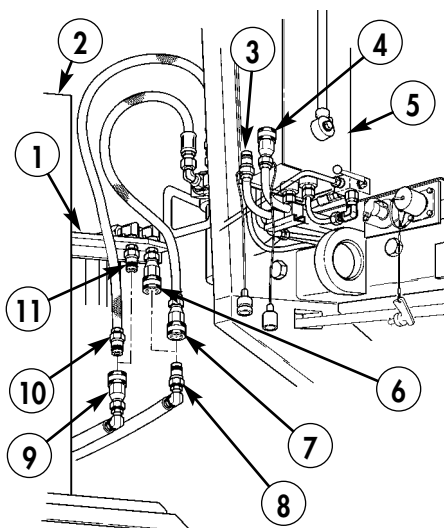
#### **CAUTION**

Prior to disconnecting/connecting hydraulic supply hoses, clean debris from couplings and catch residual oil with clean rags. Failure to comply may result in damage to equipment.

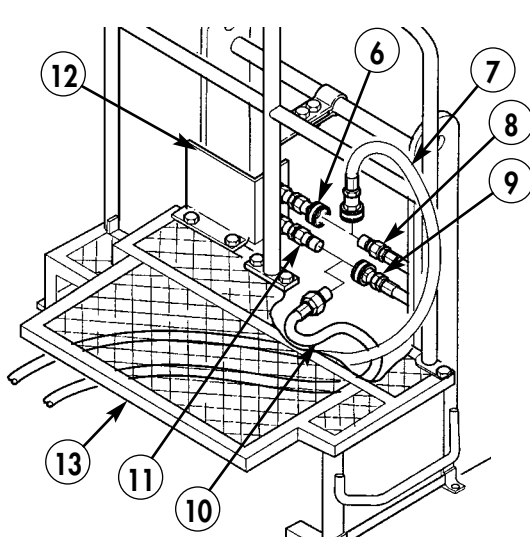
#### **NOTE**

Perform steps 1 through 3 if pallet hydraulic supply hoses are connected to CBT.

1. Disconnect pallet hydraulic supply hoses (7) and (10) from CBT hydraulic pump hoses (8) and (9), located adjacent to LHS cabinet assembly (2) on late model CBTs, or at rear of work platform (13) on early model CBTs.
2. Connect CBT hydraulic pump hoses (8) and (9) to LHS hydraulic supply quick-disconnect couplings (6) and (11), located on bracket (1) on late model CBTs, or bracket (12) on early model CBTs.



**CBT COUPLINGS,  
LATE MODEL CBT**



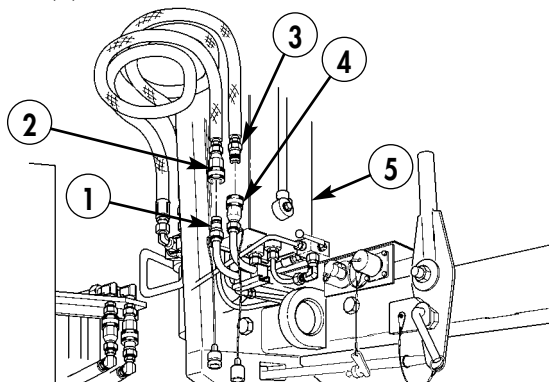
**CBT COUPLINGS,  
EARLY MODEL CBT**

## OPERATION OF LPU FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

### **CAUTION**

Ensure hydraulic supply hoses are positioned behind retaining brackets on pallet A-frame and auxiliary reservoir, or damage to equipment may result.

3. Connect pallet hydraulic supply hoses (2) and (3) to pallet hydraulic quick-disconnect couplings (1) and (4), located on pallet A-frame adjacent to auxiliary reservoir (5).



### **CAUTION**

Never use starting fluid (ether) to assist starting LPU. Failure to comply will result in damage to engine.

### **NOTE**

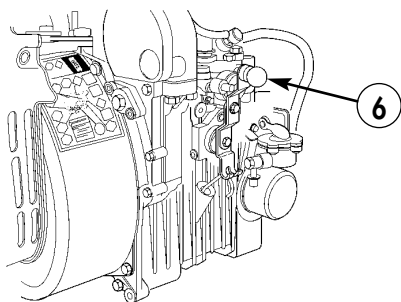
If the REB will be operated in expected temperatures below +15°F (-9°C), the pallet hydraulic oil must be changed to OE/HDO-10 and below -15°F (-26°C) changed to OEA. For warm-up procedures, refer to Launch or Retrieve in Extreme Cold (Arctic Operation), WP 0025 00.

4. Place speed control lever (6) to maximum START position; end of lever (6) should point up.

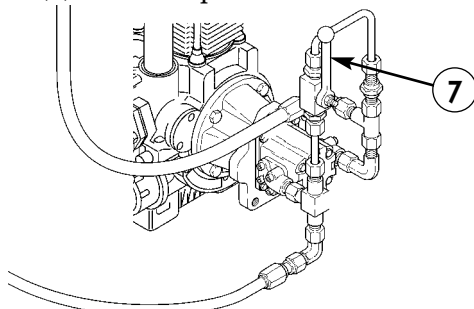
### **NOTE**

Perform step 5 if starting a cold engine with air temperature below +20°F (-7°C).

5. Place hydraulic pump bypass valve lever (7) to OPEN position.



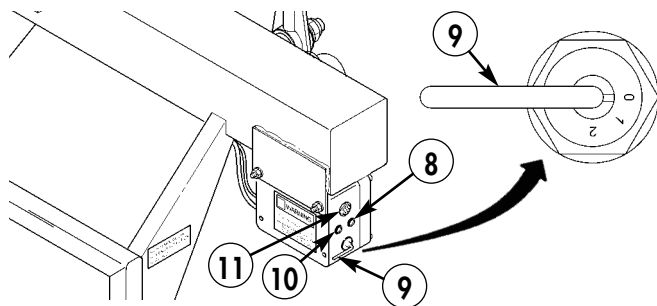
**SPEED CONTROL LEVER, START POSITION**



**BYPASS VALVE, OPEN POSITION**



## OPERATION OF LPU FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)



6. Turn pallet main power switch to ON position prior to starting LPU engine. Refer to WP 0007 00.
7. With pallet main power switch ON, observe battery charge warning lamp (8) and oil pressure indicator lamp (10). Both lamps should be illuminated, indicating correct system operation.

### **NOTE**

If starting a cold engine with air temperature below +40°F (+4°C), engine must be preheated before starting. Refer to WP 0025 00.

8. Turn ignition switch (9) to position 1 and hold for required duration to preheat engine. Refer to WP 0025 00. Indicator lamp (11) should be illuminated during this period.

### **WARNING**

Do not operate CBT engine or LPU engine in an enclosed area. Be alert at all times for exhaust odors. Failure to comply may result in injury to personnel or death.

Operators will wear hearing protection during LPU start-up and when performing launch/retrieval operations in close proximity to LPU. Failure to comply may result in injury to personnel.

### **CAUTION**

Do not operate starter continuously for more than 20 seconds; wait 15 seconds between periods of starter operation. Failure to do so may result in damage to starter.

### **NOTE**

If engine fails to start after cranking for 15 seconds, repeat steps 8 and 9.

9. After appropriate preheat time has elapsed, if necessary, start engine by turning ignition switch (9) to position 2. Release switch after engine starts. Switch (9) will return automatically to position 0 once released.

### **NOTE**

If air temperature is below +40°F (+4°C), allow engine to warm up as necessary before performing launch or retrieval. Refer to WP 0025 00.

10. Once engine starts, ensure warning lamps indicate the following:
  - a. Charge warning lamp (8) should not be illuminated.
  - b. Oil pressure warning lamp (10) should not be illuminated.

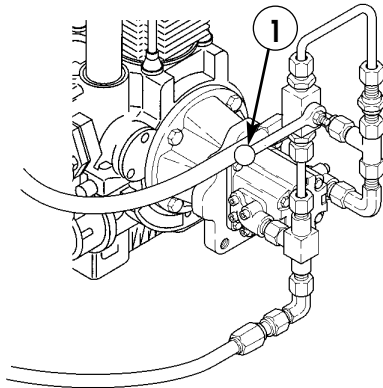
## OPERATION OF LPU FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

11. Immediately stop engine by pushing speed control lever (6) to the right if any of the follow conditions occur:
  - a. Oil pressure warning lamp (10) is illuminated.
  - b. Charge warning lamp (8) is illuminated.
  - c. Excessive engine vibration or unusual noise.

### NOTE

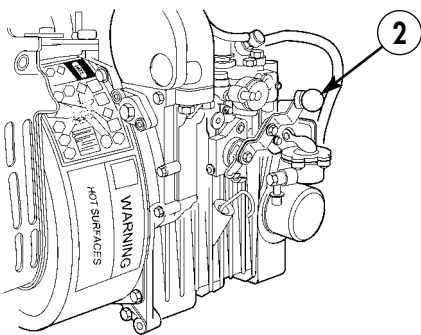
Perform step 12 to close pump bypass valve, if opened in step 5. Allow hydraulic system oil to warm up for an additional 5 minutes after closing valve. Refer to WP 0025 00.

12. If opened, place hydraulic pump bypass valve lever (1) to CLOSED position.

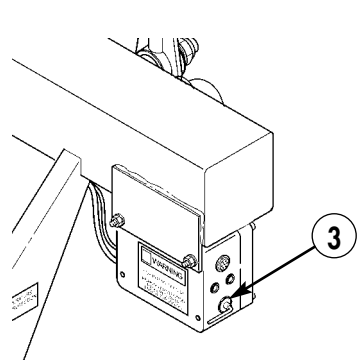


**BYPASS VALVE, CLOSED POSITION**

13. Launch bridge or retrieve bridge. Refer to WP 0016 00 or WP 0020 00.
14. When bridge launch or retrieval has been completed, place speed control lever (2) in STOP position, LPU control box ignition switch (3) in position 0, and pallet main power switch in OFF position. Refer to WP 0007 00.



**SPEED CONTROL LEVER, STOP POSITION**



**END OF WORK PACKAGE**

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# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### LAUNCH OF BRIDGE

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#### **WARNING**

Ensure all launch site requirements are met prior to deploying REB. Failure to comply may result in damage to equipment and possible injury or death to personnel.

All non-essential personnel will stand a minimum of 30 ft (9 m) away from truck and bridge during all launch/retrieval operations. Failure to comply may result in injury or death to personnel.

Assistant will act as a ground guide when maneuvering Common Bridge Transporter (CBT) and during launch and retrieval operations. Failure to comply may result in damage to equipment and possible injury or death to personnel.

Launch of bridge will only be performed with REB loaded on CBT. Do not attempt to launch bridge from Palletized Load System Trailer (PLST). Failure to comply may result in damage to equipment or possible injury or death to personnel.

#### **CAUTION**

Ensure REB is clean before performing launch procedures. Failure to comply may result in damage to equipment.

#### **NOTE**

Unloading bridge to ground is the same as launching bridge over a gap. Conditions that necessitate unloading to ground range from deployment by helicopter, temporary stowage of bridge, use of CBT and pallet for retrieval or launch of another bridge, or maintenance of pallet or bridge.

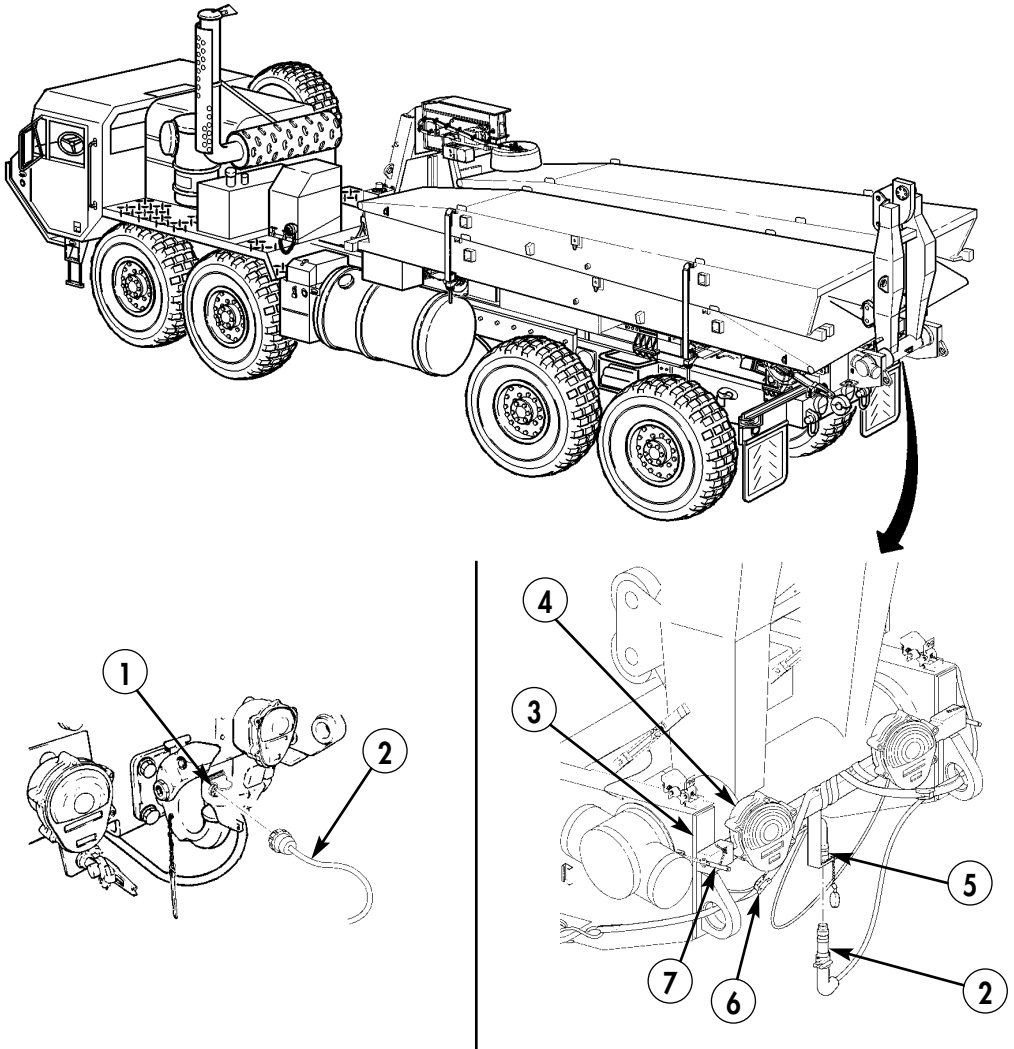
During all bridge transport, launch and retrieval operations, the CBT operator will drive and be responsible for operation of CBT, Load Handling System (LHS), and REB controls. The assistant will act as a ground guide, be responsible for directing the operator using hand signals, and assist the operator as needed.

1. Ensure launch site conditions exist for deployment of bridge. (Refer to Transporter Operations Site Survey, WP 0011 00.) If launch site conditions do not meet requirements, notify supervisor.

**LAUNCH OF BRIDGE (Contd)****NOTE**

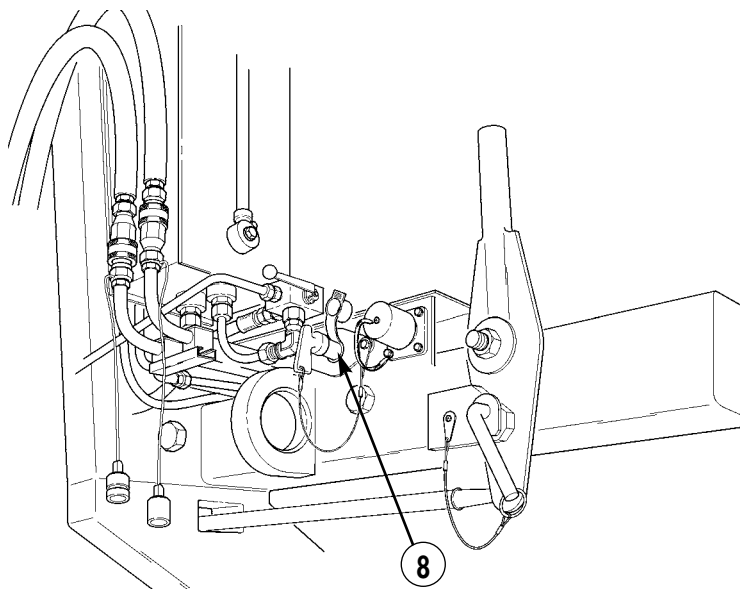
Perform step 2 if auxiliary light bar is connected to pallet.

2. Disconnect power cable (2) from CBT electrical connector (1) and auxiliary light bar connector (5). Remove safety strap (6), release two locking clamps (7), and remove auxiliary light bar (4) from two pallet frame girders (3).



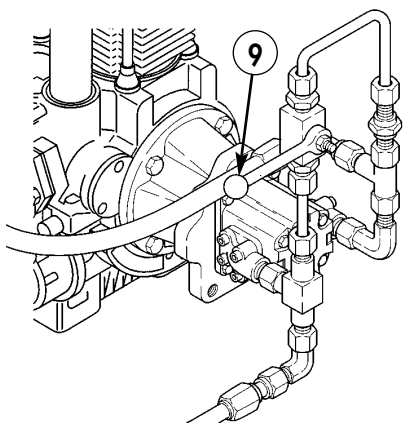
## LAUNCH OF BRIDGE (Contd)

3. Check main power switch (8) to ensure it is in ON position. (Switch is on when key is in vertical position.)

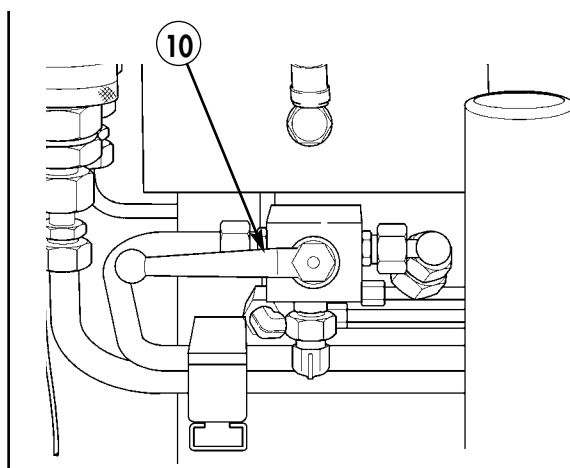


**ON POSITION**

4. Check to ensure bypass valve (9) and transfer valve (10) are closed prior to starting LPU or operating CBT hydraulic pump.



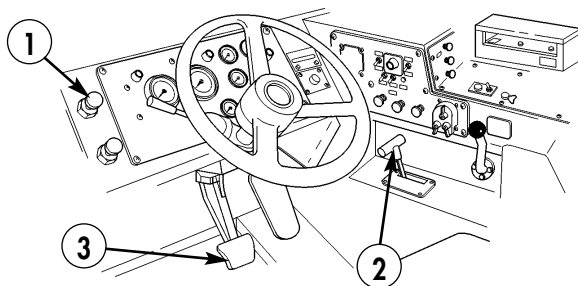
**BYPASS VALVE, CLOSED POSITION**



**TRANSFER VALVE, CLOSED POSITION**

### LAUNCH OF BRIDGE (Contd)

5. Back up CBT on shore so end of pallet is approximately 3 ft (0.9 m) from edge of gap. Apply service brake (3), move transmission selector lever (2) to N (neutral), and pull PARKING BRAKE control (1) out. Chock front wheels.

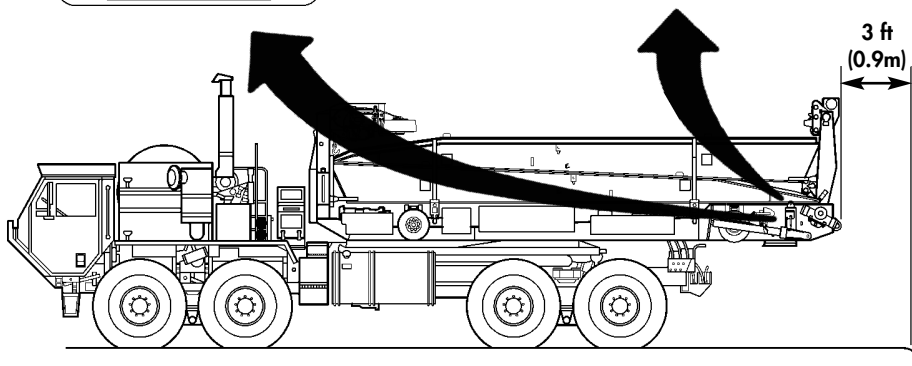
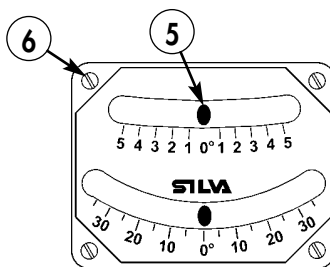
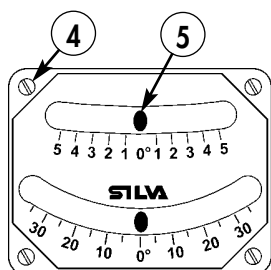


**NOTE**

CBT must be level within  $\pm 2.5$  degrees ( $\pm 5\%$ ) from front-to-rear and side-to-side prior to leveling pallet. Repeat steps 5 and 6 until CBT is level within range.

Observe that bridge quarters and launch beam of both bridge halves are centered and aligned on pallet. If out of alignment, refer to WP 0036 00, and align bridge halves prior to launching bridge.

6. Check front-to-rear leveling gauge (4) and side-to-side leveling gauge (6) to ensure bubbles (5) are visible within  $\pm 2.5$  degrees ( $\pm 5\%$ ).



**LAUNCH OF BRIDGE (Contd)**

7. Remove key from passenger side pallet toolbox, and open RCU stowage box lid (7). Refer to WP 0007 00.

**CAUTION**

If bridge halves become jammed due to misalignment during launch functions, it may become necessary to align bridge halves using pry bar before completing launch function. Ensure jammed bridge halves are free before performing launch function, or damage to equipment may result.

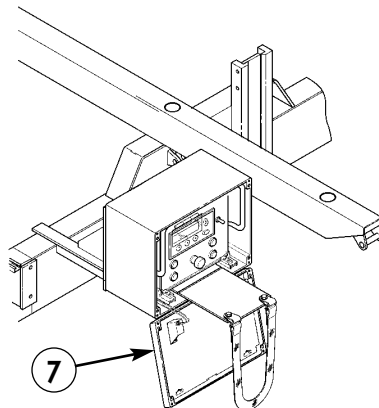
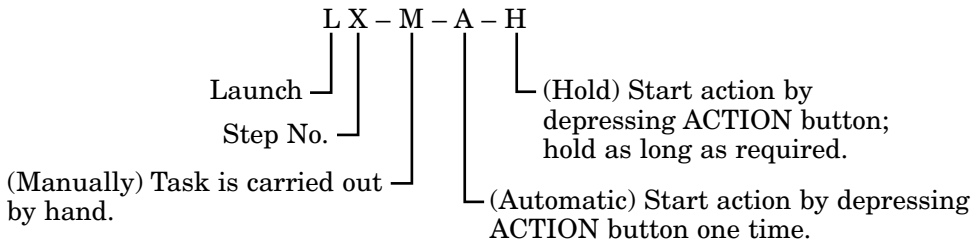
**NOTE**

Step 8 through 60 are presented in the working step sequence as programmed on the RCU display screen for each function.

To start the launch sequence, release RCU EMERGENCY STOP button, read the display screen, and perform the stated launch function according to L X-M-A-H code until the stated function is completed.

If RCU will not power up, check main power switch and emergency stop buttons; main power switch and all emergency stop buttons must be in the ON position for the system to operate.

Explanation of RCU Display Screen Text



## LAUNCH OF BRIDGE (Contd)

### NOTE

After completing each launch function, depress the green LAUNCH button to confirm and step into the next launch function. It is necessary to wait two seconds for the display screen to read out the next function after confirming each launch function.

If it becomes necessary to return to the first displayed launch function, the sequence can be reset by depressing at least LAUNCH, ACTION 1, and ACTION 2 buttons simultaneously.

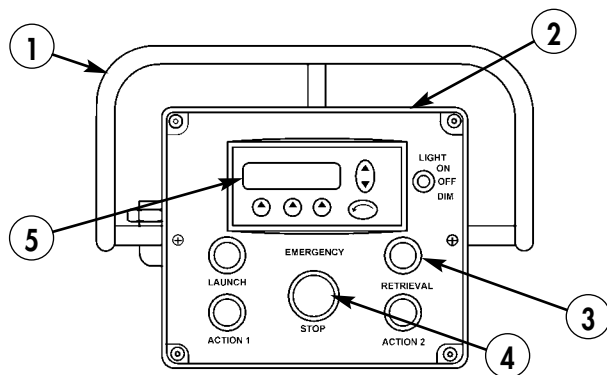
To change function from launch steps to retrieval steps or back, depress LAUNCH and RETRIEVAL simultaneously.

To stop any automatic function or in case of emergency while the RCU is in use, push the red EMERGENCY STOP button to shut down operation.

Retrieval mode step R22-M will appear on RCU display if bridge retrieval was the last operation performed.

Perform steps 8 through 23 with RCU mounted in RCU stowage box hold-down brackets.

8. Turn on RCU (1) by turning EMERGENCY STOP button (4) on RCU control panel (2) to the right. Depress RETRIEVAL button (3); launch step L1 will appear on display screen (5).



9. Perform L1-M-STOW FASTENING RODS AND LOCK COUPLING HELP LEVER as follows:

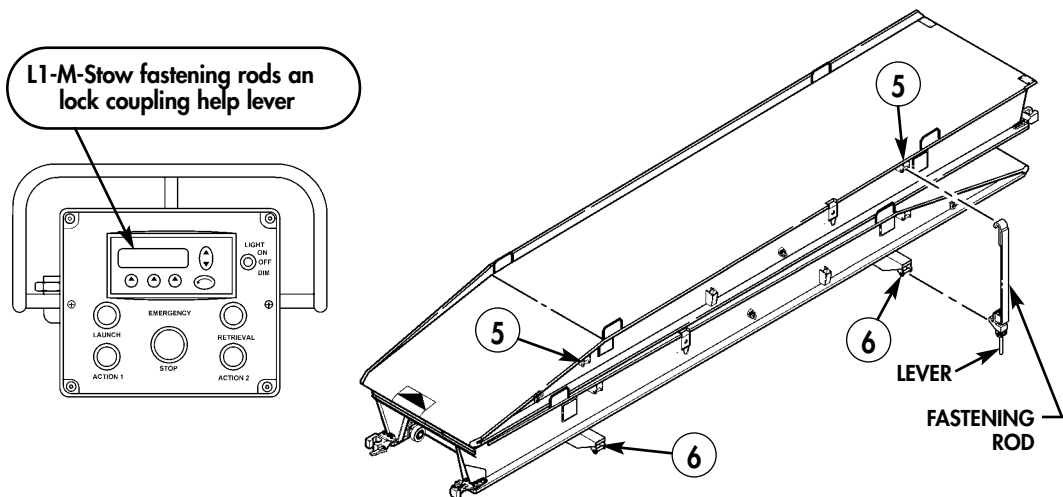
### NOTE

Operator and assistant will remove and stow fastening rods simultaneously to decrease launch time.

- a. Remove four fastening rods by pulling lever out on each fastening rod, and removing fastening rod from transverse girder bracket (6) and bridge quarter hold-down bracket (5). Stow fastening rods in pallet toolboxes.



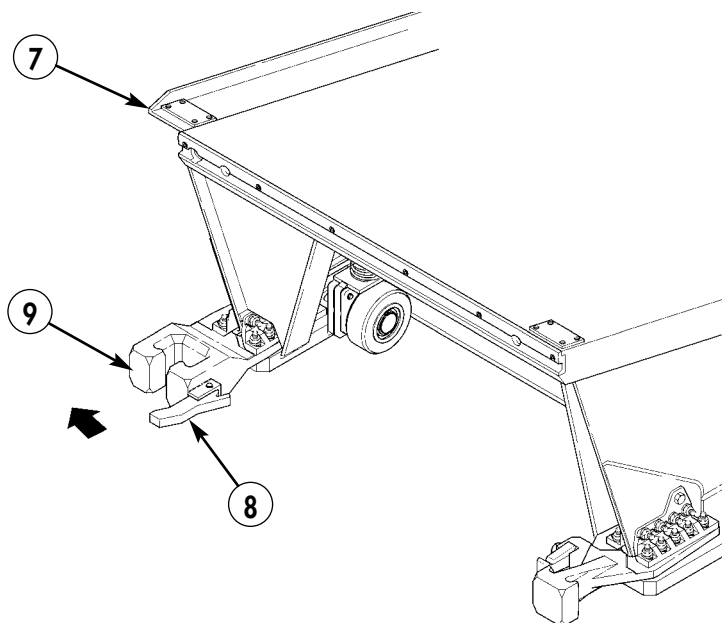
**LAUNCH OF BRIDGE (Contd)**



**NOTE**

Operator and assistant will set help device levers simultaneously to decrease launch time.

- b. Using soft-nosed hammer, tap end of help device lever (8) toward center of lower coupling receptacle (9) until set in detent on each bridge quarter (7).



## LAUNCH OF BRIDGE (Contd)

10. Depress LAUNCH button (5) to confirm and step into next function.

### **WARNING**

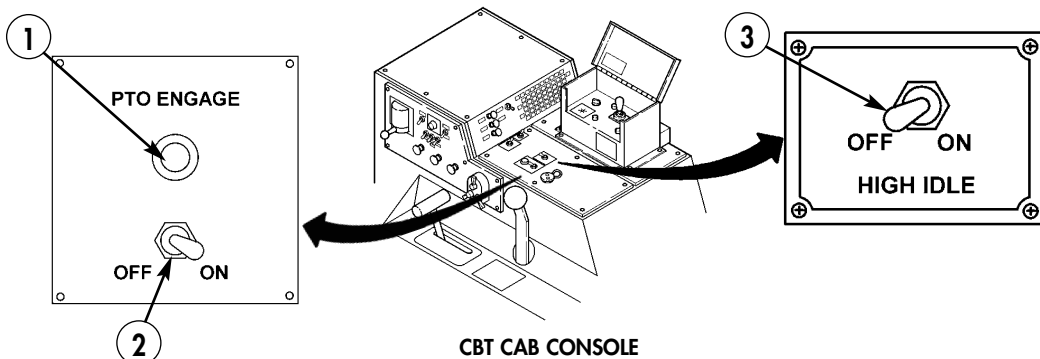
Operators must wear hearing protection during LPU start-up and when performing launch/retrieval operations in close proximity to LPU. Failure to comply may result in injury to personnel.

11. Start LPU. Refer to WP 0015 00.

### **CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to vehicle transmission.

12. With HIGH IDLE switch (3) in OFF position, move PTO ENGAGE switch (2) to ON position. PTO ENGAGE indicator (1) will light.



### **CAUTION**

Ensure that fastening rods are removed from upper bridge half and transverse girders, or damage to equipment will result.

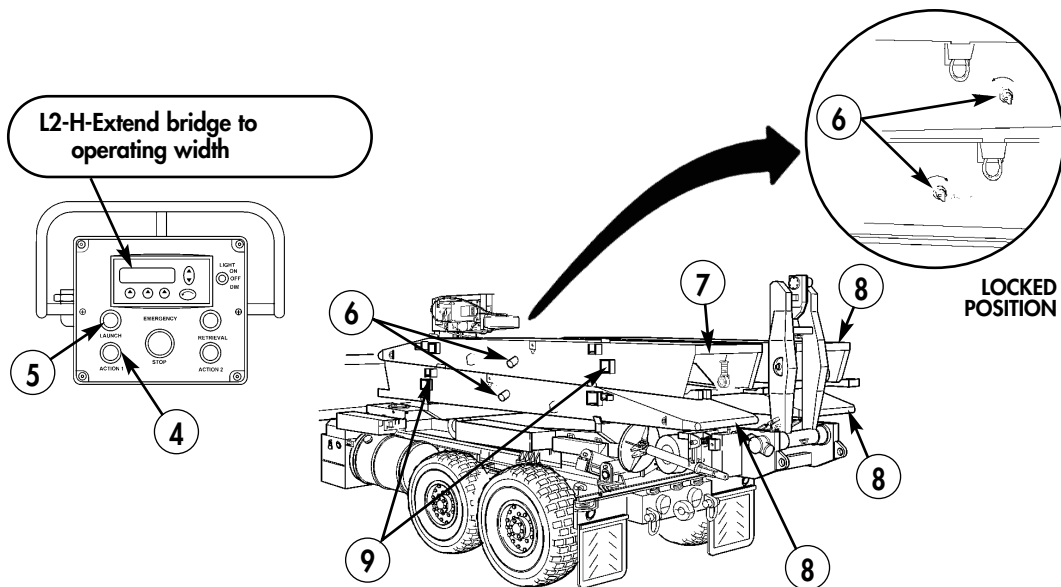
After performing step 13, visually check to ensure bridge quarters on upper and lower bridge halves are fully extended and slide locks are engaged in locked position or damage to equipment may result.

### **NOTE**

Operator and assistant will observe locked position at each control lever simultaneously to decrease launch time.

13. Depress and hold ACTION 1 button (4) to L2-H-EXTEND BRIDGE TO OPERATING WIDTH, and observe transverse handling unit telescopic tubes (9) spread bridge quarters (7) and (8) on both bridge halves. Listen for click and observe locked position at each control lever (6).

**LAUNCH OF BRIDGE (Contd)**



14. Depress LAUNCH button (5) to confirm and step into next function.

**CAUTION**

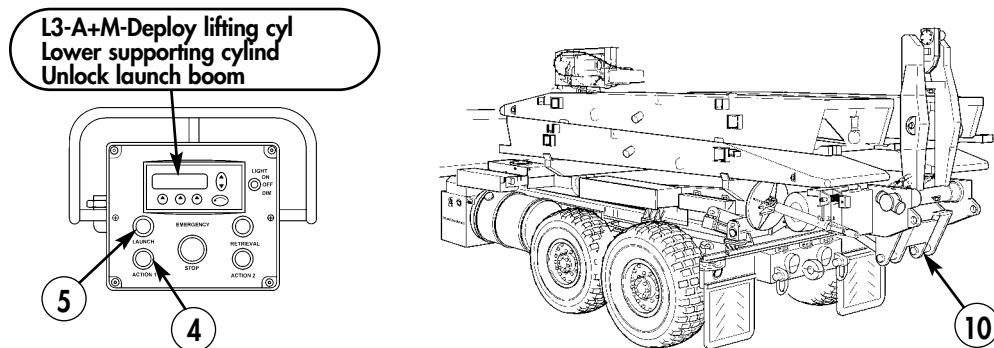
Ensure transload roller bar is removed from lower support boom or damage to equipment will result.

**NOTE**

While lower support boom is deploying, operator and assistant will unlock, lower, and lock supporting cylinders on both sides of pallet simultaneously to decrease launch time.

15. Depress ACTION 1 button (4) to L3-A+M-DEPLOY LIFTING CYLINDER, LOWER SUPPORT CYLINDERS, AND UNLOCK LAUNCH BOOM as follows:

- a. Observe lower support boom (10) lift to highest position.



## LAUNCH OF BRIDGE (Contd)

### **WARNING**

Operators must stand clear while lowering supporting cylinders. Failure to comply may result in injury to personnel.

### **NOTE**

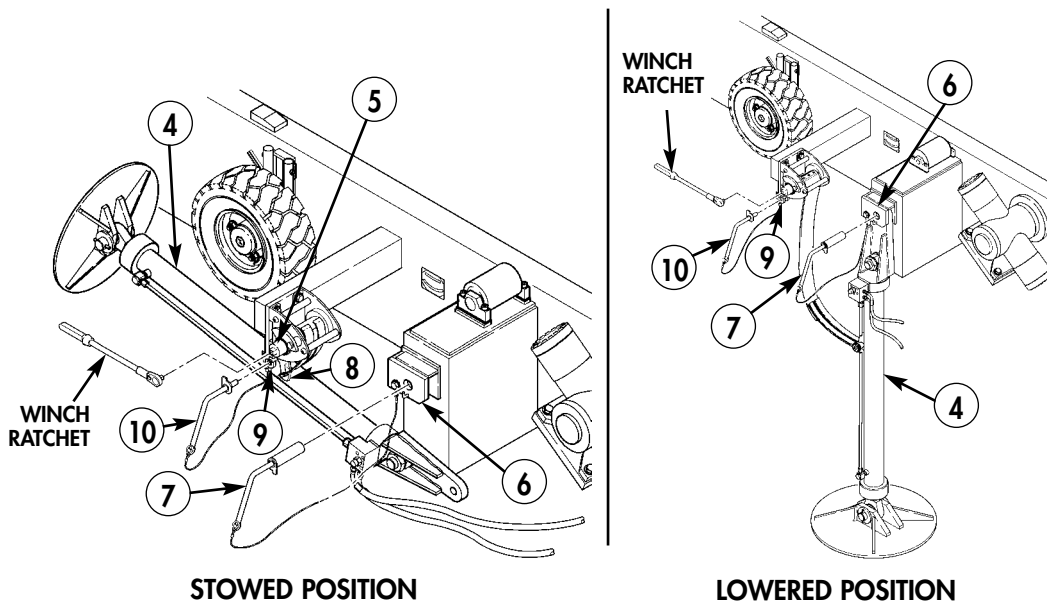
Operator and assistant will unlock, lower, and lock supporting cylinders simultaneously to decrease launch time. Steps b through f are performed the same way for right and left supporting cylinders.

- b. Remove winch ratchet from pallet toolbox and install on ratchet wheel (5).
- c. Remove retaining pin (7) from pallet frame bracket (6).
- d. Turn winch ratchet wheel (5) to the right to remove tension from retaining pin (10), and remove retaining pin (10) from winch clevis (9) and supporting cylinder bracket (8).

### **CAUTION**

Failure to install retaining pin on winch clevis before completing lowering of support cylinder may result in damage to equipment.

- e. Using ratchet, slowly turn ratchet wheel (5) to the left, install retaining pin (10) on winch clevis (9), and lower supporting cylinder (4).
- f. Lock supporting cylinder (4) by installing retaining pin (7) on supporting cylinder (4) and pallet frame bracket (6).



## LAUNCH OF BRIDGE (Contd)

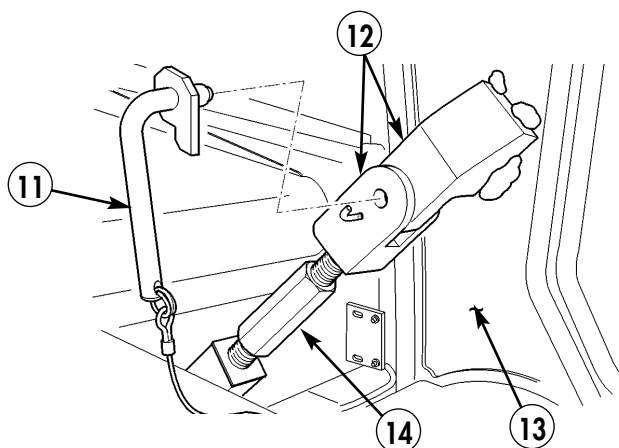
### **CAUTION**

Failure to remove the launch boom retaining pins prior to lowering launch boom or stowing retaining pins in mounting holes of launch boom lock brackets will result in damage to equipment.

### **NOTE**

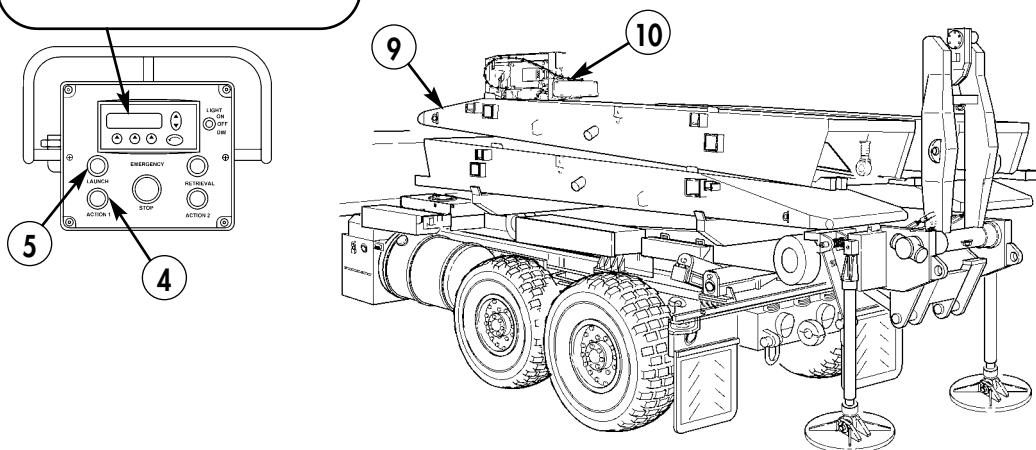
Operator and assistant will remove launch boom lock retaining pins simultaneously to decrease launch time

- g. Loosen turnbuckle nut (14) as necessary, and remove retaining pin (11) from launch boom lock (12) at both sides of pallet launch boom (13).



16. Depress LAUNCH button (5) to confirm and step into next function.
17. Depress ACTION 1 button (4) to L4-A-RETRACT WINCH CABLE, and observe winch (10) lift upper bridge half (9) at ramp end.

### L4-A-Retract winch cable



## LAUNCH OF BRIDGE (Contd)

### NOTE

Assistant will perform measurement using inch marks on BII tanker bar, and signal CBT operator in steps 18 and 19. Positioning time required is 2 minutes.

For gap widths up to 41 ft (12.5 m), perform step 18. For gap widths between 41 ft (12.5 m) and 42.6 ft (13 m), perform step 19.

18. Back up CBT until distance between outside edge of bottom plate (1) and edge of near shore bank is approximately 31.5 in. (800 mm).
19. Refer to REB Distance from Gap Table below, and back up CBT until distance between outside edge of bottom plate (1) and edge of near shore bank is within required distance as determined from table-1, REB Distance from Gap.

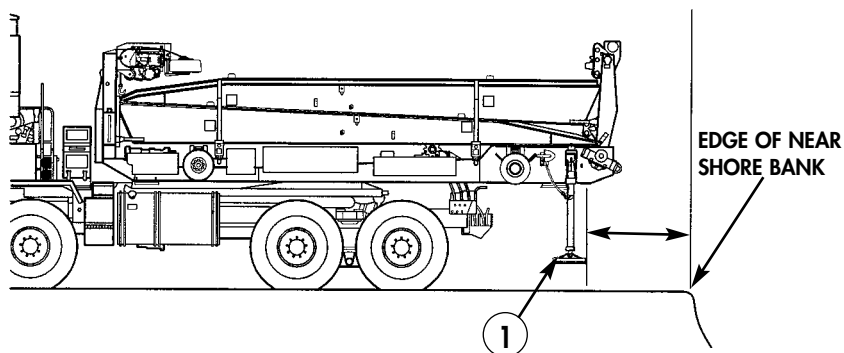
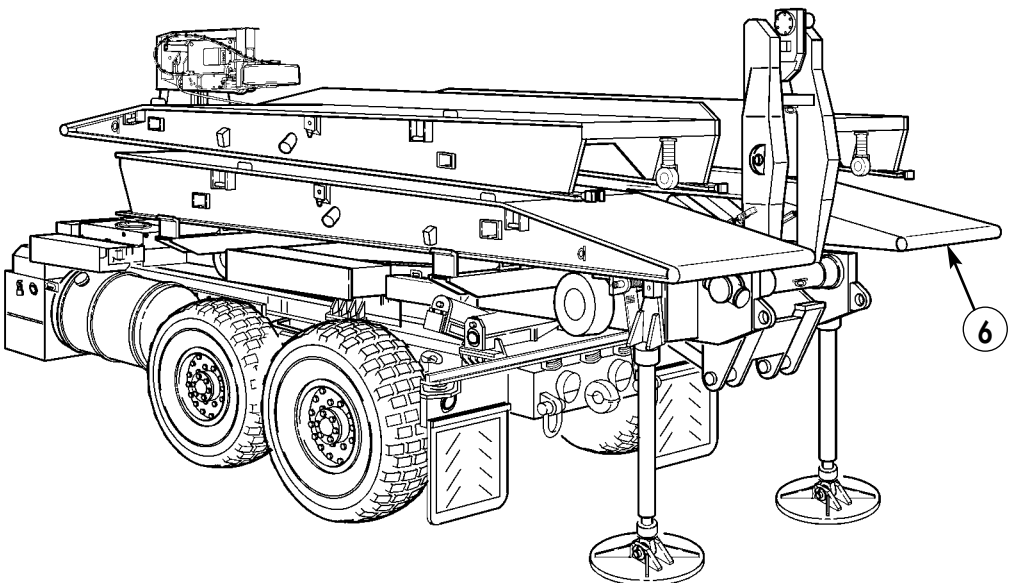
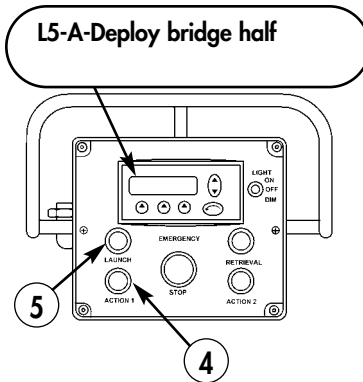


Table 1. REB Distance from Gap.

DIFFERENCE IN HEIGHT OF FAR AND NEAR SHORE BANKS	DISTANCE FROM EDGE OF GAP TO BOTTOM PLATE OF PALLET SUPPORTING CYLINDER
+4.3 ft (1.3 m)	33–37 in. (830–950 mm)
+3.3 ft (1.0 m)	31.5–36 in. (800–920 mm)
+2.6 ft (0.8 m)	30–35 in. (770–890 mm)
+2 ft (0.6 m)	29–34 in. (740–860 mm)
+1.3 ft (0.4 m)	28–33 in. (720–840 mm)
+0.7 ft (0.2 m)	27–32 in. (690–810 mm)
+/- 0 ft (0 m)	26–31 in. (660–780 mm)
-0.7 ft (0.2 m)	25–29.5 in. (630–750 mm)
-1.3 ft (0.4 m)	24–28 in. (600–720 mm)
-2 ft (0.6 m)	23–27 in. (570–690 mm)
-2.6 ft (0.8 m)	22–26 in. (550–670 mm)
-3.3 ft (1.0 m)	21–26 in. (530–650 mm)
-4.3 ft (1.3 m)	20–25 in. (510–630 mm)

**LAUNCH OF BRIDGE (Contd)**

20. Depress LAUNCH button (5) to confirm and step into next function.
21. Depress ACTION 1 button (4) to L5-A-DEPLOY BRIDGE HALF, and observe forward pinwheel drive extend lower bridge half (6) toward rear of pallet.



## LAUNCH OF BRIDGE (Contd)

22. Depress LAUNCH button (3) to confirm and step into next function.
23. Depress ACTION 1 button (1) to L6-A-LAUNCH BOOM 90 IN 0, and observe launch boom (4) lower to horizontal position.

### **WARNING**

The Remote Control Unit (RCU) neck strap should always be worn to prevent accidental operation of control buttons or damage if dropped during launch and retrieval operations. Failure to comply may result in damage to equipment or possible injury to personnel.

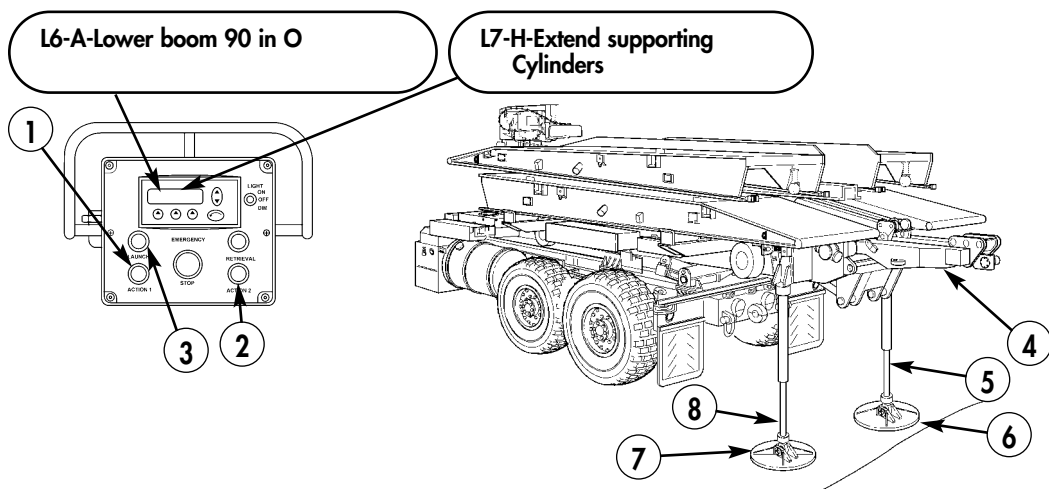
24. Remove RCU from RCU stowage box and place neck strap around neck. Refer to WP 0007 00.
25. Depress LAUNCH button (3) to confirm and step into next function.

### **NOTE**

Where ground is firm and approximately level, extend both support cylinders at the same time by depressing and holding ACTION buttons 1 and 2 simultaneously.

Where ground is not level, note number of degrees pallet is out of level front-to-rear and extend both cylinders at the same time until support cylinder on the higher side contacts the ground. The opposite support cylinder is extended to ground and raises pallet until approximately level.

26. Simultaneously depress and hold ACTION 1 button (1) and ACTION 2 button (2) to L7-H-EXTEND SUPPORTING CYLINDERS, and observe left and right supporting cylinders (8) and (5) extend until either one or both bottom plates (7) and (6) contact ground depending on side slope. Release buttons (1) and (2).





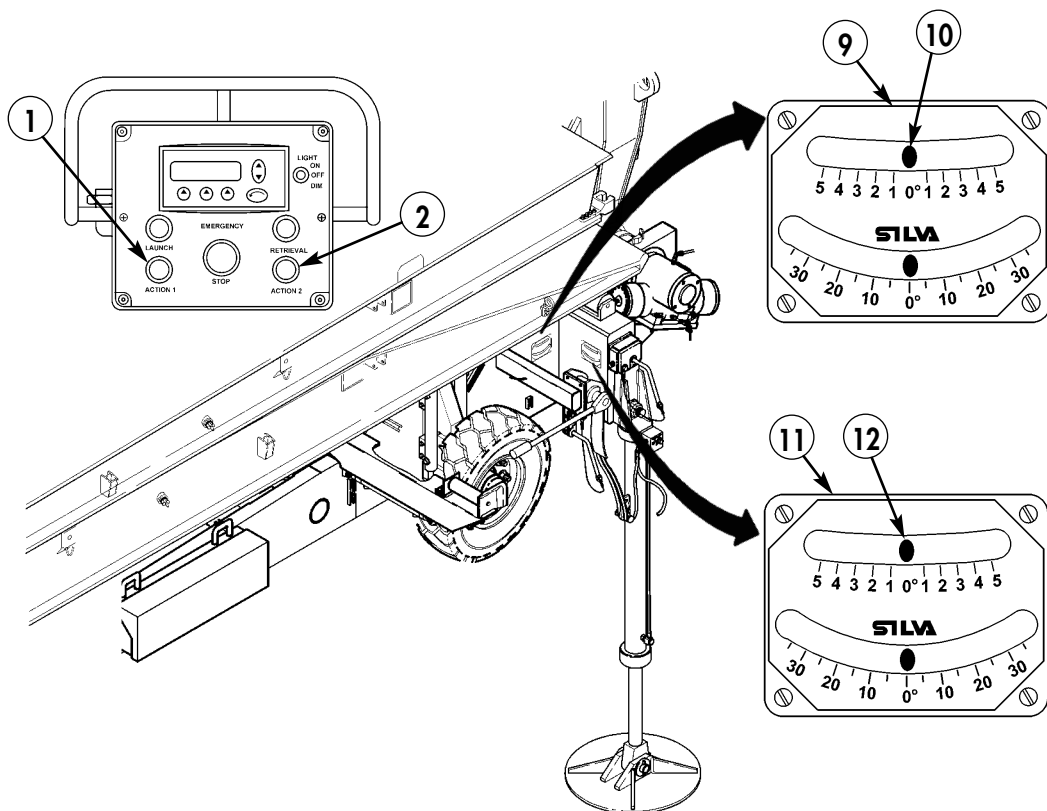
## LAUNCH OF BRIDGE (Contd)

27. Adjust side-to-side level of pallet by raising low side of pallet as follows:
- Determine low side of pallet by observing bubble (12) on side-to-side leveling gauge (11).
  - Depress ACTION button that corresponds to support cylinder on low side of pallet, and extend support cylinder until bubble (12) on side-to-side leveling gauge (11) is between 0 and + or - 1/4 degree. Release ACTION button.

### NOTE

The far shore should not be more than 4 ft 3 in. (1.3 m) (10%) higher or lower than near shore. Refer to WP 0012 00, Site Requirements and Layouts.

28. Adjust front-to-rear level of pallet to meet far shore height as follows:
- Determine number of degrees rear of pallet must be raised by referring to table 2, Pallet Front-to-Rear Leveling, on following page.
  - Depress, hold, and release ACTION 1 button (1) and ACTION 2 button (2) simultaneously until bubble (10) on front-to-rear leveling gauge (9) moves the required number of degrees as determined in step 28a.
  - Re-check side-to-side level gauge (9) and adjust level of pallet as necessary.



**LAUNCH OF BRIDGE (Contd)****CAUTION**

The REB should not be launched or retrieved outside the given range specified in table 2 below. Failure to comply may result in damage to equipment.

**NOTE**

Front-to rear level of pallet is optimized by raising pallet an additional 1.5 degrees after side-to-side leveling. Note degree mark of gauge before raising 1.5 degrees.

The possible leveling height required for a given launch site may be limited by the extending capability of the supporting cylinders.

*Table 2. Pallet Front-to-Rear Leveling.*

<b>LEVELING PROCEDURE</b>	
Front-to-rear leveling gauge before leveling	-5.5 to +5.5 degrees
Front-to-rear leveling gauge after leveling	-1.5 to +6.5 degrees

**WARNING**

At no time when lower bridge half is extended on pallet will personnel walk or stand under lower bridge half. Failure to comply may result in death to personnel.

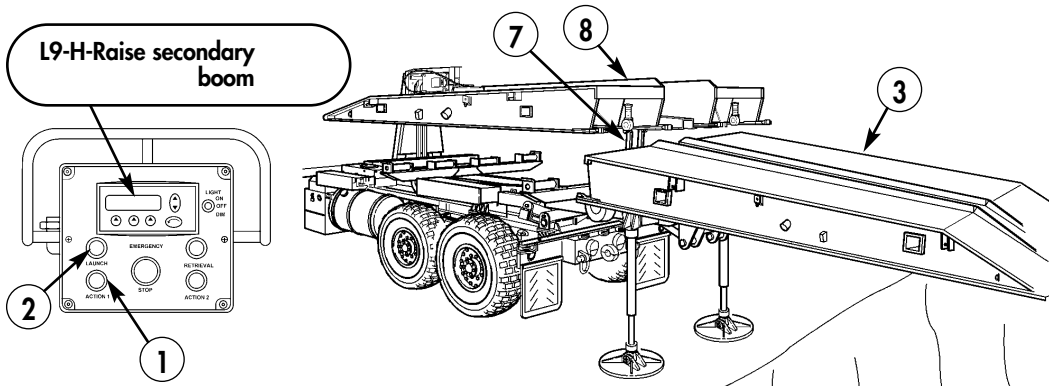
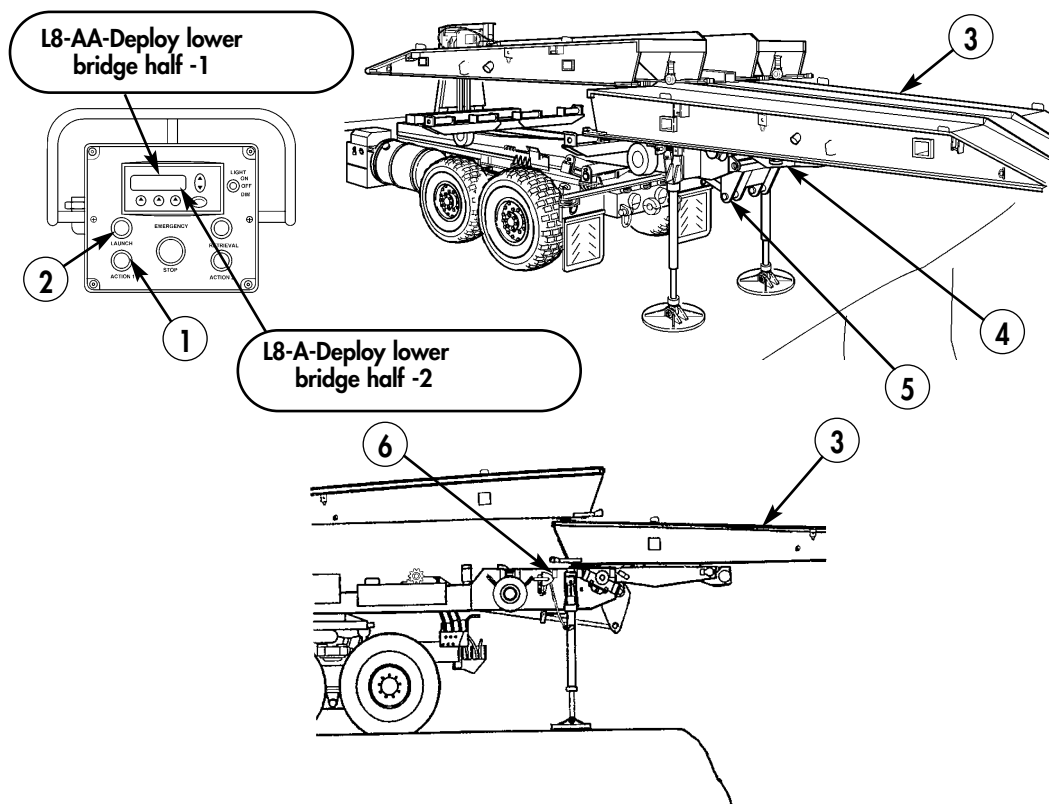
29. Depress LAUNCH button (2) to confirm and step into next function.

**NOTE**

Observe that bridge half is deployed toward rear of pallet by forward pinwheel drive. A limit switch will switch forward pinwheel drive off and start rear pinwheel drive automatically. Action 1 button will be depressed twice.

30. Depress ACTION 1 button (1) to L8-AA-DEPLOY LOWER BRIDGE HALF-1, and observe lower support boom (5) and launch boom (4) lower. Depress ACTION 1 button (1) again to L8-A-DEPLOY LOWER BRIDGE HALF-2, and observe pinwheel drives extend lower bridge half (3) toward rear of pallet until coupling end of lower bridge half (3) reaches first yellow mark (6) on pallet frame.

### LAUNCH OF BRIDGE (Contd)



## LAUNCH OF BRIDGE (Contd)

33. Depress LAUNCH button (2) to confirm and step into next function.

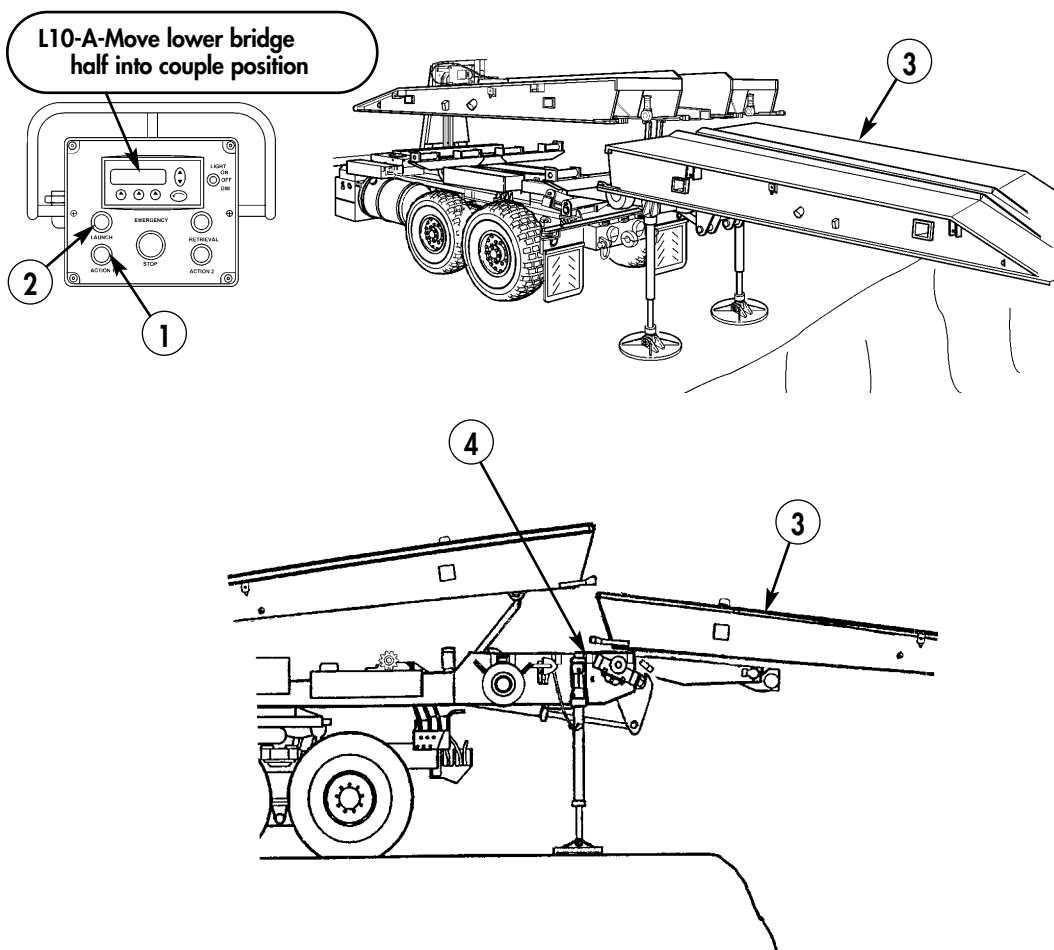
### **WARNING**

Ensure pallet stop cylinder is extended prior to performing step 34 or damage to equipment or possible injury or death to personnel may result.

### **NOTE**

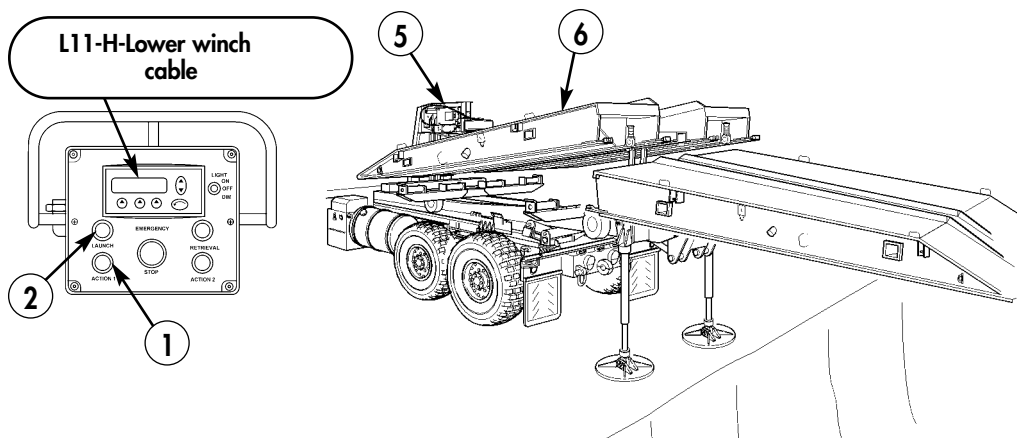
Observe connecting end of upper bridge half to ensure that it stops at second mark on pallet.

34. Depress and hold ACTION 1 button (1) to L10-A-MOVE LOWER BRIDGE HALF INTO COUPLE POSITION, and observe rear pinwheel drive extend lower bridge half (3) toward rear of pallet. Release button (1) when coupling end of lower bridge half (3) reaches second yellow mark (4) on pallet frame.

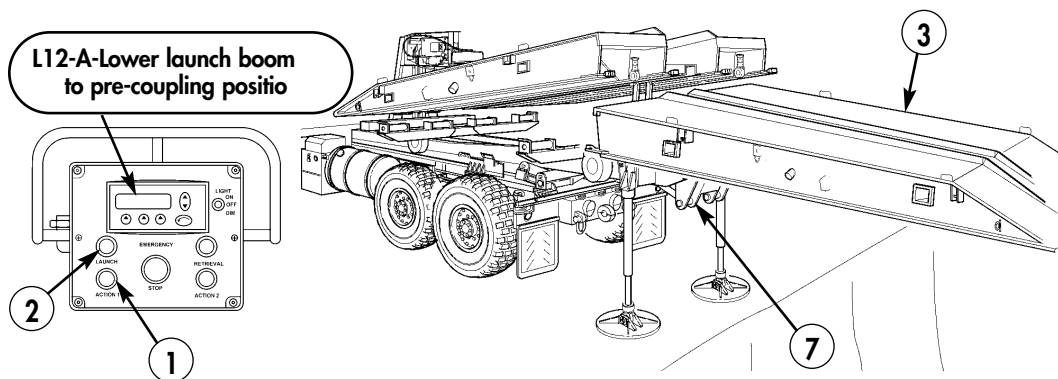


## LAUNCH OF BRIDGE (Contd)

35. Depress LAUNCH button (2) to confirm and step into next function.
36. Depress and hold ACTION 1 button (1) to L11-H-LOWER WINCH CABLE, and observe winch (5) lower upper bridge half (6) at ramp end. Release button (1) when upper bridge half (6) ramp end is lowered to bottom of A-frame channel.



37. Depress LAUNCH button (2) to confirm and step into next function.
38. Depress ACTION 1 button (1) to L12-A-LOWER LAUNCH BOOM TO PRE-COUPLING POSITION, and observe lower support boom (7) tilt lower bridge half (3) to coupling position.

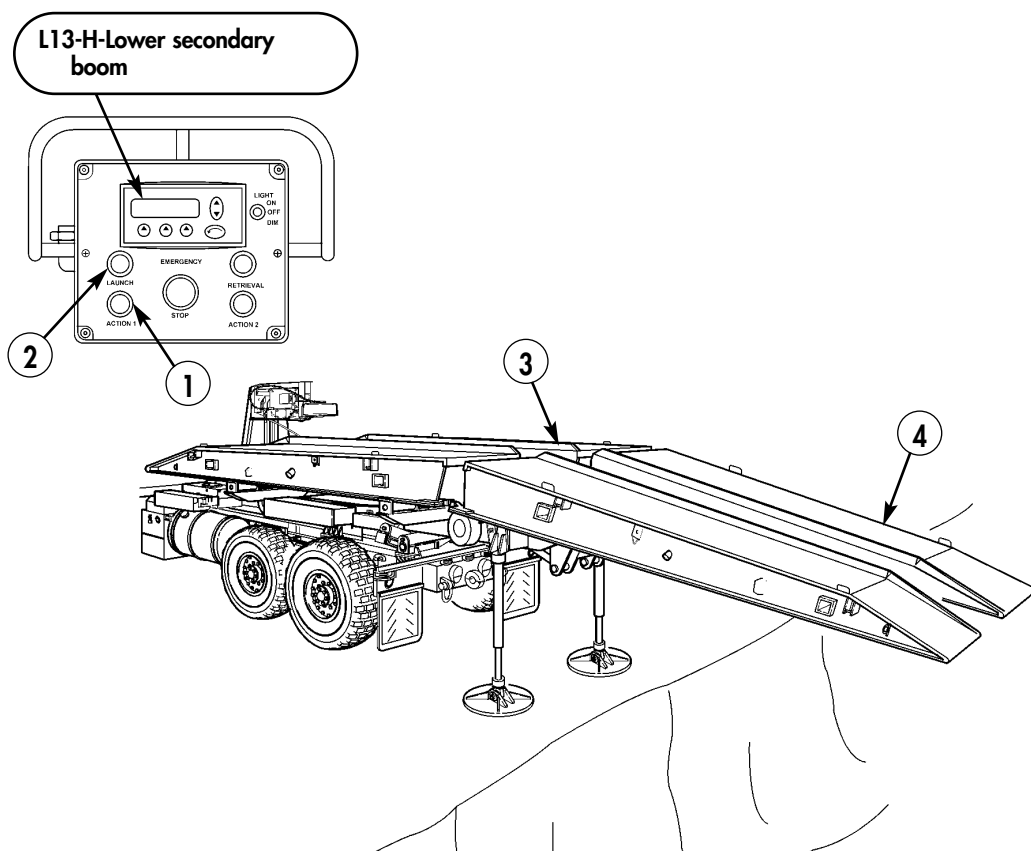


## LAUNCH OF BRIDGE (Contd)

### NOTE

During launch step L13-H, once the upper bridge half is lowered, observe the lower support boom lift the lower bridge half. When step is completed, the lower couplings of the upper bridge half should rest on the coupling help levers of the lower bridge half, and the crossforce couplings of both bridge halves should be aligned close together. If not, upper bridge half may be hung up on forward pinwheel drive gear. Refer to troubleshooting, WP 0035 00.

39. Depress LAUNCH button (2) to confirm and step into next function.
40. Depress and hold ACTION 1 button (1) to L13-H-LOWER SECONDARY BOOM, and observe secondary boom lower upper bridge half (3) to pre-coupling position with lower bridge half (4).
41. Depress LAUNCH button (2) to confirm and step into next function.



## LAUNCH OF BRIDGE (Contd)

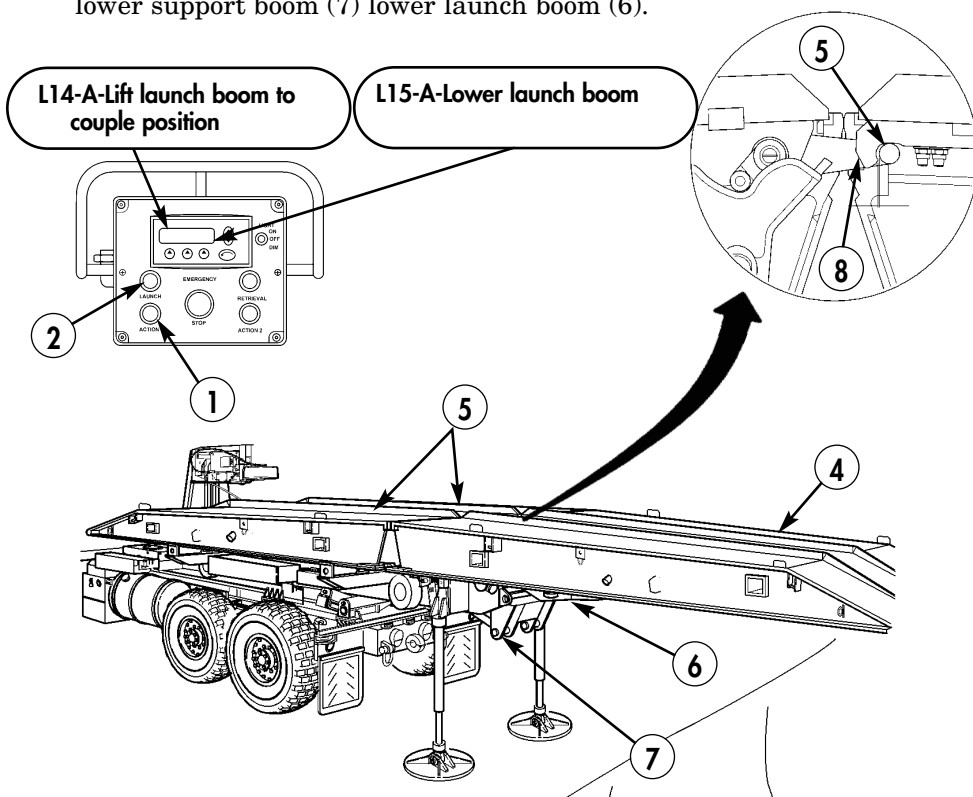
### **WARNING**

Ensure upper coupling lock remote control lever on each side of bridge is fully engaged. Assistant will check opposite side (do not walk under bridge). Do not proceed to next launch function unless both levers are fully engaged. Assistant will manually engage them if necessary. Failure to fully engage both levers may result in lower bridge half falling to ground, and damage to equipment and possible injury or death to personnel may result.

### **NOTE**

Check alignment of lower couplings on both bridge halves prior to performing step 42.

42. Depress ACTION 1 button (1) to L14-A-LIFT LAUNCH BOOM TO COUPLE POSITION, and observe lower support boom (7) lift lower bridge half (4) until upper coupling lock remote control lever (5) (red lever) engages in receptacle bracket (8) at both sides of bridge.
43. Depress LAUNCH button (2) to confirm and step into next function.
44. Depress ACTION button (1) to L15-A-LOWER LAUNCH BOOM, and observe lower support boom (7) lower launch boom (6).



## LAUNCH OF BRIDGE (Contd)

45. Depress LAUNCH button (2) to confirm and step into next function.

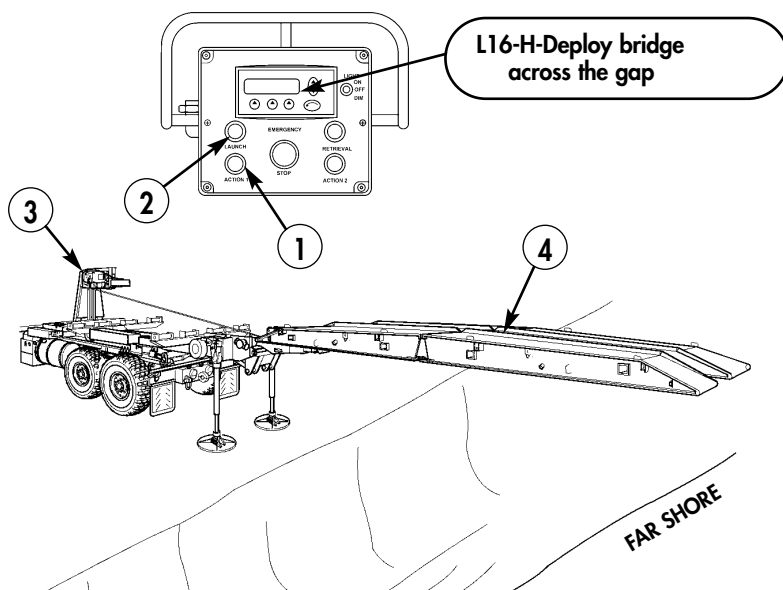
### **CAUTION**

When deploying bridge across the gap, observe end of bridge to ensure it does not drive into far shore. If end of bridge is too low to meet far shore, perform retrieval step R7 to drive bridge back on pallet until couplings reach upper roller block on pallet launch boom. Do not drive bridge back all the way or bridge will uncouple. Refer to WP 0020 00. Then perform launch step L7 in this Work Package to raise pallet. Failure to comply may result in damage to equipment.

While bridge is fully extended on pallet launch boom, do not attempt to raise or lower bridge to meet far shore by extending or retracting pallet supporting cylinders prior to driving bridge back on pallet using retrieval step R7. Failing to comply may result in damage to pallet frame.

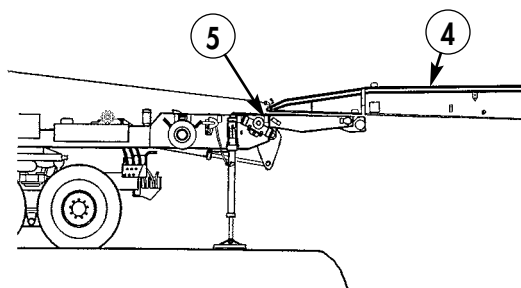
When deploying bridge over gap, ensure that bridge launch beam does not travel past roller blocks on launch boom or damage to equipment may result.

46. Depress and hold ACTION 1 button (1) to L16-H-DEPLOY BRIDGE ACROSS THE GAP, and observe pinwheel drives and winch (3) extend bridge assembly (4) over gap. Release button (1) when bridge stops. Ramp end of bridge assembly (4) will be approximately 6 in.(15 cm) past third yellow mark (5) on pallet frame.





**LAUNCH OF BRIDGE (Contd)**



- 47. Depress LAUNCH button (2) to confirm and step into next function.

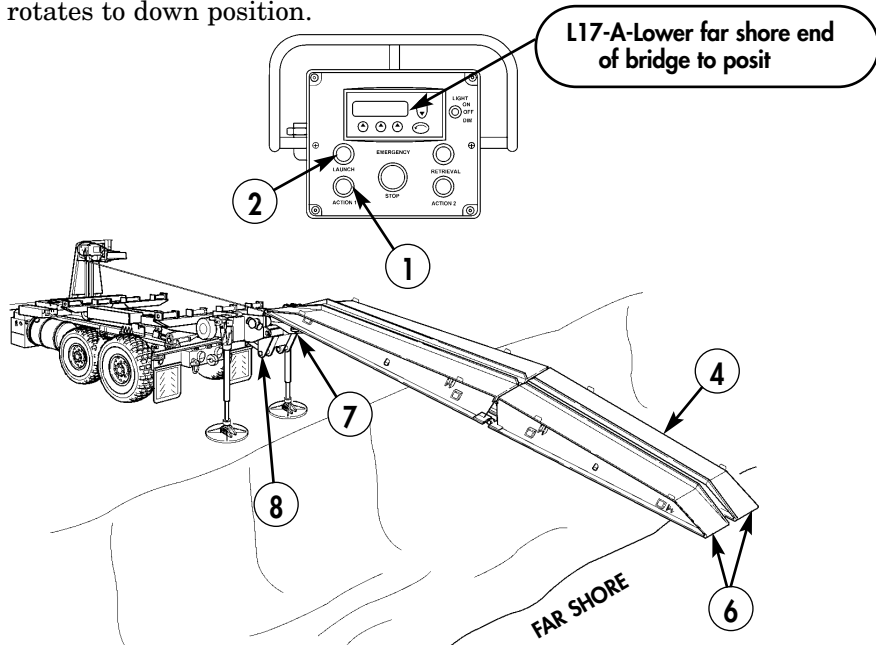
**CAUTION**

While bridge is fully extended on pallet launch boom, do not attempt to lower bridge to meet far shore by retracting pallet supporting cylinders or damage to pallet frame will result.

**NOTE**

Ensure that winch wire rope contacts launch boom rope guide roller at center with launch boom in lowered position.

- 48. Depress ACTION 1 button (1) to L17-A-LOWER FAR SHORE END OF BRIDGE TO POSITION, and observe ramp ends (6) of bridge assembly (4) contact ground at far shore, as lower support boom (8) retracts, and launch boom (7) rotates to down position.



## LAUNCH OF BRIDGE (Contd)

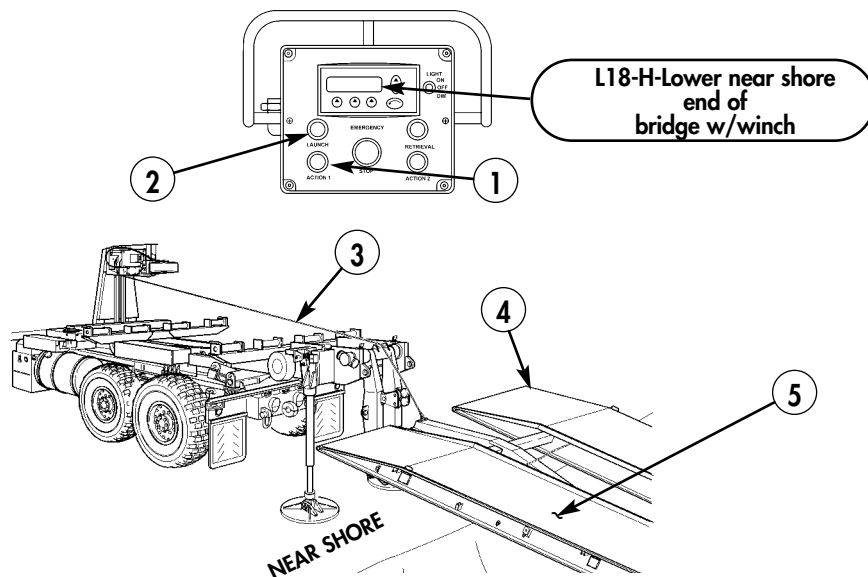
49. Depress LAUNCH button (2) to confirm and step into next function.

### **WARNING**

The minimum safety setback for bridge at both far and near shore banks is 20 in. (510 mm) and a SBC of 4.5 ton/ft<sup>2</sup> (450 kN/m<sup>2</sup>). If either end of bridge is not set back 20 in. (510 mm) minimum from edge of gap, move bridge as necessary. Failure to comply may result in damage to equipment or possible injury or death to personnel.

Winch wire rope may contain broken wire strands. Do not handle or pull on wire rope while winch is operating or injury to personal may result.

50. Depress and hold ACTION 1 button (1) to L18-H-LOWER NEAR SHORE END OF BRIDGE W/ WINCH, and observe ramp end (4) of bridge assembly (5) contact ground at near shore. Continue to hold button (1) until winch stops pay-out of wire rope (3).



51. Depress LAUNCH button (2) to confirm and step into next function.

### **WARNING**

Always wear leather gloves when handling winch cable. Failure to comply may result in injury to personnel.

### **NOTE**

Assistant will help perform step 52.

52. Depress and hold ACTION 1 button (1) to L19-M+H-UNHOOK CABLE AND SECURE ON LAUNCH BOOM while assistant pulls wire rope (3) and disconnects winch rope hook (6) from bridge lifting eye (7), then release button (1). Connect winch rope hook (6) to pallet launch boom connecting eye (9).

## LAUNCH OF BRIDGE (Contd)

### **WARNING**

Do not depress LAUNCH button to confirm and step into next function until assistant is clear of pallet launch boom. Failure to comply may result in injury to personnel.

53. Depress LAUNCH button (2) to confirm and step into next function.

### **CAUTION**

Ensure open end of winch hook is facing bridge when connected to launch beam lifting eye, or hook may catch on pallet and damage equipment.

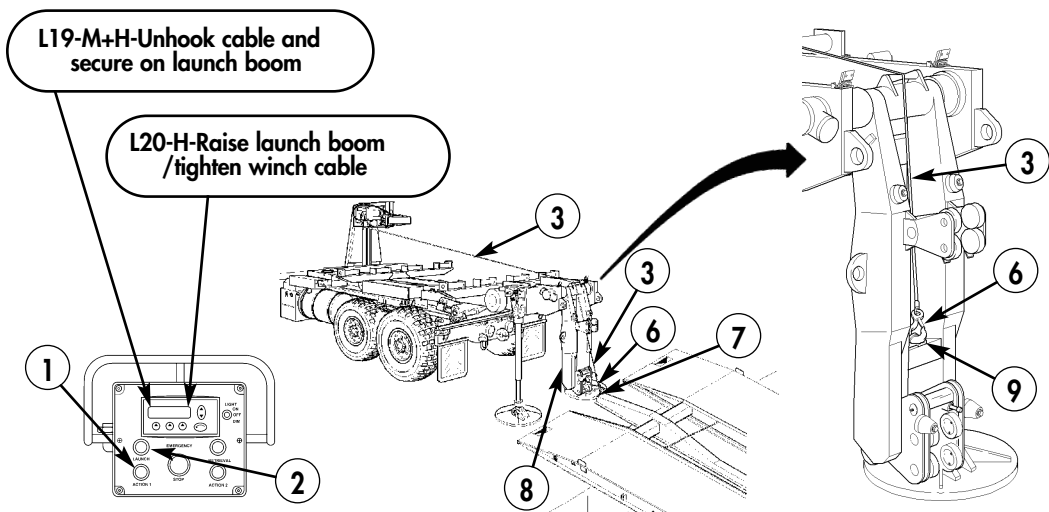
When paying in winch wire rope after pallet launch boom is at final raised position, allow a slight amount of slack. Tightening winch wire rope may result in damage to equipment.

Assistant will watch winch wire rope to ensure it does not catch on launch boom roller block assembly during step L 20. Failure to comply may result in damage to equipment.

### **NOTE**

During step L20, the pallet launch boom will automatically stop at two preset positions, and the winch will pay-in wire rope automatically.

54. Depress and hold ACTION 1 button (1) to L20-H-RAISE LAUNCH BOOM/TIGHTEN WINCH CABLE, and observe pallet launch boom (8) raise, and winch rope (3) pay-in until pallet launch boom (8) reaches final raised position. Then, depress and hold ACTION 1 button (1) until slack in winch rope (3) is raised off pallet frame.



## LAUNCH OF BRIDGE (Contd)

55. Depress LAUNCH button (6) to confirm and step into next function.

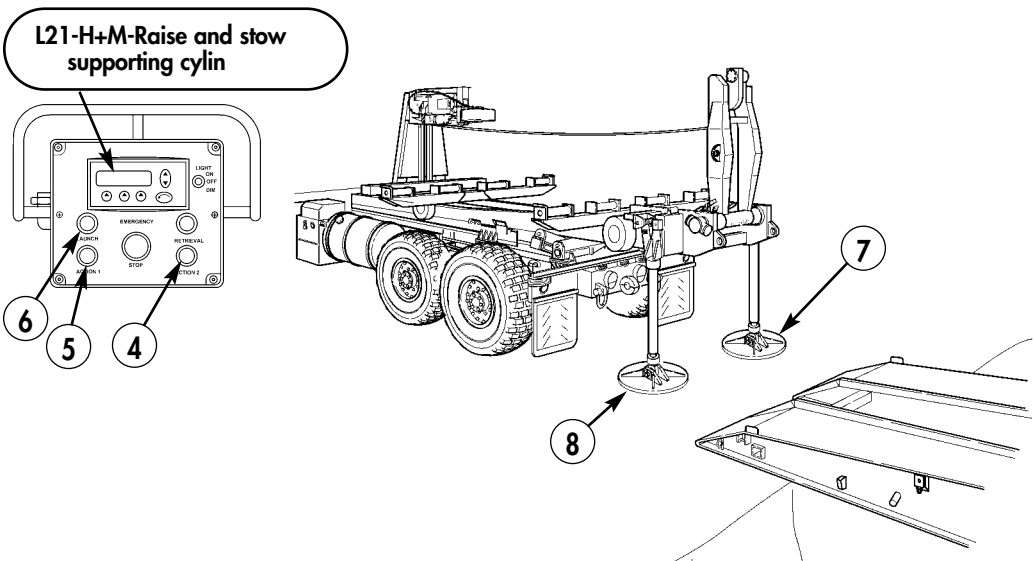
### **CAUTION**

Failure to install launch boom retaining pins prior to over-the-road travel may result in damage to equipment.

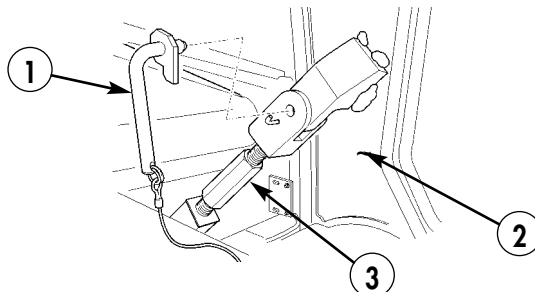
### **NOTE**

Operator and assistant will install launch boom lock retaining pins simultaneously to decrease launch time.

56. Install retaining pin (1) on launch boom lock (3) at both sides of pallet launch boom (2).



57. Depress and hold ACTION 2 button (4) and ACTION 1 button (5) simultaneously to L21-H+M-RAISE AND STOW SUPPORTING CYLINDER, and observe right supporting cylinder (7) and left supporting cylinder (8) retract. Release buttons (5) and (4) when fully retracted.



## LAUNCH OF BRIDGE (Contd)

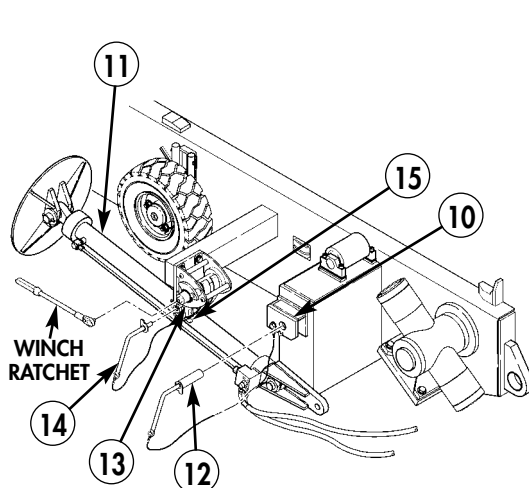
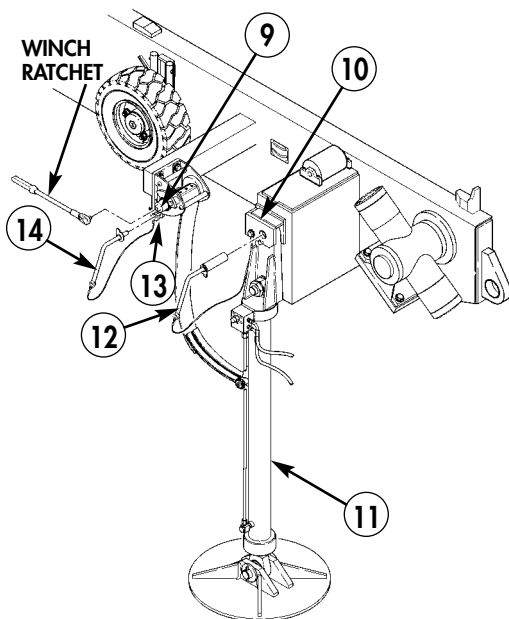
### **WARNING**

Operators must stand clear of supporting cylinders while raising them. Failure to comply may result in injury to personnel.

### **NOTE**

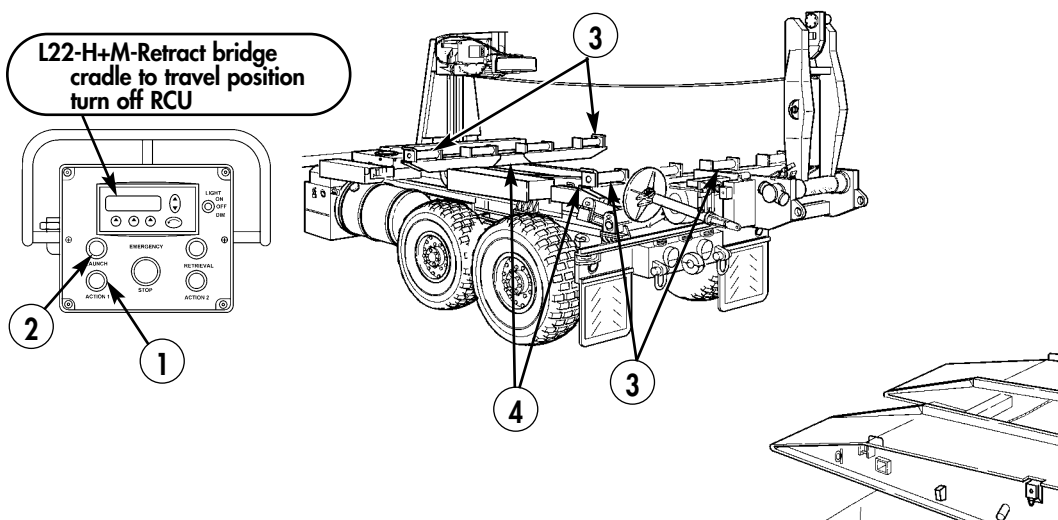
Operator and assistant will raise and lock both supporting cylinders simultaneously to decrease launch time. Steps a through f are performed the same way for right and left supporting cylinders.

58. Manually raise and lock both support cylinders simultaneously as follows:
- Unlock supporting cylinder (11) by removing retaining pin (12) from supporting cylinder (11) and pallet frame bracket (10).
  - Using winch ratchet, turn winch ratchet wheel (9) slowly until supporting cylinder (11) is just below winch clevis (13).
  - Remove retaining pin (14) from winch clevis (13).
  - Turn winch ratchet wheel (9) until supporting cylinder (11) is fully raised, and install retaining pin (14) on winch clevis (13) and supporting cylinder bracket (15).
  - Install retaining pin (12) on pallet frame bracket (10), and loosen tension on strap.
  - Remove and stow winch ratchets in pallet toolboxes.

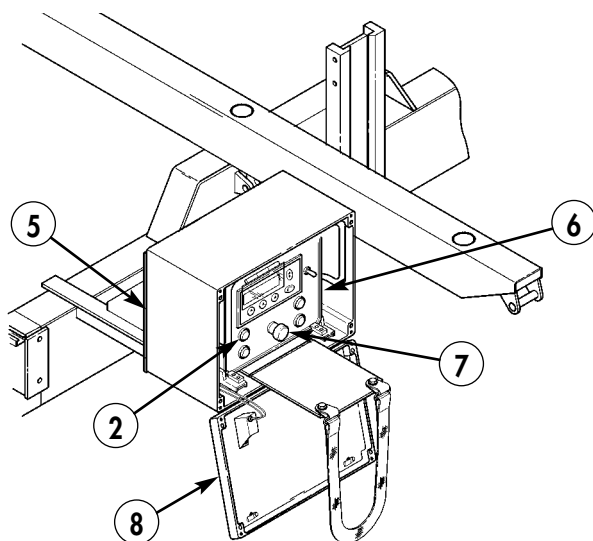


## LAUNCH OF BRIDGE (Contd)

59. Depress LAUNCH button (2) to confirm and step into next function.
60. Depress and hold ACTION 1 button (1) to L22-H+M-RETRACT BRIDGE CRADLE TO TRAVEL POSITION, TURN OFF RCU, and observe transverse handling unit telescopic tubes (3) retract on both transverse girders (4).



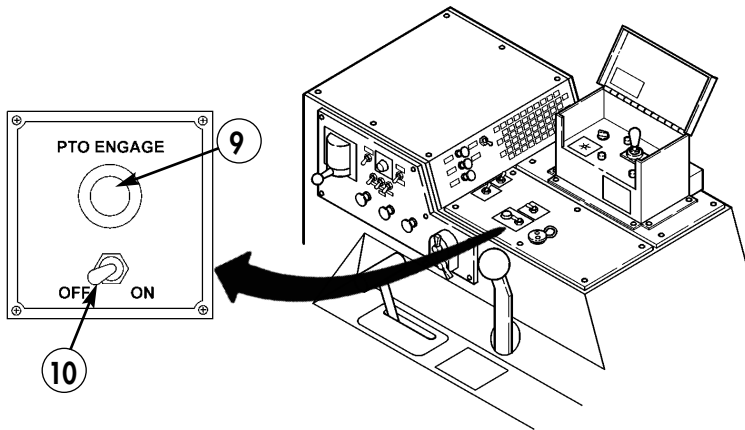
61. Turn RCU (6) off by depressing EMERGENCY STOP button (7) until locked in position.
62. Stow RCU (6) in RCU stowage box (5), remove key from passenger side pallet toolbox, and lock RCU stowage box lid (8) in closed position. Refer to WP 0007 00.



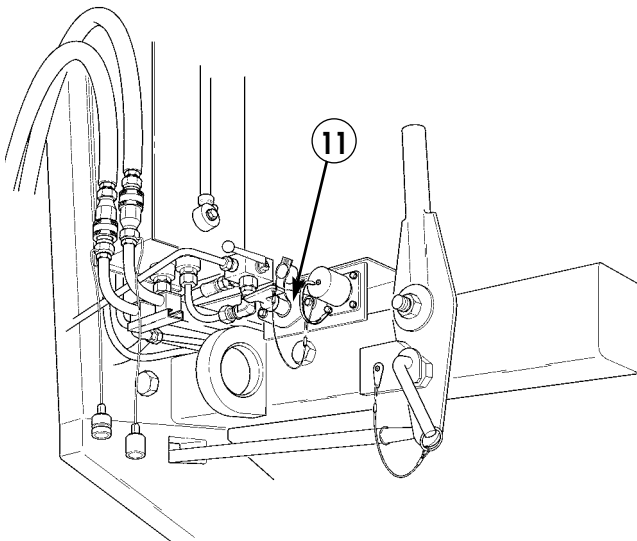
**LAUNCH OF BRIDGE (Contd)****NOTE**

If using LPU, perform step 63. If using CBT back-up power, perform step 64.

63. Stop LPU. Refer to WP 0015 00.
64. Move PTO ENGAGE switch (10) to OFF position. PTO ENGAGE indicator (9) will go out.



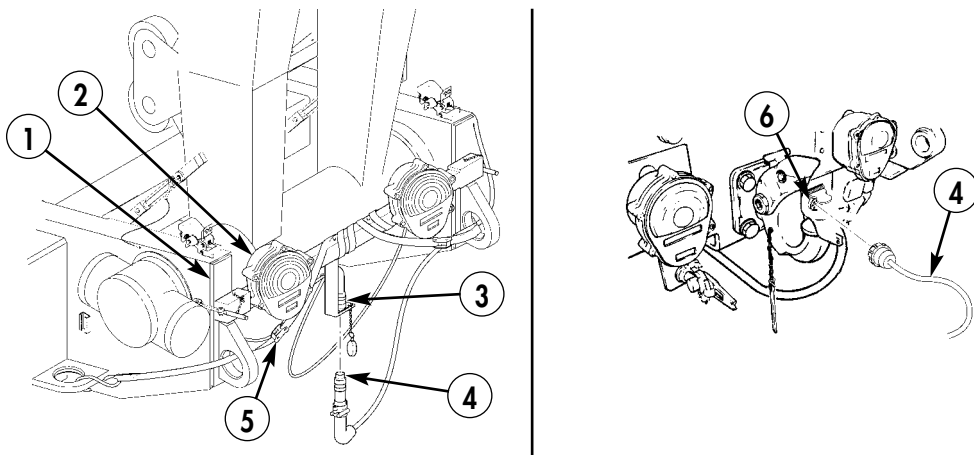
65. Check main power switch (11) to ensure it is in OFF position. (Switch is off when key is in horizontal position.)

**OFF POSITION**

**LAUNCH OF BRIDGE (Contd)****NOTE**

If REB pallet will be transported on CBT in over the road transit, perform step 66 to install auxiliary light bar kit. Refer to WP 0051 00. If REB pallet will be transported on CBT during road marches/convoys, perform step 67 to connect PLST.

66. Install auxiliary light bar (2) on pallet frame girders (1) and secure with safety strap (5). Refer to WP 0007 00 then connect power cable (4) to auxiliary light bar connector (3) and CBT electrical connector (6).

**WARNING**

Due to the severe overhang of the REB pallet when mounted on the CBT, a rear-end collision by a HMMWV or any comparable vehicle may result in that vehicle under riding the REB pallet. To prevent this, an empty PLST shall be connected to any CBT loaded with the REB pallet during all road marches/convoys. Failure to comply may result in severe injury or death to personnel.

**CAUTION**

The PLST cannot be towed behind the CBT loaded with a REB pallet unless the PLST is equipped with the drawbar extension, and both the drawbar extension and drawbar tube are in their extended positions. Refer to TM 9-2330-385-14. Failure to comply will result in damage to equipment.

67. Extend drawbar tube and drawbar extension on PLST, and connect empty PLST to CBT. Refer to TM 9-2330-385-14.
68. Anchor bridge prior to vehicle crossing. Refer to Bridge Anchorage, WP 0018 00.

**END OF WORK PACKAGE**



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## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## DEPLOYMENT BY HELICOPTER

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### **NOTE**

Unit commanders are cautioned of the necessity to anticipate requirements for an airlift operation and arrange for timely delivery.

Deployment by helicopter is performed under conditions where it may be advantageous to use a helicopter to transport and emplace the bridge or where site conditions make it impossible to emplace the bridge by any other means.

Two personnel can prepare and rig bridge in 20 minutes.

The bridge can be transported at speeds up to 130 knots.

### **NOTE**

Perform step 1 if bridge is loaded on CBT.

1. Launch bridge (2) to ground where specified by unit commander. Refer to Launch of Bridge, WP 0016 00.

### **NOTE**

Perform steps 2 and 3 if bridge is emplaced over gap and anchorage is installed.

When deploying bridge by helicopter, bridge anchorage must stay with the bridge.

2. Disconnect anchorage from bridge and remove anchoring pins from ground. Refer to Bridge Anchorage, WP 0018 00.
3. Remove anchorage stowage boxes from pallet and install on bridge quarters. Refer to WP 0007 00.
4. Stow anchoring pins, sledge hammers, nail heads, removers, and drawing apparatuses in anchorage stowage boxes. Refer to WP 0007 00.

### **CAUTION**

Do not attempt to transport anchoring straps and hold-fasts on bridge when deploying bridge by helicopter. Failure to comply may result in damage to equipment.

5. Transport anchoring straps and hold-fasts to deployment site by aircraft or ground transport.

## DEPLOYMENT BY HELICOPTER (Contd)

6. Determine and prepare site for bridge emplacement. Refer to Site Requirements and Layouts, WP 0012 00.
7. Secure all loose equipment with tape or tie-straps, and check all latches to ensure they are securely fastened

### NOTE

Since bridge is symmetrical in design, either end can be designated as the front to be flown forward. The chains connecting the forward sling set to the bridge will be set at the third chain link. The chains connecting the aft sling set to bridge will be set at the twenty-fifth chain link.

8. Position two sling legs (2) on bridge half (1), and connect two sling legs (2) to apex fitting (3) with coupling link (4).
9. Position chain (9) through helicopter lifting ring (10) on both sides of bridge half (1).
10. Loop two chains (9) through sling legs (2) and connect chain grab-hook (11) on third link from end of chain at both sides on bridge half (1).
11. Position two sling legs (5) on bridge half (8), and connect two sling legs (5) to apex fitting (6) with coupling link (7).
12. Position chain (9) through helicopter lifting ring (10) on both sides of bridge half (8).
13. Loop two chains (9) through sling legs (5) and connect chain grab-hook (11) on twenty-fifth link from end of chain at both sides on bridge half (8).
14. Secure all excess chain with 2-in. (51-mm) wide tape or Type III nylon cord.
15. Cluster and tie or tape all sling legs above bridge to prevent fouling during hookup.

### NOTE

The hookup team kneels on top of the load. The static wand person discharges the static electricity with the static wand. The forward hookup person places apex fitting 1 onto the forward cargo hook. The aft hookup person places apex fitting 2 onto the aft cargo hook.

The hookup team then carefully dismounts the bridge and remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

16. Bridge supervisor will signal helicopter pilot to position helicopter directly over bridge.

### **WARNING**

Ground helicopter connecting ring prior to connecting/disconnecting. Static electricity generated from helicopter will shock personnel and injury or death may result.

**DEPLOYMENT BY HELICOPTER (Contd)****CAUTION**

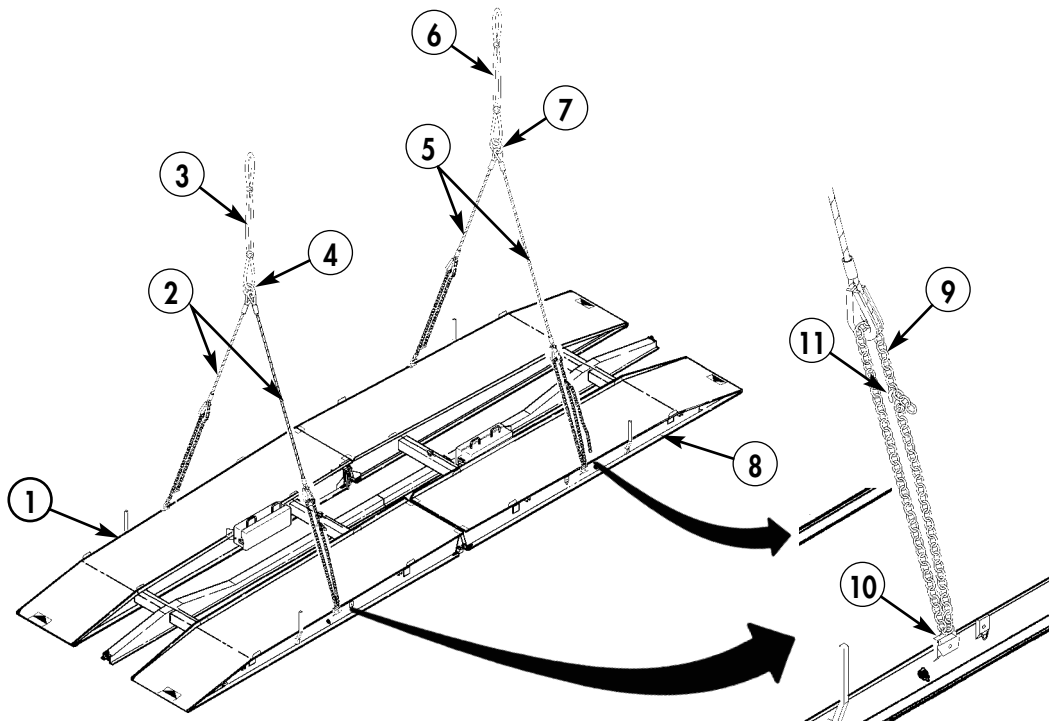
Ensure all four bridge quarter slide locks are locked by visually checking position of control levers and feeling each lock lever for engagement on launch beam support tubes. Failure to comply may result in damage to equipment.

17. Connect apex fittings (3) and (6) to helicopter forward and aft hooks, and signal helicopter pilot to slowly lift bridge and transport to emplacement area.

**WARNING**

Ensure bridge minimum bearing safety setback is observed during helicopter deployment, or damage to equipment or possible injury or death to personnel may result.

18. Bridge supervisor will signal helicopter pilot to lower bridge over gap.
19. Ensure ramp ends of bridge quarters contact ground evenly on both sides of gap, signal helicopter pilot to release lifting sling, and clear emplacement area.
20. Disconnect apex fittings (3) and (6) from coupling links (4) and (7), and remove helicopter lifting sling legs (2) and (5) and chains (9) from bridge.
21. Securely anchor bridge as required. Refer to Bridge Anchorage, WP 0018 00.
22. Before crossing bridge, refer to Bridge Operation WP 0019 00.



END OF WORK PACKAGE

0017 00-3/4 blank

Change 1



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

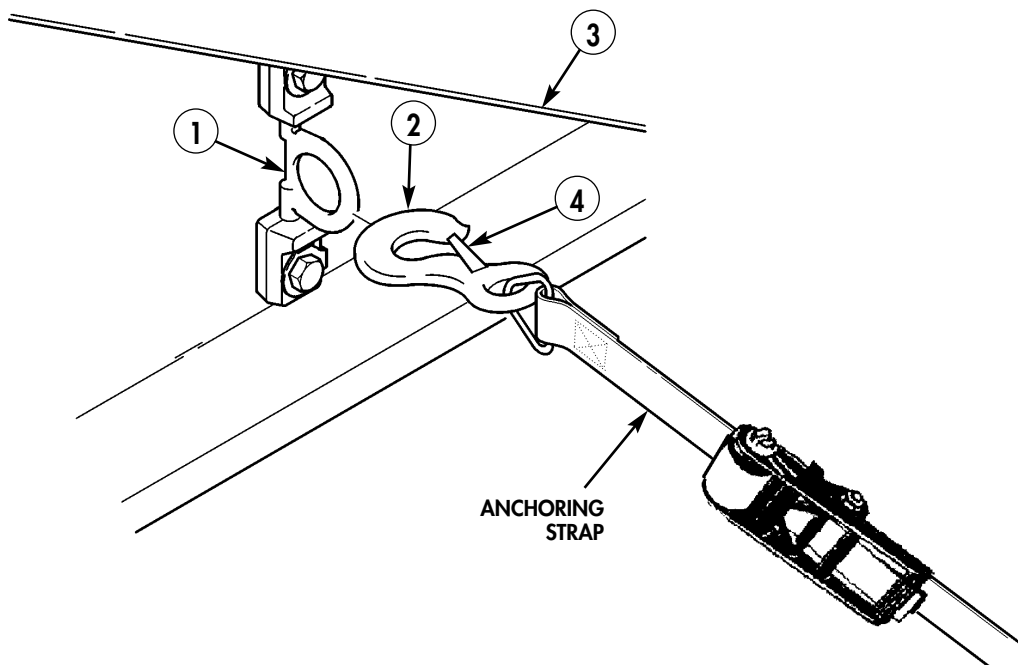
### BRIDGE ANCHORAGE

#### NOTE

The installation of anchorage will be determined by the Non-commissioned Officer In Charge (NCOIC) based on assessment of the soil bearing capacity (SBC) of the launch site. Refer to Site Parameters in WP 0012 00.

The steel picket hold-fast consists of a steel bar having nine holes and a shackle held by a pin at its connecting end. The hold-fast is secured to the ground with eight anchoring pins, each positioned in holes of hold-fast and driven into the ground at an angle.

1. Remove anchoring strap and hold-fast from pallet toolbox. Refer to WP 0007 00.
2. Connect anchoring strap to bridge anchoring eye (1), located at ramp end outside corner of each bridge quarter (3). Ensure latch (4) closes in hook (2).



**BRIDGE ANCHORAGE (Contd)**

3. Position hold-fast on ground adjacent to anchoring eye (1), and connect opposite end of anchoring strap to shackle (5). Ensure that latch (3) closes on hook (4).

**NOTE**

Ensure that ground under hold-fast is firm, relatively flat, and free from rocks and debris. Anchoring pins should be driven into ground until seated against hold-fast.

4. Adjust length of anchoring strap as space allows. Position hold-fast in line with anchoring strap and bridge anchoring eye (1) at approximately a 45-degree angle to centerline of bridge.
5. Remove eight anchoring pins from anchorage stowage box. Refer to WP 0007 00.

**WARNING**

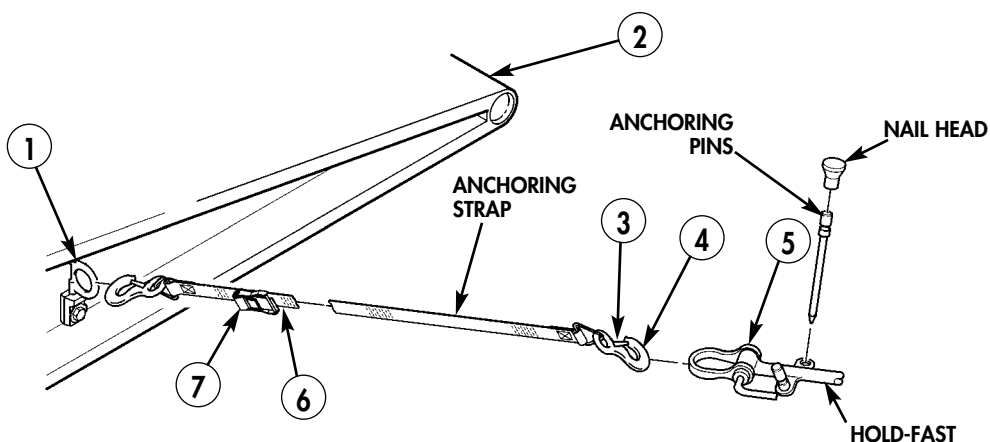
Wear safety glasses when using sledge hammer to drive anchoring pins in ground; metal fragments from anchoring pins may result in injury to personnel.

6. Using sledge hammer and nail head supplied in anchorage stowage boxes, secure hold-fast to ground with eight anchoring pins.
7. Repeat steps 1 through 6 for remaining three bridge quarters (2)

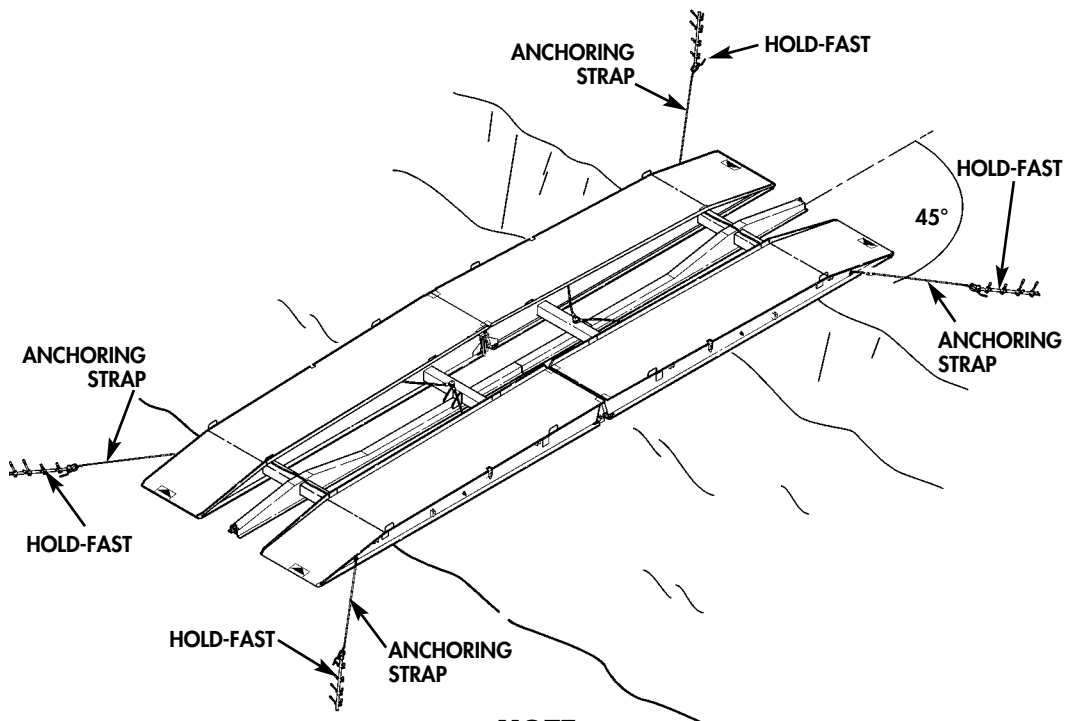
**WARNING**

Ensure that anchoring strap is adjusted so that when tightened, there is a minimum of three complete wraps on the ratchet wheel. Failure to comply may result in damage to equipment and injury or possible death to personnel.

8. Remove slack from each anchoring strap, and evenly tighten four anchoring straps by cranking ratchet wheel (7) using ratchet lever (6).



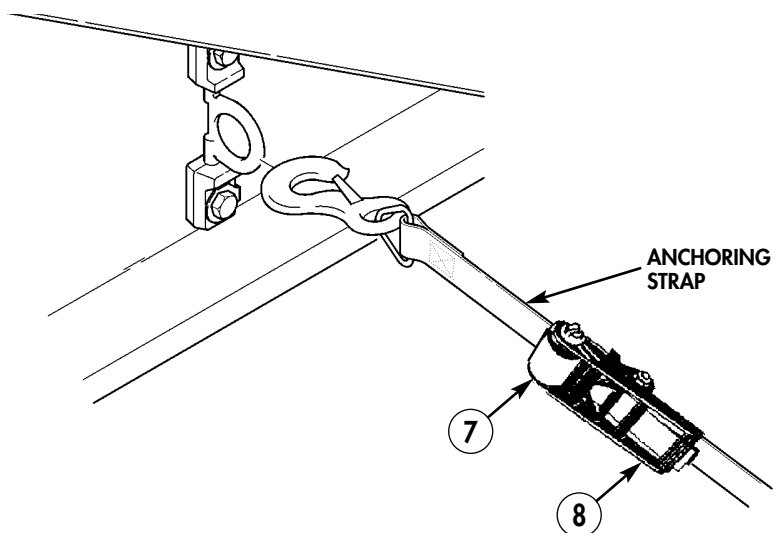
**BRIDGE ANCHORAGE (Contd)**



**NOTE**

Perform steps 9 through 15 to remove anchorage from bridge.

- Loosen anchoring strap by releasing ratchet wheel (7) and holding spring-loaded lock (8) open.



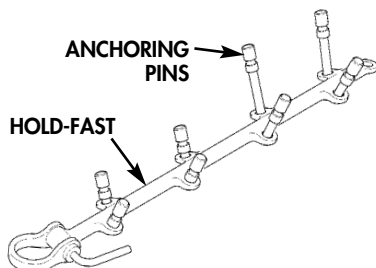
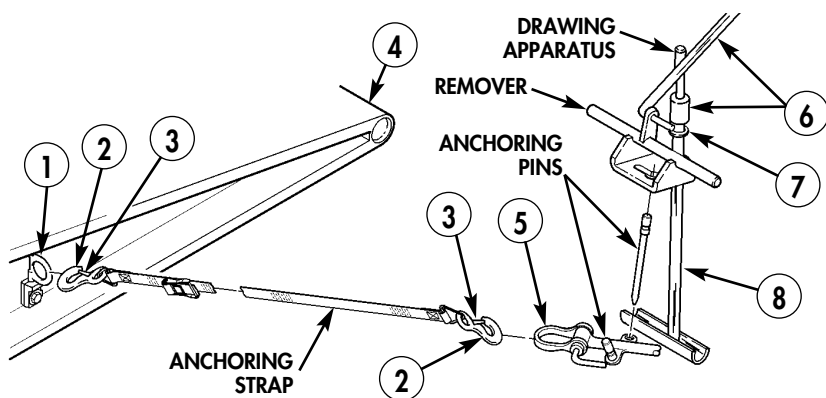
**BRIDGE ANCHORAGE (Contd)**

10. Remove anchoring strap by depressing latch (3) and removing hook (2) from bridge anchoring eye (1) and hold-fast shackle (5).
11. Using remover supplied in anchorage stowage box, connect remover to anchoring pin.
12. Depress sliding ring (7) on drawing apparatus, and slide cog and lever (6) down support rod (8) until end of lever (6) can be inserted in hole on remover.

**NOTE**

Once anchoring pins are loosened from ground using remover and drawing apparatus, anchoring pins may be pulled from ground using remover only.

13. Pull anchoring pin from ground by pushing lever on drawing apparatus down as far as possible. Slide cog and lever up support rod and continue pulling anchoring pin until removed from ground.
14. Repeat steps 11 through 13 and remove remaining seven anchoring pins and hold-fast from ground.
15. Repeat steps 9 through 14 for remaining three bridge quarters (4).
16. Stow 16 anchoring pins, sledge hammer, nail head, drawing apparatus, and remover in each anchorage stowage box, and stow two hold-fasts and two anchoring straps in each pallet toolbox. Refer to WP 0007 00.



**END OF WORK PACKAGE**



# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

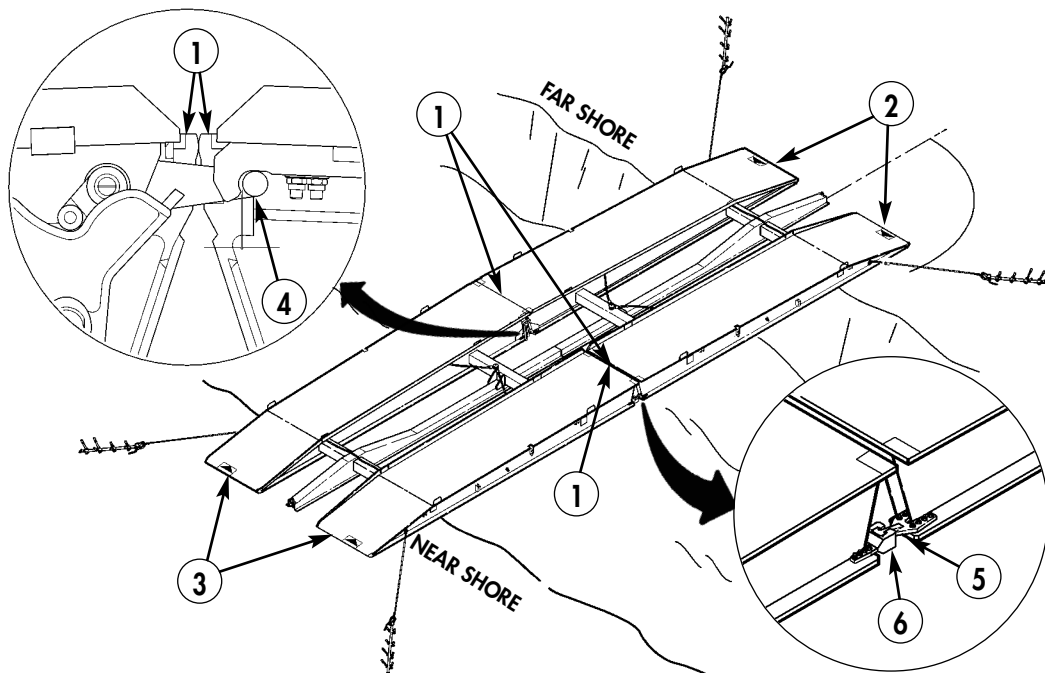
### BRIDGE OPERATION

#### 1. Bridge Setup Prior to Crossing.

#### **WARNING**

At no time should any personnel or vehicle of any kind enter the emplaced bridge until the NCOIC has approved the bridge safe for crossing. Failure to comply may result in damage to equipment or possible injury or death to personnel.

- a. Check footing under ramp ends (3) of bridge at near shore to ensure it is not loose or breaking away.
- b. Visually check condition of bridge structure prior to entering bridge on foot. Check crossforce coupling bumpers (1) for proper alignment, and check both upper coupling lock remote control levers (4) and lower couplings (5) and receptacles (6) for engagement.
- c. Check footing under ramp ends (2) of bridge at far shore to ensure it is not loose or breaking away.



## BRIDGE OPERATION (Contd)

### 1. Bridge Setup Prior to Crossing (Contd).

#### **WARNING**

The minimum safety setback for bridge at both far and near shore banks is 20 in. (510 mm) and an SBC of 4.5 ton/ft<sup>2</sup> (450 kN/m<sup>2</sup>). If either end of bridge is not set back 20 in. (510 mm) minimum from edge of cap, move bridge as necessary. Failure to comply may result in damage to equipment or possible injury or death to personnel.

- d. Check minimum safety setback of bridge ramp ends at far and near shore banks.

#### **NOTE**

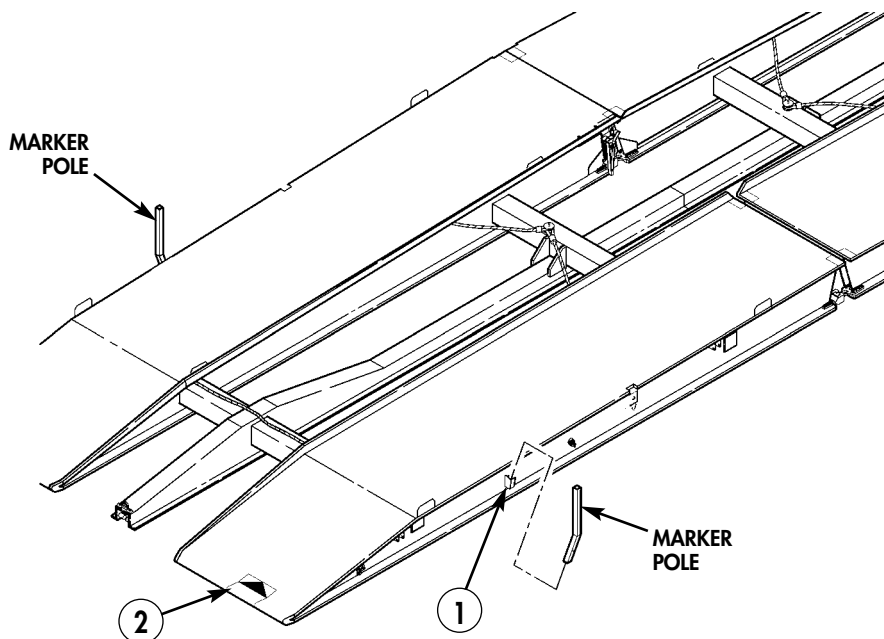
Perform step e if anchorage has not been connected to bridge anchoring eyes.

- e. Secure bridge with anchorage as required. Refer to WP 0018 00.
- f. Install marker pole on bracket (1) at each bridge quarter (2).

#### **NOTE**

Perform step f prior to crossing bridge with vehicle if anchorage stowage boxes were installed.

- g. If installed, remove anchorage stowage boxes from bridge. Refer to WP 0007 00.



## BRIDGE OPERATION (Contd)

### 2. Required Conditions for Bridge Crossing.

#### **NOTE**

The REB has a Class 40 normal crossing capability and a Class 50 caution crossing capability.

- a. Vehicle spacing criteria:

Rating:

Normal Crossing — One vehicle only on bridge

Caution Crossing — One vehicle only on bridge

- b. Maximum speeds for crossings:

#### **WARNING**

To minimize possible loss of control while towing the PLST, the maximum safe speed on paved roads is 35 mph (56 km/h), based on quick lane change testing, 15 mph (24 km/h) on off-road cross country terrain, and 10 mph (16 km/h) on heavily wash boarded areas. Refer to TM 9-2330-385-14 for additional guidance on PLST operation. Failure to comply may result in damage to equipment and possible injury or death to personnel.

#### **NOTE**

The maximum crossing speed is the maximum speed at which a vehicle can safely come to an abrupt stop on the bridge while crossing.

Rating:

Class 0 to Class 40 — 25 mph (40 km/h) maximum

Class 40 to Class 50 — 10 mph (16 km/h) maximum

- c. If bridge will be crossed under unusual operating conditions such as in rain or high wind conditions, refer to Operation Under Unusual Conditions, WP 0025 00, prior to approving bridge safe for crossing.
- d. The bridge may be emplaced over a gap no wider than 42.6 ft (13 m). When crossing the REB emplaced over a gap either at or near 42.6 ft (13 m), the NCOIC must observe the condition of both near and far shores both during and after each vehicle crossing. Should the footing under any ramp end of bridge settle unevenly or become loose or appear to be breaking away at the edge of the shore, all vehicle crossing must be stopped immediately until the condition is corrected. Refer to Site Requirements and Layouts, WP 0012 00.
- e. During periods of heavy traffic, shores may start to erode under ramp ends of bridge. The anchorage system (anchoring straps) must be periodically adjusted to keep bridge movement and subsequent erosion to a minimum. If erosion becomes significant, the bridge should be raised and sand bags or other suitable fill material should be placed under its ramp ends. The ramp ends should be lowered and securely anchored prior to resuming vehicle crossing. WP 0018 00.

## BRIDGE OPERATION (Contd)

### 2. Required Conditions for Bridge Crossing (Contd).

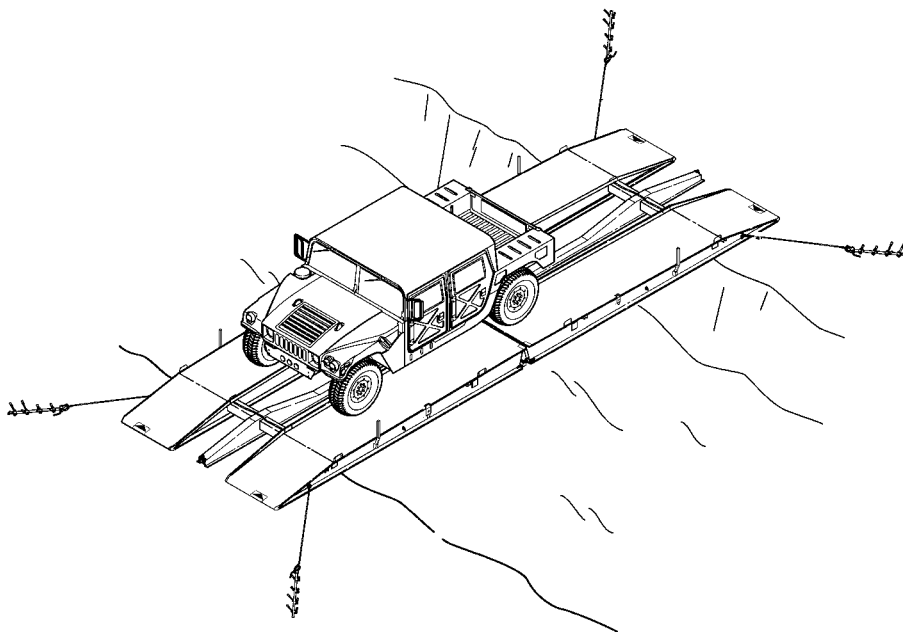
#### **WARNING**

Ensure one ground guide is present during all vehicle crossings. Failure to comply may result in damage to equipment or possible injury or death to personnel.

#### **CAUTION**

Stopping, accelerating, and shifting of gears on the bridge is not permitted during a crossing. Failure to comply may result in damage to equipment.

- f. Prior to allowing vehicle traffic on bridge, the Equipment Regulating Point (ERP) NCOIC will instruct each vehicle operator to line up vehicle with front tires inside roadway paint markings, and keep vehicle to centerline of bridge roadway during crossing. In addition, the NCOIC will specify to the operator of each vehicle the distance to be maintained between the next vehicle and the maximum allowable speed for that vehicle during crossing.
- g. During periods of heavy traffic, dirt and foreign materials may accumulate on roadway surface. Clean roadway surface. If water is available at bridge site, use pressure pump as described in Operation of Special Purpose Kits, WP 0033 00.



**VEHICLE CROSSING BRIDGE, TYPICAL**

## **BRIDGE OPERATION (Contd)**

### **3. Bridge Preparation Prior to Retrieval.**

- a. If recovering bridge by helicopter, refer to WP 0021 00.
- b. Remove four marker poles from bridge. Refer to WP 0008 00.
- c. If installed, remove anchorage from bridge. Refer to WP 0018 00.
- d. If bridge is covered with dirt and debris, clean external surfaces of bridge. Refer to WP 0046 00.



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# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### BRIDGE RETRIEVAL

#### **WARNING**

Ensure all launch site requirements are met prior to retrieving the REB or damage to equipment and possible injury or death to personnel may result.

All non-essential personnel must stand a minimum of 30 ft (9.1 m) away from pallet and bridge during all launch/retrieval operations. Failure to comply may result in injury or death to personnel.

Assistant will act as a ground guide when maneuvering Common Bridge Transporter (CBT) and during launch and retrieval operations. Failure to comply may result in damage to equipment and possible injury or death to personnel.

Bridge retrieval will only be performed with REB pallet loaded on CBT. Do not attempt to retrieve bridge from PLST. Failure to comply may result in damage to equipment or possible injury or death to personnel.

#### **CAUTION**

Bridge must be free of dirt, rocks, mud, and debris prior to bridge retrieval, or damage to equipment may result.

Ensure REB is clean before performing retrieval procedures. Failure to comply may result in damage to equipment.

#### **NOTE**

Loading the bridge from ground is the same as retrieving bridge from a gap. Conditions that necessitate loading bridge from ground are transport of bridge, other than by helicopter, stowage of bridge, or maintenance of bridge.

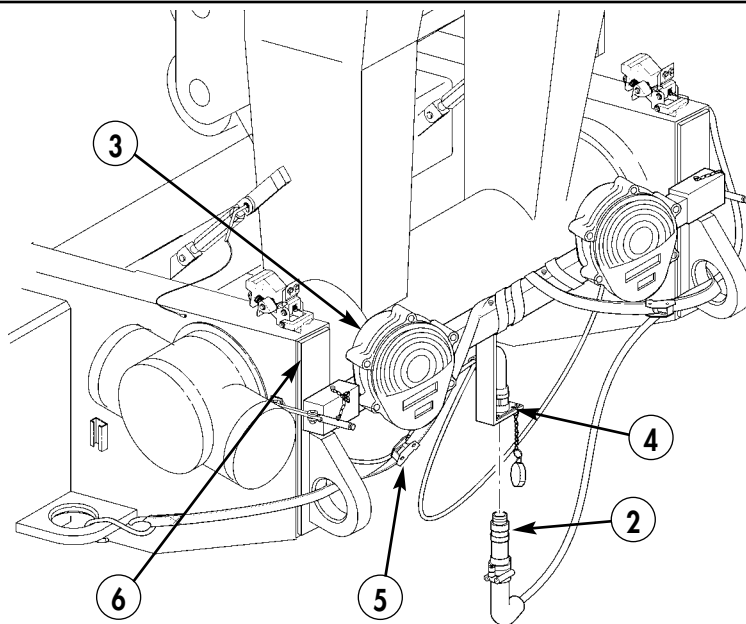
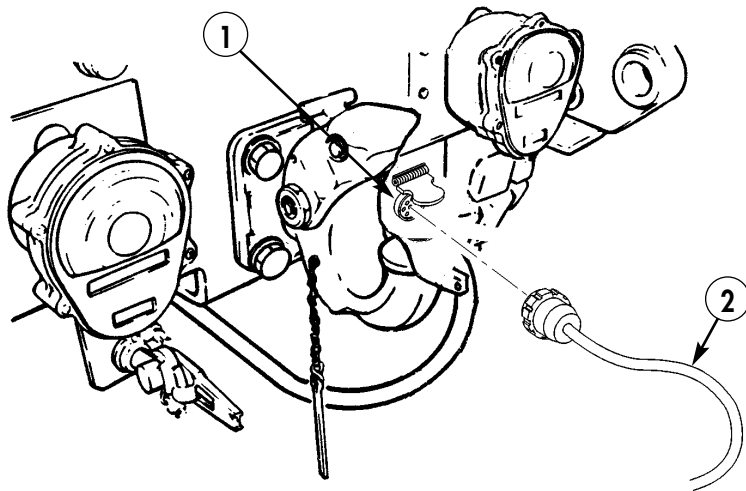
During all CBT operations, the CBT operator will drive and be responsible for the operation of the Load Handling System (LHS) via the cab and remote control boxes. The assistant will act as a ground guide, be responsible for directing the operator using hand signals, and assist the operator as needed.

Ensure bridge is clean, and bridge marker poles, anchorage stowage boxes, and anchorage, if installed, have been removed from bridge prior to performing bridge retrieval.

**BRIDGE RETRIEVAL (Contd)****NOTE**

Perform step 1 if auxiliary light bar is installed on pallet.

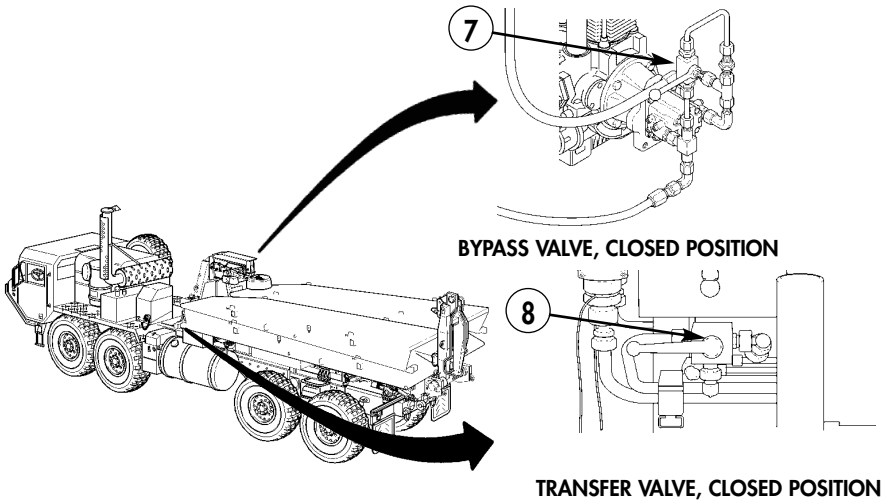
1. Disconnect power cable (2) from CBT electrical connector (1) and auxiliary light bar connector (4), and remove safety strap (5) and auxiliary light bar (3) from pallet frame girders (6).



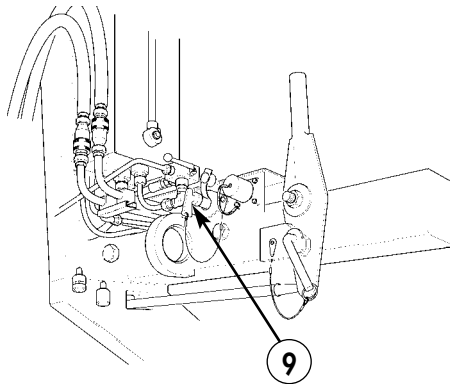


**BRIDGE RETRIEVAL (Contd)**

2. Check to ensure bypass valve (7) and transfer valve (8) are closed prior to starting LPU or operating CBT hydraulic pump.



3. Check main power switch (9) to ensure it is in ON position. (Switch is on when key is in vertical position.)



**ON POSITION**

**BRIDGE RETRIEVAL (Contd)****CAUTION**

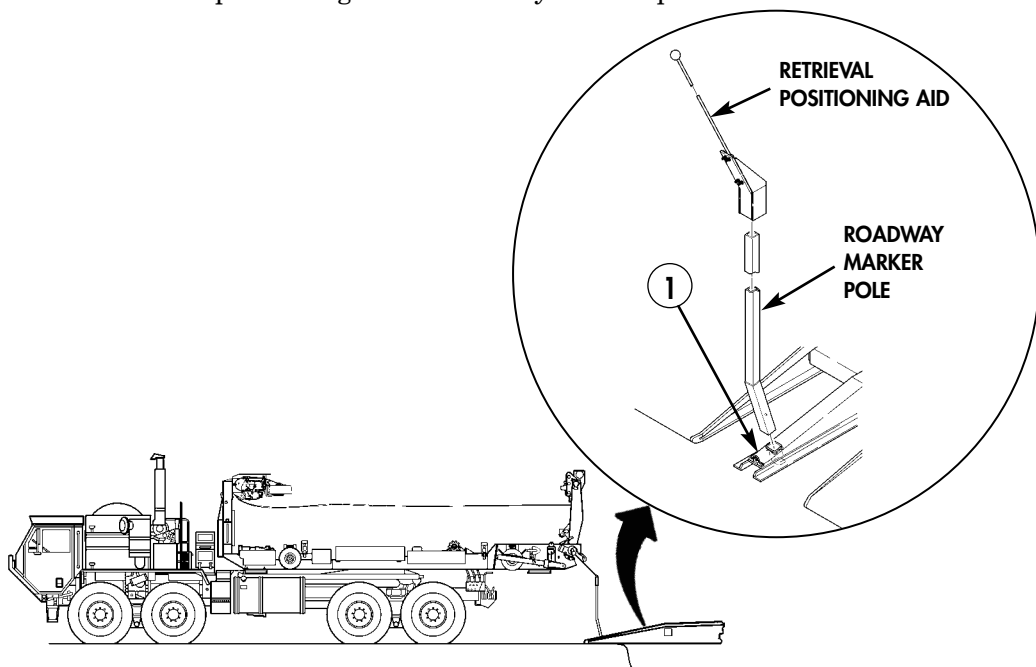
Alignment of CBT with emplaced bridge is crucial for retrieval. The CBT must be centered in a straight line down the center mass of bridge prior to installation of retrieval positioning aid. Failure to comply may result in damage to pallet and bridge during bridge retrieval.

**NOTE**

Ensure all exterior surfaces of bridge quarters and launch beam are cleaned as necessary. If water is available at bridge site, use pressure pump. Refer to Operation of Special Purpose Kits, WP 0033 00.

Assistant will direct operator during alignment of CBT and install retrieval positioning aid. Positioning time required is 3 minutes.

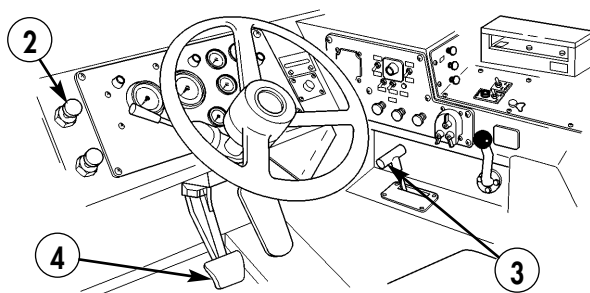
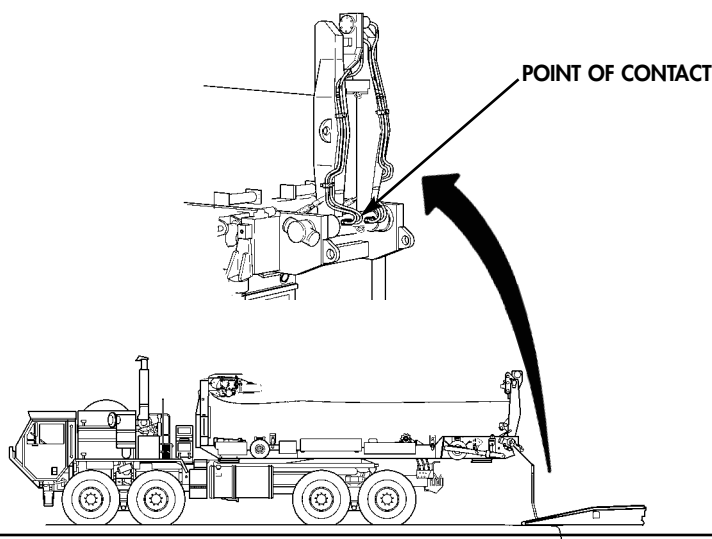
- 3.1. With front tires aligned at yellow paint marks on ramp edges of bridge, drive CBT across bridge to opposite end so that CBT is centered and in-line with bridge. Drive CBT off bridge keeping front wheels aimed straight ahead. Once CBT is off bridge, rear tires must be centered with yellow paint marks at ramp edges. Only drive CBT off end of bridge far enough to install retrieval positioning aid.
4. Install roadway marker pole on bridge launch beam (1), and install bridge retrieval positioning aid on roadway marker pole.



**BRIDGE RETRIEVAL (Contd)****NOTE**

If retrieving from a near shore bank that is higher than far shore bank, remove positioning aid after performing step 5 and back CBT until pallet frame lifting eyes are even with ramp edges of bridge.

5. Back up CBT on shore parallel to bridge so end of retrieval positioning aid contacts center of pallet launch boom near red lifting eye. Apply service brake (4), move transmission selector lever (3) to N (neutral), and pull PARKING BRAKE control (2) out. Chock front wheels. Remove retrieval positioning aid and roadway marker pole from bridge launch beam (4).



**BRIDGE RETRIEVAL (Contd)**

6. Remove marker poles from bridge. Refer to WP 0008 00.
7. Remove anchorage from bridge if installed. Refer to WP 0018 00.
8. Remove key from passenger side pallet toolbox, and open RCU stowage box lid (1). Refer to WP 0007 00.

**CAUTION**

If bridge halves become jammed due to misalignment during retrieval functions, it may become necessary to align bridge halves using pry bar before completing retrieval function. Ensure jammed bridge halves are free before performing retrieval function, or damage to equipment may result.

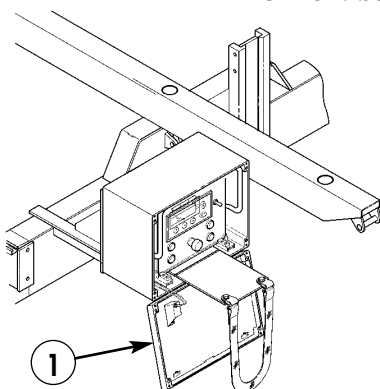
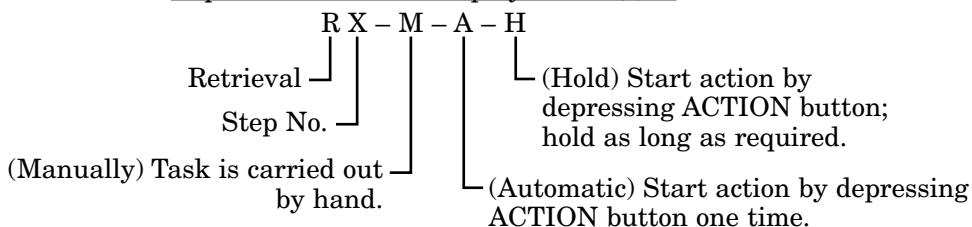
**NOTE**

Steps 9 through 59 are presented in the working step sequence as programmed on the RCU display screen for each function.

To start the retrieval sequence, release RCU EMERGENCY STOP button, read the display screen, and perform the stated retrieval function according to R X-M-A-H code until the stated function is completed.

If RCU will not power up, check main power switch and emergency stop buttons; main power switch and all emergency stop buttons must be in the ON position for the system to operate.

Explanation of RCU Display Screen Text



## BRIDGE RETRIEVAL (Contd)

### NOTE

After completing each retrieval function, depress the green RETRIEVAL button to confirm and step into the next retrieval function. It is necessary to wait two seconds for the display screen to read out the next function after confirming each retrieval function.

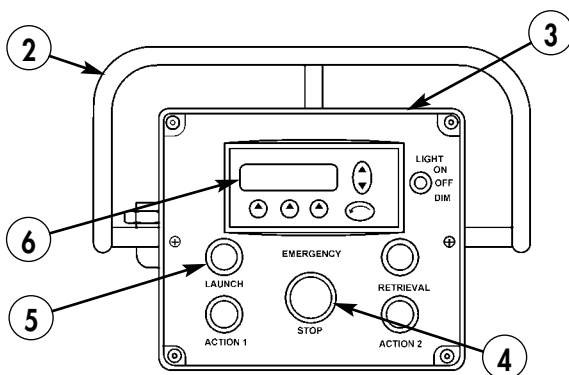
To change function from retrieval steps to launch steps or back, depress LAUNCH and RETRIEVAL simultaneously. To return to the first display of retrieval function go to LAUNCH and step through it.

To stop any automatic function or in case of emergency while the RCU is in use, push the red EMERGENCY STOP button to shut down operation.

Launch mode step L22-H+M will appear on RCU display if bridge launch was the last operation performed.

Perform steps 9 through 12 with RCU mounted in RCU stowage box hold-down brackets.

9. Turn on RCU (2) by turning EMERGENCY STOP button (4) on RCU control panel (3) to the right. Depress LAUNCH button (5); retrieval step R1 will appear on display screen (6).



**BRIDGE RETRIEVAL (Contd)**

10. R1-M-UNLOCK LAUNCH BOOM AND UNLOCK AND LOWER SUPPORT CYLINDERS as follows:

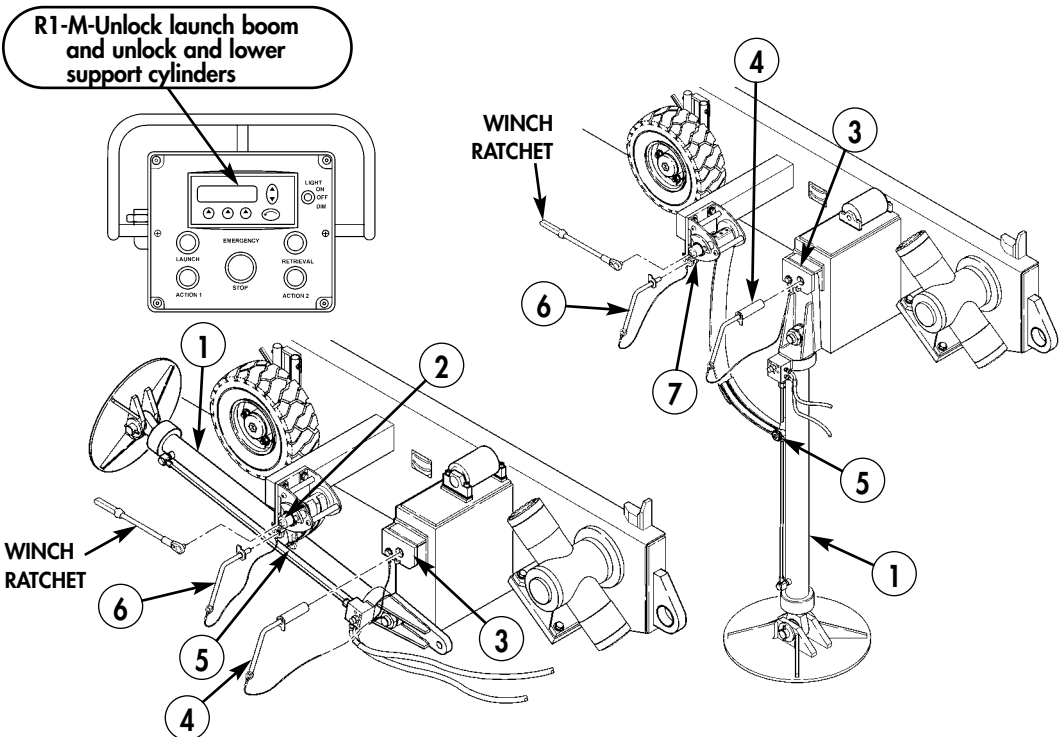
**WARNING**

Operators must stand clear while lowering supporting cylinders. Failure to comply may result in injury to personnel.

**NOTE**

Operator and assistant will unlock, lower, and lock supporting cylinders simultaneously to decrease retrieval time. Steps a through f are performed the same way for right and left supporting cylinders.

- a. Remove winch ratchet from pallet toolbox and install on ratchet wheel (2).
- b. Remove retaining pin (4) from pallet frame bracket (3).
- c. Turn winch ratchet wheel (2) to the right to remove tension from retaining pin (6), and remove retaining pin (6) from winch clevis (7) and supporting cylinder bracket (5).
- d. Using ratchet, slowly turn ratchet wheel (2) to the left and lower supporting cylinder (1).
- e. Lock supporting cylinder (1) by installing retaining pin (4) on supporting cylinder (1) and pallet frame bracket (3).
- f. Install retaining pin (6) on winch clevis (7).



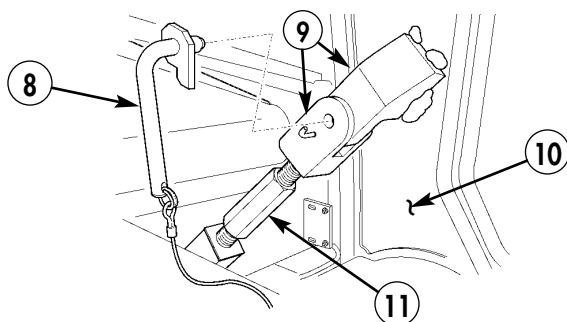
**BRIDGE RETRIEVAL (Contd)****CAUTION**

Failure to remove launch boom retaining pins prior to lowering launch boom, or stowing retaining pins in mounting holes of launch boom lock brackets will result in damage to equipment.

**NOTE**

Operator and assistant will remove launch boom lock retaining pins simultaneously to decrease retrieval time.

- g. Loosen turnbuckle nut (11) as necessary, and remove retaining pin (8) from launch boom lock (9) at both sides of pallet launch boom (10).

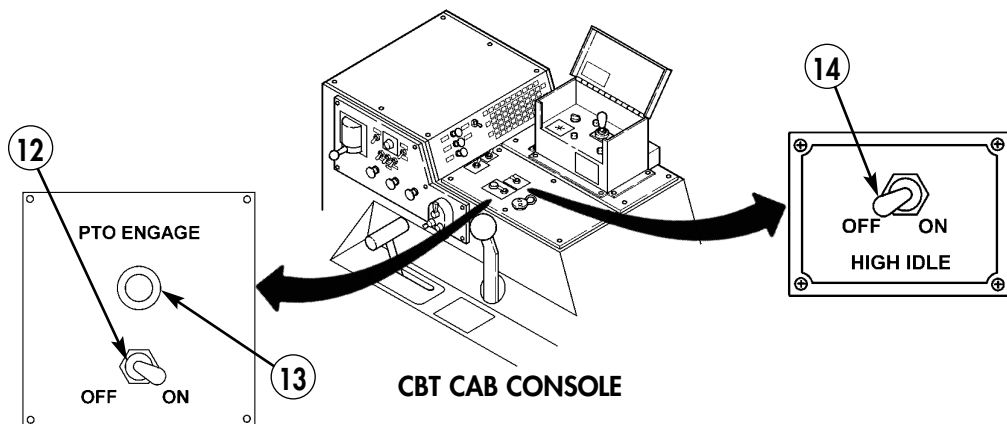
**CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission.

**NOTE**

If using LPU to retrieve bridge, perform step 11. If using CBT back-up power, perform step 12.

11. Start LPU. Refer to WP 0015 00.
12. With HIGH IDLE switch (14) in OFF position, move PTO ENGAGE switch (12) to ON position. PTO ENGAGE indicator (13) will light.



**BRIDGE RETRIEVAL (Contd)**

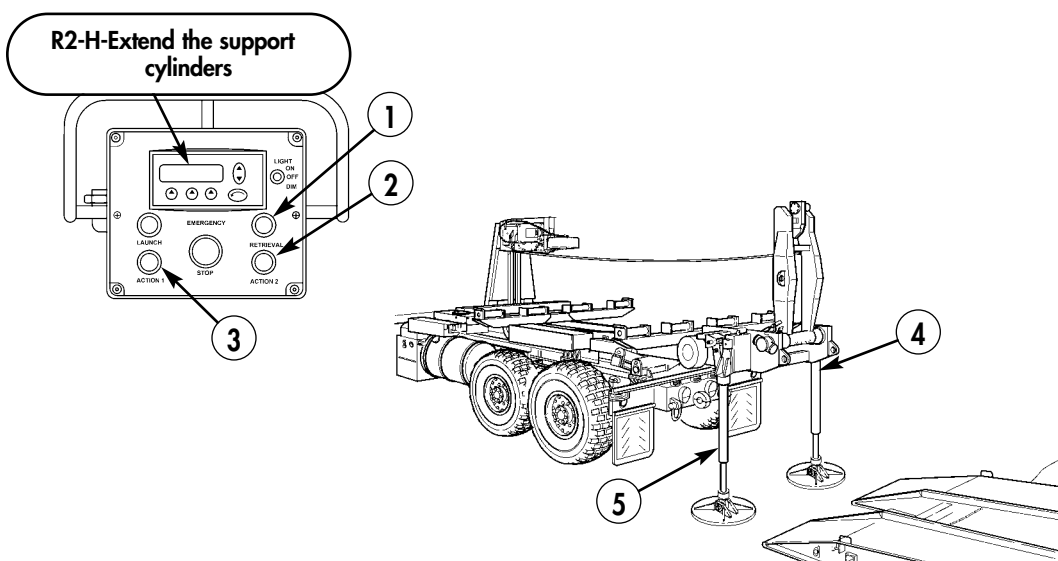
13. Depress RETRIEVAL button (1) to confirm and step into next function.

**NOTE**

Where the ground is firm and approximately level, extend both support cylinders at the same time by depressing and holding ACTION buttons 1 and 2 simultaneously.

Where ground is not level, note number of degrees pallet is out of level front-to-rear and extend both cylinders at the same time until support cylinder on higher side contacts ground first. The opposite support cylinder is then extended to ground and raises pallet until approximately level.

14. Simultaneously depress and hold ACTION 1 button (3) and ACTION 2 button (2) to R2-H-EXTEND THE SUPPORT CYLINDERS, and observe left and right supporting cylinders (5) extend until either one or both bottom plates (5) and (4) contact ground depending on side slope. Release buttons (3) and (2).

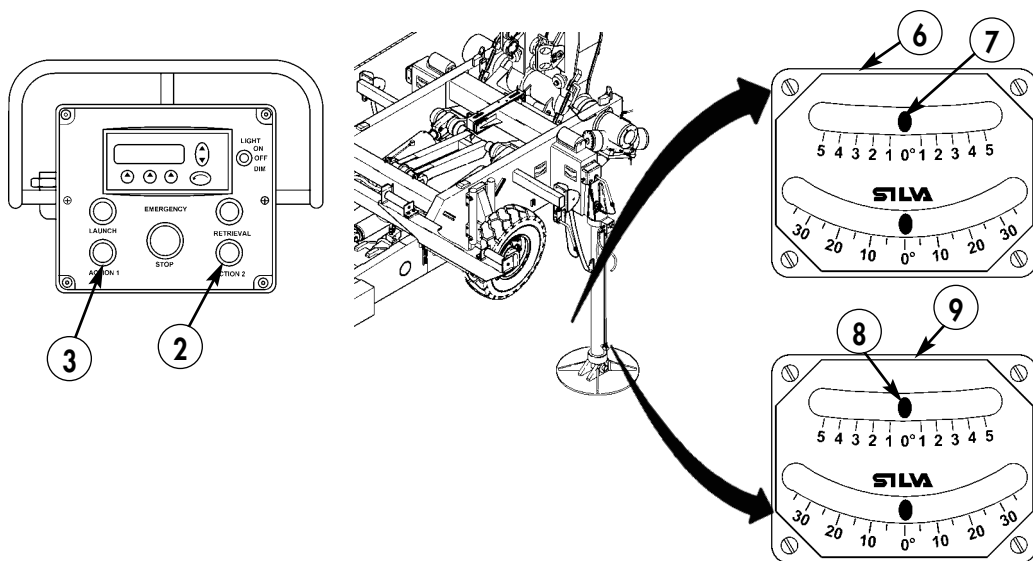


15. Adjust side-to-side level of pallet by raising low side of pallet as follows:
- Determine low side of pallet by observing bubble (8) on side-to-side leveling gauge (9).
  - Depress ACTION button that corresponds to support cylinder on low side of pallet, and extend support cylinder until bubble (8) on side-to-side leveling gauge (9) is between 0 and + or - 1/4 degree. Release ACTION button.



**BRIDGE RETRIEVAL (Contd)**

16. Adjust front-to-rear level of pallet to meet far shore height as follows:
  - a. Determine number of degrees rear of pallet must be raised by referring to Pallet Front-to-Rear Leveling table below.
  - b. Depress, hold, and release ACTION 1 button (3) and ACTION 2 button (2) simultaneously until bubble (7) on front-to-rear leveling gauge (6) moves the required number of degrees as determined in step 17a.
  - c. Re-check side-to-side level gauge (9) and adjust level of pallet as necessary.



**CAUTION**

The REB should not be launched or retrieved outside the given range specified in table below. Failure to comply may result in damage to equipment. Note degree mark of gauge before raising 1.5 degrees.

**NOTE**

Front-to-rear level of pallet is optimized by raising pallet an additional 1.5 degrees after side-to-side leveling.

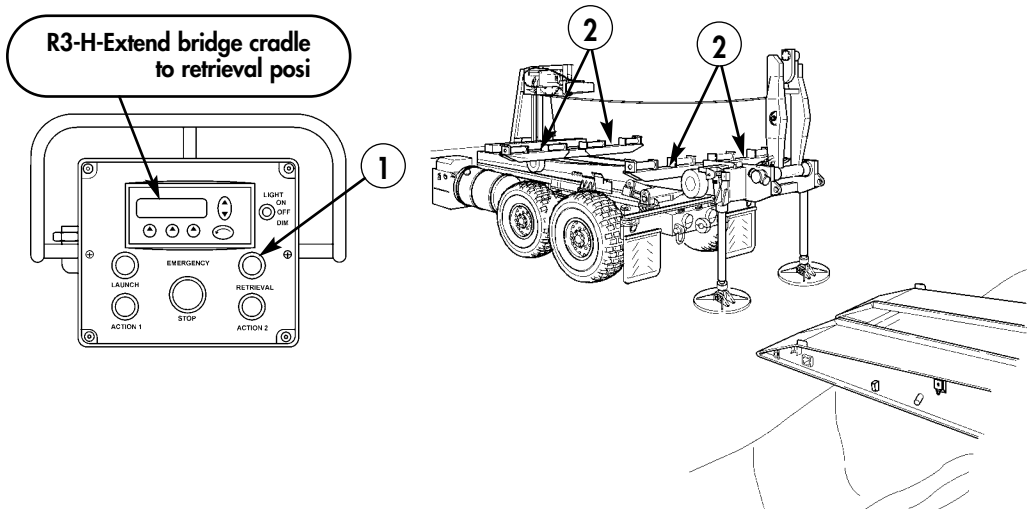
The possible leveling height required for a given launch site may be limited by the extending capability of the supporting cylinders.

*Pallet Front-to-Rear Leveling Table.*

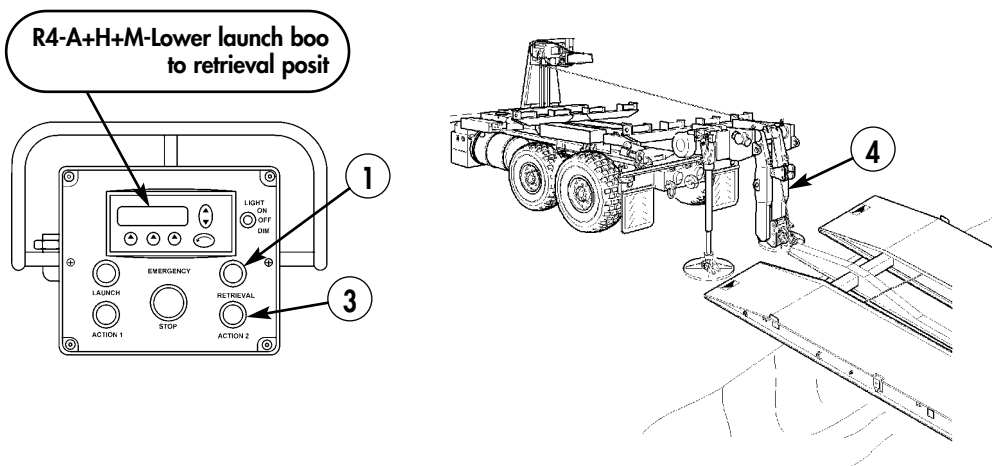
<b>LEVELING PROCEDURE</b>	
Front-to-rear leveling gauge before leveling	-5.5 to +5.5 degrees
Front-to-rear leveling gauge after leveling	-1.5 to +6.5 degrees

## BRIDGE RETRIEVAL (Contd)

17. Depress RETRIEVAL button (1) to confirm and step into next function.
18. Depress and hold ACTION 2 button (1) to R3-H-EXTEND BRIDGE CRADLE TO RETRIEVAL POSITION, and observe transverse handling unit cylinders extend telescopic tubes (2) on both transverse girders. Release button (1) when telescopic tubes (2) are at end of travel.



19. Depress RETRIEVAL button (1) to confirm and step into next function.
20. Depress ACTION 2 button (3) to R4-A+H+M-LOWER LAUNCH BOOM TO RETRIEVAL POSITION, and observe launch boom (4) rotate down.



**BRIDGE RETRIEVAL (Contd)****WARNING**

Always wear leather gloves when handling winch wire rope. Failure to comply may result in injury to personnel.

**CAUTION**

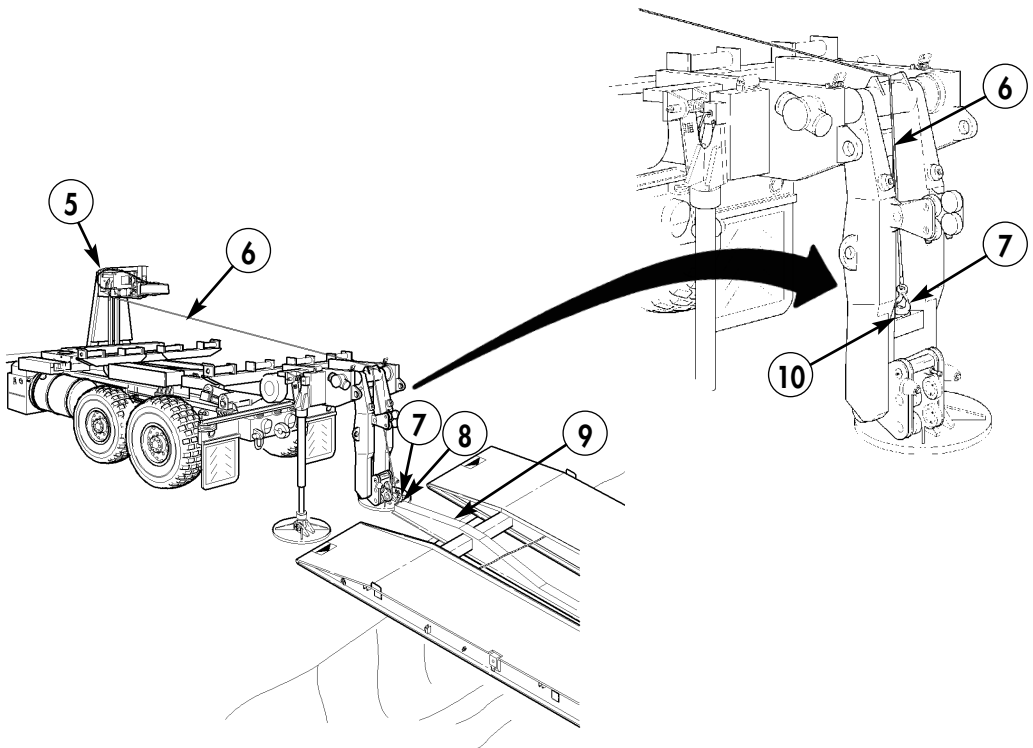
Ensure open end of winch hook is facing bridge when connected to launch beam lifting eye, or hook may catch on pallet and damage equipment.

Ensure winch wire rope is centered and not fouled in roller block during retrieval. Failure to comply may result in damage to equipment.

**NOTE**

Assistant will disconnect winch wire rope from launch boom, pull on winch rope while rope is paid out, and connect winch rope to bridge launch beam.

- a. Depress and hold ACTION 2 button (3) to loosen winch cable, and observe winch rope (6) slacken, then release button (3). Disconnect hook (7) from launch boom connecting eye (10).
- b. Depress and hold ACTION 2 button (3) to uncoil cable, uncouple hook, and attach to bridge, and observe winch (5) pay-out cable (6). Connect hook (7) to bridge lifting eye (8) at end of bridge launch beam (9).



**BRIDGE RETRIEVAL (Contd)**

21. Depress RETRIEVAL button (1) to confirm and step into next function.

**WARNING**

At no time when bridge is extended on pallet will personnel walk or stand under bridge. Failure to comply may result in death to personnel.

**CAUTION**

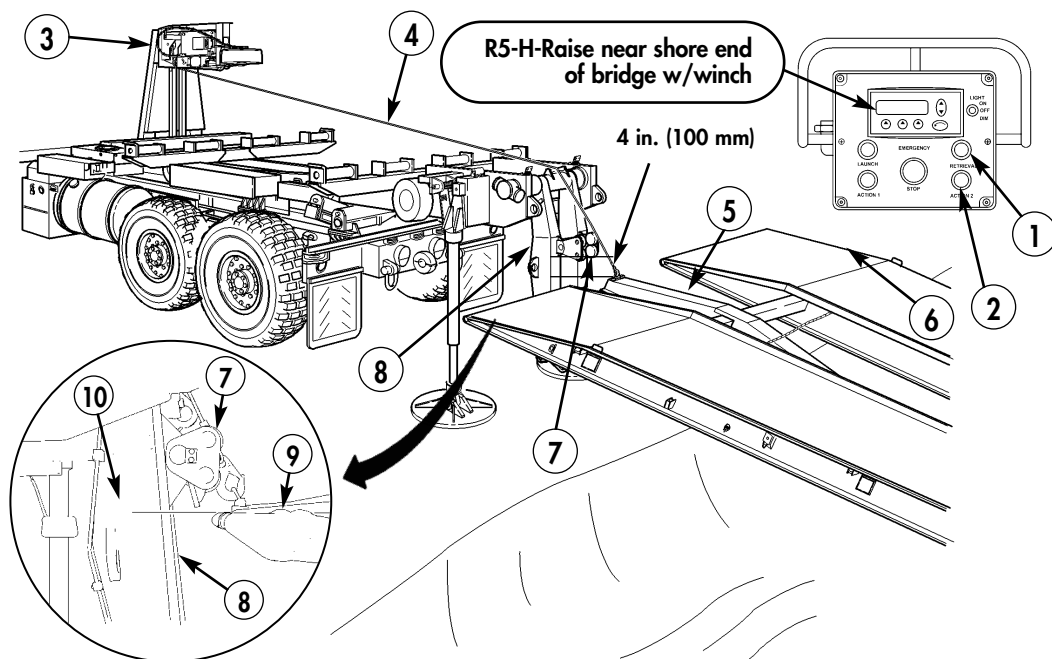
While bridge is fully extended on pallet launch boom, do not attempt to lower bridge by retracting pallet supporting cylinders or damage to pallet frame will result.

**NOTE**

Before performing step 23, check to ensure upper coupling lock lever on each side of bridge is fully engaged.

Ensure the winch cable contacts the launch boom cable guide roller at the center with the launch boom in the 45-degree position.

22. Depress and hold ACTION 2 button (2) to R5-H-RAISE NEAR SHORE END OF BRIDGE W/WINCH, and observe winch (3) pay-in rope (4) and launch boom (8) lift near shore end of bridge assembly (6) off ground. Release button (2) once top of ramp edge (9) reaches yellow paint mark (10) on pallet launch boom (8); bridge launch beam (5) is approximately 4 in. (100 mm) below upper roller block rollers (7).



**BRIDGE RETRIEVAL (Contd)****WARNING**

After performing step 23, check to ensure upper coupling lock remote control lever on each side of bridge is fully engaged. Do not proceed to next function unless both levers are fully engaged. Assistant will manually engage them if necessary. Failure to comply will result in lower bridge half falling to ground and damage to equipment and possible injury or death to personnel may result.

**CAUTION**

While bridge is fully extended on pallet launch boom, do not attempt to lower bridge by retracting pallet supporting cylinders or damage to pallet frame will result.

23. Depress RETRIEVAL button (1) to confirm and step into next function.
24. Check to ensure upper coupling lock remote control lever (12) (red lever) is engaged in receptacle bracket (13) at both sides of bridge.

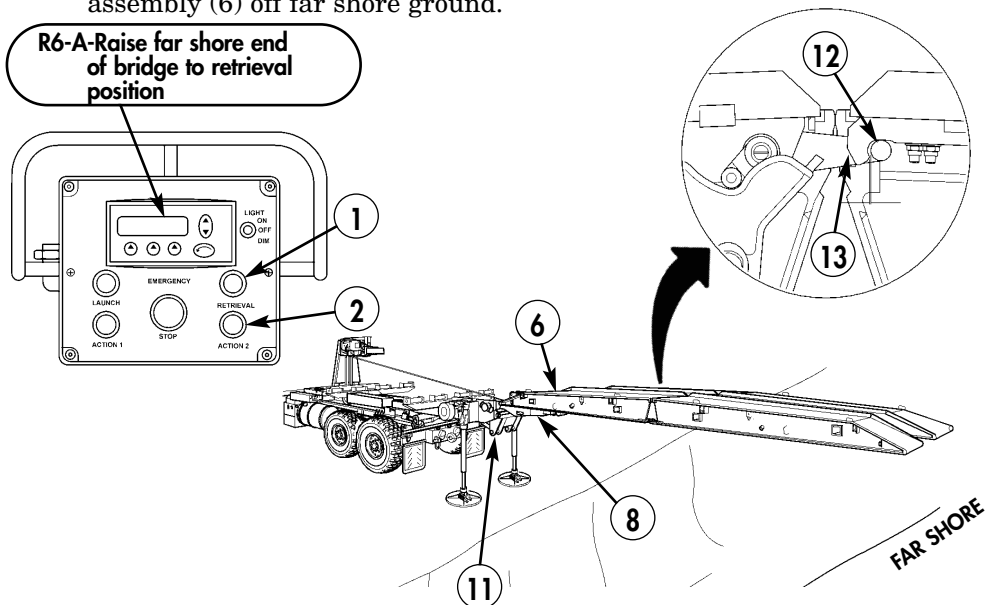
**CAUTION**

If retrieving bridge from an unlevel launch site, ensure pallet launch boom upper roller block rollers engage properly with bridge launch beam. If not aligned, stop operation before stress is applied to upper roller block or damage to equipment may result.

**NOTE**

Winch in bridge as necessary to ensure launch beam engages with upper roller block. Repeat step 23 to operate winch.

25. Depress ACTION 2 button (2) to R6-A-RAISE FAR SHORE END OF BRIDGE TO RETRIEVAL POSITION, and observe launch boom (8) and lower support boom (11) rotate to horizontal position, and lift bridge assembly (6) off far shore ground.



## BRIDGE RETRIEVAL (Contd)

26. Depress RETRIEVAL button (2) to confirm and step into next function.

### NOTE

Ensure slack from winch wire rope is removed before confirming next function.

Ensure guide pins at end of launch beam are aligned in channel on A-frame prior to releasing hold button. Once guide pins are aligned in channel, observe bridge assembly raise 1.5 in. (26–38 mm) prior to confirming next function.

27. Depress and hold ACTION 2 button (1) to R7-H-RETRIEVE BRIDGE FROM GAP, and observe bridge assembly (4) as follows:
- Observe bridge assembly (5) align and engage with launch boom pinwheel drives.
  - As bridge assembly (5) is driven toward pallet A-frame (3), observe pay-in of winch wire rope (4) at same rate.

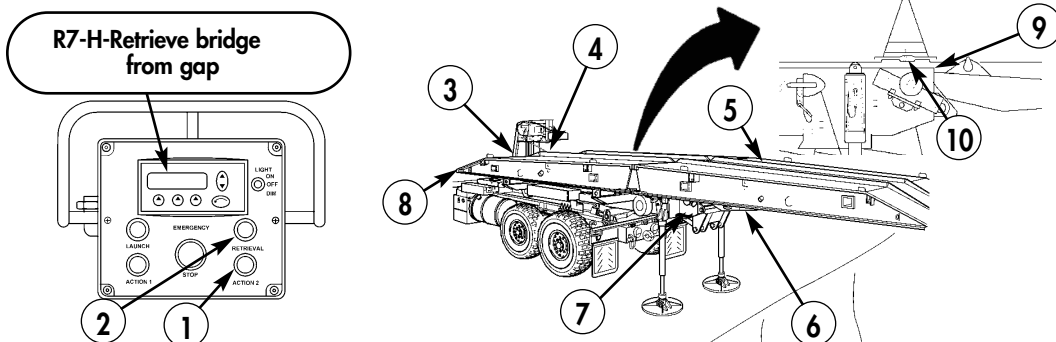
### CAUTION

Release ACTION 2 button immediately if launch boom does not lift bridge to pre-stressed position after lower couplings have passed yellow mark. Failure to comply will result in damage to needle cam follower bearings when upper coupling remote control arms contact release levers on pallet. Refer to troubleshooting, WP 0036 00.

### NOTE

If upper coupling lock levers do not fully unlock, manually release them by pulling remote control arms or by placing tapered end of BII tanker bar under slot in upper coupling lock mechanism. Refer to WP 0008 00.

- Observe launch boom (6) is lifted when bridge lower couplings (10) pass yellow mark (9) at end of pallet frame girder (7). Travel of bridge assembly (5) will stop while launch boom (6) is lifted, and will continue once launch boom (6) has reached its pre-stressed position. Pallet remote control release levers will trip bridge remote control arms and release upper coupling lock levers (red levers) which will result in two loud clicks as upper coupling locks release.
- Observe tip (8) of bridge assembly (5) raise 1–1.5 in. (26–38 mm) after reaching A-frame (3).



## BRIDGE RETRIEVAL (Contd)

28. Depress RETRIEVAL button (2) to confirm and step into next function.

### **CAUTION**

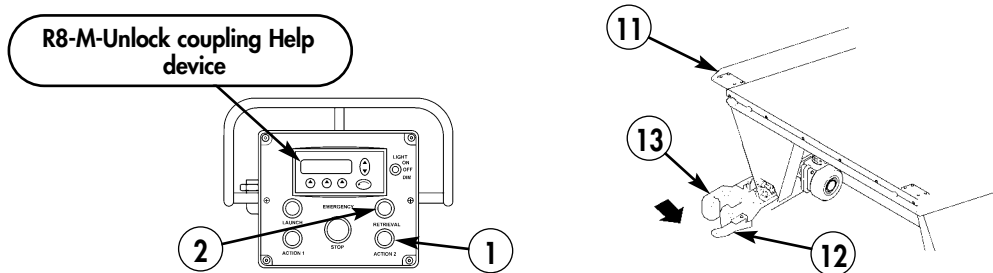
If retrieving from far shore, coupling help device levers must be unlocked on each bridge quarter, or damage to equipment will result.

Use a soft-nosed hammer to unlock coupling help device levers, or damage to equipment may result.

### **NOTE**

Operator and assistant will set help device levers simultaneously to decrease launch time.

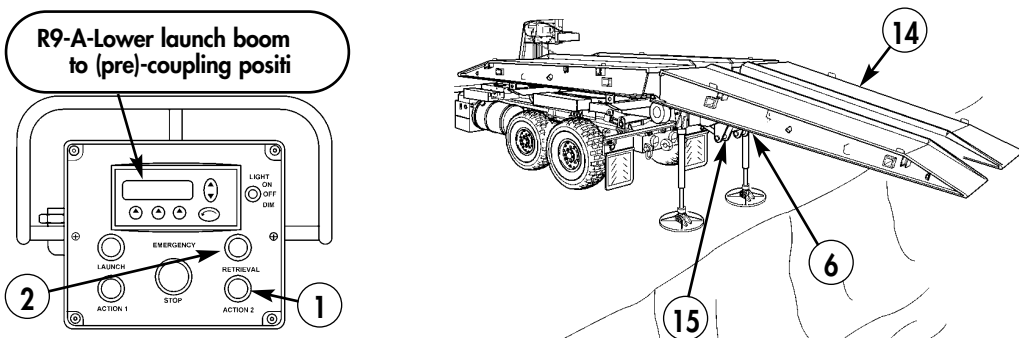
29. Perform R8-M-UNLOCK COUPLING HELP DEVICE as follows: Using soft-nosed hammer, tap end of lever (12) out from center of lower coupling receptacle (13) until set in detent on each bridge quarter (11).



### **CAUTION**

Ensure all coupling help device levers and both upper coupling lock levers are disengaged from lock receptacles before proceeding to next function; use soft-nosed hammer only. Failure to comply may result in damage to equipment.

30. Depress RETRIEVAL button (2) to confirm and step into next function.  
 31. Depress ACTION 2 button (1) to R9-A-LOWER LAUNCH BOOM TO PRE-COUPLING POSITION, and observe lower support boom (15) and launch boom (6) tilt bridge half (14) to pre-coupling position.



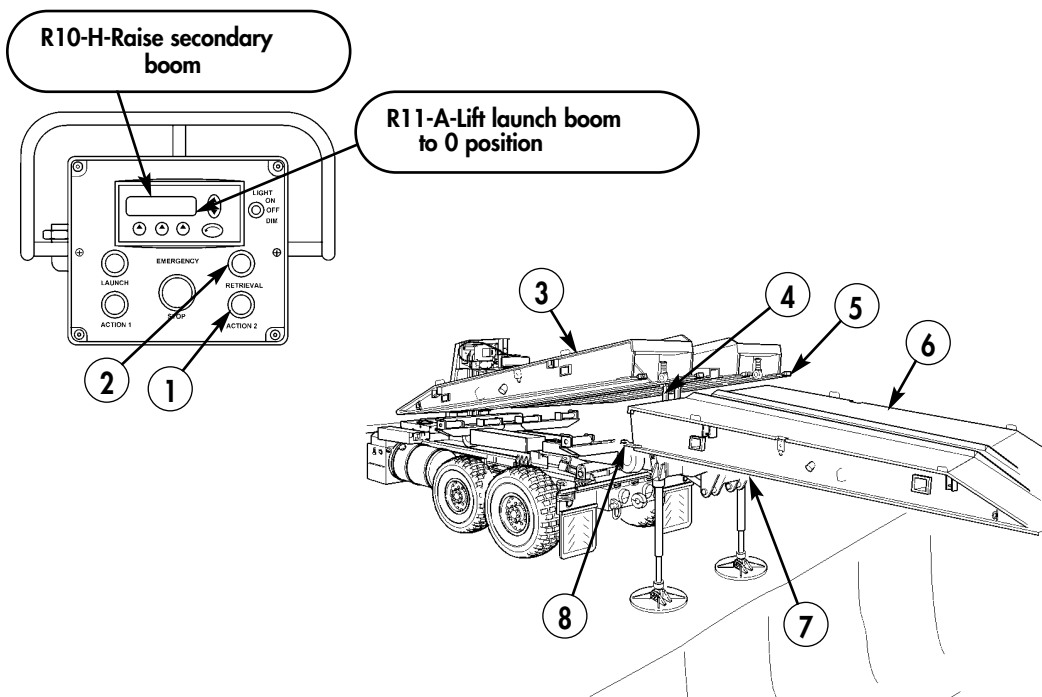
**BRIDGE RETRIEVAL (Contd)**

32. Depress RETRIEVAL button (2) to confirm and step into next function.

**WARNING**

Ensure pallet stop cylinder is extended prior to performing step 33, or damage to equipment or possible injury or death to personnel may result.

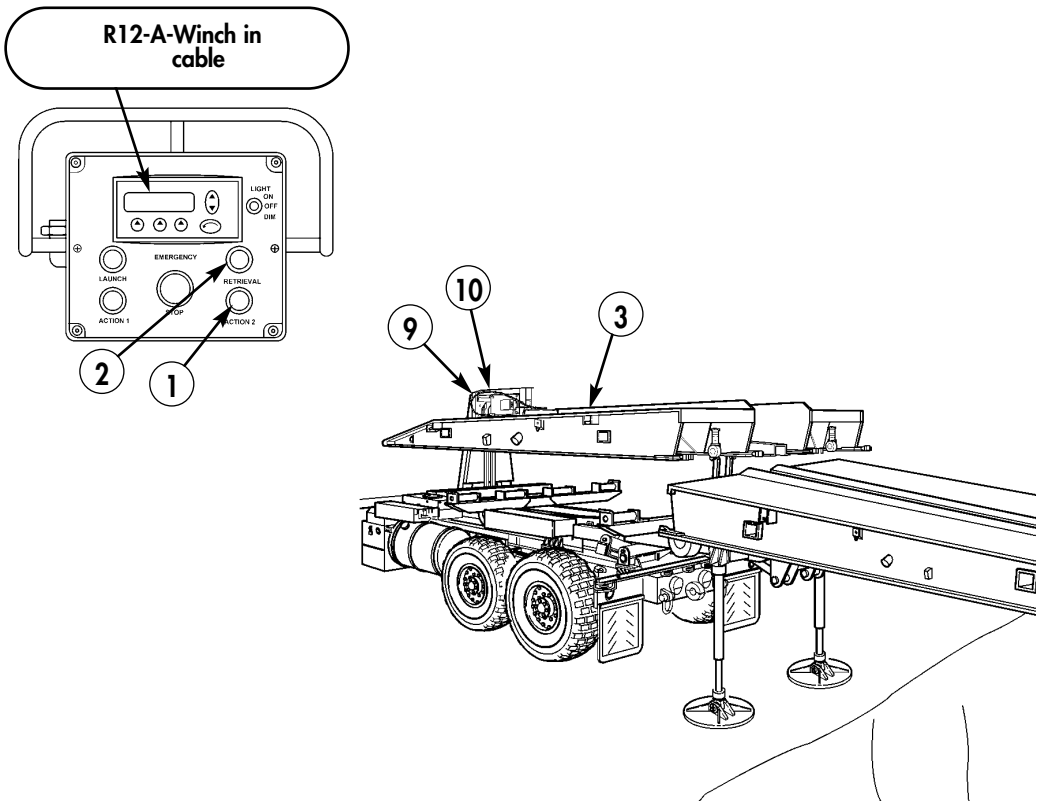
33. Depress and hold ACTION 2 button (1) to R10-H-RAISE SECONDARY BOOM, and observe the following:
- Observe secondary boom (4) lift uncoupled upper bridge half (3) from lower bridge half (6), and stop lifting once lower couplings (5) of upper bridge half (3) are above height of lower couplings (8) on lower bridge half (6).
  - Observe launch boom (7) lower ramp end of lower bridge half (6) to increase gap between bridge halves, then stop movement.
  - Observe secondary boom (4) continue raising upper bridge half (3) to end stop position. When movement stops, release ACTION 2 button (1).
34. Depress RETRIEVAL button (2) to confirm and step into next function.
35. Depress ACTION 2 button (1) to R11-A-LIFT LAUNCH BOOM TO 0-DEGREE POSITION, and observe lower bridge half (6) clear lower couplings (5).





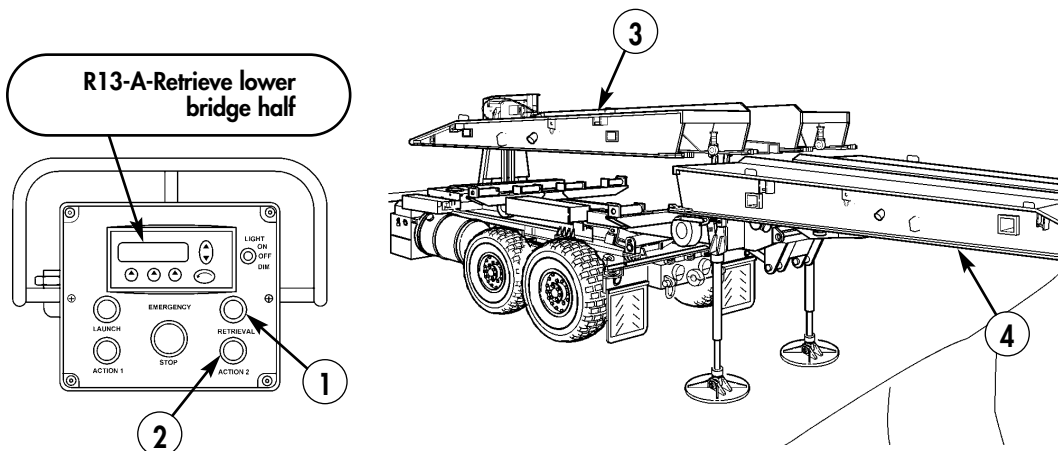
**BRIDGE RETRIEVAL (Contd)**

36. Depress RETRIEVAL button (2) to confirm and step into next function.
37. Depress ACTION 2 button (1) to R12-A-WINCH IN CABLE, and observe winch (9) pay-in wire rope (10) and lift ramp end of upper bridge half (3).

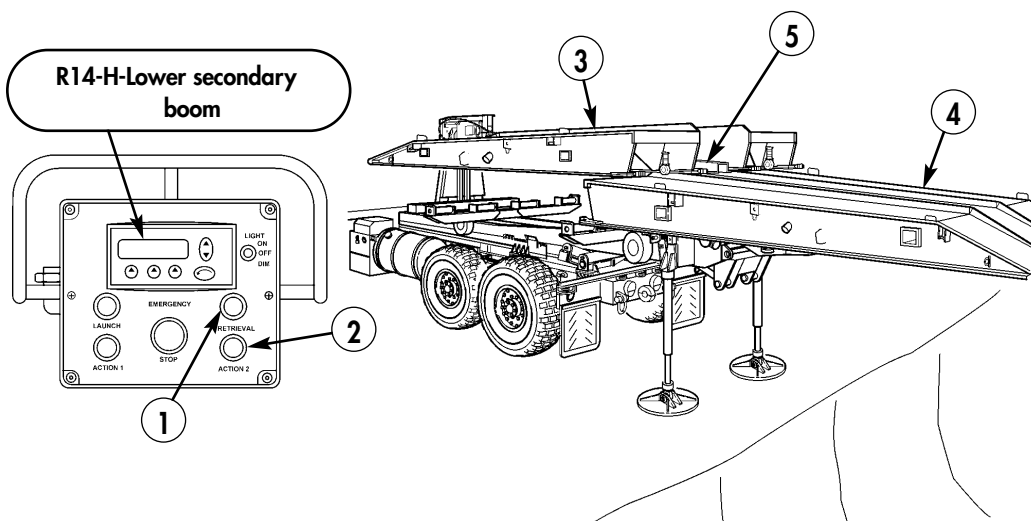


## BRIDGE RETRIEVAL (Contd)

38. Depress RETRIEVAL button (1) to confirm and step into next function.
39. Depress ACTION 2 button (2) to R13-A-RETRIEVE LOWER BRIDGE HALF, and observe lower bridge half (4) advance under upper bridge half (3).

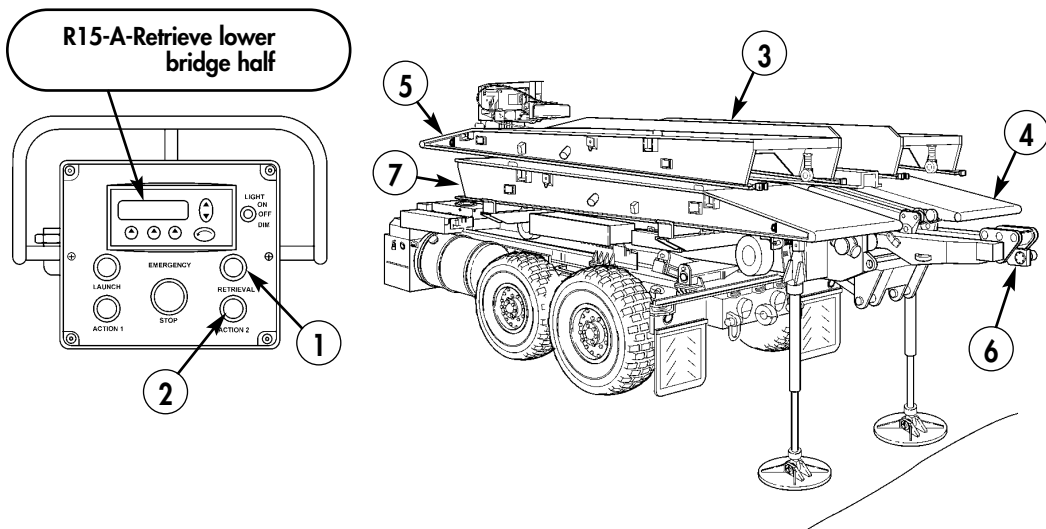


40. Depress RETRIEVAL button (1) to confirm and step into next function.
41. Depress and hold ACTION 2 button (2) to R14-H-LOWER SECONDARY BOOM, and observe secondary boom (5) lower upper bridge half (3) onto lower bridge half (4). Release button (2) once secondary boom (5) is fully down.

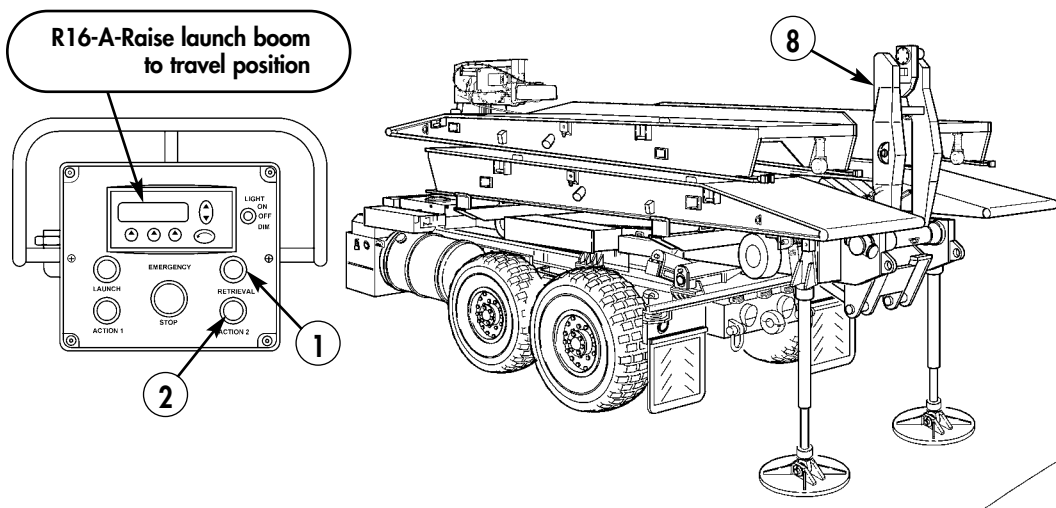


## BRIDGE RETRIEVAL (Contd)

42. Depress RETRIEVAL button (1) to confirm and step into next function.
43. Depress ACTION button 2 (2) to R15-A-RETRIEVE LOWER BRIDGE HALF, and observe launch boom pinwheel drive (6) retract lower bridge half (4) until coupling end (7) is under ramp end (5) at front of pallet.

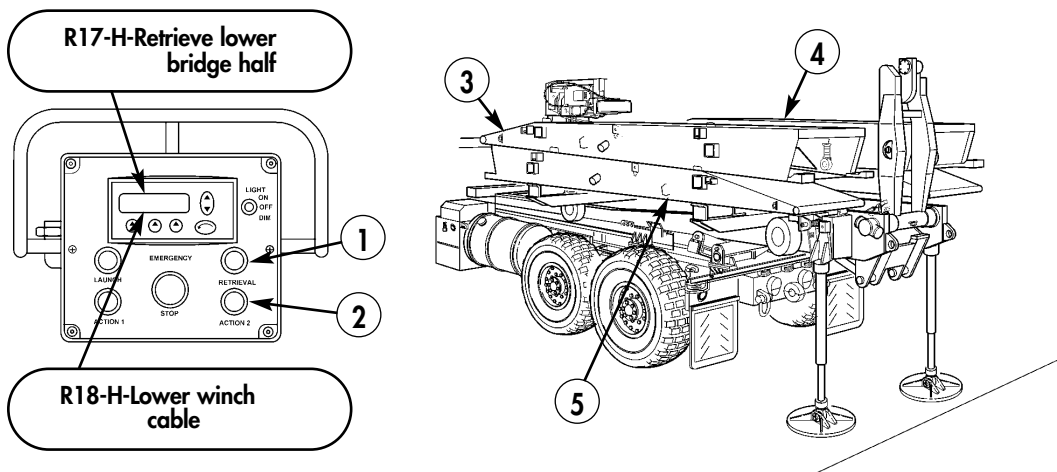


44. Depress RETRIEVAL button (1) to confirm and step into next function.
45. Depress ACTION 2 button (2) to R16-A-RAISE LAUNCH BOOM TO TRAVEL POSITION, and observe launch boom (8) rotate up to vertical position.

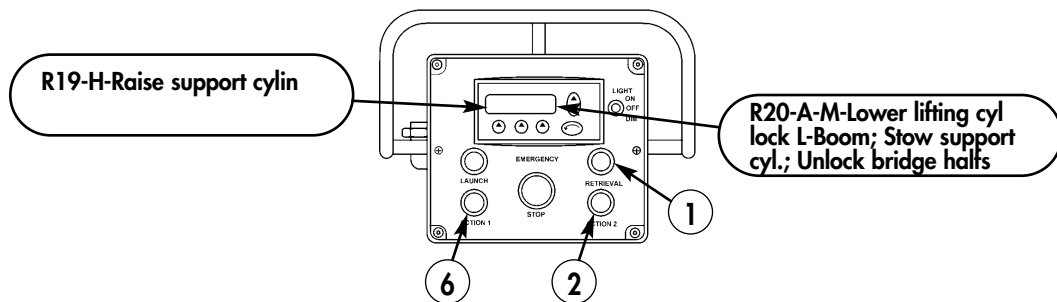


## BRIDGE RETRIEVAL (Contd)

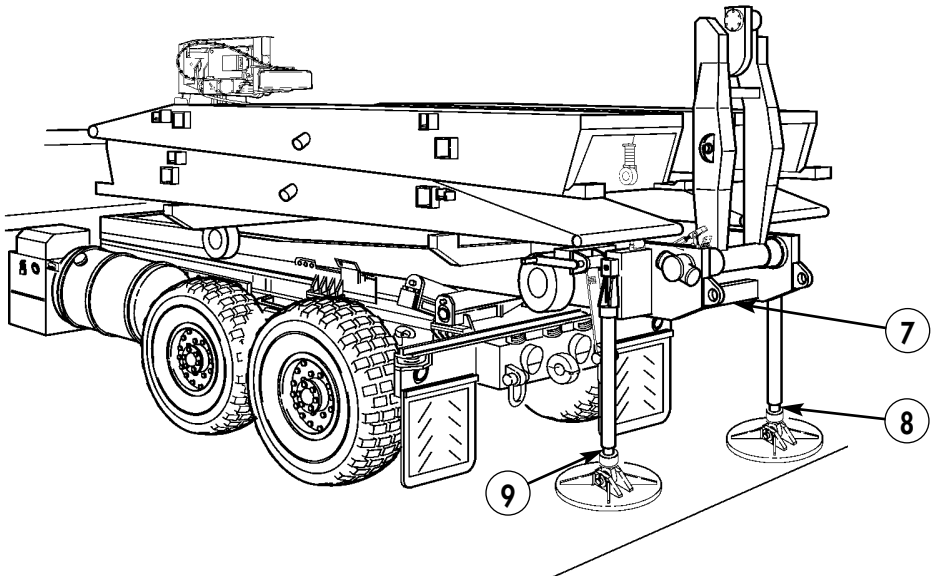
46. Depress RETRIEVAL button (1) to confirm and step into next function.
47. Depress and hold ACTION 2 button (2) to R17-H-RETRIEVE LOWER BRIDGE HALF, and observe lower bridge half (5) advance to its end position. Release button (2).
48. Depress RETRIEVAL button (1) to confirm and step into next function.
49. Depress and hold ACTION 2 button (2) to R18-H-LOWER WINCH CABLE, and observe ramp end (3) of upper bridge half (4) lower onto lower bridge half (5). Release button (2) once upper bridge half (4) is fully lowered.



50. Depress RETRIEVAL button (1) to confirm and step into next function.
51. Depress and hold ACTION 1 button (6) and ACTION 2 button (2) to R19-H-RAISE SUPPORT CYLINDERS, and observe left supporting cylinder (9) and right supporting cylinder (8) until fully retracted. Release buttons (6) and (2).
52. Depress RETRIEVAL button (1) to confirm and step into next function.
53. Depress ACTION 2 button (2) to R20-A-M-LOWER LIFTING CYLINDER, LOCK LAUNCH BOOM, STOW SUPPORTING CYLINDERS, AND UNLOCK BRIDGE HALVES as follows:
  - a. Observe lower support boom (7) retract to stowed position.



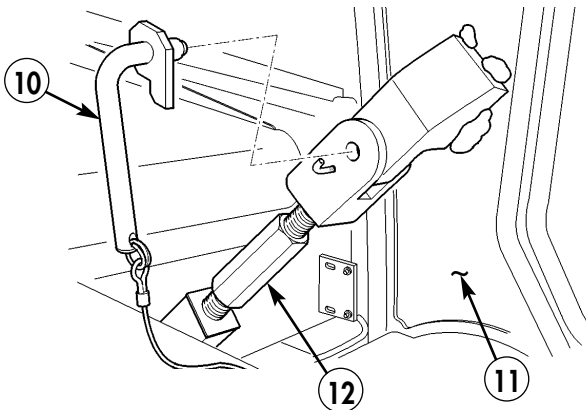
**BRIDGE RETRIEVAL (Contd)**



**NOTE**

Operator and assistant will install launch boom lock retaining pins simultaneously to decrease retrieval time.

- b. Manually install retaining pin (10) on launch boom lock (12) at both sides of pallet launch boom (11).



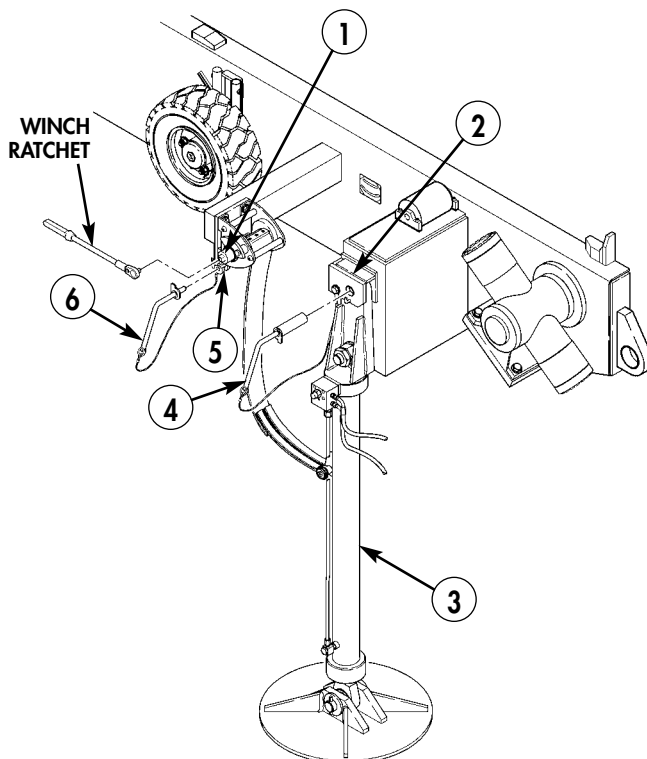
**BRIDGE RETRIEVAL (Contd)****WARNING**

Operators must stand clear while raising supporting cylinders. Failure to comply may result in injury to personnel.

**NOTE**

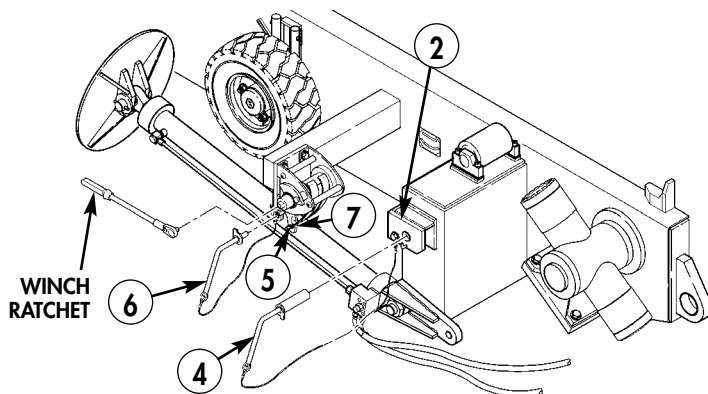
Operator and assistant will raise supporting cylinders simultaneously to decrease retrieval time. Steps c (1) through c (6) are performed the same way for right and left supporting cylinders.

- c. Manually raise and lock both supporting cylinders simultaneously as follows:
- (1) Unlock supporting cylinder (3) by removing retaining pin (4) from supporting cylinder (3) and pallet frame bracket (2).
  - (2) Remove retaining pin (6) from winch clevis (5).
  - (3) Using winch ratchet, turn ratchet wheel (1) slowly until supporting cylinder (3) is fully raised.



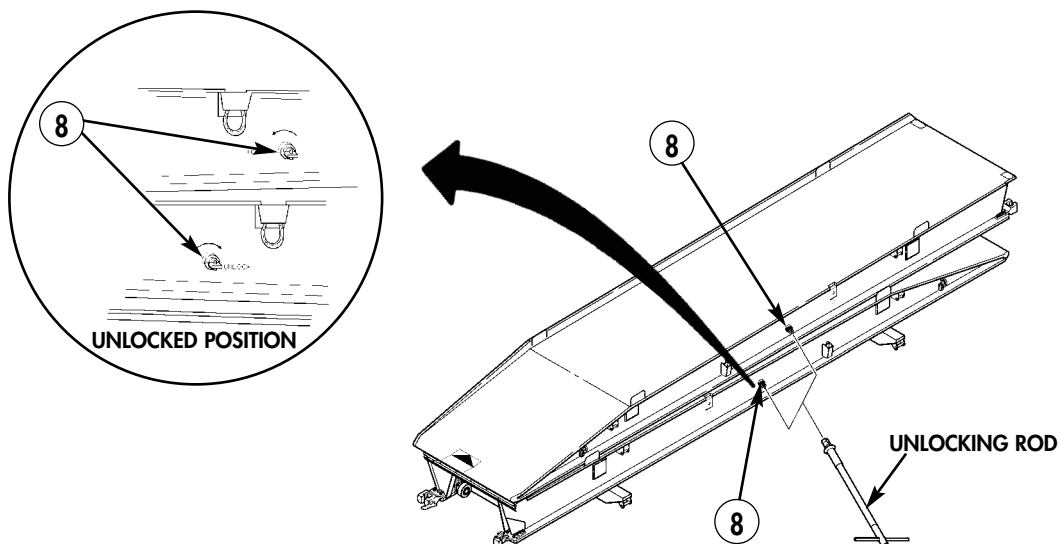
**BRIDGE RETRIEVAL (Contd)**

- (4) Install retaining pin (6) on winch clevis (5) and supporting cylinder bracket (7).
- (5) Install retaining pin (4) on pallet frame bracket (2), and loosen tension on strap.
- (6) Remove and stow winch ratchets in pallet toolboxes.

**NOTE**

Operator and assistant will release slide locks simultaneously to decrease retrieval time.

- d. Manually release four slide locks (8) using unlocking rod.

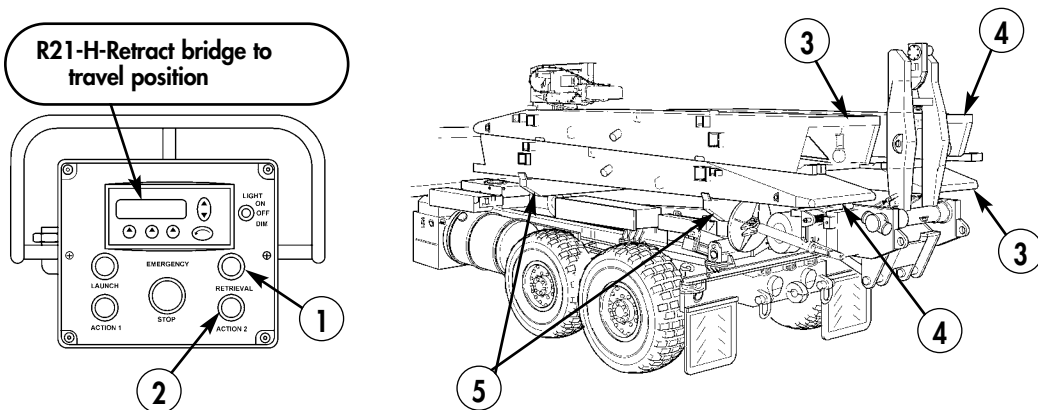


## BRIDGE RETRIEVAL (Contd)

### **CAUTION**

Failure to ensure bridge quarters are unlocked prior to retracting them may result in damage to equipment.

54. Depress RETRIEVAL button (1) to confirm and step into next function.
55. Depress and hold ACTION 2 button (2) to R21-H-RETRACT BRIDGE TO TRAVEL POSITION and observe transverse handling unit telescopic tubes (5) retract bridge quarters (3) and (4) on both bridge halves.



### **NOTE**

If using LPU to retrieve bridge, perform step 56.

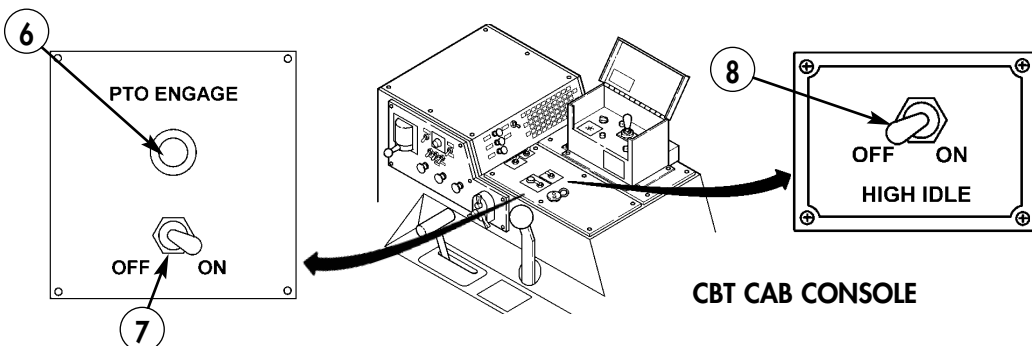
If using CBT back-up power, perform step 57.

56. Stop LPU. Refer to WP 0015 00.

### **CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission.

57. With HIGH IDLE switch (8) in OFF position, move PTO ENGAGE switch (7) to ON position. PTO ENGAGE indicator (6) will light.





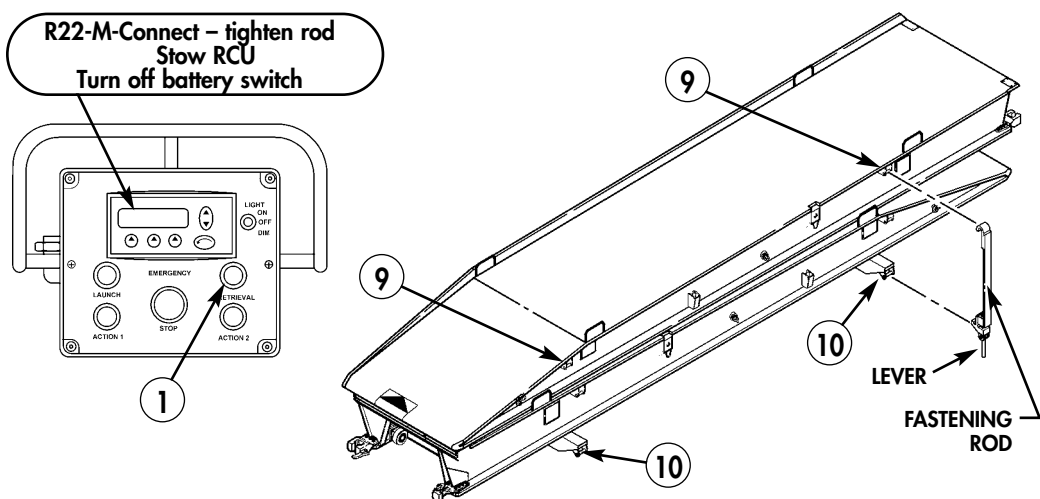
## BRIDGE RETRIEVAL (Contd)

58. Depress RETRIEVAL button (1) to confirm and step into next function.
59. Perform R22-M-CONNECT – TIGHTEN FASTENING RODS, STOW RCU, TURN OFF BATTERY SWITCH, and manually install fastening rods as follows:

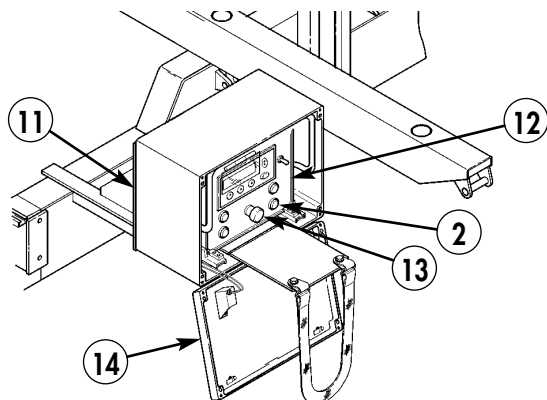
### NOTE

Operator and assistant will install fastening rods simultaneously to decrease retrieval time.

Remove fastening rods from pallet toolboxes, and install four fastening rods on transverse girder brackets (10) and bridge quarter hold-down brackets (9). Turn lever on each fastening rod until tight.

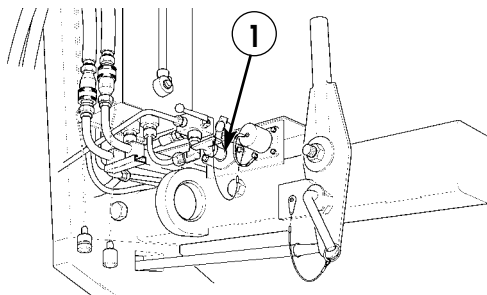


60. Stow RCU (12) in RCU stowage box (11), depress EMERGENCY STOP button (13), remove key from passenger side pallet toolbox, and lock RCU stowage box lid (14) in closed position. Refer to WP 0007 00.



**BRIDGE RETRIEVAL (Contd)**

61. Check main power switch (1) to ensure it is in OFF position. (Switch is off when key is in horizontal position.)



**OFF POSITION**

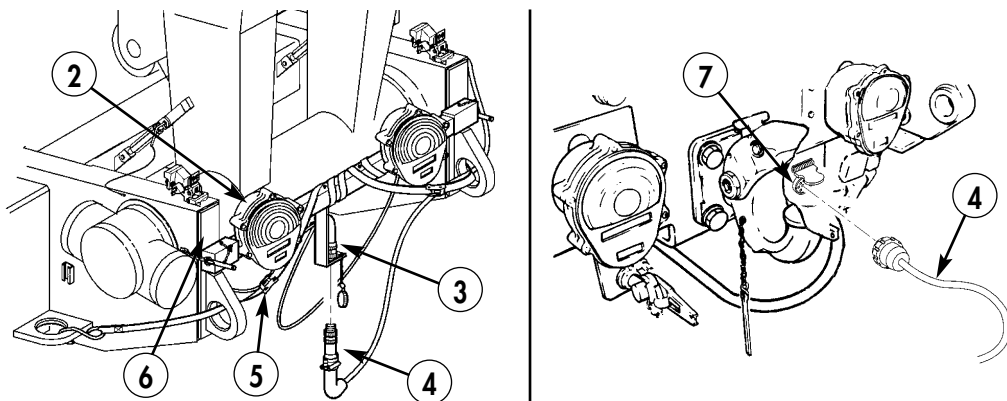
**WARNING**

Due to the severe overhang of the REB pallet when mounted on the CBT, a rear-end collision by a HMMWV or any comparable vehicle may result in that vehicle under riding the REB pallet. To prevent this, an empty PLST shall be connected to any CBT loaded with the REB pallet during all road marches/convoys. Failure to comply may result in severe injury or death to personnel.

**NOTE**

Perform step 62 to install auxiliary light bar if pallet will be transported on CBT for over-the-road transit. Refer to WP 0052 00. If REB pallet will be transported on CBT during road marches/convoys, perform step 63 to connect PLST.

62. Install auxiliary light bar (2) and safety strap (5) on pallet frame girders (6), and connect power cable (4) to auxiliary light bar connector (3) and CBT electrical connector (7).



**BRIDGE RETRIEVAL (Contd)****CAUTION**

The PLST cannot be towed behind the CBT loaded with a REB pallet unless the PLST is equipped with the drawbar extension kit, and both the drawbar extension and drawbar tube are in their extended positions. Refer to TM 9-2330-385-14. Failure to comply will result in damage to equipment.

63. Extend drawbar tube and drawbar extension on PLST, and connect empty PLST to CBT. Refer to TM 9-2330-385-14.

**END OF WORK PACKAGE**



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## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## RECOVERY BY HELICOPTER

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### NOTE

Unit commanders are cautioned of the necessity to anticipate requirements for an airlift operation and arrange for timely delivery.

Recovery by helicopter is performed under conditions where it may be necessary to use a helicopter to remove the bridge from ground or gap where CBT is not available or site conditions make it impossible to retrieve bridge by any other means.

Two personnel can prepare and rig bridge in 20 minutes.

The bridge can be transported by helicopter at speeds up to 130 knots.

### NOTE

Perform steps 1 through 3 if bridge anchorage is installed.

When recovering bridge by helicopter, the bridge anchorage must stay with the bridge.

1. If installed, remove anchoring pins from ground. Refer to WP 0018 00.
2. Transport anchoring straps and hold-fasts by aircraft or ground transport, and install anchorage stowage boxes on bridge quarters. Refer to WP 0007 00.
3. Stow anchoring pins, sledge hammers, nail heads, removers, and drawing apparatuses in anchorage stowage boxes. Refer to WP 0007 00.
4. Secure all loose equipment with tape or tie-straps, and check all latches to ensure they are securely fastened.

### NOTE

Since bridge is symmetrical in design, either end can be designated as the front to be flown forward. The chains connecting the forward sling set to the bridge will be set at the third chain link. The chains connecting the aft sling set to bridge will be set at the twenty-fifth chain link.

5. Position two sling legs (2) on bridge half (1), and connect two sling legs (2) to apex fitting (3) with coupling link (4).

## RECOVERY BY HELICOPTER (Contd)

6. Position chain (9) through helicopter lifting ring (10) on both sides of bridge half (1).
7. Loop two chains (9) through sling legs (2) and connect chain grab-hook (11) on third link from end of chain at both sides on bridge half (1).
8. Position two sling legs (5) on bridge half (8), and connect two sling legs (5) to apex fitting (6) with coupling link (7).
9. Position chain (9) through helicopter lifting ring (10) on both sides of bridge half (8).
10. Loop two chains (9) through sling legs (5) and connect chain grab-hook (11) on twenty-fifth link from end of chain at both sides on bridge half (8).
11. Secure all excess chain with 2-in. (51-mm) wide tape or Type III nylon cord.
12. Cluster and tie or tape all sling legs above bridge to prevent fouling during hookup.

### **NOTE**

The hookup team kneels on top of the load. The static wand person discharges the static electricity with the static wand. The forward hookup person places apex fitting 1 onto the forward cargo hook. The aft hookup person places apex fitting 2 onto the aft cargo hook.

The hookup team then carefully dismounts the bridge and remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

13. Bridge supervisor will signal helicopter pilot to position helicopter directly over bridge.

### **WARNING**

Ground helicopter connecting ring prior to connecting/disconnecting. Static electricity generated from helicopter will shock personnel and injury or death may result.

### **CAUTION**

Ensure all four bridge quarter slide locks are locked by visually checking position of control levers and feeling each lock lever for engagement on launch beam support tubes. Failure to comply may result in damage to equipment.

14. Connect apex fittings (3) and (6) to helicopter forward and aft hooks, and signal helicopter pilot to slowly lift bridge from ground or gap.

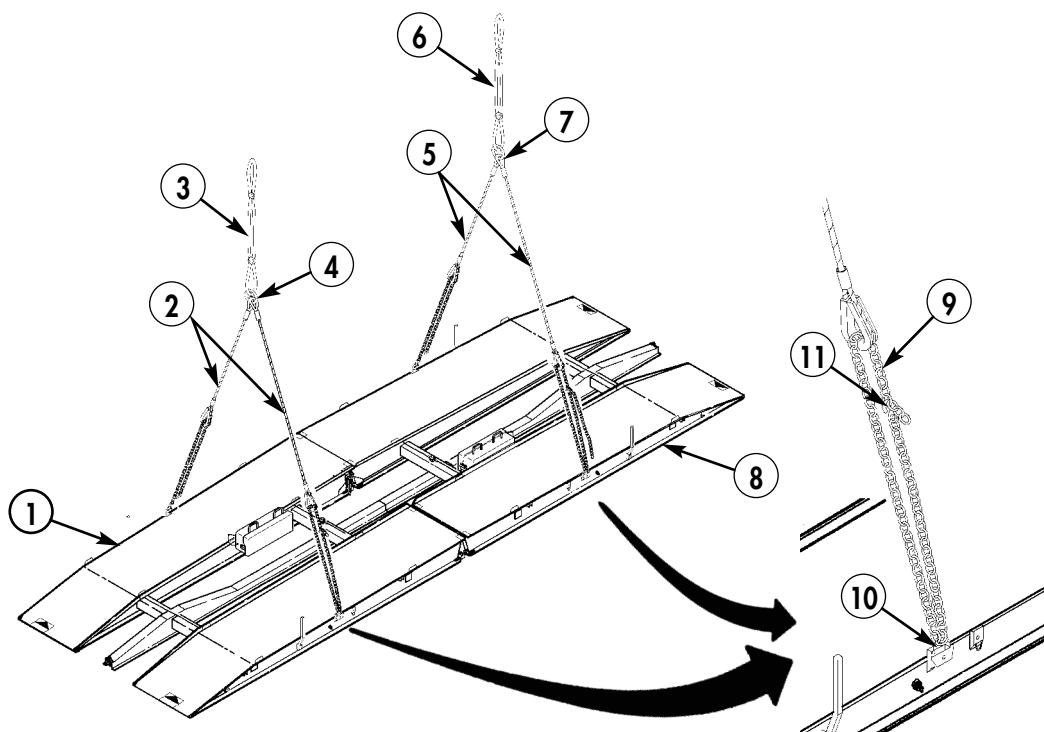
## RECOVERY BY HELICOPTER (Contd)

### NOTE

Perform step 15 if transporting bridge to new emplacement area.

Perform steps 16 through 19 if bridge will be retrieved to pallet.

15. Transport bridge to new emplacement area. Refer to Deployment by Helicopter, WP 0017 00.
16. Transport bridge to location of CBT.
17. Bridge supervisor will signal helicopter pilot to lower bridge onto ground near CBT, release lifting slings, and clear area.
18. Disconnect apex fittings (3) and (6) from coupling links (4) and (7), and remove helicopter lifting sling legs (2) and (5) and chains (9) from bridge.
19. Remove anchorage stowage boxes from bridge, WP 0007 00, and retrieve bridge from ground. Refer to Bridge Retrieval, WP 0020 00.



END OF WORK PACKAGE

0021 00-3/4 blank

Change 1





## OPERATOR INSTRUCTIONS

RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### TRANSPORT OF PALLET ON GROUND

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#### **CAUTION**

The pallet's transport on the ground capability is intended for the purpose of maneuvering the pallet on and off an aircraft or railcar and not as a towing feature for over the road transit. Failure to comply will result in damage to equipment.

Ensure transload rollers and transload roller bar are removed prior to unloading pallet to ground, or damage to equipment may result.

#### **NOTE**

If pallet is loaded on transporter, perform step 1.

If pallet is on the ground and the pallet support wheels are in the raised position (pallet frame is resting on ground or dunnage), perform step 2.

1. Unload pallet to ground. Refer to WP 0014 00.

## TRANSPORT OF PALLET ON GROUND (Contd)

2. Lower steering axles (1) as follows:

- a. Position selector valve lever (6) in POSITION 3 or pointing down and move control valve lever (3) to POSITION B or right of center.

### **WARNING**

Do not crawl under or place hands or arms under pallet without placing dunnage under pallet frame or until support wheels are raised. Failure to comply may result in injury or death to personnel.

### **CAUTION**

Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (235 bar). If pressure on gauge reaches 3,626 psi (250 bar), stop and check for obstructions. Do not exceed 3,626 psi (250 bar), or damage to equipment may result.

- b. Install pump handle on pump lever (4) and operate hydraulic pump (5) until steering axles (1) are fully lowered (pallet frame is raised off ground or dunnage).

3. Lower fixed axles (2) as follows:

- a. Position selector valve lever (6) in POSITION 2 or pointing up and move control valve lever (3) to POSITION B or right of center.

### **WARNING**

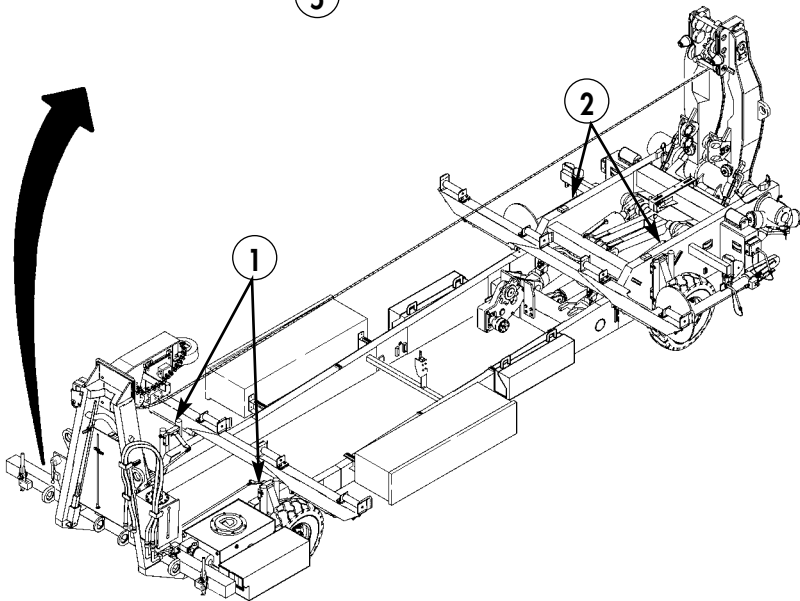
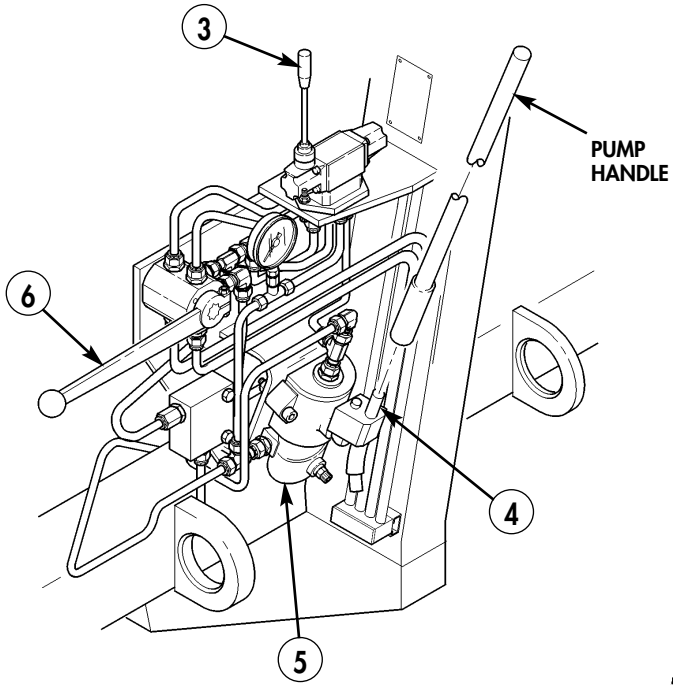
Do not crawl under or place hands or arms under pallet without placing dunnage under pallet frame or until support wheels are raised. Failure to comply may result in injury or death to personnel.

### **CAUTION**

Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (250 bar). If pressure gauge reaches 3,626 psi (250 bar), stop and check for obstructions. Do not exceed 3,626 psi (250 bar), or damage to equipment may result.

- b. Install pump handle on pump lever (4) and operate hydraulic pump (5) until fixed axles (2) are fully lowered (pallet frame is raised off ground or dunnage).

TRANSPORT OF PALLET ON GROUND (Contd)



## TRANSPORT OF PALLET ON GROUND (Contd)

3. Remove retaining pin (2) from steering lever (1) and pallet frame (3) on both sides of pallet.
4. Connect two towing cables to towing eyes (4) and (5) on pallet frame (3), and connect towing vehicle to ring (6) on towing cables.

### **WARNING**

The pallet does not have brakes. If maneuvering pallet on an incline or on or off loading ramp, have chocks ready and chock supporting wheels when necessary. Do not walk directly behind pallet when winching pallet up loading ramp. Failure to comply may result in damage to equipment or possible injury or death to personnel.

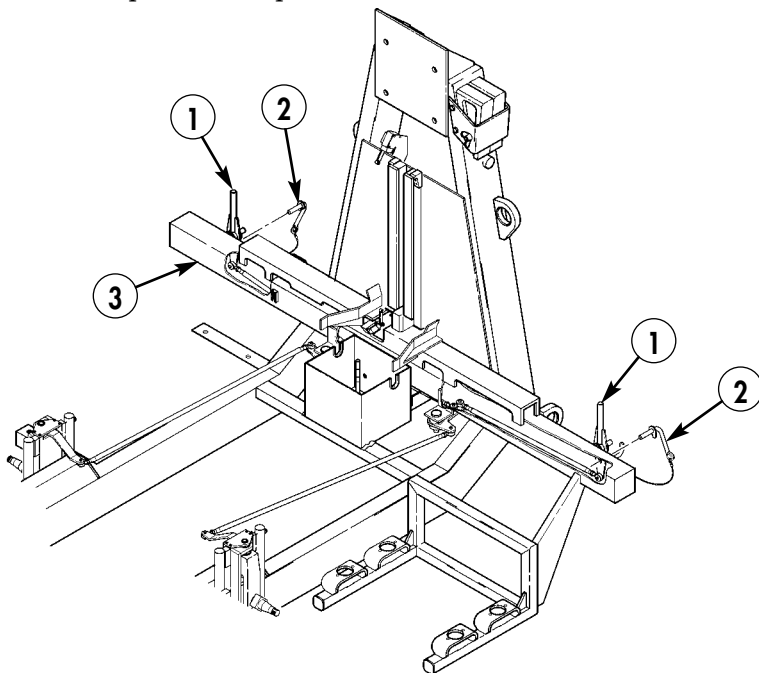
### **CAUTION**

Pallet should be towed at speeds no greater than 5 mph (8 km/h). Failure to comply may result in injury to personnel.

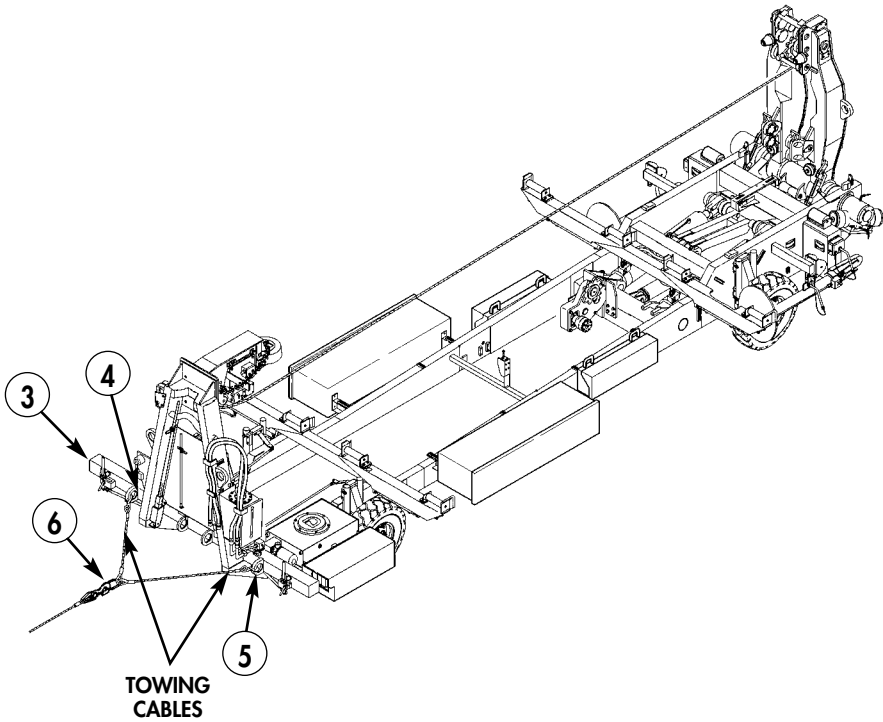
### **NOTE**

Assistant will help steer pallet.

5. Using both steering levers (1), have vehicle operator tow pallet to desired location and steer pallet as required.



**TRANSPORT OF PALLET ON GROUND (Contd)**

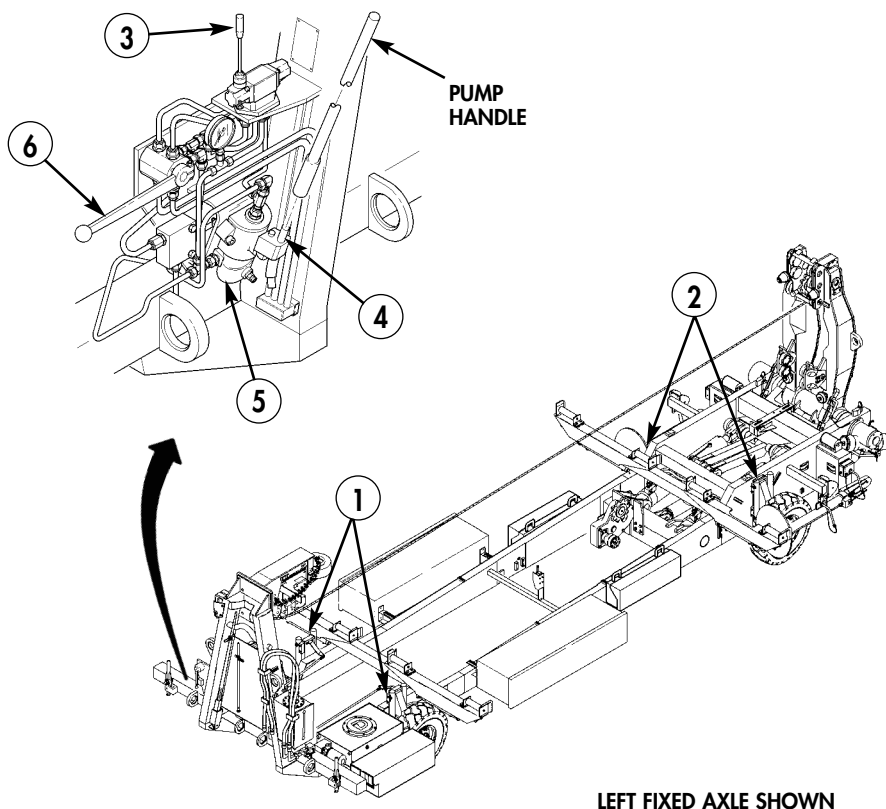


**TRANSPORT OF PALLET ON GROUND (Contd)****NOTE**

If pallet will be stowed on ground for an extended period of time or pallet is loaded on aircraft, support wheels should be raised. Perform step 6.

Placing dunnage under pallet frame is recommended if pallet will be stowed on ground for an extended period of time.

6. Raise fixed axles (2) and steering axles (1) (lower pallet to ground) as follows:
  - a. Position selector valve lever (6) in POSITION 1 or pointing left of center, and move control valve lever (3) to POSITION A or left of center.
  - b. Install pump handle on pump lever (4) and operate hydraulic pump (5) until steering axles (1) are fully raised (pallet is lowered to ground).

**LEFT FIXED AXLE SHOWN****END OF WORK PACKAGE**

## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST)

### **WARNING**

Prior to and during any load or unload cycle, all non-essential personnel must stay clear of Load Handling System (LHS) and pallet, or serious injury or death to personnel may result.

Trailer wheels must be chocked during transfer operations, or serious injury or death to personnel may result.

Ensure trailer air system is charged before beginning transfer, or trailer locks will not retract. Serious injury or death to personnel could result.

### **CAUTION**

To avoid damage to equipment during transfer operations, ensure trailer drawbar extension is retracted and on the ground, centered forward of trailer. Ensure drawbar and drawbar extensions are properly stowed. Refer to TM 9-2330-385-14.

Ensure air lines and cables are properly stowed, to prevent damage to equipment. Refer to TM 9-2330-385-14.

Both trailer bumper points must be under truck bump plate, and at least one trailer bumper point must contact bump plate. Trailer bumper point not contacting transporter bumper stop cannot exceed 0.5 in. (12.7 mm) or pallet will miss main rail guides and damage to equipment may result.

### **NOTE**

During all transporter operations, the operator will drive and be responsible for operation of LHS cab control box or Remote Control Unit (RCU). The assistant acts as a ground guide and will be responsible for directing the operator using hand signals and assisting the operator as needed.

1. Check transfer site for 22 ft (6.7 m) overhead clearance, ground firmness, and level ground.
2. If pallet is loaded with bridge, ensure bridge is properly secured with fastening rods. Refer to WP 0008 00.

## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### **CAUTION**

Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (235 bar). If pressure on gauge reaches 3,626 psi (250 bar), stop and check for obstructions. Do not exceed 3,626 psi (250 bar), or damage to equipment may result.

3. Lower fixed axles (2) to fully down position as follows:
  - a. Position selector valve (6) in POSITION 2 or pointing up, and move control valve (3) to POSITION B or right of center.
  - b. Install pump handle on pump lever (4) and operate hydraulic pump (5) until fixed axles (2) are in fully down position.

### **CAUTION**

Ensure transload rollers are installed with bushing taper facing to the rear of pallet. Ensure lynch pins will clear pallet frame when fixed axles are raised during transloading. Failure to comply may result in damage to transload rollers or lynch pins.

### **NOTE**

Perform step 4 if transload rollers are not installed on pallet fixed axles. Use inboard mounting holes only. Refer to WP 0007 00.

4. Ensure transload roller (13) is installed on each fixed axle (2) with retaining pin (12) and lynch pin (11).

### **CAUTION**

Ensure transload roller bar is installed in transload position or damage to equipment will result.

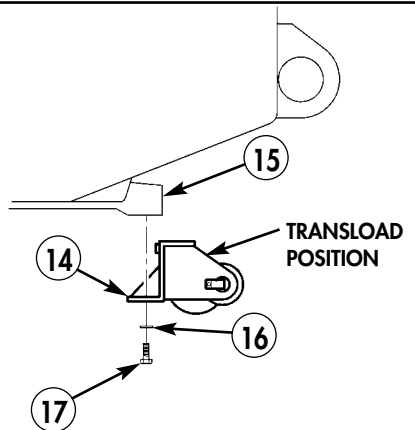
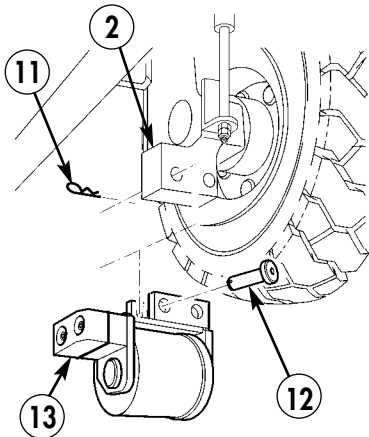
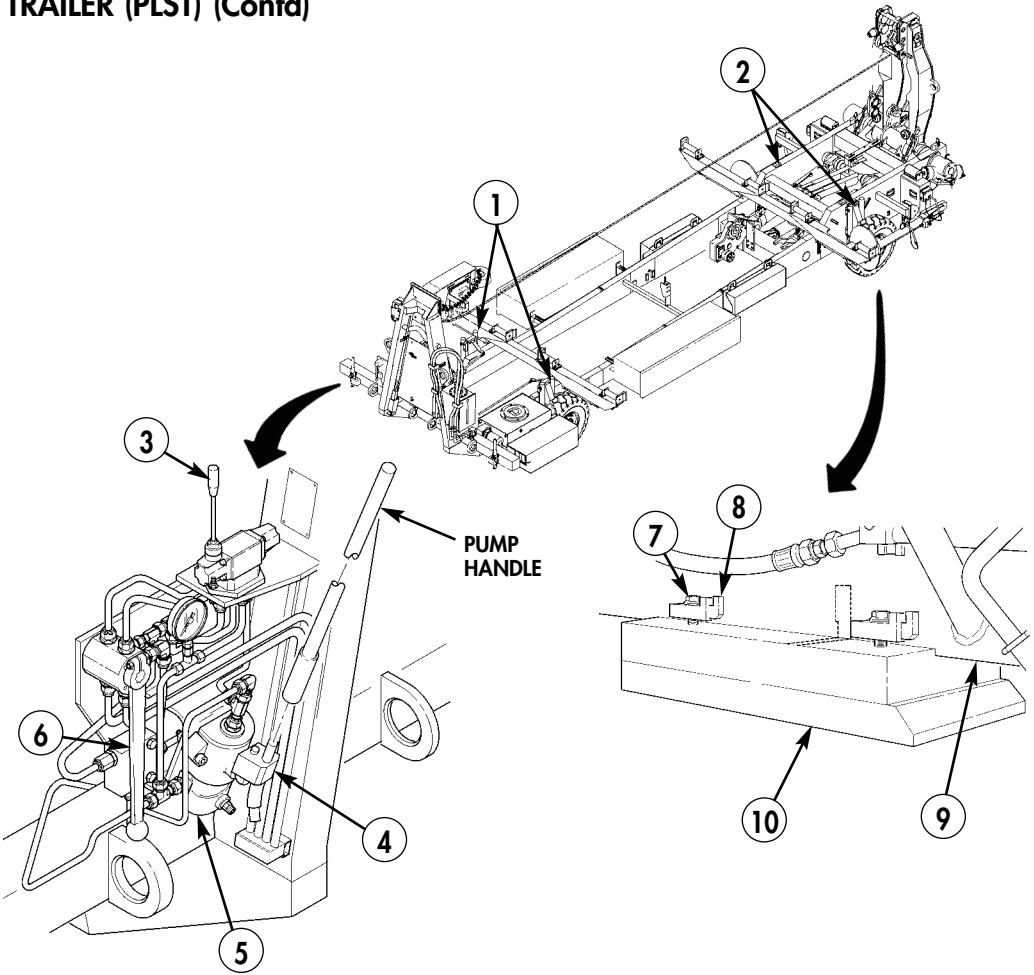
### **NOTE**

Assistant will help install transload roller bar.

5. Install transload roller bar (14) on lower support boom (15) with two washers (16) and screws (17).
6. Move control valve (3) to POSITION A or left of center, operate hydraulic pump (5), and raise fixed axles (2) until top of transload rollers (13) are approximately 1 in. (25.4 mm) from pallet frame.
7. Loosen four screws (7) and remove shoring pad (10) from mounting brackets (8) on both sides of pallet frame (9).



**TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)**



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

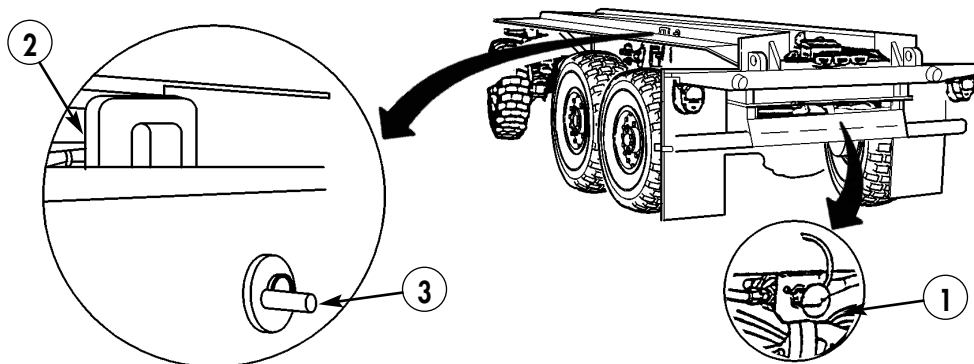
8. Disconnect pallet hold-down bars and place in stowed position. Refer to WP 0007 00.

### **CAUTION**

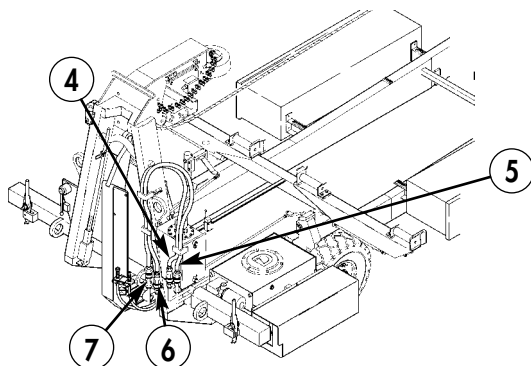
Air pressure in trailer air system must be sufficient to retract trailer locks, or damage to trailer locks may occur while attempting to load pallet on trailer. If air pressure is not sufficient, use truck to charge trailer air system using trailer air-charging hose. If air system cannot retract trailer locks, use manual trailer lock retract procedure. Refer to TM 9-2330-385-14.

Ensure both trailer locks are fully retracted, or damage to equipment may result.

9. Push in on knob (1) and retract left and right trailer locks (2). Ensure lock indicator pin (3) is fully retracted.

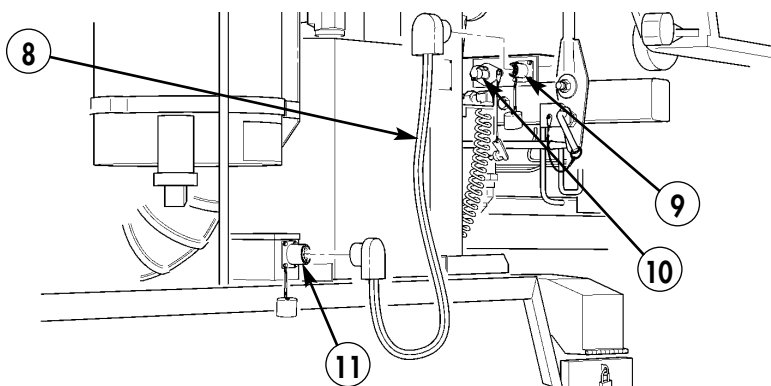


10. Ensure pallet hydraulic hoses (4) and (5) are connected to pallet couplings (7) and (6).



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

11. Ensure NATO power cable (8) is disconnected from NATO slave receptacles (9) and (11), and main power switch (10) is in OFF position.



### **CAUTION**

Prior to backing CBT, trailer drawbar extension must be all the way in, or damage to equipment may result.

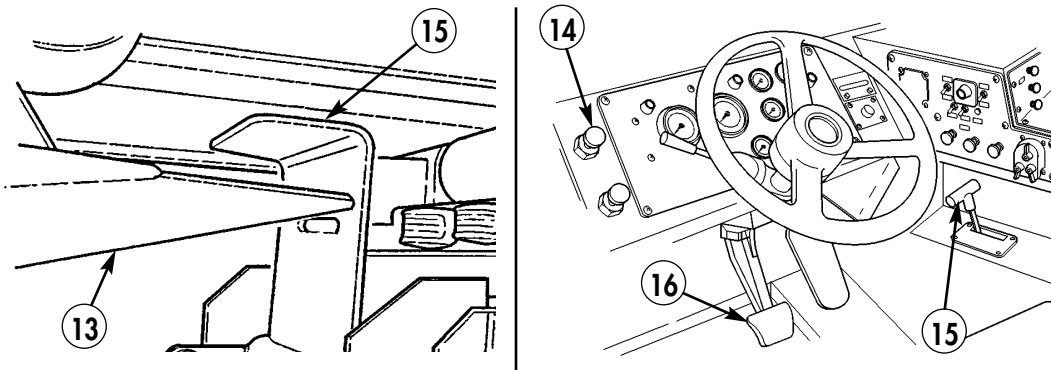
Ensure trailer drawbar is down against ground during transfer operations, or damage to equipment may result.

Both trailer bumper points must be under truck bump plate, and at least one trailer bumper point must contact bump plate. Trailer bumper point not contacting transporter bumper stop cannot exceed 0.5 in. (12.7 mm), or pallet will miss main rail guides and damage to equipment may result.

### **NOTE**

Ensure transload roller bar rollers ride over top of trailer bumper points and are centered over or on trailer guides when backing up CBT.

12. Back up transporter so trailer bumper points (13) are under flange and contact bump plate (12), apply service brake (16), move transmission selector lever (15) to N (neutral), and pull parking brake control (14) out.



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### NOTE

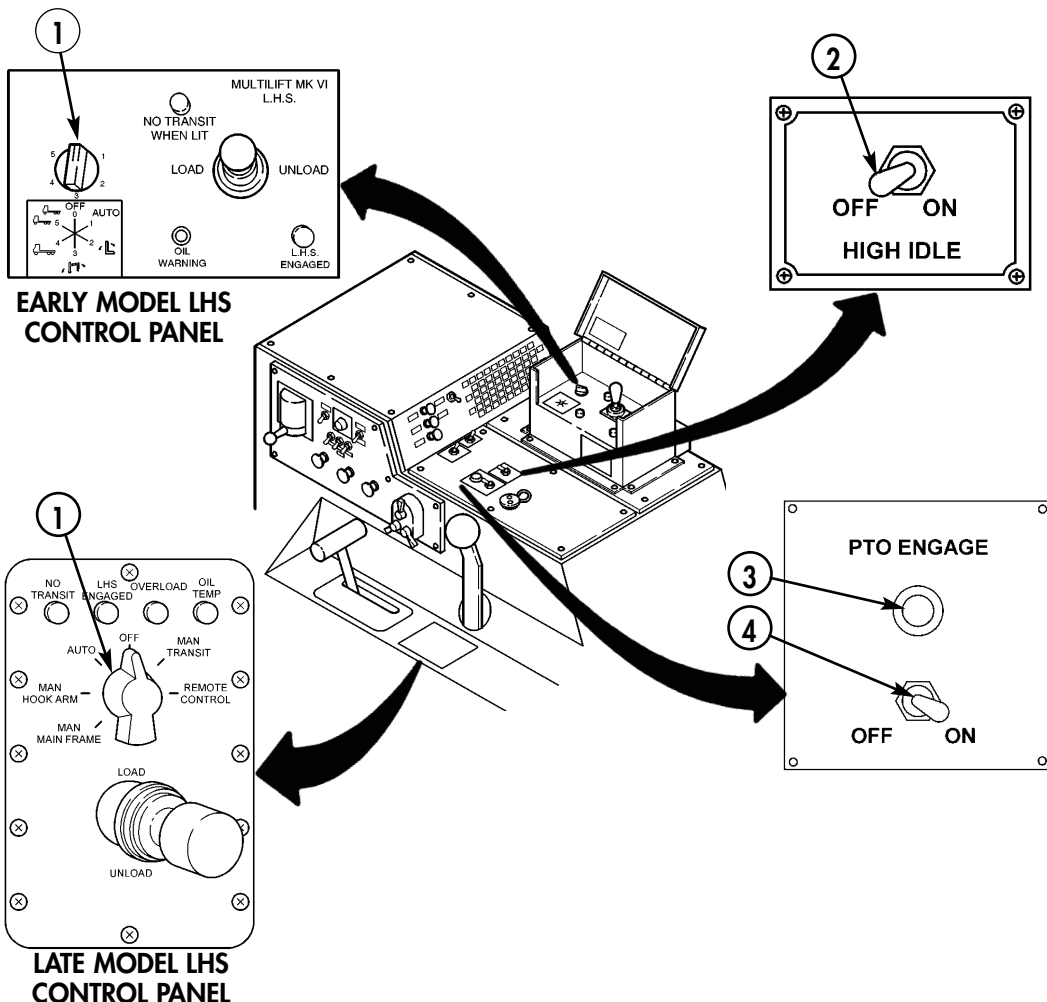
Operator will perform steps 13 through 23 using LHS RCU.

- Turn LHS MODE SELECT switch (1) to No. 1 (AUTO) position on early model CBTs or REMOTE CONTROL on late model CBTs.

### CAUTION

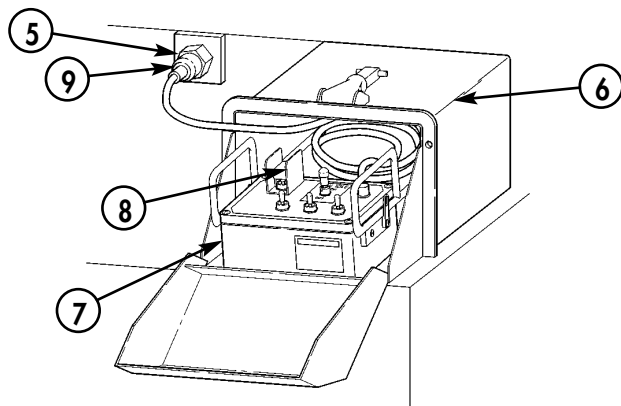
High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission or the LHS.

- With HIGH IDLE switch (2) in OFF position, turn PTO ENGAGE switch (4) to ON position. PTO ENGAGE indicator (3) will light.



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

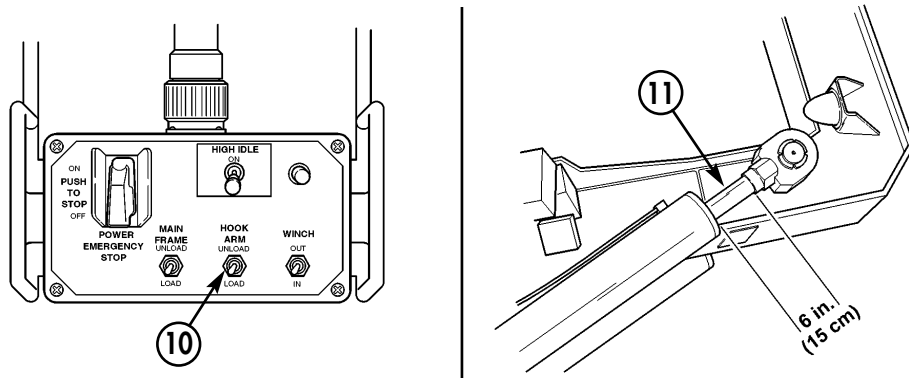
15. Remove LHS RCU (7) from RCU stowage box (6), connect power cable cannon plug (9) to receptacle (5), if removed, and place emergency stop switch (8) in ON position.



### NOTE

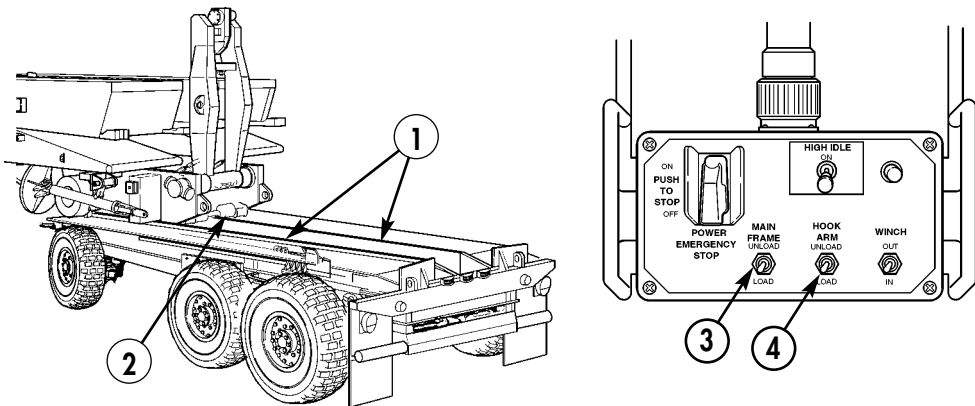
Pallet frame will clear LHS frame locks when LHS hook arm cylinders are extended approximately 6 in. (15.2 cm).

16. Hold HOOK ARM switch (10) in UNLOAD position until hook arm cylinders (11) are extended approximately 6 in. (15.2 cm), then release switch (10).

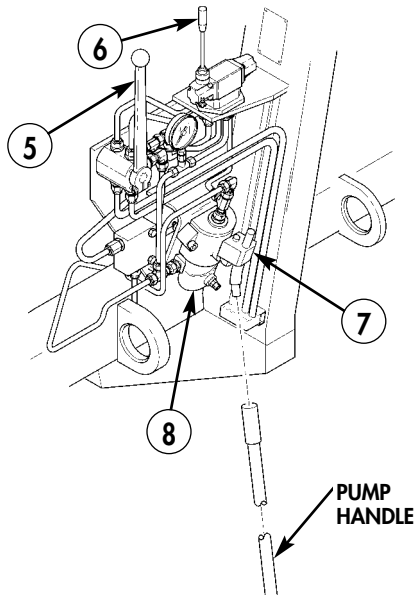


## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

17. Check to ensure pallet transload roller bar (2) is centered with top of PLST guide rails (1), then hold HOOK ARM switch (4) in UNLOAD position until transload roller bar (2) contacts PLST guide rails (1). Release switch (4).



18. Lower fixed axles until they are in fully extended position as follows:
- Position selector valve lever (5) in POSITION 2 or pointing up, and move control valve lever (6) to POSITION B or right of center.
  - Install pump handle on pump lever (7), and operate hydraulic pump (8) until transload rollers (12) on fixed axles (13) are in the fully extended position. Remove pump handle after lowering fixed axles..



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### **CAUTION**

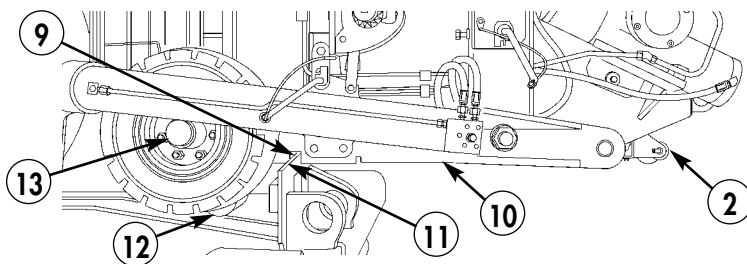
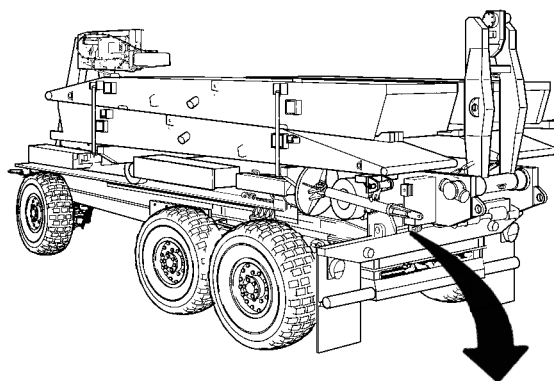
Ensure transload rollers remain in contact with PLST deck and pallet is not lifted too high with LHS hook arm or excessive pressure on transload roller bar may result in damage to equipment.

19. Hold HOOK ARM switch (4) in UNLOAD position, and observe pallet roll rearward until cylinders are fully extended. Release switch (4). Hold MAIN FRAME switch (3) in UNLOAD position and observe pallet movement until notch (9) on pallet frame girders (10) is directly over stop plate (11) on each side of trailer. Release switch (3).

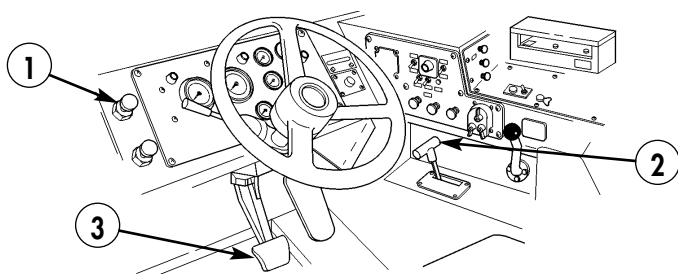
### **NOTE**

It may be necessary to adjust position of pallet when raising fixed axles to keep notch on pallet frame centered over stop plate.

20. Raise fixed axles (13) until notch (9) is down on stop plate (11) on each side of trailer as follows:
  - a. Ensure selector valve lever (5) is in POSITION 2 or pointing up, and move control valve lever (6) to POSITION A or left of center.
  - b. Install pump handle on bottom of pump lever (7), and working from ground, operate hydraulic pump (8) until fixed axles (13) are fully raised. Remove and stow pump handle.



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)



### **WARNING**

CBT will roll forward when lowering pallet down on trailer. All personnel must stand clear. Failure to comply may result in serious injury.

21. Release parking brake by pushing parking brake control (1) in.
22. Place wheel chock behind first front wheel on driver's side of CBT.

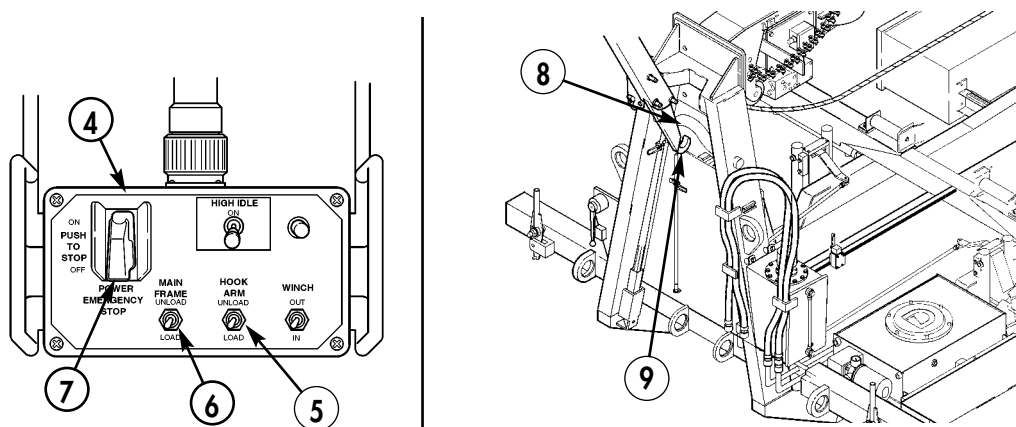
### **CAUTION**

Ensure steering axles are fully raised and not in contact with trailer. If contact is noted, raise steering axles or damage to equipment may result.

### **NOTE**

It may be necessary to move CBT forward slightly and repeat step 23 one or more times in order to clear hook arm from hook bar.

23. Hold HOOK ARM switch (5) or MAIN FRAME switch (6) in UNLOAD position to allow tip of LHS hook arm (9) to clear pallet hook bar (8). Stow RCU (4).



24. Remove wheel chocks and move transporter forward 5 ft (1.5 m), apply service brake (3), move transmission selector lever (2) to N (neutral), and pull parking brake control (1) out. Replace wheel chocks.

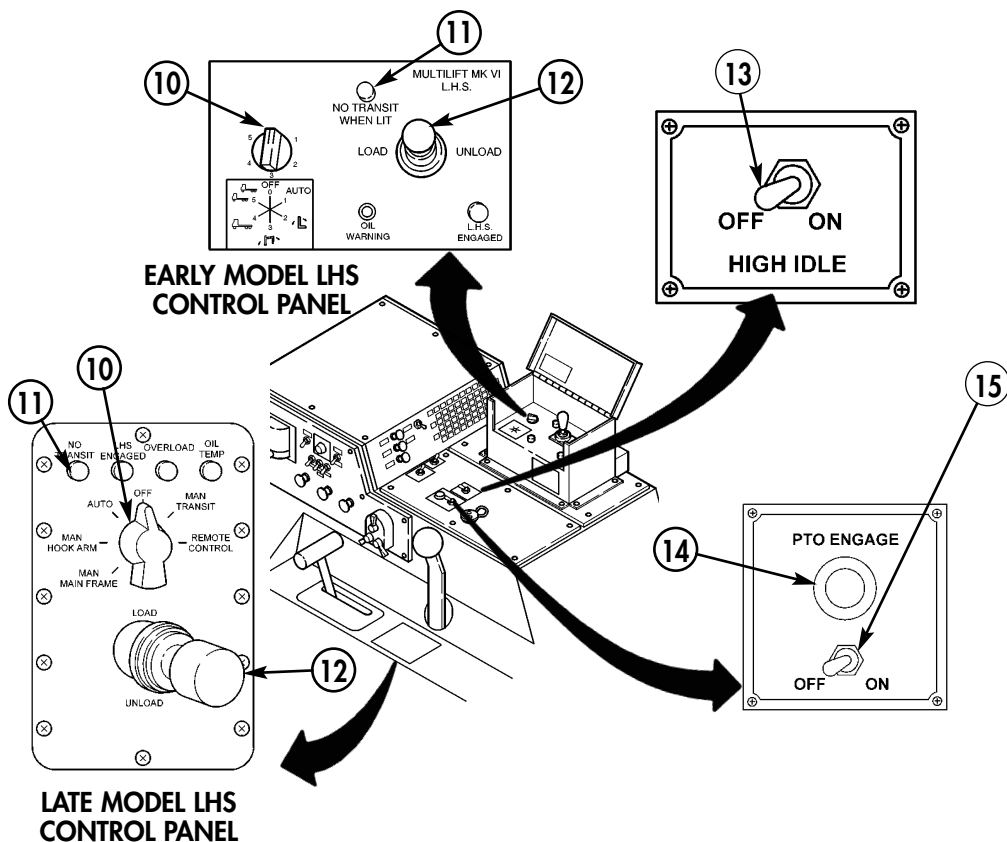


## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### NOTE

LHS hook arm and main frame do not need to be fully stowed if more loading operations will be performed.

25. Turn LHS MODE SELECT switch (10) to OFF position.
26. Place POWER EMERGENCY STOP switch (7) in OFF position, and stow RCU (4) in RCU stowage box.
27. Position HIGH IDLE switch (13) to ON.
28. Hold joystick (12) to LOAD position until NO TRANSIT WHEN LIT indicator (11) light goes out.
29. Position HIGH IDLE switch (13) to OFF.
30. Position PTO ENGAGE switch (15) to OFF. PTO ENGAGE indicator (14) will go out.
31. Turn LHS MODE SELECT switch (10) to OFF/TRANSPORT (position 0).



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### NOTE

Ensure left and right shoring pads are installed with yellow paint marks aligned.

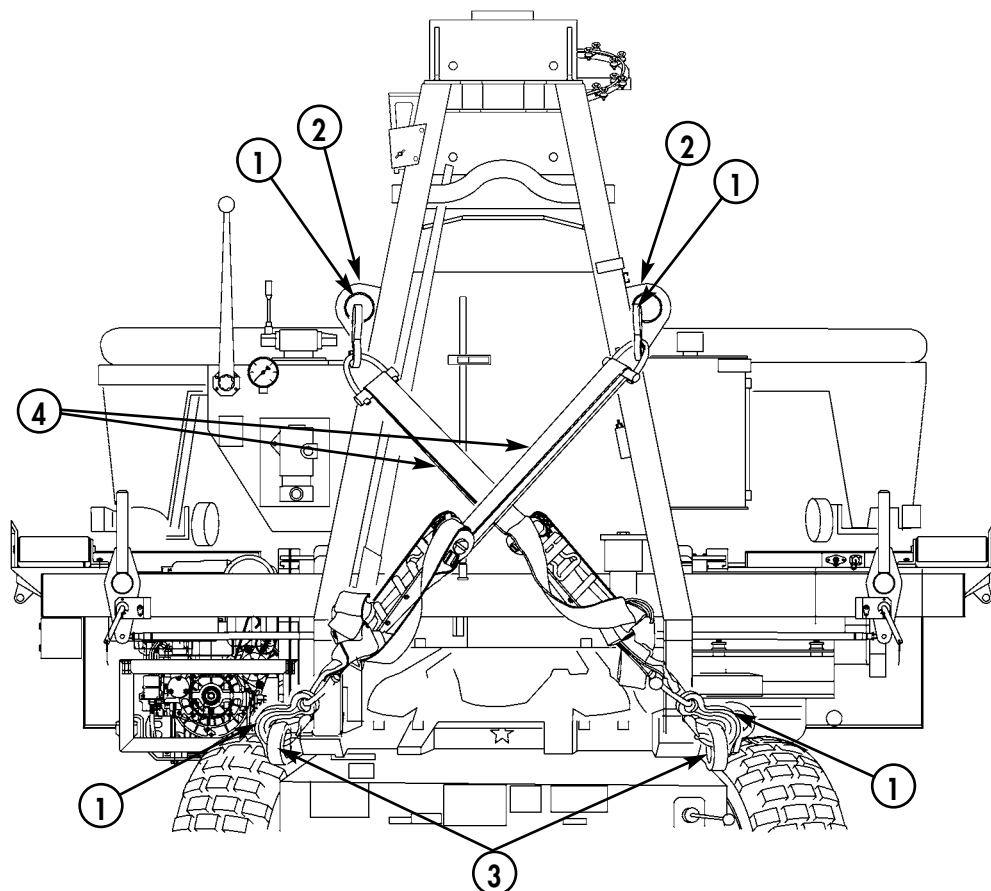
32. Install shoring pads on pallet frame. Refer to WP 0007 00.

### CAUTION

Ensure anchoring straps are positioned so as to not come in contact with any hydraulic lines or damage to equipment may result.

Ensure all ratchet straps are tight or damage to equipment may result.

33. Adjust two anchoring straps (4) to approximate required length.
34. Install two anchoring straps (4) by connecting hooks (1) to launch boom lifting eyes (2) and trailer front lifting eyes (3). Tighten straps (4).



## TRANSLOADING PALLET TO PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

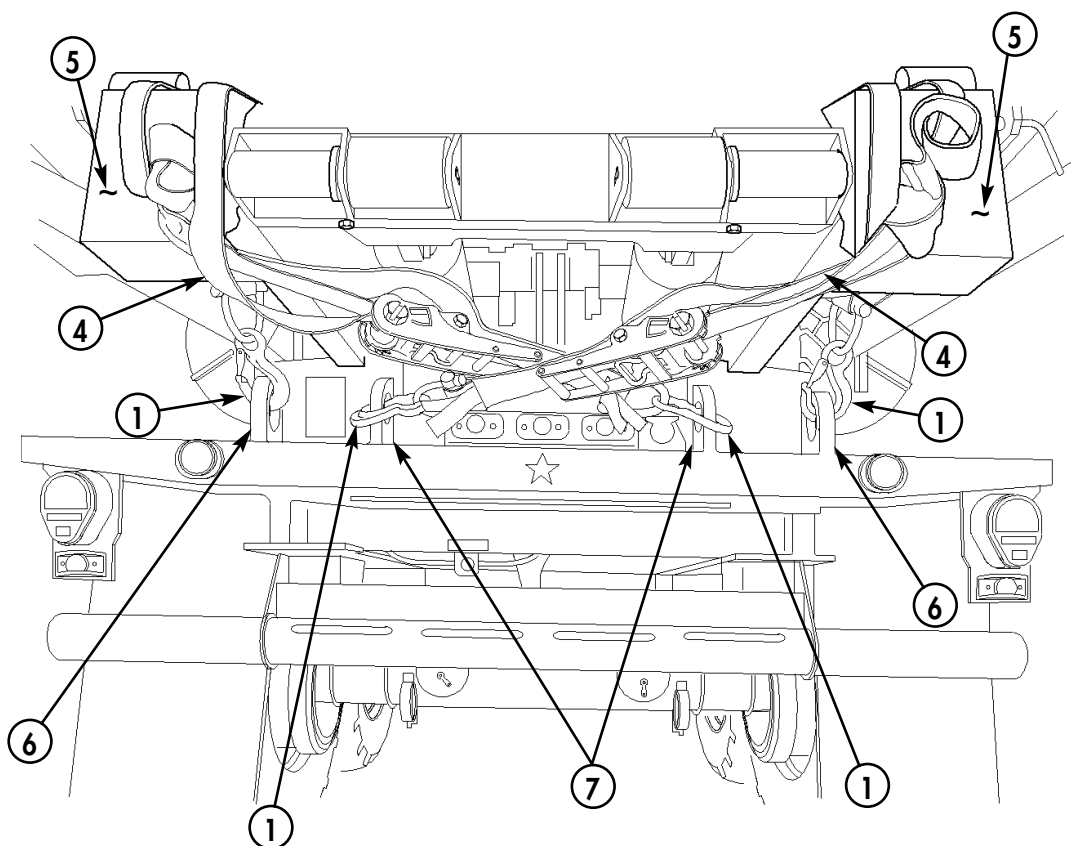
35. Adjust both anchoring straps (4) to approximate length.

### **CAUTION**

Ensure anchoring straps are routed to outside of eye on pallet frame members and do not contact hydraulic lines. Failure to comply may result in damage to equipment.

36. Route anchoring straps (4) over pallet frame members (5), and connect hooks (1) to trailer outer eyes (6).

37. Connect ratchet end hooks (1) to trailer inner eyes (7), and tighten anchoring straps (4).



38. If PLST will be towed, extend drawbar tube and drawbar extension on PLST, and connect PLST to CBT. Refer to TM 9-2330-385-14. ■

**END OF WORK PACKAGE**



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST)

### WARNING

Prior to and during any load or unload cycle, all personnel should stay clear of the Load Handling System (LHS) and the pallet or serious injury or death to personnel could result.

Trailer wheels must be chocked during transfer operations or serious injury or death to personnel could result.

### CAUTION

To avoid damage to equipment during transfer operations, make sure trailer drawbar extension is retracted and on the ground, centered forward of the trailer. Make sure drawbar and drawbar extension are properly stowed. Refer to TM 9-2330-385-14.

Ensure air lines and cables are properly stowed to prevent damage to equipment. Refer to TM 9-2330-385-14.

Both trailer bumper points must be under truck bump plate, and at least one trailer bumper point must contact bump plate. Trailer bumper point not contacting transporter bumper stop cannot exceed 0.5 in. (12.7 mm) or the pallet will miss main rail guides and damage to equipment may result.

### NOTE

During all transporter operations, the operator will drive and be responsible for the operation of the LHS cab control box. The assistant acts as a ground guide and will be responsible for directing the operator using hand signals, operating the remote control unit and winch, and assisting the operator as needed.

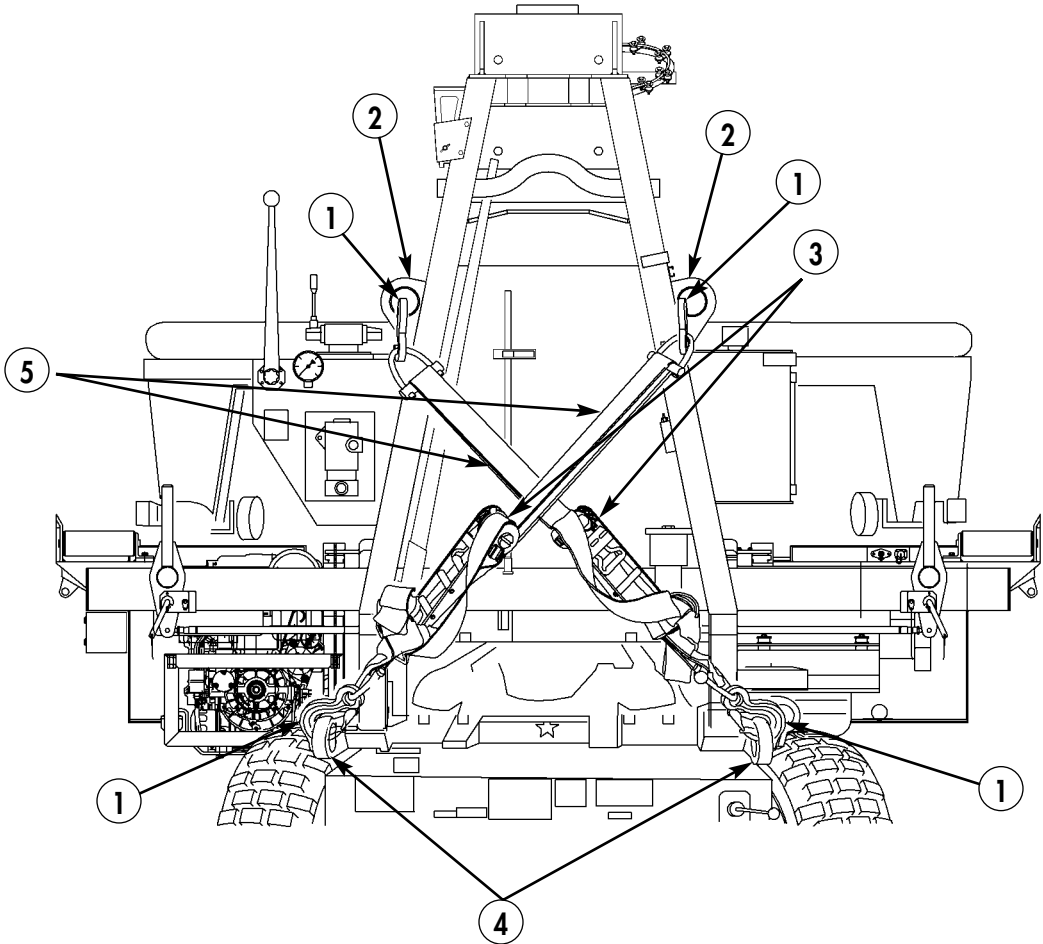
1. Check transfer site for 22 ft (6.7 m) overhead clearance, ground firmness, and level ground.
2. If pallet is loaded with bridge, ensure bridge is properly secured with fastening rods. Refer to WP 0008 00.

### WARNING

Ensure trailer air system is charged before beginning transfer, or trailer locks may not engage properly. Serious injury or death to personnel could result.

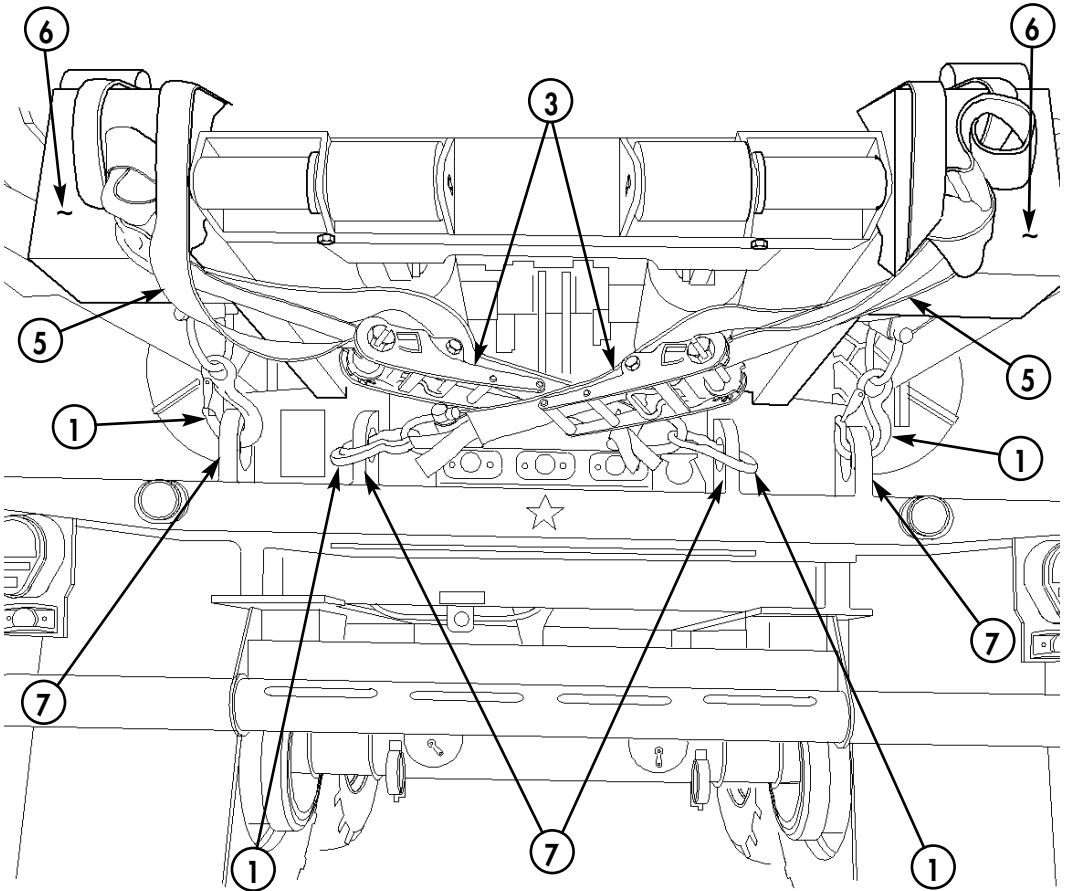
## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

3. Release anchoring strap ratchet (3) on two anchoring straps (5).
4. Remove two anchoring straps (5) from launch boom lifting eyes (2) and trailer front lifting eyes (4) by disconnecting four connecting hooks (1).



## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

5. Release anchoring strap ratchet (3) on two anchoring straps (5).
6. Remove two anchoring straps (5) from trailer rear lifting eyes (7) by disconnecting four hooks (1) and pulling anchoring straps (5) from pallet frame members (6).



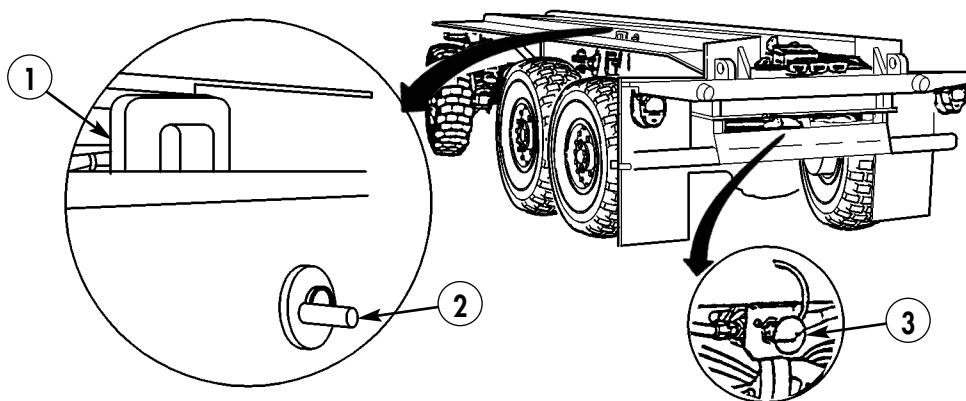
## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### **CAUTION**

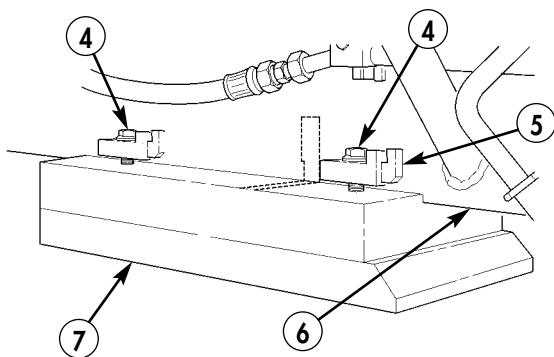
Air pressure in trailer air system must be sufficient to retract trailer locks or damage to trailer locks may occur while attempting to load the pallet on trailer. If air pressure is not sufficient, use truck to charge trailer air system using trailer air-charging hose. If air system cannot retract trailer locks, use manual trailer lock retract procedure. Refer to TM 9-2330-385-14.

Ensure both trailer locks are fully retracted or damage to equipment may result.

7. Push in on knob (3) and retract left and right trailer locks (1). Ensure lock indicator pin (2) is fully retracted.



8. Loosen four screws (4), and remove shoring pad (7) from mounting brackets (5) at both sides of pallet frame (6).





**TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST)  
(Contd)**

**NOTE**

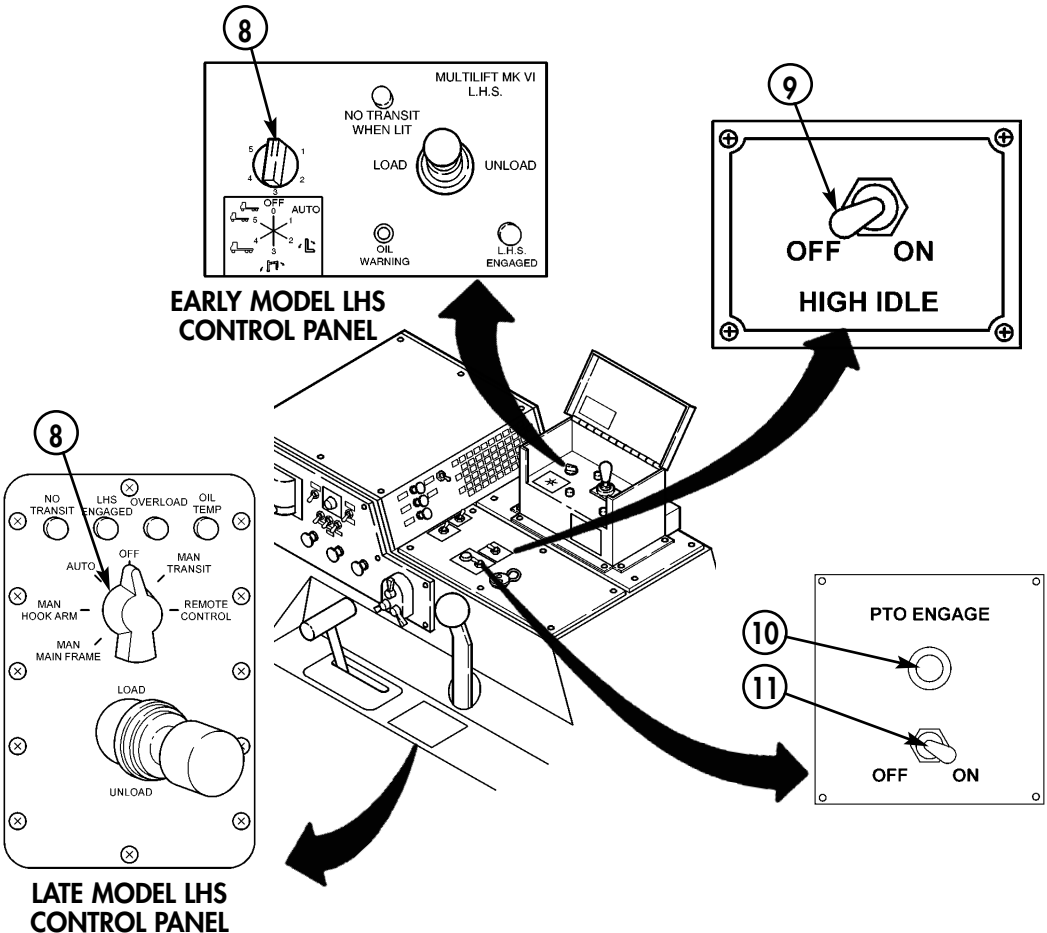
Operator will perform steps 9 through 15 using LHS cab control box.

- Turn LHS MODE SELECT switch (8) to No. 1 (AUTO SEQUENCE) position.

**CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission or the LHS.

- With HIGH IDLE switch (9) in OFF position, turn PTO ENGAGE switch (11) to ON position. The PTO ENGAGE indicator (10) will light.
- Turn HIGH IDLE switch (9) to ON position.



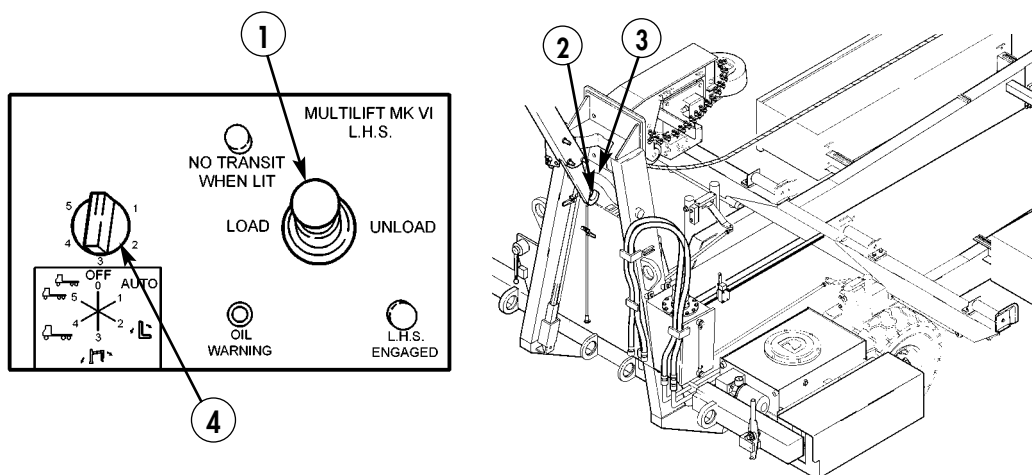
## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

12. Hold joystick (1) to UNLOAD until bottom tip of LHS hook arm (2) is just below level of pallet hook bar (3).
13. Turn cab HIGH IDLE switch (5) to OFF.

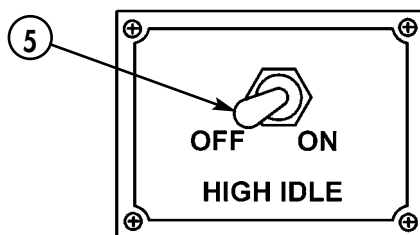
### **CAUTION**

Prior to backing CBT, ensure PLS trailer drawbar is all the way in, or damage to equipment may result.

14. Back up transporter until LHS hook arm (2) engages pallet hook bar (3).

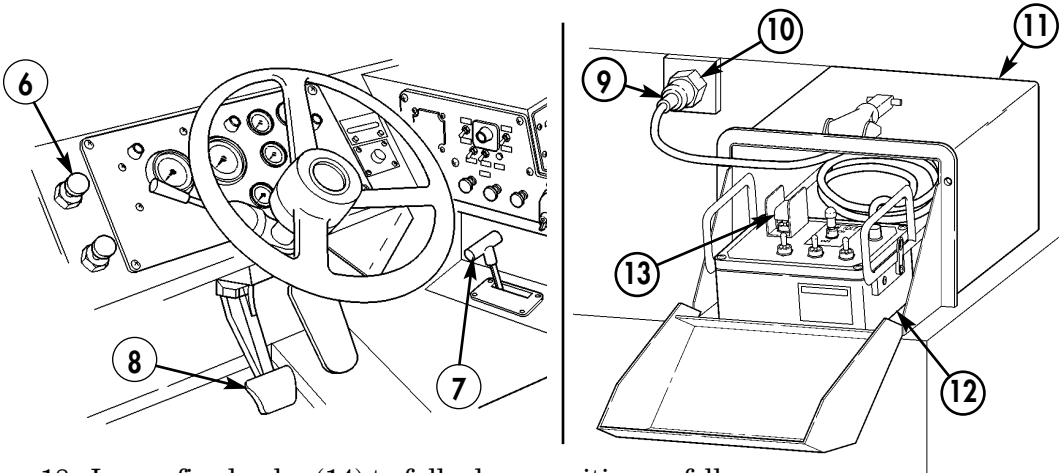


15. Turn LHS MODE SELECT switch (4) to No. 1 (AUTO) position or REMOTE CONTROL (late model CBTs).



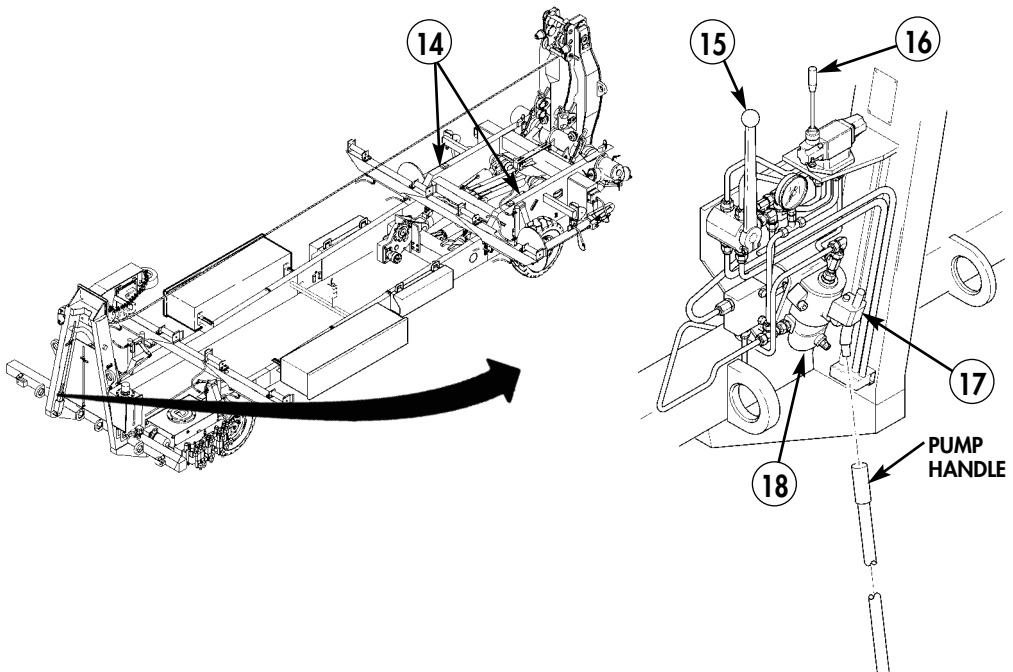
16. Remove LHS RCU (12) from RCU stowage box (11), connect power cable cannon plug (9) to receptacle (10), if removed, and place POWER switch (13) in ON position.
17. Apply service brake (8), move transmission selector lever (7) to N (neutral), and push parking brake control (6) in. Place wheel chock in front of 2nd front wheel and let foot off service brake (8).

**TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST)  
(Contd)**



18. Lower fixed axles (14) to fully down position as follows:

- a. Position selector valve (15) in POSITION 2 or pointing up, and move control valve (16) to POSITION B or right of center.
- b. Install pump handle on pump lever (17) and operate hydraulic pump (18) until fixed axles (14) are fully down. Remove pump handle.



## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

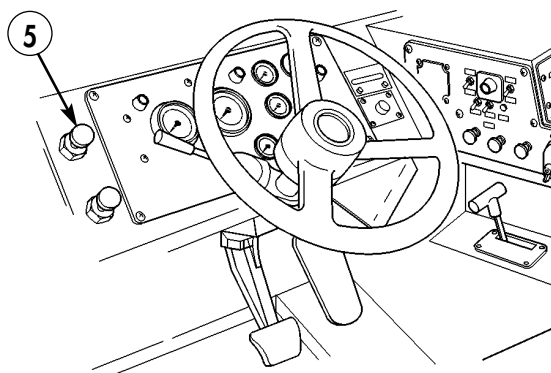
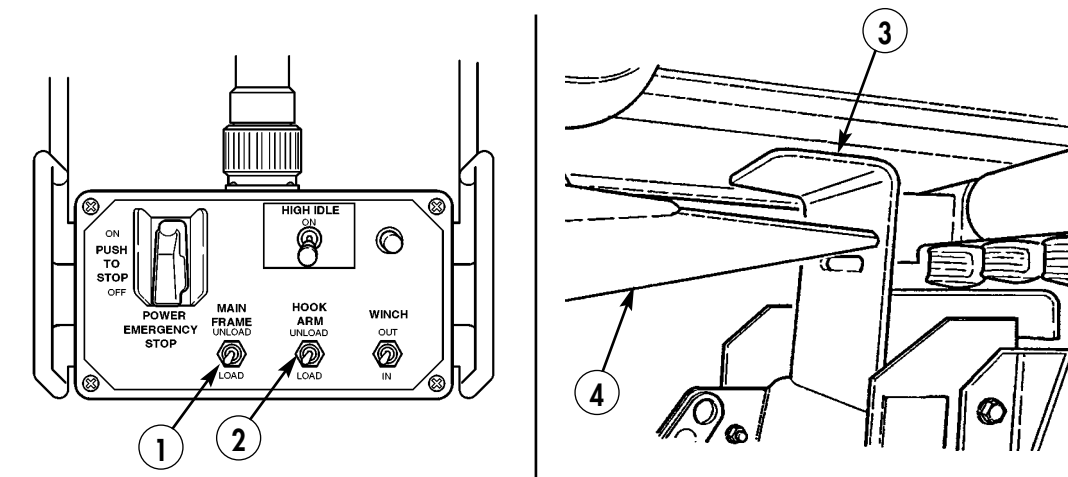
### **CAUTION**

Both trailer bumper points must be under truck bump plate, and at least one trailer bumper point must contact bump plate. Trailer bumper point not contacting transporter bumper stop cannot exceed 0.5 in. (12.7 mm) or pallet will miss main rail guides and damage to equipment may result.

### **NOTE**

Ensure trailer bumper point is under flange of CBT bumper plate.

19. Move and hold MAIN FRAME switch (1) to LOAD until LHS hook arm raises pallet, moves CBT rearward, and PLS trailer bumper points (4) are under flange and contacting CBT bumper pallet (3). Release switch (1), and pull parking brake control (5) out.

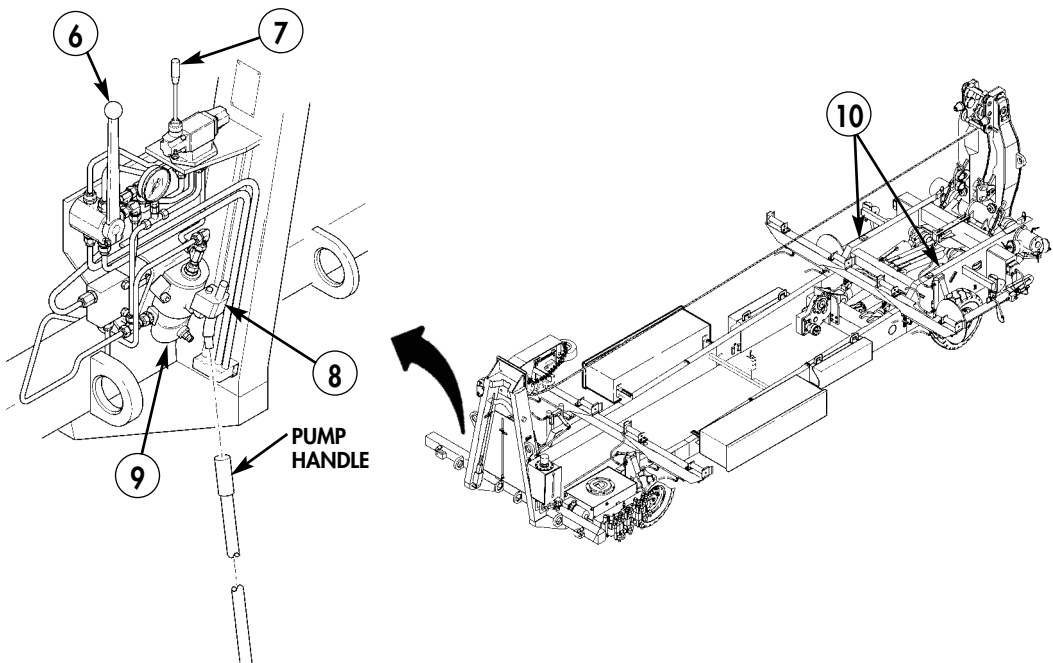


## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### **CAUTION**

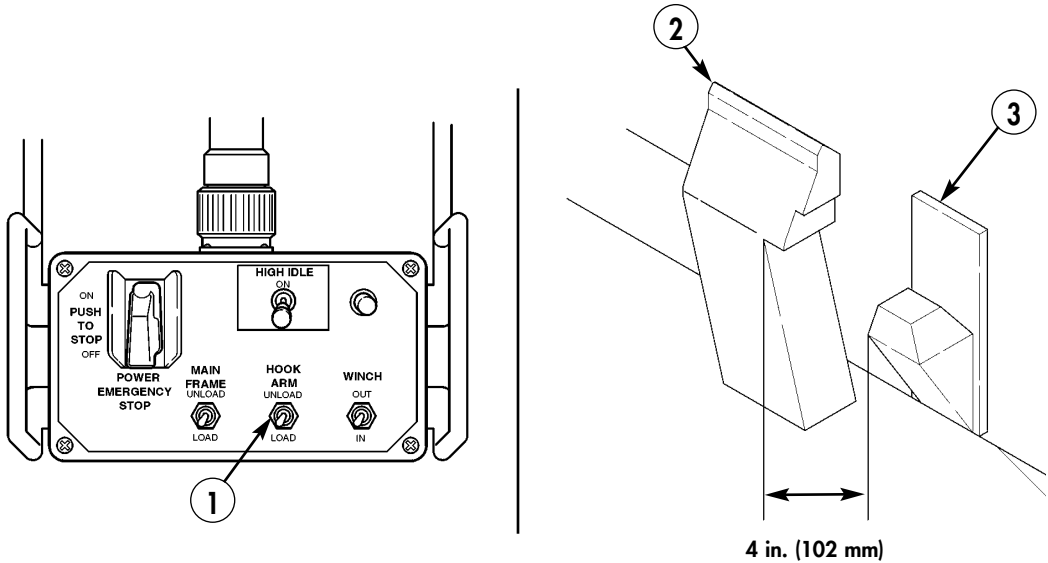
Ensure transloading of pallet is stopped when the transload rollers are lined up with the end of the PLST center guide rails. Failure to stop and raise pallet fixed axles to halfway up position may result in damage to transload roller bushings.

20. Move and hold HOOK ARM switch (2) to LOAD until transload rollers line up with end of trailer center guide rails.
21. Raise fixed axles (10) to halfway up position as follows:
  - a. Position selector valve (6) in POSITION 2 or pointing up, and move control valve (7) to POSITION A or left of center.
  - b. Install pump handle on pump lever (8) and operate hydraulic pump (9) until fixed axles (10) are in halfway up position.

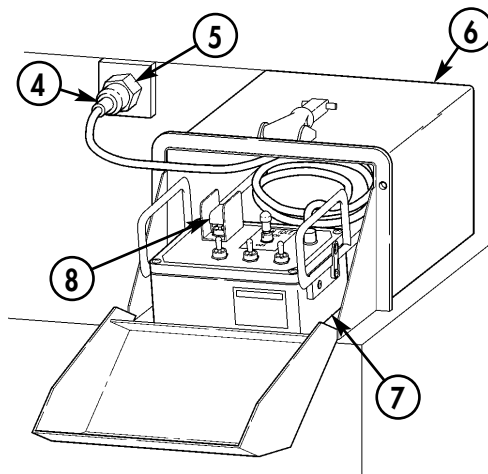


**TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST)  
(Contd)**

22. Move and hold HOOK ARM switch (1) to LOAD until pallet frame locks (3) are approximately 4 in. (102 mm) in front of LHS compression frame locks (2). Release switch (1).
23. Move and hold HOOK ARM switch (1) to LOAD until LHS hook arm is fully down. Release switch (1).



24. Turn POWER switch (8) on RCU (7) to OFF position.
25. Disconnect power cable cannon plug (4) from receptacle (5) and stow RCU (7) in RCU stowage box (6).

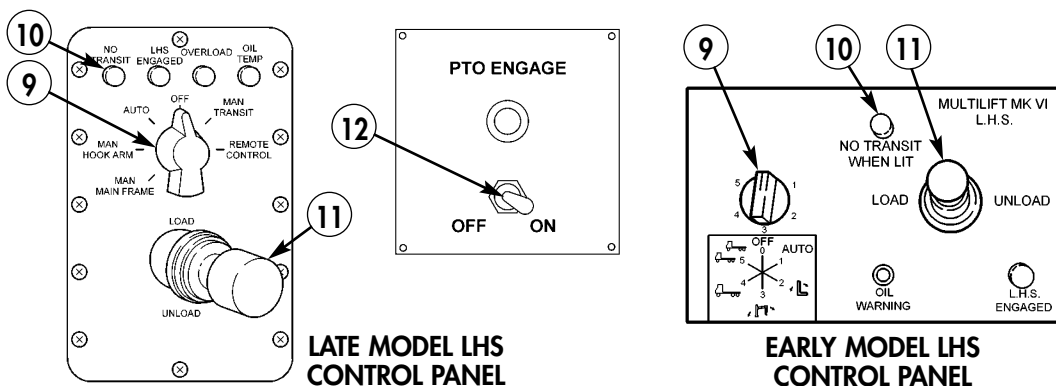


## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

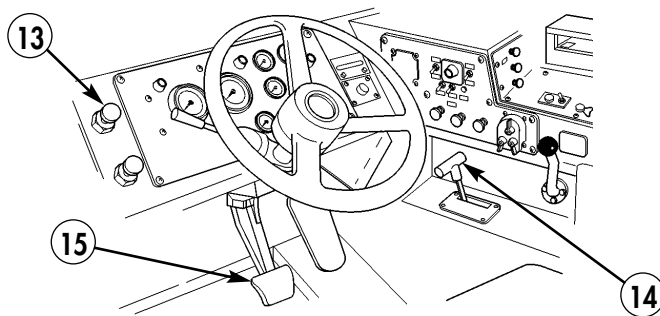
### **WARNING**

When NO TRANSIT WHEN LIT indicator is illuminated, transporter may be maneuvered in the immediate vicinity of the loading/unloading site. However, transporter is unsafe for road travel. Open road driving when NO TRANSIT WHEN LIT indicator is illuminated could result in death or injury to personnel or damage to equipment.

26. Hold LHS control box joystick (11) in LOAD, and stop when NO TRANSIT WHEN LIT (10) indicator light goes out.



27. Place transmission selector lever (11) in forward mode, and slowly move CBT forward 5 ft (1.5 m) from trailer.
28. Apply service brake (15), and place transmission selector lever (14) in N (neutral), and pull parking brake control (13) out.



29. Position PTO ENGAGE switch (12) to OFF, and turn LHS MODE SELECT switch (9) to OFF.

## TRANSLOADING PALLET FROM PALLETIZED LOAD SYSTEM TRAILER (PLST) (Contd)

### NOTE

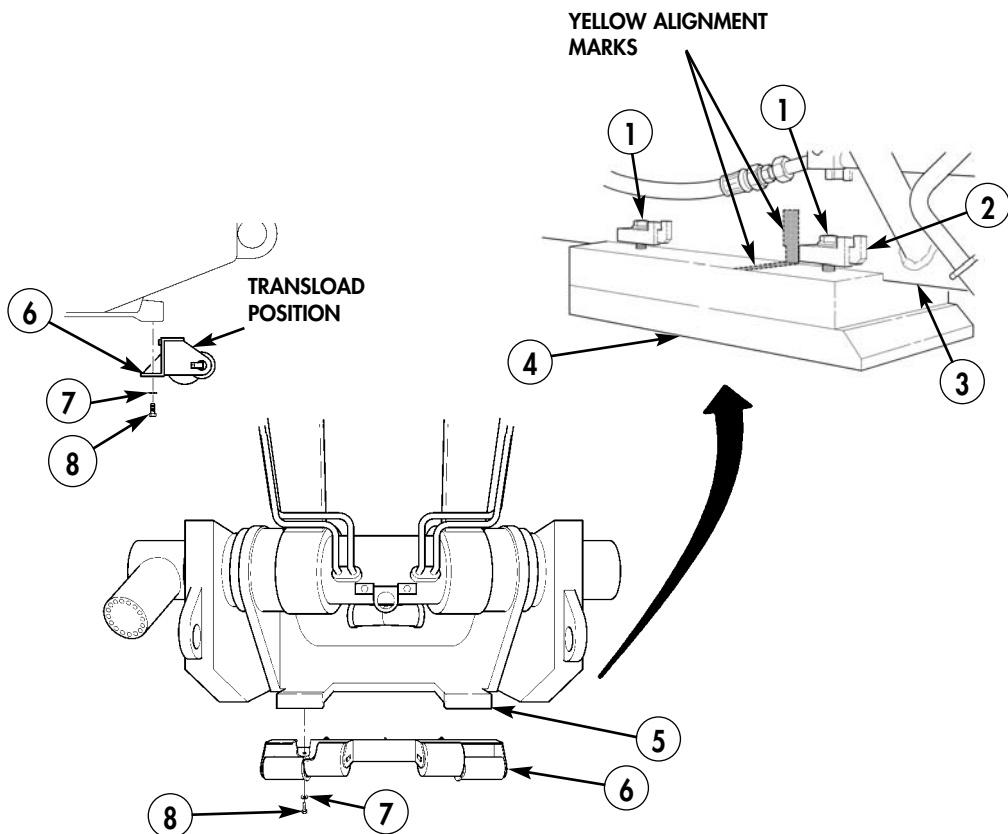
Ensure shoring pads are installed with yellow paint marks aligned.

30. Install left and right shoring pads (4) on mounting brackets (2) at both sides of pallet frame (3), and tighten screws (1).
31. Connect pallet hold-down bars to CBT. Refer to WP 0007 00.
32. Raise fixed axles until transload rollers contact pallet frame. Refer to WP 0007 00.

### NOTE

Assistant will help remove and stow transload roller bar.

33. Using 19-mm wrench, remove two screws (8), washers (7), and transload roller bar (6) from lower support boom (5). Stow transload roller bar (6) and mounting hardware in either pallet toolbox.



END OF WORK PACKAGE

0024 00-12



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## OPERATION UNDER UNUSUAL CONDITIONS

### GENERAL

#### **WARNING**

Operating on side slopes can cause payload shift and instability that may result in a rollover. Failure to comply may result in damage to equipment or possible injury or death to personnel.

To minimize the risk of a rollover, avoid steep side slopes. Verify payload is well secured prior to operating on side slopes from 20% to 30%, and keep speed to a minimum, make no sudden steering inputs, and avoid depressions while traversing undulating terrain. Failure to comply may result in vehicle rollover and injury or death to personnel.

To minimize possible loss of control while towing the PLST, the maximum safe speed on paved roads is 35 mph (56 km/h), based on quick lane change testing, 15 mph (24 km/h) on off-road cross country terrain, and 10 mph (16 km/h) on heavily wash boarded areas. Refer to TM 9-2330-385-14 for additional guidance on PLST operation. Failure to comply may result in damage to equipment and possible injury or death to personnel.

#### **CAUTION**

The PLST cannot be towed behind the CBT loaded with a REB pallet unless the PLST is equipped with the drawbar extension kit, and both the drawbar extension and drawbar tube are in their extended positions. Refer to TM 9-2330-385-14. Failure to comply will result in damage to equipment.

Work packages 0025 00 through 0033 00 contain special instructions for pallet and bridge operations under unusual conditions. The standard guidelines for bridge operation should be followed along with the following precautions for various weather conditions.

## **OPERATION UNDER UNUSUAL CONDITIONS (Contd)**

### **OPERATION IN SNOW OR ICY CONDITIONS**

During deployment, operation, and recovery of bridge, follow all operating procedures for normal conditions and the following special instructions.

#### **CAUTION**

Do not use rock salt to de-ice bridge and do not chip ice from roadway surface with tools or damage to bridge will result.

Sand applied to bridge must be free from rocks or damage to equipment may result.

1. Remove any snow or ice from bridge equipment before it accumulates. Apply sand to roadway surfaces having ice buildup.
2. Wear gloves when operating or handling metallic equipment that is wet or ice covered, and exercise caution when working on bridge where snow or ice exist.
3. Check fluid levels more frequently in cold temperatures prior to operation. Refer to Lubrication Instructions, WP 0045 00.

### **OPERATION IN RAINY OR HUMID CONDITIONS**

Follow all operating procedures for normal conditions and the following special instructions. Exercise caution when working on bridge where wet surfaces and equipment may become slippery.

### **OPERATION IN HIGH WIND CONDITIONS**

Follow all operating procedures for normal conditions and the following special instructions. The maximum wind capacity for launch or retrieval of bridge is 33 mph (53 km/h).

## OPERATION UNDER UNUSUAL CONDITIONS (Contd)

### OPERATION IN EXTREME HEAT OR DRY CONDITIONS

Follow all operating procedures for normal conditions and the following special instructions.

#### **NOTE**

If necessary to park in direct sunlight, cover parked vehicle with tarpaulin if no other shelter is available.

A very high standard of maintenance is essential to long term operation under conditions of extreme heat. High temperature can cause early failure of systems. Constant checking is necessary to prevent failures.

1. Check oil levels more frequently. Refer to Lubrication Instructions, WP 0045 00.
2. Do not leave RCU in direct sunlight for extended periods.
3. Keep moving parts clean and well lubricated and ensure all air inlets are kept clean to permit maximum cooling. For cleaning instructions, refer to WP 0046 00. For lubrication instructions, refer to WP 0045 00.
4. Engine oil should be changed more frequently when Launch Power Unit engine is run in extreme heat. Run LPU engine at idle for about 2 minutes before shutting down. Idling will cool engine faster than a quick shutdown and may prevent damage from remaining engine heat.

### OPERATING TRANSPORTER IN UNUSUAL ENVIRONMENT OR WEATHER

For operation of the Heavy Expanded Mobility Tactical Truck (HEMTT) in unusual environment/weather conditions, see TM 9-2320-279-10.

### LAUNCH OR RETRIEVE IN EXTREME COLD (ARCTIC OPERATION)

#### **WARNING**

Bridge must not be launched or retrieved at temperatures below -25.6 °F (-32 °C). Hydraulic lines can rupture resulting in damage to equipment and possible injury to personnel.

#### **NOTE**

Launch and retrieval times will vary depending on ambient temperatures and viscosity of oil in use.

**OPERATION UNDER UNUSUAL CONDITIONS (Contd)**

**LAUNCH OR RETRIEVE IN EXTREME COLD (ARCTIC OPERATION) (Contd)**

1. Change oil in pallet hydraulic system and LPU engine to a viscosity category that matches the ambient temperature when starting from cold. Refer to table 1, and notify field maintenance to change oil as required.
2. Refer to table 2, and open bypass valve as required. Refer to WP 0007 00.
3. Refer to table 3, and determine glow-plug preheat time as required.
4. Refer to table 4, and determine LPU engine warm-up time as required

*Table 1. Lubrication Specifications.*

Expected Temperatures	Above +15 °F (-9 °C)	+40 °F to -15 °F (+4 °C to -26 °C)	+40 °F to -50 °F (+4 °C to -46 °C)
Hydraulic System Oil	OE/HDO-30	OE/HDO-10	OEA
LPU Engine Oil	OE/HDO-15W-40		OE/HDO-5W-30

*Table 2. Bypass Valve Operation.*

Type of Oil Used in Pallet Hydraulic System	OE/HDO-30	OE/HDO-10	OEA
Temperature Range Bypass Valve is Opened Prior to Starting LPU	+5 °F to +20 °F (-15 °C to -7 °C)	+15 °F to -20 °F (-9 °C to -29 °C)	-15 °F to -25.6 °F (-26 °C to -32 °C)

*Table 3. LPU Glow-plug Operation.*

Expected Temperature	Above +40 °F (+4 °C)	+40 °F to -15 °F (+4 °C to -26 °C)	-15 °F to -25.6 °F (-26 °C to -32 °C)
Glow-plug Preheat Time	None	1 Minute	2 Minutes

*Table 4. LPU Engine Warm-up Time.*

Expected Temperature	Above +40 °F (+4 °C)	+40 °F to -15 °F (+4 °C to -26 °C)	-15 °F to -25.6 °F (-26 °C to -32 °C)
Engine Warm-up Time	None	1 to 5 Minutes	5 Minutes

**OPERATION UNDER UNUSUAL CONDITIONS (Contd)****LAUNCH OR RETRIEVE IN EXTREME COLD (ARCTIC OPERATION) (Contd)****CAUTION**

Never use starting fluid (ether) to assist starting LPU. Failure to comply will result in damage to engine.

Do not set RCU on ground during freezing weather conditions. RCU must remain in RCU stowage box until working step L-4. Failure to comply may result in freeze-up of RCU and possible damage to equipment.

**NOTE**

If LPU engine will not crank or cranks slowly with pallet main power switch ON, connect NATO slave cable from CBT to pallet to assist starting LPU. At -25.6 °F (-32 °C), pallet batteries must be jumped using NATO slave. Refer to WP0007 00.

If starting LPU engine at -15 °F (-26 °C) or below, ensure engine is preheated for 2 minutes. If after 15 seconds of cranking engine it fails to start, preheat engine for 1 additional minute, then crank engine again.

If using CBT back-up power to launch or retrieve bridge, allow CBT engine to warm up for 10 minutes, then engage PTO and run CBT engine at high idle for an additional 10 minutes to warm up hydraulic oil.

5. Start LPU engine (refer to WP 0015 00), and warm up engine as required in table 4.

**NOTE**

If bridge will be launched or retrieved at -15 °F to -25.6 °F (-26 °C to -32 °C), place pallet RCU in CBT cab during warm-up operations and allow it to warm up for approximately 10 minute.

6. Turn on RCU. Refer to WP 0016 00.
7. If bypass valve was opened in step 2 above, close bypass valve (Refer to WP 0007 00) and allow LPU engine to run an additional 5 minutes to warm-up pallet hydraulic system.

**NOTE**

Refer to table 5, and perform steps 8 through 11 to warm-up pallet main hydraulic manifold, rear pinwheel drive, lower support boom lifting cylinders, and winch as required.

**OPERATION UNDER UNUSUAL CONDITIONS (Contd)**

**LAUNCH OR RETRIEVE IN EXTREME COLD (ARCTIC OPERATION) (Contd)**

- 8. Refer to table 5, Warm-up Step 1, and circulate oil through pallet main hydraulic manifold by locking in hydraulic control valve KY1 for specified duration. Refer to WP 0007 00 for operation of hydraulic control valve KY1. Unlock KY1.

**NOTE**

If RCU is unavailable, lock in control valve KY1 and manually operate control valves KY6 or KY7.

- 9. Refer to table 5, Warm-up Step 2, and run rear pinwheel drive by actuating hydraulic control valves KY6 or KY 7 through working step L16 for specified duration using RCU. Refer to WP 0016 00.
- 10. Refer to table 5, Warm-up Step 3, and extend and retract lower support boom lifting cylinders using RCU as follows:
  - a. Actuate hydraulic control valve KY17 through working step L3 to extend cylinders. Refer to WP 0016 00.
  - b. Actuate hydraulic control valve KY16 through working step R20 to retract cylinders. Refer to WP 0020 00.
- 11. Refer to table 5, Warm-up step 4, and warm up winch hydraulic manifold as follows:

**CAUTION**

Do not use RCU to operate KY22 to warm up winch or damage to equipment may result.

- 12. If locked, unlock control valve KY1.
- 13. Depress and Lock-in hydraulic control valve KY22 for specified duration as determined in table 5 below. Refer to WP 0007 00. Unlock KY22.

*Table 5. Warm-up Steps.*

WARM-UP STEP	HYDRAULIC FLUID		
	OE/HDO-30	OE/HDO-10	OEA
	+5 to +20 °F	-20 to +15 °F	-25.6 to -15 °F
Step 1	120 sec	120 sec	180 sec
Step 2	30 sec	30 sec	60 sec
Step 3	2 times	2 times	3 times
Step 4	30 sec	30 sec	60 sec
Total duration	about 6 minutes	about 6 minutes	about 10 minutes

- 14. Launch bridge (refer to WP0016 00) or retrieve bridge (refer to WP 0020 00).

## OPERATION UNDER UNUSUAL CONDITIONS (Contd)

### OPERATING CBT OR LPU IN EXTREME DUST, SAND, AND DESERT ENVIRONMENT CONDITIONS

1. During operation in extreme conditions, change air filter and oil filter more frequently. Refer to Pallet Maintenance Procedures, WP 0048 00.
2. Check air filter and clean more frequently as necessary. Refer to Pallet Maintenance Procedures, WP 0048 00.
3. Clean sand from pallet and bridge prior to operation (WP 0046 00). Ensure sand stuck to greased areas is removed and those areas are properly re-greased (WP 0045 00).

### OPERATE LPU IN EXTREME HEAT (MAINTAIN BATTERIES)

Monitor LOW BATTERY CHARGE warning on LPU control box or LOW ELECTRICAL SYSTEM VOLTAGE caution messages on pallet Remote Control Unit (RCU) display screen.

### RETRIEVAL OF MIRED BRIDGE

#### **CAUTION**

If ramp ends of bridge are stuck with dirt and mud once raised from gap, clean ramp ends of bridge prior to retrieving bridge onto pallet, or damage to equipment may result.

1. Remove dirt, mud, and debris from around sides and end of bridge to reduce suction when bridge is raised during retrieval.
2. Follow standard bridge retrieval procedures. Refer to Bridge Retrieval, WP 0020 00.
3. Clean sand from pallet and bridge after retrieval or before next launch. Refer to WP 0046 00. Ensure sand stuck to greased areas is removed and those areas are properly re-greased. Refer to WP 0045 00.

### OPERATION OF RCU UNDER BLACKOUT CONDITIONS

1. Place RCU control panel buttons light switch in OFF position. Refer to WP 0007 00.

#### **NOTE**

Settings for night vision equipment are: contrast "40" and light "0."

2. Using RCU menu system buttons (refer to WP 0007 00), adjust LCD screen brightness values as follows:
  - a. Depress F1 button. Then depress ESC button until "LCD SETTINGS" mode is displayed.
  - b. Depress F1 button to select "CONTRAST" or "LIGHT" mode.
  - c. Depress UP or DN button to change brightness value of LCD screen.





## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL

### WARNING

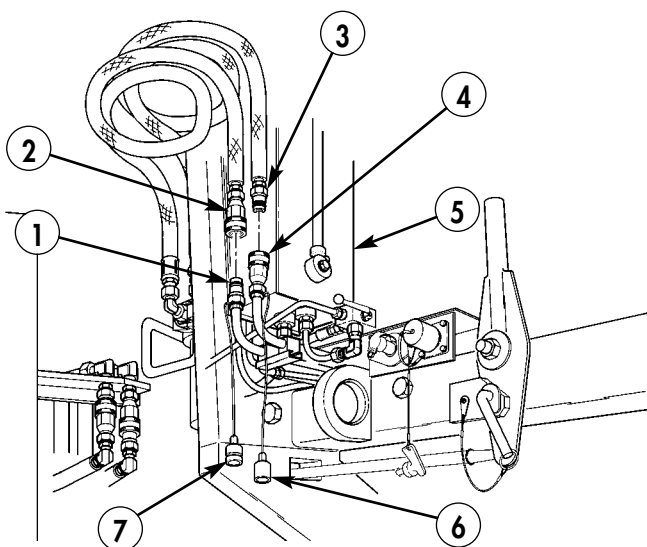
Hydraulic oil may be hot. Exercise caution when disconnecting pallet hydraulic supply hoses; wear gloves and safety glasses. Failure to comply may result in injury to personnel

### CAUTION

CBT backup power should only be used when LPU is inoperable. Use of CBT for continuous launch/retrieval cycles will overheat CBT hydraulic pump and may result in damage to equipment.

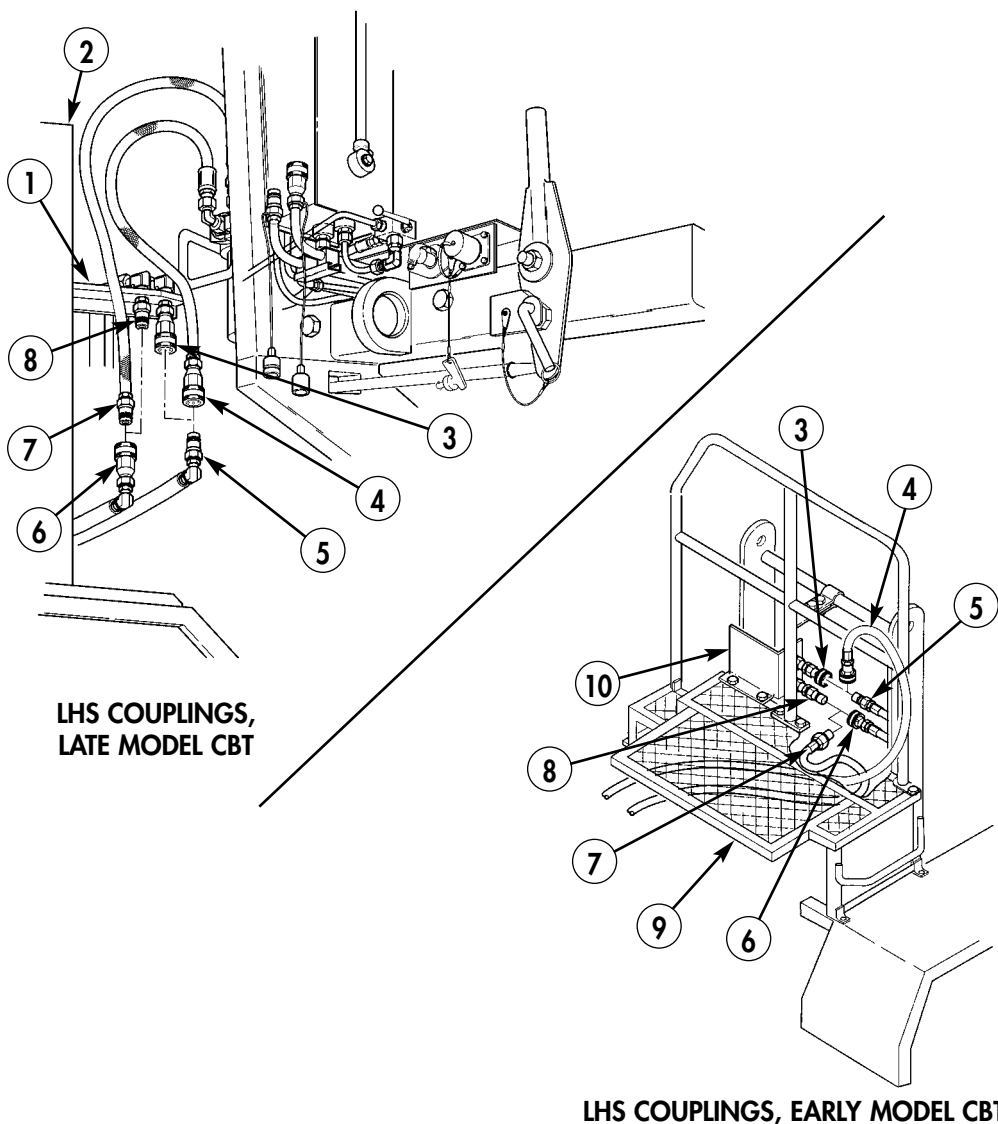
Prior to disconnecting/connecting hydraulic supply hoses, clean debris from couplings and catch residual oil with clean rags. Failure to comply may result in damage to equipment.

1. Disconnect pallet hydraulic supply hoses (2) and (3) from pallet hydraulic quick-disconnect couplings (1) and (4), located on A-frame adjacent to auxiliary reservoir (5). Install dust cap (6) and plug (7) on quick-disconnect couplings (1) and (4).



## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

2. Disconnect CBT hydraulic pump hoses (5) and (6) from LHS hydraulic supply quick-disconnect couplings (3) and (8), located on bracket (1) on late model CBTs or bracket (10) on early model CBTs.
3. Connect pallet hydraulic hoses (4) and (7) to CBT hydraulic pump hoses (5) and (6), located adjacent to LHS cabinet assembly (2) on late model CBTs, or at rear of work platform (9) on early model CBTs.



## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

### **CAUTION**

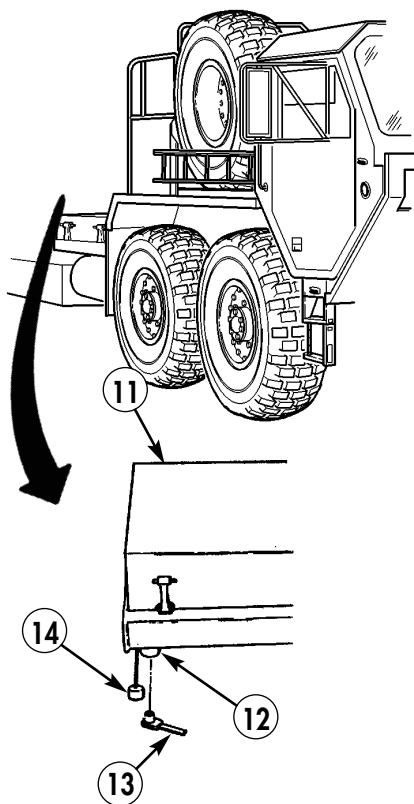
Ensure electrical connectors on slave receptacle and cannon plug are free of dirt, sand, and debris, or damage to equipment may result.

### **NOTE**

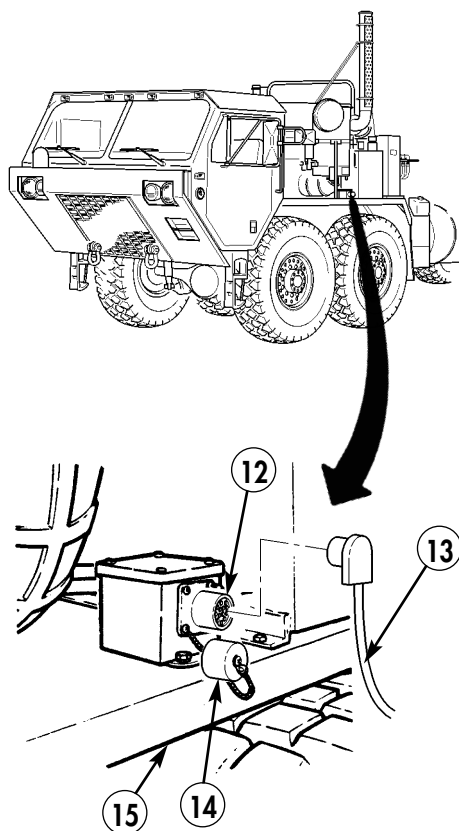
Perform steps 4 and 5 if pallet electrical power cable is not connected to North Atlantic Treaty Organization (NATO) slave receptacle on the transporter and pallet.

NATO slave receptacle may be located on either the battery box or the left front fender of CBT.

4. Remove dust cap (14) from NATO slave receptacle (12), located on CBT battery box (11) or fender (15), and connect power cable (13) to NATO slave receptacle (12).



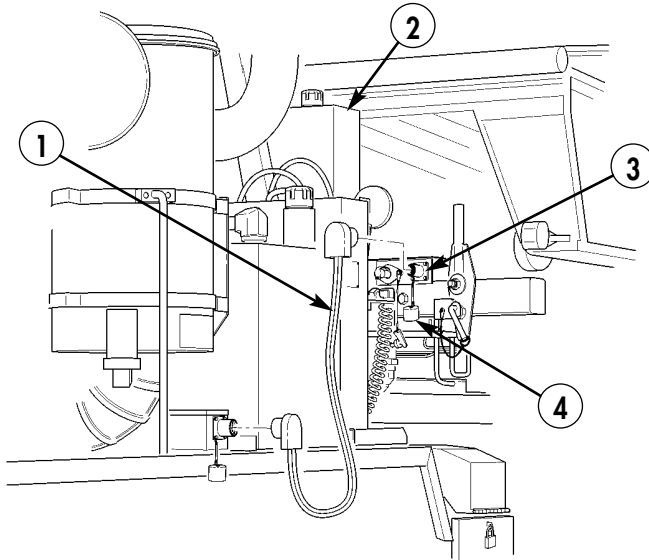
**SLAVE RECEPTACLE,  
BATTERY BOX LOCATION**



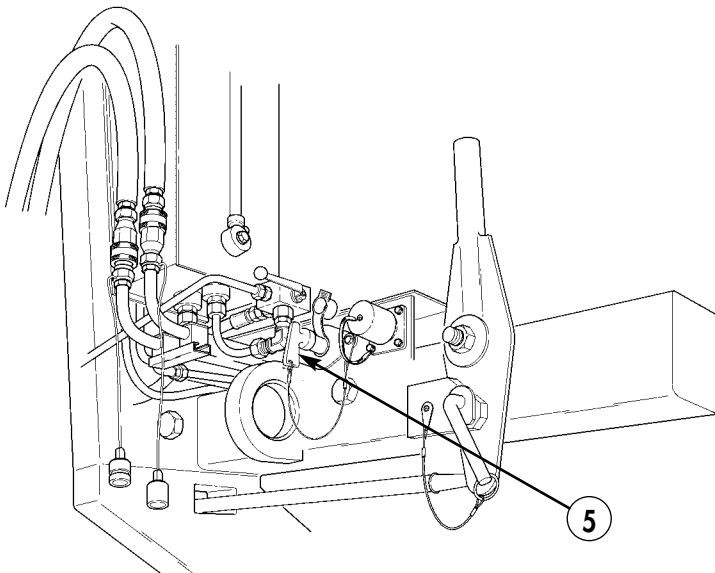
**SLAVE RECEPTACLE,  
LEFT FRONT FENDER LOCATION**

**OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL  
(Contd)**

5. Remove dust cap (4) from NATO slave receptacle (3), located on pallet adjacent to auxiliary reservoir (2), and connect power cable (1) to NATO slave receptacle (3).

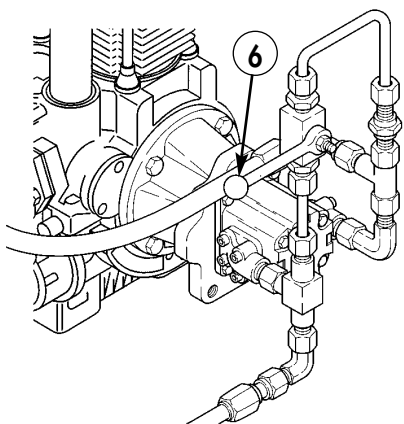


6. Check main power switch (5) to ensure it is in ON position. (Switch is on when key is in vertical position.)

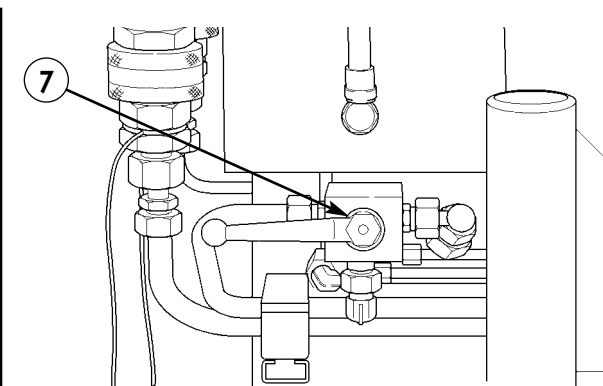
**ON POSITION**

## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

7. Check to ensure bypass valve (6) and transfer valve (7) are closed prior to operating CBT hydraulic pump.



**BYPASS VALVE, CLOSED POSITION**



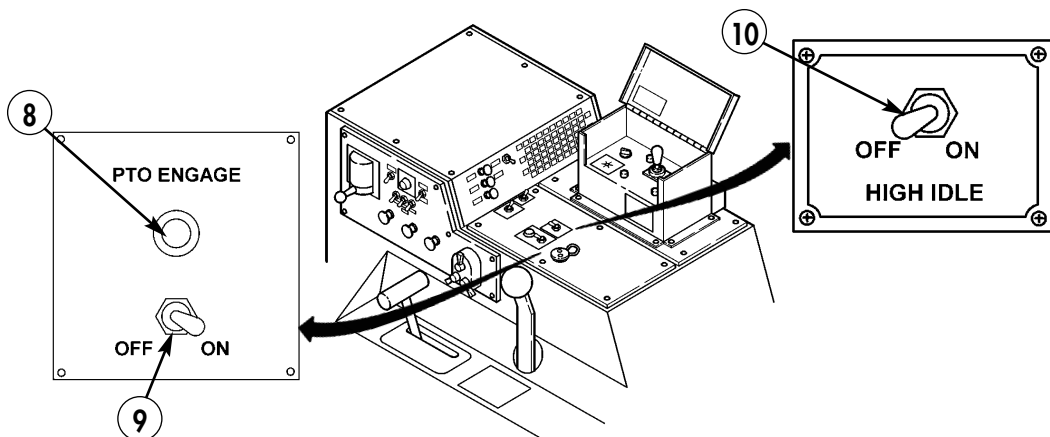
**TRANSFER VALVE, CLOSED POSITION**

8. Start CBT. Refer to TM 5-2320-279-10.

### **CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to vehicle transmission.

9. With HIGH IDLE switch (10) in OFF position, move PTO ENGAGE switch (9) to ON position. PTO ENGAGE indicator (8) will light.



**CBT CAB CONSOLE, EARLY MODEL SHOWN**

## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

### **CAUTION**

Failure to transfer residual hydraulic oil if power change from LPU to CBT occurs during launch or retrieval may result in overflow of oil or damage to equipment.

### **NOTE**

Should the Launch Power Unit (LPU) become inoperable during the middle of a bridge launch or retrieval, the Common Bridge Transporter (CBT) will be used to complete launch or retrieval. In this event, before completing launch or retrieval, a specific amount of oil from the CBT's hydraulic reservoir must be transferred to the pallet's auxiliary reservoir to prevent the CBT hydraulic reservoir from overflowing.

Ensure weight of oil in CBT and pallet hydraulic systems are the same prior to transferring oil. Change oil if necessary.

The amount of oil to be transferred will be determined using the Oil Transfer Table below.

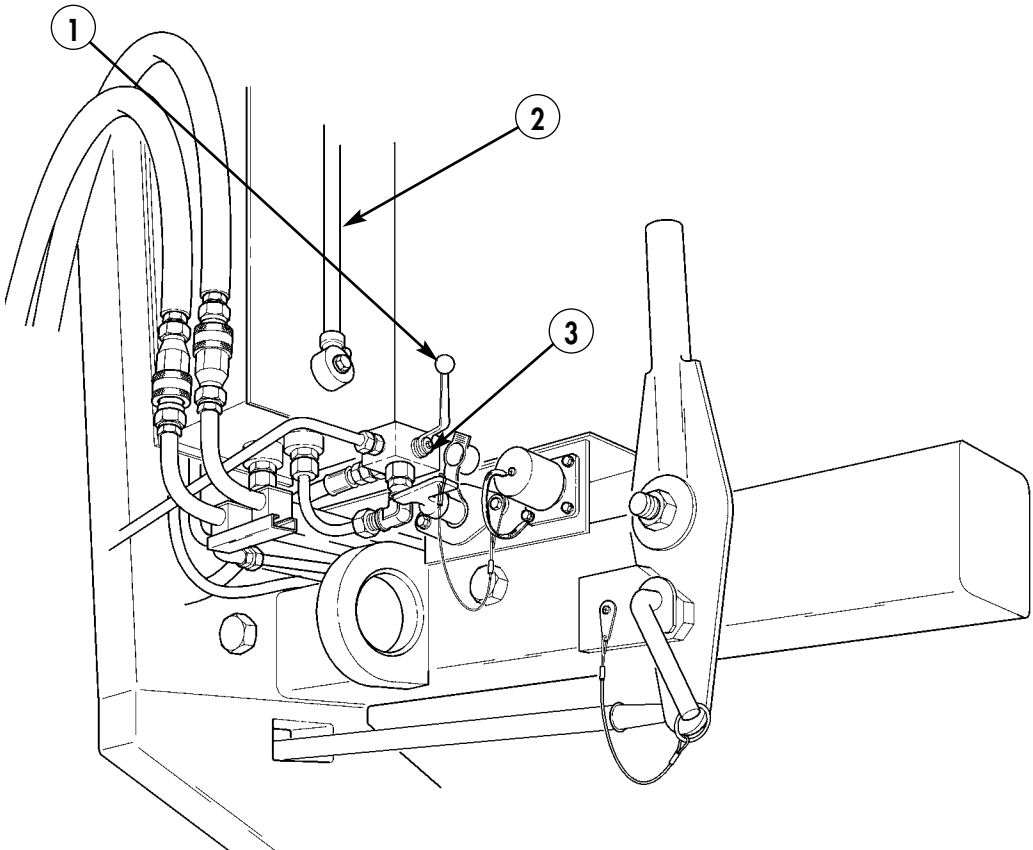
- Referring to digital display on pallet RCU, determine the launch or retrieval work step at time of power failure and the amount of oil to be transferred using the Oil Transfer table below.

*Oil Transfer Table.*

<b>Work Step</b>	<b>Mark No.</b>	<b>Oil quantity</b>
L1-L2	0	0 Liter
L3-L6	2	8.5 Liter
L7-L16	3	12.8 Liter
L17-L21	1	4.1 Liter
L22	0	0 Liter
R1	0	0 Liter
R2-R5	1	4.1 Liter
R6-R8	3	12.8 Liter
R19	2	8.5 Liter
R20-R22	0	0 Liter

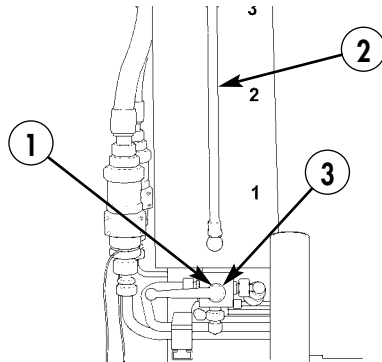
**OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL  
(Contd)**

11. While observing sight gauge (2), open transfer valve (3) by turning lever (1) until pointing up.

**TRANSFER VALVE, OPEN POSITION**

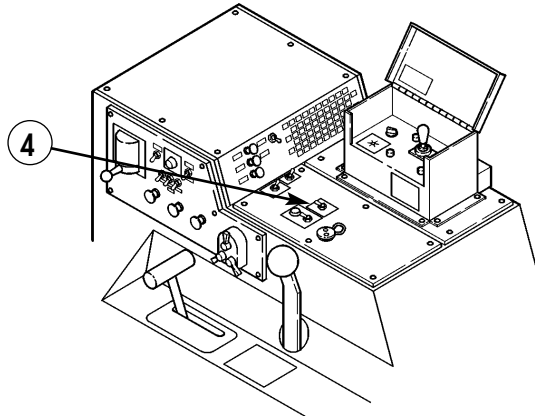
## OPERATION OF CBT BACK-UP POWER FOR BRIDGE LAUNCH OR RETRIEVAL (Contd)

12. Close transfer valve (3), by turning lever (1) until pointing to the left, once oil level in sight gauge (2) reaches mark 1, 2, or 3 as determined in step 10.



### TRANSFER VALVE, CLOSED POSITION

13. Move HIGH IDLE switch (4) to ON position and complete launch or retrieval. Refer to WP 0016 00 or WP 0020 00.



14. Switch from CBT back-up power to LPU. Refer to WP 0015 00.

### NOTE

Oil level in auxiliary reservoir sight gauge will take 24 hours or more to drain back to pallet main reservoir.

15. After completing launch or retrieval, check oil level in pallet main reservoir. Refer to WP 0007 00.

**END OF WORK PACKAGE**



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

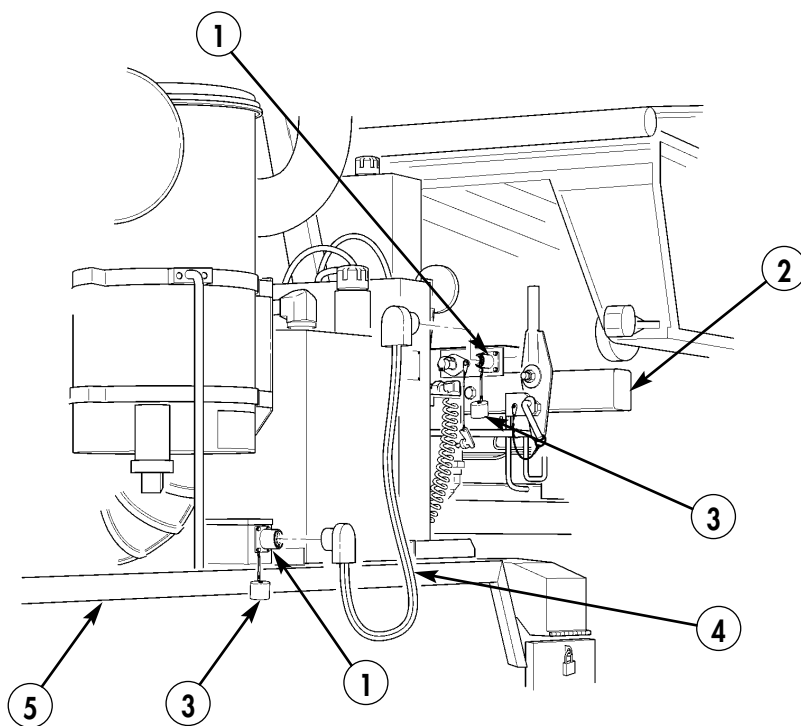
NSN 5420-01-481-3959 P/N 12480471

## CHARGING PALLET BATTERIES USING CBT

### NOTE

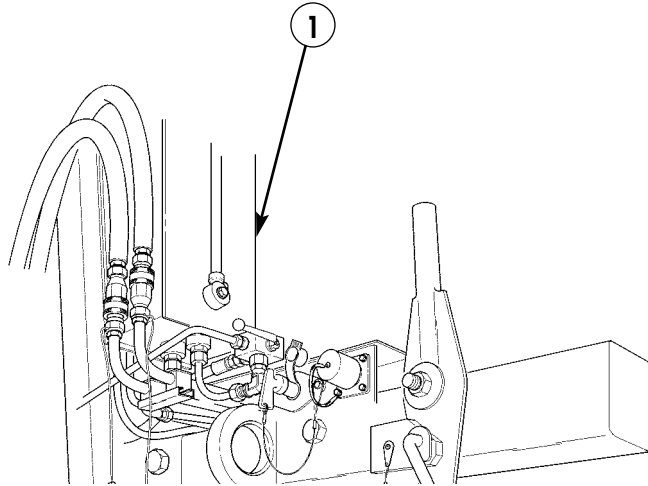
If pallet electrical system is inoperable or LPU engine will not crank when operating from pallet batteries (pallet electrical system is not connected to CBT), perform steps 1 through 6 to charge pallet batteries.

1. Remove dust cap (3) from NATO slave receptacle (1) at pallet (2) and CBT (5), and connect NATO slave power cable (4) to each receptacle (1).



## CHARGING PALLET BATTERIES USING CBT (Contd)

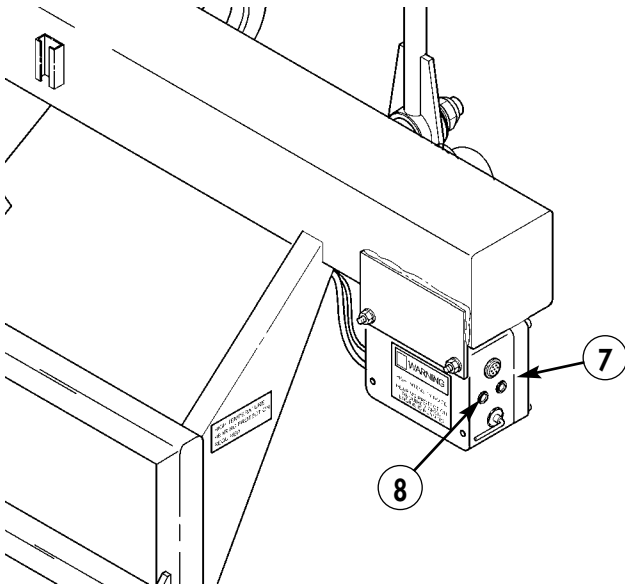
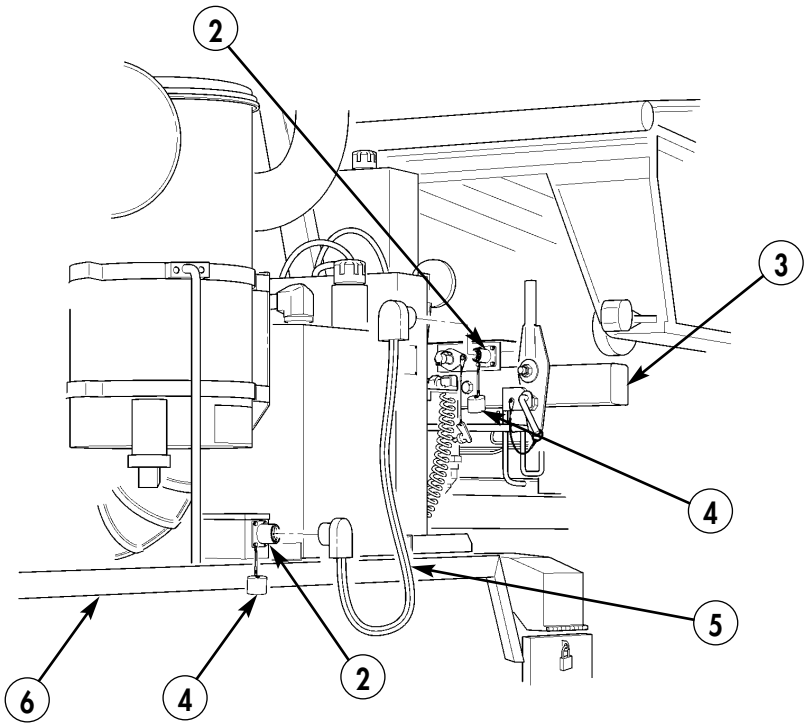
2. Turn main power switch (1) to ON position.



### MAIN POWER SWITCH, ON POSITION

3. Start CBT (6) and run engine at high idle for approximately 15 minutes, then stop engine. Refer to TM 9-2320-279-10.
4. Disconnect NATO slave power cable (5) from NATO slave receptacle (2) at CBT (6) and pallet (3), and install dust cap (4) on each receptacle (2).
5. Power up RCU to verify batteries are charged. Refer to WP 0016 00.
6. Start LPU engine. Refer to WP 0015 00. If battery charge indicator light (8) on APU control box (7) goes out after starting LPU engine, pallet batteries are fully charged. If light (8) remains on after starting, run LPU engine until light (8) goes out.

### CHARGING PALLET BATTERIES USING CBT (Contd)



END OF WORK PACKAGE



## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## MANUALLY LOADING PALLET FROM GROUND

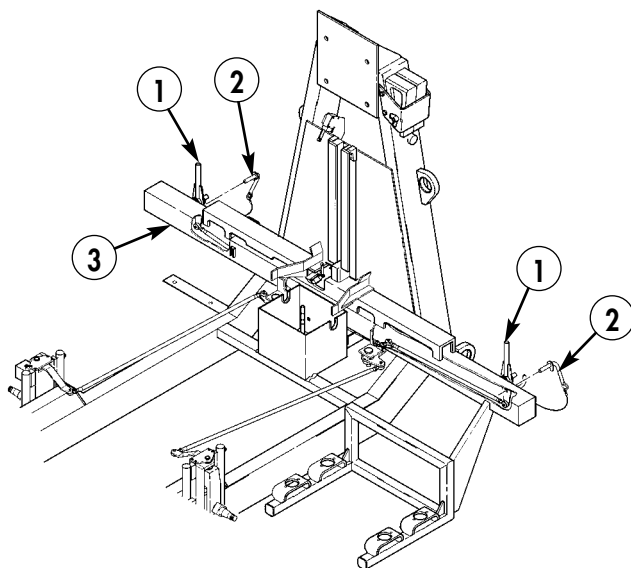
### NOTE

The following manual mode operations using cab control box are to be performed only when normal AUTO mode electric circuit is malfunctioning.

During all transporter operations, Common Bridge Transporter (CBT) operator will drive and be responsible for operation of Load Handling System (LHS) via the cab control box or remote control unit. The assistant will act as a ground guide, be responsible for directing operator using hand signals, and assist operator as needed.

Perform step 1 if pallet support wheel steering levers are not locked in the straight-ahead position.

1. Move steering levers (1) right or left until retaining pins (2) can be inserted through holes in steering levers (1) and pallet frame (3), then install retaining pins (2).



## MANUALLY LOADING PALLET FROM GROUND (Contd)

### **CAUTION**

Ensure both steering axles are locked in the raised position prior to loading pallet on transporter, or damage to equipment may result.

Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (235 bar). If pressure on gauge reaches 3,626 psi (250 bar), stop and check for obstructions. Do not exceed 3,626 psi (250 bar), or damage to equipment may result.

### **NOTE**

Perform step 2 if the steering and fixed axles are in lowered position.

2. Raise steering axles (1) and fixed axles (2) as follows:
  - a. Position selector valve lever (3) in POSITION 1 or pointing left of center, and move control valve lever (4) to position A or left of center.
  - b. Install pump handle on pump lever (5), and operate hydraulic pump (6) until steering axles (1) and fixed axles (2) are fully raised. Remove and stow pump handle.

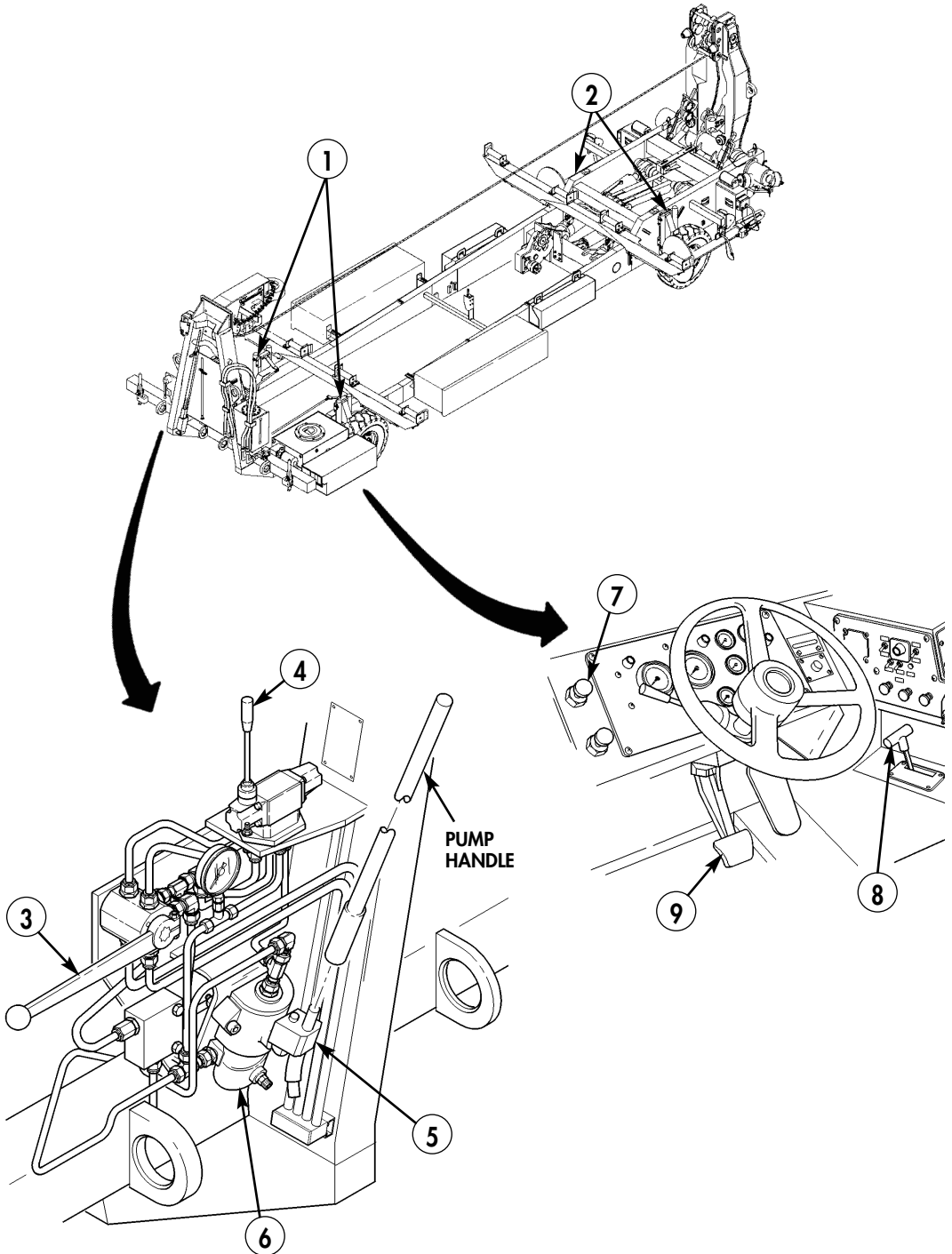
### **CAUTION**

Assistant will act as ground guide when backing up CBT and during operation of LHS. Failure to comply may result in damage to equipment.

Prior to loading pallet from ground, ensure transload roller bar has been removed from pallet lower support boom or damage to equipment may result.

3. Back up CBT so that rear of vehicle is directly in line with pallet and approximately 5 to 6 ft (1.5 to 1.8 m) away, then apply service brake (9), move transmission selector lever (8) to N (neutral) and pull **PARKING BRAKE** control (7) out.

# MANUALLY LOADING PALLET FROM GROUND (Contd)



## MANUALLY LOADING PALLET FROM GROUND (Contd)

### **WARNING**

All non-essential personnel will stand a minimum of 30 ft (9 m) away from pallet and bridge during loading/unloading operations. Failure to comply may result in injury or death to personnel.

### **CAUTION**

High idle switch must be in OFF position prior to engaging PTO. Failure to comply may result in damage to vehicle transmission or LHS.

### **NOTE**

Operator will perform steps 4 through 21 using LHS cab control box.

4. With HIGH IDLE switch (4) in OFF position, move PTO ENGAGE switch (6) to ON position. PTO ENGAGE indicator (5) will light.
5. Turn LHS MODE SELECT switch (1) to HOOK ARM ONLY (position 2).
6. Move HIGH IDLE switch (4) to ON position.

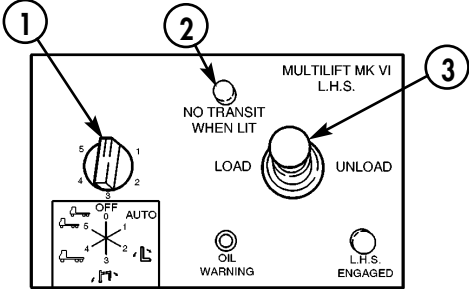
### **NOTE**

LHS ENGAGED indicator will light up whenever joystick is held in LOAD or UNLOAD position.

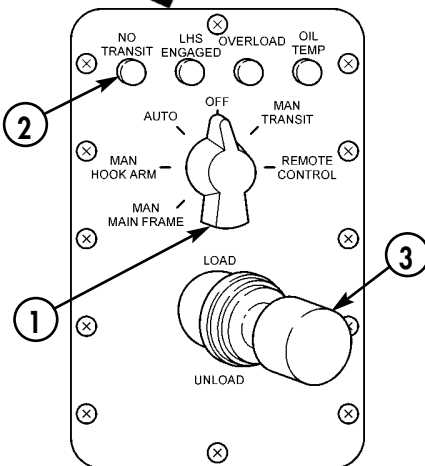
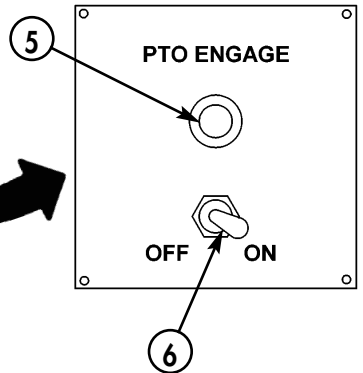
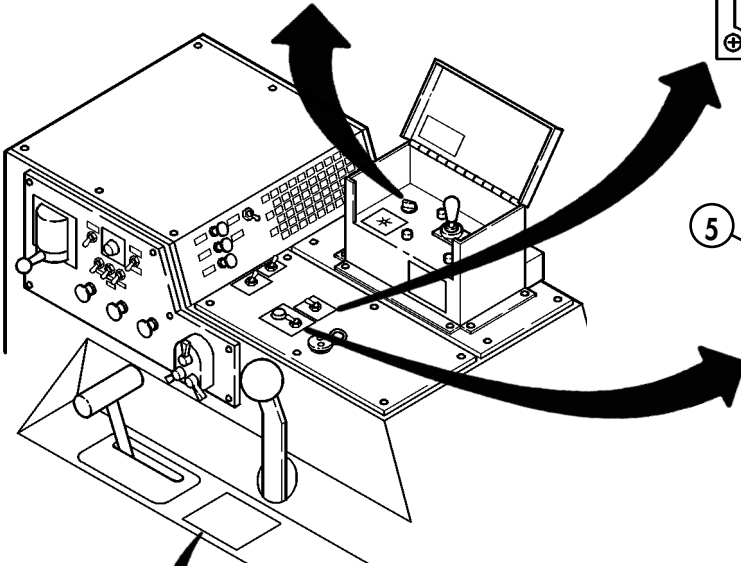
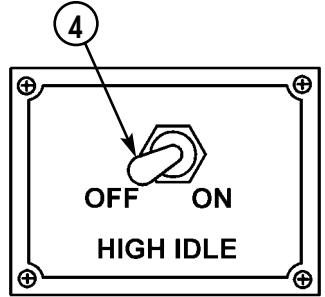
7. Hold joystick (3) in UNLOAD position until LHS hook arm (8) is fully extended rearward, then release joystick (3).
8. Move HIGH IDLE switch (4) to OFF position.
9. Turn LHS MODE SELECT switch (1) to MAIN FRAME ONLY (position 3).
10. Move HIGH IDLE switch (4) to ON position.
11. Hold joystick (3) in UNLOAD position until LHS main frame (7) is extended, then release joystick (3).
12. Move HIGH IDLE switch (4) to OFF position.



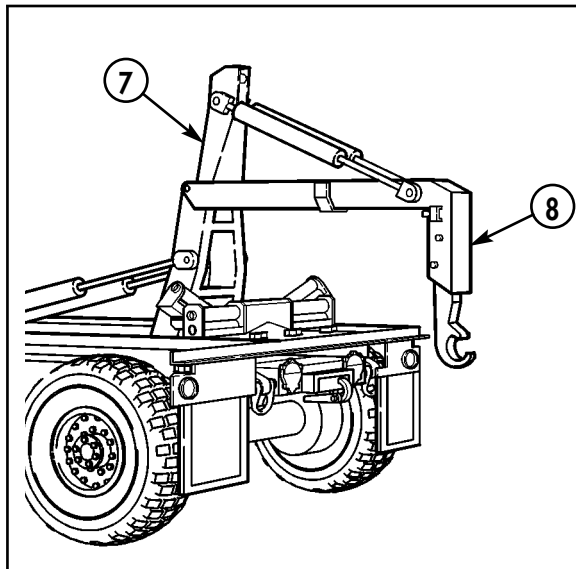
# MANUALLY LOADING PALLET FROM GROUND (Contd)



EARLY MODEL LHS CONTROL PANEL



LATE MODEL LHS CONTROL PANEL



## MANUALLY LOADING PALLET FROM GROUND (Contd)

### **CAUTION**

Ensure HIGH IDLE switch is in OFF position prior to placing vehicle transmission in gear, or damage to transmission may occur.

If hook end of LHS hook arm is not properly connected to pallet hook bar, assistant must immediately signal operator to stop loading procedure. Move CBT forward and repeat steps 13 and 14, or damage to equipment may result.

### **NOTE**

It may be necessary to adjust height of hook arm when backing up CBT. Assistant will signal operator.

13. Back up CBT until end of hook arm (2) is centered directly under pallet hook bar (1), then apply service brake (5), move transmission selector lever (4) to N (neutral), and pull PARKING BRAKE control (3) out.
14. Hold joystick (8) in LOAD position until LHS hook arm (2) is fully connected to pallet hook bar (1), then release joystick (8).
15. Push PARKING BRAKE control (3) in, and take foot off service brake (5).

### **WARNING**

When NO TRANSIT WHEN LIT indicator is illuminated, CBT may be maneuvered in the immediate vicinity of loading/unloading site, but should not be driven on open road. Failure to comply may result in damage to equipment and possible injury or death to personnel.

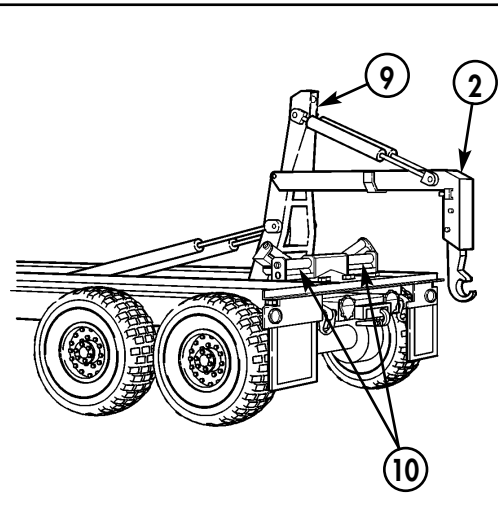
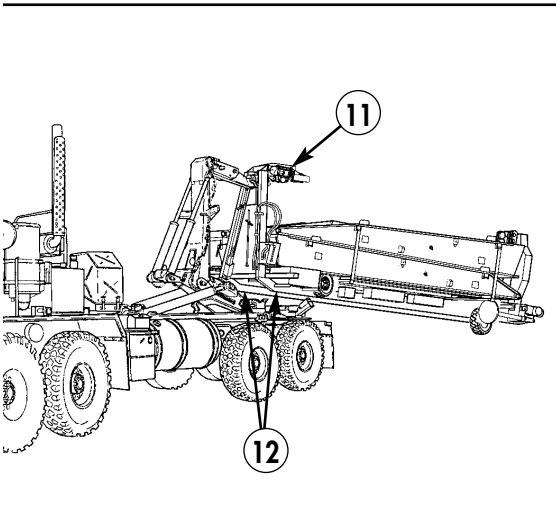
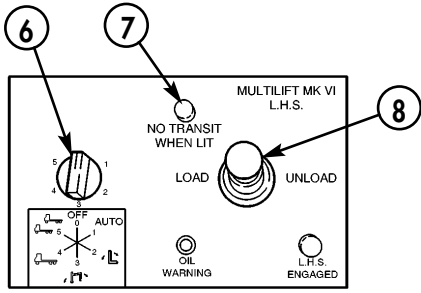
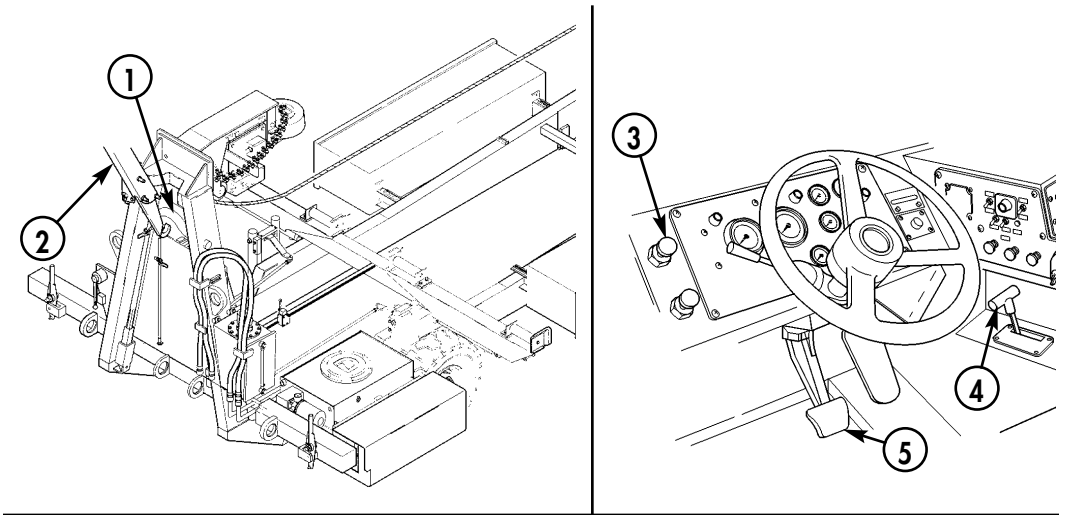
CBT will roll backward when loading pallet from ground. All personnel must stand clear. Failure to comply may result in serious injury.

### **NOTE**

When loading pallet, its runners must line up with LHS rear rollers, and it may become necessary to steer transporter straight under pallet as it is lifted from ground.

16. Hold joystick (8) in LOAD position until pallet runners (12) contact LHS rear rollers (10) and pallet (11) clears ground, then release joystick (8) and pull PARKING BRAKE control (3) out.
17. Hold joystick (8) in LOAD position until pallet (11) is loaded, LHS main frame (9) is fully stowed, and NO TRANSIT WHEN LIT indicator (7) is off, then release joystick (8).
18. Turn LHS MODE SELECT switch (6) to HOOK ARM ONLY (position 2).
19. Hold joystick (8) in LOAD position until LHS hook arm (2) is fully stowed and NO TRANSIT WHEN LIT indicator (7) is off, then release joystick (8).

**MANUALLY LOADING PALLET FROM GROUND (Contd)**



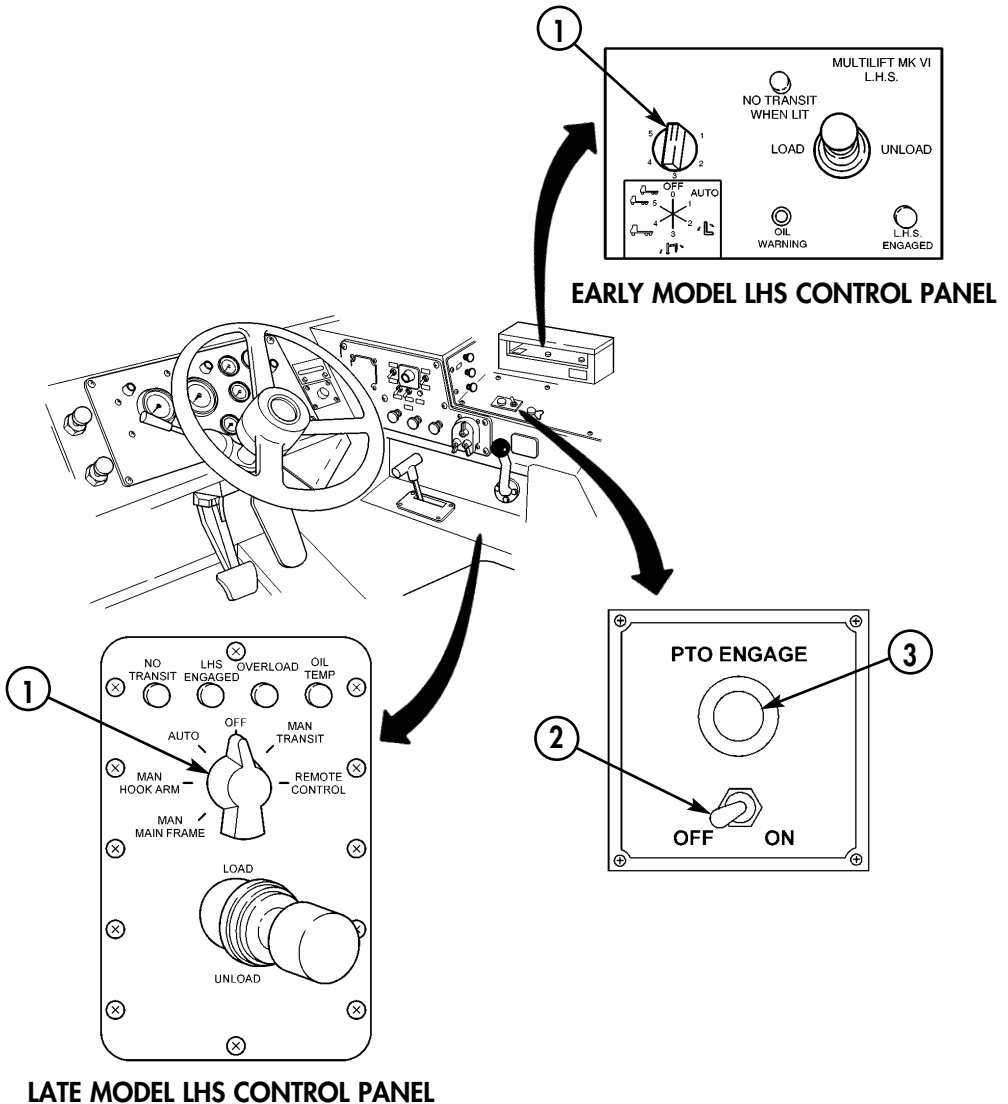
## MANUALLY LOADING PALLET FROM GROUND (Contd)

20. Move PTO ENGAGE switch (2) to OFF position. PTO ENGAGE indicator light (3) should go out.

### **CAUTION**

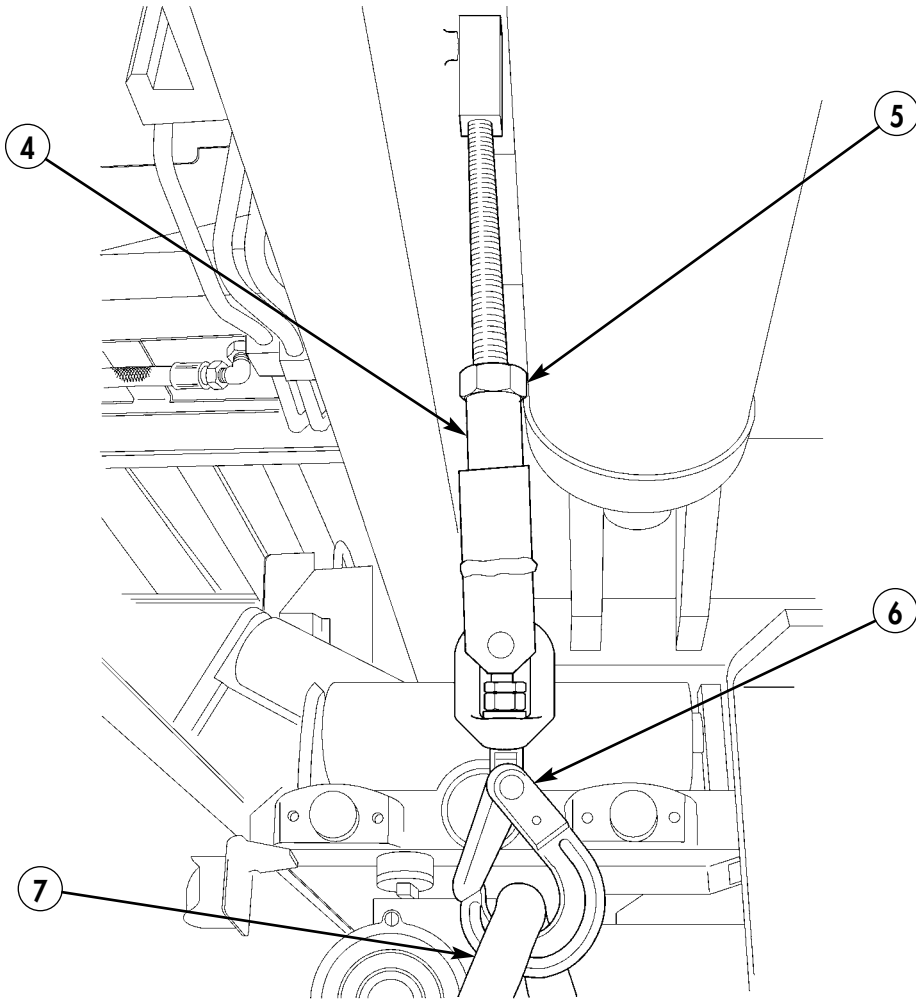
LHS mode select switch must be in 0 (OFF/TRANSPORT) position prior to road travel, or damage to LHS main frame and hook arm cylinders may result.

21. Turn LHS MODE SELECT SWITCH (1) to 0 (OFF position).



**MANUALLY LOADING PALLET FROM GROUND (Contd)**

22. Remove two pallet hold-down bars (4) from stowed position, and connect hook (6) on each hold-down bar (4) to CBT towing shackles (7). Tighten both hold-down bars (4) and jamnuts (5).



23. Install two transload rollers on fixed axles. Refer to WP 0007 00.

**END OF WORK PACKAGE**

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## OPERATOR INSTRUCTIONS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## MANUALLY UNLOADING PALLET TO GROUND

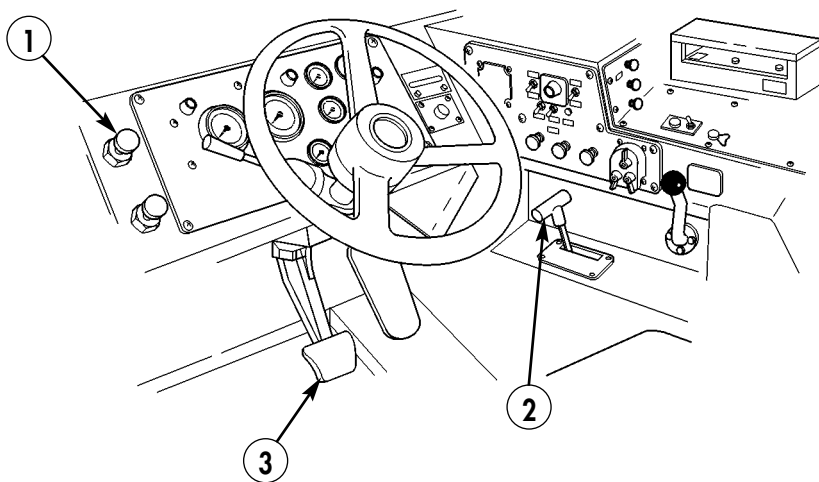
### **CAUTION**

Assistant will act as ground guide when maneuvering the Common Bridge Transporter (CBT) and during operation of the Load Handling System (LHS). Failure to comply may result in damage to equipment.

### **NOTE**

During all transporter operations, the CBT operator will drive and be responsible for operation of the LHS via the cab and remote control boxes. The assistant will act as a ground guide, be responsible for directing the operator using hand signals, and assist the operator as needed.

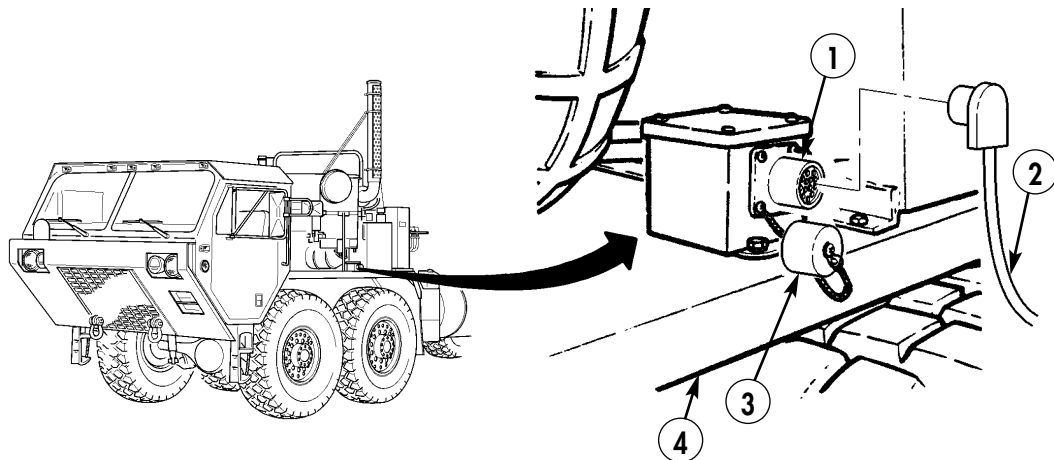
1. Position CBT so that rear of vehicle is approximately 16 ft (4.9 m) in front of where pallet is to set on ground, apply service brake (3), move transmission selector lever (2) to N (neutral), and pull parking brake control (1) out.



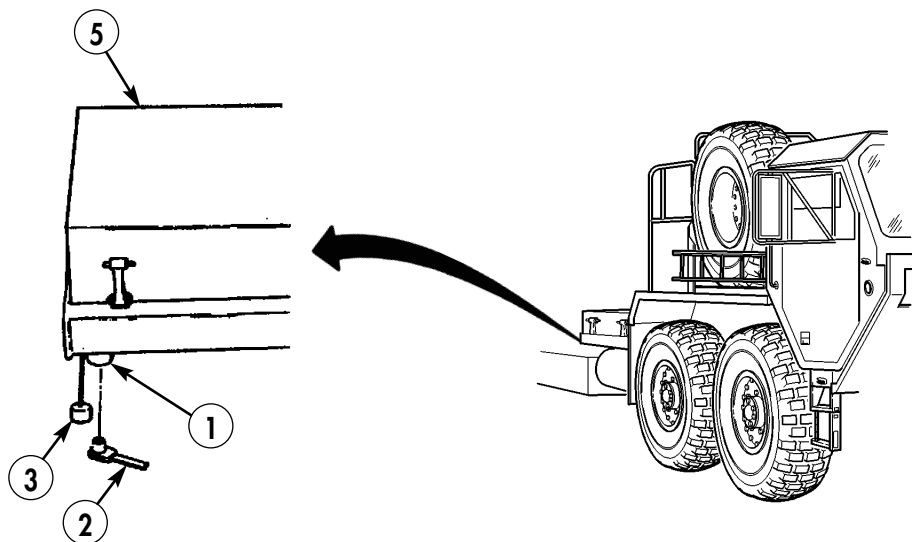
**MANUALLY UNLOADING PALLET TO GROUND (Contd)****NOTE**

Perform steps 2 through 8 if pallet electrical and hydraulic systems are connected to the CBT.

2. Disconnect power cable (2) from NATO slave receptacle (1), located on front fender (4) or CBT battery box (5), and install dust cap (3) on NATO slave receptacle (1).



**SLAVE RECEPTACLE,  
LEFT FRONT FENDER LOCATION**

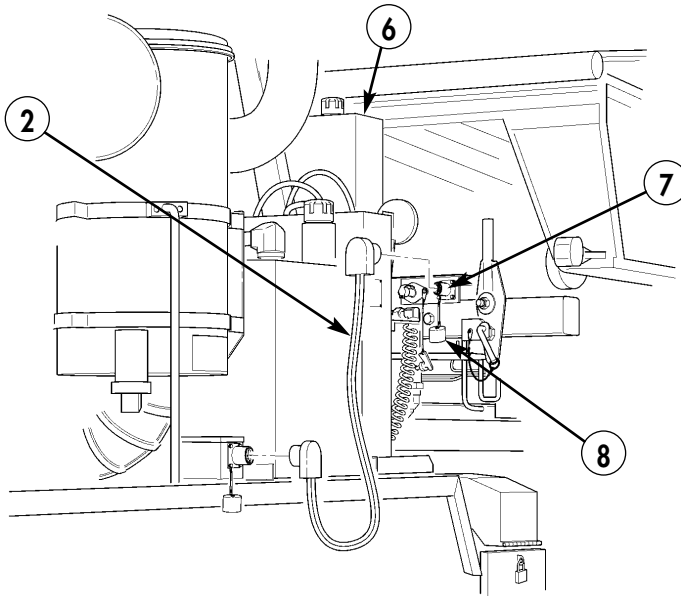


**SLAVE RECEPTACLE,  
BATTERY BOX LOCATION**

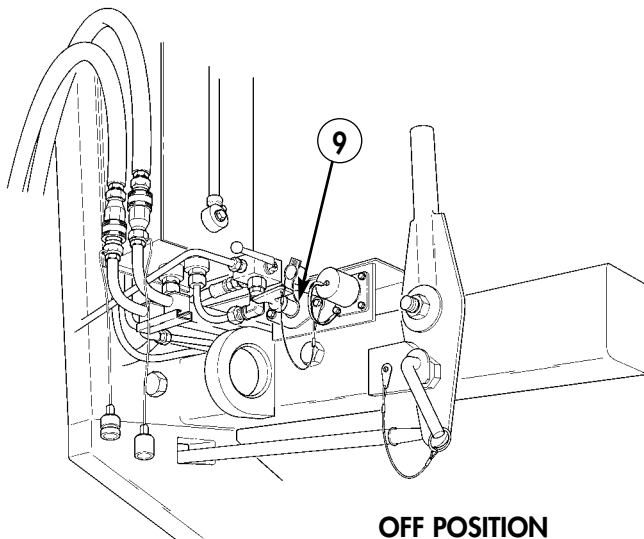


## MANUALLY UNLOADING PALLET TO GROUND (Contd)

3. Disconnect and remove power cable (2) from NATO slave receptacle (7), located on pallet adjacent to auxiliary reservoir (6), and install dust cap (8) on NATO slave receptacle (7).

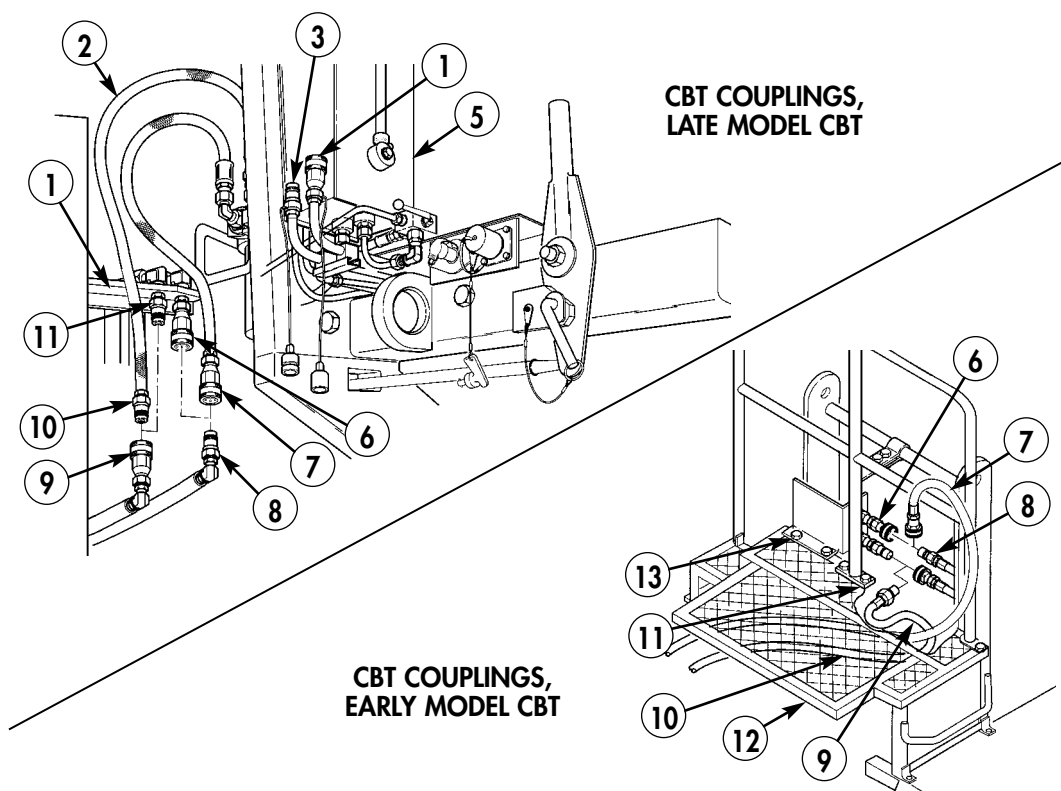


4. Check main power switch (9) to ensure it is in OFF position. (Switch is off when key is in horizontal position.)



## MANUALLY UNLOADING PALLET TO GROUND (Contd)

5. Disconnect pallet hydraulic supply hoses (7) and (10) from CBT hydraulic pump hoses (8) and (9), located adjacent to LHS cabinet assembly (2) on late model CBTs, or at rear of work platform (12) on early model CBTs.
6. Connect CBT hydraulic pump hoses (8) and (9) to LHS hydraulic supply quick-disconnect couplings (6) and (11), located on bracket (1) on late model CBTs, or bracket (13) on early model CBTs.
7. Connect pallet hydraulic hoses (7) and (10) to pallet hydraulic quick-disconnect couplings (3) and (4), located on pallet A-frame adjacent to auxiliary reservoir (5).



### **CAUTION**

Ensure transload rollers and transload roller bar have been removed from pallet prior to unloading pallet to ground. Failure to comply may result in damage to equipment.

## MANUALLY UNLOADING PALLET TO GROUND (Contd)

8. Remove two transload rollers from fixed axles and stow in pallet toolboxes. Refer to WP 0007 00.

### NOTE

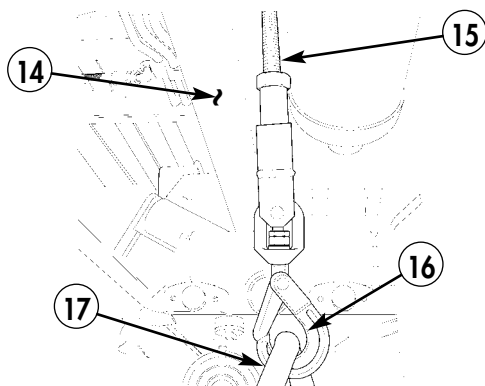
Perform step 9 if transload roller bar is installed on lower support boom.

9. Remove transload roller bar from lower support boom and stow in either pallet toolbox. Refer to WP 0007 00.

### NOTE

Assistant will help install transload roller bar.

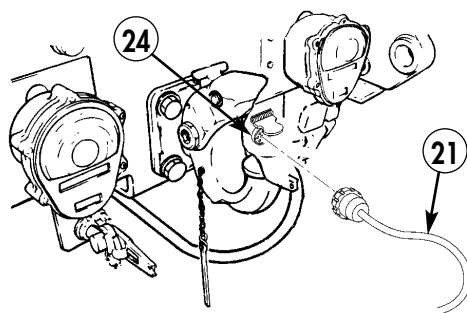
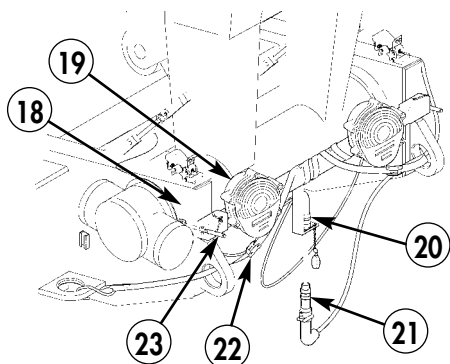
10. Disconnect pallet hold-down bar hook (16) from CBT towing shackle (17) at each side of pallet frame (14), and place both hold-down bars (15) in stowed position. Refer to WP 0007 00.



### NOTE

Perform steps 11 and 12 if bridge is on pallet and auxiliary light bar is installed.

11. Remove auxiliary light bar (19) from pallet frame girders (18) by removing safety strap (22) and releasing two clamps (23).
12. Disconnect power cable (21) from auxiliary light bar connector (20) and CBT electrical connector (24).



## MANUALLY UNLOADING PALLET TO GROUND (Contd)

### NOTE

Perform step 13 if steering axles and fixed axles are in the lowered position.

Removal and installation of retaining pins on steering and fixed axles is the same. Left steering axle is shown.

13. Raise steering axles (2) and fixed axles (3) as follows:

- a. Position selector valve lever (4) in POSITION 1 or pointing to the left, and move control valve lever (5) to POSITION A or left of center.

### CAUTION

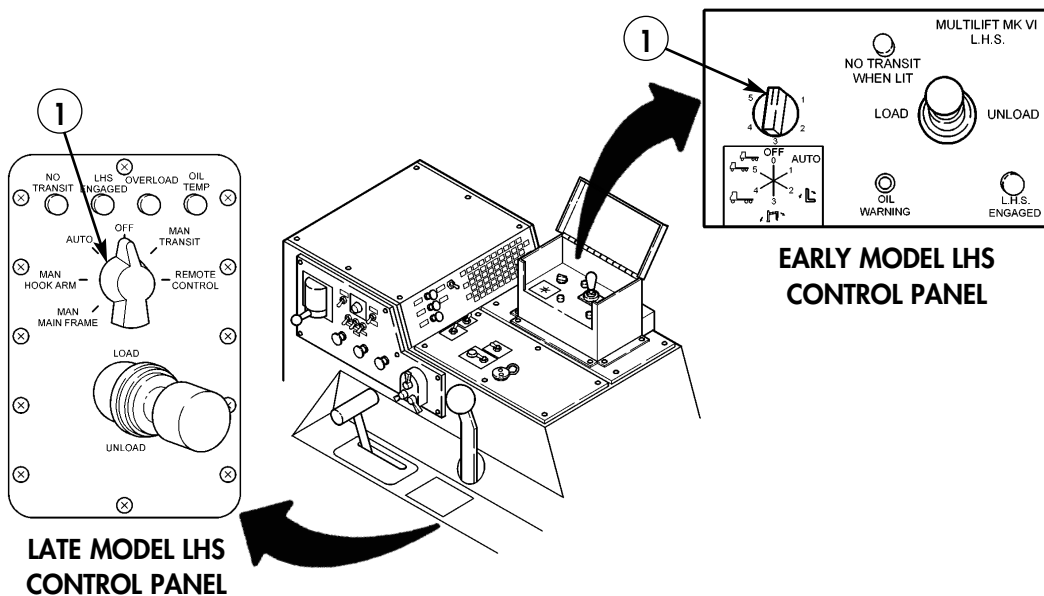
Operating pressure range of hydraulic pump is 2,611 psi (180 bar) to 3,408 psi (235 bar). If pressure on gauge reaches 3,626 psi (250 bar), stop and check for obstructions. Do not exceed 3,626 psi (250 bar) or damage to equipment may result.

- b. Install pump handle on pump lever (6), and operate hydraulic pump (7) until steering axles (2) and fixed axles (3) are fully raised. Remove and stow pump handle.

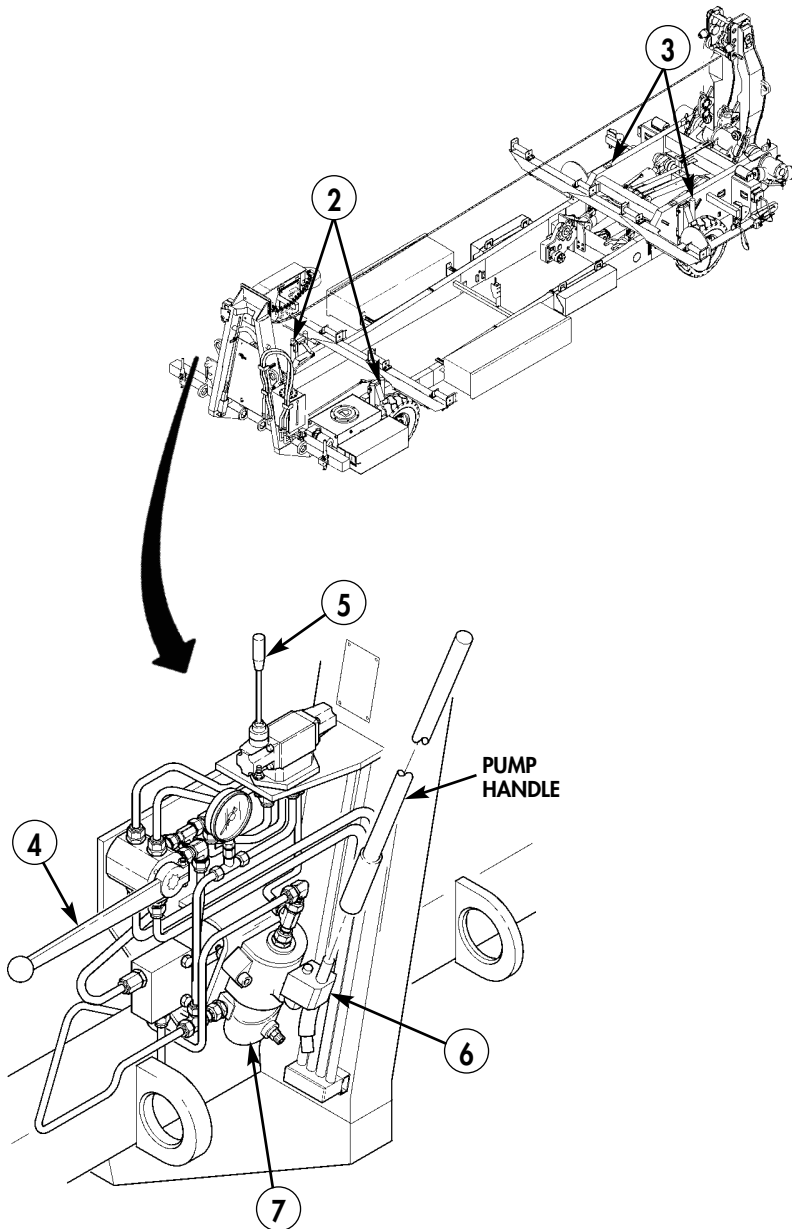
### NOTE

Operator will perform steps 14 through 30 using LHS control box.

14. Turn LHS MODE SELECT switch (1) to HOOK ARM ONLY (position 2).



MANUALLY UNLOADING PALLET TO GROUND (Contd)



## MANUALLY UNLOADING PALLET TO GROUND (Contd)

### **CAUTION**

High idle switch must be in the OFF position prior to engaging PTO. Failure to comply may result in damage to the vehicle transmission or the LHS.

15. With HIGH IDLE switch (5) in OFF position, turn PTO ENGAGE switch (3) to ON position. PTO ENGAGE indicator (4) will light.

### **WARNING**

When the NO TRANSIT WHEN LIT indicator is illuminated, the CBT may be maneuvered in the immediate vicinity of the loading/unloading site, but should not be driven on the open road. Failure to comply may result in damage to equipment and possible injury or death to personnel.

Ensure fastening rods are installed and secure, and there is sufficient overhead clearance to unload pallet or damage to equipment or possible injury or death to personnel may result.

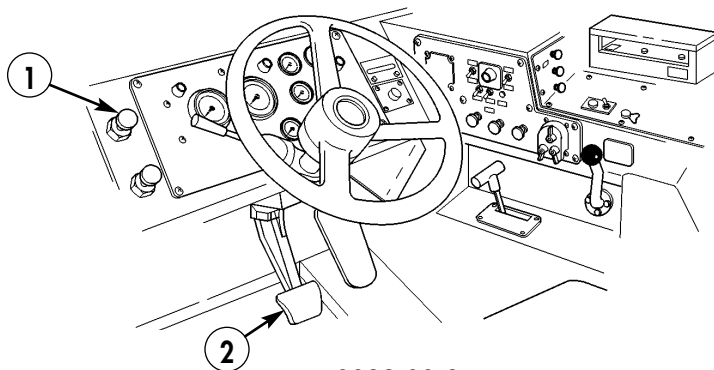
All non-essential personnel will stand a minimum of 30 ft (9 m) away from pallet and bridge during loading and unloading operations. Failure to comply may result in injury or death to personnel.

CBT will roll forward when unloading pallet to ground. All personnel must stand clear. Failure to comply may result in serious injury.

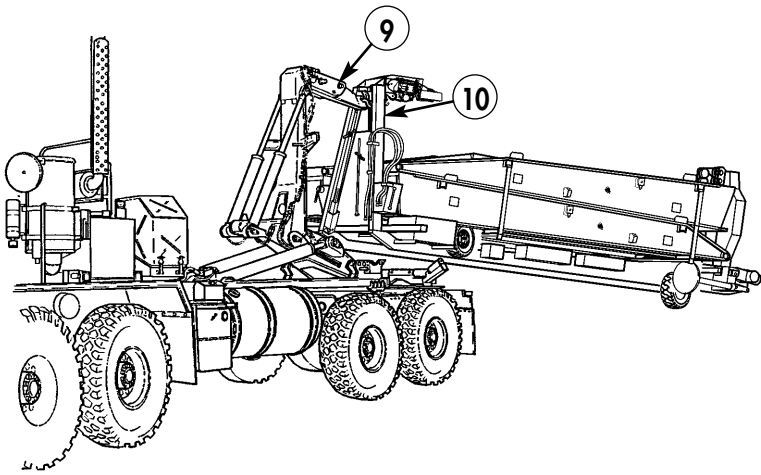
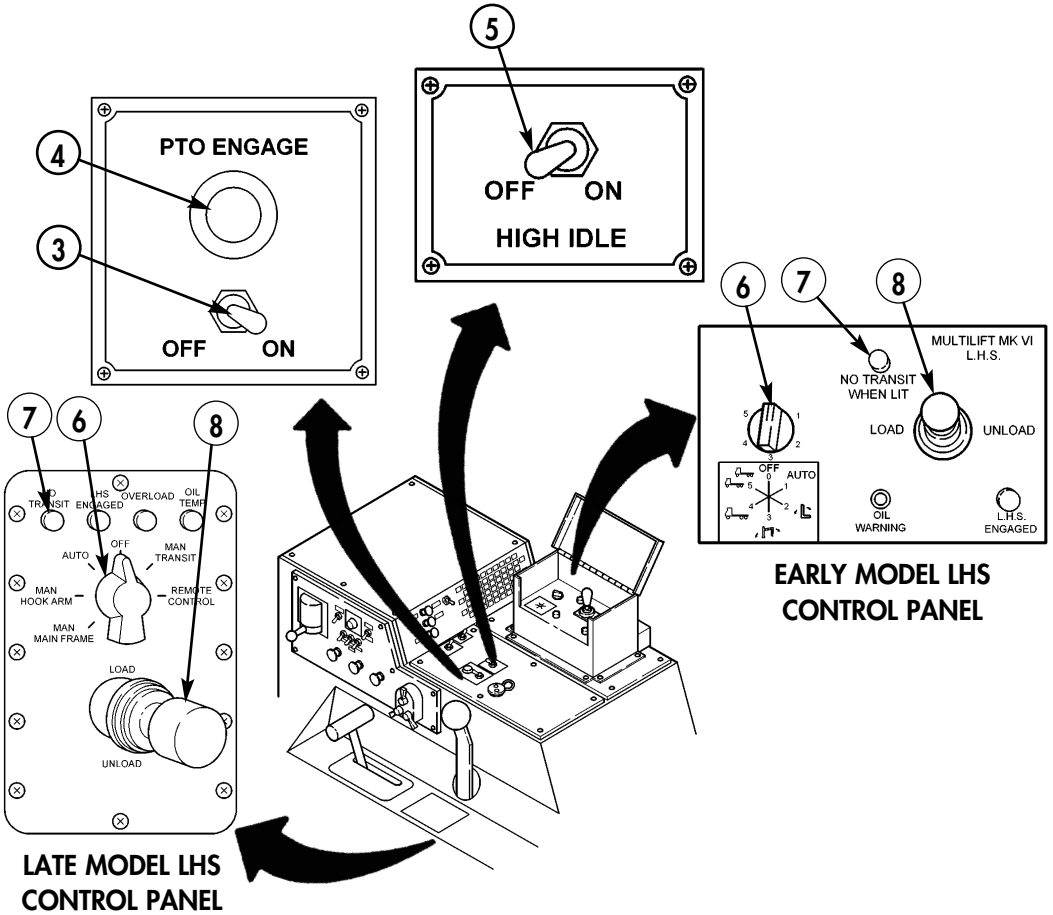
### **NOTE**

The LHS ENGAGED indicator will light up whenever the joystick is held in the LOAD or UNLOAD position.

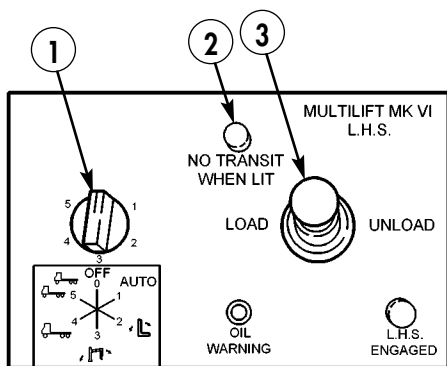
16. Hold joystick (8) in UNLOAD position until LHS hook arm (9) raises pallet (10) and completes its full movement rearward, then release joystick (8). NO TRANSIT WHEN LIT indicator (7) will light.
17. Push PARKING BRAKE control (1) in, and take foot off service brake (2).
18. Turn LHS MODE SELECT switch (6) to MAIN FRAME ONLY (position 3).



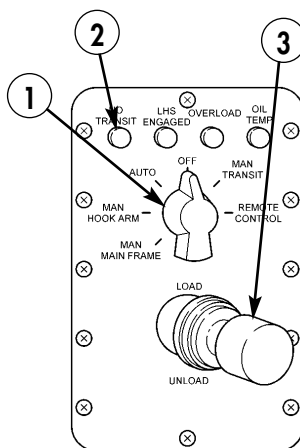
# MANUALLY UNLOADING PALLET TO GROUND (Contd)



**MANUALLY UNLOADING PALLET TO GROUND (Contd)**



**EARLY MODEL LHS CONTROL PANEL**

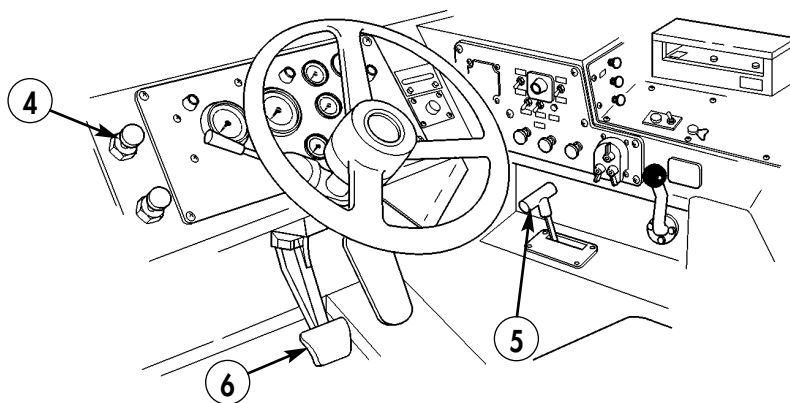


**LATE MODEL LHS CONTROL PANEL**

**NOTE**

CBT should be in neutral and parking brake released to allow transporter to roll forward when unloading pallet.

19. Hold joystick (3) in UNLOAD position until front end of pallet (9) rests on ground, then release joystick (3) and set parking brake by pulling PARKING BRAKE control (4) out.



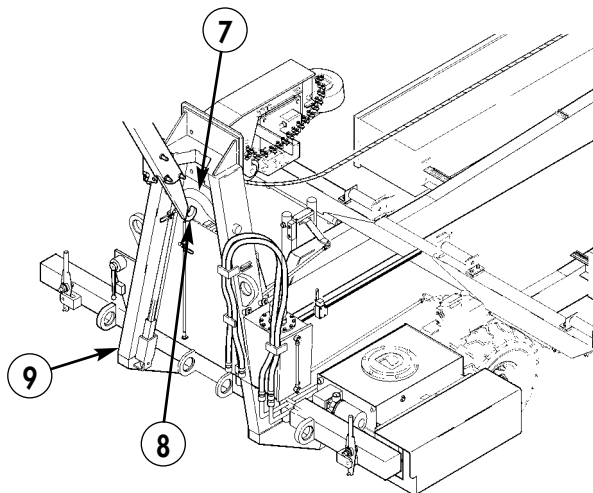
**NOTE**

If LHS hook arm does not disengage, drive CBT forward 2 in. (5 cm) and repeat step 20.

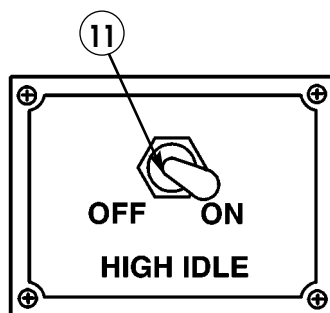
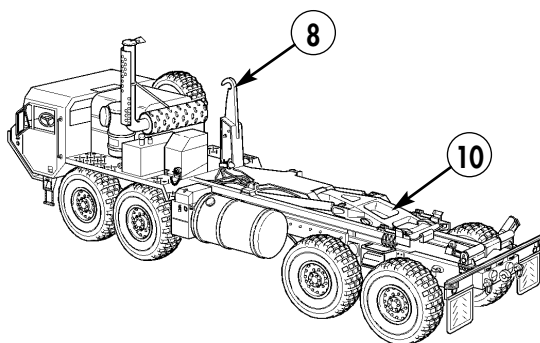
20. Hold joystick (3) in UNLOAD position until end of LHS hook (8) is fully disconnected from pallet hook bar (7).



## MANUALLY UNLOADING PALLET TO GROUND (Contd)



21. Push PARKING BRAKE control (4) in and drive CBT forward approximately 5 ft (1.5 m), then apply service brake (6), move transmission selector lever (5) to N (neutral), and set parking brake by pulling PARKING BRAKE control (4) out.
22. Move HIGH IDLE switch (11) to ON position.
23. Hold joystick (3) in LOAD position until main frame (10) is fully stowed, then release joystick (3).
24. Move HIGH IDLE switch (11) to OFF position.
25. Turn LHS MODE SELECT switch (1) to HOOK ARM ONLY (position 2).
26. Move HIGH IDLE switch (11) to ON position.
27. Hold joystick in LOAD position until hook arm (8) is fully stowed and NO TRANSIT WHEN LIT indicator (2) is off.



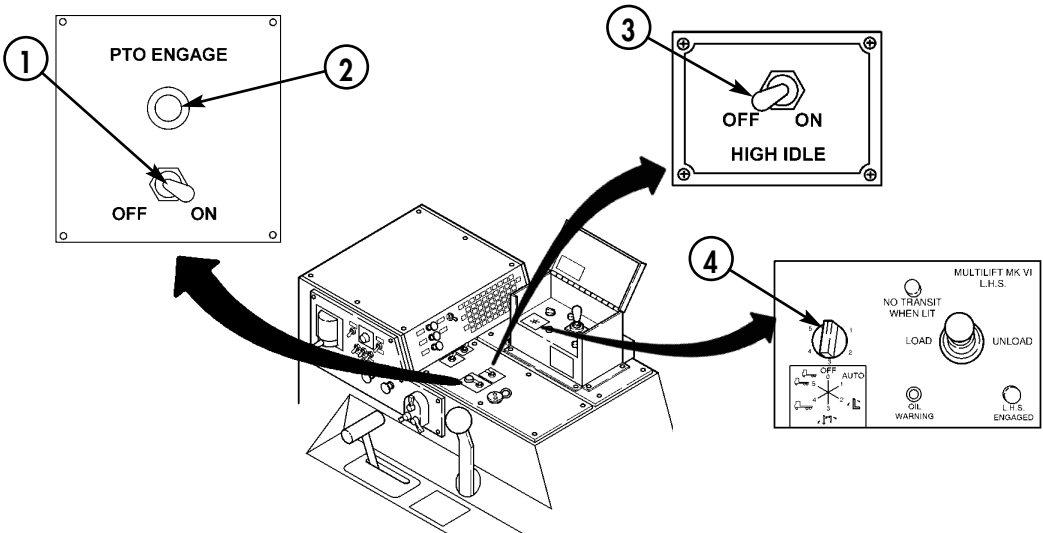
## MANUALLY UNLOADING PALLET TO GROUND (Contd)

28. Move HIGH IDLE switch (3) to OFF position.
29. Move PTO ENGAGE switch (1) to OFF position. PTO ENGAGE indicator (2) should go off.

### **CAUTION**

The LHS mode select switch must be in the 0 (OFF/TRANSPORT) position prior to road travel or damage to LHS main frame and hook arm cylinders may result.

30. Turn LHS MODE SELECT switch (4) to 0 (OFF/TRANSPORT) position.



END OF WORK PACKAGE

# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

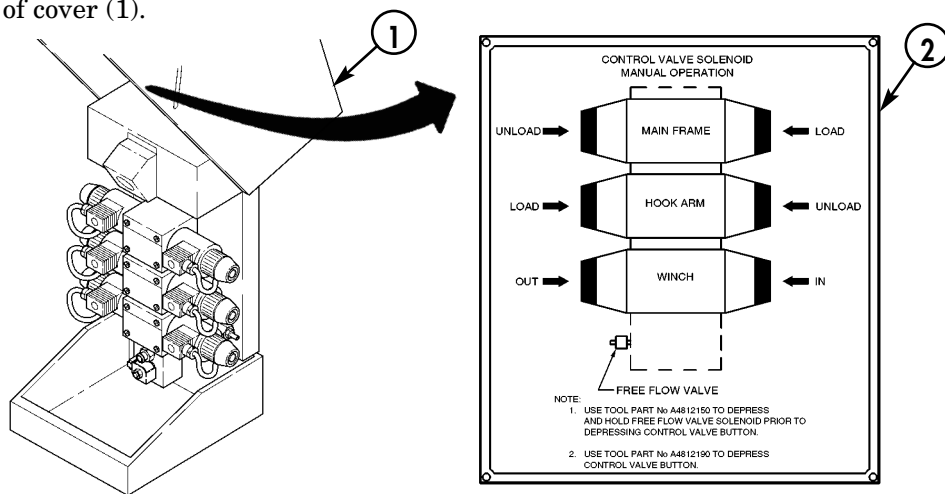
### MANUALLY BYPASSING SOLENOID DURING ELECTRIC POWER LOSS

#### NOTE

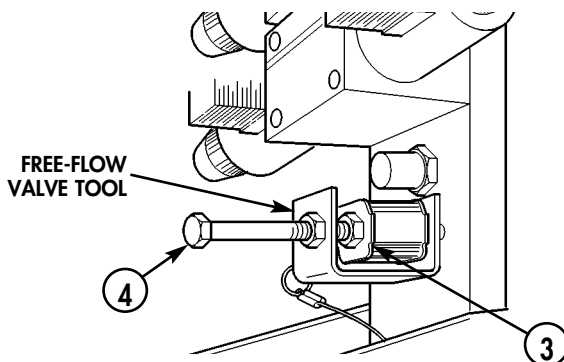
Manual mode operations using the cab control box are to be performed only when the normal AUTO mode electric circuit is malfunctioning.

When determined necessary, the solenoid bypass procedure may be used to perform transporter operations.

1. Open hydraulic manifold assembly cover (1) and review data plate (2) inside of cover (1).



2. Install free-flow valve tool on free-flow valve (3) and tighten thumbscrew (4).

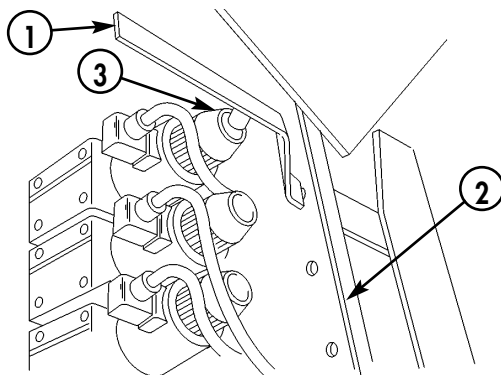


## MANUALLY BYPASSING SOLENOID DURING ELECTRIC POWER LOSS (Contd)

### **WARNING**

It may be necessary for operator to stand on fender near exhaust to operate control valves. Exhaust system will be hot. Keep clear of exhaust system or injury to personnel may result.

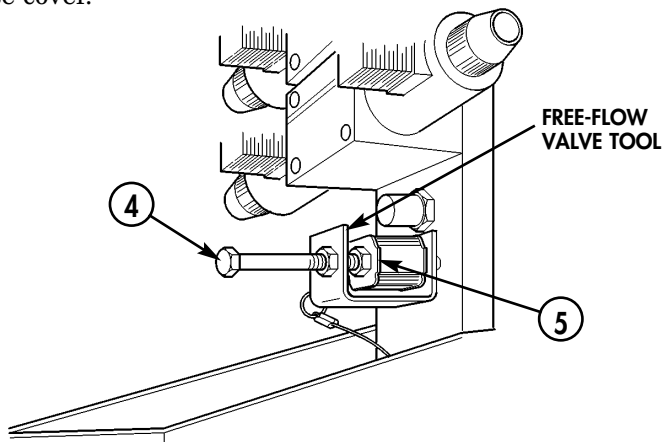
- Refer to and perform the appropriate operational procedures with the following exceptions: when the procedure directs the operation of the remote control unit or the cab controls, use the manual valve plunger tool (1), follow the data plate under the cover, and perform the operation within the control valve layout of the hydraulic manifold assembly. Fit plunger tool (1) in appropriate hole in hydraulic manifold assembly (2) and press plunger tool (1) into solenoid button (3).



### **NOTE**

Ensure PTO is off prior to removing free-flow valve tool.

- Loosen thumbscrew (4) and remove free-flow valve tool from free-flow valve (5). Close cover.



END OF WORK PACKAGE

# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### MANUALLY REMOVING LOAD DURING LHS HYDRAULIC POWER LOSS

**NOTE**

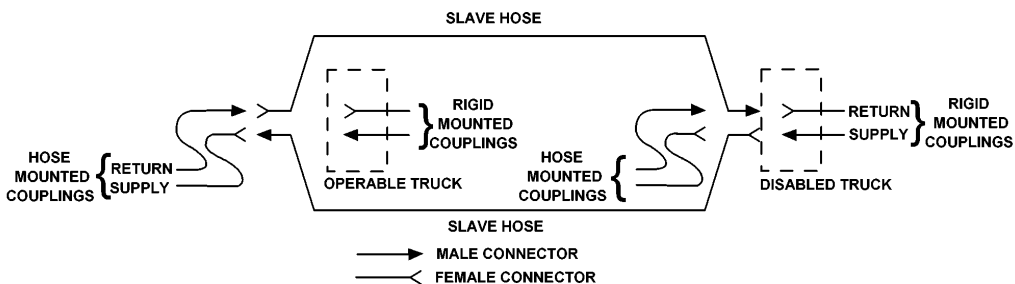
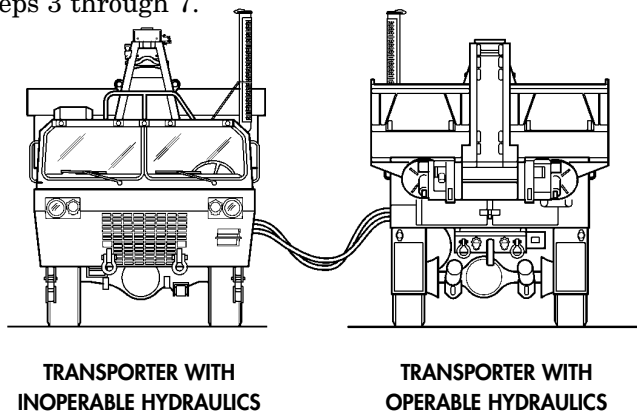
This procedure is used to remove load from transporter with a failed LHS hydraulic system or other failure that prevents operation of LHS.

Each transporter is equipped with one hose assembly stowed in left-hand stowage box on transporter. Two hose assemblies (one from each vehicle) are required.

1. Position transporters so LHS control boxes on both transporters are side by side.
2. Shut off engines on both transporters.

**NOTE**

Refer to Transporter Hose Flow Diagram Figure for steps 3 through 7.



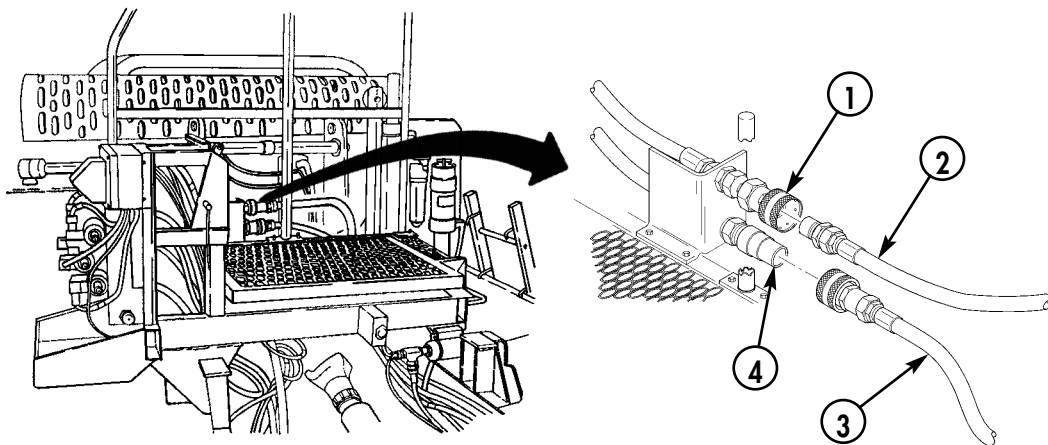
Transporter Hose Flow Diagram Figure.

## MANUALLY REMOVING LOAD DURING LHS HYDRAULIC POWER LOSS (Contd)

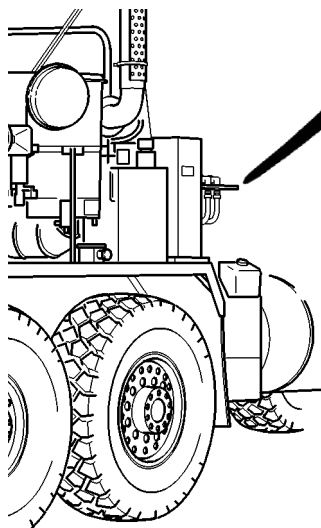
### **CAUTION**

Prior to disconnecting/connecting hydraulic supply hoses, clean debris from couplings and catch residual oil with clean rags. Failure to comply may result in damage to equipment.

3. Disconnect CBT hydraulic pump hoses (2) and (3) from LHS quick-disconnects (1) and (4) on both transporters.



**EARLY MODEL CBT HYDRAULIC PUMP COUPLINGS**



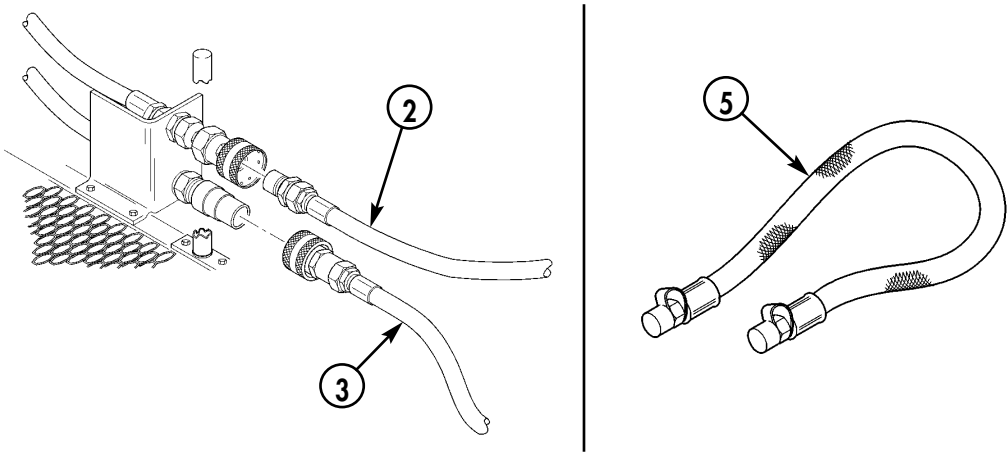
**LATE MODEL CBT HYDRAULIC PUMP COUPLINGS LOCATION**

## MANUALLY REMOVING LOAD DURING LHS HYDRAULIC POWER LOSS (Contd)

### **CAUTION**

Ensure slave hoses are not stretched or run over during operation or damage to equipment may result.

4. Connect two slave hose assemblies (5) to LHS quick-disconnects (1) and (4) on disabled transporter with inoperable hydraulics.
5. Connect opposite ends of two slave hose assemblies (5) to CBT hydraulic pump hoses (2) and (3) on transporter with operable hydraulics.



6. Start engines of both transporters and perform load/unload operations using transporter controls. Refer to WP 0013 00 or WP 0014 00 for loading/unloading procedures.
7. After completion of loading/unloading procedures, disconnect and connect hoses in reverse order.

**END OF WORK PACKAGE**





# OPERATOR INSTRUCTIONS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT

#### **WARNING**

Performing this procedure will require the assistance of field maintenance personnel and use of a crane or other lifting device having a lifting capacity of 21,000 lb (9,526 kg). Failure to comply may result in damage to equipment or possible injury or death to personnel.

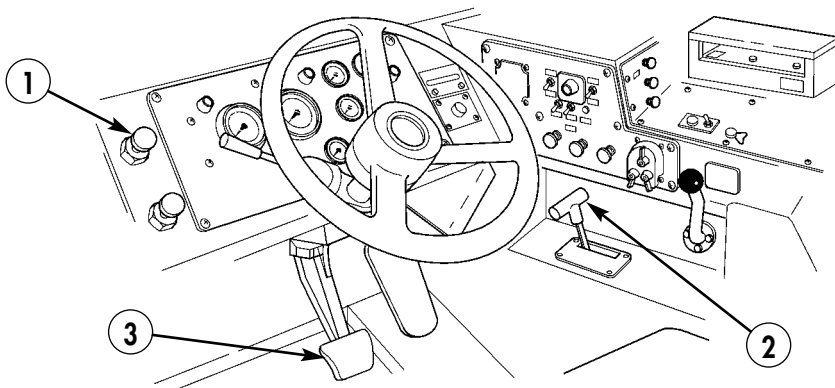
#### **CAUTION**

Main frame of Load Handling System (LHS) must be in its fully stowed position. Attempting to lift pallet with main frame not stowed could result in damage to equipment.

#### **NOTE**

This procedure is performed when the pallet cannot be unloaded to the ground due to mechanical failure of the CBT's LHS.

1. Apply service brake (3), move transmission selector lever (2) to N (neutral), and pull PARKING BRAKE control (1) out. Chock front wheels.



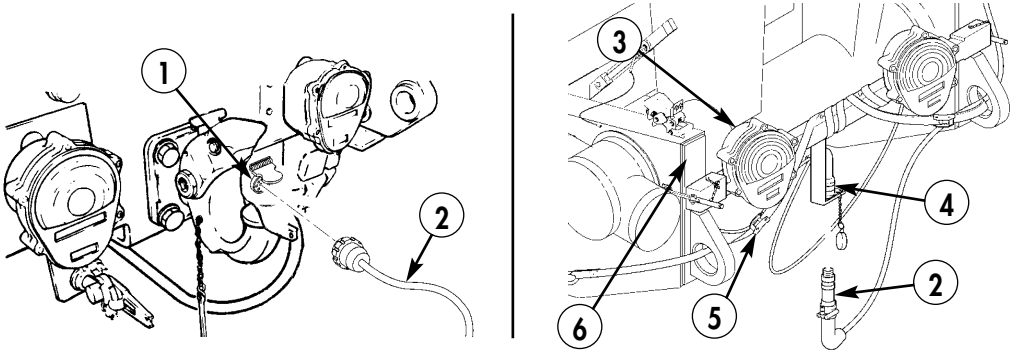
2. Ensure LHS main frame (1) is fully stowed (down). If LHS main frame (1) is not fully stowed, lower LHS main frame by following solenoid manual bypass procedure. Refer to WP 0031 00, Manually Bypassing Solenoid During Electric Power Loss.

## PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT (Contd)

### NOTE

Perform step 3 if auxiliary light bar is connected to pallet.

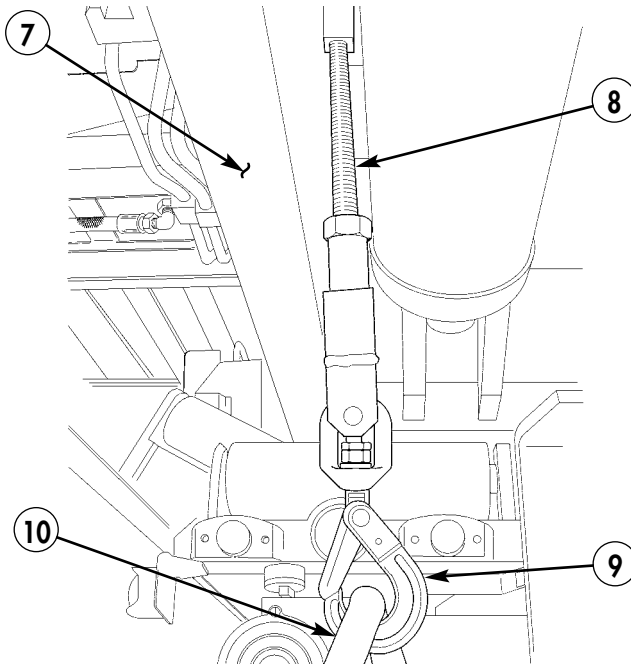
3. Disconnect power cable (2) from CBT electrical connector (1) and auxiliary light bar connector (4), and remove safety strap (5) and auxiliary light bar (3) from pallet frame girders (6).



### NOTE

If pallet will be placed on ground, transload rollers and transload roller bar will be removed prior to doing so. Refer to WP 0007 00.

4. Disconnect pallet hold-down bar hook (9) from CBT towing shackle (10) at each side of pallet frame (7), and place both hold-down bars (8) in stowed position. Refer to WP 0007 00.

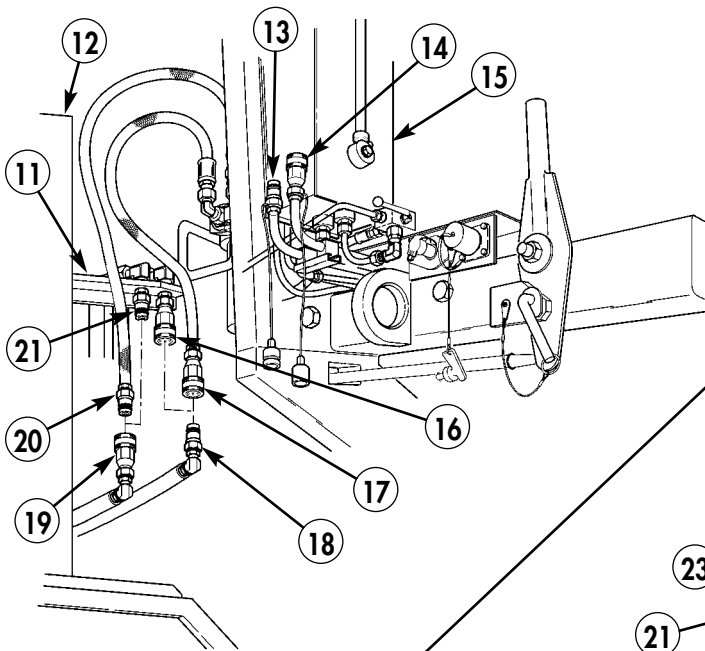


**PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT (Contd)**

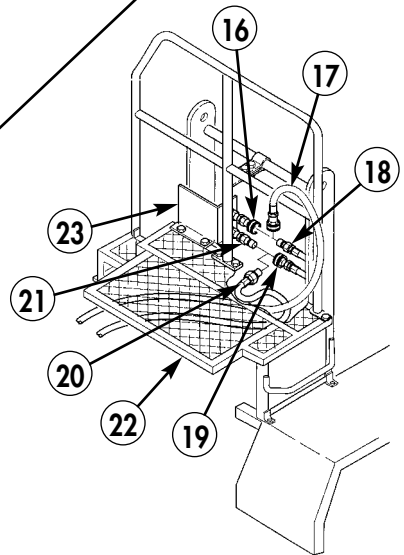
**NOTE**

Perform steps 5 through 7 if pallet hydraulic supply hoses are connected to CBT.

5. Disconnect pallet hydraulic hoses (17) and (20) from CBT hydraulic pump hoses (18) and (19), located adjacent to LHS cabinet assembly (12) on late model CBTs, or at rear of work platform (22) on early model CBTs.
6. Connect CBT hydraulic pump hoses (18) and (19) to LHS hydraulic supply quick-disconnect couplings (16) and (21), located on bracket (11) on late model CBTs or bracket (23) on early model CBTs.
7. Connect pallet hydraulic supply hoses (17) and (20) to pallet hydraulic quick-disconnect couplings (13) and (14), located on pallet A-frame adjacent to auxiliary reservoir (15).



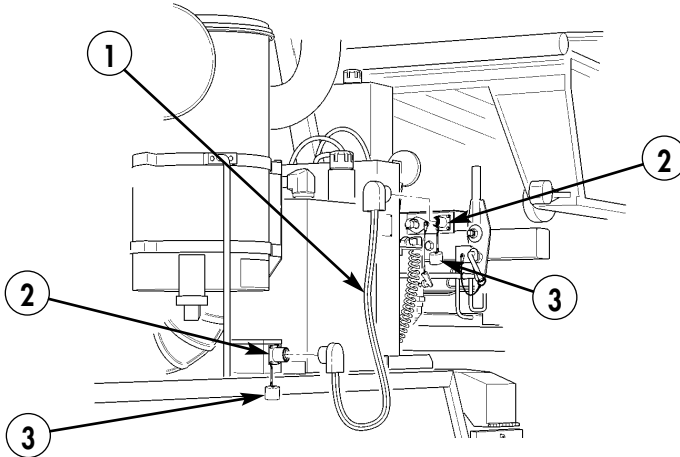
**LHS COUPLINGS,  
LATE MODEL CBT**



**LHS COUPLINGS, EARLY MODEL CBT**

## PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT (Contd)

8. Disconnect power cable (1) from NATO slave receptacle (2), located on CBT and pallet, and stow power cable (1) on CBT.
9. Install dust cap (3) on both NATO slave receptacles (2).



### **CAUTION**

If bridge halves are on pallet, do not attempt removal of pallet from CBT without the fastening rods installed. Failure to comply may result in damage to equipment.

### **NOTE**

Perform step 10 if bridge halves are on pallet and fastening rods are not installed. Perform steps 11 if fastening rods are installed. Perform step 12 if bridge halves are removed from pallet.

10. Install two fastening rods on upper bridge half (8) at both sides of pallet; ensure all fastening rods are properly tightened. Refer to WP 0008 00.

### **WARNING**

To maintain a low center of gravity, the lifting sling must be connected to pallet launch boom lifting eyes and A-frame hook bar only. Failure to comply may result in damage to equipment or injury or death to personnel.

11. Ensure all fastening rods are properly tightened. Refer to WP 0008 00.
12. Remove retaining pins from both launch boom locks (7). Refer to WP 0007 00.
13. Connect lifting sling to two pallet launch boom lifting eyes (6) and A-frame hook bar (4), and connect large ring at opposite end of lifting sling to lifting hook of crane or suitable lifting device.

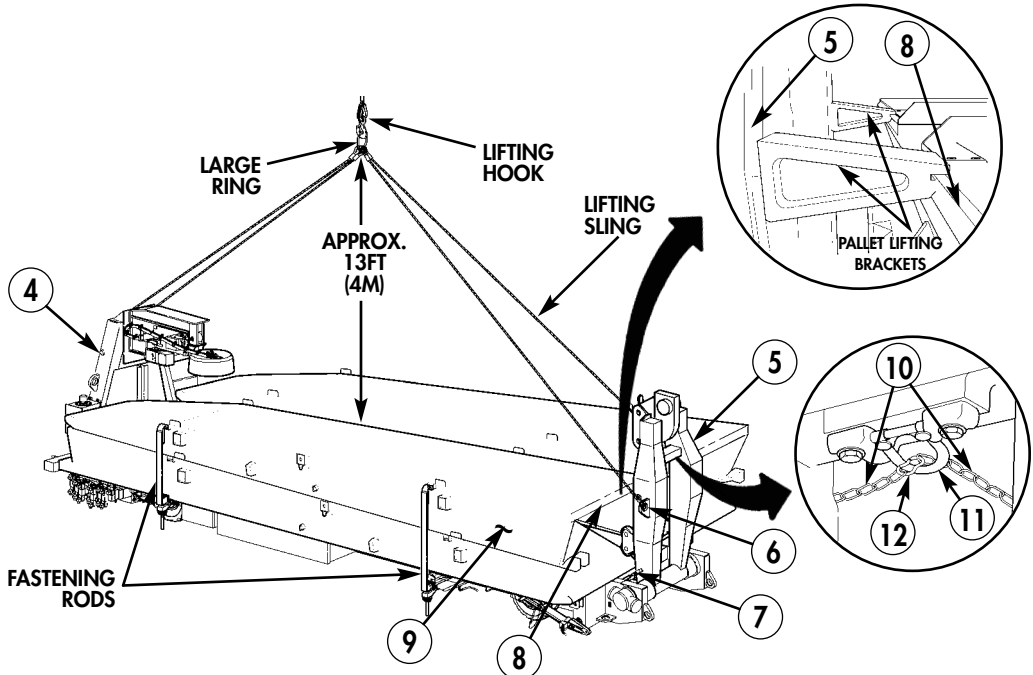
**PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT (Contd)**

14. Route safety chain (10) through launch boom eye (11) and connect ends together with snap hook (12).

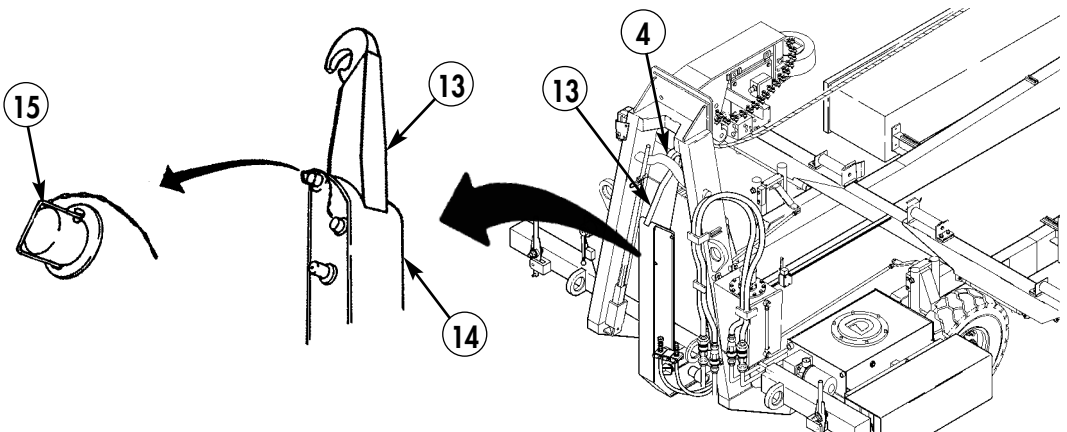
**NOTE**

Assistant will hold pallet lifting brackets until secure.

15. Position two pallet lifting brackets on cross-force couplings (8) of upper bridge half (9) and against outer edges of launch boom (5), and adjust length of two launch boom locks (7) by turning turnbuckles until lifting brackets are tight.



16. Remove locking pin (15) from hook arm (13) and frame (14).



**PREPARATION FOR EMERGENCY MANUAL REMOVAL OF PALLET FROM CBT  
(Contd)**

**WARNING**

Do not lift a load greater than the rated load capacity of the crane or materiel handling equipment. Failure to comply may result in damage to equipment or possible injury or death to personnel.

All personnel must stand clear of equipment prior to lifting operations or serious injury or death may result.

**CAUTION**

If lifting pallet only, ensure launch boom lock retaining pins are removed prior to lifting. Failure to comply will result in bending launch boom lock turnbuckles.

**NOTE**

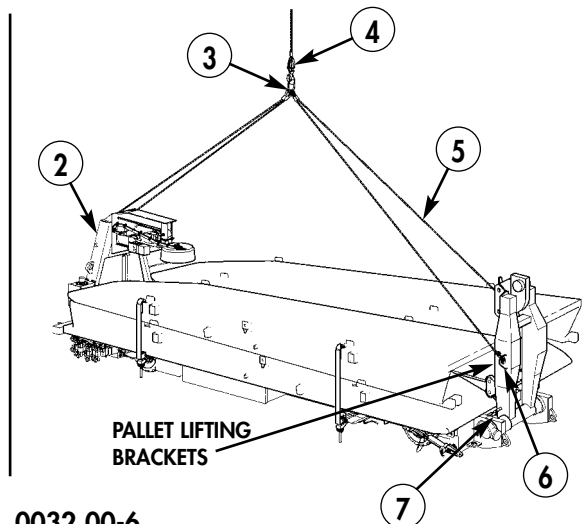
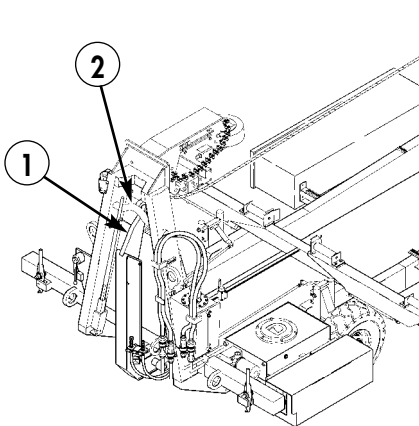
The pallet weighs 9,526 lb (4330 kg). The pallet with bridge weighs a minimum of 21,856 lb (9,480 kg).

17. Signal crane operator to slowly lift pallet until weight of pallet is off CBT.

**WARNING**

LHS hook arm is heavy and will fall free when the pallet is moved rearward. Under no circumstances should LHS hook arm be pried free from pallet hook bar by personnel. Failure to comply may result in injury or death to personnel.

18. Move pallet rearward until pallet frame clears LHS compression frame locks and LHS hook arm (1) drops free of pallet hook bar (2).
19. Raise pallet until clear of CBT, then set pallet on ground and slacken lifting sling.
20. Disconnect large ring (3) of lifting sling (5) from crane lifting hook (4), and remove lifting sling (5) from two pallet launch boom lifting eyes (6) and pallet hook bar (2).
21. Loosen two launch boom locks (7) and remove and stow two pallet lifting brackets. Refer to WP 0007 00.



**END OF WORK PACKAGE**

## **OPERATOR INSTRUCTIONS**

**RAPIDLY EMPLACED BRIDGE (REB)**

**NSN 5420-01-481-3959 P/N 12480471**

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### **OPERATION OF SPECIAL PURPOSE KIT**

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#### **GENERAL**

A gasoline engine driven self-priming centrifugal pump is authorized for use to pump water from rivers or streams under pressure for power washing the bridge. The unit is portable and has 2 in. (51 mm) diameter detachable pressure hoses complete with nozzle and pick-up screen. Refer to WP 0051 00 for part number and NSN.

## POWER WASH PUMP OPERATION (Contd)

### **NOTE**

To operate the pump as a power washer for cleaning mud and debris from the bridge, follow the procedure listed below.

1. Connect suction hose (2) to pump inlet (3).
2. Connect discharge hose (4) to pump outlet (1), and connect nozzle (5) to end of hose (4).

### **CAUTION**

Do not allow end of suction hose to touch bottom of river or stream; mud, weeds, or debris may be sucked into pump and damage pump.

3. Place end of suction hose (2) overboard into water.

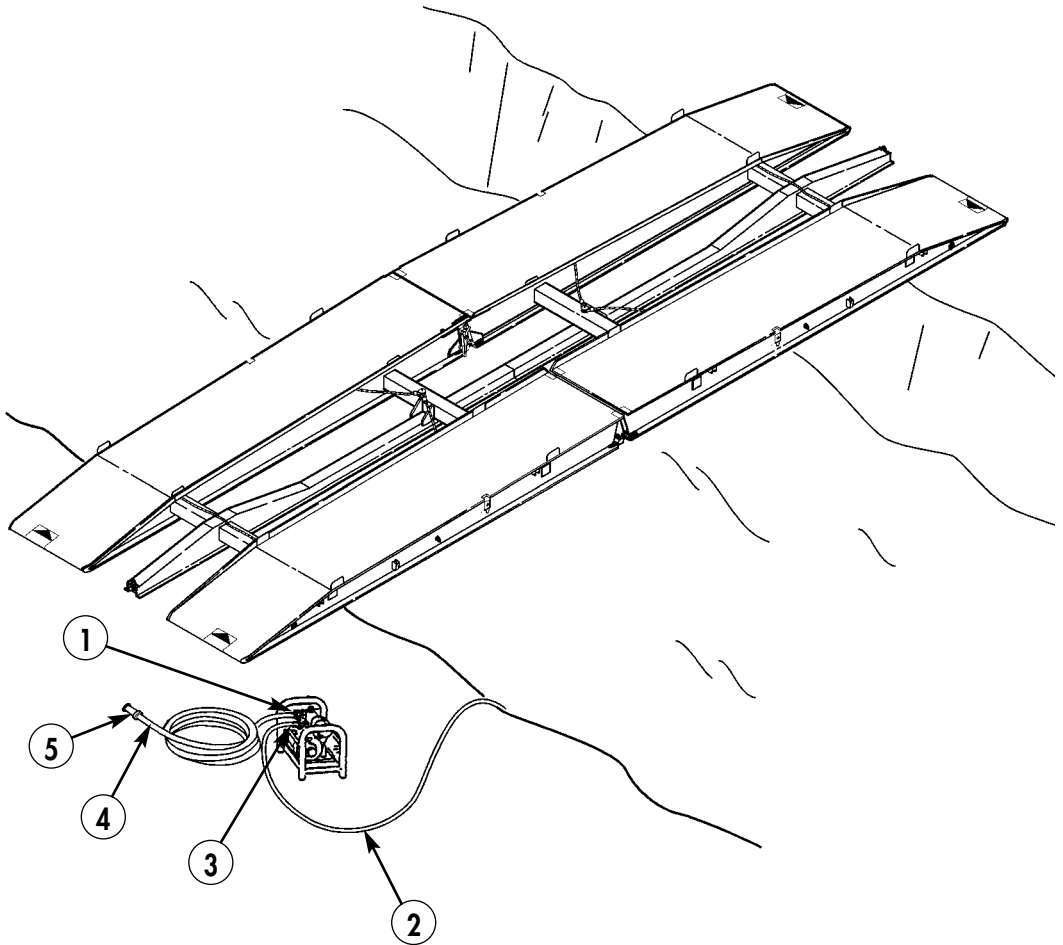
### **WARNING**

Water is discharged from pump nozzle under extreme pressure. Avoid cleaning in direction of personnel; mud, small rocks, and debris may fly up and injury to personnel may result.

4. Holding nozzle (5) away from personnel, start and operate pump in accordance with TM 5-4320-200-13&P, and wash off debris from bridge surfaces.
5. Stop pump engine in accordance with TM 5-4320-200-13&P.
6. Remove nozzle (5) from end of discharge hose (4), and disconnect hose (4) from pump outlet (1).
7. Pull suction hose (2) from water, disconnect hose (2) from pump inlet (3).



**POWER WASH PUMP OPERATION (Contd)**



**POWER WASH PUMP CONFIGURATION**

**END OF WORK PACKAGE**



## CHAPTER 3

### TROUBLESHOOTING PROCEDURES RAPIDLY EMPLACED BRIDGE (REB)

Introduction to Troubleshooting . . . . .	0034 00-1
Bridge Mechanical Troubleshooting Symptom Index . . . . .	0035 00-1
Pallet Mechanical Troubleshooting Symptom Index . . . . .	0036 00-1
Pallet Hydraulic Troubleshooting Symptom Index . . . . .	0037 00-1
Pallet Electrical Troubleshooting Symptom Index . . . . .	0038 00-1
LPU Engine Troubleshooting Symptom Index . . . . .	0039 00-1



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# TROUBLESHOOTING PROCEDURES

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## INTRODUCTION TO TROUBLESHOOTING

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### GENERAL

#### **WARNING**

Operation of a deadlined CBT or REB without preliminary inspection prior to performing troubleshooting procedures may result in damage to equipment or injury to personnel.

a. The following troubleshooting work packages provide the necessary troubleshooting procedures to diagnose mechanical, hydraulic, and electrical malfunctions for the REB.

b. The symptom index is used to identify the malfunction and locate the troubleshooting procedure to diagnose the problem.

c. Each troubleshooting procedure lists a description of the malfunction followed by a step or sequence of steps to perform a test or inspection. Then, in the order of probability, substeps instruct the user to determine if a condition exists through a check, inspection, or test, followed by the corrective action required to solve the malfunction.

d. Prior to performing any troubleshooting procedure, the following recommendations should be observed:

- (1) Isolate the system where the malfunction occurs.
- (2) Perform the troubleshooting procedure in the order in which steps are listed.
- (3) Consider the possibility that the problem could be simple in origin and may require only a minor adjustment; use common sense.
- (4) If a malfunction occurs that is not listed, notify your supervisor.
- (5) If a problem cannot be corrected after performing all corrective actions listed for a malfunction, notify your supervisor.
- (6) If the corrective action is not authorized at the operator's level, operators should provide a brief written description of the problem using Equipment Inspection and Maintenance Worksheet, DA Form 2404 or DA Form 5988-E, and Maintenance Request, DA Form 2407.

### END OF WORK PACKAGE



## TROUBLESHOOTING PROCEDURES

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### BRIDGE MECHANICAL TROUBLESHOOTING SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
1.	Upper coupling will not lock . . . . .	0035 00-2
2.	Upper coupling will not unlock . . . . .	0035 00-2
3.	Lower coupling will not engage receptacle . . . . .	0035 00-2
4.	Slide lock mechanism will not unlock . . . . .	0035 00-3
5.	Slide lock mechanism will not lock . . . . .	0035 00-3
6.	Bridge support wheels will not rotate . . . . .	0035 00-3
7.	Fastening rods will not secure bridge to pallet . . . . .	0035 00-4
8.	Bridge half will not deploy or retrieve . . . . .	0035 00-4
9.	Bridge launch beam misaligned with upper roller block . . . . .	0035 00-4

*Bridge Mechanical Troubleshooting.*

<p><b>MALFUNCTION</b>  <b>TEST OR INSPECTION</b>  <b>CORRECTIVE ACTION</b></p>
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**NOTE**

Refer to the general instructions in Introduction to Troubleshooting, WP 0034 00, prior to performing mechanical troubleshooting.

**1. UPPER COUPLING WILL NOT LOCK**

Step 1. Check side-to-side level of pallet.

If pallet is level, raise pallet 0.5 to 1 degree higher and repeat coupling steps. Refer to WP 0016 00.

Step 2. Check position of forward pinwheel drive gear and upper bridge half launch beam channel pins. If pins are not resting near bottom of drive gear tooth, operate forward pinwheel through RCU working step L-14. Refer to WP 0016 00.

Step 3. Check both upper coupling lock remote control levers (red levers) for engagement in receptacle brackets.

If one or both levers are not engaged, use BII tanker bar to manually release upper coupling lock mechanisms. Refer to WP 0008 00.

Step 4. Check for obstruction or jamming caused by rocks or debris.

Remove obstruction or clean debris from upper coupling. Refer to WP 0046 00.

Step 5. Check for broken or missing spring.

If spring is missing or broken, notify field maintenance.

Step 6. Check lock mechanism for proper engagement.

If lock mechanism will not engage, notify field maintenance.

Step 7. Check plunger on upper coupling lock mechanism for obstruction, debris, if bent, or roller is missing.

Remove obstruction or clean debris and engage mechanism using BII tanker bar. Refer to WP 0016 00. If lock mechanism will not engage, notify field maintenance.

END OF TESTING

**2. UPPER COUPLING WILL NOT UNLOCK**

Step 1. Bridge not raised to pre-stressed position.

Release ACTION 2 button immediately before upper coupling remote control arms reach release levers on pallet. Go back to launch sequence L16 and deploy bridge across gap until lower couplings are approximately 2 ft (5.1 cm) past yellow mark. Go back to retrieval sequence R7 and retrieve bridge again.

Step 2. Check lock mechanism for proper alignment.

If lock mechanism will not engage, notify field maintenance.

END OF TESTING

**3. LOWER COUPLING WILL NOT ENGAGE RECEPTACLE**

Step 1. Check for possible side-to-side misalignment of bridge halves or lower couplings.

Align bridge halves using tanker bar. Refer to WP 0016 00.

Step 2. Check for obstruction or jamming caused by rocks or debris.



*Bridge Mechanical Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

Remove obstruction or clean debris from lower coupling, receptacle, and lock levers. Refer to WP 0046 00.

Step 3. Check for broken or missing lower coupling, receptacle, or lock lever.

If coupling, receptacle, or lock levers are broken or missing, notify field maintenance.

Step 4. Check contact of limit switch or if limit switch arm is bent or missing. If contact is insufficient to activate switch or switch arm is bent or missing, notify field maintenance.

END OF TESTING

#### **4. SLIDE LOCK MECHANISM WILL NOT UNLOCK**

Step 1. Check for obstruction or jamming caused by rocks or debris.

Remove obstruction or clean debris from slide lock mechanism.  
Refer to WP 0046 00.

Step 2. Check for broken or missing locking lever clevises.

If locking lever clevises are broken or missing, notify field maintenance.

Step 3. Check for bent or broken locking rods.

If locking rods are bent or broken, notify field maintenance.

END OF TESTING

#### **5. SLIDE LOCK MECHANISM WILL NOT LOCK**

Step 1. Check if bridge quarters are fully extended.

Extend bridge quarters. Refer to WP 0016 00.

Step 2. Check for broken or missing spring.

If spring is broken or missing, notify field maintenance.

Step 3. Check for broken or missing locking lever clevises.

If locking lever clevises are broken or missing, notify field maintenance.

Step 4. Check for bent or missing locking rods.

If locking rods are bent or missing, notify field maintenance.

END OF TESTING

#### **6. BRIDGE SUPPORT WHEELS WILL NOT ROTATE**

Check for missing or damaged wheel hub or tire.

If wheel hub or tire is missing or damaged, notify field maintenance.

END OF TESTING

*Bridge Mechanical Troubleshooting (Contd)*

<b>MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION</b>
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**7. FASTENING RODS WILL NOT SECURE BRIDGE TO PALLET**

- Step 1. Check for mud debris or damaged threads on fastening rod drive screw.  
Clean mud or debris from threads on drive screw. Refer to WP 0046 00.  
Ensure bushing threads are lubricated. Refer to WP 0047 00.
- Step 2. Check for proper adjustment of fastening rods.  
Adjust fastening rods. Refer to WP 0008 00.
- Step 3. Check for missing or damaged tiedown strap bracket pins.  
If tiedown strap bracket pins are missing or damaged, notify field maintenance.

END OF TESTING

**8. BRIDGE HALF WILL NOT DEPLOY OR RETRIEVE**

- Step 1. Check height of pallet supporting cylinders.  
If bridge half stops at rear pinwheel drive, pallet is too high. Lower pallet approximately 0.5 degrees.
- Step 2. Check side-to-side level of pallet.  
If bridge halves are misaligned, adjust side-to-side level of pallet.
- Step 3. Check that lower bridge half contacts limit switch KA2 to activate forward pinwheel drive.  
If KA2 is not activated, manually actuate using rod end of retrieval positioning aid.

**9. BRIDGE LAUNCH BEAM MISALIGNED WITH PALLET UPPER ROLLER BLOCK**

- Check height of bridge launch beam; launch beam should be approximately 4 in. (100mm) below upper roller block rollers.
- If launch beam is 4 in. (100 mm) below upper roller block and will not align with rollers, winch in cable until bridge launch beam aligns with rollers.

END OF WORK PACKAGE

0035 00-4

# TROUBLESHOOTING PROCEDURES

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### PALLET MECHANICAL TROUBLESHOOTING SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
1.	Supporting cylinder winch will not lower supporting cylinder . . . . .	0036 00-2
2.	Supporting cylinder winch will not lift supporting cylinder . . . . .	0036 00-2
3.	Steering wheels will not turn . . . . .	0036 00-2
4.	Pallet wheel hub will not rotate . . . . .	0036 00-3
5.	Telescopic tube roller will not rotate . . . . .	0036 00-3
6.	Secondary boom roller will not rotate . . . . .	0036 00-3
7.	Upper roller block roller will not rotate . . . . .	0036 00-3
8.	Lower support roller will not rotate . . . . .	0036 00-4
9.	Launch boom rope guide roller will not rotate . . . . .	0036 00-4
10.	Launch boom roller guides will not rotate . . . . .	0036 00-4
11.	Launch boom will not rise to travel position . . . . .	0036 00-4
12.	Winch guide rollers will not rotate . . . . .	0036 00-4
13.	Winch guide pulleys will not rotate . . . . .	0036 00-5
14.	Winch inlet cover guide rollers will not rotate . . . . .	0036 00-5
15.	Winch force transmitter will not move . . . . .	0036 00-5
16.	Winch stowage drum unit will not rotate . . . . .	0036 00-6
17.	Winch hook clip will not lock . . . . .	0036 00-6
18.	Bridge halves not aligned to center of pallet . . . . .	0036 00-6

*Pallet Mechanical Troubleshooting.*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**1. SUPPORTING CYLINDER WINCH WILL NOT LOWER SUPPORTING CYLINDER**

Step 1. Check that retaining pin is removed from connecting link.

Remove retaining pin from connecting link. Refer to WP 0007 00.

Step 2. Check for binding winch strap.

Unreel strap and wind as necessary while maintaining tension on strap.

END OF TESTING

**2. SUPPORTING CYLINDER WINCH WILL NOT LIFT SUPPORTING CYLINDER**

Step 1. Check that retaining pin is removed from supporting cylinder.

Remove retaining pin from supporting cylinder. Refer to WP 0007 00.

Step 2. Check that supporting cylinder bottom plate clears ground.

Raise supporting cylinder until fully retracted. Refer to WP 0020 00.

Step 3. Check for broken winch strap.

If winch strap is broken, notify field maintenance.

END OF TESTING

**3. STEERING WHEELS WILL NOT TURN****NOTE**

Steering radius is very limited.

Step 1. Check that both retaining pins are removed from steering levers.

Remove retaining pins from steering levers. Refer to WP 0007 00.

Step 2. Check for obstruction or jamming caused by rocks or debris.

Remove obstruction or clean debris from steering wheels. Refer to WP 0046 00.

Step 3. Check for bent or broken tie-rod or steering links.

If tie-rod or steering links are bent or broken, notify field maintenance.

Step 4. Check for binding bellcranks or steering levers.

If bellcranks or steering levers are binding, notify field maintenance.

END OF TESTING

*Pallet Mechanical Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**4. PALLET WHEEL HUB WILL NOT ROTATE**

Step 1. Check for obstruction or jamming caused by rocks or debris between wheel and bridge pallet.

Remove obstruction or clean debris from between wheel and bridge pallet. Refer to WP 0046 00.

Step 2. Check for seized wheel bearings.

If wheel bearings are seized, notify field maintenance.

END OF TESTING

**5. TELESCOPIC TUBE ROLLER WILL NOT ROTATE**

Step 1. Check for bent, broken, or loose roller pin, bushings, or brackets.

If pin, bushings, or brackets are bent, broken, or loose, notify field maintenance.

Step 2. Check for damaged or missing roller.

If roller is damaged or missing, notify field maintenance.

END OF TESTING

**6. SECONDARY BOOM ROLLER WILL NOT ROTATE**

Step 1. Check for worn or damaged bushings.

If bushings are worn or damaged, notify field maintenance.

Step 2. Check for loose or missing hardware.

If hardware is loose or missing notify field maintenance.

END OF TESTING

**7. UPPER ROLLER BLOCK ROLLER WILL NOT ROTATE**

Step 1. Check for obstruction or jamming caused by debris between rollers.

Remove obstruction or clean debris from rollers. Refer to WP 0046 00.

Step 2. Check for loose, seized, or damaged bearings.

If bearings are loose, seized, or damaged, notify field maintenance.

END OF TESTING

*Pallet Mechanical Troubleshooting (Contd).*

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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**8. LOWER SUPPORT ROLLER WILL NOT ROTATE**

- Step 1. Check for obstruction or jamming caused by debris between rollers.  
Remove obstruction or clean debris from rollers. Refer to WP 0046 00.
- Step 2. Check for loose, seized, or damaged bearings.  
If bearings are loose, seized, or damaged, notify field maintenance.
- END OF TESTING

**9. LAUNCH BOOM ROPE GUIDE ROLLER WILL NOT ROTATE**

- Check for bent, broken, or loose roller pin or brackets.  
If roller pin or brackets are bent, broken, or loose, notify field maintenance.
- END OF TESTING

**10. LAUNCH BOOM ROLLER GUIDES WILL NOT ROTATE**

- Step 1. Check for obstruction or jamming caused by debris between rollers.  
Remove obstruction or clean debris from rollers. Refer to WP 0046 00.
- Step 2. Check for loose, seized, or damaged bearings.  
If bearings are loose, seized, or damaged, notify field maintenance.
- END OF TESTING

**11. LAUNCH BOOM WILL NOT RISE TO TRAVEL POSITION**

- Check if retrieval sequence R15 has retrieved lower bridge half to end stop position.  
If launch boom fails to rise at retrieval sequence R16, have assistant push on launch boom manually while operator depresses ACTION 2 button for R16.
- END OF TESTING

**12. WINCH GUIDE ROLLERS WILL NOT ROTATE**

- Step 1. Check for obstruction or jamming caused by rocks or debris between rollers and winch wire rope.  
Remove obstruction or clean debris from between rollers and winch wire rope. Refer to WP 0046 00.
- Step 2. Check for bent, broken, or binding rollers.
- a. Grease binding rollers. Notify field maintenance.
  - b. Replace bent or broken rollers. Notify field maintenance.
- END OF TESTING

*Pallet Mechanical Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**13. WINCH GUIDE PULLEYS WILL NOT ROTATE**

Step 1. Check for obstruction or jamming caused by rock or debris between pulleys, winch wire rope, and mounting bracket.

Remove obstruction or clean debris from between pulleys, winch wire rope, and mounting bracket. Refer to WP 0046 00.

Step 2. Check for binding pulleys.

a. Grease pulleys and pulley pins. Notify field maintenance.

b. Replace worn or damaged pulleys. Notify field maintenance.

END OF TESTING

**14. WINCH INLET COVER GUIDE ROLLERS WILL NOT ROTATE**

Step 1. Check for obstruction or jamming caused by rock or debris between rollers and winch wire rope.

Remove obstruction or clean debris from between rollers and winch wire rope. Refer to Refer to WP 0046 00.

Step 2. Check for worn or damaged rollers.

Replace worn or damaged rollers. Notify field maintenance.

END OF TESTING

**15. WINCH FORCE TRANSMITTER WILL NOT MOVE**

Step 1. Check for obstruction or debris between winch mounting bracket and force transmitter.

Remove obstruction or clean debris from between winch wire rope in force transmitter. Refer to WP 0046 00.

Step 2. Check for binding between winch mounting bracket and force transmitter.

a. Grease force transmitter and transmitter holder.

b. Replace worn or damaged force transmitter.  
Notify field maintenance.

END OF TESTING

*Pallet Mechanical Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**16. WINCH STOWAGE DRUM UNIT WILL NOT ROTATE**

Step 1. Check for obstruction or jamming caused by rock or debris between rope stowage drum and winch mounting bracket.

Remove obstruction or clean debris from between rope stowage drum and winch mounting bracket. Refer to WP 0046 00.

Step 2. Check for worn or damaged drum unit.

Replace worn or damaged drum unit. Notify field maintenance.

END OF TESTING

**17. WINCH HOOK CLIP WILL NOT LOCK**

Check for broken, bent, or missing spring or pin.

Replace broken, bent, or missing spring or pin. Notify field maintenance.

END OF TESTING

**18. BRIDGE HALVES NOT ALIGNED TO CENTER OF PALLET**

Step 1. Check alignment of launch beam on upper and lower bridge halves.

If either launch beam is not aligned with center of pallet launch boom, align them using a pry bar.

Step 2. Check alignment of lower bridge quarters on pallet transverse handling unit carriers.

If lower bridge half quarters do not line up squarely on carriers, align them using a pry bar.

Step 3. Check alignment of upper bridge half quarters resting on lower bridge half quarters.

If upper bridge half quarters are not centered between guides on lower bridge half quarters, align them using a pry bar.

END OF TESTING



## TROUBLESHOOTING PROCEDURES

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### PALLET HYDRAULIC TROUBLESHOOTING SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
1.	Hydraulic pump will not operate using LPU .....	0037 00-2
2.	Hydraulic system will not operate using CBT .....	0037 00-2
3.	Supporting cylinders will not extend or retract (L4-A+M, L7-A, or R19-H) .....	0037 00-3
4.	Bridges will not extend to operating width (L2-H or R21-H) .....	0037 00-3
5.	Winch wire rope will not operate (L4-A or R18-H) .....	0037 00-3
6.	Bottom bridge half will not move to rear (L5-A and L8-A or R15-A and R17-H) .....	0037 00-3
7.	Launch boom will not lower or raise (L6-A, L12-A, L15-A, L20-H, or R4-A+H+M, R11-A, R9-A, and R16-A) .....	0037 00-4
8.	Launch boom will not lower to coupling position (L14-A or R2-H) .....	0037 00-4
9.	Lower support boom cylinders will not extend or retract (L14-A or R2-H) .....	0037 00-4
10.	Bottom bridge half will not move on launch boom (L16-H or R7-H) .....	0037 00-5
11.	Secondary boom cylinder will not raise or lower (L9-H, L13-H, or R10H and R14-H) .....	0037 00-5
12.	Lower bridge half will not move to coupling position (L14-A, L15-A, or R9-A) ...	0037 00-5
13.	Launch boom will not move to pre-coupling position (L12-A or R9-A) .....	0037 00-6
14.	Launch boom will not hold bridge when extended over gap (L16-H or R7-H) .....	0037 00-6
15.	Wheel lifting cylinders will not lower or raise .....	0037 00-6

*Pallet Hydraulic Troubleshooting (Contd).*

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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**NOTE**

All hydraulics troubleshooting malfunctions are based on operator using the RCU only. Refer to WP 0002 00, Pallet Equipment Features, for location and description of hydraulic control valves. Launch and retrieval functional codes are listed in malfunction titles where applicable

**1. HYDRAULIC PUMP WILL NOT OPERATE USING LPU**

- Step 1. Check that LPU engine is operating. Refer to WP 0015 00.  
Start engine and set to operating speed. Refer to WP 0015 00.
- Step 2. Check that hydraulic hose quick-disconnects are connected to auxiliary engine pump supply connectors. Refer to WP 0007 00.  
Connect hydraulic hose quick-disconnects to pump supply connectors. Refer to WP 0007 00.
- Step 3. Check for low oil level in hydraulic reservoir.  
Fill hydraulic reservoir to proper oil level. Refer to WP 0045 00.
- Step 4. Check that bypass valve on LPU pump is in closed position.  
Close bypass valve on LPU pump. Refer to WP 0007 00.
- Step 5. Operate pallet hydraulic system using CBT back-up power.  
Refer to WP 0026 00.

END OF TESTING

**2. HYDRAULIC SYSTEM WILL NOT OPERATE USING CBT**

- Step 1. Check that engine is operating and PTO is engaging on CBT. Refer to HEMTT Operator's Manual, TM 9-2320-279-10, and WP 0006 00.  
Start engine and engage PTO on CBT. Refer to TM 9-2320-279-10.
- Step 2. Check for low oil level in CBT hydraulic reservoir. Refer to TM 9-2320-279-10.  
Fill hydraulic reservoir to proper oil level.
- Step 3. Check that hydraulic hose quick-disconnects are connected to cBT.  
Refer to WP 0007 00.  
Connect hydraulic hose quick-disconnects to CBT. Refer to WP 0007 00.
- Step 4. Check gauge for clogged oil pre-filter or clogged oil filter on control valve manifold. Refer to WP 0007 00.  
If either gauge indicator is in red zone, replace pre-filter and oil filter on control valve manifold. Refer to WP 0007 00.

END OF TESTING

*Pallet Hydraulic Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**3. SUPPORTING CYLINDERS WILL NOT EXTEND OR RETRACT (L4-A+M, L7-A, or R19-H)**

- Step 1. Check supporting cylinders for damage or missing hardware.  
If supporting cylinder(s) is damaged, notify field maintenance.
- Step 2. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.
- END OF TESTING

**4. BRIDGES WILL NOT EXTEND TO OPERATING WIDTH (L2-H or R21-H)**

- Step 1. Check that all four fastening rods have been removed.  
Remove all fastening rods. Refer to WP 0008 00.
- Step 2. Check for damaged telescopic tube.  
If telescopic tube is damaged, notify field maintenance.
- Step 3. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.
- END OF TESTING

**5. WINCH WIRE ROPE WILL NOT OPERATE (L4-A or R18-H)**

- Check for malfunctioning winch motor or winch assembly.
- If winch motor is inoperable, notify field maintenance.
  - If winch assembly is inoperable, notify field maintenance.
- END OF TESTING

**6. BOTTOM BRIDGE HALF WILL NOT MOVE TO REAR (L5-8 AND L8-A or R15-A AND R17-H)**

- Step 1. Check that forward pinwheel drive hydraulic motor rotates.  
If hydraulic motor will not rotate, notify field maintenance.
- Step 2. Check for damaged or missing launch beam pinwheel drive bracket or drive pins.  
If bracket or drive pins are damaged or missing, notify field maintenance.
- END OF TESTING

*Pallet Hydraulic Troubleshooting (Contd).*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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**7. LAUNCH BOOM WILL NOT LOWER OR RAISE (L6-A, L12-A, L15-A, L20-H, or R4-A+H+M, R11-A, R9-A, and R16-A)**

- Step 1. Check if launch boom lock retaining pins are installed.  
Remove launch boom lock retaining pins. Refer to WP 0007 00.
- Step 2. Check for damaged hydraulic tubing.  
If hydraulic tubing is damaged, notify field maintenance.
- Step 3. Check for damaged or missing launch boom lock pins and retaining bracket on launch boom and main shaft pallet frame.
- If launch boom lock pins and retaining bracket on launch boom and main shaft are damaged or missing, notify field maintenance.
  - If four hydraulic fittings on main shaft are damaged due to missing pin, notify field maintenance.
- Step 4. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.

END OF TESTING

**8. LAUNCH BOOM WILL NOT LOWER TO COUPLING POSITION (L14-A or R2-H)**

- Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.

END OF TESTING

**9. LOWER SUPPORT BOOM CYLINDERS WILL NOT EXTEND OR RETRACT (L14-A or R2-H)**

- Step 1. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.
- Step 2. Check for malfunctioning pressure switches KF-1 and KF-2. Notify field maintenance to test switches.
- Step 3. Check hydraulic hoses, tubing, and cylinders for damage or missing pins.
- If hydraulic hoses or steel tubing are damaged, notify field maintenance.
  - If hydraulic cylinder(s) or pins are damaged or missing, notify field maintenance.

END OF TESTING

*Pallet Hydraulic Troubleshooting (Contd).*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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**10. BOTTOM BRIDGE HALF WILL NOT MOVE ON LAUNCH BOOM (L16-H or R7-H)**

- Step 1. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.
- Step 2. Check that rear pinwheel drive hydraulic motor rotates.  
If hydraulic motor will not rotate, notify field maintenance.
- Step 3. Check for malfunctioning stop cylinder.  
If brake assembly will not hold or release, notify field maintenance.
- Step 4. Check for damaged rear pinwheel drive assembly.  
If rear pinwheel drive assembly is damaged, notify field maintenance.
- Step 5. Check for damaged launch beam pinwheel drive bracket or drive pins.  
If pinwheel drive bracket or drive pins are damaged, notify field maintenance.

END OF TESTING

**11. SECONDARY BOOM CYLINDER WILL NOT RAISE OR LOWER (L9-H, L13-H, or R10H and R14-H)**

- Step 1. Check if both limit switches are functional or if arm is bent or missing.  
If either limit switch does not function or arm is bent or missing, notify field maintenance.
- Step 2. Check for malfunctioning control valve.  
If control valve does not function, notify field maintenance.
- Step 3. Check for damaged secondary boom cylinder.  
If secondary boom cylinder is damaged, notify field maintenance.
- Step 4. Check for bent or damaged secondary boom rollers or bracket.  
If secondary boom rollers or bracket are bent or damaged, notify field maintenance.

END OF TESTING

**12. LOWER BRIDGE HALF WILL NOT MOVE TO COUPLING POSITION (L14-A, L15-A, or R9-A)**

- Step 1. Perform malfunction 7 if launch boom will not lower or raise.
- Step 2. Perform malfunction 9 if lower support boom cylinders will not extend or retract.
- Step 3. Refer to Electrical System Troubleshooting, WP 0038 00 and perform RCU Will Not Move Lower Bridge Half to Coupling Position.

END OF TESTING

*Pallet Hydraulic Troubleshooting (Contd).*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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**13. LAUNCH BOOM WILL NOT MOVE TO PRE-COUPLING POSITION (L12-A or R9-A)**

Step 1. Perform malfunction 7 if launch boom will not lower or raise.

Step 2. Perform malfunction 9 if lower support boom cylinders will not extend or retract.

Step 3. Refer to Electrical System Troubleshooting, WP 0038 00 and perform RCU Will Not Lower Launch Boom to Pre-Coupling Position.

END OF TESTING

**14. LAUNCH BOOM WILL NOT HOLD BRIDGE WHEN EXTENDED OVER GAP (L16-H or R7-H)**

Retrieve bridge and notify field maintenance. Refer to WP 0020 00.

END OF TESTING

**15. WHEEL LIFTING CYLINDERS WILL NOT LOWER OR RAISE**

Step 1. Check that retaining pins are removed.

Remove retaining pins. Refer to WP 0007 00.

Step 2. Check for proper hydraulic oil in level in reservoir.

Fill reservoir to proper oil level. Refer to WP 0045 00 and WP 0048 00.

Step 3. Check position of selector valve.

Place selector valve lever in one of three positions to lower/raise front, rear, or all wheel lifting cylinders. Refer to WP 0007 00.

Step 4. Check position of control valve.

Place control valve lever in wheels-lowered or wheels-raised position. Refer to WP 0007 00.

Step 5. Check that hydraulic pump operates and pressure to wheel lifting cylinders is shown on gauge. Refer to WP 0007 00.

Step 6. Check that wheel lifting cylinders operate after performing steps 1 through 5.

If no pressure is shown on gauge, notify field maintenance.

END OF TESTING

END OF WORK PACKAGE

## TROUBLESHOOTING PROCEDURES

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### PALLET ELECTRICAL TROUBLESHOOTING SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
1.	RCU will not power up using LPU batteries . . . . .	0038 00-4
2.	RCU will not power up using CBT . . . . .	0038 00-4
3.	RCU will not operate hydraulic system using CBT or LPU batteries . . . . .	0038 00-5
<b>NOTE</b>		
Malfunctions 4 through 26 are performed in bridge launch sequence.		
4.	RCU will not extend bridge to operating width (L2-H) . . . .	0038 00-5
5.	RCU will not retract winch wire rope (L3-A) . . . . .	0038 00-6
6.	RCU will not extend supporting cylinders (L4-A+M or L7-A) . . . . .	0038 00-6
7.	RCU will not deploy bridge half (L5-A) . . . . .	0038 00-6
8.	RCU will not lower launch boom to launch position (L6-A) . . . . .	0038 00-7
9.	RCU will not move lower bridge half (L8-AA) . . . . .	0038 00-7
10.	RCU will not raise secondary boom (L9-H) . . . . .	0038 00-7
11.	RCU will not move lower bridge half to coupling position (L10-A) . . . . .	0038 00-8
12.	RCU will not lower winch wire rope (L11-H) . . . . .	0038 00-8
13.	RCU will not lower launch boom to pre-coupling position (L12-A) . . . . .	0038 00-8
14.	RCU will not operate lifting cylinders (L14-A) . . . . .	0038 00-9
15.	RCU will not lower secondary boom (L13-H) . . . . .	0038 00-9
16.	RCU will not lift launch boom (L14-A) . . . . .	0038 00-9
17.	RCU will not lower secondary boom (L13-H) . . . . .	0038 00-10

**PALLET ELECTRICAL TROUBLESHOOTING SYMPTOM INDEX (Contd)**

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
18.	RCU will not lock launch boom into coupling position (L14-A and L15-A) . . . . .	0038 00-10
19.	RCU will not lower launch boom (L15-A) . . . . .	0038 00-10
20.	RCU will not deploy bridge across gap (L16-H) . . . . .	0038 00-11
21.	RCU will not lower far-shore end of bridge (L17-A) . . . . .	0038 00-11
22.	RCU will not lower near-shore end of bridge (L18-H) . . . . .	0038 00-11
23.	RCU will not raise launch boom to travel position (L20-H) . . . . .	0038 00-12
24.	RCU will not tighten winch wire rope (L19-M+H) . . . . .	0038 00-12
25.	RCU will not retract bridge cradle to travel position (L22-H+M) . . . . .	0038 00-12
26.	RCU will not raise supporting cylinders (L21-H+M) . . . . .	0038 00-13
<b>NOTE</b>		
Malfunctions 27 through 48 are performed in bridge retrieval sequence.		
27.	RCU will not extend supporting cylinders (R1-M and R2-H) . . . . .	0038 00-13
28.	RCU will not extend bridge cradle to retrieval position (R3-H) . . . . .	0038 00-14
29.	RCU will not uncoil winch wire rope (R4-A+H+M) . . . . .	0038 00-14
30.	RCU will not lower launch boom to retrieval position (R4-A+H+M) . . . . .	0038 00-14
31.	RCU will not raise near-shore end of bridge with winch wire rope (R5-H) . . . . .	0038 00-14
32.	RCU will not raise far-shore end of bridge with launch boom (R6-A) . . . . .	0038 00-15
33.	RCU will not retrieve bridge from gap (R7-H) . . . . .	0038 00-15
34.	RCU will not retrieve bridge to pallet (R10-H) . . . . .	0038 00-15
35.	RCU will not lift launch boom into coupling position (R9-A) . . . . .	0038 00-16
36.	RCU will not lower launch boom to pre-coupling position (R9-A) . . . . .	0038 00-16
37.	RCU will not raise secondary boom (R14-H) . . . . .	0038 00-16



**PALLET ELECTRICAL TROUBLESHOOTING SYMPTOM INDEX (Contd)**

<b>MALFUNCTION NO.</b>	<b>MALFUNCTION</b>	<b>TROUBLESHOOTING WP-PAGE</b>
38.	RCU will not lift launch boom (R11-A) . . . . .	0038 00-17
39.	RCU will not winch-in wire rope (R12-A and R13-A) . . . . .	0038 00-17
40.	RCU will not retrieve lower bridge half (R13-A) . . . . .	0038 00-17
41.	RCU will not retrieve lower bridge half (R17-H) . . . . .	0038 00-18
42.	RCU will not lower secondary boom (R14-H) . . . . .	0038 00-18
43.	RCU will not raise launch boom to travel position (R16-A) . . . . .	0038 00-18
44.	RCU will not lower winch wire rope (R18-H) . . . . .	0038 00-19
45.	RCU will not lower lifting cylinders (R2-H) . . . . .	0038 00-19
46.	RCU will not retrieve lower bridge half (R17-H) . . . . .	0038 00-19
47.	RCU will not raise supporting cylinders (R19-H) . . . . .	0038 00-20
48.	RCU will not retract bridge to travel position (R21-H) . . . . .	0038 00-20

*Pallet Electrical Troubleshooting.*

<b>MALFUNCTION</b> <b>TEST OR INSPECTION</b> <b>CORRECTIVE ACTION</b>
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**NOTE**

Refer to WP 0002 00, Pallet Equipment Features, for location and description of control valves and limit switches. Launch and retrieval functional codes are listed in malfunction titles where applicable.

**1. RCU WILL NOT POWER UP USING LPU BATTERIES**

- Step 1. Check that red main power switch is turned to ON position.  
Move red main power switch to ON position. Refer to WP 0007 00.
- Step 2. If not illuminated, check light on LPU control box for discharged LPU batteries.  
Charge batteries as necessary. Refer to WP 0027 00.
- Step 3. Check that all three emergency stops are in the OUT position.  
a. Disengage emergency stops. Refer to WP 0007 00.  
b. If any emergency stop is damaged, notify field maintenance.
- Step 4. Connect RCU to electrical control box receptacle. Refer to WP 0007 00.  
If RCU will not power up, notify field maintenance.

END OF TESTING

**2. RCU WILL NOT POWER UP USING CBT**

- Step 1. Check that power cable is properly connected between CBT and pallet.  
If power cable is not properly connected, connect power cable between CBT and pallet. Refer to WP 0007 00.
- Step 2. Check that all three emergency stops are in the OUT position.  
a. Disengage emergency stops. Refer to WP 0007 00.  
b. Replace emergency stop if damaged, notify field maintenance.
- Step 3. Check and reset circuit breaker.  
If circuit breaker cannot be reset, notify field maintenance.
- Step 4. Check that green LED lights are lit on expansion modules IQAN-XP and IQAN-XS.  
If lights are lit and system will not operate, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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**NOTE**

Refer to launch and retrieval procedures in WP 0016 00 and WP 0020 00 for operation of RCU.

Ensure hydraulic system has pressure before performing electrical troubleshooting. Any hydraulic operation will prove system has pressure.

**3. RCU WILL NOT OPERATE HYDRAULIC SYSTEM USING CBT OR LPU BATTERIES**

Step 1. Check that hydraulic system has pressure.

If no pressure is evident, notify field maintenance to check hydraulic pressure.

**NOTE**

KY1 hydraulic control valve solenoid must operate with all other control valve solenoids to perform an operation.

Step 2. Check that KY1 hydraulic control valve solenoid LED light is lit when action button 1 is depressed.

- a. If light is lit and system will not operate, notify field maintenance.
- b. If light is out, notify field maintenance.

END OF TESTING

**NOTE**

Malfunction 4 through 26 are performed in bridge launch sequence.

**4. RCU WILL NOT EXTEND BRIDGE TO OPERATING WIDTH (L2-H)**

Step 1. Check that all four fastening rods have been removed.

Remove fastening rods. Refer to WP 0008 00.

Step 2. Check that KY1 and KY13 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 3. Check to see if only one control valve solenoid LED light is lit.

If only one light is lit, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION</b>
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**5. RCU WILL NOT RETRACT WINCH WIRE ROPE (L3-A)**

- Step 1. Check that KY1 and KY21 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.
- If all lights are lit on control valve solenoids, check limit switch KA5 to see if damaged or out of adjustment. If limit switch KA5 is damaged or out of adjustment, notify field maintenance.
  - If limit switch KA5 is operating and control valve solenoid lights are lit, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.  
If light is out, notify field maintenance.
- Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.  
Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.
- END OF TESTING

**6. RCU WILL NOT EXTEND SUPPORTING CYLINDERS (L4-A+M or L7-A)****NOTE**

KY1 and KY8 control valve solenoids extend left supporting cylinder, and KY1 and KY10 control valve solenoids extend the right supporting cylinder.

- Step 1. Check that KY1 and either KY8 or KY10 hydraulic control valve solenoid LED lights are lit when action button 1 or 2 is depressed.  
If both lights are lit on control valve solenoids, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are lit.  
If only one light is lit, notify field maintenance.
- END OF TESTING

**7. RCU WILL NOT DEPLOY BRIDGE HALF (L5-A)**

- Step 1. Check that KY1 and KY4 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.
- If both lights are lit on control valve solenoids, check limit switch KA1 to see if damaged or out of adjustment. If limit switch KA1 is damaged or out of adjustment, notify field maintenance.
  - If limit switch KA1 is operating and control valve solenoid lights are lit, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.  
If lights are out, notify field maintenance.
- END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**8. RCU WILL NOT LOWER LAUNCH BOOM TO LAUNCH POSITION (L6-A)**

Step 1. Check that KY1 and KY18 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**9. RCU WILL NOT MOVE LOWER BRIDGE HALF (L8-AA)**

Step 1. Check that KY1, KY4, and KY23 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

a. If all lights are lit on control valve solenoids, check limit switch KA2 to see if damaged or out of adjustment. If limit switch KA2 is damaged or out of adjustment, notify field maintenance.

b. If limit switch KA2 is operating and control valve solenoid LED light is lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**10. RCU WILL NOT RAISE SECONDARY BOOM (L9-H)**

Step 1. Check that KY1 and KY14 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if only one control valve solenoid LED lights is lit.

If only one light is lit, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**11. RCU WILL NOT MOVE LOWER BRIDGE HALF TO COUPLING POSITION (L10-A)**

Step 1. Check that KY1 and KY6 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

- a. If all lights are lit on control valve solenoids, check limit switch KA4 to see if damaged or out of adjustment. If limit switch KA4 is damaged or out of adjustment, notify field maintenance.
- b. If limit switch KA4 is operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**12. RCU WILL NOT LOWER WINCH WIRE ROPE (L11-H)**

Step 1. Check that KY1 and KY21 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.

Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

**13. RCU WILL NOT LOWER LAUNCH BOOM TO PRE-COUPPLING POSITION (L12-A)**

Step 1. Check that KY1 and KY16 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**14. RCU WILL NOT OPERATE LIFTING CYLINDERS (L14-A)**

Step 1. Check that KY1, KY17, and KY20 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out.

If only one or two lights are lit, notify field maintenance.

END OF TESTING

**15. RCU WILL NOT LOWER SECONDARY BOOM (L13-H)**

Step 1. Check that KY1 and KY15 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

a. If both lights are lit on control valve solenoids, check limit switch KA6 to see if damaged or out of adjustment. If limit switch KA6 is damaged or out of adjustment, notify field maintenance.

b. If limit switch KA6 is operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if only one light is lit when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**16. RCU WILL NOT LIFT LAUNCH BOOM (L14-A)**

Step 1. Check that KY1 and KY17 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**17. RCU WILL NOT LOWER SECONDARY BOOM (L13-H)**

Step 1. Check that KY1 and KY15 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or no lights are lit when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**18. RCU WILL NOT LOCK LAUNCH BOOM INTO COUPLING POSITION (L14-A and L15-A)**

Step 1. Check that KY1, KY17, and KY23 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if only one or no lights are lit when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**19. RCU WILL NOT LOWER LAUNCH BOOM (L15-A)**

Step 1. Check that KY1 and KY16 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING



*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION</b>
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**20. RCU WILL NOT DEPLOY BRIDGE ACROSS GAP (L16-H)**

Step 1. Check that KY1, KY6, and KY24 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**21. RCU WILL NOT LOWER FAR-SHORE END OF BRIDGE (L17-A)**

Step 1. Check that KY1, KY16, KY18, and KY24 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

a. If lights are lit on KY1, KY16, KY18, and KY24 control valve solenoids, notify field maintenance.

b. If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**22. RCU WILL NOT LOWER NEAR-SHORE END OF BRIDGE (L18-H)**

D3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

**23. RCU WILL NOT RAISE LAUNCH BOOM TO TRAVEL POSITION (L20-H)**

Step 1. Check that KY1 and KY19 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**24. RCU WILL NOT TIGHTEN WINCH WIRE ROPE (L19-M+H)**

Step 1. Check that KY1 and KY3 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**25. RCU WILL NOT RETRACT BRIDGE CRADLE TO TRAVEL POSITION (L22-H+M)**

Step 1. Check that KY1 and KY12 hydraulic control valve solenoid LED lights are lit when action button 1 is depressed.

If lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.

Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

**26. RCU WILL NOT RAISE SUPPORTING CYLINDERS (L21-H+M)****NOTE**

KY1 and KY9 control valve solenoids raise left supporting cylinder and KY1 and KY11 control valve solenoids raise right supporting cylinder.

Step 1. Check that KY1 and either KY9 or KY11 hydraulic control valve solenoid LED lights are lit when action button 1 or 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 and 2 are depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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**NOTE**

Malfunctions 27 through 48 are performed in bridge retrieval sequence.

**27. RCU WILL NOT EXTEND SUPPORTING CYLINDERS (R1-M and R2-H)****NOTE**

KY1 and KY8 control valve solenoids extend left supporting cylinder and KY1 and KY10 control valve solenoids extend right supporting cylinder.

- Step 1. Check that KY1 and either KY8 or KY10 hydraulic control valve solenoid LED lights are lit when action button 1 or 2 is depressed.  
If both lights are lit on control valve solenoids, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 or 2 is depressed.  
If light is out, notify field maintenance.

END OF TESTING

**28. RCU WILL NOT EXTEND BRIDGE CRADLE TO RETRIEVAL POSITION (R3-H)**

- Step 1. Check that KY1 and KY13 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.  
If both lights are lit on control valve solenoids, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.  
If light is out, notify field maintenance.
- Step 3. Check for loose winch relays AD2, AD3, and AD4 located in electrical box.  
Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**29. RCU WILL NOT UNCOIL WINCH WIRE ROPE (R4-A+H+M)**

Step 1. Check that KY1 and KY2 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**30. RCU WILL NOT LOWER LAUNCH BOOM TO RETRIEVAL POSITION (R4-A+H+M)**

Step 1. Check that KY1 and KY18 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**31. RCU WILL NOT RAISE NEAR-SHORE END OF BRIDGE WITH WINCH WIRE ROPE (R5-H)**

Step 1. Check that KY1 and KY21 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.

Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**32. RCU WILL NOT RAISE FAR-SHORE END OF BRIDGE WITH LAUNCH BOOM (R6-A)**

Step 1. Check that KY1, KY17, KY20, and KY23 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**33. RCU WILL NOT RETRIEVE BRIDGE FROM GAP (R7-H)**

Step 1. Check that KY1, KY7, and KY22 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If all lights are lit on control valve solenoids, check limit switches KA3 and KA4 to see if damaged or out of adjustment. If damaged or out of adjustment, notify field maintenance.

b. If limit switches KA3 and KA4 are operating and control valve solenoid lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**34. RCU WILL NOT RETRIEVE BRIDGE TO PALLET (R10-H)**

Step 1. Check that KY1, KY3, KY7, and KY21 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If all lights are lit on control valve solenoids, check limit switch KA8 low and KA8 high to see if damaged or out of adjustment. If damaged or out of adjustment, notify field maintenance.

b. If limit switch KA8 low and KA8 high is operating and control valve solenoid LED light is lit, notify field maintenance.

Step 2. Check to see if one or more lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**35. RCU WILL NOT LIFT LAUNCH BOOM INTO COUPLING POSITION (R9-A)**

Step 1. Check that KY1 and KY16 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**36. RCU WILL NOT LOWER LAUNCH BOOM TO PRE-COUPLING POSITION (R9-A)**

Step 1. Check that KY1 and KY16 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**37. RCU WILL NOT RAISE SECONDARY BOOM (R14-H)**

Step 1. Check that KY1 and KY14 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If all lights are lit on control valve solenoids, check limit switch KA6 for damage or out of adjustment. If damaged or out of adjustment, notify field maintenance.

b. If limit switch KA6 is operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION</b>
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**38. RCU WILL NOT LIFT LAUNCH BOOM (R11-A)**

Step 1. Check that KY1 and KY17 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**39. RCU WILL NOT WINCH-IN WIRE ROPE (R12-A and R13-A)**

Step 1. Check that KY1 and KY21 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If all lights are lit on control valve solenoids, check limit switch KA5 for damage or out of adjustment. If damaged or out of adjustment, notify field maintenance.

b. If limit switch KA5 is operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.

Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

**40. RCU WILL NOT RETRIEVE LOWER BRIDGE HALF (R13-A)**

Step 1. Check that KY1, KY5, and KY7 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If all lights are lit on control valve solenoids, check limit switch KA1 and KA2 to see if damaged or out of adjustment. If limit switches KA1 and KA2 are damaged or out of adjustment, notify field maintenance.

b. If limit switches KA1 and KA2 are operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**41. RCU WILL NOT RETRIEVE LOWER BRIDGE HALF (R17-H)**

Step 1. Check that KY1 and KY7 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

- a. If all lights are lit on control valve solenoids, check limit switch KA3 for damage or out of adjustment. If limit switch KA3 is damaged or out of adjustment, notify field maintenance.
- b. If limit switch KA3 is operating and control valve solenoid LED lights are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**42. RCU WILL NOT LOWER SECONDARY BOOM (R14-H)**

Step 1. Check that KY1 and KY14 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**43. RCU WILL NOT RAISE LAUNCH BOOM TO TRAVEL POSITION (R16-A)**

Step 1. Check that KY1 and KY19 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

END OF TESTING



*Pallet Electrical Troubleshooting (Contd)*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

**44. RCU WILL NOT LOWER WINCH WIRE ROPE (R18-H)**

Step 1. Check that KY1 and KY21 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If all lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.

If light is out, notify field maintenance.

Step 3. Check for loose winch relays AD2, AD3, and AD4, located in electrical box.

Push relays AD2, AD3, and AD4 into receptacles. Refer to WP 0007 00.

END OF TESTING

**45. RCU WILL NOT LOWER LIFTING CYLINDERS (R2-H)**

Step 1. Check that KY1 and KY16 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

a. If both lights are lit on control valve solenoids, check pressure switch KF1 to see if damaged or out of adjustment. If damaged or out of adjustment, notify field maintenance.

b. If pressure switch KF1 is operating and control valve solenoids are lit, notify field maintenance.

Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 1 is depressed.

If light is out, notify field maintenance.

END OF TESTING

**46. RCU WILL NOT RETRIEVE LOWER BRIDGE HALF (R17-H)**

Step 1. Check that KY1 and KY5 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.

If both lights are lit on control valve solenoids, notify field maintenance.

Step 2. Check to see if only one of the control valve solenoid LED lights is lit.

If only one light is lit, notify field maintenance.

END OF TESTING

*Pallet Electrical Troubleshooting (Contd)*

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

**47. RCU WILL NOT RAISE SUPPORTING CYLINDERS (R19-H)****NOTE**

KY1 and KY9 control valve solenoids raise left supporting cylinder, and KY1 and KY11 control valve solenoids raise right supporting cylinder.

- Step 1. Check that KY1 and either KY9 or KY11 hydraulic control valve solenoid LED lights are lit when action button 1 or 2 is depressed.  
If both lights are lit on control valve solenoids, notify field maintenance.
- Step 2. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.  
If light is out, notify field maintenance.

END OF TESTING

**48. RCU WILL NOT RETRACT BRIDGE TO TRAVEL POSITION (R21-H)**

- Step 1. Check that both sides of bridge slide lock mechanism are unlocked or damaged.
- If slide lock mechanism is locked, unlock slide lock mechanism on both sides. Refer to WP 0008 00.
  - If bridge slide lock is damaged, notify field maintenance.
- Step 2. Check that KY1 and KY12 hydraulic control valve solenoid LED lights are lit when action button 2 is depressed.  
If lights are lit on control valve solenoids, notify field maintenance.
- Step 3. Check to see if one or more control valve solenoid LED lights are out when action button 2 is depressed.  
If light is out, notify field maintenance.

END OF TESTING

## TROUBLESHOOTING PROCEDURES

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### LPU ENGINE TROUBLESHOOTING SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING WP-PAGE
1.	Engine cranks but does not start, or starts but not immediately . . . . .	0039 00-2
2.	Engine does not start at low temperatures . . . . .	0039 00-2
3.	Engine starter motor does not operate or engine does not turn over . . . . .	0039 00-2
4.	Engine starts but stops running as soon as starter motor is disengaged . . . . .	0039 00-3
5.	Engine shuts down during operation . . . . .	0039 00-3
6.	Engine speed and performance drop off . . . . .	0039 00-3
7.	Engine speed and performance drop off and black smoke is emitted from exhaust . . . . .	0039 00-4
8.	Engine runs very hot and indicator lamp for cylinder head temperature comes on . . . . .	0039 00-4

*LPU Engine Troubleshooting.*

<b>MALFUNCTION</b> <b>TEST OR INSPECTION</b> <b>CORRECTIVE ACTION</b>
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**CAUTION**

Never use starting fluid (ether) to assist starting LPU. Failure to comply will result in damage to engine.

**NOTE**

If starting problem cannot be resolved following the LPU engine troubleshooting procedures in this work package, refer to WP 0026 00 for use of CBT back-up power. Notify field maintenance after completing mission.

**1. ENGINE CRANKS BUT DOES NOT START, OR STARTS BUT NOT IMMEDIATELY**

Step 1. Check to see speed adjustment lever is left in STOP or IDLE position.

Move engine speed adjustment lever to START position.

Step 2. Check for empty fuel tank.

Fill fuel tank.

END OF TESTING

**2. ENGINE DOES NOT START AT LOW TEMPERATURES**

Step 1. Check that engine glow plugs were operated prior to cranking.

Operate engine glow plugs.

Step 2. Faulty engine glow plugs.

Notify field maintenance to check glow plugs.

Step 3. Battery voltage too low.

a. Connect CBT and charge batteries as necessary.  
Refer to WP 0027 00.

b. Notify field maintenance to test batteries.

END OF TESTING

**3. ENGINE STARTER MOTOR DOES NOT OPERATE OR ENGINE DOES NOT TURN OVER**

Step 1. Low battery voltage.

a. Connect CBT and charge battery as necessary.  
Refer to WP 0027 00.

b. Notify field maintenance to test batteries.

*LPU Engine Troubleshooting (Contd).*

<b>MALFUNCTION</b>
<b>TEST OR INSPECTION</b>
<b>CORRECTIVE ACTION</b>

Step 2. Check starter motor cables for corrosion.  
If corrosion is present, notify field maintenance.

Step 3. Starter motor malfunctioning.  
Notify field maintenance to test starter motor.

END OF TESTING

#### **4. ENGINE STARTS BUT STOPS RUNNING AS SOON AS STARTER MOTOR IS DISENGAGED**

Step 1. Engine speed control lever not located far enough in start direction.  
Move engine speed adjustment lever to START position.

Step 2. Fuel filter blocked.  
Notify field maintenance to check fuel filter.

END OF TESTING

#### **5. ENGINE SHUTS DOWN DURING OPERATION**

Step 1. Check for empty fuel tank.  
Fill fuel tank.

Step 2. Fuel filter blocked.  
Notify field maintenance to check fuel filter if necessary.

Step 3. Use CBT back-up power to complete launch or retrieval. Refer to WP 0026 00.

END OF TESTING

#### **6. ENGINE SPEED AND PERFORMANCE DROP OFF**

Step 1. Check fuel level.  
Fill fuel tank.

Step 2. Inadequate fuel tank ventilation.  
Check vent in fuel tank cap for obstruction.

Step 3. Fuel filter blocked.  
Notify field maintenance to check and replace fuel filter if necessary.

Step 4. Check fuel lines for leaks.  
If leaks are found, notify field maintenance.

*LPU Engine Troubleshooting (Contd).*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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Step 5. Engine speed control lever does not remain in required position.  
 If loose or damaged, notify field maintenance.  
 END OF TESTING

**7. ENGINE SPEED AND PERFORMANCE DROP OFF AND BLACK SMOKE IS EMITTED FROM EXHAUST**

Air filter is obstructed.

Clean air filter element. Refer to WP 0048 00. If problem persists, notify field maintenance.

END OF TESTING

**8. ENGINE RUNS VERY HOT AND INDICATOR LAMP FOR CYLINDER HEAD TEMPERATURE COMES ON**

Step 1. Check engine for too much oil (crankcase is overfilled).  
 If overfilled, notify field maintenance.

Step 2. Inadequate cooling.

a. Shrouds plugged.

Clean obstructions or seal openings as required.

b. Cylinder head cooling fins obstructed with debris.

Clean debris from cooling fins.

END OF TESTING

**END OF WORK PACKAGE**

## CHAPTER 4

### MAINTENANCE INSTRUCTIONS/PMCS RAPIDLY EMPLACED BRIDGE (REB)

Service Upon Receipt of Material . . . . .	0040 00-1
Preventive Maintenance Checks and Services (PMCS) . . . . .	0041 00-1
Preventive Maintenance Checks and Services (PMCS) for Common Bridge Transporter (CBT) Load Handling System (LHS) . . . . .	0042 00-1
Preventive Maintenance Checks and Services (PMCS) for Pallet . . . . .	0043 00-1
Preventive Maintenance Checks and Services (PMCS) for Bridge . . . . .	0044 00-1
Lubrication Instructions . . . . .	0045 00-1
General Maintenance . . . . .	0046 00-1
Bridge Maintenance Procedures . . . . .	0047 00-1
Pallet Maintenance Procedures . . . . .	0048 00-1





# MAINTENANCE INSTRUCTIONS/PMCS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### SERVICE UPON RECEIPT OF MATERIAL

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When a REB is first received by the using organization, it is the responsibility of the gaining unit to determine if it has been properly prepared for service by the supplier. It is also the responsibility of the gaining unit to ensure the bridge is in operating condition. Field maintenance will provide any additional service required to bring the bay to operating standards. Whenever practical, the operator will assist with this service.

Upon receipt of a new or used REB, the following procedure is to be followed:

1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report.
2. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions. Refer to DA PAM 750-8.
3. Check to see whether the equipment has been modified.

### INSTALLATION INSTRUCTIONS

Prepare REB unit for use by performing the following installation procedures.

Install Basic Issue Items (BII) items on Pallet in stowage boxes. Refer to WP 0050 00.

### PRELIMINARY SERVICING OF EQUIPMENT

Perform the following tasks prior to releasing the equipment for use:

1. Perform Preventive Maintenance Checks and Services (PMCS) to verify all component assemblies and subassemblies are complete and in proper working order, and lubricated where required. Refer to WP 0041 00 and WP 0045 00.
2. Check all exterior surfaces of equipment for dirt, grease, oil, or any other existing debris, and clean bridge as necessary. Refer to WP 0046 00.
3. Check all BII to ensure they are present, in good condition, and properly mounted or stowed. Refer to WP 0050 00.
4. Check maintenance schedule for transporter and perform PMCS and lubrication on transporter as required. Refer to TM 5-5420-234-14&P.

**END OF WORK PACKAGE**



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## MAINTENANCE INSTRUCTIONS/PMCS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

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#### GENERAL

PMCS WP 0042 00 is for the CBT, WP 0043 00 is for the Pallet, and WP 0044 00 is for the Bridge. The PMCS list checks required to keep the equipment in good operating condition. PMCS is performed to ensure the equipment is ready for operation at all times.

#### NOTE

Before operation is performed prior to launch. During operation is performed during a mission launch. After operation is performed after retrieval and upon returning from mission.

- a. Before operation, perform PMCS intervals listed "Before." Observe all cautions and warnings.
- b. During operation, perform PMCS intervals listed "During." Observe all cautions and warnings.
- c. After operation, perform PMCS intervals listed "After." Observe all cautions and warnings.

#### NOTE

If bridge is not mission deployed (launched) within 30 days, perform Before, During, and After PMCS.

- d. At any PMCS interval, if your equipment fails to operate, notify field maintenance.

#### PURPOSE OF PMCS TABLE

The purpose of the PMCS is to provide a systematic method of inspection and required service of equipment. In this way, small defects can be detected early before they become a major problem, causing the equipment to fail to complete its mission. The PMCS is arranged with the individual PMCS procedures listed in sequence under assigned intervals. The most logical time (before, during, and after operation) to perform each procedure determines the interval to which it is assigned. Make a habit of performing the checks in the same order each time. See Explanation of Columns for a description of the columns in PMCS.

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Contd)

### EXPLANATION OF COLUMNS

The following is a list and description of the column headings in the PMCS.

- a. Item Number. This column shows the sequence in which the checks and services are to be performed, and is used to identify the equipment area on the Equipment Inspection and Maintenance Worksheet, DA Form 2404 or DA Form 5988-E.
- b. Interval. This column indicates when each check is to be performed.
- c. Item To Check/Service. This column identifies the item and location to be inspected by part, component, or assembly name.
- d. Procedure. This column explains what type of service, specific damage, or defect is to be checked.

#### NOTE

The terms ready/available and mission capable refer to the same status: equipment is on hand and is able to perform its combat mission. Refer to DA Pam 750-8.

- e. Not Fully Mission Capable If. This column lists conditions that make the equipment unavailable for use as a result of damage, missing parts, or improper functioning that would represent a safety hazard. Do not accept or operate equipment with a condition noted in the "Not Fully Mission Capable If" column.

### REPORTING DEFICIENCIES

If any problem with the equipment is discovered while performing PMCS or during operation that cannot be corrected at the operator's level, it must be reported. Refer to DA Pam 750-8 and report the deficiency on Equipment Inspection and Maintenance Worksheet, DA Form 2404 or DA Form 5988-E.

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Contd)

### SPECIAL INSTRUCTIONS

Preventive maintenance is not limited to performing the checks and services listed in the PMCS.

#### **WARNING**

Skysol 100 cleaning solvent is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol 100 cleaning solvent may cause skin irritation. Use chemical-resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity. Failure to comply may result in injury to personnel.

#### **WARNING**

Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to comply may result in injury to personnel.

- a. Keep it clean. Dirt, grease, oil, and debris get in the way and may cover up a serious problem. Clean work area as needed. Use Skysol 100 on all metal surfaces. Use soap and water to clean rubber or plastic material. Dry with compressed air or clean, dry cloths. Refer to item 7, WP 0052 00.
- b. Bolts, nuts, and screws. Check them all for obvious looseness, missing, bent, or broken condition. Look for chipped paint, bare metal, or rust around bolt heads; if loose, notify field maintenance.
- c. Wiring harnesses, wires, and connectors. Look for cracked or broken wiring harness insulation, bare wires, and loose or broken connectors. If faulty wiring or loose connections are found, notify field maintenance.

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Contd)

### **WARNING**

The bleed valve on hydraulic line should be used to bleed residual pressure from the line prior to disconnecting. When disconnecting any hydraulic line, open line slowly and protect face; hydraulic oil may spray out due to residual pressure in system. Failure to comply may result in serious injury to personnel.

- d. Hydraulic lines. Look for wear, damage, and leaks. Ensure clamps and fittings are tight. Wet spots and stains around a fitting or connector can mean a leak. If a leak comes from a loose connector, notify field maintenance. If a hydraulic component is leaking, notify field maintenance.

### **LEAKS**

- a. It is necessary to know how fluid leaks affect equipment operation and readiness. The following definitions for types/classes of leakage shall be observed.

### **CAUTION**

Equipment operation is allowable with minor leakage (Class I or II) of any fluid except fuel. Of course, consideration must be given to the fluid capacity in the item being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid level more often than required in the PMCS. Parts without fluid will stop working and/or cause equipment damage.

Class III leaks should be reported to your supervisor or field maintenance.

- |           |  |
|-----------|--|
| Class I   | Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.                          |
| Class II  | Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected. |
| Class III | Leakage of fluid great enough to form drops that fall from the item being checked/inspected.                         |

### **PAINTING**

Paint touch-up of the REB should be performed as needed during PMCS. Notify field maintenance.

### **END OF WORK PACKAGE**

## MAINTENANCE INSTRUCTIONS/PMCS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES FOR COMMON BRIDGE TRANSPORTER (CBT) LOAD HANDLING SYSTEM (LHS)

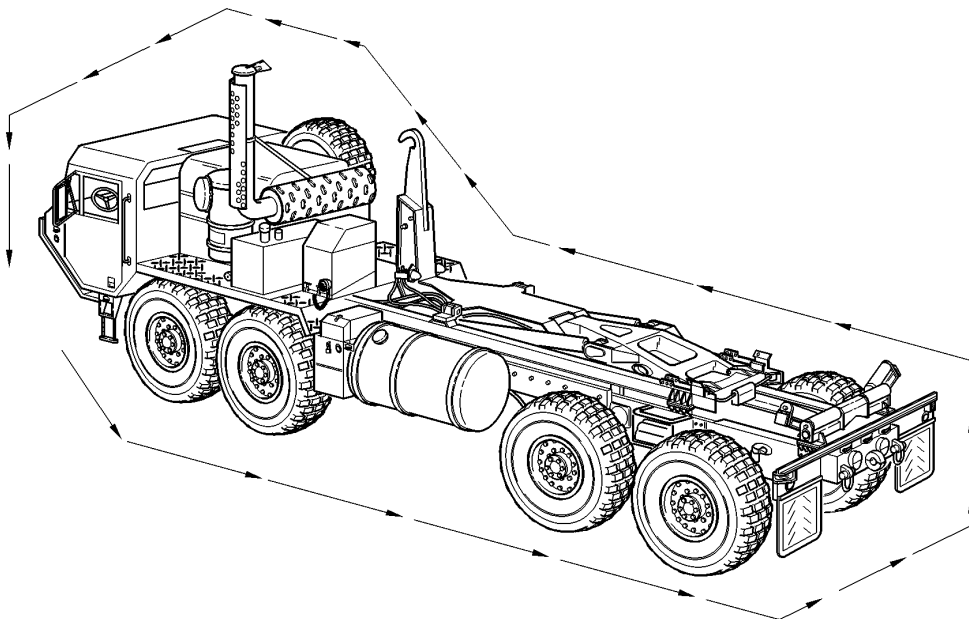
This PMCS uses the one-look format. Beginning at the driver's side of cab, proceed to the right in a counterclockwise direction. Refer to PMCS for CBT LHS Figure below.

During PMCS, ensure components and assemblies are *correctly installed*. Incorrect installation may cause additional equipment damage or failure.

When checking/servicing an item, ensure that all attaching/mounting hardware is properly secured. Loose, cracked, broken, or missing hardware may cause equipment failure or injury to personnel.

### LUBRICATION

Perform lubrication checks and services after completing PMCS. Refer to WP 0045 00.



*PMCS for CBT LHS Figure.*

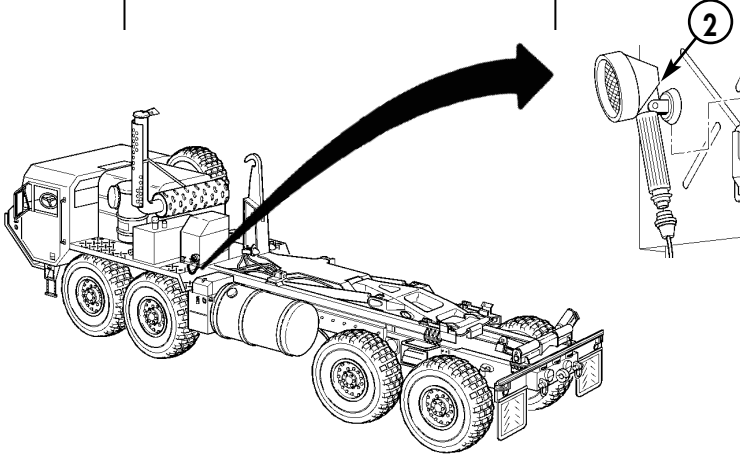
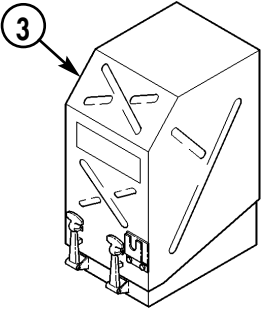
*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS.*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			<p><b>NOTE</b> Perform HEMTT PMCS prior to performing PMCS for Common Bridge Transporter (CBT) Load Handling System (LHS) Refer to TM 9-2320-279-10.</p> <p>If leakage is detected, further investigation is needed to determine the location and cause of the leak. If there is any doubt, contact your supervisor or field maintenance.</p>	
1	Before	Leaks on ground and CBT components	Check underneath vehicle for evidence of obvious fluid leakage.	Any Class III leak is evident.
2	Before	LHS hydraulic reservoir (1)	Check oil level at reservoir site gauge.	Oil level is not visible in site gauge.

The diagram shows a side view of a heavy-duty vehicle. An arrow points from the rear of the vehicle to a detailed view of a site gauge. The gauge is a vertical rectangular device with a circular window at the top. It is mounted on a metal plate. The gauge has two horizontal markings: 'FULL' at the top and 'ADD' at the bottom. A circled number '1' with an arrow points to the top of the gauge, indicating the location of the LHS hydraulic reservoir.



*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

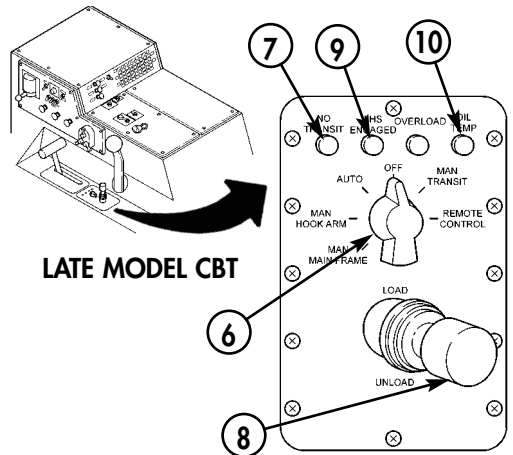
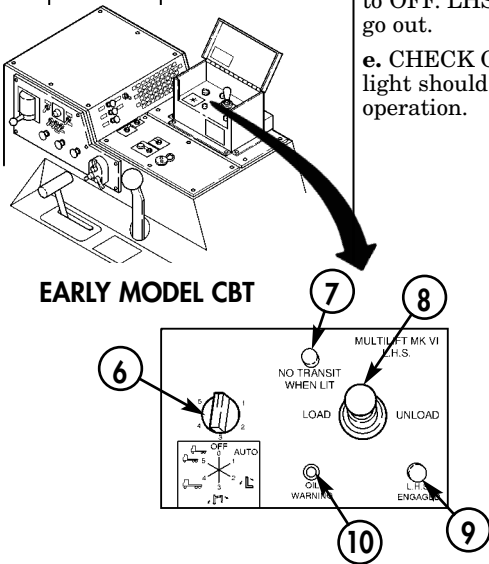
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
3	Before	Spotlight (2)	Check for any physical damage and if lamp is burned out.	
4	Before	Manifold cover assembly (3) (Early model CBT only)	<p><b>a.</b> Check cover assembly for damaged or missing hardware.</p> <p><b>b.</b> Check weldment for breaks, cracks or damage. Check cover assembly for rust, corrosion, or chipped paint.</p>  <p><b>MANIFOLD COVER ASSEMBLY, EARLY MODEL CBT</b></p>	

*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
5	Before	Remote control unit (4), stowage box (3), RCU cable (1), and LHS receptacle (2)	<p><b>a.</b> Check exterior of RCU stowage box and RCU cable for damage. If damaged, use manual operation. Refer to WP 0030 00.</p> <p><b>b.</b> Connect RCU cable to left or right LHS receptacle. If both receptacles are damaged, use manual operation. Refer to WP 0030 00.</p>	<p><b>a.</b> Manual operation will not operate LHS.</p> <p><b>b.</b> Manual operation will not operate LHS.</p>
<p>A technical drawing of an RCU stowage box with its front panel open. Callout 1 points to the RCU cable, callout 2 points to the LHS receptacle on the side, callout 3 points to the stowage box, and callout 4 points to the internal RCU unit.</p>				
6	Before	LHS rollers (5)	Check rollers for damage and binding.	Any rollers are broken, missing, or inoperable.
<p>A technical drawing showing a side view of a truck chassis. An arrow points from the chassis to a detailed view of the LHS rollers. Callout 5 points to the rollers in both views.</p>				

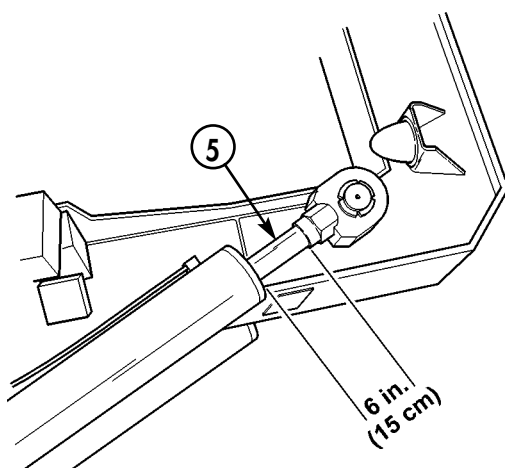
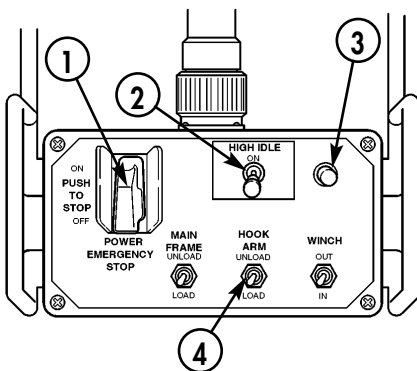
Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
7	During	Load handling system (LHS) controls: LHS MODE SELECT switch (6), NO TRANSIT WHEN LIT indicator (7), joystick (8), LHS ENGAGED indicator (9), and OIL WARNING indicator (10)	<p style="text-align: center;"><b>WARNING</b></p> <p>Check for overhead power lines or other obstructions before attempting operation of the LHS. The LHS reaches a height of 22 ft. 2 in. (6.7 m). Serious injury or death may result from contact with electric power lines.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Perform before operation PMCS for pallet. Refer to WP 0043 00.</p> <p>Perform during operation PMCS, for pallet (WP 0043 00), steps 7-12, prior to LHS during operation PMCS.</p> <p><b>a.</b> Check for proper operation of LHS MODE SELECT switch and joystick. Verify by placing LHS MODE SELECT switch in AUTO position.</p> <p><b>b.</b> Pull joystick to UNLOAD to raise the LHS about 1-2 ft. (0.305 - 0.610 m). LHS ENGAGED indicator light will light green, and NO TRANSIT WHEN LIT indicator light will light red.</p> <p><b>c.</b> Push joystick to LOAD position. NO TRANSIT WHEN LIT indicator light will go out.</p> <p><b>d.</b> Turn LHS MODE SELECT switch to OFF. LHS ENGAGED indicator will go out.</p> <p><b>e.</b> CHECK OIL WARNING indicator; light should remain out during LHS operation.</p>	<p><b>a.</b> LHS will not operate electrically using RCU and manually using valve tools.</p>



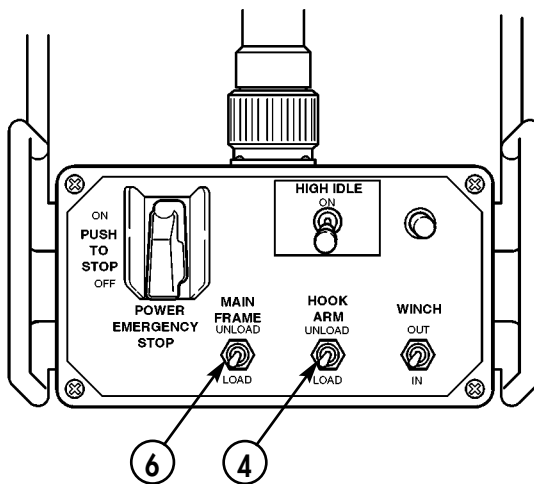
*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
8	During	EMERGENCY STOP switch (1) panel illumination lamp (3), HIGH IDLE switch (2), HOOK ARM switch (4), and cylinder (5)	<p><b>a.</b> Check to ensure RCU switches are non-operational when RCU EMERGENCY STOP switch is in OFF position. Use manual operation. Refer to WP 0030 00.</p> <p><b>b.</b> Move EMERGENCY STOP switch to ON position. Panel illumination lamp should light. Use manual operation. Refer to WP 0030 00.</p> <p><b>c.</b> Move HIGH IDLE switch to ON. Engine rpm should increase audibly. Move HIGH IDLE switch to OFF. Use manual operation. Refer to WP 0030 00.</p> <p><b>d.</b> Move HOOK ARM switch to UNLOAD until hook arm cylinders are extended to approximately 6 in. (15 cm). Use manual operation. Refer to WP 0030 00.</p>	<p><b>a.</b> Switch operates with EMERGENCY STOP switch in OFF position.</p> <p><b>b.</b> Panel illumination lamp is not lit using a new lamp.</p> <p><b>c.</b> Engine rpm will not increase with switch in HIGH IDLE position.</p> <p><b>d.</b> Hook arm cylinders will not extend.</p>



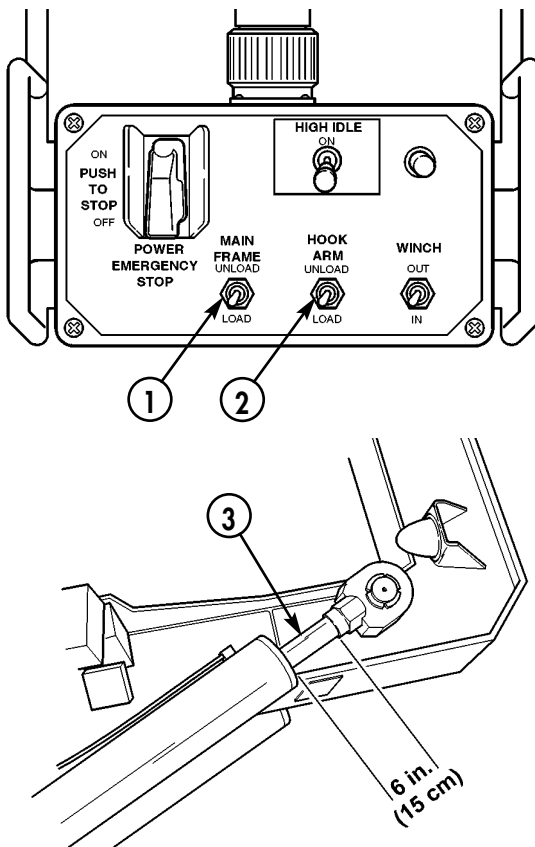
*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
9	During	MAIN FRAME switch (6), and HOOK ARM switch (4)	<p><b>a.</b> Move MAIN FRAME switch to UNLOAD and release when main frame is extended fully. Ensure main frame extends fully. If not, use manual operation. Refer to WP 0030 00.</p> <p><b>b.</b> Move HOOK ARM switch to UNLOAD and release when hook arm is fully extended rearward. If not, use manual operation. Refer to WP 0030 00.</p>	<p><b>a.</b> Main frame will not operate.</p> <p><b>b.</b> Hook arm will not operate.</p>

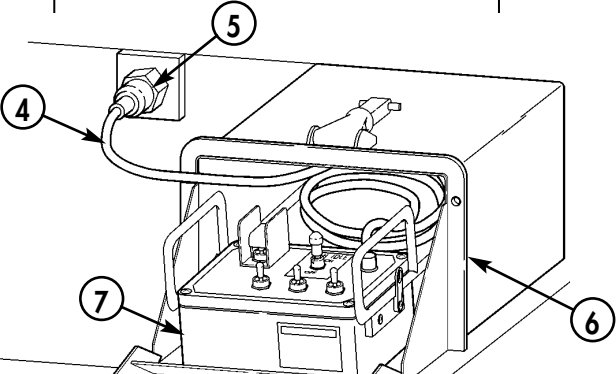
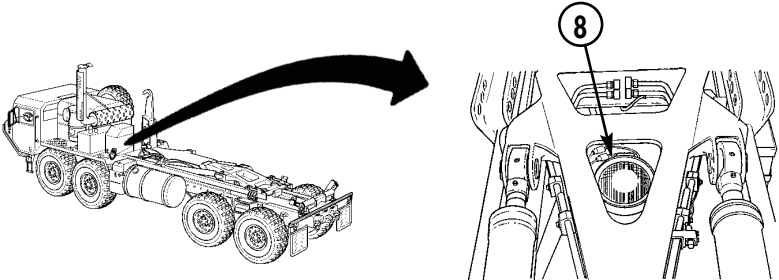


Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).

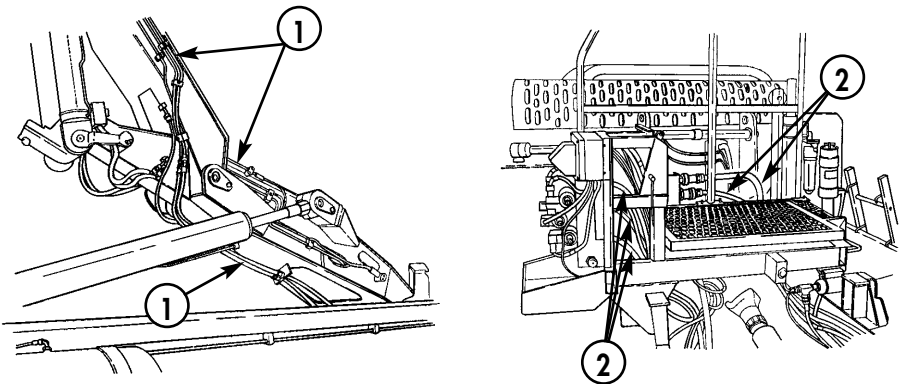
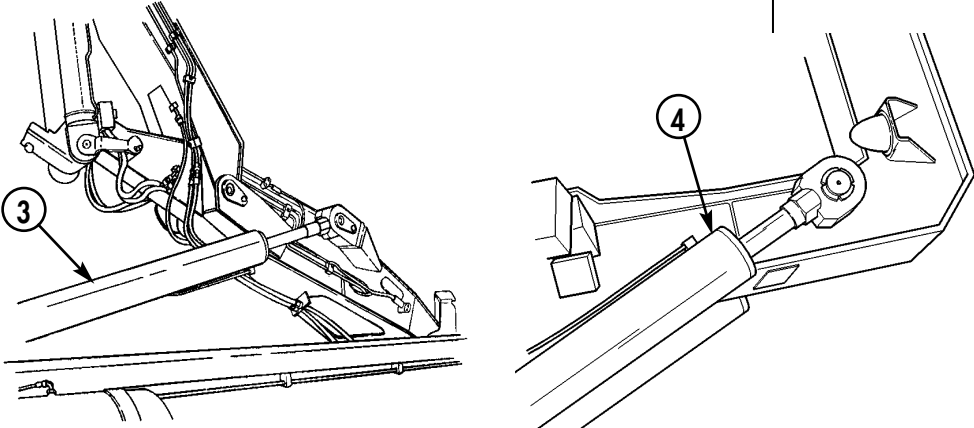
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
10	During	HOOK ARM SWITCH (2), MAIN FRAME switch (1), and cylinder (3)	<p><b>a.</b> Move HOOK ARM switch to LOAD and hold until hook arm cylinders are extended approximately 6 in. (15 cm). If not, use manual operation. Refer to WP 0030 00.</p> <p><b>b.</b> Move MAIN FRAME switch to LOAD and hold until main frame is in stowed position. If not, use manual operation. Refer to WP 0030 00.</p> <p><b>c.</b> Move HOOK ARM switch to LOAD and hold until hook arm is in stowed position. If not, use manual operation. Refer to WP 0030 00.</p>	<p><b>a.</b> Cylinder arms will not operate.</p> <p><b>b.</b> Main frame will not move to stowed position.</p> <p><b>c.</b> Hook arm will not move to stowed position.</p>



*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
11	During	RCU cable (4), LHS receptacle (5), RCU (7), and stowage box (6)	<p>Disconnect RCU cable from LHS receptacle, and stow cable and remote control unit in stowage box.</p> 	
			<p align="center"><b>WARNING</b></p> <p>When checking LHS components, keep clear of CBT exhaust system. Exhaust system may be hot! Failure to comply may result in injury to personnel.</p>	
12	During	Worklight (8)	<p>Check for damage and if lamp is burned out.</p> 	
13	After	All components of LHS	<p>Check LHS for any visible loose or missing mounting hardware.</p>	<p>Mounting hardware is missing.</p>

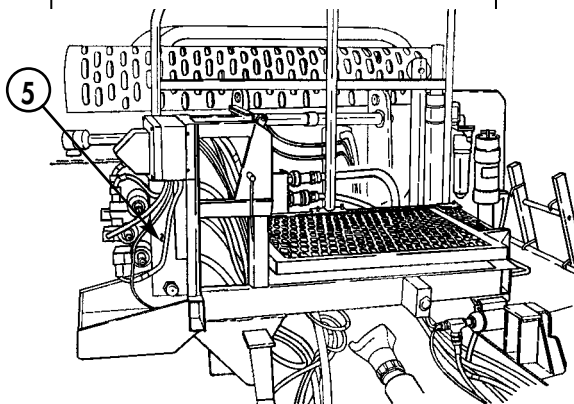
*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
14	After	Tube assemblies (1) and hoses (2)	<p><b>a.</b> Visually check tube assemblies for cracks, kinks, and leaks.</p> <p><b>b.</b> Visually check hoses for leaks.</p>	<p><b>a.</b> Cracked or kinked tubes impair operation or result in Class III leaks.</p> <p><b>b.</b> Any Class III leaks are detected.</p>
		 <p>The diagram for item 14 consists of two line drawings. The left drawing shows a close-up of a mechanical assembly with two callouts labeled '1' pointing to tube assemblies. The right drawing shows a wider view of the same assembly with two callouts labeled '2' pointing to hoses.</p>		
15	After	Cylinders (3) and (4)	Visually check lift cylinders for leaks, damage, or missing hardware.	Any Class III leaks are detected or cylinders are damaged.
		 <p>The diagram for item 15 consists of two line drawings. The left drawing shows a close-up of a lift cylinder with a callout labeled '3' pointing to the cylinder body. The right drawing shows a different view of the lift cylinder with a callout labeled '4' pointing to a specific component on the cylinder.</p>		



*Preventive Maintenance Checks and Services (PMCS)  
for CBT LHS (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
16	After	Main manifold (5)	<p><b>WARNING</b></p> <p>When checking main manifold, keep clear of CBT exhaust system. Exhaust system may be hot! Failure to comply may result in injury to personnel.</p> <p>Visually check main manifold for leaks or damaged hardware.</p>	Any Class III leaks are detected or hardware is damaged.





## MAINTENANCE INSTRUCTIONS/PMCS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) FOR PALLET

### **WARNING**

When checking/servicing an item, ensure that all attaching/mounting hardware is properly secured. Loose, cracked, broken, or missing hardware may cause equipment failure or injury to personnel.

### **CAUTION**

During PMCS, ensure that components and assemblies are correctly installed. Incorrect installation may cause equipment damage or failure.

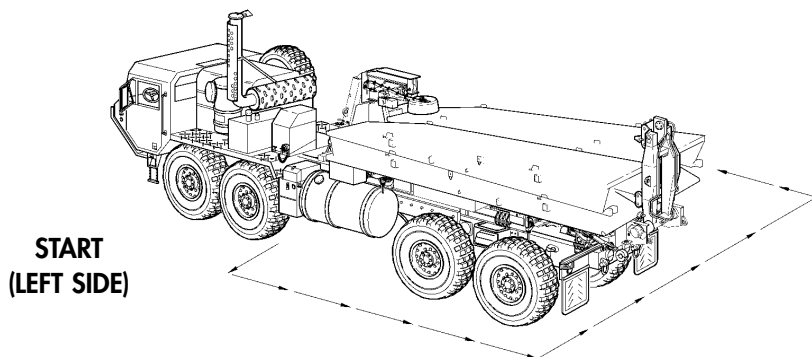
### **NOTE**

If performing PMCS in extreme cold (arctic operation), anticipate starting and warm-up of LPU and hydraulic system prior to performing PMCS. Refer to WP 0025 00.

This PMCS uses the one-look format. With REB on transporter, begin at the front of pallet nearest the driver's side of cab, and proceed to the right in a counterclockwise direction. Refer to PMCS for Pallet Figure below.

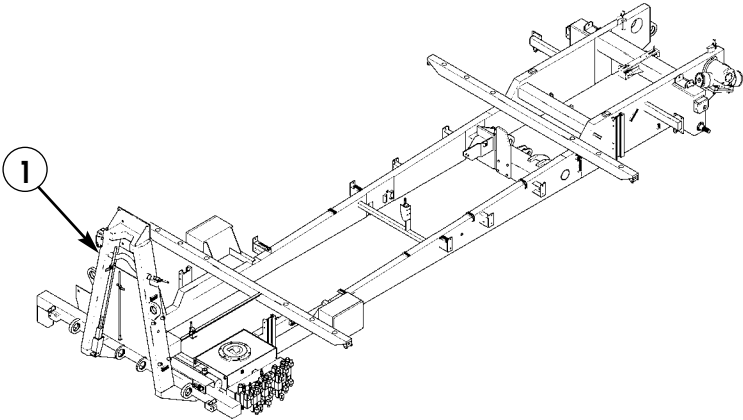
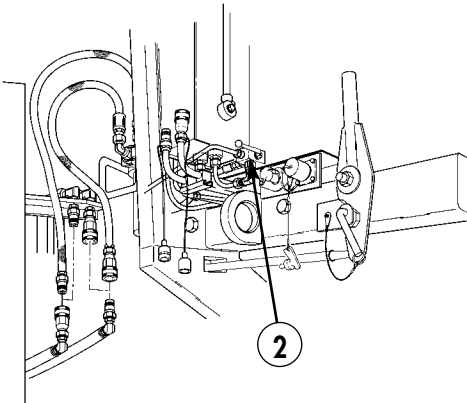
### **LUBRICATION**

Perform lubrication checks and services after completing PMCS. Refer to WP 0045 00.



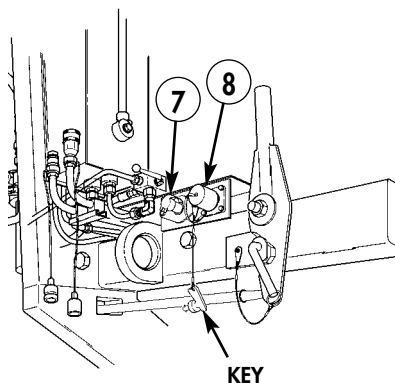
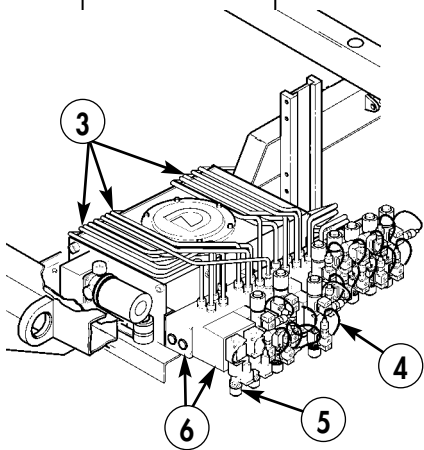
*PMCS for Pallet Figure.*

*Preventive Maintenance Checks and Services (PMCS) for Pallet.*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Before	Pallet A-frame (1)	Check for cracks, broken welds, or if bent.	Pallet A-frame member is cracked, has broken welds, or is bent enough to affect operation.
				
2	Before	Transfer valve (2)	Check for damage or missing lever.	Damaged or lever is missing.
				

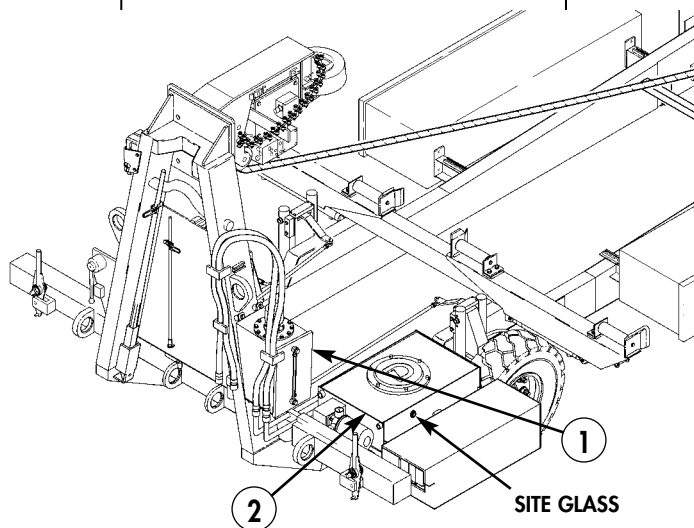
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
3	Before	NATO slave receptacle (8) and main power switch (7)	<p><b>a.</b> Check for damage, loose electrical leads, missing hardware, or missing key.</p> <p><b>b.</b> Check NATO slave cable for damage or if missing.</p>	<p><b>a.</b> Damaged or loose electrical leads, or key or hardware is missing.</p> <p><b>b.</b> NATO slave cable is damaged or missing.</p>
4	Before	Control valves (5), manifolds (6), hydraulic lines (3), and solenoid electrical leads (4)	<p><b>a.</b> Check control valves for loose mounting hardware or oil leakage.</p> <p><b>b.</b> Check manifolds for loose mounting hardware or oil leakage.</p> <p><b>c.</b> Check hydraulic lines for damage or oil leakage.</p> <p><b>d.</b> Check solenoid electrical leads for damage, loose connectors, or frayed wires.</p>	<p><b>a.</b> Any mounting hardware is loose, or Class III leak is noted.</p> <p><b>b.</b> Any mounting hardware is loose, or Class III leak is noted.</p> <p><b>c.</b> Any Class III is leak noted.</p> <p><b>d.</b> Any electrical lead is damaged, loose, or frayed.</p>



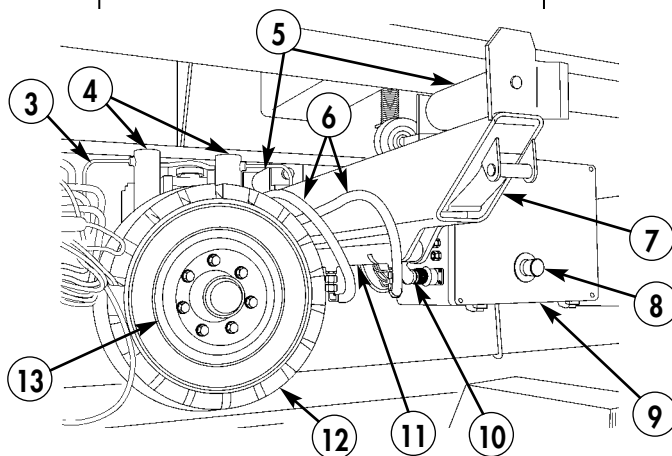
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
5	Before	Auxiliary hydraulic oil reservoir (1) and hydraulic reservoir (2)	<p>a. Check for leaks or missing hardware.</p> <p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">Oil level must be visible through pallet main reservoir site glass.</p> <p>b. Check oil level in hydraulic reservoir.</p>	<p>a. Any Class III leak noted.</p> <p>b. Oil level is not visible in reservoir site glass.</p>

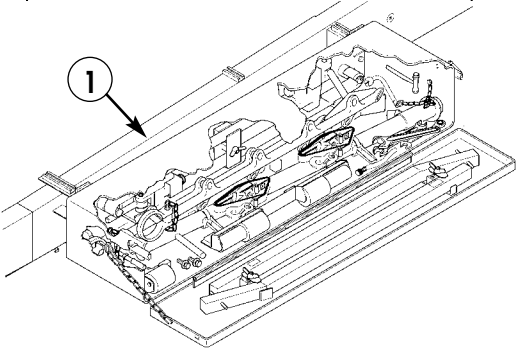
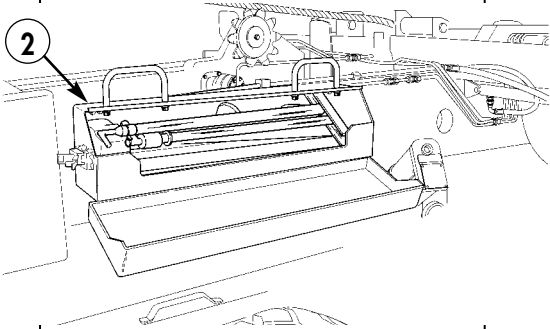


Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
6	Before	Telescopic tube (7), rollers (5), hydraulic cylinder (11) and lines, and hoses (6)	<p><b>a.</b> Check telescopic tube for cracks or damage.</p> <p><b>b.</b> Check for loose or missing rollers.</p> <p><b>c.</b> Check hydraulic cylinder, lines, fittings, and hoses for damage or leaks.</p>	<p><b>a.</b> Any cracks or damage is noted.</p> <p><b>b.</b> Any rollers are loose or missing.</p> <p><b>c.</b> Any damage or Class III leak is noted.</p>
7	Before	Supporting wheel (13), tire (12), hydraulic cylinders (4), and lines (3)	<p><b>a.</b> Check supporting wheel and retaining bracket for damage or missing hardware. Spin wheel to ensure it rotates freely.</p> <p><b>b.</b> Check tire for cuts, cracks, or deflation. Check tire pressure and add air as necessary; fill to 100 psi (690 kPa)</p> <p><b>c.</b> Check hydraulic cylinders for loose or missing hardware.</p> <p><b>d.</b> Check hydraulic cylinders, lines, and fittings for leaks.</p>	<p><b>d.</b> Any Class III leak is noted.</p>
8	Before	Electrical system box (9), electrical harnesses (10), and emergency stop button (8)	<p><b>a.</b> Check electrical system stowage box for loose or missing hardware.</p> <p><b>b.</b> Check electrical harnesses for damaged, frayed, or missing mounting hardware.</p>	<p><b>a.</b> Stowage box is hanging loose or door is missing.</p> <p><b>b.</b> Any electrical lead is cut.</p>



Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
9	Before	Pallet toolbox (1) and BII	<p><b>a.</b> Check toolbox for loose mounting hardware.</p> <p><b>b.</b> Check tool hold-down brackets for missing or loose mounting hardware.</p> <p><b>c.</b> Check toolbox cover and latches for loose or missing hardware.</p> <p style="text-align: center;"><b>NOTE</b> Fastening rods may be securing bridge.</p> <p><b>d.</b> Check for missing or damaged BII. Refer to WP 0009 00.</p> 	<p><b>a.</b> Any mounting hardware is loose.</p> <p><b>c.</b> Latches or mounting hardware are damaged or missing.</p> <p><b>d.</b> Any BII are damaged or missing.</p>
10	Before	Anchorage stowage box (2) and BII	<p style="text-align: center;"><b>NOTE</b> Boxes may be stowed on bridge.</p> <p><b>a.</b> Check for loose mounting hardware, brackets, latches, pins, or missing cover.</p> <p><b>b.</b> Check for missing or damaged BII. Refer to WP 0009 00.</p> 	<p><b>a.</b> Latches, pins, or cover are damaged or missing.</p> <p><b>b.</b> Any BII are damaged or missing.</p>



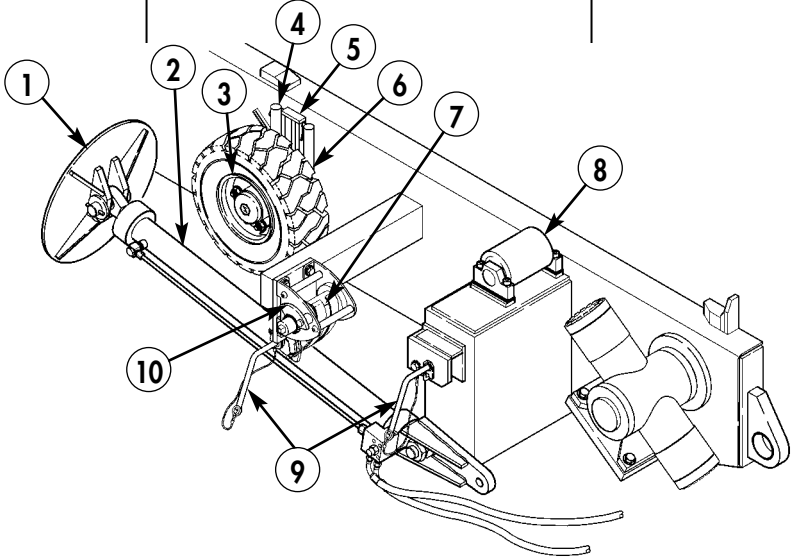
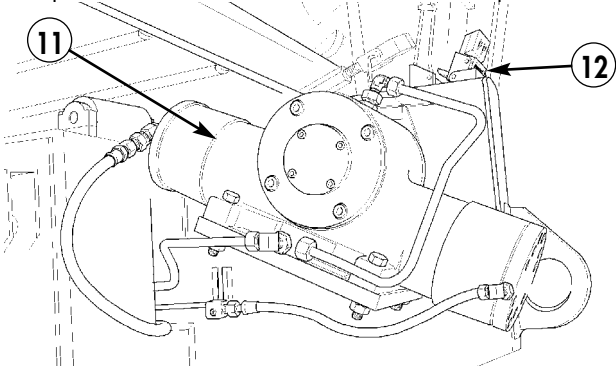
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
11	Before	Hydraulic tubing (3) on pallet frame	Check hydraulic tubing on pallet for kinks, damage, loose mounting hardware, or leaking fittings.	Any tubing is kinked, damaged, mounting hardware is loose, or Class III leak is noted.
12	Before	Telescopic tube (5), rollers (4), hydraulic cylinder (6), lines (8), and hoses (7)	<p>a. Check telescopic tube for cracks or damage.</p> <p>b. Check for loose or missing rollers.</p> <p>c. Check hydraulic cylinder, lines, fittings, and hoses for damage or leaks.</p>	<p>a. Any cracks or damage is noted.</p> <p>b. Any rollers are loose or missing.</p> <p>c. Any damage or Class III leak is noted.</p>

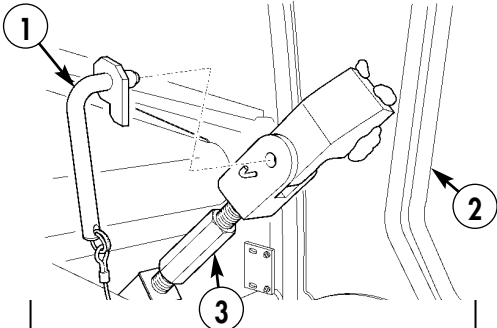
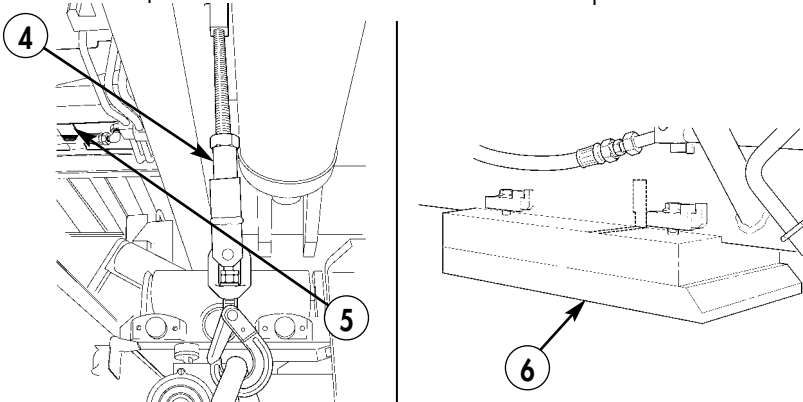
*Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
13	Before	Supporting cylinder bottom plate (1)	Check for damage, cracks, or missing pin.	Supporting cylinder bottom plate is damaged or pin is missing.
14	Before	Supporting cylinder (2), winch (10), strap (7), retaining pins (9), and roller (8)	<p><b>a.</b> Check for damaged or missing retaining pins.</p> <p><b>b.</b> Check for damaged or missing hand winch strap or strap pin.</p> <p><b>c.</b> Check winch ratchet operation for looseness or damage using BII ratchet.</p> <p><b>d.</b> Check hydraulic hoses, fittings, and lines for damage or leaks.</p> <p><b>e.</b> Check for damaged roller.</p>	<p><b>a.</b> Retaining pins are missing or damaged.</p> <p><b>b.</b> Strap or strap pin is damaged or missing.</p> <p><b>c.</b> Ratchet is not operational.</p> <p><b>d.</b> Lines, hoses, or fittings are damaged, or Class III leak is noted.</p> <p><b>e.</b> Roller is damaged or will not turn.</p>
15	Before	Supporting wheel (3), tire (6), hydraulic cylinders (4), and retaining bracket (5)	<p><b>a.</b> Check supporting wheel and retaining bracket for damage or missing hardware. Spin wheel to ensure it rotates freely.</p> <p><b>b.</b> Check tire for cuts, cracks, or deflation. Check tire pressure and add air as necessary; fill to 100 psi (690 kPa)</p> <p><b>c.</b> Check hydraulic cylinders for loose or missing hardware.</p> <p><b>d.</b> Check hydraulic cylinders, lines, and fittings for leaks, or if tubing is kinked or damaged.</p>	<p><b>d.</b> Any Class III leak is noted or faulty cylinders prevent transload or transport of pallet on ground.</p>

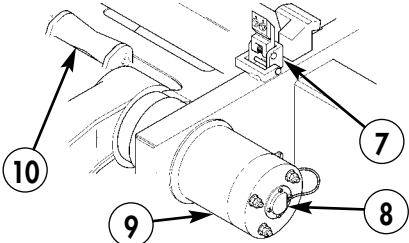
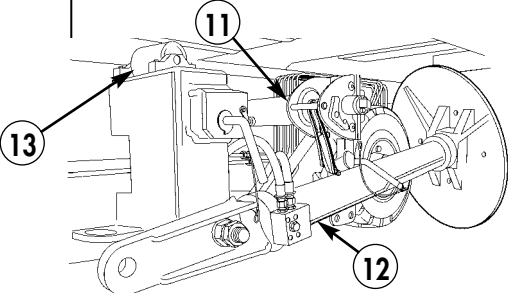
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
16	Before	Swivel drive (11) and lever (12)	 <p>a. Check swivel drive for missing or loose mounting hardware.</p> <p>b. Check hydraulic lines and fitting for damage or leaks.</p> <p>c. Check lever for damage or missing parts. Check for dirt or debris lodged in lever bracket; remove as necessary.</p> 	<p>a. Mounting hardware is missing or loose.</p> <p>b. Hydraulic lines are damaged or Class III leak is noted.</p> <p>c. Lever is not operational.</p>

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

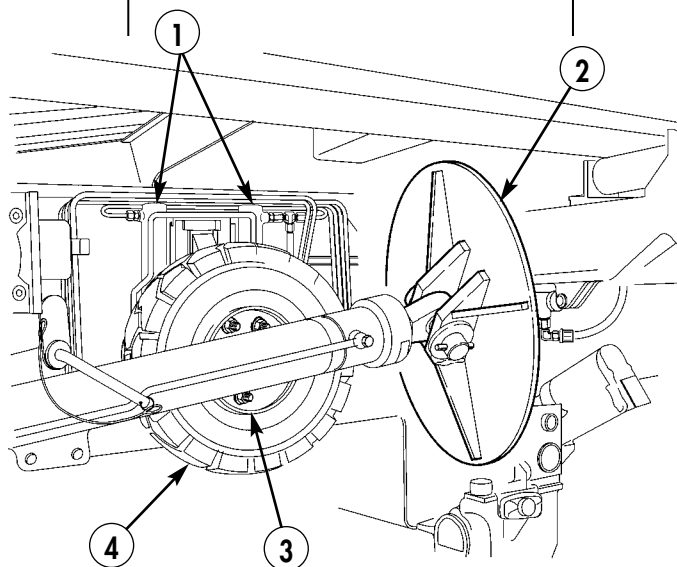
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
17	Before	Launch boom (2), launch boom locks (3), and retaining pins (1)	<p>a. Check hydraulic lines for damage, or loose mounting hardware.</p> <p>b. Check hydraulic lines for leaks.</p> <p>c. Check launch boom locks for damage or if retaining pins are missing.</p> 	<p>a. Lines are not secured properly.</p> <p>b. Any Class III leak is noted.</p> <p>c. Launch boom locks are damaged or retaining pins are missing.</p>
18	Before	Pallet hold-down bars (4), shoring pads (6), and KA3 and KA4 limit switches (5)	<p>a. Check both hold-down bars for damage or missing parts. Ensure hold-down bars (4) are tight.</p> <p>b. Check to see both shoring pads are present, secured, and aligned as marked.</p> 	
19	Before	Bearing shaft manifold (9), potentiometer (8), lever (7), and winch wire rope roller (10)	<p>a. Check for damage, loose or missing hardware, or leakage.</p>	<p>a. Any damage, loose or missing hardware, or Class III leaks noted.</p>

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
20	Before	Supporting cylinder (12), roller (13), and winch (11)	<p>b. Check hydraulic tubing and fittings for damage or leakage.</p> <p>c. Check potentiometer electrical harness for damaged or frayed wires.</p> <p>d. Check lever for damaged or missing parts. Check for dirt or debris lodged in lever ratchet; remove as necessary.</p> <p>e. Check winch wire rope roller is free moving; lube as necessary.</p>  <p>a. Check for damaged or missing retaining pins.</p> <p>b. Check for damaged or missing hand winch strap or strap pin.</p> <p>c. Check winch ratchet operation for looseness or damage.</p> <p>d. Check hydraulic hoses, fittings, and lines for damage or leaks.</p> <p>e. Check for damaged roller.</p> 	<p>b. Any Class III leaks noted.</p> <p>c. Harness wires are damaged or frayed.</p> <p>d. Lever is not operational.</p> <p>e. Winch wire rope roller will not turn.</p> <p>a. Missing or damaged retaining pins.</p> <p>b. Strap or strap pin is damaged or missing.</p> <p>c. Ratchet is not operational.</p> <p>d. Damaged lines, hoses, fittings, or Class III leak noted.</p> <p>e. Roller is damaged or will not turn.</p>

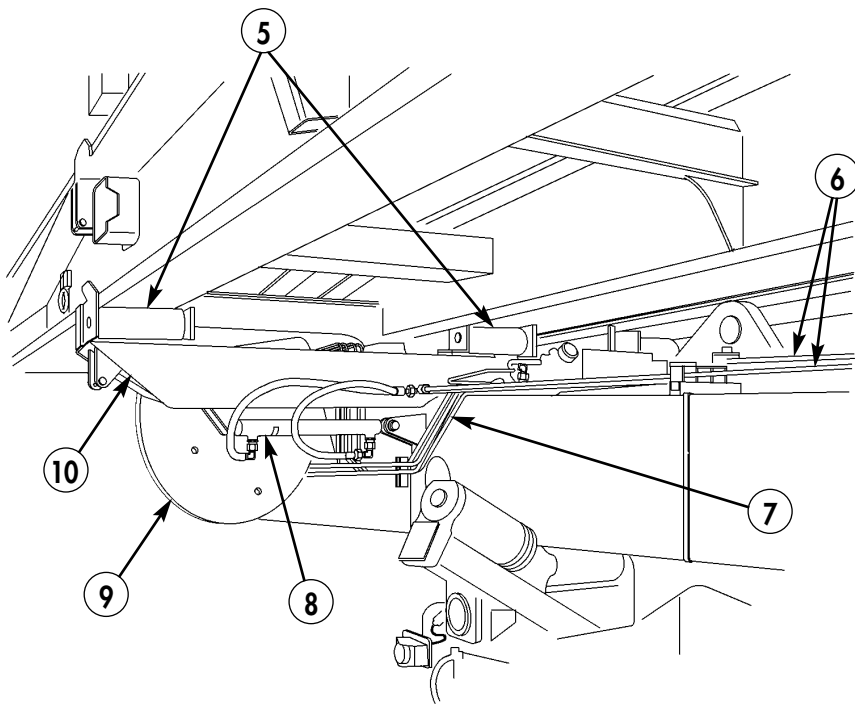
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
21	Before	Supporting wheel (3), tire (4), and hydraulic cylinders (1)	<p><b>a.</b> Check supporting wheel and retaining bracket for damage or missing hardware. Spin wheel to ensure it rotates freely.</p> <p><b>b.</b> Check tire for cuts, cracks, or deflation. Check tire pressure and add air as necessary; fill to 100 psi (690 kPa)</p> <p><b>c.</b> Check hydraulic cylinders for loose or missing hardware.</p> <p><b>d.</b> Check hydraulic cylinders, lines, and fittings for leaks, or if tubing is kinked or damaged.</p>	<p><b>d.</b> Any Class III leak is noted or faulty cylinders prevent transload or transport of pallet on ground.</p>
22	Before	Supporting cylinder bottom plate (2)	Check supporting cylinder bottom plate for damage, cracks, or missing pin.	Supporting cylinder bottom plate damaged or missing pin.

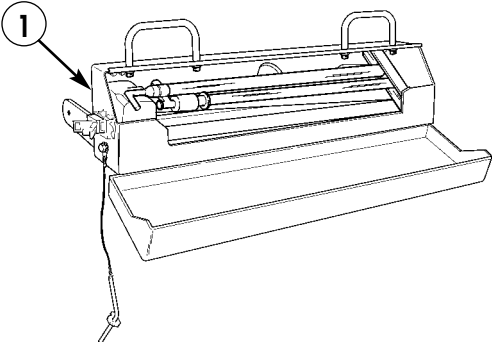
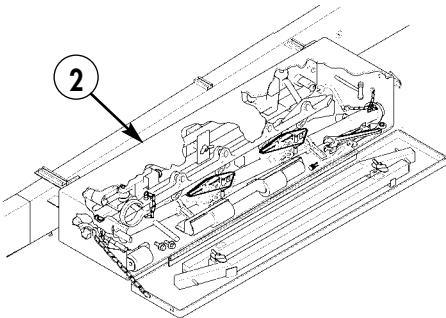


Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
23	Before	Telescopic tube (10), rollers (5), hydraulic cylinder (8), lines (6), and hoses (9)	<p><b>a.</b> Check telescopic tube for cracks or damage.</p> <p><b>b.</b> Check for loose or missing rollers.</p> <p><b>c.</b> Check hydraulic cylinder, lines, fittings, and hoses for damage or leaks.</p>	<p><b>a.</b> Any cracks or damage noted.</p> <p><b>b.</b> Any loose or missing rollers.</p> <p><b>c.</b> Any damage or Class III leaks noted.</p>
24	Before	Hydraulic tubing (7) on pallet frame	Check hydraulic tubing on pallet for kinks, damage, loose mounting hardware, or leaking fittings.	Any kinked or damaged tubing, loose mounting hardware, or Class III leak noted.

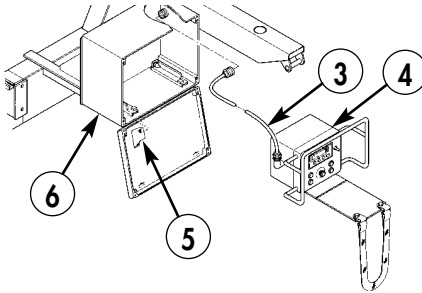
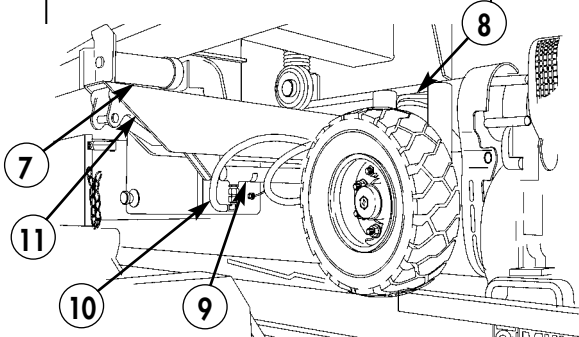


Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
25	Before	Anchorage stowage box (1) and BII	<p><b>a.</b> Check for loose mounting hardware, brackets, latches, pins, or missing cover.</p> <p><b>b.</b> Check for missing or damaged BII. Refer to WP 0009 00.</p> 	<p><b>a.</b> Latches, pins, or cover are damaged or missing.</p> <p><b>b.</b> Any BII are damaged or missing.</p>
26	Before	Pallet toolbox (2) and BII	<p><b>a.</b> Check toolbox for loose mounting hardware.</p> <p><b>b.</b> Check tool hold-down brackets for missing or loose mounting hardware.</p> <p><b>c.</b> Check toolbox cover and latches for loose or missing hardware.</p> <p><b>d.</b> Check for missing or damaged BII. Refer to WP 0009 00.</p> 	<p><b>a.</b> Any mounting hardware is loose.</p> <p><b>c.</b> Latches or mounting hardware are missing.</p> <p><b>d.</b> Any BII are damaged or missing.</p>



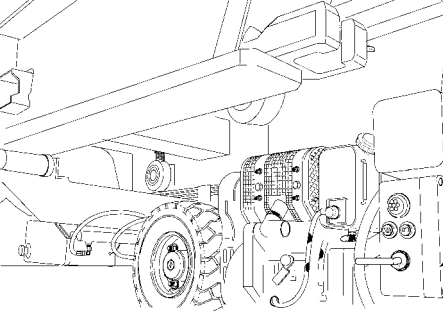
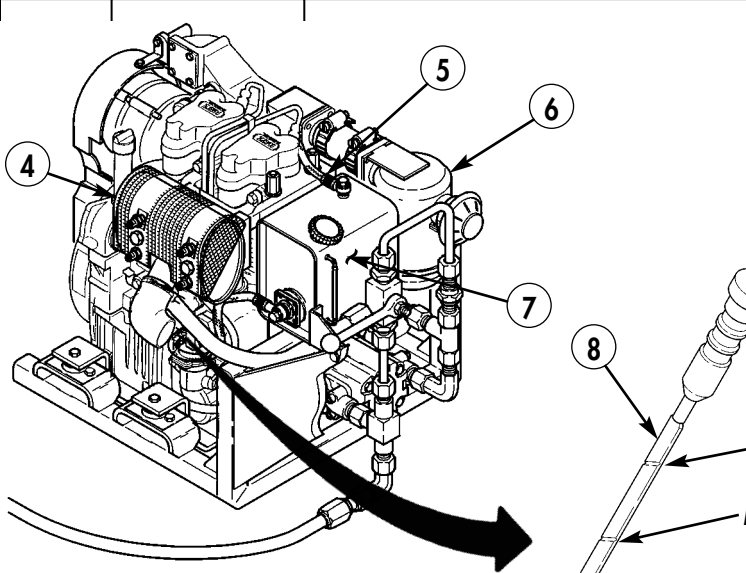
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:			
27	Before	RCU stowage box (6), electrical harness (3), emergency stop button (5) and RCU (4)	<p><b>a.</b> Check RCU stowage box for damaged latch, cover hinges, O-ring seal, or loose or missing hardware.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Turn on main power switch to verify emergency stop button functions. Ensure emergency stop buttons on electrical system box lid and RCU storage box lid are in ON position.</p> <p><b>b.</b> Actuate emergency stop button on RCU stowage box lid and electrical box lid.</p> <p><b>c.</b> Remove and check electrical harness for damage or loose connector.</p> <p><b>d.</b> Check RCU for damaged display or controls.</p>	<p><b>a.</b> Latch or hinges missing.</p> <p><b>b.</b> Any emergency stop button is inoperable.</p> <p><b>c.</b> Electrical harness damaged.</p> <p><b>d.</b> RCU damaged.</p>			
			28	Before	Telescopic tube (11), rollers (7), hydraulic cylinder (9), lines (8), and hoses (10)	<p><b>a.</b> Check telescopic tube for cracks or damage.</p> <p><b>b.</b> Check for loose or missing rollers.</p> <p><b>c.</b> Check hydraulic cylinder, lines, fittings, and hoses for damage or leaks.</p>	<p><b>a.</b> Any cracks or damage is noted.</p> <p><b>b.</b> Any loose or missing rollers.</p> <p><b>c.</b> Any damage or Class III leaks noted.</p>
							

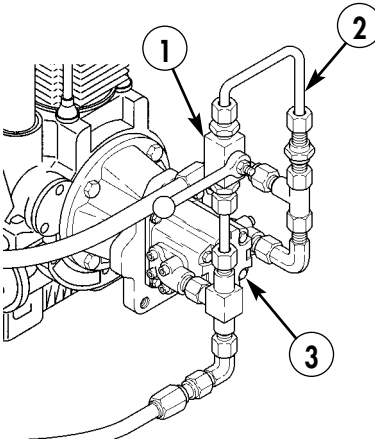
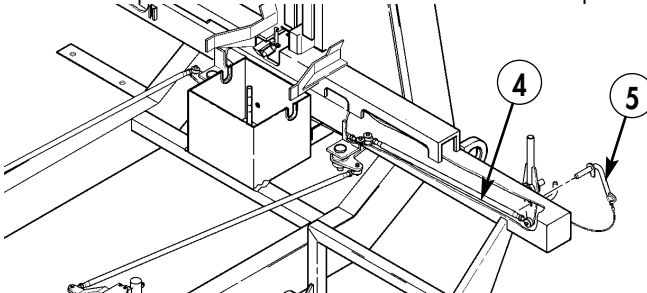
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
29	Before	Supporting wheel (2), tire (3), and hydraulic cylinders (1)	<p><b>a.</b> Check supporting wheel and retaining bracket for damage or missing hardware. Spin wheel to ensure it rotates freely.</p> <p><b>b.</b> Check tire for cuts, cracks, or deflation. Check tire pressure and add air as necessary; fill to 100 psi (690 kPa).</p> <p><b>c.</b> Check hydraulic cylinders for loose or missing hardware.</p> <p><b>d.</b> Check hydraulic cylinders, lines, and fittings for damage or leaks.</p>	<p><b>d.</b> Any Class III leak is noted or faulty cylinders prevent transload or transport of pallet on ground.</p>
30	Before	LPU engine oil level (8), air cleaner (6), muffler and exhaust elbow (4), fuel tank level (7), and hoses (5)	<p><b>a.</b> Check oil level before starting engine; level must be visible between maximum and minimum marks on dipstick.</p> <p><b>b.</b> Check air cleaner for damage, loose or missing hardware, or obstructions.</p> <p><b>c.</b> Check muffler and exhaust elbow for damage or loose or missing hardware.</p> <p><b>d.</b> Check site tube for full fuel level, and check tank for damage, loose or missing hardware, or leakage.</p> <p><b>e.</b> Check hoses for damage or leakage.</p>	<p><b>a.</b> Oil level is below minimum.</p> <p><b>b.</b> Air cleaner is damaged or obstructed.</p> <p><b>c.</b> Fuel tank leaks.</p> <p><b>d.</b> Any Class III leak is noted.</p>

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

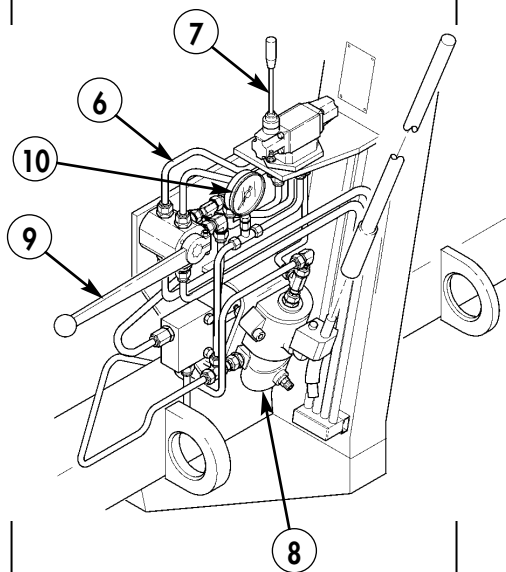
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
31	Before	LPU engine control box (9)	<p><b>NOTE</b> Refer to WP 0015 00 for starting procedure.</p> <p>a. Check LPU control box for damage.</p> <p>b. Check engine for damage. Start and run engine.</p> <p>c. With engine running, refer to step 7 and check gauges on hydraulic system filter and pre-filter; if clogged, gauge will indicate red zone.</p> <p>d. Shut off power at LPU and master power switch</p> 	 <p>a. Engine is damaged or will not run.</p> <p>b. Either gauge indicates red zone.</p> <p>c. Damage prevents starting LPU engine.</p>

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
32	Before	LPU engine hydraulic pump (3), bypass valve (1), and lines (2)	<p><b>NOTE</b> Inspection hole is located at bottom of adapter housing.</p> <p><b>a.</b> Check hydraulic pump for damaged drive gear coupling.</p> <p><b>b.</b> Check bypass valve for damage or loose or missing hardware.</p> <p><b>c.</b> Check lines and fitting for damage or leakage.</p> 	<p><b>a.</b> Damaged drive gear coupling (if LPU engine will be used).</p> <p><b>b.</b> Damaged drive gear coupling (if LPU engine will be used).</p> <p><b>c.</b> Damaged drive gear coupling (if LPU engine will be used).</p>
33	Before	Steering linkage (4) and both retaining pins (5)	<p><b>a.</b> Check steering linkage for damage, loose or missing hardware, or binding.</p> <p><b>b.</b> Check retaining pins for damage.</p> 	

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
34	Before	Supporting wheel pump (8), selector valve (9), control valve (7), pressure gauge (10), and tubing (6)	<p><b>a.</b> Check pump for damage, loose or missing hardware, or leakage.</p> <p><b>b.</b> Check valves and gauge for damage, loose or missing hardware, or leaks.</p> <p><b>c.</b> Check tubing and fittings for damage, loose or missing hardware, or leakage.</p>	<p><b>a.</b> Any damage, loose or missing hardware, or Class III leak noted.</p> <p><b>b.</b> Any damage, loose or missing hardware, or Class III leak noted.</p> <p><b>c.</b> Any damage, loose or missing hardware, or Class III leak noted.</p>

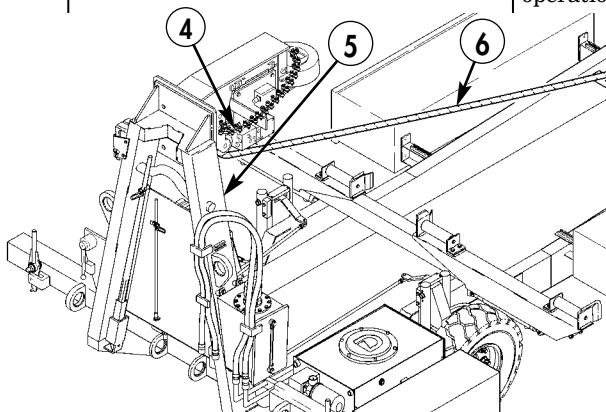


Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
35	Before	Hydraulic reservoir oil filter (1) and pre-filter (2)	Check for damage or leaks.	Any damage or Class III leak noted.
36	During	Rear pinwheel drive mounting bolts (3)	Check for loose mounting bolts. Notify unit maintenance to tighten if loose.	Mounting bolts are loose.
37	During	RCU	Launch bridge to ground and observe RCU display screen. Refer to WP 0016 00.	RCU will not operate.

Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
38	During	Winch motor (4), wire rope (6), and hydraulic lines (5)	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>Winch wire rope may be frayed. Wear heavy leather gloves when handling winch cable, and do not run hands on cable. Failure to comply may result in injury to personnel.</p> <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>When performing PMCS on pallet, do not stand or sit on hydraulic lines, tubing, limit switches, steering linkage, or mounting brackets. Failure to comply may result in damage to equipment.</p> <p style="text-align: center;"><b><u>NOTE</u></b></p> <p>Perform item numbers 38 through 53 with bridge removed.</p> <p><b>a.</b> Check winch motor for loose or missing hardware.</p> <p><b>b.</b> Check hydraulic lines for loose mounting hardware, damaged lines, or leaking lines or fittings.</p> <p><b>c.</b> Check winch wire rope for signs of pigtailling, unwrapping, broken wires, kinks, frays, or damage. Check winch wire rope sensor for build-up of dirt and debris.</p>	<p><b>a.</b> Any loose or missing hardware.</p> <p><b>b.</b> Any loose or missing hardware, damaged lines, or Class III leaks noted.</p> <p><b>c.</b> Winch wire rope is kinked, frayed, damaged, or shows signs of unwrapping or pigtailling. Dirt and debris on sensor prevents winch operation.</p>

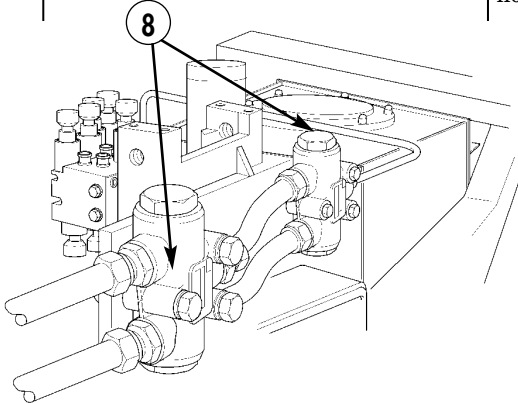


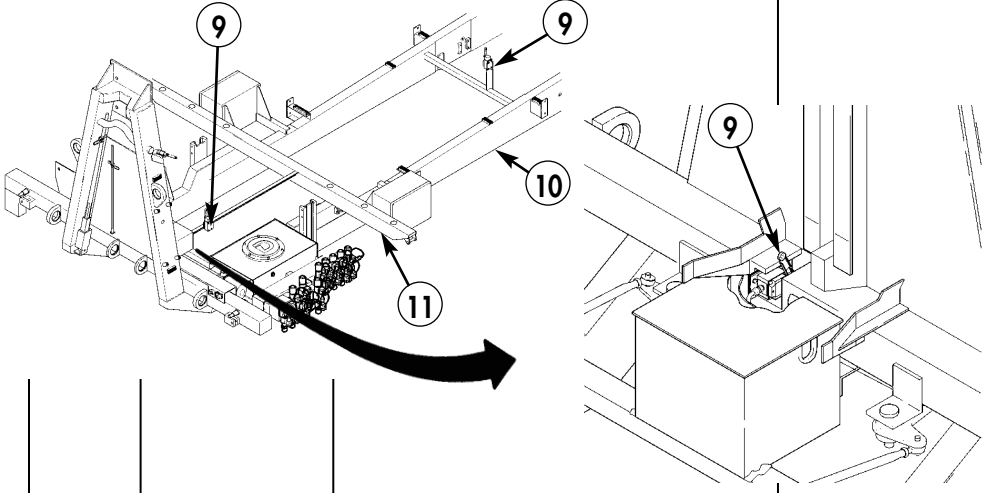
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
39	During	Winch limit switches (3)	Check limit switches for damage or broken electrical wires. Refer to WP 0002 00.	Limit switches broken or damaged, broken wires, or out of adjustment.
40	During	Battery box (6), batteries (2), cables (4), and terminal covers (7)	<p><b>a.</b> Check battery box for damage or loose mount hardware.</p> <p><b>b.</b> Check battery cases for visible cracks or damage.</p> <p><b>c.</b> Check for damaged or missing terminal covers.</p> <p><b>d.</b> Check battery cable terminals for corrosion, loose or damaged cable, or missing hardware.</p>	<p><b>a.</b> Any damage or loose mounting hardware.</p> <p><b>b.</b> Any visible cracks or damage.</p> <p><b>d.</b> Any damage or loose battery cables or missing hardware.</p>
41	During	Steering rods (1) and tie rod (5)	<p><b>a.</b> Check steering rods for damage or loose or missing hardware.</p> <p><b>b.</b> Check tie rod for damage or loose or missing hardware.</p>	



Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
42	During	Flow dividers (8)	<p>Check flow divider and pressure regulators for damage, loose mounting hardware, or leaking lines.</p> 	Any damage, loose mounting hardware, or Class III leaks noted.
43	During	Transverse girders (11) and longitudinal girders (10)	Check for cracks, broken welds, or if bent.	Cracked, broken welds are found, or is bent enough to offset operation.
44	During	Limit switches (9)	Check limit switches for damage or broken electrical wires. Refer to WP 0002 00.	Limit switches are broken or damaged.



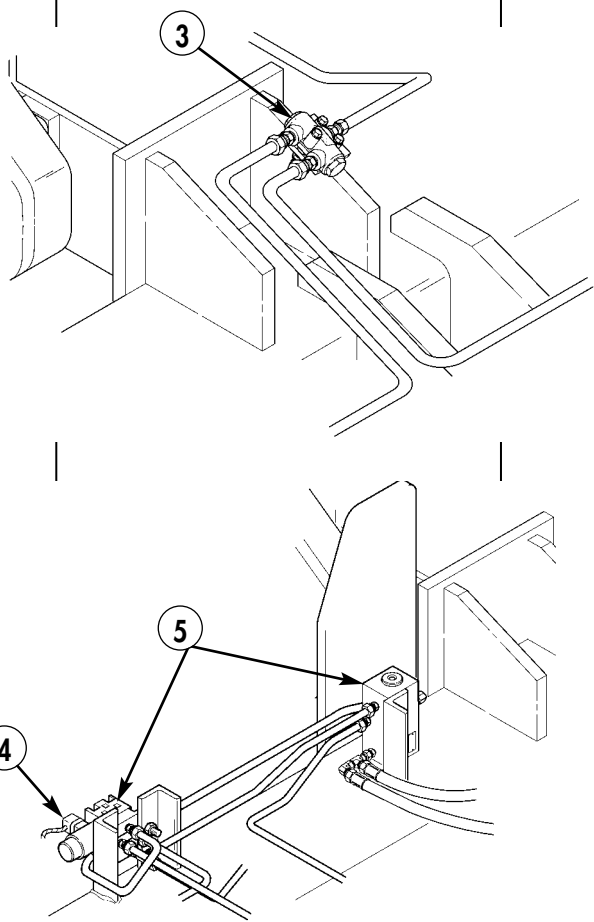
*Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
45	During	Forward pinwheel drive (2), hydraulic motor (1), and lines	<p><b>a.</b> Check forward pinwheel drive for damaged, loose, or missing hardware and for oil leaks.</p> <p><b>b.</b> Check hydraulic motor for damage or loose or missing hardware.</p> <p><b>c.</b> Check hydraulic lines and fittings for leakage.</p>	<p><b>a.</b> Any damage or loose or missing hardware.</p> <p><b>b.</b> Any damage or loose or missing hardware.</p> <p><b>c.</b> Any Class III leaks noted.</p>

The diagram shows a detailed view of the pallet's drive mechanism. Callout 1 points to a hydraulic motor, and callout 2 points to a pinwheel drive. The drawing includes various components like gears, shafts, and structural beams.

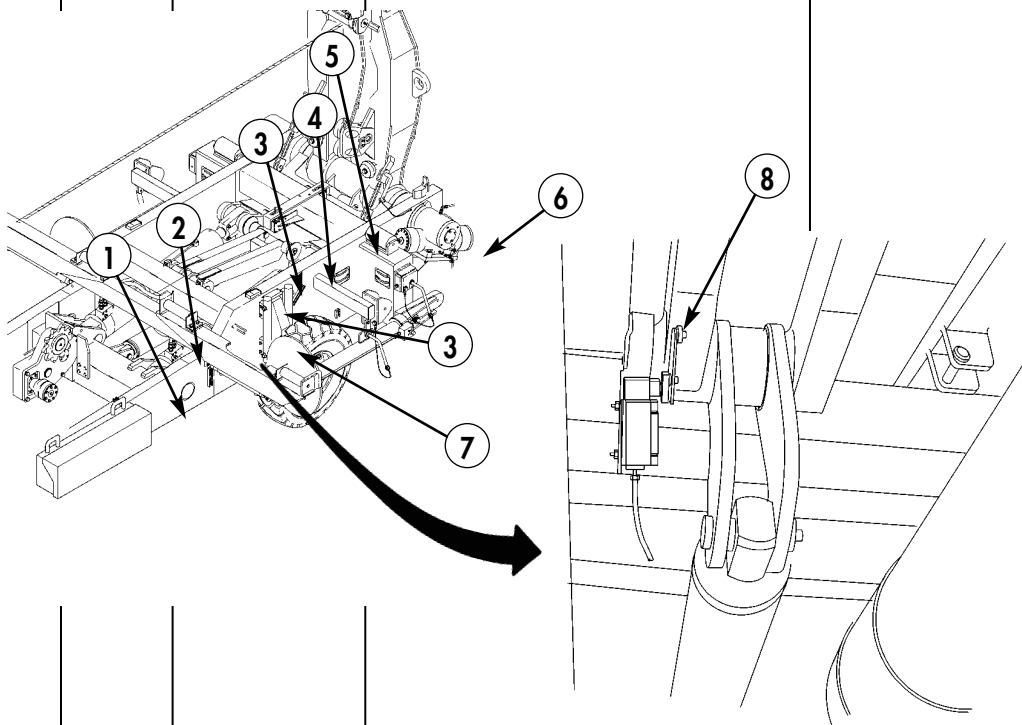
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
46	During	Flow divider (3), pressure regulators (5), and solenoid (4)	<p><b>a.</b> Check flow divider and pressure regulators for damage, loose mounting hardware, or leaking lines.</p> <p><b>b.</b> Check solenoid for damaged electrical leads, loose mounting hardware, and leaking lines.</p>	<p><b>a.</b> Any damage, loose mounting hardware, or Class III leaks noted.</p> <p><b>b.</b> Any damage, loose mounting hardware, or Class III leaks noted.</p>



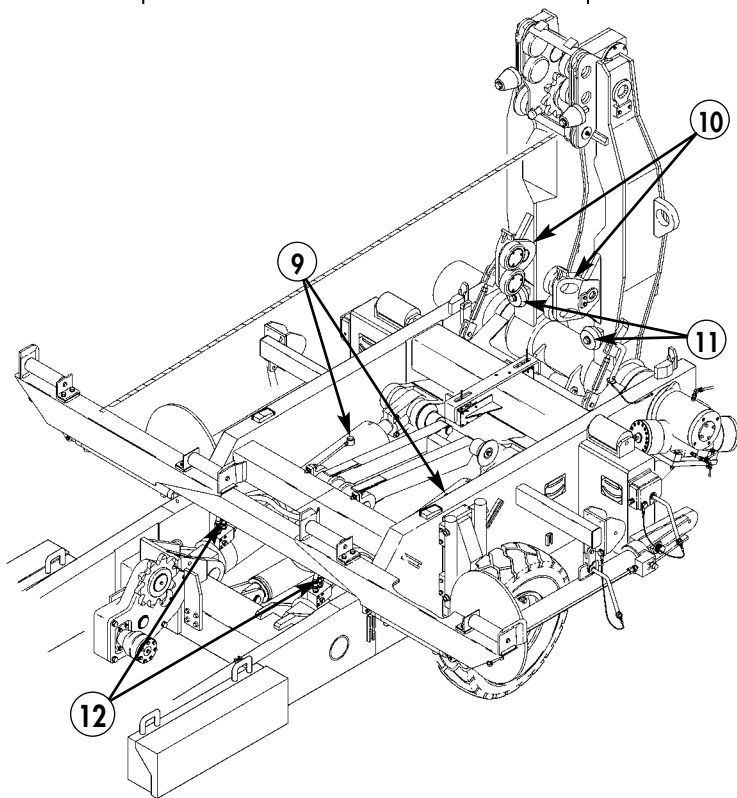
Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
47	During	Secondary boom (7), rollers (3), hydraulic cylinder (1), and hoses (2), and levers (6)	<p><b>a.</b> Check secondary boom for cracks or loose or missing hardware.</p> <p><b>b.</b> Check rollers for damage or loose or missing hardware.</p> <p><b>c.</b> Check hydraulic cylinder for damage, loose or missing hardware, or leakage.</p> <p><b>d.</b> Check hoses and fittings for damage or leakage.</p>	<p><b>a.</b> Any cracks or missing hardware.</p> <p><b>b.</b> Any cracks or missing hardware.</p> <p><b>c.</b> Any cracks or missing hardware or Class III leaks noted.</p> <p><b>d.</b> Any damage or Class III leaks noted.</p>
48	During	Limit switches (4), (5), and (8)	<p><b>a.</b> Check for damage, broken electrical wires, or if out of adjustment.</p> <p><b>b.</b> Check limit switches (4) and (5) for proper operation by moving spring levers forward and rearward and listening for a clicking sound from limit switches (4) and (5).</p>	<p><b>a.</b> Damaged or broken wires, or if out of adjustment.</p> <p><b>b.</b> If no clicking sound is heard coming from limit switches or switch levers are damaged.</p>



*Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
49	During	Lower support boom cylinders (9), hydraulic hoses (12)	<p><b>a.</b> Check lower support boom for cracks, damage, or loose or missing hardware.</p> <p><b>b.</b> Check cylinders for damage, loose or missing hardware, or leakage.</p> <p><b>c.</b> Check hydraulic hoses and fittings for damage or leakage.</p>	<p><b>a.</b> Any cracks, damage, or missing hardware.</p> <p><b>b.</b> Any damage, loose or missing hardware, or Class III leaks noted.</p> <p><b>c.</b> Any Class III leaks noted.</p>
50	During	Upper roller blocks (10) and cone alignment rollers (11)	Check upper roller blocks for damaged rollers, loose or missing hardware, or missing rollers.	Any damage or missing rollers.



Preventive Maintenance Checks and Services (PMCS) for Pallet (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
51	During	Roller track frame (6), rollers (3), and cone alignment rollers (2)	<p><b>a.</b> Check roller track frame for cracks or damage.</p> <p><b>b.</b> Check roller track rollers for damage, loose or missing hardware or rollers.</p> <p><b>c.</b> Check cone alignment rollers for damage, if loose, or if missing.</p> <p><b>NOTE</b> If rear pinwheel drive mounting bolts are loose, notify field maintenance to tighten.</p>	<p><b>a.</b> Any cracks or damage.</p> <p><b>b.</b> Any rollers damaged, loose, or missing hardware or rollers.</p> <p><b>c.</b> Any damage, loose, or missing cone alignment rollers.</p>
52	During	Rear pinwheel drive (4), hydraulic motor (5), stop cylinder (1), and hydraulic lines (7)	<p><b>a.</b> Check rear pinwheel drive for damaged, loose, or missing hardware and Class III oil leak.</p> <p><b>b.</b> Check hydraulic motor and stop cylinder for damage or loose or missing hardware.</p> <p><b>c.</b> Check hydraulic lines and fittings for damage or leakage.</p>	<p><b>a.</b> Any damage, loose or missing hardware, or Class III oil leak.</p> <p><b>b.</b> Any damage or loose or missing hardware.</p> <p><b>c.</b> Any Class III leaks noted.</p>
53	After	Pallet assembly	Check for leaks and any visible damage.	

END OF WORK PACKAGE

Change 2

0043 00-28

## MAINTENANCE INSTRUCTIONS/PMCS

RAPIDLY EMPLACED BRIDGE (REB)  
NSN 5420-01-481-3959 P/N 124804

### PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) FOR BRIDGE

#### **WARNING**

When checking/servicing an item, ensure that all attaching/mounting hardware is properly secured. Loose, cracked, broken, or missing hardware may cause equipment failure or injury to personnel.

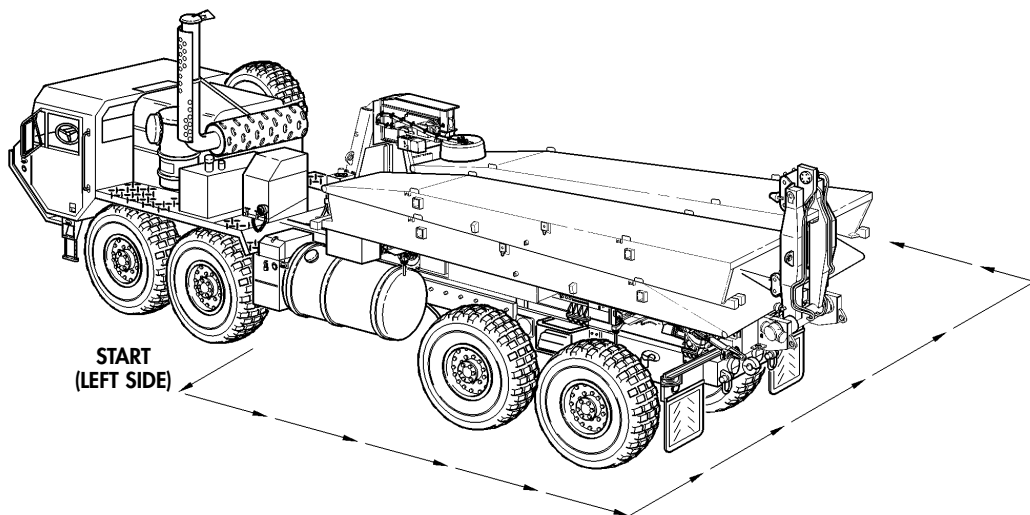
#### **CAUTION**

During PMCS, ensure that components and assemblies are correctly installed. Incorrect installation may cause equipment damage or failure.

This PMCS uses the one-look format. With REB on transporter, begin at front of pallet nearest the driver's side of cab, and proceed to the right in a counterclockwise direction. Refer to PMCS for Bridge Figure below.

#### **LUBRICATION**

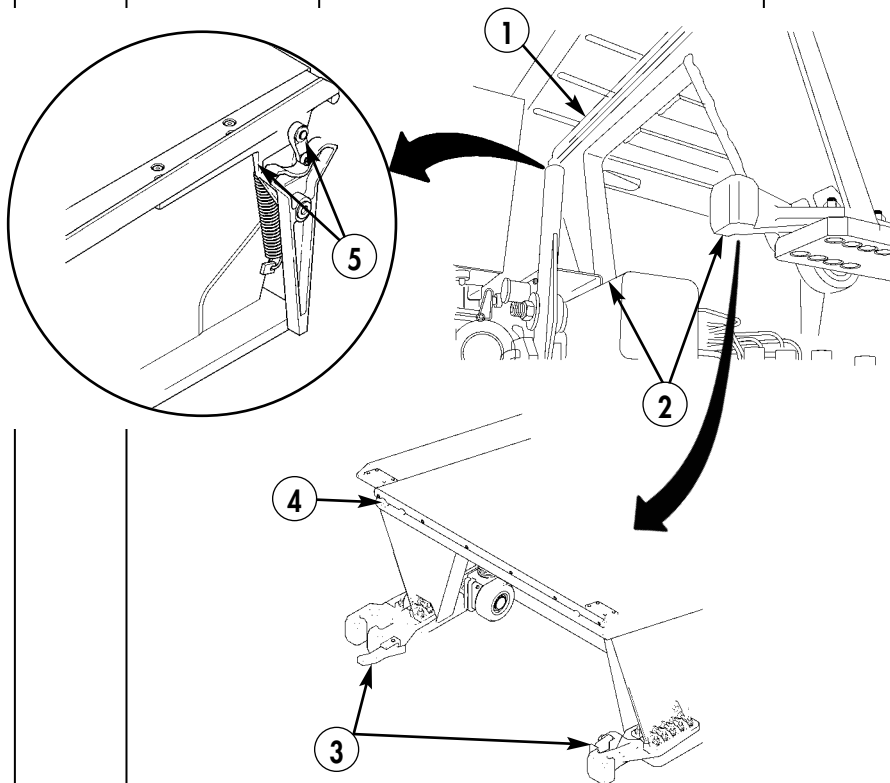
Perform lubrication checks and services after completing PMCS. Refer to WP 0045 00.



*PMCS for Bridge Figure.*

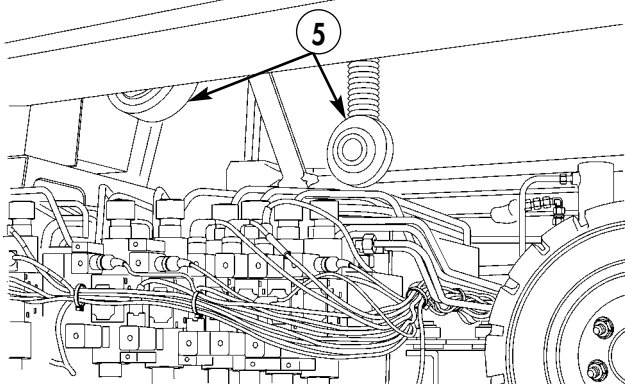
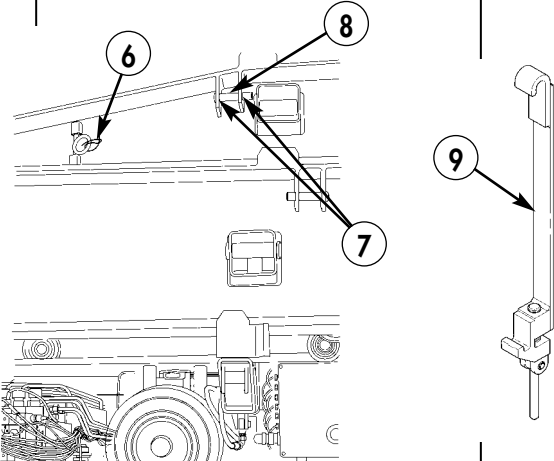
*Preventive Maintenance Checks and Services (PMCS) for Bridge.*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Before	Lower bridge quarter crossforce coupling bumper (1)	Check for degradation, deformity, or missing or loose mounting hardware.	
2	Before	Lower bridge quarter upper coupling lock mechanism (5) and plunger (4)	Check for missing spring, damaged lock lever pins, loose mounting hardware, or damaged plunger.	Any missing spring, loose mounting hardware, damaged lock lever pins, or damaged plunger.
3	Before	Lower bridge quarter lower coupling and receptacle (2) and help levers (3)	<p><b>a.</b> Check lower coupling and receptacle for cracks or missing hardware.</p> <p><b>b.</b> Check latch and catch for proper operation or if damaged.</p>	<p><b>a.</b> Any cracks or missing hardware.</p> <p><b>b.</b> Help levers are not operational.</p>



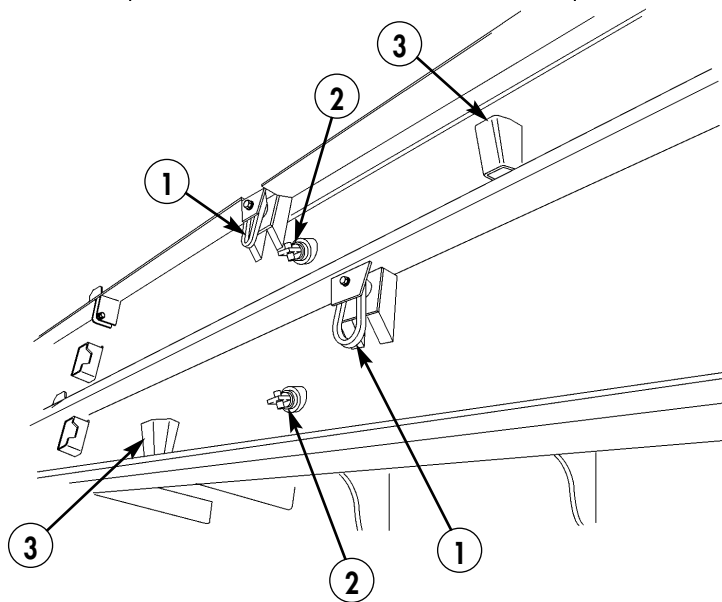


Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

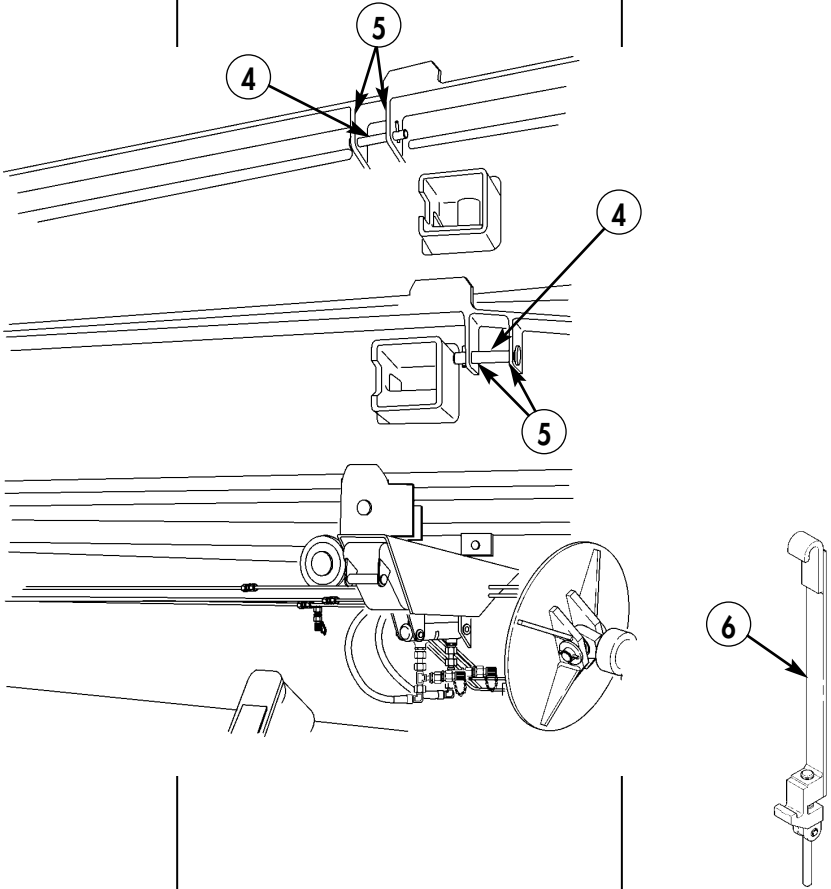
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
4	Before	Lower bridge quarter support wheels (5)	<p>Check support wheels for missing rubber tires, frozen wheel bearings, or missing hardware, and loose hardware on support wheel brackets.</p> 	Any missing rubber tires, frozen wheel bearings, loose or missing hardware.
5	Before	Upper bridge quarter anchoring eye (6)	Visually check for degradation of anchoring eye or missing hardware.	Any cracks or missing hardware.
6	Before	Fastening rod pin (8), brackets (7), and fastening rod (9)	<p><b>a.</b> Visually check for cracks, missing pin, or if fastening rod is missing or damaged.</p> <p><b>b.</b> Check fastening rod drive screw for binding; ensure threads are clean and free from dirt and debris.</p> 	<p><b>a.</b> Any cracks, missing pin, or damaged or missing fastening rod.</p> <p><b>b.</b> Drive screw threads bind and prevent adjustment of fastening rod.</p>

*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
7	Before	Upper and lower bridge quarter marker pole brackets (3) and helicopter lifting rings (1)	Visually check for missing bracket, lifting ring, or cracked welds.	
8	Before	Upper and lower bridge slide locks (2)	Using BII unlocking rod, check slide locks for broken springs, tie rods, locking levers, and missing pins.	Any broken levers or missing pins, or if shaft is seized or spins freely.



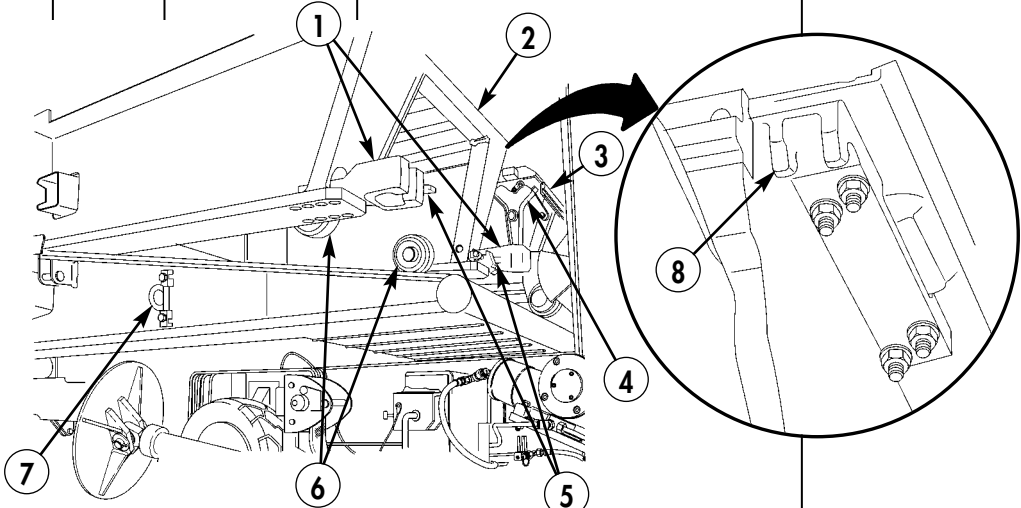
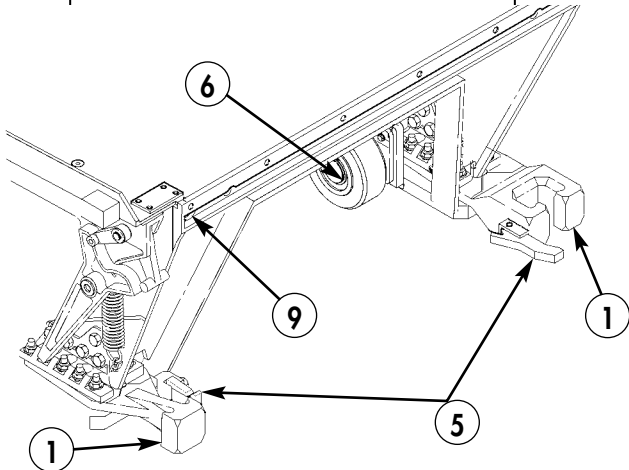
Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
9	Before	Fastening rod pin (4), brackets (5), and fastening rod (6)	<p><b>a.</b> Visually check for cracks, missing pin, or if fastening rod is missing or damaged.</p> <p><b>b.</b> Check fastening rod drive screw for binding; ensure threads are clean and free from dirt and debris.</p> 	<p><b>a.</b> Any cracks, missing pin, or damaged or missing fastening rod.</p> <p><b>b.</b> Drive screw threads bind and prevent adjustment of fastening rod.</p>

*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

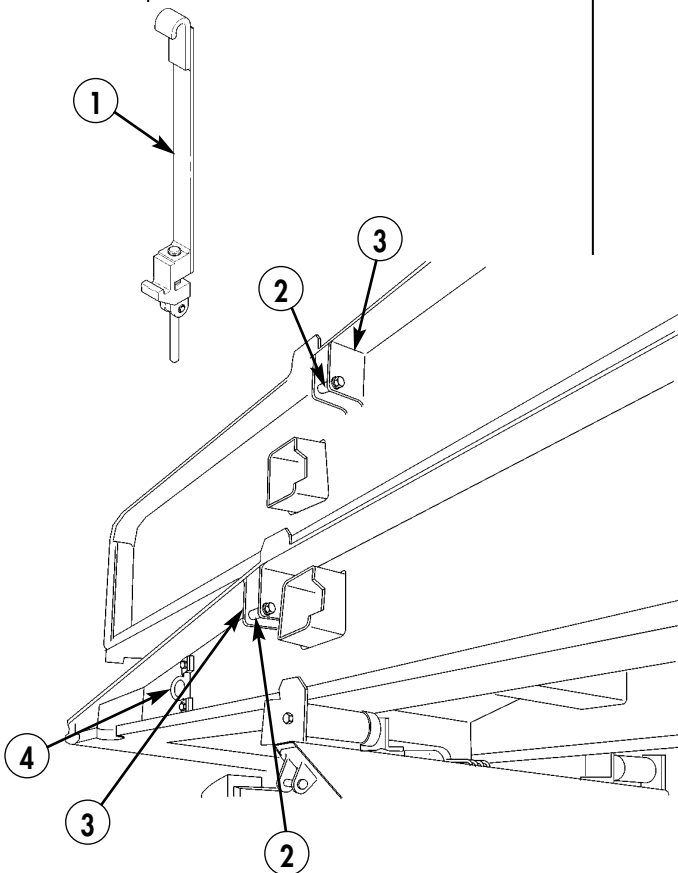
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
10	Before	Lower bridge quarter anchoring eye (7)	Check for degradation of anchoring eye or missing hardware.	Any cracks or missing hardware.
11	Before	Upper bridge crossforce coupling bumper (2)	Check for degradation, missing or loose mounting hardware, and damaged or missing alignment pins.	
12	Before	Upper bridge quarter lower coupling and receptacle (1) and help levers (5)	<p><b>a.</b> Check lower coupling and receptacle for cracks or missing hardware.</p> <p><b>b.</b> Check latch and catch for proper operation or if damaged.</p>	<p><b>a.</b> Any cracks or missing hardware.</p> <p><b>b.</b> Help levers are not operational.</p>
13	Before	Upper bridge quarter support wheels (6)	Check support wheels for missing rubber tires, frozen wheel bearings, or missing hardware.	Any missing rubber tires, frozen wheel bearing, or missing hardware.
14	Before	Upper bridge half upper coupling lock receptacle (8)	Check for cracks, broken hooks, or loose mounting hardware.	Any cracks or broken hooks.
15	Before	Launch beam lifting eye	Check for missing hardware or if damaged.	Any missing hardware or if damaged.
16	Before	Upper bridge crossforce coupling bumper (3)	Check for cracks or missing or loose mounting hardware.	
17	Before	Upper bridge quarter upper coupling lock mechanism (4) and plunger (9)	Check for missing spring, damaged lock lever pins, plunger, or loose mounting hardware.	Any missing spring, loose mounting hardware, or damaged lock lever pins or plunger.

Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
				
18	Before	Upper bridge quarter lower coupling and receptacle (1) and help levers (5)	<p>a. Check lower coupling and receptacle for cracks or missing hardware.</p> <p>b. Check latch and catch for proper operation or if damaged.</p>	Any cracks or missing hardware.
19	Before	Upper bridge quarter support wheels (6)	Check support wheels for missing rubber tires, frozen wheel bearings, missing hardware, and loose hardware on support wheel brackets.	Any missing rubber tires, frozen wheel bearings, or loose or missing hardware.
				

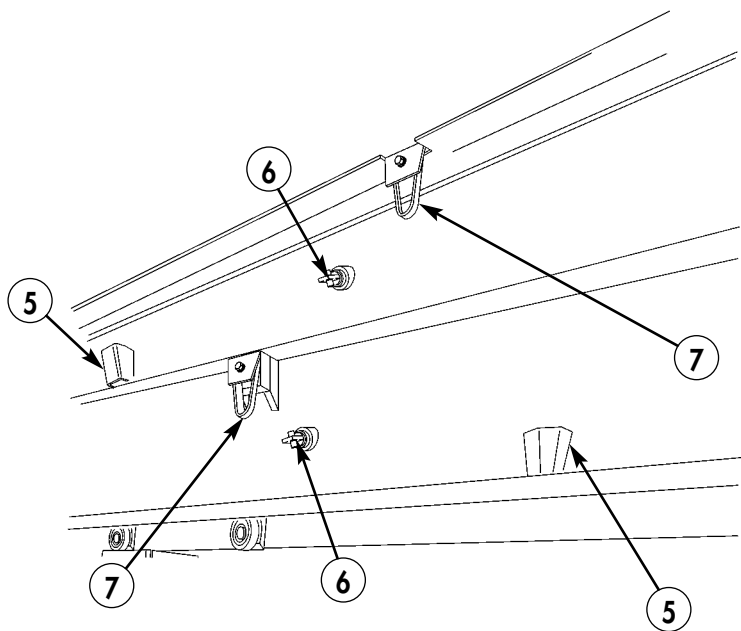
Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
20	Before	Lower bridge quarter anchoring eye (4)	Check for degradation of anchoring eye or missing hardware.	Any cracks or missing hardware.
21	Before	Fastening rod pin (2), brackets (3), and fastening rod (1)	<p><b>a.</b> Visually check for cracks, missing pin, or if fastening rod is missing or damaged.</p> <p><b>b.</b> Check fastening rod drive screw for binding; ensure threads are clean and free from dirt and debris.</p>	<p><b>a.</b> Any cracks, missing pin, or damaged or missing fastening rod.</p> <p><b>b.</b> Drive screw threads bind and prevent adjustment of fastening rod.</p>

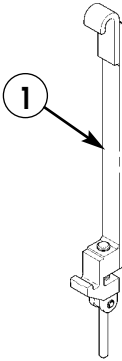
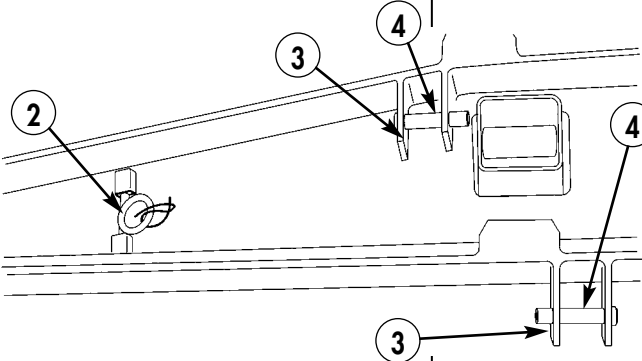
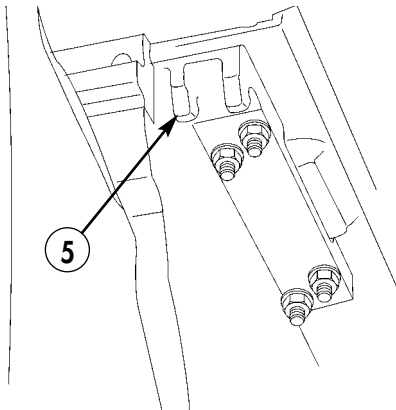


Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
22	Before	Upper and lower bridge quarter marker pole brackets (5) and helicopter lifting rings (7)	Check for missing bracket, lifting rings, or cracked welds.	
23	Before	Upper and lower bridge slide locks (6)	Using BII unlocking rod, check slide locks for broken springs, tie rods, locking levers, and missing pins.	Any broken levers or missing pins, or if shaft is seized or spins freely.



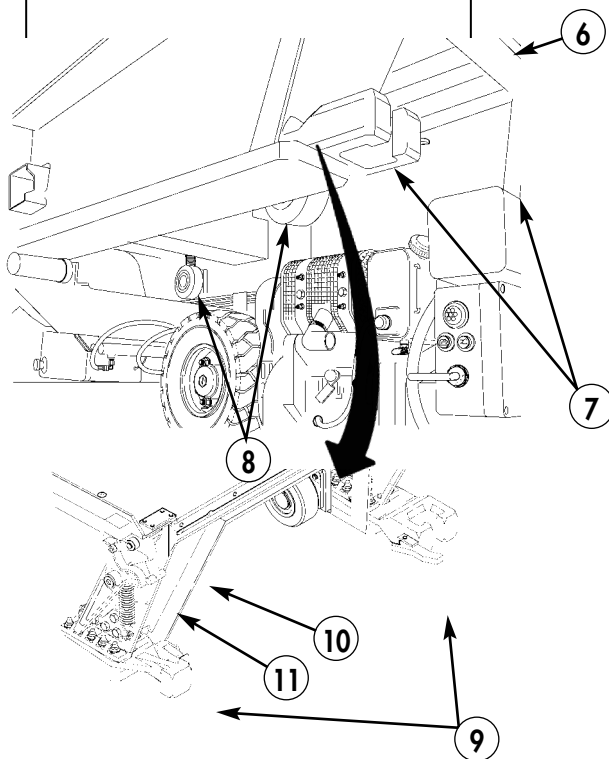
Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
24	Before	Fastening rod pin (4), brackets (3), and fastening rod (1)	<p><b>a.</b> Visually check for cracks, missing pin, or if fastening rod is missing or damaged.</p> <p><b>b.</b> Check fastening rod drive screw for binding; ensure threads are clean and free from dirt and debris.</p>	<p><b>a.</b> Any cracks, missing pin, or damaged or missing fastening rod.</p> <p><b>b.</b> Drive screw threads bind and prevent adjustment of fastening rod.</p>
25	Before	Upper bridge quarter anchoring eye (2)	<p>Check for cracks, deformation of anchoring eye or missing hardware.</p>	<p>Any cracks or missing hardware.</p>
				
26	Before	Lower bridge half upper coupling lock receptacle (5)	<p>Check for cracks, missing hooks, or loose mounting hardware.</p>	<p>Any cracks or missing hooks.</p>
				



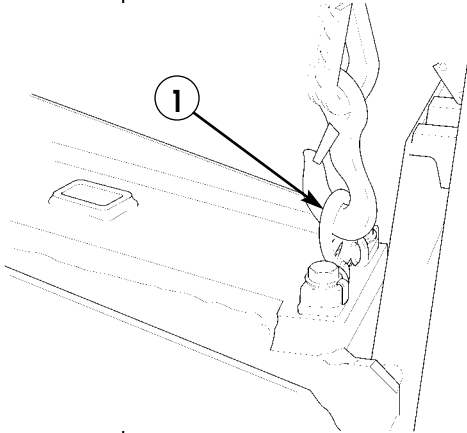
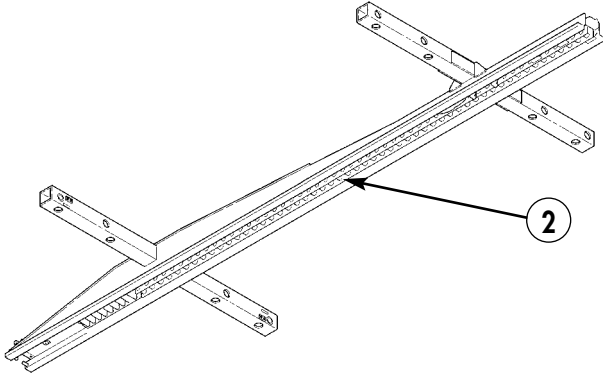
Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
27	Before	Lower bridge quarter crossforce coupling bumper (6), upper coupling lock mechanism (11), and plunger (10).	Check for degradation, or missing or loose mounting hardware, damaged lock lever pins or missing springs.	Any missing spring, loose mounting hardware, or damaged lock lever pins or plunger.
28	Before	Lower bridge quarter lower coupling and receptacle (7) and help levers (9)	<p><b>a.</b> Check lower coupling and receptacle for cracks or missing hardware.</p> <p><b>b.</b> Check latch and catch for proper operation or if damaged.</p>	Any cracks or missing hardware.
29	Before	Lower bridge quarter support wheels (8)	Check support wheels for missing rubber tires, frozen wheel bearings, missing hardware, and loose hardware on support wheel brackets.	Any missing rubber tires, frozen wheel bearings, or loose or missing hardware.

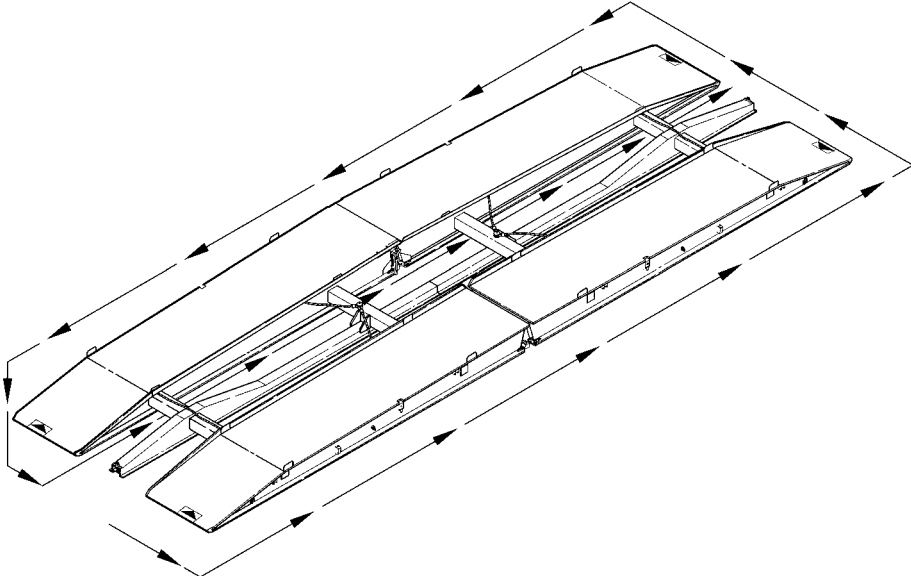


Active/REB Project/An/PMCS/30

Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
30	Before	Launch beam lifting eye (1)	Visually check for deformation, missing hardware, or if damaged or missing.  	Any missing hardware or if damaged or missing.
31	During	Launch beam channel pins (2)	<p style="text-align: center;"><b>NOTE</b> No more than one consecutive pin may be missing</p> Check for smooth operation and if pins are damaged or missing.  	Any erratic movement or more than one consecutive pin is missing.

*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

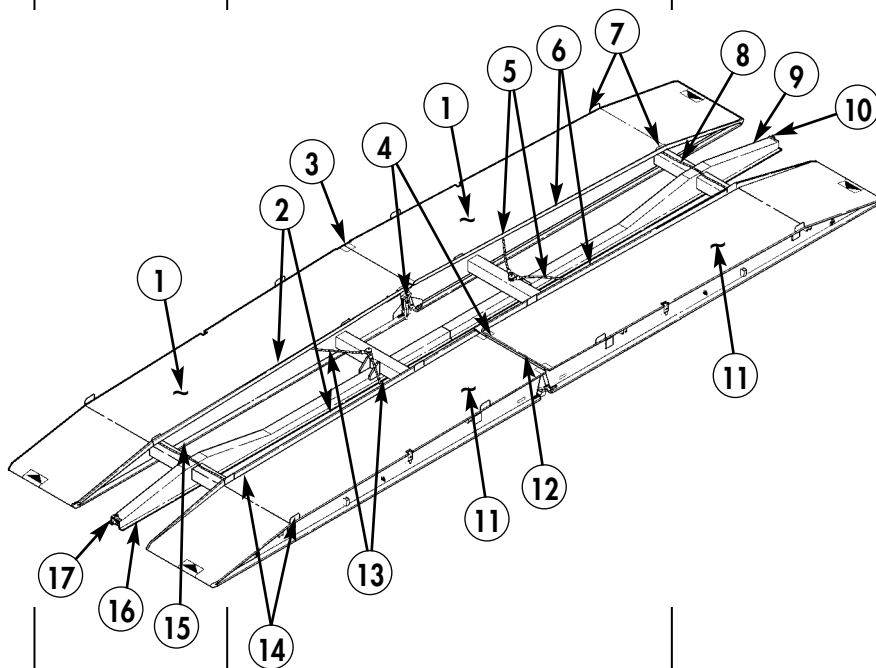
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			<p><b>NOTE</b>                      Perform item numbers 32 through 41 with bridge launched to ground (WP 0016 00) starting at right bridge quarter at either ramp end, and proceeding counterclockwise.</p>	
				
<p><i>PMCS for Deployed Bridge Figure.</i></p>				

*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

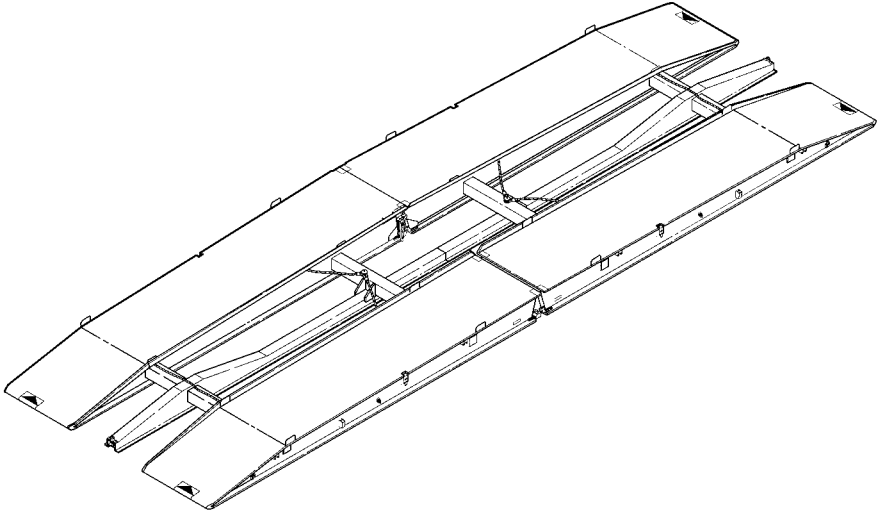
ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
32	During	Right deck surfaces of roadway (11), guides (14), and crossforce coupling bumpers (12)	Check deck surface and guides for cracks, tears, and broken welds.	Any cracks longer than 3 in. (7.6 cm) or broken welds longer than .59 in. (1.5 mm).
33	During	Left deck surfaces of roadway (1), guides (7), and crossforce coupling bumpers (3)	Check deck surface and guides for cracks, tears, and broken welds.	Any cracks longer than 3 in. (7.6 cm) or broken welds longer than .59 in. (1.5 mm).
34	During	Launch beam (16) and lifting eye (17)	Check launch beam and lifting eye for deformation, damage, and loose or missing hardware.	
35	During	Left and right bridge quarter sides (2) and retaining wire rope assembly (15)	<p><b>a.</b> Check for cracked welds on sides and brackets.</p> <p><b>b.</b> Check for loose or missing wire rope assembly, pins, or mounting hardware.</p>	
36	During	Left and right bridge quarter sides (2) and retaining wire rope assemblies (13)	<p><b>a.</b> Check for cracked welds on sides and brackets.</p> <p><b>b.</b> Check for loose or missing retaining wire rope assemblies, pins, or mounting hardware.</p> <p><b>c.</b> Check for frayed, missing, or damaged retaining wire rope assemblies.</p>	
37	During	Upper coupling lock mechanism levers (4)	Check to ensure lever is fully engaged in lock receptacle on both sides of bridge.	Levers are not fully engaged.

*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
38	During	Left and right bridge quarter sides (6) and retaining wire rope assemblies (5)	<p><b>a.</b> Check for cracked welds on sides and brackets.</p> <p><b>b.</b> Check for loose or missing retaining wire rope assemblies, pins, or hardware.</p> <p><b>c.</b> Check for frayed, missing, or damaged retaining wire rope assemblies.</p>	
39	During	Right and left bridge quarter sides (6) and retaining wire rope assemblies (8)	<p><b>a.</b> Check for cracked welds on sides and brackets.</p> <p><b>b.</b> Check for loose or missing wire rope assemblies, pins, or hardware.</p>	
40	During	Launch beam (9) and lifting eye (10)	Check launch beam and lifting eye for deformation, damage, and loose or missing hardware.	



*Preventive Maintenance Checks and Services (PMCS) for Bridge (Contd).*

ITEM NO.	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			<p align="center"><b>NOTE</b></p> <p>Perform item 41 with bridge on ground, proceeding counterclockwise.</p>	
41	During	Bridge assembly	Prior to retrieval, clean all dirt and debris from bridge as needed. Refer to WP 0046 00.	
42	After	Bridge halves	Check for any visible damage after retrieval.	
				
43	Annual	Remaining Service Life Indicators (RSLI)	Check RSLI fatigue fuses annually.	All fatigue fuses on any RSLI are broken (cracked).

**END OF WORK PACKAGE**

# MAINTENANCE INSTRUCTIONS/PMCS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### LUBRICATION INSTRUCTIONS

#### GENERAL

The following lubrication instructions are for operator maintenance, and provide the lubrication requirements necessary to support the REB. Refer to tables 1, 2, and 3 in this work package for fluid capacities, lubricant requirements, lubrication points, and lubrication intervals for the bridge and pallet. For lubrication instructions for the CBT, refer to TM 5-5420-234-14&P. For lubrication instructions for the Palletized Load System Trailer (PLST), refer to TM 9-2330-385-14.

#### SERVICE INTERVALS

1. Operator's service intervals are for normal operation of the bridge in moderate temperature, humidity, and atmospheric conditions. The lubrication for the bridge is to be performed at whichever interval occurs first.
2. Clean bridge halves and lubricate bridge components as required prior to use. Refer to WP 0046 00 for cleaning instructions. Refer to tables 1 and 3 in this work package for bridge lubrication.
3. Clean pallet and lubricate pallet components as required prior to use. Refer to WP 0046 00 for cleaning instructions. Refer to tables 1 and 2 in this work package for pallet lubrication.
4. Check Launch Power Unit (LPU) engine oil level weekly and after each use. If necessary, add OE/HDO 15W-40 or OE/HDO 5W-30 lubricating oil, (81349) MIL-PRF-2104. Refer to Pallet Maintenance Procedures, WP 0048 00.
5. Check pallet hydraulic reservoir weekly and after each use. Refer to WP 0007 00. If oil level is not visible through site glass, add OE/HDO-30 or OE/HDO-10 lubricating oil, MIL-PRF-2104. Refer to Pallet Maintenance, WP 0048 00.
6. If operating in extreme heat or cold, notify field maintenance to change oils and lubricants as required.

#### **WARNING**

Accidental or intentional introduction of liquid contaminants into the environment is in violation of state, federal and military regulation. Refer to Army POL, WP 0001 00 for information concerning storage, use, and disposal of these liquids. Failure to comply may result in damage to environment and health of personnel.

7. The REB is not enrolled in AOAP.

# LUBRICATION INSTRUCTIONS (Contd)

Table 1. Lubrication Specification.

APPLICATION	CAPACITY	LUBRICANTS	AMBIENT TEMPERATURE RANGE USAGE																		
			°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
Launch Power Unit	w/Filter 3.2 qt (3 L)	Lubricating Oil, OE/HDO-15W-40 (MIL-PRF-2104) or OE/HDO-5W-30 (MIL-L-46152 5W-30)	°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
Oil Bath Air Filter			°C	<-46	-40	-34	-29	-23	-18	-12	-7	-1	4	10	16	21	27	32	38	44	49
			OE/HDO-15W-40																		
			OE/HDO-5W-30																		
			[REDACTED]																		
Limit Switches; Plungers on KA1 thru KA4 and Rollers on KA5, KA6, and KA8	As Required	Lubricating Oil, OE/HDO-30 or OE/IIDO-10 ICE, Arctic (MIL-PRF-2104)	°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
			°C	<-46	-40	-34	-29	-23	-18	-12	-7	-1	4	10	16	21	27	32	38	44	49
			OE/HDO-30																		
Pallet Hydraulic Fluid Reservoir	Reservoir- 74 qts (70 L) Hyd Sys-121.5 qt (115L)		OE/HDO-10																		
Bridge Quarter Slide Locks	As Required		OEA																		
			[REDACTED]																		
Winch Gearbox	2.2 qt (2 L)	GO Lubricating Oil, Gear, Multipurpose 80/90 (MIL-L-2105C)	°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
Forward and Rear Pin Wheel Gearbox	0.44 L		°C	<-46	-40	-34	-29	-23	-18	-12	-7	-1	4	10	16	21	27	32	38	44	49
			GO-75/90																		
			[REDACTED]																		
A-Frame Pin Guide Channels	As Required	Grease, Automotive and Artillery, (MIL-PRF-10924)	°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
Crossforce Couplings			°C	<-46	-40	-34	-29	-23	-18	-12	-7	-1	4	10	16	21	27	32	38	44	49
Launch Beam Wheel Drive Pins			GAA																		
Lower Coupling Connectors & Receptacles			[REDACTED]																		
Bridge Quarter Support Tubes			[REDACTED]																		
Winch Wire Rope	As Required	GO Lubricating Oil, Gear Multipurpose 80/90 (MIL-L-2105C) & Grease, Wire Rope - Exposed Gear, Type II, (MIL-PRF-18458)	°F	<-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
			°C	<-46	-40	-34	-29	-23	-18	-12	-7	-1	4	10	16	21	27	32	38	44	49
			Type II MIL-PRF-18458																		
			GO-75/90																		
			[REDACTED]																		
Launch Power Unit (LPU) Engine Fuel		JP-8 (MIL-T-83133 GRJPS)	(ALL TEMPERATURES)																		



## LUBRICATION INSTRUCTIONS (Contd)

Table 2. Pallet Lubrication Intervals.

LOCATION	INTERVAL	LUBRICANT
<b>Launch Power Unit (LPU) Engine Oil and Filter</b>		
Engine oil	6 months	MIL-PRF-2104 OE/HDO 15 W-40 or OE/HDO 5 W-30
Oil filter	6 months	
Fuel filter clean	6 months	
Oil bath air filter	6 months	MIL-PRF-2104 OE/HDO 15 W-40
<b>Winch</b>		
Gearbox	12 months	MIL-L-2105C SAE 75W90
Track rollers	6 months	MIL-PRF-2104 OE/HDO 15 W-40
Force transmitter bushings	6 months	MIL-PRF-2104 OE/HDO 15 W-40
Wire rope	6 months	MIL-G-18458 W-L-751
<b>Hydraulic Reservoir</b>		
Oil filter replace	6 months	
Reservoir	12 months	MIL-PRF-2104 OE/HDO-30 or OE/HDO-10
Pre-filter clean	6 months	
<b>Pallet Steering Linkage</b>		
Bellcranks (2) Lube fittings (2)	12 months	MIL-PRF-10924 GAA
Front turning wheels (2) Lube fittings (2)	12 months	MIL-PRF-10924 GAA
<b>Pallet Support Wheels (4)</b>		
Wheel bearings Pack bearings	24 months	MIL-PRF-10924 GAA
Support wheel channels	6 months	MIL-PRF-10924 GAA
<b>Pallet A-Frame</b>		
A-frame guide channel	6 months	MIL-PRF-10924 GAA
<b>Pin Wheel Drives (2)</b>		
Forward pin wheel drive	12 months	MIL-L-2105C GO 80/90
Rear pin wheel drive	12 months	MIL-L-2105C GO 80/90
<b>Launch Boom</b>		
Lower support rollers Lube fittings (4)	6 months	MIL-PRF-10924 GAA
Lower support guide rollers Lube fittings (2)	6 months	MIL-PRF-10924 GAA
Upper roller blocks Lube fittings (4)	6 months	MIL-PRF-10924 GAA
Launch boom and lower support boom bushings Lube fittings (2)	6 months	MIL-PRF-10924 GAA
Lower support boom cylinders Lube fittings (2)	6 months	MIL-PRF-10924 GAA

**LUBRICATION INSTRUCTIONS (Contd)***Table 3. Bridge Lubrication Intervals.*

LOCATION	INTERVAL	LUBRICANT
<b>Bridge Halves (2)</b>		
Support wheel hub slide plates	6 months	MIL-PRF-10924 GAA
Bridge quarter support tubes	6 months	MIL-PRF-10924 GAA
Crossforce coupling bumpers	6 months	MIL-PRF-10924 GAA
Remote control levers	6 months	MIL-PRF-10924 GAA
Upper coupling lock levers and receptacles	6 months	MIL-PRF-10924 GAA
Needle cam followers Lube fittings (2)	6 months	MIL-PRF-10924 GAA
Upper coupling lock plunger shafts	6 months	MIL-PRF-10924 GAA
Launch beam channel drive pins, rack, and rails	6 months	MIL-PRF-10924 GAA
Lower coupling connectors and receptacles	6 months	MIL-PRF-10924 GAA
<b>Slide Lock Mechanism (4)</b>		
Control lever housings pack or lube fittings (4)	6 months	MIL-PRF-10924 GAA

**LUBRICATION POINTS**

Refer to Bridge Maintenance Procedures, WP 0047 00, for bridge lubrication points. Refer to Pallet Maintenance Procedures, WP 0048 00, for pallet lubrication points.

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# MAINTENANCE INSTRUCTIONS/PMCS

## RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### GENERAL MAINTENANCE

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#### GENERAL

General maintenance instructions for cleaning, painting, placing in service, and preparation for storage or shipment are provided in this work package. Publications that provide additional information on general shop practice techniques and preservation are listed in References, WP 0049 00.

#### CLEANING

**1. General Instructions.** Cleaning procedures will be the same for the majority of parts and components on the REB. General cleaning procedures are detailed in steps 2 through 6.

**2. The Importance of Cleaning.** Great care and effort are required in all cleaning operations. The presence of dirt and foreign material is a constant threat to satisfactory equipment operation and maintenance. The following instructions will apply to all cleaning operations:

#### **WARNING**

Improper cleaning methods and use of unauthorized cleaning solvents may result in injury to personnel and damage to equipment.

#### **CAUTION**

Keep all related parts and components together. Do not mix parts.

Failure to comply may result in damage to parts.

- a. Clean all parts on pallet and bridge before performing PMCS, lubrication, and maintenance procedures.
- b. Hands must be kept free of any accumulation of grease which can transfer to pallet or bridge and thereby collect dust and grit.

## GENERAL MAINTENANCE (Contd)

### CLEANING (Contd)

#### **WARNING**

Skysol 100 cleaning solvent is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol 100 cleaning solvent may cause skin irritation. Use chemical resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing or blurring of vision, Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity. Failure to comply may result in injury to personnel.

#### **CAUTION**

Before opening reservoir, ensure area around reservoir filler cap is clean. Do not allow dirt, dust, or water to enter reservoir. Failure to do this may cause damage to internal components.

**3. Oil and Grease Covered Surfaces.** Using Skysol 100, clean oil and grease from exterior surfaces of bridge prior to cleaning dirt, mud, and debris with soap and water.

**4. Oil Seals and Flexible Hoses.**

#### **CAUTION**

Do not allow Skysol 100 to come in contact with seals or flexible hoses. Failure to comply will result in damage to parts.

Do not use power washer to clean external surfaces of RCU, and avoid directly spraying at all other electrical components, or damage to equipment may result.

**5. External Surfaces.** Clean all accessible external surfaces of pallet and bridge with soap and water and rinse thoroughly. Use power wash pump when cleaning to save time and effort. Refer to WP 0033 00.

**6. Rusted Surfaces.**

#### **NOTE**

All parts subject to rusting must be lightly oiled after cleaning and prior to storage.

Remove all evidence of corrosion.

## GENERAL MAINTENANCE (Contd)

### PAINTING

REB unit(s) will require touch-up of painted surfaces periodically. The REB is Chemical Agent Resistant Coating (CARC) painted; notify field maintenance if bridge or pallet requires touch-up of painted surfaces.

### LOADING AND MOVEMENT OF EQUIPMENT

#### **WARNING**

Do not lift a load greater than the rated load capacity of the crane or materiel handling equipment. Failure to comply may result in damage to equipment or possible injury or death to personnel.

All personnel must stand clear of equipment prior to lifting operations or serious injury or death may result.

#### **CAUTION**

Ensure pallet launch boom lock pins are removed prior to lifting pallet. Failure to comply will result in bending launch boom lock turnbuckles.

#### **NOTE**

The pallet weighs 9,526 lb (4330 kg). The pallet with bridge weighs a minimum of 21,856 lb (9,480 kg).

**1. Shipping Data Plate.** The shipping data plate is mounted on pallet A-frame. A silhouette of the side view of the REB is depicted, and lift/tiedown points and center of gravity locations are given.

#### **WARNING**

To maintain a low center of gravity, the lifting sling must be connected to pallet launch boom lifting eyes and A-frame hook bar only. Failure to comply may result in damage to equipment or injury or death to personnel.

**2. Slings Provisions.** REB slinging provisions enable lifting of REB for both normal lift and external lift by helicopter. To lift bridge, connect lifting sling to helicopter lifting rings, located on side of each bridge quarter. To lift pallet, with or without bridge, refer to WP 0032 00 for installation of sling and BII lifting brackets. When pallet and bridge are tied down together, tiedowns are to be attached to bridge and not pallet.

**3. Center of Gravity.** Lift points are located in relationship to center of gravity. Refer to Shipping Data Plate, WP 0003 00.

**4. Loading and Movement.** For transportability guidance, handling, and movement of the REB, refer to TM 743-200-1, Storage and Materials Handling, and TM 55-2200-001-12, Transportability Guidance for Application of Blocking, Bracing, and Tiedown Materials for Rail Transport. Refer to TM 9-2320-279-10 for loading and movement information on the Common Bridge Transporter (CBT).

#### **NOTE**

When pallet is placed on level surface, the pallet front-to-rear leveling gauges will read approximately 2-degrees from 0-degree mark.

## GENERAL MAINTENANCE (Contd)

### LOADING AND MOVEMENT OF EQUIPMENT (Contd)

- a. When unloading a REB for shipment or storage, ensure cargo bed, pallet, or ground surface is flat, level, and capable of supporting weight of bridge. Refer to Equipment Data, WP 0003 00, for weights and dimensions of REB.
- b. Dunnage should be placed under the REB during unloading to facilitate tiedown and prevent movement during shipment. Dunnage also prevents damage to bottom of pallet when loading/unloading from ground to transporter.
- c. The pallet can be transported on the ground for loading/unloading onto aircraft. Refer to WP 0022 00.

### PREPARATION FOR SHIPMENT AND LIMITED STORAGE

**1. Cleaning.** Protection for REB and accompanying equipment must be sufficient to protect the material against deterioration and physical damage.

#### **WARNING**

Skysol 100 mixture is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. **DO NOT** use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol 100 may cause skin irritation. Use chemical-resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. **DO NOT** have food or drink in the vicinity. Failure to comply may result in injury to personnel.

#### **NOTE**

Prior to application of corrosion preventive compound, surfaces must be cleaned to ensure removal of corrosion, soil, grease, or vehicle acid and alkali residues.

- a. Remove all dirt, grease, oil, and other foreign matter from all painted metal surfaces of the REB by scrubbing with cloths soaked in Skysol 100. Refer to items 1 and 7, WP 0052 00. Use warm water for cleaning rubber parts.

#### **WARNING**

Compressed air source must not exceed 30 psi (207 kPa).  
When cleaning with compressed air, eyeshields must be worn.  
Failure to comply may result in injury to personnel.

- b. Clean exterior surfaces of REB by power washing with water, to ensure removal of all dirt and foreign matter. After cleaning, allow parts to air dry, use compressed air, or wipe with clean, dry cloths. Refer to item 7, WP 0052 00.

## GENERAL MAINTENANCE (Contd)

### PREPARATION FOR SHIPMENT AND LIMITED STORAGE (Contd)

**2. Preservation.** All critical unpainted metal surfaces must be protected during shipment. Coat all unpainted, exposed, or machined metal surfaces on the exterior of the bridge with approved corrosion-preventive compound only. Refer to item 2, WP 0052 00. Equipment protected must be closely watched for signs of corrosion. For additional information on preservation, refer to FM 38-700 and TC 38-3.

**3. Packing.** Pack all Basic Issue Items (BII) and Additional Authorization List (AAL) items to prevent physical damage. Refer to WP 0009 00. For additional information on packing, refer to FM 38-701 and TC 38-3.

**4. Shipment of Army Documents.** Prepare all Army shipping documents accompanying REB in accordance with DA Pam 750-8.

**5. Limited Storage Instructions.** Commanders are responsible for ensuring that all REB units issued or assigned to their command are maintained in a serviceable condition and properly cared for, and that personnel under their command comply with technical instructions. Lack of time, trained personnel, or proper tools may result in a unit being incapable of performing maintenance for which it is responsible. In such cases, unit commanders may, with the approval of major commanders, place a REB that is beyond the maintenance capability of the unit in administrative storage. For detailed information, refer to AR 750-1.

#### **6. Storage of New REB units.**

**a.** If new REB units are placed in storage at either contractor or Government facilities, before being put in service, the warranty period shall not start until each such REB is withdrawn from that storage, or until nine months from the date shown on the Material Inspection and Receiving Report (DD Form 250); whichever occurs first.

**b.** If new REB units are placed in contractor storage, the contractor shall maintain and exercise such stored REB units in accordance with the contractor's approved technical manual. Upon removal from storage, and before delivering the REB units to the Government, the contractor shall exercise and perform all PMCS tasks in accordance with the contractor's approved technical manual.

**c.** If new REB units are placed in Government storage, the Government will exercise stored REB units in accordance with the contractor's approved technical manual. The Government shall notify the contractor before placing each such REB in storage, and again at the time it is withdrawn. If there are any contractor-caused retrofits that must be applied to the REB units, the storage time does not start until those retrofits are completed.

## GENERAL MAINTENANCE (Contd)

### PREPARATION FOR SHIPMENT AND LIMITED STORAGE (Contd)

**7. Transport of REB by Aircraft.** The REB is transportable by C-130 aircraft. Refer to Marking, Packing, and Shipment of Supplies and Equipment, TM 746-10, for shipping information. Refer to steps 7a through 7e for aircraft loading preparation, and step 7f for palletizing and loading instructions.

#### **NOTE**

The operator will prep the REB for loading, at the aircraft loadmaster's direction, by performing steps 7a through 7e.

**a.** Remove battery box cover. Refer to WP 0007 00. Loadmaster will visually inspect all four battery terminals for plastic terminal lug covers. Replace battery box cover. Install washer and wingnut tightly.

**b.** With loadmaster present, drain LPU fuel tank as required by AFJMAN 24-204, Air Force Joint Manual. Refer to WP 0007 00.

#### **CAUTION**

To prevent damage to tarmac when unloading pallet to ground, position plywood under contact points of pallet.

**c.** Unload pallet to ground. Refer to WP 0014 00.

#### **CAUTION**

The REB should not be loaded onto C-130 aircraft utilizing the REB pallet wheels and standard internal winching procedures. Failure to comply will result in damage to the aircraft's ramp and deformation of cargo floor.

#### **NOTE**

Perform step 7d if transport of pallet on ground is necessary to locate REB near aircraft prior to palletizing.

**d.** Lower pallet support wheels to fully down position. Refer to WP 0022 00. Raise pallet support wheels to fully up position prior to palletizing REB.

**e.** Install pallet lifting brackets. Refer to WP 0032 00.

**f.** Palletize REB prior to loading on aircraft as follows:

#### **WARNING**

Ensure cargo loader has a lifting capacity of 25,000 lb (1,134 kg) or damage to equipment and injury or death to personnel may result.

(1) Position a three pallet train with couplers onto a suitable cargo loader.

(2) Position ten 4 in. (102mm) by 4 in. (102 mm) by 70 in. (178 cm) pieces of shoring laterally across the three pallet train approximately 20 in. (51 cm) apart.

#### **CAUTION**

Ensure BII pallet lifting brackets and lifting sling are correctly installed or damage to the REB launch boom locks and winch assembly will result. Refer to WP 0032 00.



## GENERAL MAINTENANCE (Contd)

### PREPARATION FOR SHIPMENT AND LIMITED STORAGE (Contd)

#### **WARNING**

To maintain a low center of gravity, the lifting sling must be connected to pallet launch boom lifting eyes and A-frame hook bar only. Failure to comply may result in damage to equipment or injury or death to personnel.

- (3) Using a suitable lifting device and lifting sling connected to REB pallet's launch boom lifting eyes and A-frame center hook bar (refer to WP 0032 00), lift and position REB onto the ten pieces of shoring.
- (4) Due to insufficient space along the aircraft's sides, it is recommended that vertical restraints be applied to the three pallet train prior to loading on aircraft. Loadmaster will determine quantity and location of restraints.

#### **WARNING**

Ensure cargo loader has a lifting capacity of 25,000 lb (1,134 kg) or damage to equipment and injury or death to personnel may result.

#### **NOTE**

To accomplish loading, two loadmasters and three aerial port personnel are recommended to observe clearances when loading REB on aircraft and applying required restraint.

- (5) Using suitable cargo loader, load REB on aircraft using standard palletized loading procedures.
- (6) Apply forward, aft, and lateral restraint once REB is downloaded. Follow standard tiedown pattern. Loadmaster will determine tiedown points and tiedown forces to be applied.
- (7) Offloading is the reverse of loading.

END OF WORK PACKAGE



## MAINTENANCE INSTRUCTIONS/PMCS

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## BRIDGE MAINTENANCE PROCEDURES

### GENERAL

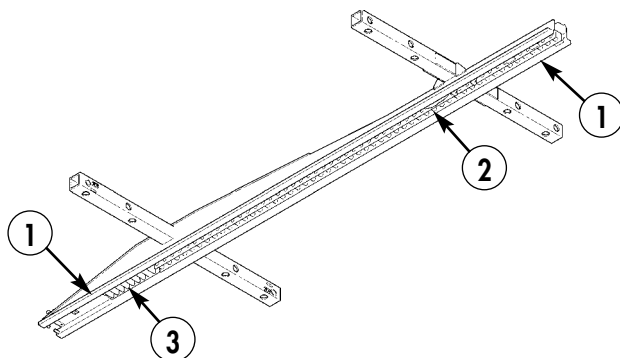
#### **WARNING**

Do not perform maintenance on equipment while in operation. Do not allow vehicles on bridge while performing operator maintenance. Failure to comply may result in injury or death to personnel or damage to equipment.

This section contains operator's level maintenance procedures for the bridge. For operator's level maintenance procedures for the CBT, refer to TM 5-5420-234-14&P. Perform all procedures in the order of the steps provided. Notify your supervisor if you cannot perform a maintenance procedure due to wear, damage, or missing parts. Refer to WP 0045 00, tables 1, 2, and 3 for lubricants and intervals.

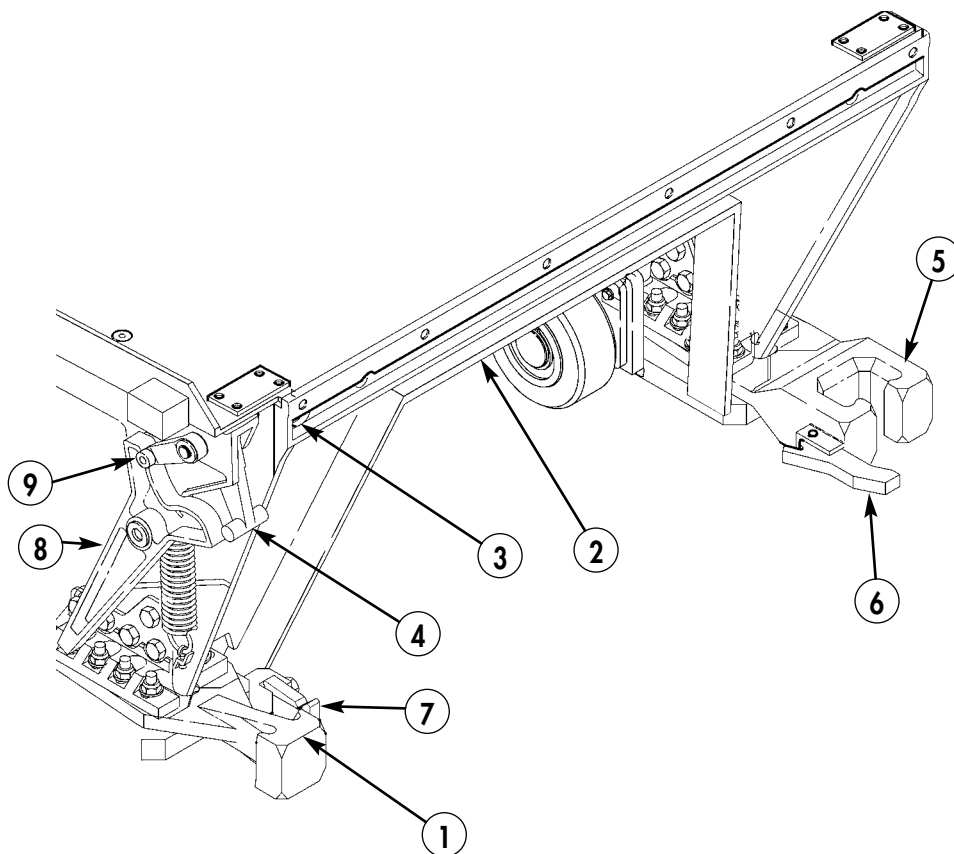
### LAUNCH BEAM

1. Using clean rags and solvent, clean pinwheel drive pins (2), rack (3), and rails (1). Refer to items 7 and 1, WP 0052 00.
2. Using clean rags, wipe dry pins (2), rack (3), and rails (1).
3. Coat all pins (2) and rack (3) with grease. Refer to items 4 and 5, WP 0052 00.
4. Coat rails (1) on both sides of launch beam with grease. Refer to items 4 and 5, WP 0052 00.



**BRIDGE MAINTENANCE PROCEDURES (Contd)****CROSSFORCE COUPLINGS, UPPER COUPLING LOCK PLUNGERS AND LEVERS, AND LOWER COUPLING CONNECTORS AND RECEPTACLES**

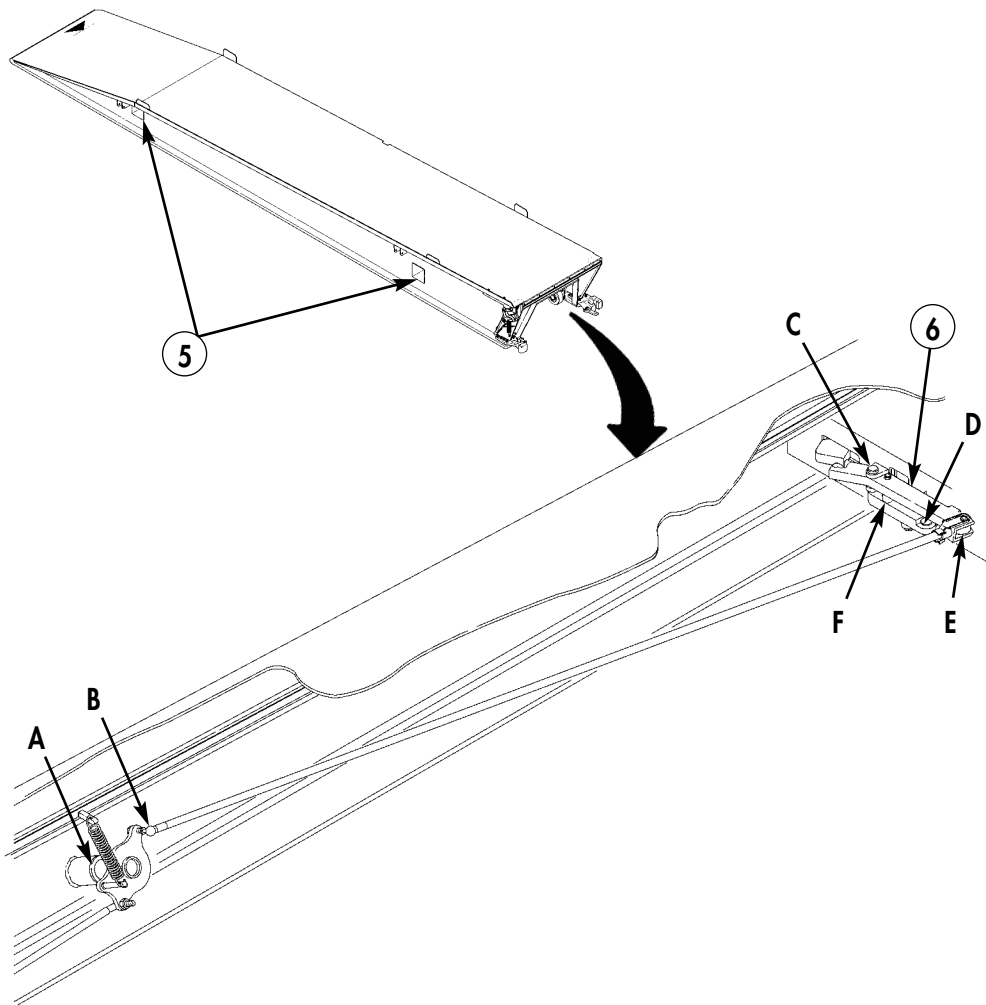
1. Using clean rags and solvent, clean crossforce coupling bumper (2), upper coupling lock plunger (3), lever (4), lower coupling connector (1), lower coupling receptacle (5), lower coupling help levers (6) and (7), remote control lever (8), and needle cam follower (9) on four bridge quarters. Refer to items 7 and 1, WP 0052 00.
2. Using clean rags, wipe dry all items cleaned with solvent in step 1 above.
3. Coat four crossforce couplings bumpers (2), upper coupling lock plunger shafts (3), levers (4), lower coupling connectors (1), receptacles (5), and roller surface of remote control lever (8) with grease. Refer to items 4 and 5, WP 0052 00.
4. Notify field maintenance to grease bearing of four needle cam followers (9) at grease fitting with grease. Refer to items 4 and 5, WP 0052 00.



## BRIDGE MAINTENANCE PROCEDURES (Contd)

### BRIDGE QUARTER SUPPORT TUBES AND SLIDE LOCKS

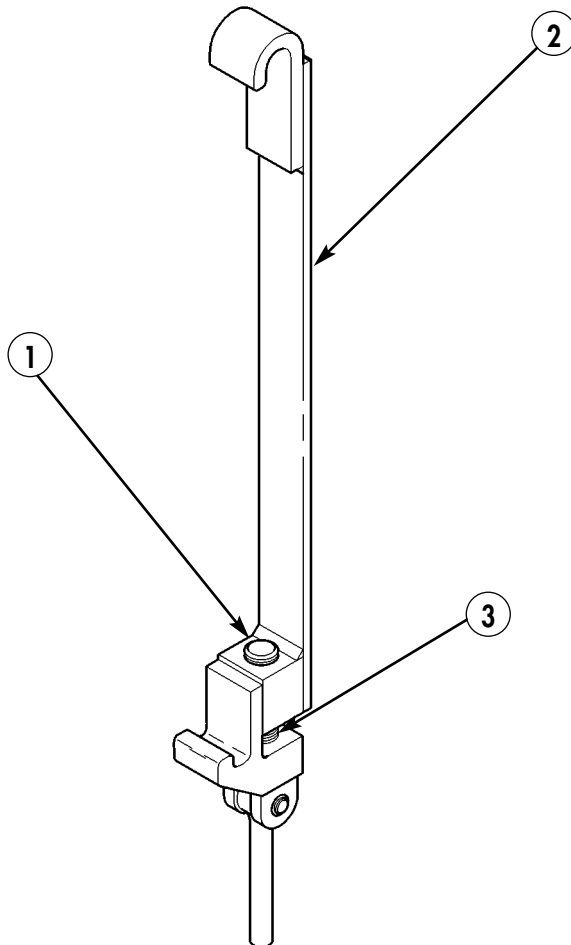
1. Using clean rags and solvent, clean support tubes (5) on four bridge quarters. Refer to items 7 and 1, WP 0052 00.
2. Using clean rags, wipe dry support tubes (5).
3. Coat inside of support tubes (5) on four bridge quarters with grease. Refer to items 4 and 5, WP 0052 00.
4. Apply lubricating oil to slide locks (6) on four bridge quarters at points A through F. Refer to item 11, WP 0052 00.



## BRIDGE MAINTENANCE PROCEDURES (Contd)

### BRIDGE FASTENING RODS

Apply spray lubricant to fastening rod drive screw (1) and bushing (3) on four fastening rods (2). Refer to item 15, WP 0052 00.



## BRIDGE MAINTENANCE PROCEDURES (Contd)

### REMAINING SERVICE LIFE INDICATORS (RSLI) ANNUAL INSPECTION

#### **WARNING**

The usable condition of the bridge is not limited to RSLI inspection. If cracks or damage to bridge are noted while performing PMCS, notify field maintenance prior to using bridge. Do not use bridge if any bridge quarter fails RSLI inspection or other cracks or damage is noted while performing PMCS. Failure to comply may result in damage to equipment and possible injury or death to personnel.

#### **NOTE**

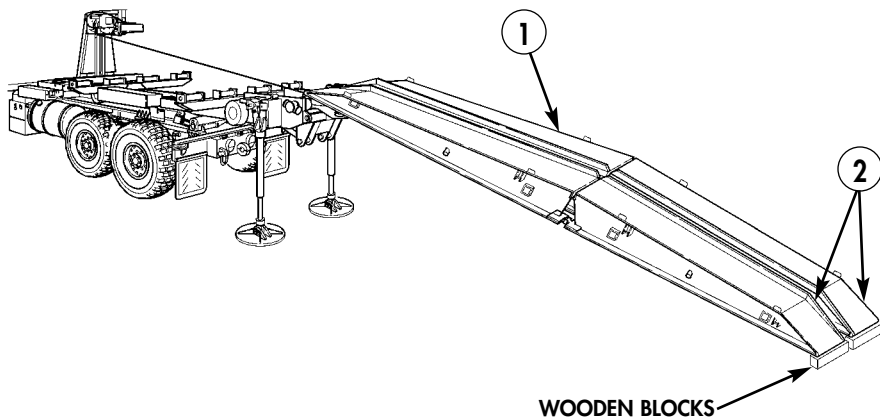
Each bridge quarter has a RSLI, and each RSLI consists of four fatigue fuses. An annual inspection is required to monitor the usable condition of the bridge by checking for cracked fatigue fuses on each RSDI. The results of each annual inspection are recorded to monitor the usable lifespan and condition of the bridge.

1. Locate a level space with firm ground to launch bridge.

#### **NOTE**

To provide space under bridge for tensile load during inspection, assistant will position an 8 in. x 6 in. (200 mm x 150 mm) wooden block under far ramp ends only during launch of bridge to ground.

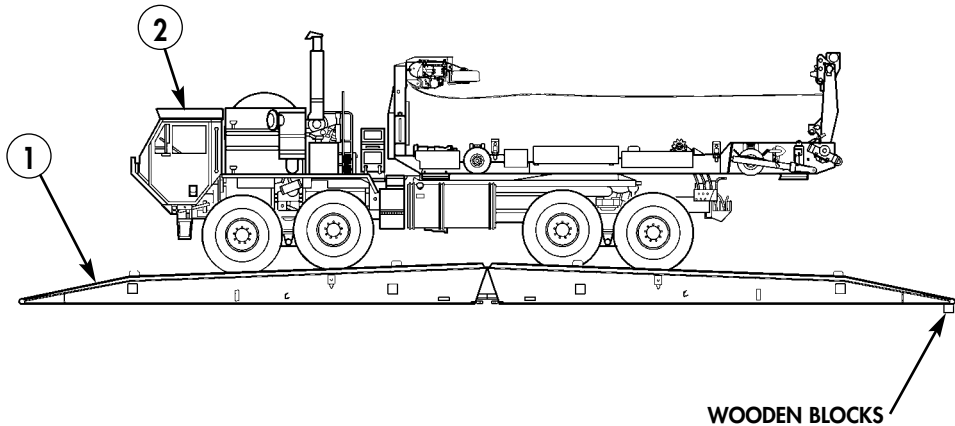
2. Launch bridge (1) to Ground. Refer to WP 0016 00. Position a wooden block under far shore ramp ends (2) prior to lowering bridge (1) to ground.



**BRIDGE MAINTENANCE PROCEDURES (Contd)****REMAINING SERVICE LIFE INDICATORS (RSLI) ANNUAL INSPECTION (Contd)****NOTE**

Ensure no part of bottom of bridge between wooden blocks and opposite ramp ends is in contact with ground with CBT on bridge.

3. Back up CBT (2) onto center of bridge (1) and apply parking brake.



4. Clean RSLI (2) and area around RSLI (2) on bridge quarter (1). For cleaning instructions, refer to WP 0046 00.
5. Identify bridge quarter (1) by serial number and date of inspection on Fatigue Fuses Inspection Sheet. Refer to Fatigue Fuses Inspection Sheet table in this work package.



## BRIDGE MAINTENANCE PROCEDURES (Contd)

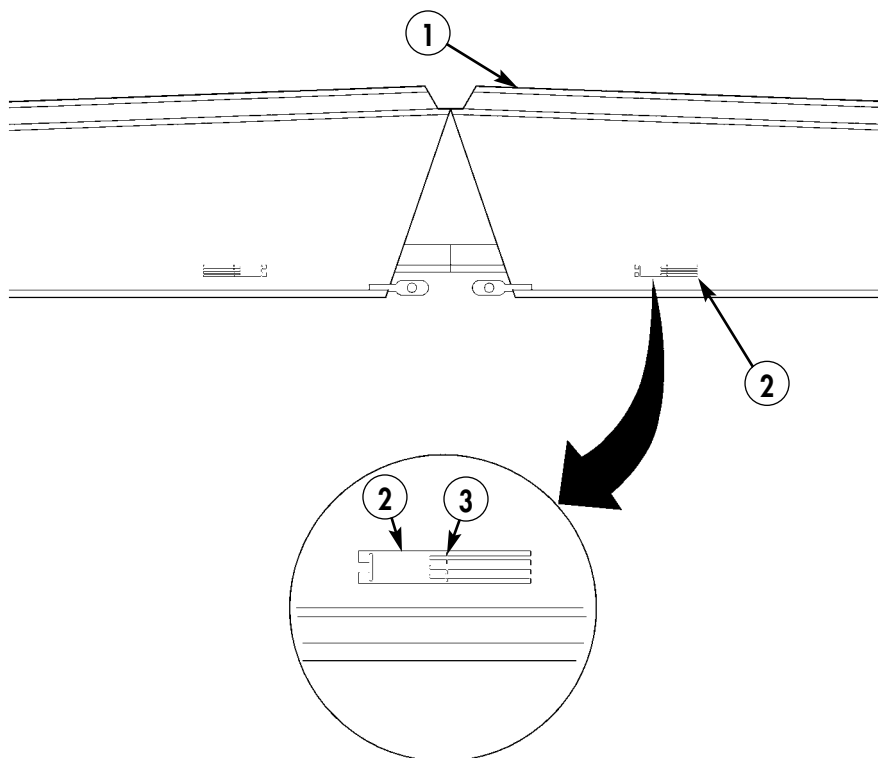
### REMAINING SERVICE LIFE INDICATORS (RSLI) ANNUAL INSPECTION (Contd)

#### NOTE

A fracture usually cannot be detected by the naked eye. Use of a 10X magnifier is necessary to observe the RSLI fatigue fuses during tensile load inspection.

If area adjacent to notches A and B is cracked, approximately 2,500 full-load cycles remain. If area A and B and C and D are cracked on any RSLI, the bridge has reached its usable lifespan and must be deadlined.

6. Using a magnifier, visually check each RSDI fatigue fuse (2) at notch (3), and record results on Fatigue Fuses Inspection Sheet. For notches A through D, mark an "O" if no crack is detected or an "X" if a crack is detected. Refer to Fatigue Fuses Inspection Sheet table in this work package.
7. Repeat steps 4 through 6 for inspection of RSLI (2) on remaining three bridge quarters (1).
8. Drive CBT forward off bridge and retrieve bridge from ground. Refer to WP 0020 00.



**BRIDGE MAINTENANCE PROCEDURES (Contd)**

**REMAINING SERVICE LIFE INDICATORS (RSLI) ANNUAL INSPECTION (Contd)**

**Fatigue Fuses Inspection Sheet Table**

Bridge Quarter/Part No./Serial No.	Year of Inspection															
	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Left-86 700 0413/ 	Notch															
	A															
	B															
	C															
	D															
Right-86 700 0411/ 	A															
	B															
	C															
	D															
	Left-86 700 0413 	A														
	B															
	C															
	D															
	Right-86 700 0411/ 	A														
	B															
	C															
	D															
	If no crack is detected - fill in "O" into field of inspection If crack is detected - fill in "X" into field of inspection															

END OF WORK PACKAGE  
Change 1

0047 00-8

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## MAINTENANCE INSTRUCTIONS/PMCS

RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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### PALLET MAINTENANCE PROCEDURES

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#### GENERAL

#### **WARNING**

Do not perform maintenance on equipment while in operation. Do not allow vehicles on bridge while performing operator maintenance. Failure to comply may result in injury or death to personnel or damage to equipment.

Accidental or intentional introduction of liquid contaminants into the environment is in violation of state, federal and military regulation. Refer to Army POL,WP 0001 00, for information concerning storage, use, and disposal of these liquids. Failure to do so may result in damage to environment and health of personnel.

#### **NOTE**

This section contains operator's level maintenance procedures for the pallet. For operator's level maintenance procedures for the CBT, refer to TM 5-5420-234-14&P. Perform all procedures in the order of the steps provided. Notify your supervisor if you cannot perform a maintenance procedure due to wear, damage, or missing parts.

This section contains operator's level maintenance procedures for the pallet. For operator's level maintenance procedures for the CBT, refer to TM 5-5420-234-14&P. Perform all procedures in the order of the steps provided. Notify your supervisor if you cannot perform a maintenance procedure due to wear, damage, or missing parts. Refer to WP 0045 00, tables 1, 2, and 3 for lubricants and intervals.

## PALLET MAINTENANCE PROCEDURES (Contd)

### LPU ENGINE OIL LEVEL

#### NOTE

Refer to HATZ Diesel Maintenance Decal Figure for HATZ engine maintenance intervals.

When checking LPU engine oil level, ensure engine is stopped and in a horizontal position.

1. Remove dipstick (1) from LPU engine (2), and check oil level on dipstick (1).
2. If engine oil level is below mark (3) on dipstick (1), add oil to oil fill pipe (4) until oil level reaches upper mark (3) on dipstick (1). Refer to items 10 and 16, WP 0052 00.

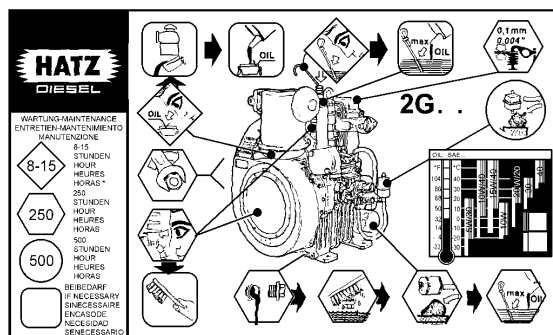
### LPU ENGINE OIL BATH AIR FILTER

#### NOTE

Refer to HATZ Diesel Maintenance Decal Figure for HATZ engine maintenance intervals.

LPU oil filter oil tank should be supported when removing clips to prevent oil in tank from spilling.

1. Disconnect two clips (8) from oil tank (10), and remove oil tank (10) and seal (9) from oil bath air filter housing (7).
2. Inspect seal (9) and replace if damaged.
3. Inspect oil for dirt or contamination. If dirt or contamination is found, notify field maintenance.
4. Inspect oil level and add oil to oil tank (10) up to mark (11). Refer to items 10 and 16, WP 0052 00.
5. Install seal (9) and oil tank (10) on oil bath air filter housing (7) with two clips (8).



*HATZ Diesel Maintenance Decal Figure.*

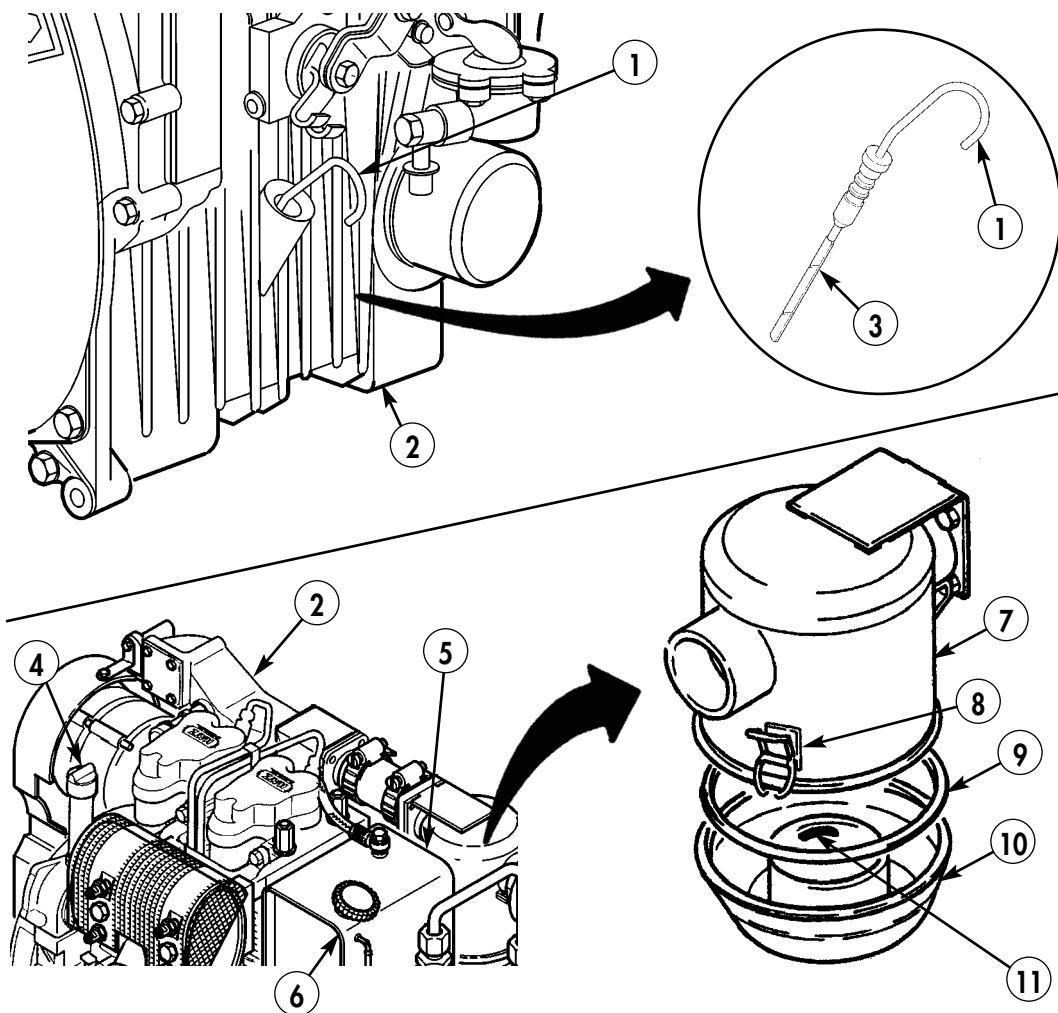
## PALLET MAINTENANCE PROCEDURES (Contd)

### LPU ENGINE FUEL LEVEL

#### **WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system while engine is hot. Fuel can be ignited by contact with hot engine. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET OF PALLET.

Remove fuel tank cap (6) from fuel tank (5) and visually observe fuel level in tank (5). Fill fuel tank (5) with fuel to within 1/2 in. (13 mm) of top of tank (5). Refer to item 12, WP 0052 00.



## **PALLET MAINTENANCE PROCEDURES (Contd)**

### **HYDRAULIC WINCH GEARBOX**

#### **NOTE**

Winch oil level is normally checked only if leaking is evident. Notify field maintenance to remove/install plugs.

Perform step 1 if draining oil from winch gearbox.

1. Remove drain plug (13) from hole (12) and allow oil to drain from winch gearbox (9). Install plug (13) on hole (12).
2. Remove full-level plug (7) from hydraulic winch gearbox (8). Observe that oil level is even with bottom of hole (11). Perform step 3 if oil level is below hole (11).
3. Remove fill plug (8) from hole (10), and fill gearbox (8) with gear oil until oil runs out of full-level hole (11). Install plug (8) on hole (10). Refer to item 14, WP 0052 00.
4. Install full-level plug (7) on hole (11) of hydraulic winch gearbox (9).

### **HYDRAULIC RESERVOIR**

1. If oil level in hydraulic reservoir (3) is below halfway on site glass white indicator (4), remove auxiliary reservoir cap (6) from auxiliary reservoir (5).
2. Add oil to auxiliary reservoir (5) until level is halfway on hydraulic reservoir (3) site glass white indicator (4). Refer to item 11, WP 0052 00.
3. Install auxiliary reservoir cap (6) on auxiliary reservoir (5).

### **FORWARD PINWHEEL GEARBOX**

1. Remove fill plug (17) and O-ring (16) from forward pinwheel gearbox (14). Discard O-ring (16).
2. Fill forward pinwheel gearbox (14) to bottom of fill plug hole (15) with gear oil. Refer to item 14, WP 0052 00.
3. Install new O-ring (16) and fill plug (17) on forward pinwheel gearbox (14).

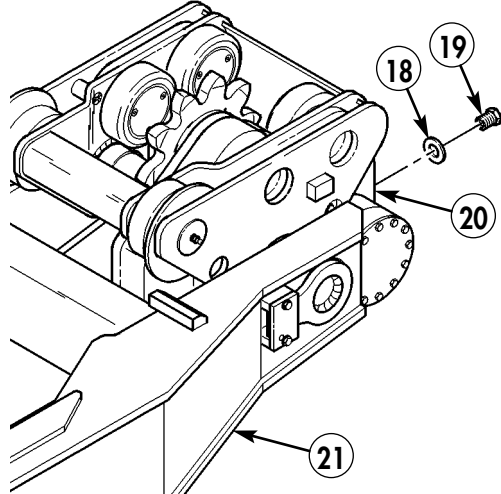
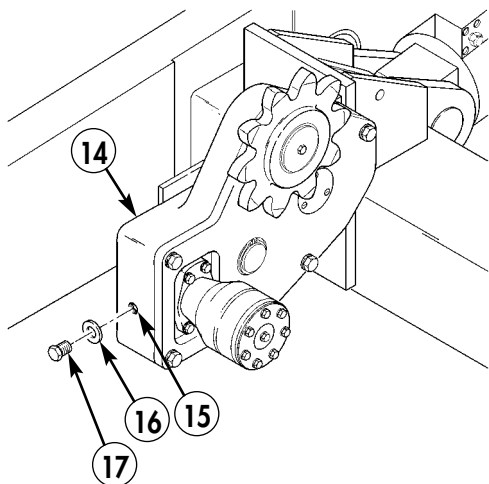
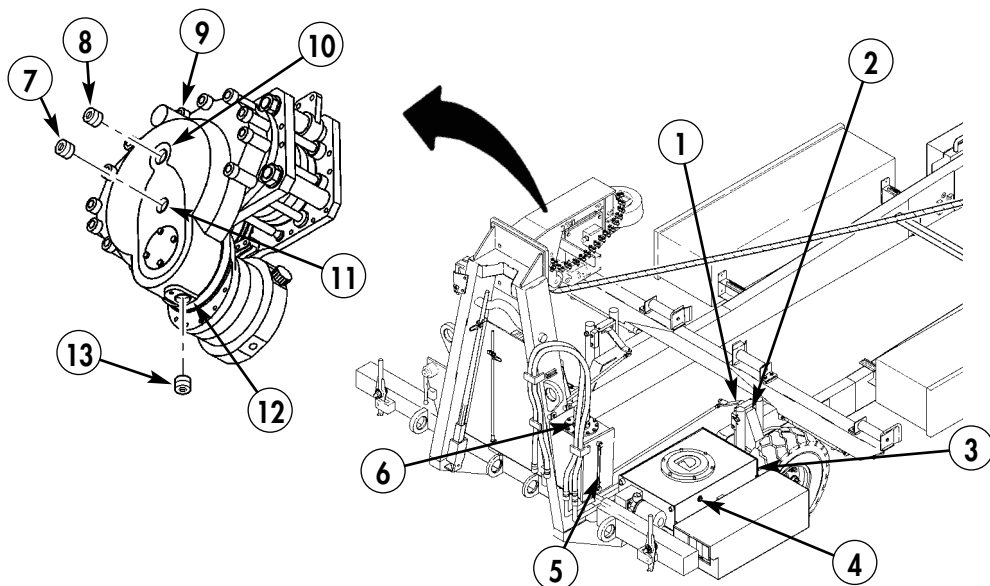
### **REAR PINWHEEL GEARBOX**

1. Using control valves KY1 and KY18, manually lower pallet launch boom (21) until horizontal (0-degree position). Refer to WP 0007 00.
2. Remove fill plug (19) and O-ring (18) from rear pinwheel gearbox (20). Discard O-ring (18).
3. Fill rear pinwheel gearbox (20) to bottom of fill plug hole with gear oil. Refer to item 14, WP 0052 00.
4. Install new O-ring (18) and fill plug (19) on rear pinwheel gearbox (20).
5. Using control valves KY1 and KY19, manually raise and secure pallet launch boom (21) in vertical (+90-degree position). Refer to WP 0007 00.

## PALLET MAINTENANCE PROCEDURES (Contd)

### PALLET SUPPORT WHEELS

1. Using clean rags and solvent, clean four support wheel channels (2) and two steering levers (1). Refer to items 7 and 1, WP 0052 00.
2. Using clean rags, wipe dry all parts.
3. Coat four support wheel channels (2) and two steering levers (1) with grease. Refer to items 4 and 5, WP 0052 00.



## PALLET MAINTENANCE PROCEDURES (Contd)

### WINCH WIRE ROPE ASSEMBLY SERVICE

#### **WARNING**

Skysol 100 cleaning solvent is combustible. Use mechanical ventilation whenever product is used in a confined space, is heated above ambient temperatures, or is agitated. DO NOT use or store near heat, sparks, flame, or other ignition sources. Keep container sealed when not in use.

Contact with Skysol 100 cleaning solvent may cause skin irritation. Use chemical-resistant gloves. In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water. Wash contaminated clothing before reuse. Eye contact may cause irritation, tearing, or blurring of vision. Use face shield or goggles when eye contact may occur. In case of eye contact, flush eyes with large amounts of water for at least fifteen (15) minutes or until irritation subsides. Inhalation may cause irritation to upper respiratory passages. DO NOT have food or drink in the vicinity. Failure to comply may result in injury to personnel.

Wire rope may be frayed. Wear heavy leather gloves when handling rope. Do not run hands on rope when applying cleaning solvent or lubricant. Failure to comply may cause injury to personnel.

#### **CAUTION**

Do not pay-out rope past working portion or rope will have to be installed using pilot tool.

#### **NOTE**

Perform steps 1 through 5 with bridge on pallet.

Operator will control winch using RCU, first assistant will disconnect hook from bridge launch beam eye and pull rope to end of pallet and second assistant will pull on cable until hook contacts ground.

1. Using RCU, operator will pay-out winch wire rope (1) until hook end of rope can be disconnected from bridge launch beam. Then continue to pay-out rope (1) until hook (2) extends through center of launch boom and contacts ground. Refer to WP 0007 00.
2. Using clean rags and solvent, clean hydraulic winch wire rope (1). Refer to items 1 and 7, WP 0052 00.
3. Using clean rags, wipe dry hydraulic winch wire rope (1).

#### **NOTE**

Ensure wire rope assembly is clean and dry prior to applying oil and lubricant.

4. Coat cable thoroughly with lubricant. Refer to item 6, WP 0052 00. Remove excess with clean rags. Refer to item 7, WP 0052 00.



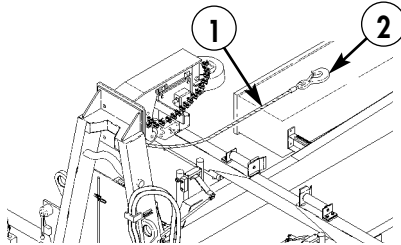
## PALLET MAINTENANCE PROCEDURES (Contd)

### WINCH WIRE ROPE ASSEMBLY SERVICE (Contd)

#### **CAUTION**

Ensure some slack is left in winch wire rope when paying in. Overtightening rope may result in damage to equipment

- Using RCU, operator will pay-in winch wire rope (1) until hook (2) is even with connecting eye on bridge launch beam. Refer to WP 0007 00. Connect hook (2) to connecting eye and pay-in wire rope (1).

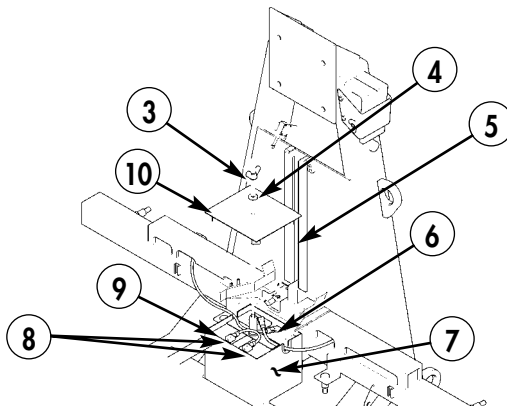


### PALLET BATTERIES

#### **NOTE**

Perform step 1 if bridge is loaded on pallet.

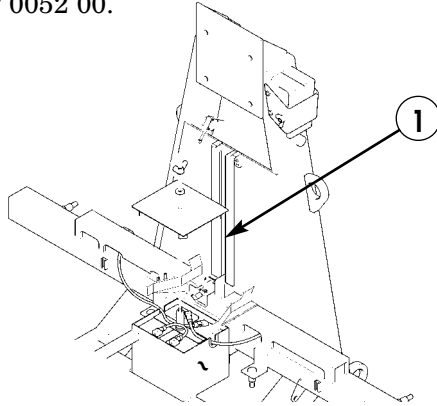
- Launch bridge to ground. Refer to WP 0016 00.
- Remove wingnut (3), washer (4), and battery box lid (10) from battery box (7).
- Check all battery terminals (6) for looseness and corrosion. If necessary, notify field maintenance to tighten any loose terminals (6) or remove terminals (6) if corroded. If corrosion is present, refer to WP 0046 00 to remove corrosion from terminals (6). Ensure plastic terminal lug covers (8) are present.
- If necessary, charge pallet batteries (9). Refer to WP 0027 00. If pallet batteries (8) will not hold charge, notify supervisor.
- Install battery box lid (10) on battery box (7) with washer (4) and wingnut (3)



## PALLET MAINTENANCE PROCEDURES (Contd)

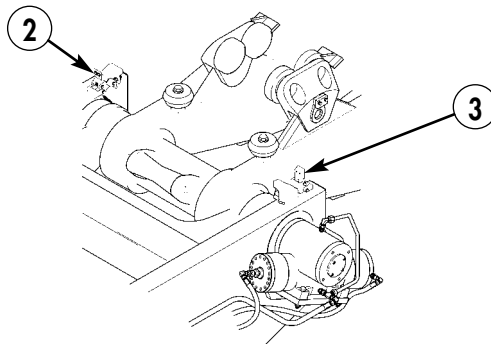
### A-FRAME PIN GUIDE CHANNELS

1. Using clean rags and solvent, clean two guide channels (1) and wipe dry. Refer to items 1 and 7, WP 0052 00.
2. Apply a light coat of grease to inside edge of two guide channels (1). Refer to items 4 and 5, WP 0052 00.



### RIGHT AND LEFT REMOTE CONTROL LEVER RELEASES

1. Using clean rags and solvent, clean levers (2) and (3) and wipe dry. Refer to items 1 and 7, WP 0052 00.
2. Apply a light coat of grease to hinge points on levers (2) and (3). Refer to items 4 and 5, WP 0052 00.



### LIMIT SWITCHES

1. Using clean rags and solvent, clean flexible rods on limit switches KA1 (5), KA2 (6), KA3 (7), and KA4 (8), and three rollers on limit switches on KA5 (4), KA6 (9), and KA8 (10). Refer to items 1 and 7, WP 0052 00.

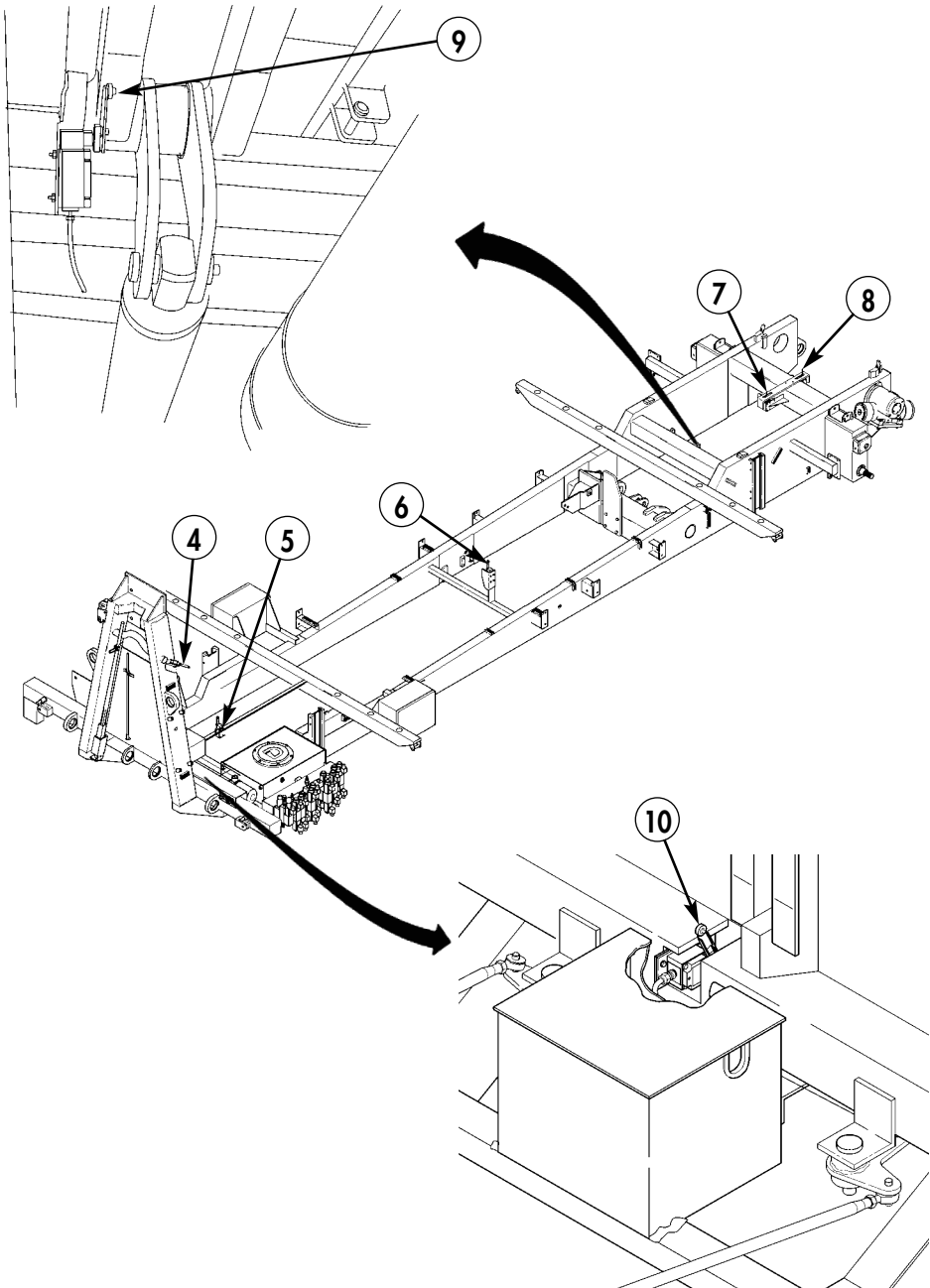
#### NOTE

Do not oil flexible rods on limit switches KA1 through KA4.

2. Apply a small amount of lubricating oil to rollers on limit switches KA5 (4), KA6 (9), and KA8 (7).

## PALLET MAINTENANCE PROCEDURES (Contd)

### LIMIT SWITCHES (Contd)



END OF WORK PACKAGE



## CHAPTER 5

### SUPPORTING INFORMATION RAPIDLY EMPLACED BRIDGE (REB)

References .....	0049 00-1
Components of End Item (COEI) and Basic Issue Items (BII) Lists .....	0050 00-1
Additional Authorization List (AAL) .....	0051 00-1
Expendable/Durable Supplies and Materials List .....	0052 00-1
Glossary .....	Glossary-1
Index .....	INDEX-1



## SUPPORTING INFORMATION

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## REFERENCES

### SCOPE

This work package lists all field manuals, forms, technical manuals, and miscellaneous publications referenced in this manual.

### PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this manual.

DA Pam 750-8                    The Army Maintenance Management System (TAMMS)  
Users Manual

### FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 750-8, The Army Maintenance Management System (TAMMS) Users Manual, for instructions on the use of maintenance forms pertaining to this manual.

DD Form 250	Material Inspection and Receiving Report
DD Form 314	Preventive Maintenance Schedule and Report Card
DA Form 2028	Recommended Changes to DA Publications and Blank Forms
DA Form 2404/5988-E	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Form 2408-9	Equipment Control Record
DA Form 5504	Maintenance Request
SF 361	Transportation Discrepancy
SF 364	Report of Discrepancy (ROD)
SF 368	Product Quality Deficiency Report (Category 11)

### FIELD MANUALS

FM 3-4	Nuclear, Biological, and Chemical (NBC) Protection
FM 3-5	Nuclear, Biological, and Chemical (NBC) Decontamination
FM 4-25.11	First Aid
FM 5-20	Camouflage Pattern Painting
FM 5-34	Engineering Field Data
FM 38-700	Field Manual, Preservation
FM 38-701	Field Manual, Packing
FM 10-450-4	Single Point Load Rigging
FM 10-450-5	Dual Point Load Rigging
FM 90-7	Combined Arms Obstacle Integration
FM 90-13	River-Crossing Operations

## REFERENCES (Contd)

### TECHNICAL MANUALS

TM 5-5420-280-23&P	Unit and Direct Support Maintenance and Repair Parts and Special Tool List for Rapidly Emplaced Bridge (REB)
TM 9-2320-279-10	M977 Series, 8 x 8 Heavy Expanded Mobility Tractor Truck (HEMTT) Operator's Manual
TM 9-2330-385-14	Operator's, Unit, Direct Support, and General Support Maintenance Manual for Palletized Load System Trailer (PLST) Model M1076
TM 5-5420-234-14&P	Operator's, Unit, Direct Support, and General Support Manual (Including Repair Parts and Special Tool List), Common Bridge Transporter
TM 43-0139	Painting Instructions for Field Use
TM 43-1043	Equipment Improvement Report and Maintenance Summary
TM 55-2200-001-12	Transportability Guidance for Applications of Blocking, Bracing, and Tiedown Materials
TM 743-200-1	Storage and Materials Handling
TM 746-10	Marking, Packing, and Shipment of Supplies and Equipment: General Packaging Instructions for Field Use
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

### TECHNICAL BULLETINS

TB 5-5420-234-15	Warranty Program for the Common Bridge Transporter (CBT)
TB 43-0142	Safety, Inspection and Testing of Lifting Devices
TB 43-0209	Color, Marking, and Camouflage Painting of Military Vehicles
TB 43-0002	Maintenance Federal Supply Class (FSC) 54

### OTHER PUBLICATIONS

AFJMAN 24-204	Air Force Joint Manual
AR 750-1	Army Materiel Maintenance Policy
ASME Y14.38	Abbreviations & Acronyms
CTA 50-970	Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items)
MIL-PRF-2104G	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
TC 38-3	Guide for Basic Military Preservation and Packing
TC 5-210	Military Float Bridge Equipment

### END OF WORK PACKAGE



## SUPPORTING INFORMATION

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

## COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

### Section I. INTRODUCTION

#### SCOPE

This work package lists Components of the End Item (COEI) and Basic Issue Items (BII) for the Rapidly Emplaced Bridge (REB) to help inventory items required for safe and efficient operation. For a list of BII for the Common Bridge Transporter (CBT), refer to TM 5-5420-234-14&P.

#### GENERAL

The Components of End Item (COEI) and Basic Issue Items (BII) lists are divided into the following sections:

**a. Section II, Components of End Item (COEI).** 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 (BII).** These are the minimum essential items required to place the Rapidly Emplaced Bridge (REB) in operation. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on Table of Organization and Equipment/Modified Table of Organization and Equipment (TOE/MTOE) authorization of the end item.

#### EXPLANATION OF COLUMNS

The following provides an explanation of columns found in tabular listings:

**a. Column (1) – Illustration Number (Illus Number).** This column indicates the number of the illustration in which the item is shown.

**b. Column (2) – National Stock Number.** Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

**c. Column (3) – Description.** Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the Commercial and Government Entity Code for Manufacturer (CAGEC) for (in parentheses), followed by a part number.

**d. Column (4) – Unit of Measure (U/M).** Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g.: ea, in., pr).

**e. Column (5) – Quantity Required (Qty Rqr).** Indicates the quantity of the item authorized to be used with/on the Rapidly Emplaced Bridge (REB).

**COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS  
(Contd)**

**Section II. COMPONENTS OF END ITEM**

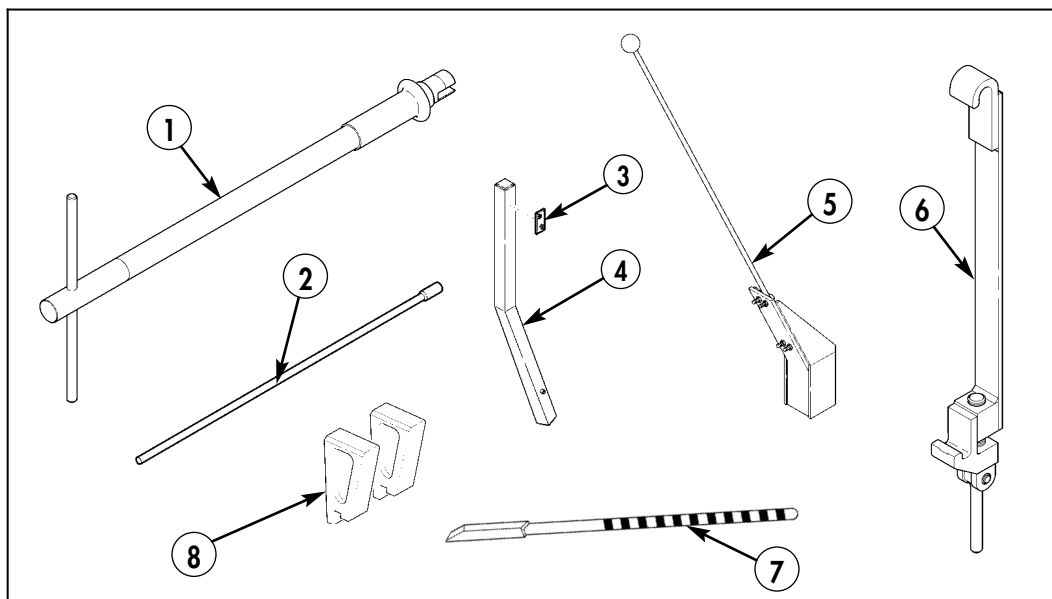
**REB**

There are no COEI for the REB.

**CBT**

There are no COEI for the CBT.

**Section III. BASIC ISSUE ITEMS**

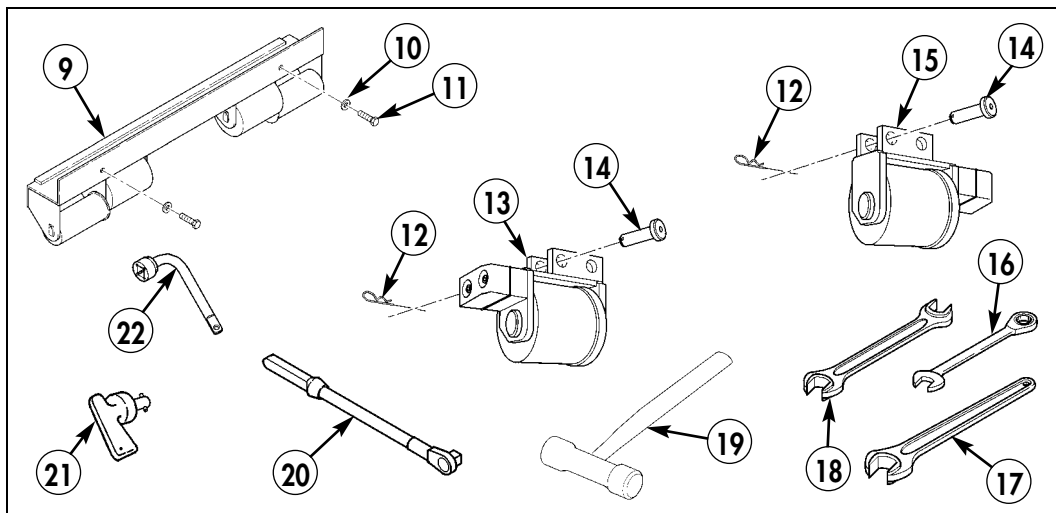


(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
1	5340-12-359-3467	LEVER, LOCK-RELEASE UNLOCKING ROD (D9913) 869108903	REB	EA	2
2	3990-12-359-2610	HANDLE, PUMP EXTENSION (D9913) 869101901	REB	EA	1
3	9905-12-359-0022	REFLECTOR, MARKER POLE (D9913) 908491715	REB	EA	8
*4	5340-12-359-2949	MARKER POLE, REFLECTING (D9913) 864501101	REB	EA	4
5	5340-12-359-3468	BRACKET, MOUNTING, POSITION AID, RETRIEVAL (D9913) 869107101	REB	EA	2
6	3990-12-359-2610	BINDER, LOAD, FASTENING ROD (D9913) 869108901	REB	EA	4
7		TANKER BAR (D9913) 029185190	REB	EA	1
8		BRACKET, PALLET LIFTING (D9913) 869147104	REB	EA	2

\*Item #4 includes item #3

**COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS  
(Contd)**

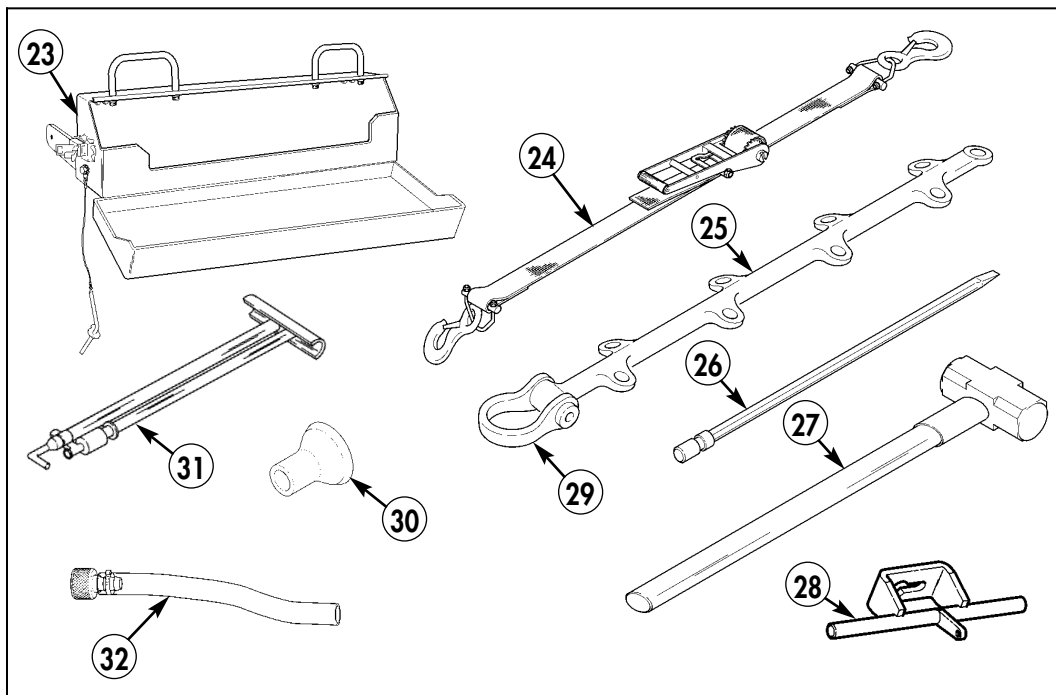
**Section III. BASIC ISSUE ITEMS (Contd)**



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION  CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) QTY RQR
9		TRANSLOAD ROLLER BAR (D9913) 869100901	REB	EA 1
10	5310-12-156-4899	WASHER (D8286) DIN1250B13	REB	EA 2
11	5305-12-156-4875	SCREW (D8286) DIN933	REB	EA 2
12	5315-12-164-6290	LYNCH PIN (D8286) DIN11024-4-A3P	REB	EA 2
13		TRANSLOAD ROLLER, RIGHT (D9913) 869104504	REB	EA 1
14		PIN (D9913) 869145011	REB	EA 2
15		TRANSLOAD ROLLER, LEFT (D9913) 869104505	REB	EA 1
16		WRENCH, 19 MM (DD985) 614812-19	REB	EA 2
17	5120-99-862-8250	WRENCH, 50 MM (D8286) DIN894-50	REB	EA 2
18	5120-12-123-5008	WRENCH, OPEN END, COMBINATION, 36MM/41MM (D8286) DIN895-36X41	REB	EA 2
19		HAMMER, SOFT-NOSED (D9913) 770089	REB	EA 2
20		RATCHET, WRENCH (D9913) 775926	REB	EA 2
21	5930-12-331-9999	KEY, SWITCH (D0728) 14682	REB	EA 1
22		KEY (D9913) 908077005	REB	EA 1

**COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BI) LISTS  
(Contd)**

**Section III. BASIC ISSUE ITEMS (Contd)**



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER	(4) USABLE ON CODE	(4) U/M	(5) QTY RQR
23		STOWAGE BOX, ANCHORAGE (D9913) 869107205	REB	EA	2
24		STRAP RATCHET (D9913) 909143807	REB	EA	4
25		HOLD-FAST, ANCHORING (D9913) 909154001	REB	EA	4
26		PIN, ANCHORING (D9913) 909119601	REB	EA	32
27		HAMMER, SLEDGE (D9913) 909120506	REB	EA	2
28		REMOVER, ANCHORING PIN (D9913) 909186102	REB	EA	2
29		SHACKLE, HOLD-FAST (D9913) 909144415	REB	EA	4
30		NAIL HEAD, ANCHORING (D9913) 869116101	REB	EA	2
31		DRAWING APPARATUS, ANCHORING PIN (D9913) 909150201	REB	EA	2
32		HOSE ASSEMBLY, DRAIN, 20 IN. (500 MM) LONG (D9913) 18	REB	EA	1

## SUPPORTING INFORMATION

RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

### ADDITIONAL AUTHORIZATION LIST (AAL)

#### Section I. INTRODUCTION

##### SCOPE

This work package lists additional items authorized for the support of the Rapidly Emplaced Bridge (REB).

##### GENERAL

This lists identifies items that do not have to accompany the REB and that do not have to be turned in with it. These items are authorized by CTA, MTOE, or JTA.

##### EXPLANATION OF COLUMNS IN THE AAL

Column (1) - National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) - Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). 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 (in parentheses) and the part number.

Column (3) - Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used on</u>
REB	M21

Column (4) - Unit of Measure (U/M). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) - Qty Recm. Indicates the quantity recommended.

## Section II. ADDITIONAL AUTHORIZATION LIST (AAL)

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
3940-00-141-7195	BLOCK, TACKLE: 1.00 IN. DIA. WIRE ROPE, 26,000 LB. MAX. LOAD (58536) A-A-59390-D-1-A-14	REB	EA	2
3940-00-338-5653	BLOCK, TACKLE, 0.500 IN. DIA. WIRE ROPE, 10,000 LB. MAX. LOAD (75535) 418-4-1-2	REB	EA	3
4930-00-288-1511	ADAPTER, GREASE GUN COUPLING, FLEX. 14 IN. O/A LG. (0AYB6) G6	REB	EA	6
4030-00-243-4440	CLAMP, WIRE ROPE, SADDLED, STEEL, 0.500 IN. NOM. (96906) MS16842-7	REB	EA	100
4030-00-243-4444	CLAMP, WIRE ROPE, SADDLED, GALV. STEEL, 1.000 IN. NOM. (96906) MS16842-11	REB	EA	100
5420-00-507-6560	CONNECTOR, BRIDLE, SHEAVE, SELF-ALIGNING, 1.00 IN. DIA. ROPE (97403) 7941	REB	EA	15
5110-00-224-7058	CUTTER, WIRE ROPE, HAND OPERATED, HYDRAULIC, 1-1/8 IN. MAX. WIRE ROPE CAP. (58536) A-A-3029	REB	EA	1
5110-00-293-1066	CUTTER, WIRE ROPE, HAND OPERATED, HAPPER IMPACT, 1-1/2 IN. MAX. WIRE ROPE CAP. (85767) 2	REB	EA	1
6220-01-456-2746	TOW LIGHT ASSEMBLY, AUXILIARY LIGHT BAR KIT (33287) J-43173	REB	EA	1
6230-00-163-1856	FLASHLIGHT, 2.500 O/A DIA. 8 IN. O/A LG. PLASTIC, WATER-TIGHT, 1 CLEAR LENS, MINIATURE FLANGED INCANDESCENT LAMP (64067) 6230 00-163-1856	REB	EA	6
5120-00-224-2660	GRIP, CABLE JAW: PARALLEL, BRONZE LINED STEEL JAWS, SMOOTH SURFACES, 15,000 LB. SAFE OPERATING LOAD, 3/4-1.00 IN. WIRE ROPE (81348) RRG691	REB	EA	4

## ADDITIONAL AUTHORIZATION LIST (AAL) (Contd)

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
5120-00-900-6096	HAMMER, HAND, BLACKSMITH'S SLEDGE, 8 LB. HEAD W/FIBERGLASS HANDLE (76732) 8D-8	REB	EA	8
3950-00-276-9188	CHEST, CHAIN HOIST (97403) 13220E8275	REB	EA	2
3950-00-292-9882	HOIST, CHAIN, HAND DRIVEN, 10,000 LB. MAX. LIFT. W/SAFETY LATCHES, FREE SPOOLING, 63 LBS. (27404) AC-4	REB	EA	4
5420-00-377-0764	HOLDFAST ASSEMBLY, STEEL, BAR TYPE, 51.00 IN. LG. 8.00 IN. W. (97403) 13207E9737	REB	EA	8
5420-00-355-6772	PIN, HOLDFAST, 7/8 IN. DIA. (97403) 13207E9739		EA	8
5420-00-371-9897	STAKE, ANCHOR, BRIDGE, STEEL, 42 IN. LG., TAPERED END, W/D-SHAPE HOLDER (81349) MILP52258	REB	EA	53
5420-00-060-7031	RETAINER, BRIDGE PIN (81349) MILR52243	REB	EA	8
5420-00-371-9890	HOLDFAST ASSEMBLY, CHAIN TYPE, 12 LINKS (81349) MILH3586	REB	EA	8
6260-01-178-5559	LIGHT, CHEMILUMINESCENT, 6 IN. LG., RED, 12 HOUR, WATER-PROOF (58536) A-A-55134-E	REB	BX	5
4930-00-253-2478	LUBRICATION GUN, HAND, LEVER OPERATED, 14 OZ. CAP, 6000 PSIG, W/COUPLING AND 6.500 IN. EXTENSION (36251) 1142	REB	EA	6
4210-00-240-1654	NOZZLE, FIRE HOSE, PLAIN, TAPERED (02413) NOZZLE FIREHOSE	REB	EA	3
4320-00-221-5174	PUMP, HYDRAULIC RAM, HAND OPERATED, 1500 LBS. PSI. (95745) 1751	REB	EA	4

## ADDITIONAL AUTHORIZATION LIST (AAL) (Contd)

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
4320-00-542-3347	PUMP UNIT, CENTRIFUGAL, 125 GPM, 5000 LB. PROOF LOAD (96046) A52109	REB	EA	3
1670-00-360-0466	RING, PARACHUTE HARNESS D, STEEL OR CADMIUM PLATED (96906) MS22046-3	REB	EA	21
4020-00-141-7152	ROPE, FIBROUS, NYLON, 2.250 IN. NOM CIRCUMFERENCE, 13,200.0 LBS. BREAKING STRENGTH, REEL, 600.00 FT., 3/4 IN. DIA. (81349) MILR17343	REB	RL	1
4020-00-968-1357	ROPE, FIBROUS, NYLON, 1.500 NOM. CIRCUMFERENCE, 5,800 LBS. BREAKING STRENGTH, REEL, 200 YDS, 1/2 IN. DIA. (81349) MILR17343	REB	RL	2
4010-00-080-6234	ROPE, WIRE, STEEL IMPROVED PLOW CORE AND STRAND, INDEPENDENT WIRE ROPE, RIGHT REGULAR LAY, PREFORMED, 89,800 LBS NOM BREAKING STRENGTH (81348) RRW410	REB	RL	1
1670-01-027-2900	SLING, CARGO, AERIAL DELIVER, WEB STRAP TYPE (56646) 38850-00001-044	REB	EA	22
6670-01-010-5906	SCALE, WEIGHING, HANGING TYPE, DIAL INDICATOR, 0-60 LBS. RANGE (11710) IN-60	REB	EA	1
4030-00-090-5354	SHACKLE, STEEL, ANCHOR TYPE, 40,000 LBS PROOF LOAD, AIR DELIVERY, 2.130 IN. MAX. OPENING WIDTH (96906) MS70087-3	REB	EA	84
4030-00-244-6092	SHACKLE, STEEL, ANCHOR TYPE, 31,800 LBS. PROOF LOAD, 1.250 IN. NOM. OPENING WIDTH (80205) NAS1042-12	REB	EA	12
3940-00-214-7493	SLING AND WIRE ROPE ASSEMBLY (97403) 13218E4318	REB	EA	3



## ADDITIONAL AUTHORIZATION LIST (AAL) (Contd)

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
4730-00-202-9174	STRAINER, SUCTION TYPE, COPPER ALLOY BODY AND SCREEN (81349) M12165-12	REB	EA	3
5420-00-501-6997	PLATE, BRIDGE, ALUMINUM ALLOY, 12.00 IN. LG., 4.00 IN. W. (81348) QQ-A-250/9F	REB	EA	24
5420-00-501-6998	PLATE, BRIDGE, ALUMINUM ALLOY, 24.00 IN. LG., 12.00 IN. W. (81348) QQ-A-250	REB	EA	6
5210-00-554-7087	TAPE, MEASURING, FIBER, 100 FT., HAND CRANK WINDING (37163) 406	REB	EA	3
9390-00-753-3208	TAPE, REFLECTIVE, YELLOW, PRESSURE SENSITIVE, 1.000 IN. W., 1800 IN. LG. (81346) ASTM-D4956	REB	EA	4
4940-00-595-5720	TESTER, HYDRAULIC HOSE, FOR PRESSURE READINGS (08832) GS5	REB	EA	4
4030-00-266-0066	THIMBLE, ROPE, SPLIT OVAL, ZINC COATED, 0.500 IN. NOM. DIA. (81348) FFT276	REB	EA	24
4030-00-266-0071	THIMBLE, ROPE, SPLIT OVAL, ZINC COATED, 1.000 IN. NOM. DIA. (81348) FFT276	REB	EA	24
5120-00-204-1999	WRENCH SET, SOCKET, 3/4 IN. SQ. DR. 12 PT. W/CASE (05047) B107.1	REB	EA	2
5120-01-399-9663	EXTENSION, SOCKET, 2 1/2 IN. LG., 1/2 IN. DR. (1CV05) 5460	REB	EA	2
5120-00-273-9208	EXTENSION, SOCKET WRENCH, 3 IN. LG. (58536) A-A-2170	REB	EA	2
5120-00-227-8079	EXTENSION, SOCKET WRENCH, 16 IN. LG (58536) A-A-2170	REB	EA	2

## ADDITIONAL AUTHORIZATION LIST (AAL) (Contd)

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
5120-00-243-7328	EXTENSION, SOCKET WRENCH, 8 IN. LG. (58536) A-A-2170	REB	EA	2
5120-00-221-7959	HANDLE, SOCKET WRENCH, HINGED (45225) H377	REB	EA	2
5120-00-249-1076	HANDLE, SOCKET WRENCH, RATCHET (77053) 9649	REB	EA	2
5130-01-486-2245	SOCKET, SOCKET WRENCH, 19 MM ST. 6 PT., 1/2 IN. DR. (1CV05) 7419M	REB	EA	2
5120-00-709-4072	HANDLE, SOCKET WRENCH, SLIDING TEE (55719) L52BH	REB	EA	2
5120-00-181-6813	SOCKET, SOCKET WRENCH, 15/16 IN. (24789) 1230	REB	EA	2
5120-00-189-7910	SOCKET, SOCKET WRENCH, 1-9/16 IN. (58536) A-A-1394	REB	EA	2
5120-00-189-7928	SOCKET, SOCKET WRENCH, 1-1/16 IN. (58536) A-A-1394	REB	EA	2
5120-00-189-7931	SOCKET, SOCKET WRENCH, 1-7/16 IN. (80204) B107.1	REB	EA	2
5120-00-199-7765	SOCKET, SOCKET WRENCH, 1-5/8 IN. (79808) 5120-00-199-7765	REB	EA	2
5120-00-199-7768	SOCKET, SOCKET WRENCH, 1-13/16 IN. (80204) A-A-1394	REB	EA	2
5120-00-199-7769	SOCKET, SOCKET WRENCH, 1-7/8 IN. (8Z799) H-1260	REB	EA	2
5120-00-199-7770	SOCKET, SOCKET WRENCH, 2 IN. (80204) B107.1	REB	EA	2
5120-00-232-5681	SOCKET, SOCKET WRENCH, 1-5/16 IN. (79808) 5120-00-232-5681	REB	EA	2
5120-00-235-5871	SOCKET, SOCKET WRENCH, 1-1/4 IN. (1ML14) 3105A	REB	EA	2

**ADDITIONAL AUTHORIZATION LIST (AAL) (Contd)**

(1) NATIONAL STOCK	(2) DESCRIPTION CAGEC & PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
5120-00-237-0989	SOCKET, SOCKET WRENCH, 1 IN. (80204) B107.1 CL1STA	REB	EA	2
5120-00-239-0021	SOCKET, SOCKET WRENCH, 1-1/8 IN. (58536) A-A-1394	REB	EA	2
5120-00-243-1687	UNIVERSAL JOINT, SOCKET WRENCH, 1-1/2 IN. (58536) A-A-2169	REB	EA	2
5140-00-772-4142	BAG, TOOL, COTTON DUCK, W/FLAP, 10.000 X 20.000 IN. (81337) 5-3-62	REB	EA	1
5120-00-316-9217	WRENCH, WHEEL STUD NUT, DBLE SOCKET TYPE 11 (19207) 11677000-3	REB	EA	1
5120-00-222-8852	SCREWDRIVER, FLAT TIP, HVY DUTY, PLASTIC HDL, 1/4 IN. TIP, 4 IN. BLADE, 7-3/4 IN. LG. (80063) SCC539502-2	REB	EA	1
5120-00-227-7338	SCREWDRIVER, FLAT TIP, HVY DUTY, STEEL HDL, W/WOOD INSERTS, 5 IN. BLADE, 9-1/2 IN. LG. (77948) D339	REB	EA	1
5120-00-234-8912	SCREWDRIVER, CROSS TIP, PHILLIPS NO. 3, PLASTIC HDL, 6 IN. BLADE, 10-1/8 IN. LG. (C7127) SSDP63	REB	EA	1
5120-00-449-8083	WRENCH, ADJ., OPEN END, 9-1/2 TO 10-1/2 IN. OPENING, TYPE 1, CLASS 1 (96508) D710	REB	EA	1
5120-00-061-8546	HAMMER, HAND, MACHINIST'S BALL-PEEN, 2 LB., TYII, CL1, STY A (79171) FS432	REB	EA	1



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## SUPPORTING INFORMATION

### RAPIDLY EMPLACED BRIDGE (REB)

NSN 5420-01-481-3959 P/N 12480471

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## EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

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### Section I. INTRODUCTION

#### SCOPE

This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized by CTA 50-970, Expendable/ Durable Items (except medical, class V, repair parts, and heraldic items).

#### EXPLANATION OF COLUMNS

**a. Column (1) – Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g.: cleaning solvent compound, item 1, WP 0052 00).

**b. Column (2) – Level.** This column identifies the lowest level of maintenance that requires the listed item.

- C — Operator/Crew
- O — Field 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) – Description.** This column 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 for Manufacturer (CAGEC) in parentheses followed by the part number.

**e. Column (5) – Unit of Measure (U/M).** This column indicates the measure used in performing the actual maintenance function. This measure is expressed by a alphabetical abbreviation (e.g., EA, GAL., OZ). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements. Adjust when higher category maintenance requirements are involved.

## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION CAGEC AND PART NUMBER	(5) UNIT MEASURE
1	C	6850-01-381-4423	CLEANING SOLVENT COMPOUND: (0K209) SKYSOL 100 5-Gallon Can	GAL
2	C	8030-00-051-4011	CORROSION PREVENTIVE COMPOUND: grade II, soft film (81349) MIL-C-16173 1-Gallon Can	GAL
3	C	8040-00-833-9563	DETERGENT, GENERAL: liquid, (81349) MIL-D-1679 1-Gallon Can	GAL
4	C	9150-00-935-1017	GREASE: automotive and artillery: (81349) MIL-PERF-10924 1-Gallon Can	GAL
5	C	9150-01-197-7690	GREASE: automotive and artillery: (81349) MIL-PERF-10924 1 3/4-Pound Can	OZ
6	C	9150-00-234-5197	LUBRICANT, EXPOSED WIRE: Grd 1 Cw (81349) W-L-751 5-Pound Can	LB
7	C	5350-00-321-0872	RAG, WIPING: unbleached cotton and cotton-synthetic, mixed colors (58536) A-A-531 50-Pound Bale	LB
8	C	8030-01-418-9008	CORROSION PREVENTIVE COMPOUND (39428) WD-401347K11 12-Ounce Can	OZ
9	C	9150-00-234-5197	LUBRICATING OIL, EXPOSED GEAR: CW (81348) VV-L-751 5-Pound Can	LB
10	C	9150-00-188-9862	LUBRICATING OIL, GEAR: OE/HDO 15W40, multi-purpose (81349) MIL-PRF-2104 55-Gallon Drum	GAL

**EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (Contd)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION CAGEC AND PART NUMBER	(5) UNIT MEASURE
11	C	9150-00-191-2772	LUBRICATING OIL, GEAR: OEA-30 MIL-PRF-46167 55-Gallon Drum	GAL
12	C	9130-01-031-5816	OIL, FUEL, aviation, turbine, all temperature (81349) MILT83133GRJP8 Bulk	GAL
13	C	9150-01-035-5393	OIL, LUBRICATING GEAR, GO 75 MIL-L-2105C 5-Gallon Can	GAL
14	C	9150-00-577-5844	OIL, LUBRICATING GEAR, GO 80/90 MIL-L-2105C 5-Gallon Can	GAL
15	C	9150-01-054-6453	CLEANER, LUBRICANT AND PERSERVATIVE (CLP) (81349) MIL-PRF-63460 1-Pint Bottle	PT
16	C	9150-01-278-1357	LUBRICATING OIL, GEAR, 5W-30, Multi-purpose (81349) MIL-L-46152 5W-30 1-Quart Plastic Bottle	QT
17	C	5640-00-103-2254	TAPE, DUCT, (39428) 1791K70 Roll	EA
18	C	5975-00-985-6630	STRAP, TIEDOWN, BLACK, (96906) MS 3367-3-0 One Hundred	EA





## GLOSSARY

The following is a list of abbreviations/acronyms and their definitions appearing in this manual. Other terms found in this manual are defined in the paragraph from where they first appear. Refer to ASME Y14.38 for a complete list of standard military abbreviations and acronyms.

**AAL** — Additional Authorization List  
**AEPS** — Army Electronic Product Support  
**AOAP** — Army Oil Analysis Program  
**Bar** — Pressure  
**BII** — Basic Issue Items  
**BX** — Box  
**CAGEC** — Commercial and Government Entity Code  
**CBT** — Common Bridge Transporter  
**cm** — centimeter  
**COEI** — Components of End Item  
**CPC** — Corrosion Prevention and Control  
**EA** — Each  
**EDRS** — Electronic Deficiency Reporting System  
**EEP** — Engineer Equipment Park  
**EIC** — End Item Code  
**EIR** — Equipment Improvement Recommendation  
**ERP** — Engineer Regulating Point  
**FGC** — Functional Group Code  
**FM** — Field Manual  
**ft** — foot  
**GAL** — Gallon  
**GVWR** — Gross Vehicle Weight Rating  
**HEMTT** — Heavy Expanded Mobility Tactical Truck  
**in.** — inch  
**kg** — kilogram  
**kp/h** — kilometers per hour  
**kPa** — kilopascals  
**lb** — pound  
**lb-ft** — pound foot  
**LHS** — Load Handling System  
**LPU** — Launch Power Unit  
**MAC** — Maintenance Allocation Chart  
**MLC** — Military Load Classification  
**mm** — millimeter

**mph** — miles per hour  
**N•m** — Newton meter  
**NATO** — North Atlantic Treaty Organization  
**NCOIC** — Non-commissioned Officer in Charge  
**NSN** — National Stock Number  
**ODS** — Ozone Depleting Substances  
**OZ** — Ounces  
**PLST** — Palletized Load System Trailer  
**PMCS** — Preventive Maintenance Checks and Services  
**POL** — Army Petroleum, Oil, and Lubricants  
**PQDR** — Product Quality Deficiency Report  
**PSI** — Pressure Per Square Inch  
**PTO** — Power Take-off  
**QDR** — Quality Deficiency Report  
**RCU** — Remote Control Unit  
**REB** — Rapidly Emplaced Bridge  
**RL** — Roll  
**RPSTL** — Repair Parts and Special Tools List  
**RSLI** — Remaining Service Life Indicator  
**SBC** — Soil Bearing Capacity  
**SBCT** — Stryker Brigade Combat Team  
**SMR** — Sources, Maintenance, and Recoverability  
**SPS** — Stored Program System  
**TAMMS** — The Army Maintenance Management System  
**TM** — Technical Manual  
**TMDE** — Test, Measuring, and Diagnostic Equipments  
**Vdc** — Volts direct current  
**WP** — Work Package



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By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.  
*General, United States Army*  
*Chief of Staff*

Official:

A handwritten signature in black ink that reads "Joyce E. Morrow". The signature is written in a cursive, flowing style.

JOYCE E. MORROW  
*Administrative Assistant to*  
*the Secretary of the Army*  
0622002

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 256911, requirements for TM 5-5420-280-10.



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PUBLICATION/FORM NUMBER: <b>TM 5-5420-280-10</b>	DATE: <b>31 AUGUST 06</b>	TITLE: <b>OPERATOR'S MANUAL FOR RAPIDLY EMPLACED BRIDGE (REB)</b>
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ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>
1	0076 00-1  0015 00-3				1	<p>Item number 1 reads part number 024522600. Should read 4522601.</p> <p>Callout to pump outlet reads 21. Should read 2.</p>

SAMPLE

\*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE, OR TITLE: <b>Pat Smith, ILT</b>	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION: <b>AV272-4162</b>	SIGNATURE: <i>Pat Smith, ILT</i>
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**PART II - REPAIR PARTS AND SPECIAL TOOLS LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

<b>PUBLICATION/FORM NUMBER:</b>	<b>DATE:</b>	<b>TITLE:</b>
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<b>PAGE NO.</b>	<b>COLM NO.</b>	<b>LINE NO.</b>	<b>NATIONAL STOCK NUMBER</b>	<b>REFERENCE NO.</b>	<b>FIGURE NO.</b>	<b>ITEM NO.</b>	<b>TOTAL NO. OF MAJOR ITEMS SUPPORTED</b>	<b>RECOMMENDED ACTION</b>
<b>SAMPLE</b>								

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<b>TYPED NAME, GRADE, OR TITLE:</b>	<b>TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION:</b>	<b>SIGNATURE:</b>
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# STANDARD AND METRIC CONVERSIONS

## 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

## 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

## LIQUID MEASURE

- 1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
- 1 Liter = 1,000 Milliliters = 33.82 Fluid Ounces

## TEMPERATURE

- Degrees Fahrenheit (F) = °C • 9 ÷ 5 + 32
- Degrees Celsius (C) = °F - 32 • 5 ÷ 9
- 212° Fahrenheit is equivalent to 100° Celsius
- 89.96° Fahrenheit is equivalent to 32.2° Celsius
- 32° Fahrenheit is equivalent to 0° Celsius

## 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

## APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Millimeters	25.400
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	0.4536
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square Inch	Bar	0.06895
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
Millimeters	Inches	0.03937
Centimeters	Inches	0.3937
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	2.2046
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Bar	Pounds Per Square Inch	14.503
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621

