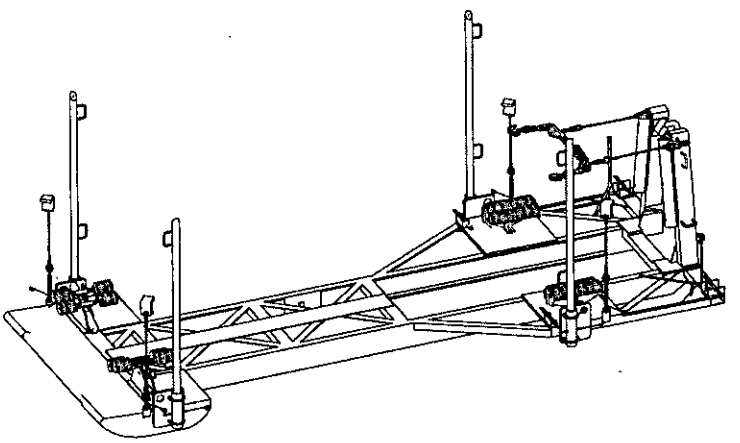
TM 5-5420-277-14&P

TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
FOR
CRADLE, BOAT, IMPROVED, M14
NSN 3990-01-442-1941
EIC: DV6



HEADQUARTERS, DEPARTMENT OF THE ARMY

15 JULY 1999

WARNING

Transporter Operation

- **When the NO TRANSIT WHEN LIT indicator is illuminated, the transporter is unsafe for road travel. Open road driving could result in death or injury to personnel, or equipment damage.**
- **Never drive with NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose causing injury or death to personnel.**

WARNING

Boat Cradle

- **The stanchion poles weigh 60 lbs. (27.24kg) each and require two personnel to remove them from their pockets. Failure to follow this warning may result in injury to personnel or damage to equipment.**
- **Removable skid plate weighs 100 lbs. (45.5kg). It must be supported while removing ring pins, and requires three personnel to remove and replace. Failure to follow this warning may result in injury to personnel or damage to equipment.**
- **Roller bracket must be supported while removing shoulder screw or roller bracket may fall, causing injury to personnel.**
- **Cradle roller assembly must be supported while installing straight pin assemblies or roller assembly may fall, causing injury to personnel.**

WARNING

Loading Cradle on PLS Trailer

- **Prior to and during any loading or unloading cycle, all personnel should stay clear of LHS and cradle or serious injury or death could result to personnel.**
- **Trailer wheels must be chocked during transfer operations or serious injury or death could result to personnel.**
- **When operating the CBT with PLS trailer, the heaviest load must always be placed on the transporter, otherwise adverse handling and/or braking may result, causing injury or death to personnel.**
- **Ensure trailer air system is charged before beginning transfer or cradle locking tabs may not properly engage, causing serious injury or death to personnel.**
- **When loading or unloading cradle on uneven ground (sides slope or downgrades up to 10 degrees), it may be necessary to apply transporter service brakes to prevent transporter from rolling away or severe injury or death could result.**
- **Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 20 feet (6.1m) with cradle. Serious injury or death could result from contact with electrical power lines.**
- **Check ground condition for firmness and extreme sideways inclination before picking-up or off-loading a cradle. Any ground instability beneath tires could cause serious injury or death to personnel.**
- **Ensure trailer air system is pressurized before beginning removal or cradle locking tabs may not properly disengage, causing serious injury or death to personnel.**

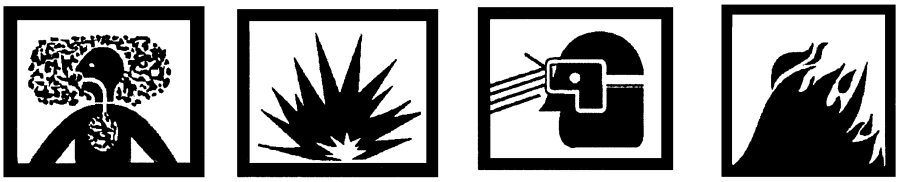
WARNING

CARC PAINT

- **CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can causae cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:**
  - **ALWAYS use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.**
  - **DO NOT use CARC paint without adequate ventilation.**
  - **NEVER weld or cut CARC-coated materials.**
  - **DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.**
  - **BE AWARE of CARC paint exposure symptoms; can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.**

WARNING

CLEANING COMPOUND



- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

TECHNICAL MANUAL
NO. 5-5420-277-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *15 July 1999*

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) FOR CRADLE, BOAT, IMPROVED, M14 NSN 3990-01-442-1941 EIC: DV6

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) , or DA FORM 2028-2, located in the back of this manual, directly to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630. A reply will be furnished to you.

You may also provide DA Form 2028-2 information to TACOM via data fax or e-mail:
- The fax number is DSN 793-0726 or Commercial (309) 782-0726
- The e-mail address is amsta-ac-nml@ria-emh.army.mil

Approved for public release; distribution is unlimited

TABLE OF CONTENTS

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

Para Contents **Page**

Section I. GENERAL INFORMATION

1-1. SCOPE.

This section provides general information, equipment descriptions, and principles of operation for the Improved Boat Cradle (IBC).

a. ***Type of Manual.*** This Technical Manual (TM) provides Operator's instructions and Unit Maintenance, Direct and General Support, and a Repair Parts and Special Tools List (RPSTL) for the IBC. Preventive Maintenance Checks and Services, and maintenance procedures are included.

b. ***Equipment Name.*** Improved Boat Cradle (IBC).

c. ***Purpose of Equipment.*** The IBC will be used with the Common Bridge Transporter (CBT) or Palletized Load System (PLS) trailer. The IBC shall not be transported on the PLS transporter due to lack of a lock-down device on the transporter. The CBT system consists of a Transporter and a Load-Handling System (LHS). The CBT is a converted Heavy Expanded Mobility Tactical Truck (HEMTT). The CBT provides the capability for transporting, launching, and retrieving the Bridge Erection Boat, Twin Jet, Aluminum Hull (Models USCSBMK1, NSN 1940-01-105-5728, and USCSBMK2, NSN 1940-01-218-2165).

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in the Maintenance Management Update.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Procedures for the destruction of Army materiel are contained in TM 750-244-3.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS.

If your IBC needs improvement, let us know. Send us an equipment improvement recommendation (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. Describe the problem on an SF Form 368 (Product Quality Deficiency Report) and mail it to us at Commander, USA TACOM, ATTN: AMSTA-TR-E/MPA, Warren, MI 48395000. We will send you a reply.

1-5. WARRANTY INFORMATION.

No warranty is available for the IBC. See TB 5-5420-234-15 for CBT.

1-6. CORROSION PREVENTION AND CONTROL.

a. Corrosion prevention and control (CPC) of Army materiel is a continuing concern, particularly since the IBC normally operates in a wet environment. It is important that any corrosion problems be reported so they can be corrected and improvements can be made to prevent problems in the future.

b. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of theses materials may be a corrosion problem.

c. If a corrosion problem is identified, it can be reported using SF Form 368. The use of key words, such as “corrosion,” “rust,” “deterioration,” and “cracking,” will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA Pam 738-750.

1-7. NOMENCLATURE CROSS-REFERENCE LIST.

Common Name	***Official Nomenclature***
Bay	Interior Bay or Ramp Bay, Bridge Chapter
Boat	Bridge Erection Boat, Twin Jet, Aluminum Hull
Transporter	Converted HEMTT (M977 to M1977) with Load Handling System (LHS)

1-8. LIST OF ABBREVIATIONS AND ACRONYMS.

BAP	Bridge Adapter Pallet
BII	Basic Issue Items
BOI	Basis of Issue
CAGE	Commercial and Government Entity
CBT	Common Bridge Transporter
COEI	Components of End Item
CPC	Corrosion Prevention and Control
DS	Direct Support
EIR	Equipment Improvement Recommendation
EMP	Electromagnetic Pulse
GAA	Grease, Automotive Artillery
GL	Gallon
GS	General Support
HCI	Hardness Critical Item
HEMTT	Heavy Expanded Mobility Tactical Truck
HEX	Hexagon
IBC	Improved Boat Cradle
LH	Left Hand
LHS	Load-Handling System
MAC	Maintenance Allocation Chart
MTOE	Modified Table of Organization and Equipment
NIIN	National Item Identification Number
NSN	National Stock Number
PLS	Palletized Load System
PMCS	Preventive Maintenance Checks and Services
P/N	Part Number
PTO	Power Take-Off
RH	Right Hand
RPSTL	Repair Parts and Special Tools List
SMR	Source, Maintenance, and Recoverability
SRA	Specialized Repair Activity
TM	Technical Manual
TMDE	Test, Measuring, and Diagnostic Equipment
UNC	Universal National Course Thread
UNF	Universal National Fine Thread
UOC	Usable on Code
U/M	Unit of Measure

Hard-Time Maintenance	Scheduled maintenance conducted at predetermined fixed intervals because of age, calendar, or usage, such as operating time, hours, or miles driven.
On-Condition Maintenance	Maintenance or item replacement action performed based on the condition of an item as determined by an evaluation of the item on a scheduled basis.

Section II. EQUIPMENT DESCRIPTION

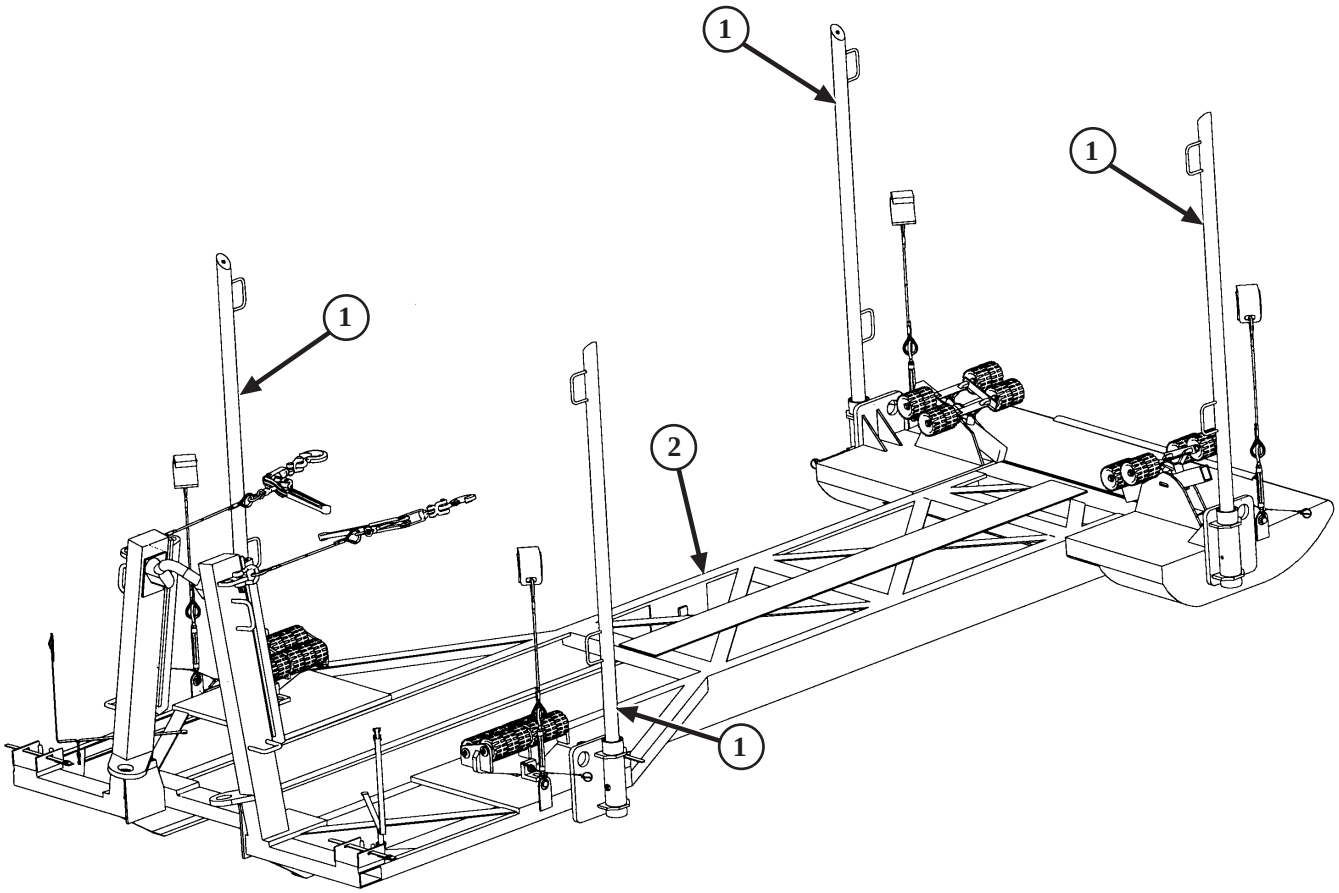
1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. ***Characteristics.*** The IBC is made up of a steel frame, front and rear stanchions, cradle rollers, front and rear rollers, boat bumper guards (fenders), boat load binders, hook bar, frame skid plate, removable skid plate, transport locking tabs, and boat tie-down cables. For a detailed explanation of support equipment characteristics, capabilities, and features, refer to TM 9-2320-279-10 for CBT features, TM 5–1940–277-10 for the bridge boat, or TM 9-2330-385-14 for the PLS trailer.

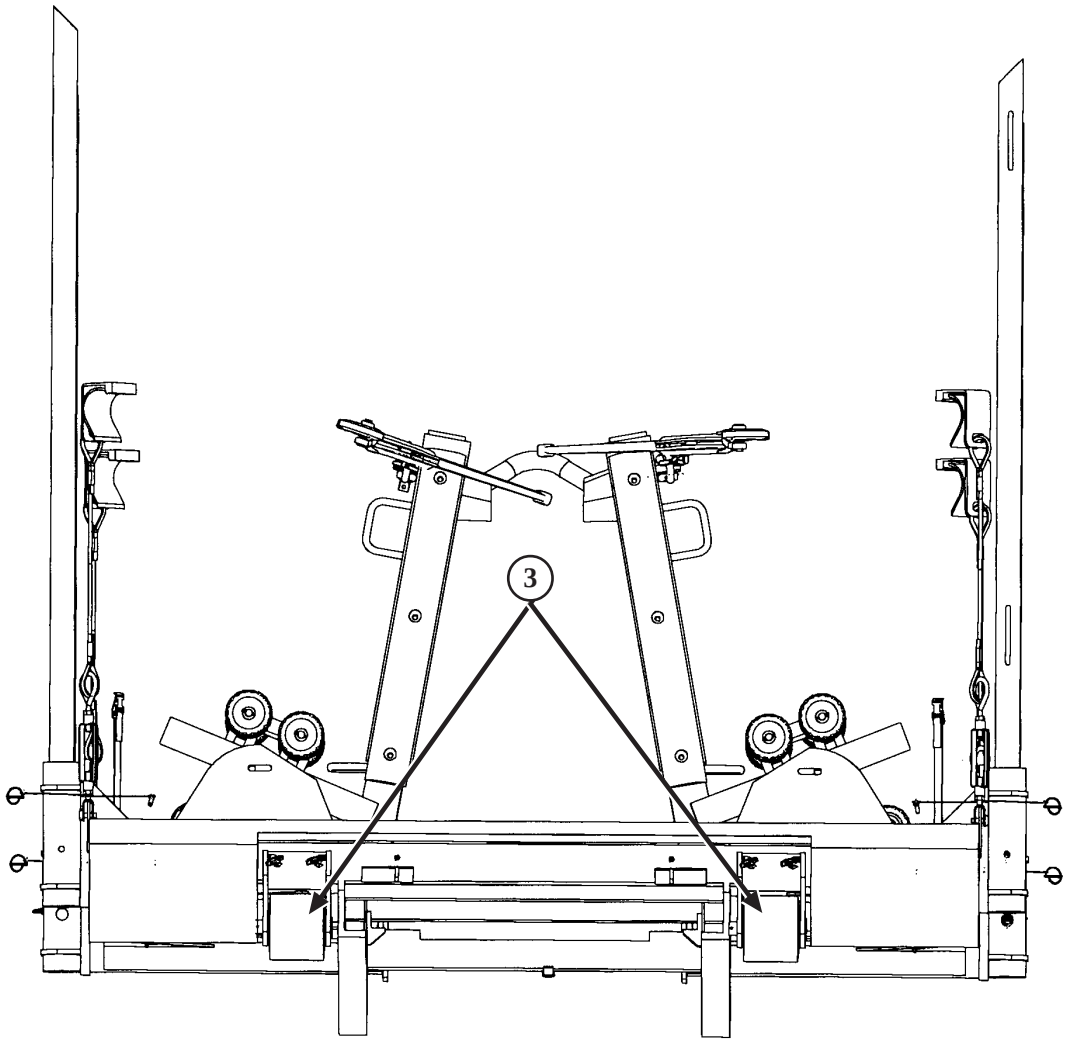
- Constructed of steel.
- Can be stored on hardstand or on CBT or PLS trailer.
- Can launch and retrieve a bridge erection boat, models USCSB MK-1 and MK-2 from CBT.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

a. ***Cradle Pallet.***



1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Continued).



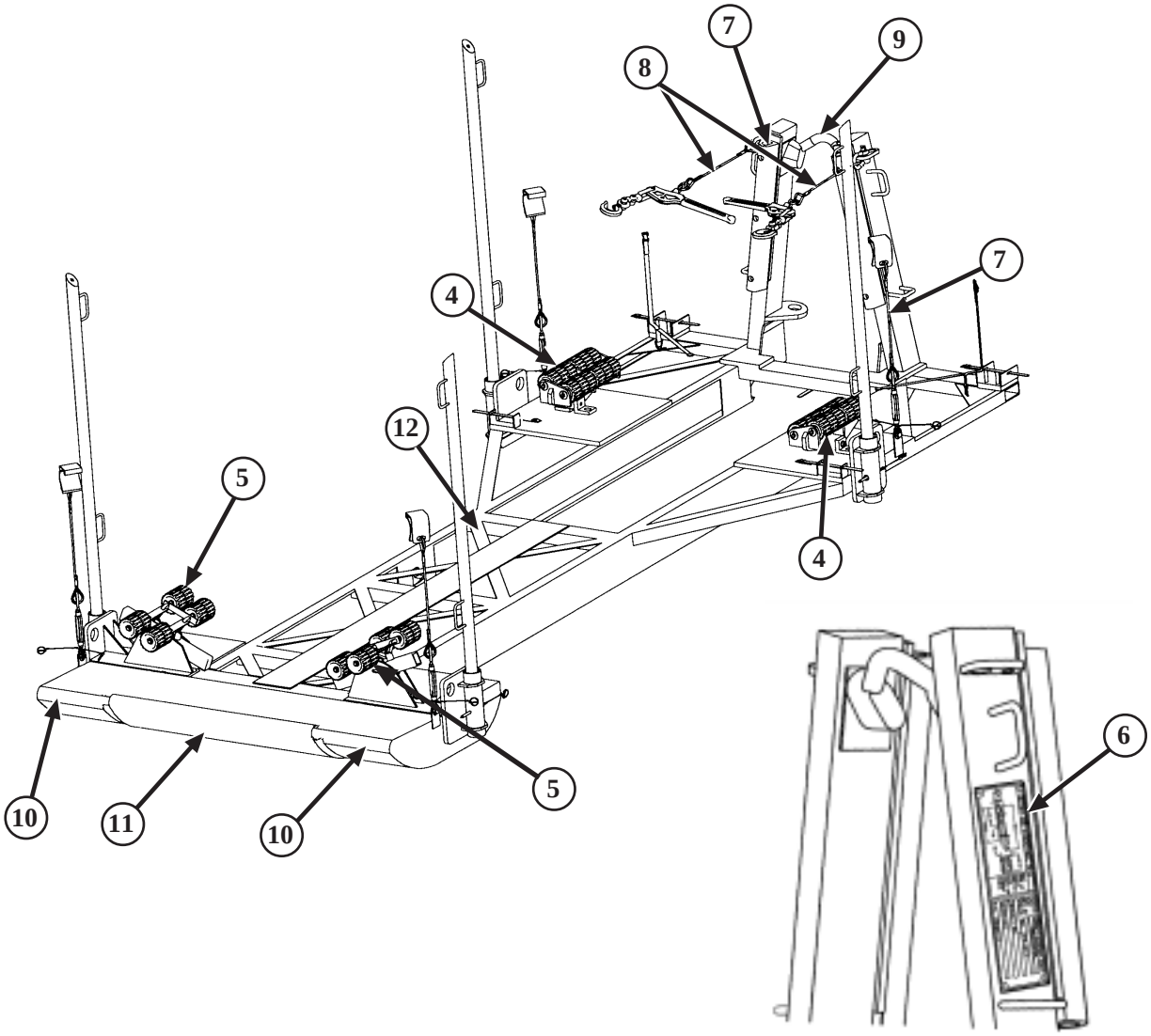
REMOVABLE SKID PLATE REMOVED FOR CLARITY

(1) STANCHIONS. Positions boat on cradle during retrieval.

(2) FRAME. Main structural member of the cradle.

(3) CRADLE ROLLERS. Used to support the cradle during the loading/unloading from the transporter on hard surfaces. Also for loading and unloading the cradle from the transporter to the trailer.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Continued).



(4) FRONT ROLLERS. Supports the boat stern while in the cradle. Keeps the boat from tipping over.

(5) REAR ROLLERS. Supports the boat bow while in the cradle. Prevents damage from the cradle saddle to the hull of the boat.

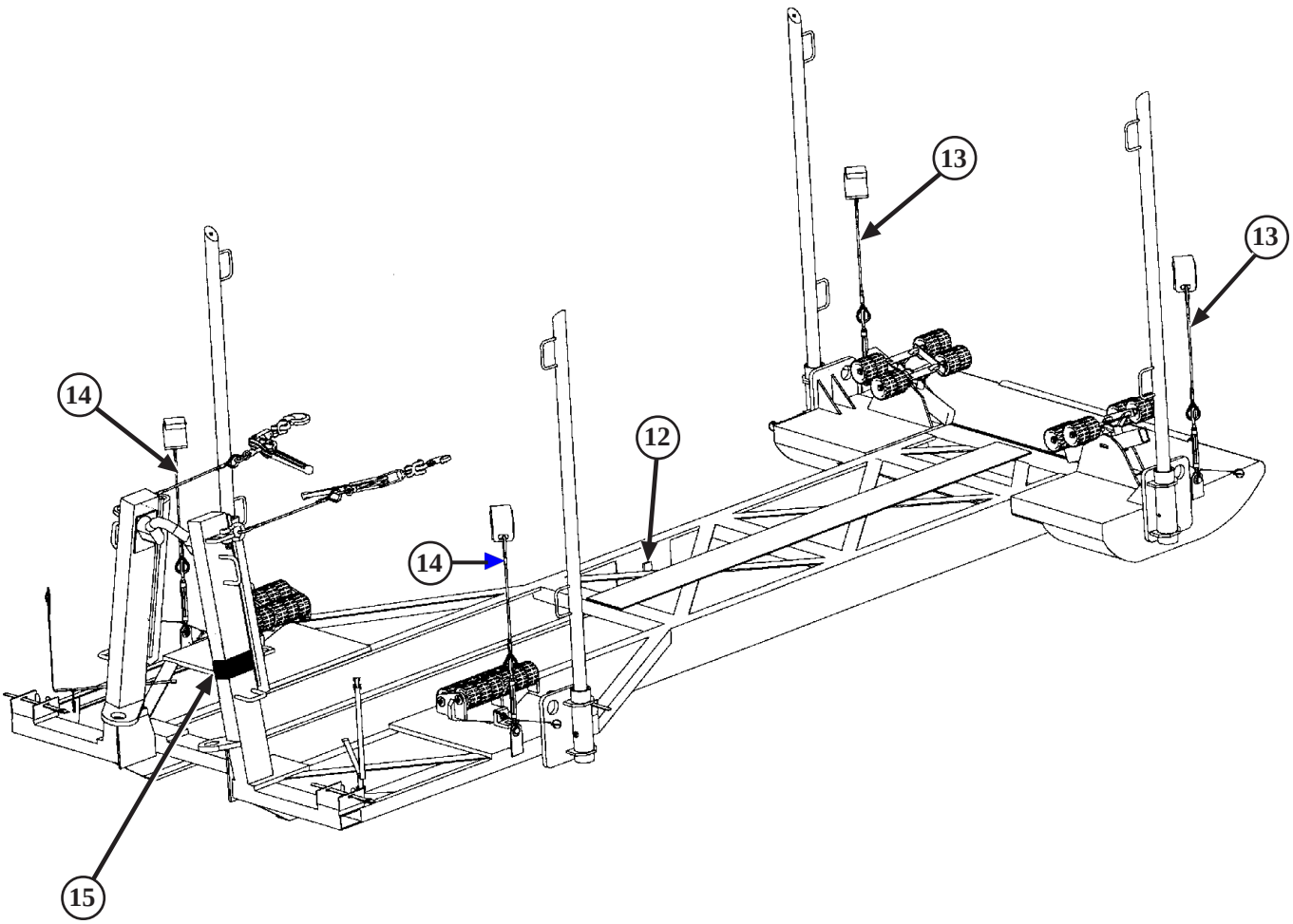
(6) IDENTIFICATION PLATE. Has nomenclature, equipment, and transportability data for the cradle.

(7) BUMPER GUARDS. Stops damage from occuring during boat retrieval operations.

(8) LOAD BINDER CABLES. Secures boat to cradle during normal operations.

(9) HOOK BAR (Bail Bar). Used in lifting cradle on/off the CBT or PLS trailer.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Continued).



(10) FRAME SKID PLATE. Keeps the rear of the cradle from digging into the ground.

(11) REMOVABLE SKID PLATE. Used for rocky or soft stream bottoms.

(12) TRANSPORT LOCKING TABS. Used to secure cradle to CBT or PLS trailer.

(13) REAR TIE-DOWN CABLES. Used to secure bow of boat to cradle during normal operations.

(14) FRONT TIE-DOWN CABLES. Used to secure stern of boat to cradle during normal operations.

(15) WATER INDICATOR LINE. Used to determine how deep to unload cradle into water.

1-11. EQUIPMENT DATA.

a. IBC.

Dimensions

Length ..... 264.50 inches (671.83 cm)

Width ..... 105.50 inches (267.97 cm)

Height ..... 68.50 inches (173.99 cm)

Weight

Boat ..... 9,160 pounds (4,158.64 Kg)

IBC ..... 5,440 pounds (2,469.76 Kg)

b. Boat and IBC.

Dimensions

Length ..... 333.5 inches (847.09 cm)

Width ..... 107.50 inches (273.05 cm)

Height ..... 99.0 inches (251.46 cm)

Weight

Boat and IBC ..... 14,560 pounds (6,610.24 Kg)

c. IBC with Boat on CBT.

Dimensions

Length ..... 323.0 inches (251.46 cm)

Width ..... 109.0 inches (276.86 cm)

Height ..... 131.0 inches (332.74 cm)

Weight

IBC w/boat and CBT ..... 52,500 pounds (23,835 Kg)

Dimensions:

Weight ..... 5,038 lb (2,285 kg)

Length ..... 250.9 in. (6,373 cm)

Width ..... 138.6 in. (3,520 cm)

Height ..... 108.6 in. (2,758 cm)

Section III. PRINCIPLES OF OPERATION

1-12. GENERAL.

The purpose of the IBC is to launch, retrieve, or stow the Bridge Erection Boat from the CBT, PLS trailer, or hardstand. The IBC is a modified flatrack that holds the bridge erection boat.

CHAPTER 2
OPERATING INSTRUCTIONS

Para **Contents** **Page**

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. GENERAL.

This section shows the location and function of the operator's controls and indicators for the CBT. For operation and use of the controls and indicators, refer to Chapter 2 of this manual.

Section II. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL.

This section contains the Preventive Maintenance Checks and Services (PMCS) for the Improved Boat Cradle (IBC). The PMCS table (Table 2-1) contains the checks and services necessary to ensure that the IBC is ready for operation. Using Table 2-1, perform each maintenance procedure at the specific interval.

2-3. PMCS PROCEDURES.

While conducting PMCS, perform the following general maintenance procedures as required:

a. ***Cleanliness.*** Dirt, grease, oil, and debris only get in the way, conceal problems and may in fact cause a serious problem. Clean all metal surfaces and grease fittings.

b. ***Bolts, Nuts, and Screws.*** Check bolts, nuts, and screws for looseness. Inspect for bent, broken, or missing hardware. Tighten all loose hardware and replace all damaged or missing hardware.

c. ***Paint.*** Check for chipped or flaking paint. Check around and along welds and around nuts, bolts, and hardware items. Scrape and remove all loose paint. Inspect for corrosion. If corrosion is found, report it using DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

d. ***Welds.*** Inspect welds for cracks or gaps. If a bad weld is found, notify unit maintenance.

e. ***Roller Damage Definition.*** To be classified as "damaged," the roller must have major cracks or have pieces missing from the roller. Scratches and dents are normal wear for rollers.

2-4. PMCS TABLE.

Thoroughly read and understand the following paragraphs before conducting PMCS procedures on the IBC.

a. ***Warnings and Cautions.*** Always observe warnings and cautions that appear in the PMCS table. These warnings and cautions appear before the applicable procedure. Failure to observe the warnings and cautions could result in death or injury to personnel or damage to equipment.

b. ***Intervals Used on the PMCS Table.***

NOTE

Perform *During* and *After* PMCS if you are (1) assigned as the operator but have not operated the IBC since the last monthly inspection; or (2) you are operating the IBC for the first time.

2-4. PMCS TABLE (Continued).

(1) During. *During* checks are those checks that are performed during the mission and that identify faults in IBC performance. Faults that render the equipment not fully mission capable must be corrected immediately.

(2) After. *After* checks are those checks that are performed immediately at the conclusion of the mission and that identify faults which will prevent the next mission. These faults must be corrected to ensure that the equipment is fully mission capable and to maintain the equipment at an original-condition standard.

c. Explanation of Table 2-1 Columns.

(1) Item No. Item numbers appear in the order in which you should perform the PMCS procedures. These item numbers are also used for reference when completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

(2) Interval. This column indicates the interval that the PMCS procedures must be performed: *During* or *After* checks.

(3) Location; Item To Check/Service. This column provides the location and the item to be checked or serviced.

(4) Procedure. This column tells you how the procedure is to be performed.

(5) Not Fully Mission Capable. Information in this column identifies what faults keep the IBC from being fully mission capable. When performing checks and finding faults that indicate the equipment is not fully mission capable, notify your supervisor immediately if the fault cannot be corrected.

Table 2-1. Preventive Maintenance Checks and Services for the Improved Boat Cradle.

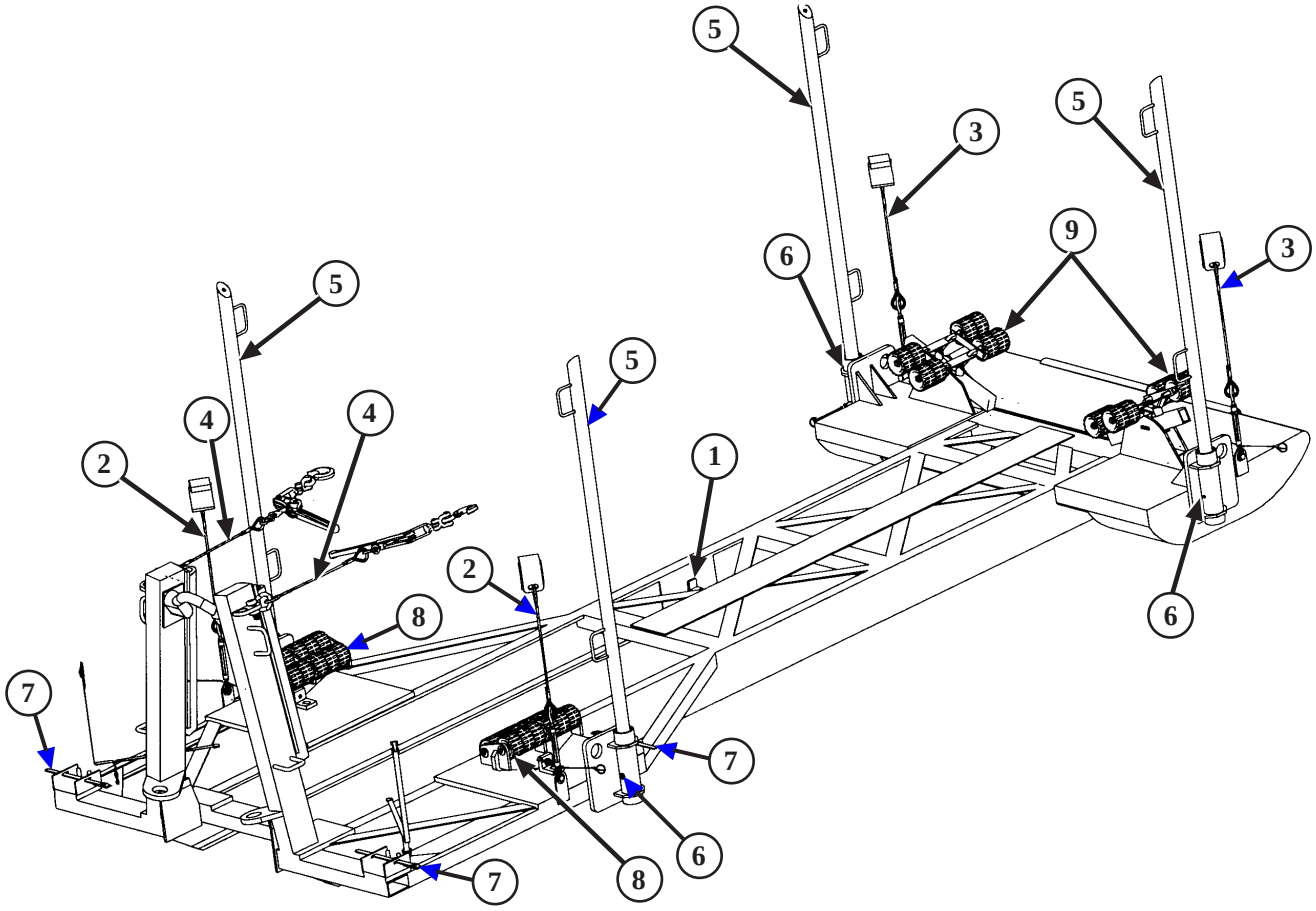
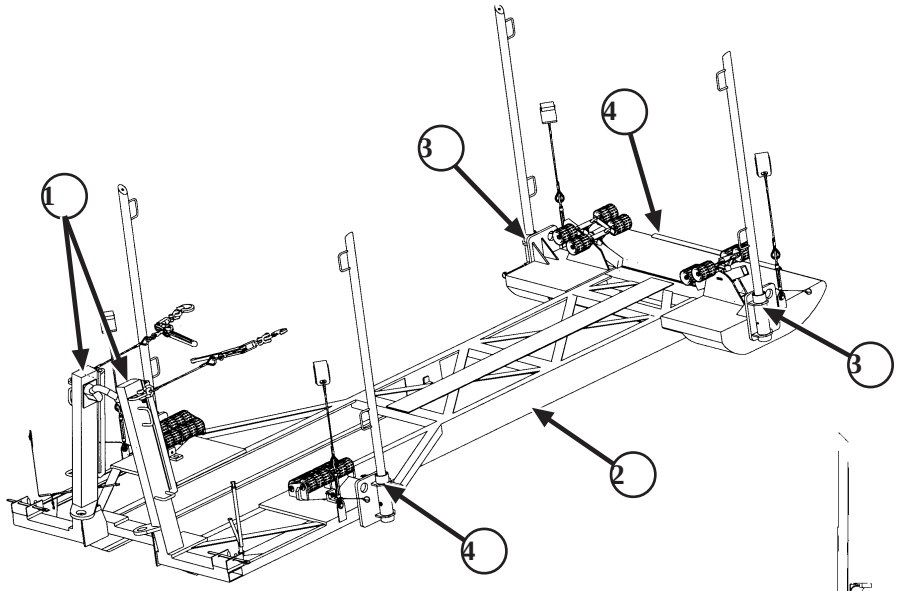
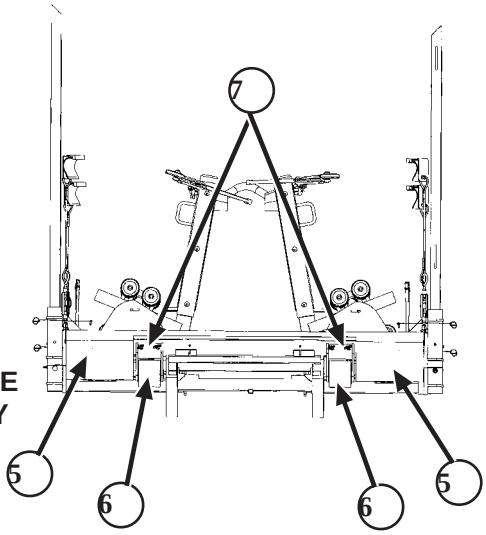
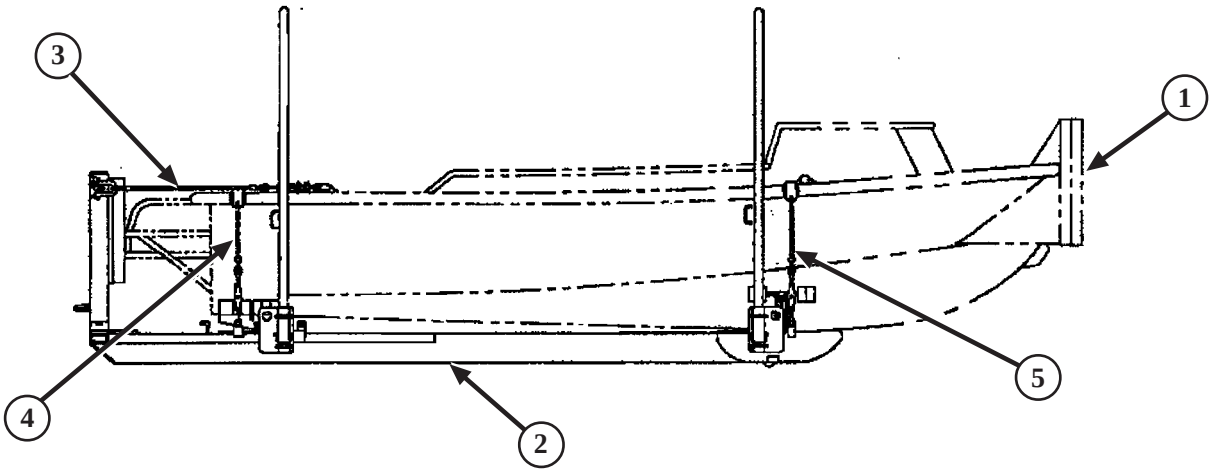
Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
				
1	Before	Cradle Frame	Inspect two transport locking tabs (1) for damage.	Cradle has bent or missing locking tabs.
2	Before	Front and Rear Tie-Down Cables	Inspect for worn, damaged, frayed or broken cables (2 and 3) .	Two or more boat tie-down cables are kinked, frayed, broken or have damaged turnbuckles.
3	Before	Load Binders	Inspect for worn, damaged, frayed or broken cables (4).	Load binders are missing, frayed, broken, or worn.
4	Before	Stanchion Poles	Inspect stanchion poles (5) for damage, missing pins (6), or stowage straps (7).	Two or more stanchion poles are missing.
5	During	Front and Rear Rollers	Inspect for damage, stuck, or missing rollers (8 and 9).	

Table 2-1. Preventive Maintenance Checks and Services for the Improved Boat Cradle (Continued).

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
			  **REMOVABLE SKID PLATE REMOVED FOR CLARITY**	
6	After	Bumper Guards	Inspect bumper guards (1) for worn, damaged, loose, or missing bumpers.	Bumper guards are torn more than three inches in any area or are not secured.
7	After	Cradle Frame	Inspect cradle frame (2) for damage.	Cradle has cracks or broken welds.
8	After	Stanchion Pockets	Visually inspect pockets (3) for corrosion, dirt, oil, and damage.	
9	After	Removable Skid Plate	Inspect removable skid plate (4) for damage or missing ring pins or missing drain plug.	
10	After	Frame Skid Plate	Inspect skid plate (5) for damage.	
11	After	Cradle Rollers	a. Ensure that rollers (6) will rotate. b. Ensure straight pins (7) are not damaged.	Not fully capable for transload to PLS trailer if one or more rollers are missing.

Section III Operation under Usual Conditions

2-5. LOADING CRADLE WITH OR WITHOUT BOAT FROM GROUND.



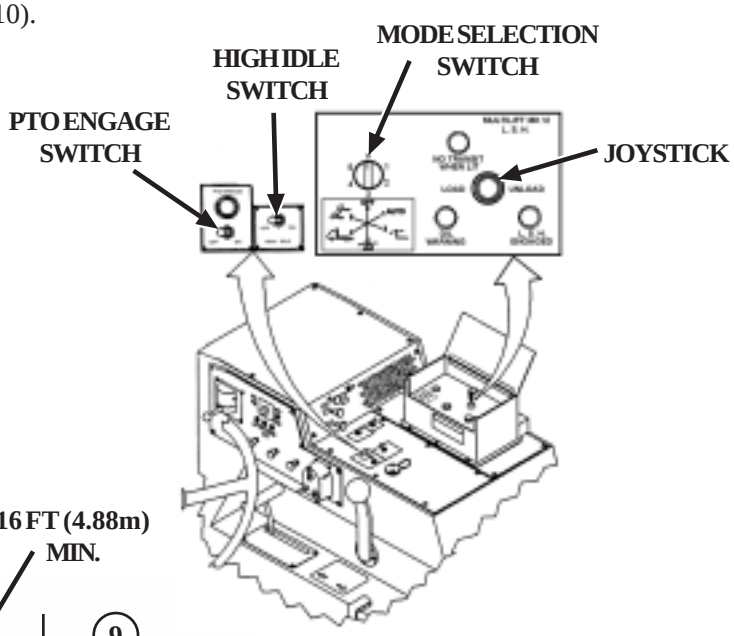
a. If boat (1) is loaded on cradle (2) ensure that load binder cables (3) and both front and rear tie-down cables (4 and 5) are secured to boat (1) (para 3-3 and 3-4).

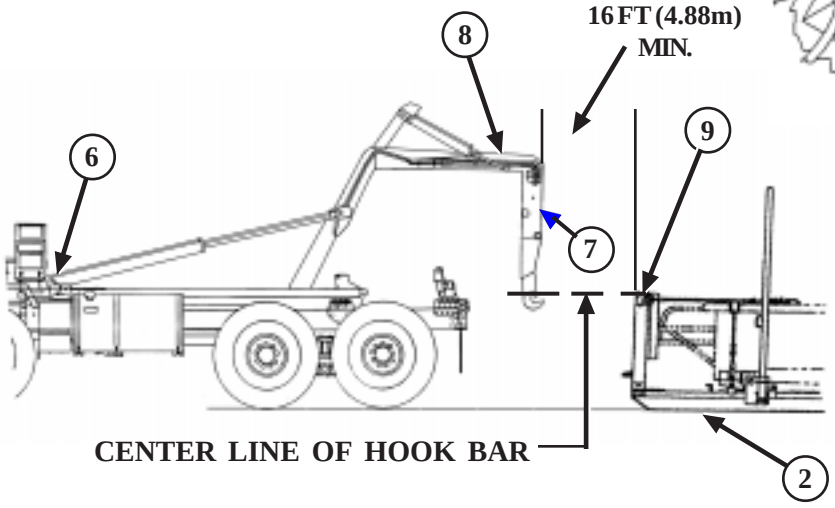
b. Back up transporter (6) so that at least 16 ft (4.88 m) clearance is available behind the transporter (6) for loading the cradle (2) (Ref TM 9-2320-279-10).

c. Set parking brake.

d. Place transmission in neutral.

e. Turn PTO ENGAGE switch to ON.





2-5. LOADING CRADLE WITH OR WITHOUT BOAT FROM GROUND (Continued).

CAUTION

When selecting any LHS operating mode with the MODE SELECTION Switch, the engine must be at low idle speed. Selection of any LHS operating mode with HIGH IDLE switch ON may result in the sudden application of hydraulic pressure to the LHS, resulting in equipment damage.

f. Turn MODE SELECTION switch to AUTO SEQUENCE.

g. Turn HIGH IDLE switch to ON.

h. Move joystick to unload and hold to automatically raise and move LHS hook arm (7), and main frame (8) toward cradle (2).

i. Release joystick when LHS hook moves below level of cradle hook bar (9).

j. Turn HIGH IDLE switch to OFF.

k. Turn PTO ENGAGE switch to OFF.

l. Release transporter parking brake.

m. Back up transporter (6) until the LHS hook arm (7) contacts the cradle hook bar (9).

n. Apply service brake.

o. Place transmission in Neutral.

p. Turn PTO ENGAGE switch to ON.

q. Turn HIGH IDLE switch to ON.

r. Move joystick to LOAD.

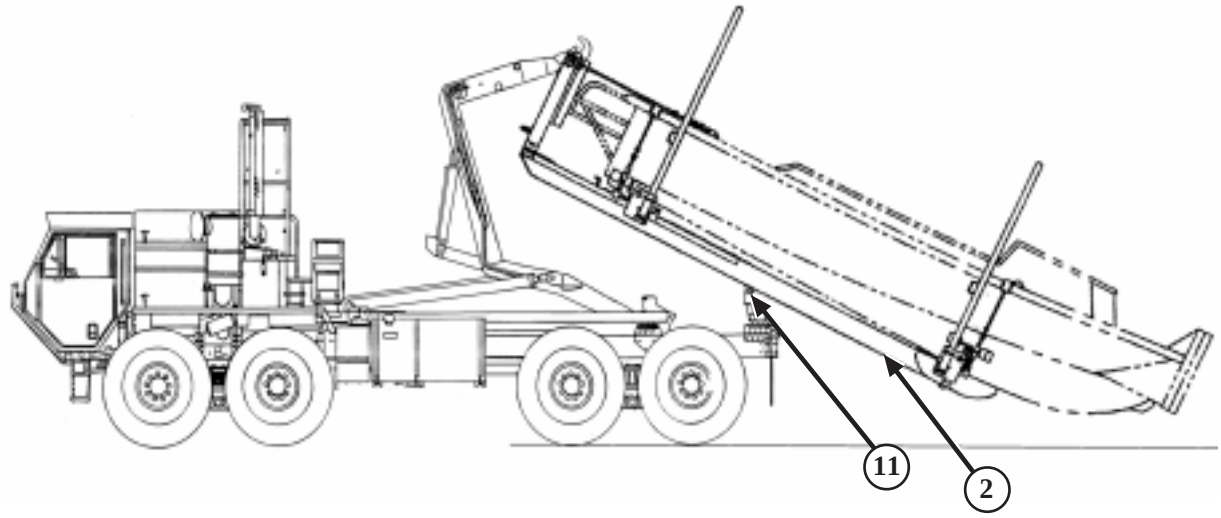
CAUTION

Dragging the cradle on the ground may cause damage to the boat keel.

NOTE

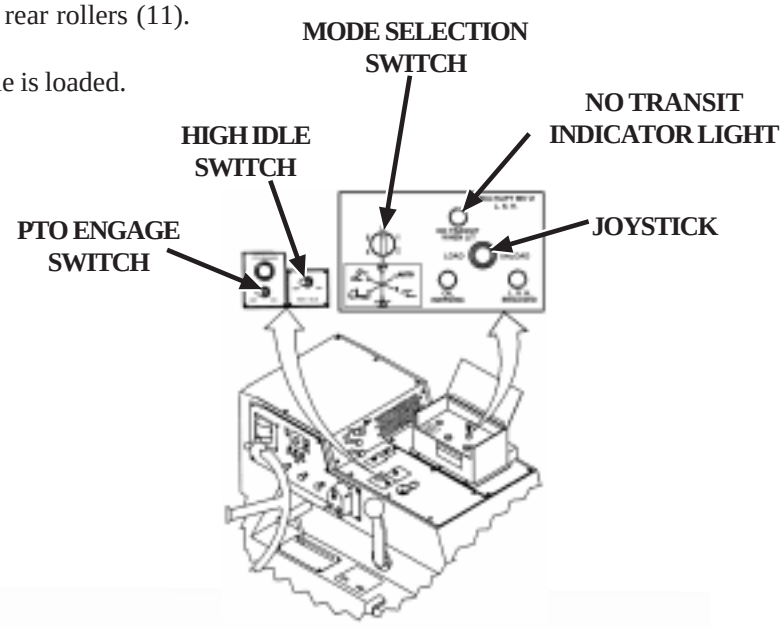
To facilitate loading, it may be necessary to release pressure on the service brake to allow the CBT to move beneath the cradle.

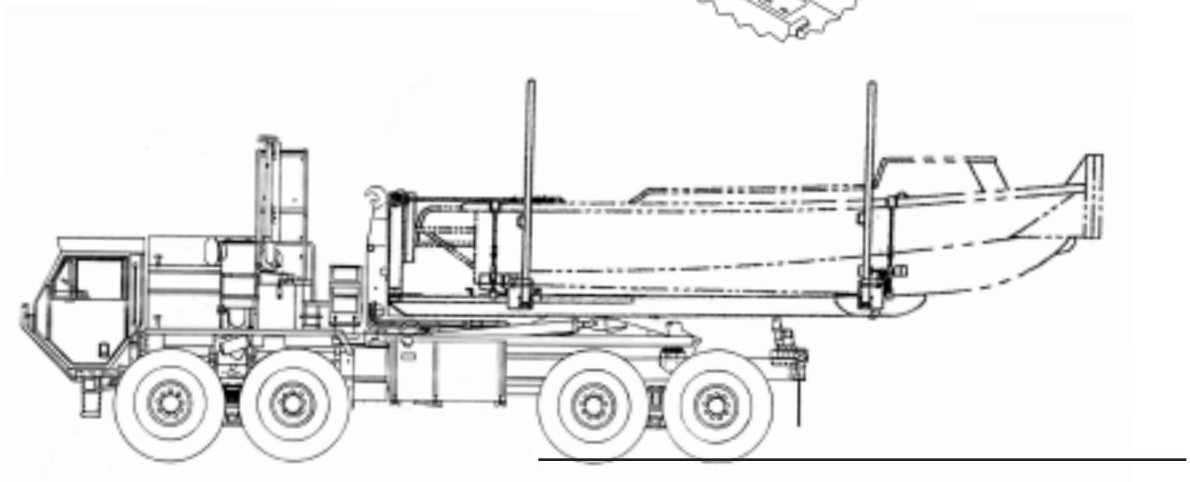
2-5. LOADING CRADLE WITH OR WITHOUT BOAT FROM GROUND (Continued).



s. Insure that cradle frame (2) engages LHS rear rollers (11).

t. Hold joystick in LOAD position until cradle is loaded.





2-5. LOADING CRADLE WITH OR WITHOUT BOAT FROM GROUND (Continued).

WARNING

When the NO TRANSIT WHEN LIT indicator is illuminated, the transporter is unsafe for road travel. Open road driving could result in death or injury to personnel, or equipment damage.

u. Release joystick when LHS hook arm (7) is fully stowed, and the NO TRANSIT WHEN LIT indicator is off.

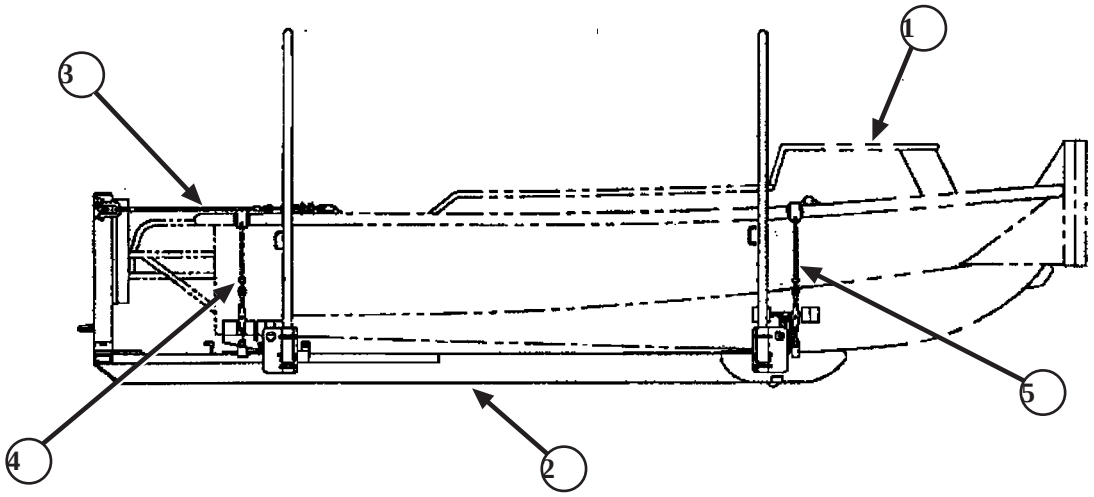
v. Turn HIGH IDLE switch to OFF.

CAUTION

While maneuvering the transporter in the immediate vicinity of the loading/unloading site, the MODE SELECTION switch may be in any setting. However, the MODE SELECTION switch must be set to OFF/TRANSPORT prior to road travel to prevent damage to the main frame and hook arm.

w. Turn MODE SELECTION switch to OFF/TRANSPORT.

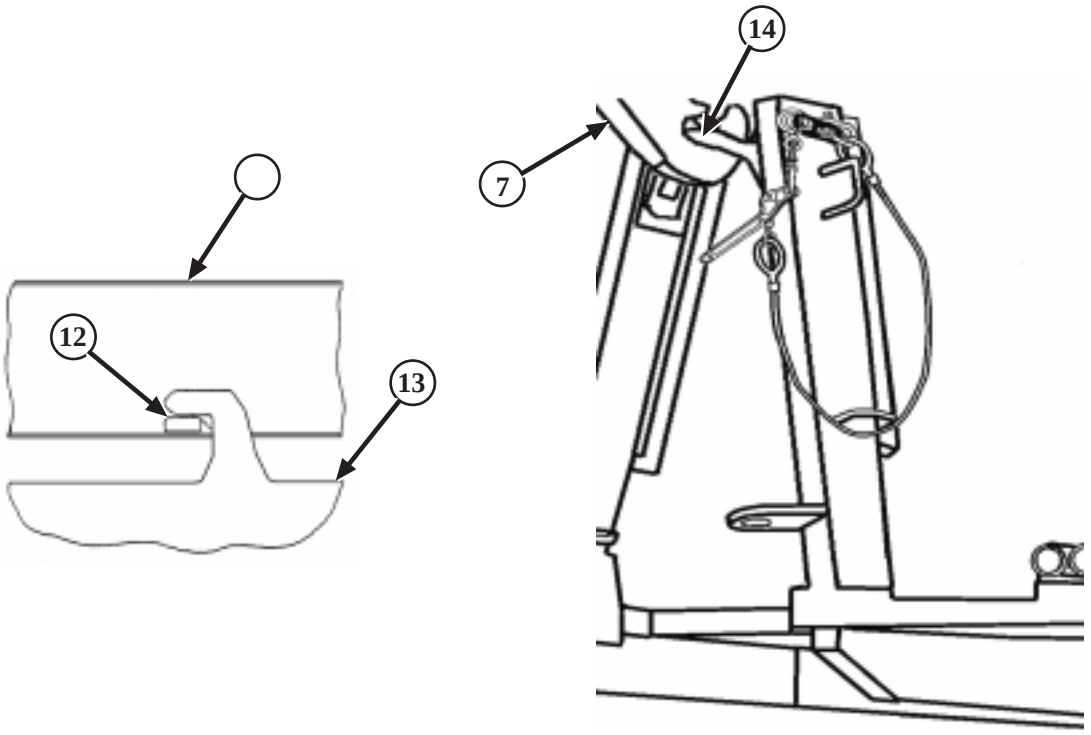
x. Turn PTO ENGAGE switch to OFF.



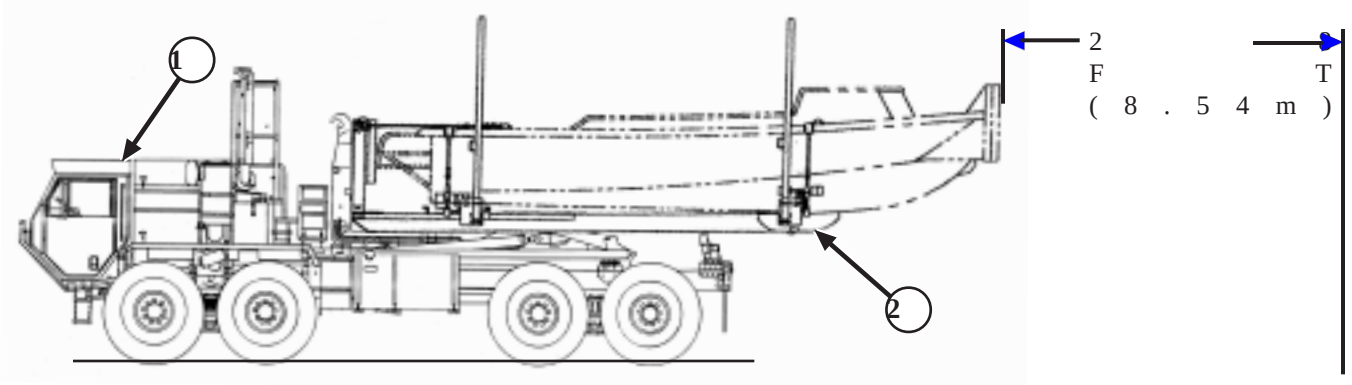
y. Inspect cradle (2) to ensure that the load binder cables (3) are secured and both front and rear tie-down cables (4 and 5) are attached and tight if boat (1) is on cradle (2) (para 3-3 and 3-4).

2-5. LOADING CRADLE WITH OR WITHOUT BOAT FROM GROUND (Continued).

z. Inspect cradle (2) to ensure two transport locking tabs (12) are engaged in transporter frame (13) and hook bar (14) is securely in hook



2-6. UNLOADING CRADLE WITH OR WITHOUT BOAT ON GROUND.



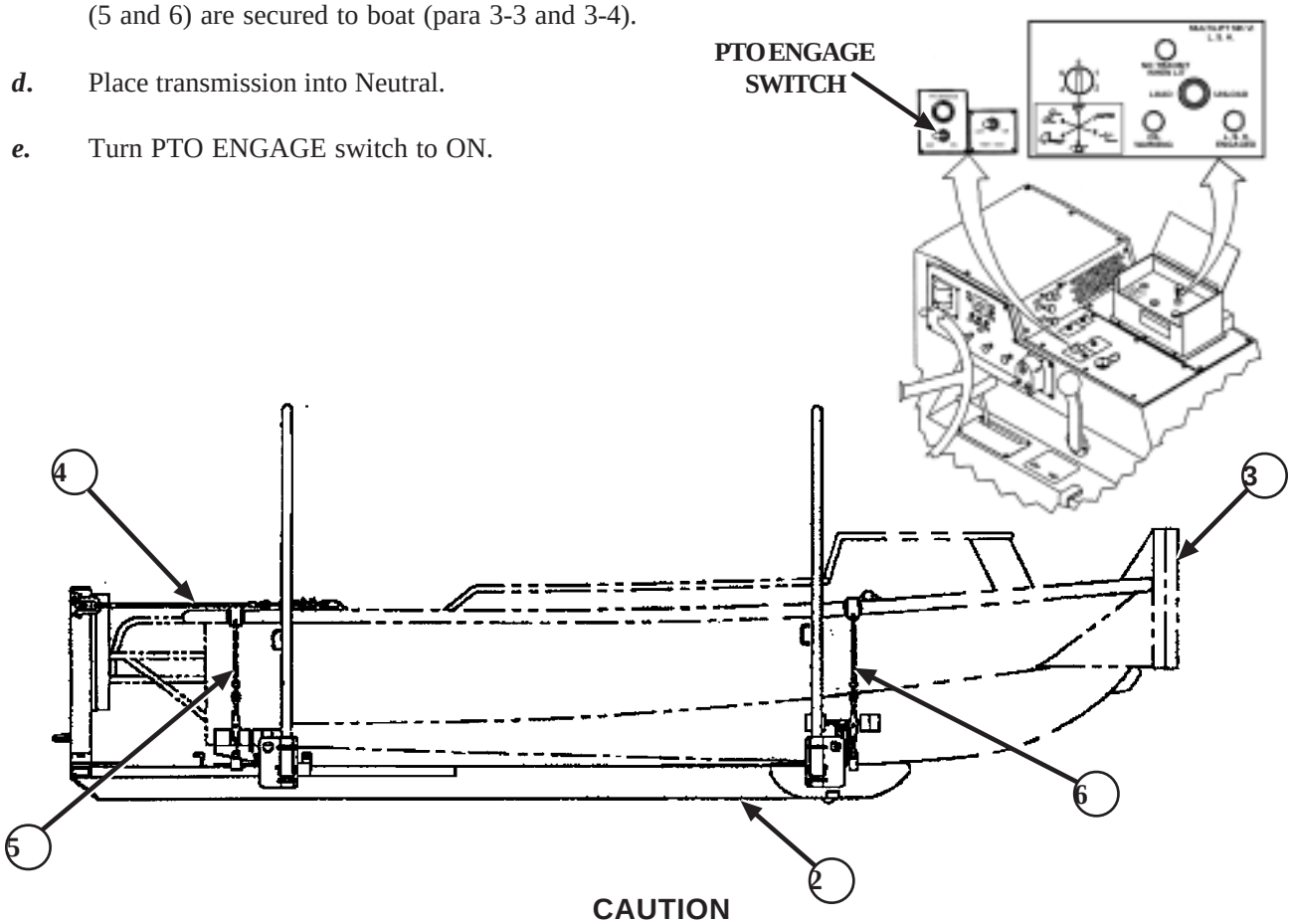
a. Back up transporter (1) so that at least 28 ft. (8.54 m) is available behind the transporter (1) for unloading the cradle (2) (Ref TM 9-2330-279-10).

b. Set parking brake.

c. If boat (3) is loaded on cradle (2), ensure that load binder cables (4) and both front and rear tie-down cables (5 and 6) are secured to boat (para 3-3 and 3-4).

d. Place transmission into Neutral.

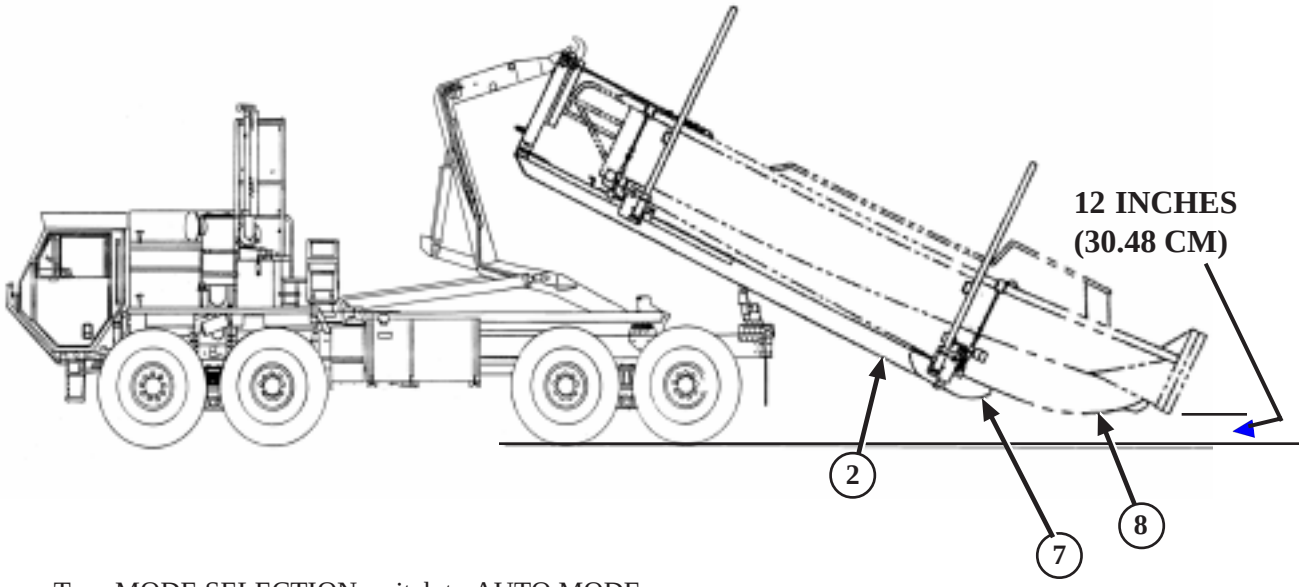
e. Turn PTO ENGAGE switch to ON.



CAUTION

When selecting any LHS operating mode with the MODE SELECTION Switch, the engine must be at low idle speed. Selection of any LHS operating mode with HIGH IDLE switch ON may result in the sudden application of hydraulic pressure to the LHS, resulting in equipment damage.

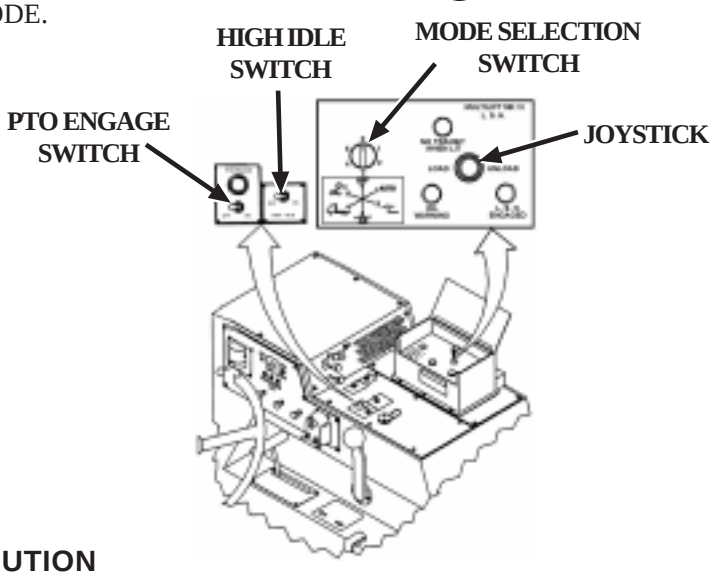
2-6. UNLOADING CRADLE WITH OR WITHOUT BOAT ON GROUND (Continued).



f. Turn MODE SELECTION switch to AUTO MODE.

g. Turn HIGH IDLE switch to ON.

h. Release parking brake and apply service brake.



CAUTION

Dragging the cradle on the ground may cause damage to the boat keel.

NOTE

To facilitate unloading, it may be necessary to release pressure on the service brake to allow the CBT to move away from the cradle.

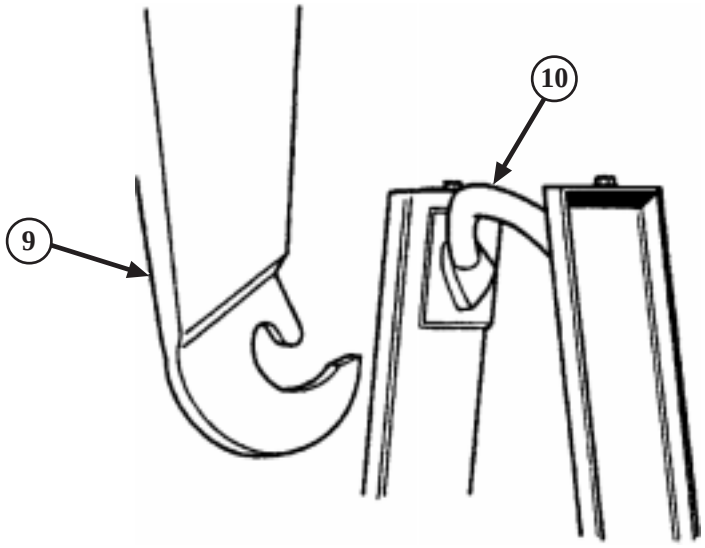
i. Move the joystick to UNLOAD position and hold until front end boat or cradle skid plate (7) rests 12 inches (30.48 cm) off the ground.

j. Turn HIGH IDLE switch to OFF.

k. Once the cradle skid plate (7) or boat keel (8) make contact with the ground, release service brake and continue unloading.

l. Continue to unload using the joystick until cradle (2) rests on ground.

2-6. UNLOADING CRADLE WITH OR WITHOUT BOAT ON GROUND (Continued).



m. Place transmission in drive and move forward approximately 3 inches (7.62 cm).

n. Apply service brake and place transmission in Neutral.

o. Unload using joystick until hook arm (9) is free of bail bar (10).

p. Place transmission into drive and move forward.

q. Set parking brake.

r. Turn PTO ENGAGE switch to ON.

s. Turn HIGH IDLE switch to ON.

t. Move joystick to LOAD position and hold until the hook arm is fully stowed, and the NO TRANSIT WHEN LIT indicator is off .

u. Turn HIGH IDLE switch to OFF.

v. Turn MODE SELECTION switch to OFF/TRANSPORT.

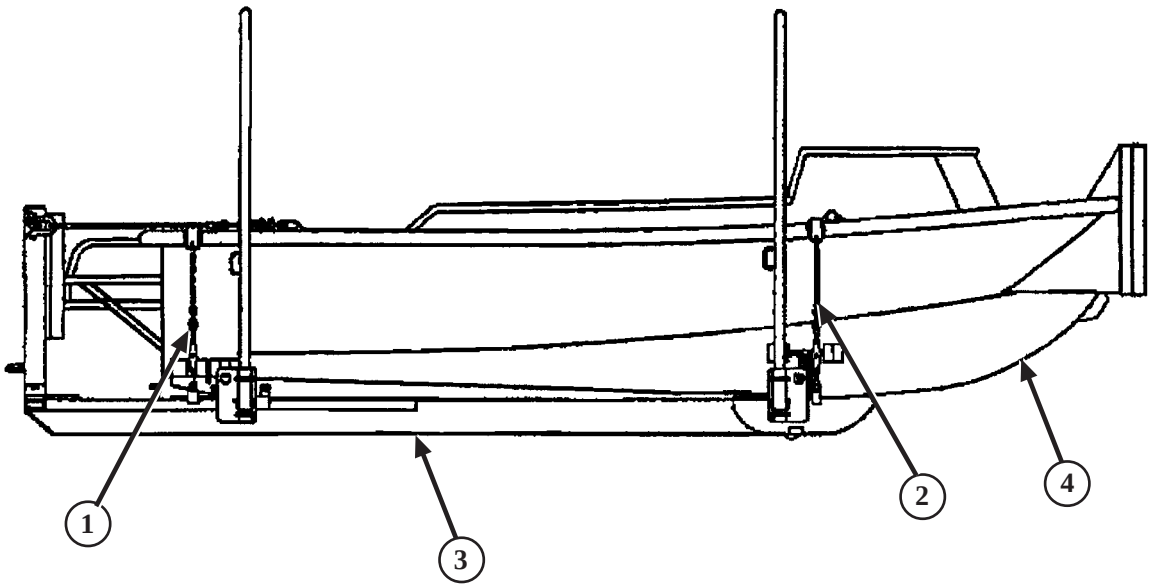
w. Turn PTO ENGAGE switch to OFF.

x. Transporter is now ready to be driven.

2-7. RIBBON BRIDGE ERECTION BOAT LAUNCHING.

NOTE

During all launching operations, the operator will drive and be responsible for launching the boat using the cradle and LHS cab control box. Assistant is the ground guide and will be responsible for directing and assisting the operator. The operator and the ground guide will prepare the boat and transporter for launching and be assisted by the boat crew.



a. Set parking brake (Ref TM 9-2320-279-10).

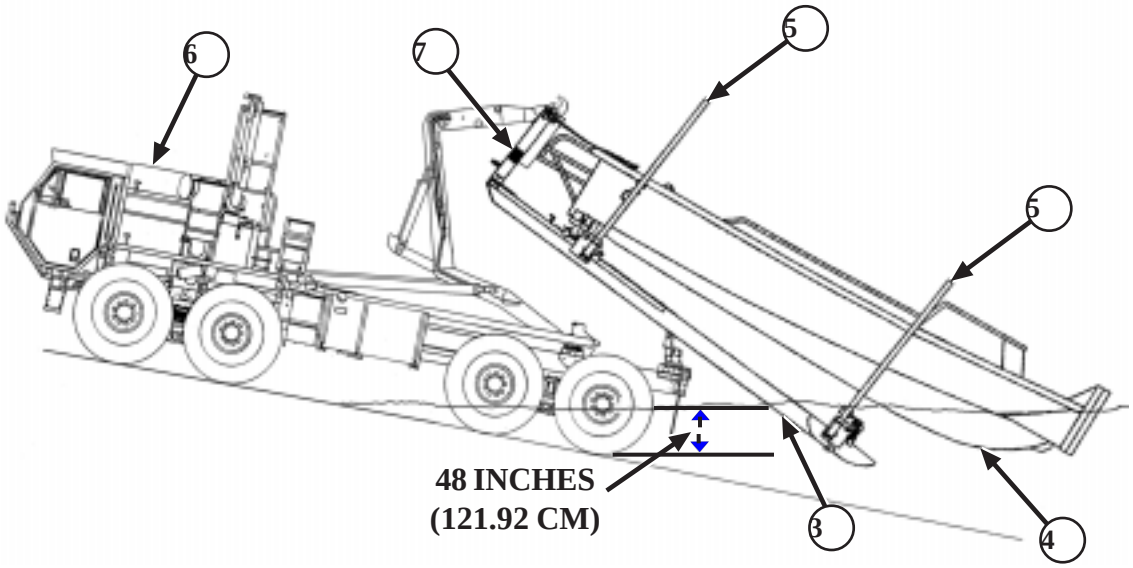
b. Remove both front and rear tie-down cables (1 and 2) from the cradle (3) and boat (4) (para 3-4).

2-7. RIBBON BRIDGE ERECTION BOAT LAUNCHING (Continued).

NOTE

Use ground guide assistance for launching of the cradle.

The stanchion poles (5) will remain in place during launching.



c. Release parking brake and back up transporter (6) into the water using water indicator line (7). Do not exceed deep water fording depth of 48 inches (121.92 cm).

d. Set parking brake.

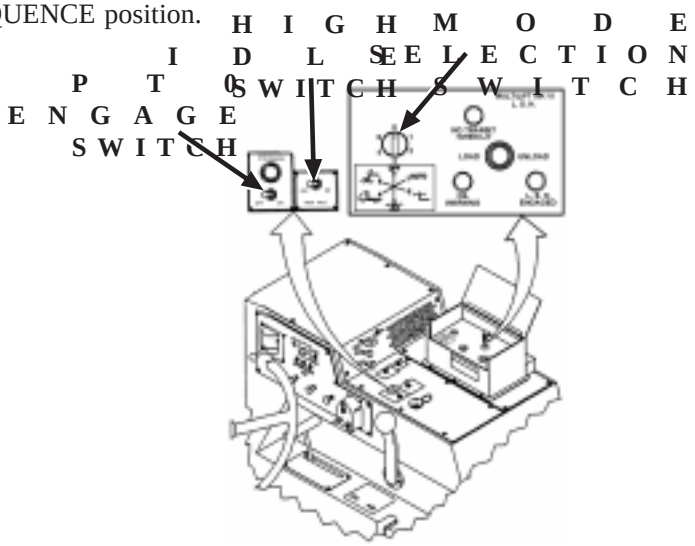
CAUTION

When selecting any LHS operating mode with the MODE SELECTION switch, the engine must be at low idle speed. Selection of any LHS operating mode with HIGH IDLE switch ON may result in the sudden application hydraulic pressure to the LHS, resulting in equipment damage.

e. Turn PTO ENGAGE switch to ON position .

f. Turn MODE SELECTION switch to AUTO SEQUENCE position.

g. Turn HIGH IDLE switch to ON position.



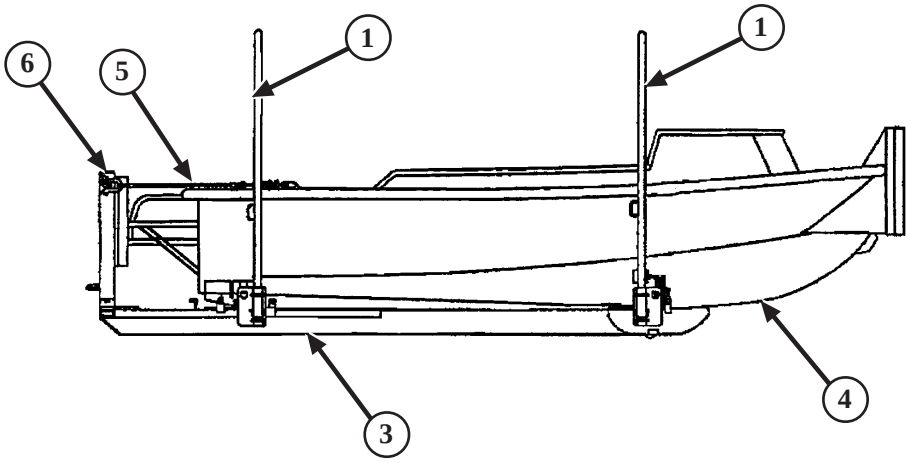
2-7. RIBBON BRIDGE ERECTION BOAT LAUNCHING (Continued).

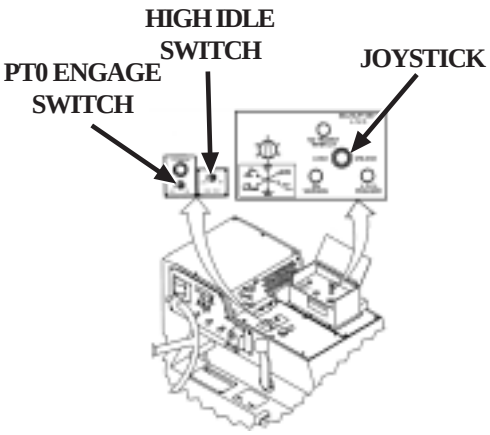
CAUTION

Use ground guide to ensure that hook remains secure to hook bar during launch.

h. Hold joystick in UNLOAD position to unload the cradle (3) until the boat (4) floats.

i. Boat crew will undo load binder cables (5) and stow them on the A-Frame brackets (6).





CAUTION

When selecting any LHS operating mode with the MODE SELECTION switch, the engine must be at low idle speed. Selection of any LHS operating mode with HIGH IDLE switch ON may result in the sudden application of hydraulic pressure to the LHS, resulting in equipment damage.

j. Once the boat (4) is clear of the cradle (3), hold the joystick in LOAD position until the cradle is fully loaded onto the transporter.

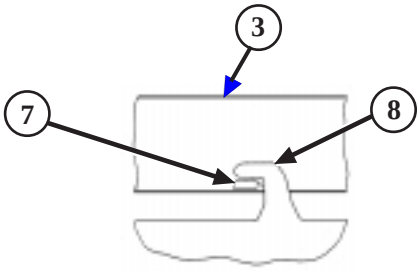
k. Turn the HIGH IDLE switch to the OFF position.

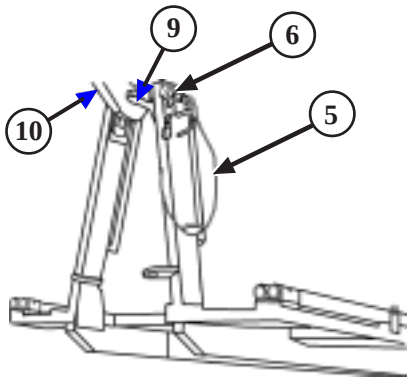
l. Turn the PTO ENGAGE switch to the OFF position.

m. Place the transmission in DRIVE and release the park brake and pull forward.

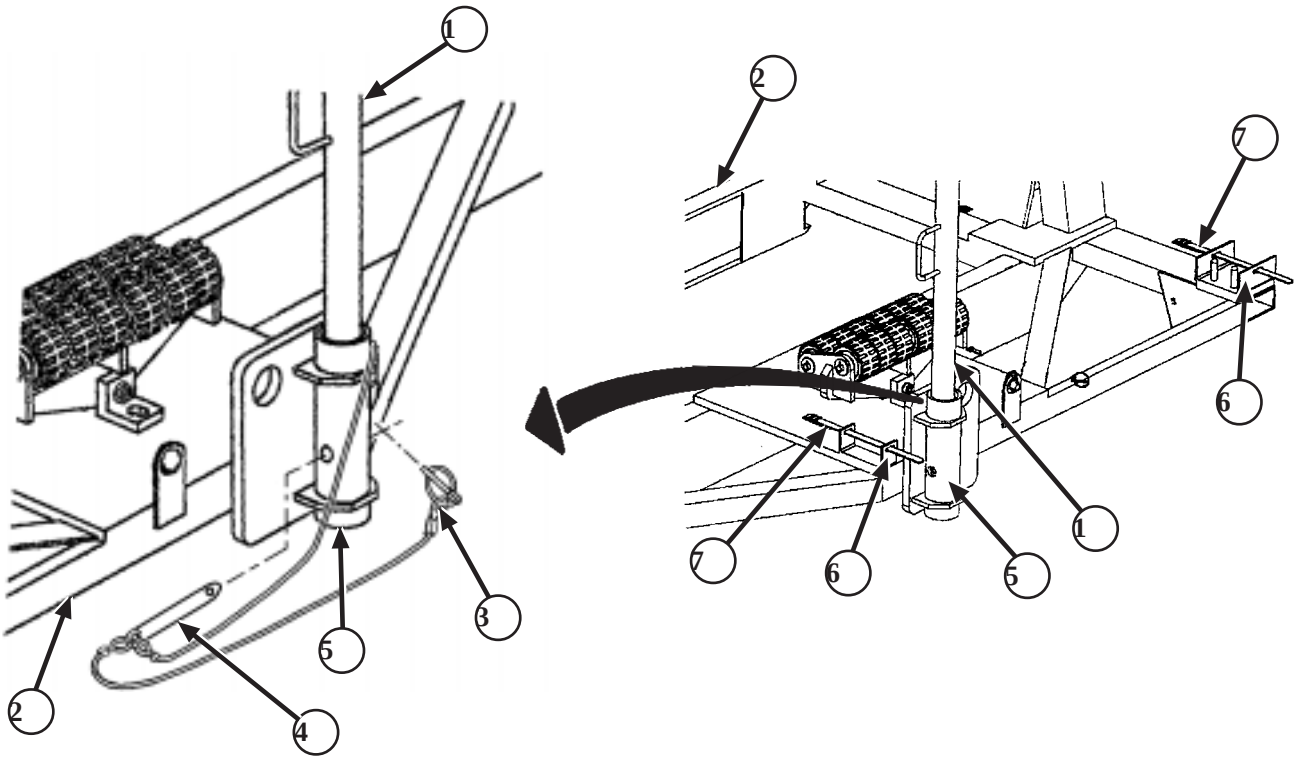
n. Inspect the cradle (3) to ensure the transport locking tabs (7) are engaged in transport frame (8), the hook bar (9) is secured in the hook arm (10), and the two load binders (5) are secured in their storage position on the A-Frame brackets (6).

t. Transporter can now be moved away from launching area.





2-8. RIBBON BRIDGE ERECTION BOAT RETRIEVAL.



a. Preparation for retrieval.

WARNING

The stanchion poles weigh 60 lbs. (27.24 kg) each and require two personnel to remove them from their pockets. Failure to follow this warning may result in injury to personnel or damage to equipment.

(1) Remove front and rear stanchions poles (1) from pockets on UPSTREAM SIDE of the cradle (2).

(a) While assistant holds the stanchion pole (1), remove ring pin (3) from straight pin (4). Remove straight pin (4).

(b) Lift and remove stanchion poles (1) from their pockets (5) and place into storage bracket (6). Secure with two straps (7).

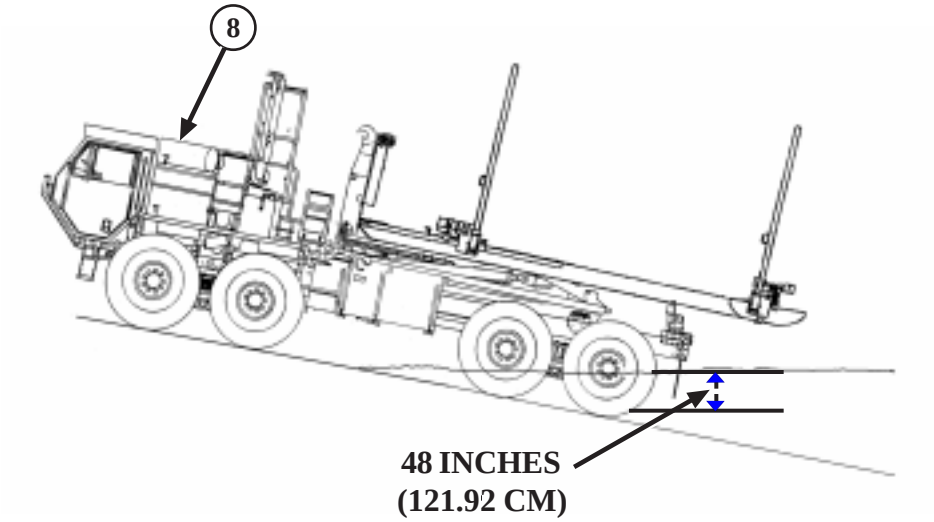
(c) Replace straight pin (4) into pocket (5) and secure with ring pin (3).

2-8. RIBBON BRIDGE ERECTION BOAT RETRIEVAL (Continued).

b. Back up transporter (8) into the water. Do not exceed deep water fording depth of CBT, 48 inches (121.92 cm) (Ref TM 9-2320-279-10).

c. Apply parking brake.

d. Place transmission in NEUTRAL.



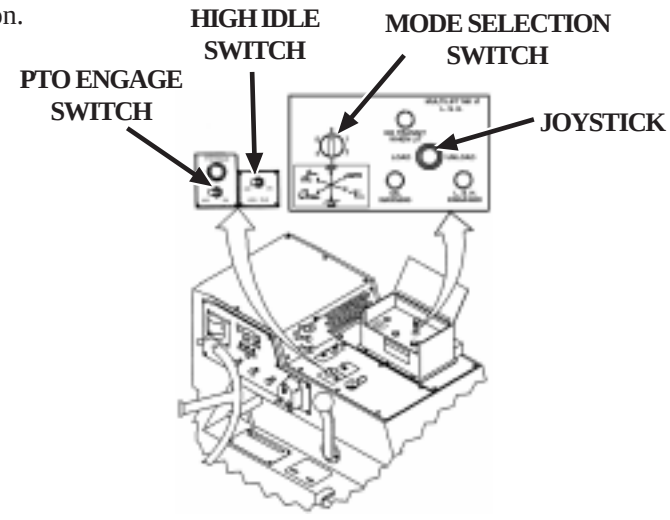
CAUTION

When selecting any LHS operating mode with the mode SELECTOR switch, the engine must be at low idle speed. Selection of any LHS operating mode with HIGH IDLE switch ON may result in the sudden application of hydraulic pressure to the LHS, resulting in equipment damage.

e. Turn PTO ENGAGE switch to ON position.

f. Turn MODE SELECTION switch to AUTO position.

g. Turn HIGH IDLE switch to ON position.



2-8. RIBBON BRIDGE ERECTION BOAT RETRIEVAL (Continued).

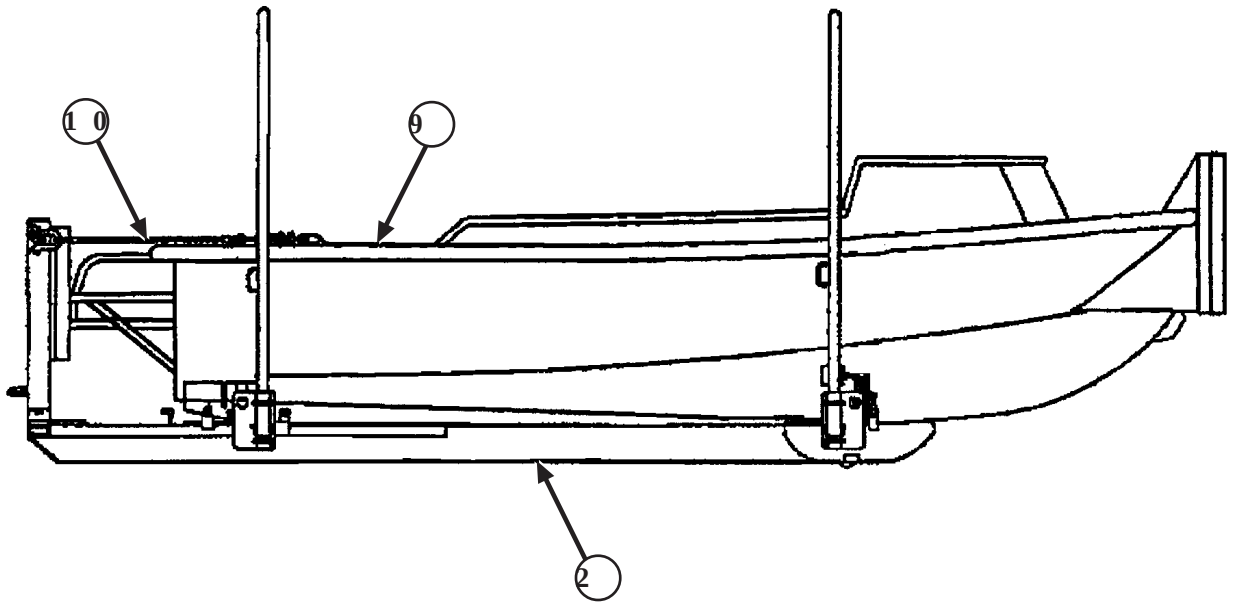
NOTE

The assistant must ensure that the hook arm and the hook bar remain in contact while the cradle is lowered into the water.

h. While using the assistant as a ground guide, hold the joystick in UNLOAD position to unload the cradle.

i. Boat crew will maneuver the boat (9) onto the cradle from the UPSTREAM SIDE of the cradle (2).

j. Boat crew will secure the boat (9) to the cradle (2) by attaching load binder cables (10) to the stern of the boat (9) (para 3-3).



2-8. RIBBON BRIDGE ERECTION BOAT RETRIEVAL (Continued).

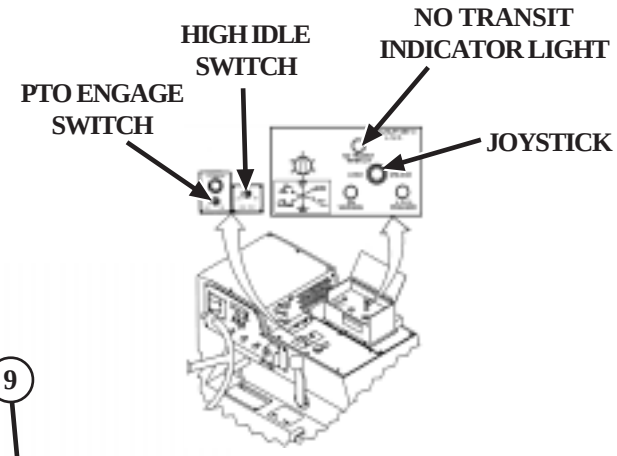
CAUTION

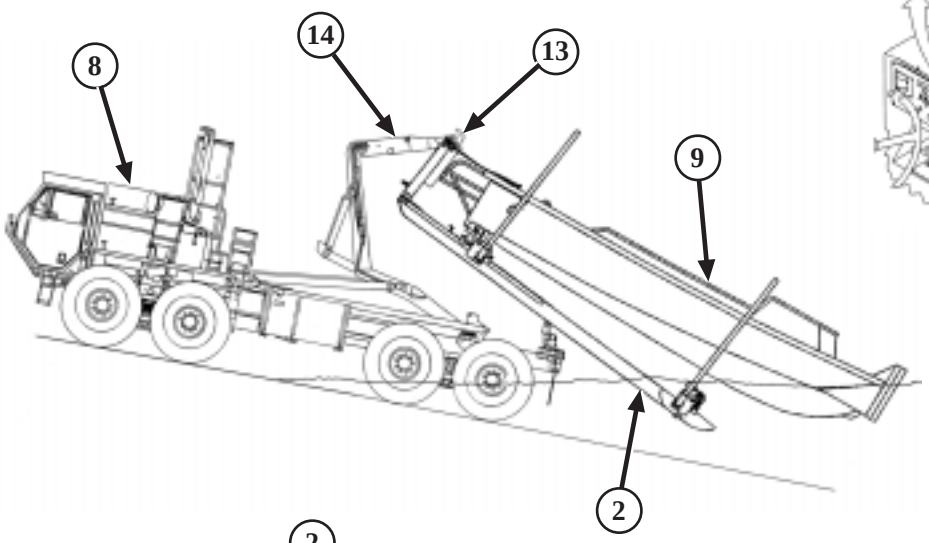
Prior to loading boat and cradle in fast water, ensure that cradle is in line with transporter. The CBT driver may need to pull forward to align the cradle.

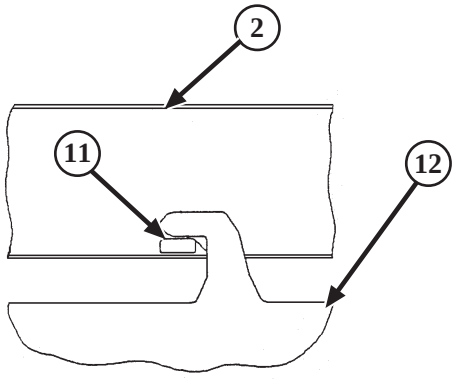
k. Once the boat (9) is secured, move joystick to LOAD position and hold until the cradle (2) is fully loaded onto the transporter (8) and the NO TRANSIT LIGHT is OFF.

l. Turn the HIGH IDLE switch to OFF.

m. Turn PTO ENGAGE switch to OFF .







n. Place transmission in the DRIVE position, release park brake, and pull forward from water's edge.

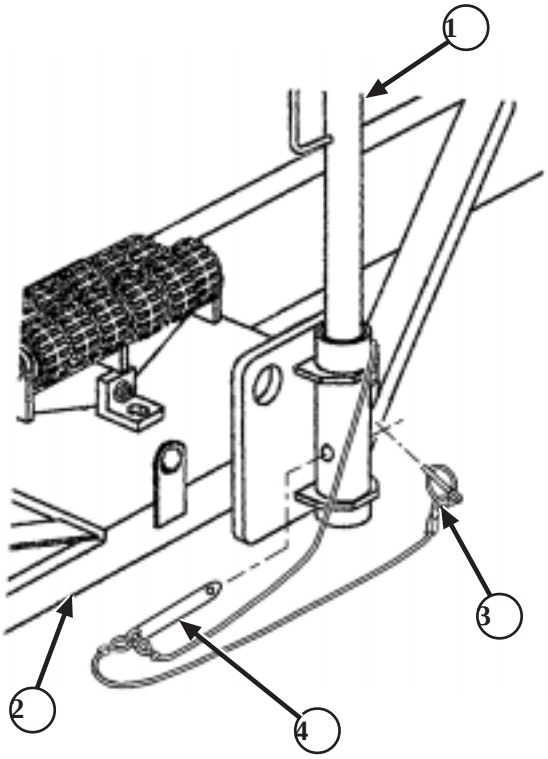
o. Allow the boat crew to dismount from boat via the transporter operator platform.

p. Inspect cradle frame (2) to ensure two transport locking tabs (11) are engaged in transport frame (12) and the hook bar (13) is secured in the hook arm (14).

2-8. RIBBON BRIDGE ERECTION BOAT RETRIEVAL (Continued).

q. Preparation for Transport.

(1) Attach both front and rear tie-down cables to the boat (para 3-4).



WARNING

The stanchion poles weigh 60 lb. (27.24 kg) each and require two personnel to remove them from their bracket. Failure to follow this warning may result in injury to personnel or damage to equipment.

(2) Mount two stanchion poles (1) on the UPSTREAM SIDE of cradle (2) and secure with straight pin (4) and ring pin (3).

r. Transporter is ready to be moved.

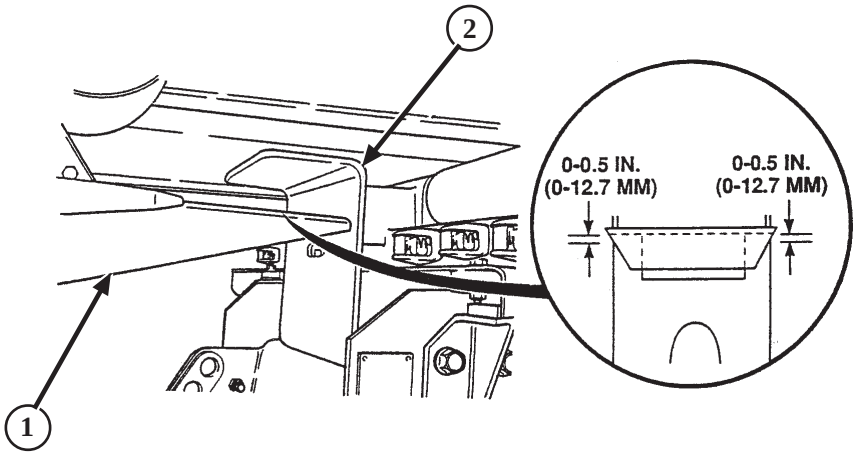
2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER.

WARNING

- **Prior to and during any loading or unloading cycle, all personnel should stay clear of LHS and cradle or serious injury or death could result to personnel.**
- **Trailer wheels must be chocked during transfer operations or serious injury or death could result to personnel.**

CAUTION

- **Removable skid plate must be installed in stowage position (Ref para 3-2) or damage to equipment may result.**
- **Ensure that trailer drawbar is down against the ground during transfer operations or damage to equipment may result.**
- **Ensure air lines and cables are properly stowed to prevent damage to equipment (Ref TM 9-2320-385-14).**
- **Both trailer bumper points must be under the transporter bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the transporter bumper stop cannot exceed 1/2 inch (1.27cm) or cradle will miss main rail guides and equipment damage may result.**



a. Back up transporter (Ref TM 9-2320-279-10) so that trailer bumper (1) is under flange and contacts truck bumper stop (2).

b. Apply parking brakes and set transmission range selector to Neutral (N).

2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER (Continued).

WARNING

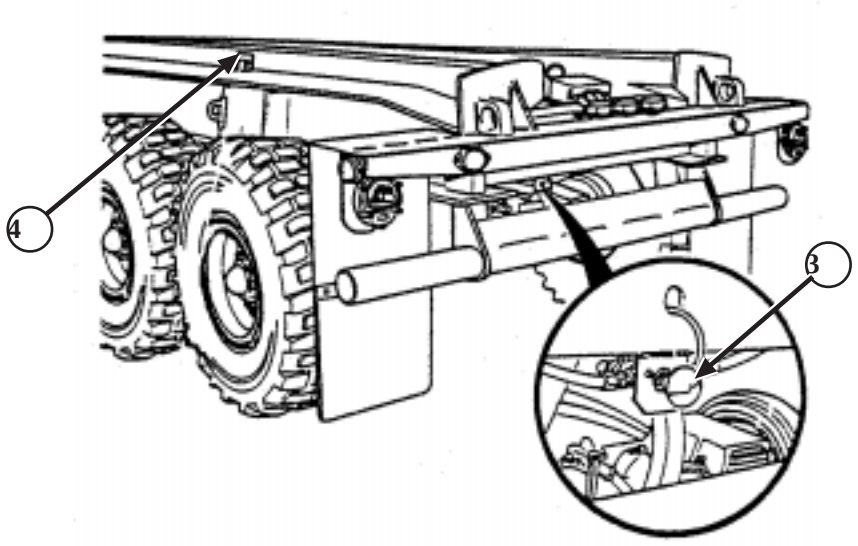
- **When operating the CBT with PLS trailer, the heaviest load must always be placed on the transporter, otherwise adverse handling and/or braking may result, causing injury or death to personnel.**

- **Ensure trailer air system is charged before beginning transfer or cradle locking tabs may not properly engage, causing serious injury or death to personnel.**

CAUTION

- **There must be sufficient air pressure in trailer air system to retract locks or damage to cradle locking tabs can occur while attempting to load cradle on trailer. If air pressure is not sufficient, use transporter to charge trailer air system using trailer air charging hose. If air system cannot retract locks, use manual lock retract procedures (Ref TM 9-2320-385-14).**

- **Ensure both locks are fully retracted or damage to equipment may result.**



c. Push in on knob (3) and retract locks (4) on trailer.

2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER (Continued).

CAUTION

Engine speed must be at idle before activating mode selector switch or damage to equipment may result.

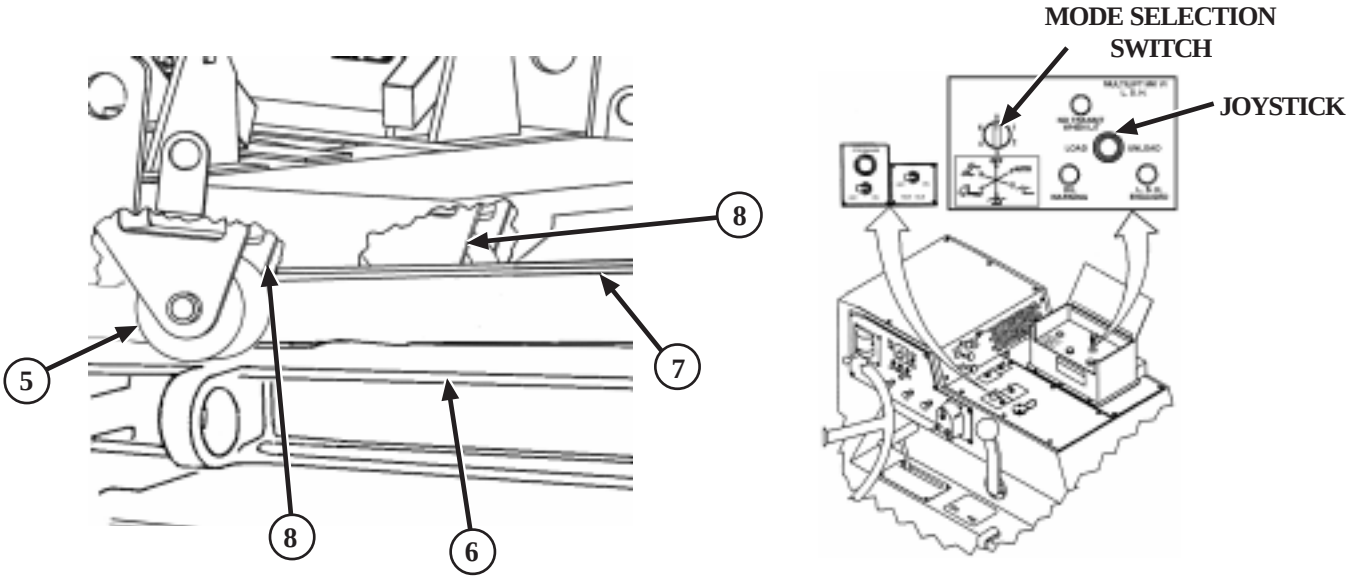
d. Turn MODE SELECTION switch to AUTO.

WARNING

- **When loading or unloading cradle on uneven ground (sides slope or downgrades up to 10 degrees), it may be necessary to apply transporter service brakes to prevent transporter from rolling away or severe injury or death could result.**
- **Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 20 feet (6.1 m) with cradle. Serious injury or death could result from contact with electrical power lines.**
- **Trailer wheels must be chocked during transfer operations or serious injury or death could result.**

NOTE

The amount of time to load is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading time.



e. Move joystick to UNLOAD position until cradle rollers (5) contact trailer (6).

f. Release the joystick.

g. Inspect and verify trailer guides (7) are lined up between inboard surfaces of cradle roller brackets (8).

2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER (Continued).

NOTE

If not aligned, repeat steps ***a*** through ***g***. If aligned, go to step ***h***.

h. Move the joystick to the UNLOAD position until cradle rollers (5) contact rear trailers stops (9) and cradle frame is seated on trailer.

i. Release the joystick.

j. Ensure that cradle rollers (5) have contacted rear trailer stops (9).

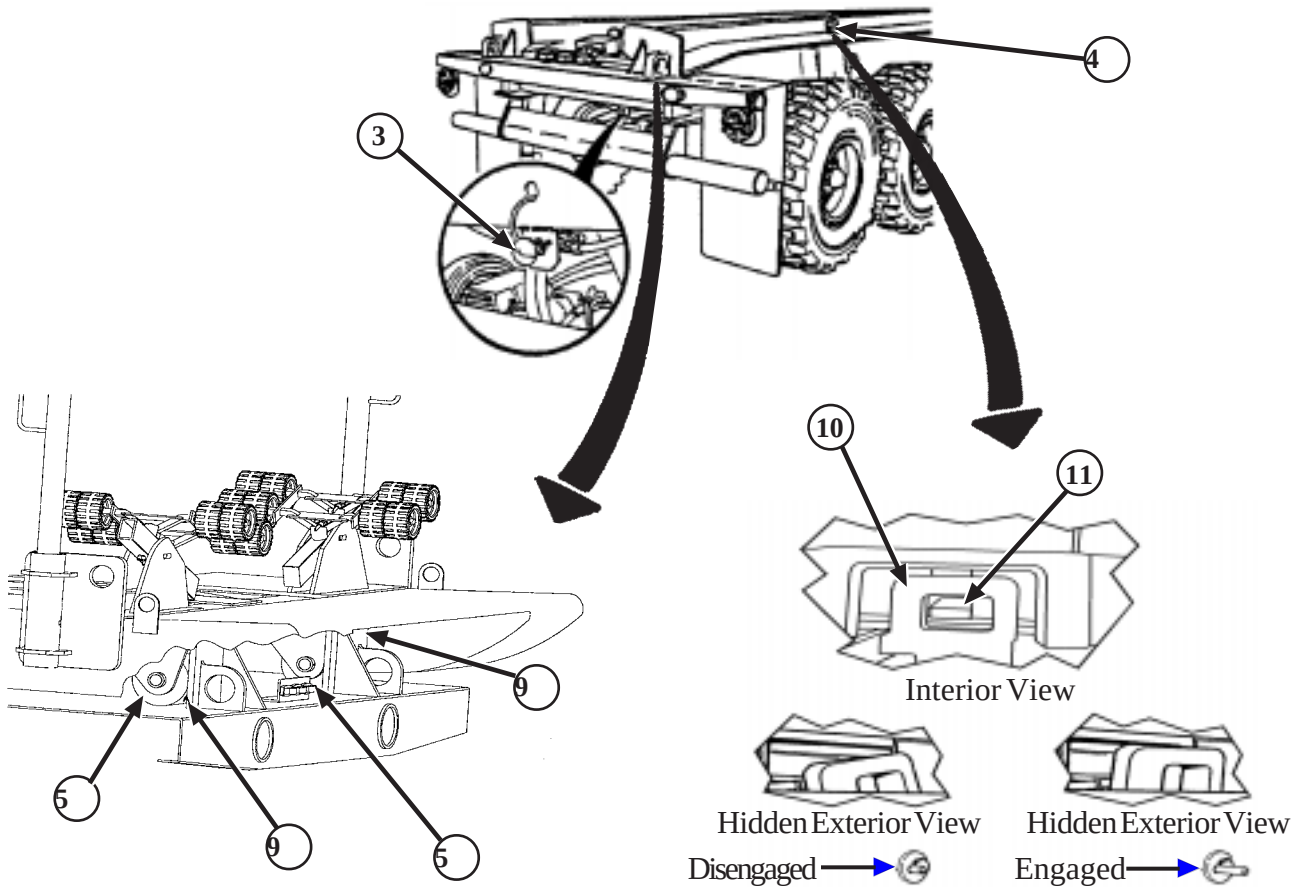
k. Pull knob (3) and engage locks (4).

NOTE

If locks do not engage, raise cradle slightly and lower again. Cradle should seat completely.

l. Inspect that locks (10) are engaged in cradle locking tabs (11).

m. Release transporter parking brakes.



2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER (Continued).

NOTE

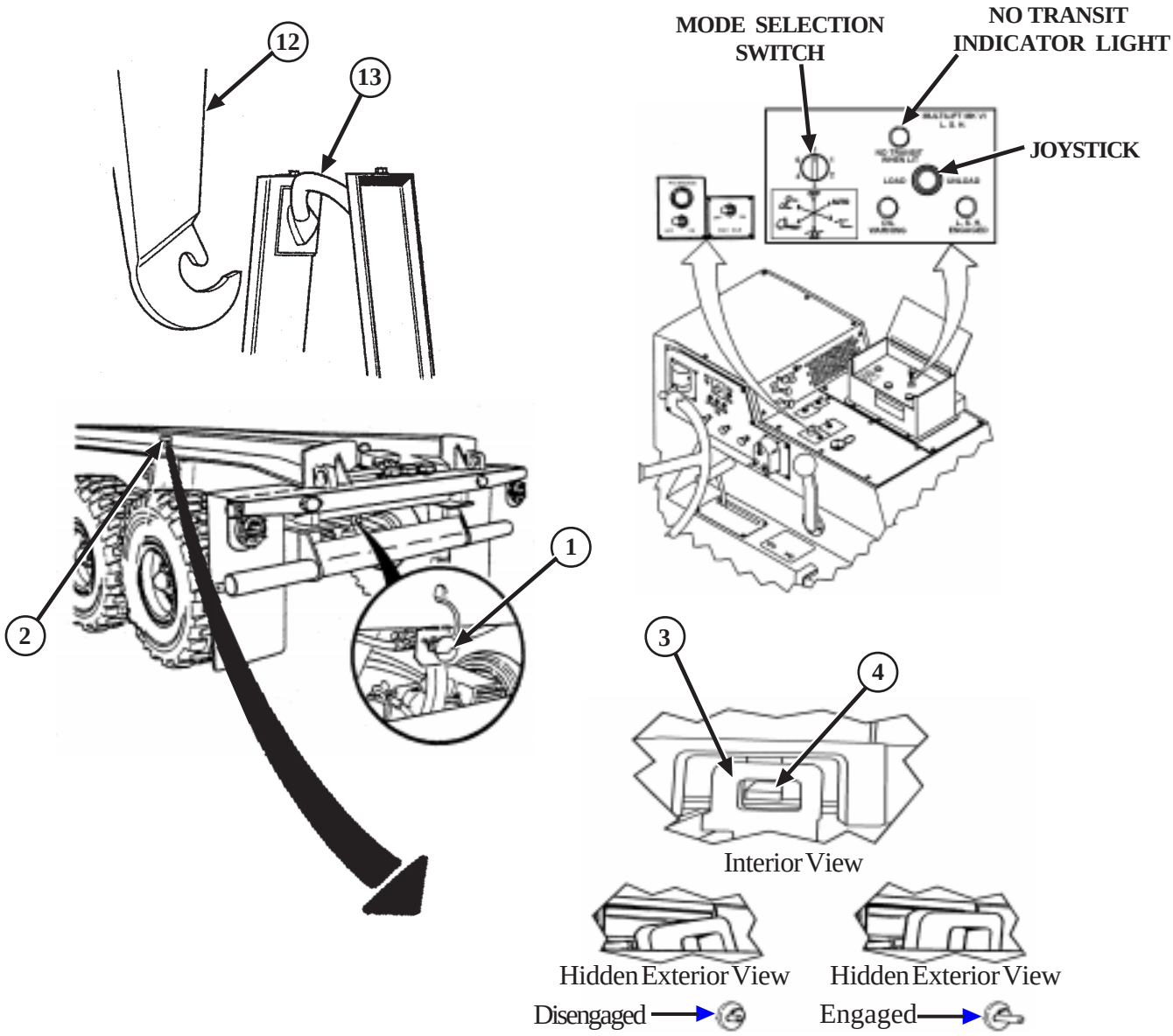
It may be necessary to repeat steps ***o*** through ***r*** several times to clear hook arm from hook bar.

n. Move the joystick to LOAD position to allow top of LHS hook arm (12) to clear cradle hook bar (13).

NOTE

Do not move transporter forward more than 3 inches (7.62 cm) to prevent cradle from pulling away from trailer stops.

o. Place transmission range selector in Drive (D). Move transporter forward approximately 3 inches (7.6 cm). Apply service brake.



2-9. NORMAL LOADING OF CRADLE ON PLS TRAILER (Continued).

p. Place transmission in Neutral (N).

q. Move the joystick to UNLOAD position to disengage LHS hook arm (12) from hook bar (13).

r. Release the parking brake.

s. Set transmission range selector to Drive (D).

t. Move the transporter forward approximately 5 feet (1.52 m).

u. Apply the transporter parking brakes and set transmission range selector to Neutral (N).

WARNING

Never drive with NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose causing injury or death to personnel.

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

NOTE

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

v. Turn the MODE SELECTION switch to AUTO.

w. Move the joystick to LOAD and retract LHS until LHS NO TRANSIT light is extinguished.

NOTE

MODE SELECTION switch must be in OFF position before driving or hydraulic system can overheat causing damage to equipment.

x. Turn MODE SELECTION switch to OFF.

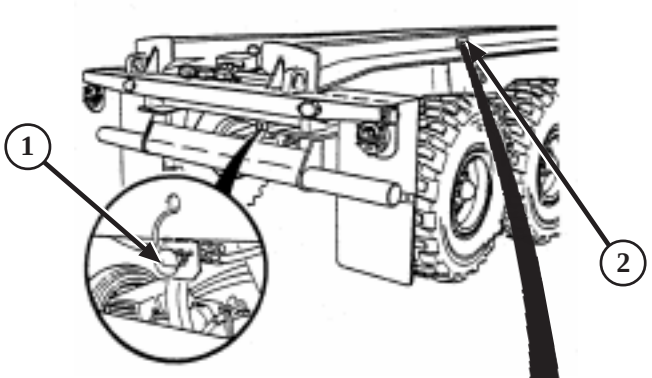
2-10. NORMAL UNLOADING OF CRADLE FROM PLS TRAILER.

a. Back the transporter up in line with trailer and stop approximately 5 feet (1.53 m) from trailer (Ref TM 9-2320-279-10).

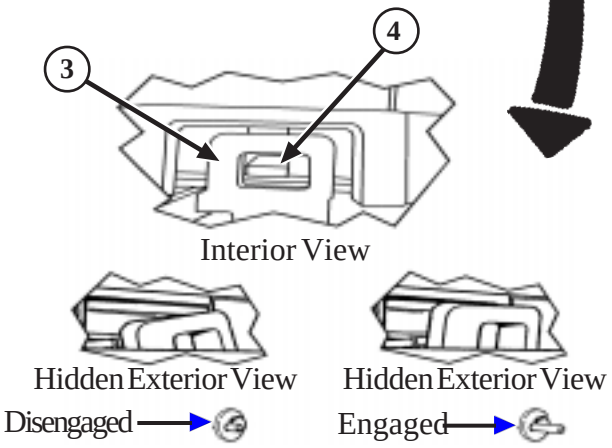
b. Apply parking brake and place transmission range selector in Neutral (N).

CAUTION

- **There must be sufficient air pressure in trailer air system to retract locks or damage to cradle locking tabs can occur while attempting to remove cradle from trailer. If air pressure is not sufficient, use transporter to charge trailer air system using trailer air charging hose. If air system cannot retract locks, use manual lock retract procedure (Ref TM 9-2330-385-14).**
- **Ensure air lines and cables are properly stowed to prevent damage to equipment (Ref TM 9-2330-385-14).**
- **Ensure that trailer drawbar is down against the ground during transfer operation or damage to equipment may result.**



c. Push the knob (1) on trailer to retract locks (2) on trailer.



2-10. NORMAL UNLOADING OF CRADLE FROM PLS TRAILER (Continued).

CAUTION

Ensure both locks are fully retracted or damage to equipment may result.

d. Ensure that both locks (3) are fully retracted from cradle locking tabs (4).

WARNING

- **Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 20 feet (6.1 m) with cradle. Serious injury or death could result from contact with electrical power lines.**
- **Prior to and during any load or unload cycle, all personnel should stay clear of LHS and cradle or serious injury or death could result to personnel.**
- **Trailer wheels must be chocked during transfer operation or serious injury or death could result.**
- **Check ground condition for firmness and extreme sideways inclination before picking-up or off-loading a cradle. Any ground instability beneath tires could cause serious injury or death to personnel.**

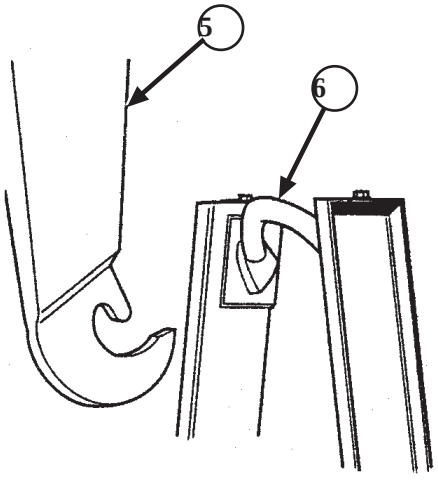
CAUTION

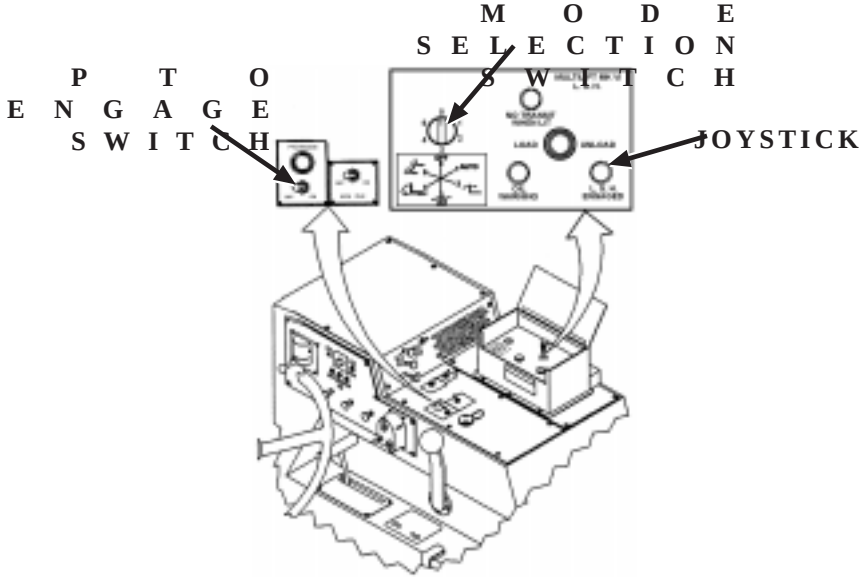
Engine speed must be at idle before activating MODE SELECTION switch or damage to equipment may result.

e. Turn PTO ENGAGE to ON.

f. Turn MODE SELECTION switch to AUTO.

g. Move the joystick to the UNLOAD position until LHS hook arm (5) has moved just below level of cradle hook bar (6).



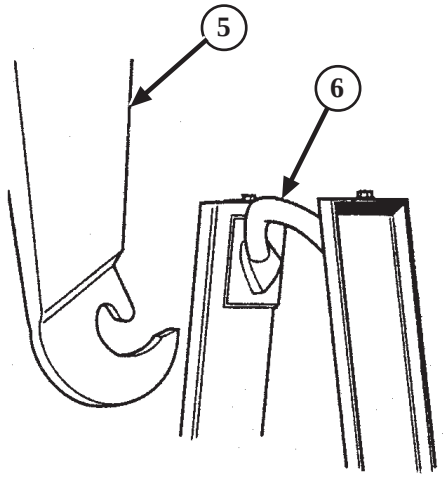


2-10. NORMAL UNLOADING OF CRADLE FROM PLS TRAILER (Continued).

h. Apply service brake pedal and release parking brake.

i. Set transmission range selector to Reverse (R), release service brake pedal, and back transporter up until LHS hook arm (5) contacts cradle hook bar (6).

j. Set Transmission range selector to Neutral (N) and apply transporter parking brake.

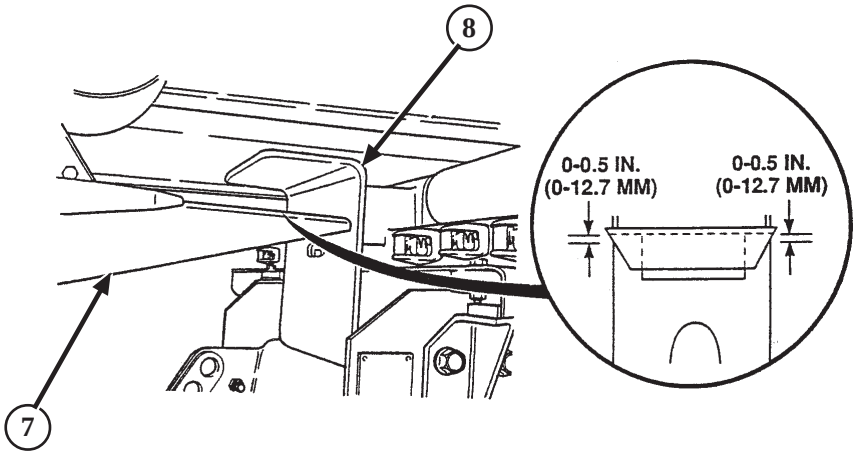


CAUTION

Both the trailer bumper points must be under the transporter bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the transporter bumper stop cannot exceed 1/2 inch (1.27 cm) or cradle will miss main rail guides and equipment damage may result.

Do no use Reverse (R) to back up transporter while hook arm is attached to cradle hook bar or damage to LHS will occur.

k. Check that trailer bumper (7) is under flange of transporter bumper stop (8).



2-10. NORMAL UNLOADING OF CRADLE FROM PLS TRAILER (Continued).

WARNING

Ensure trailer air system is pressurized before beginning removal or cradle locking tabs may not properly disengage, causing serious injury or death to personnel.

NOTE

The amount of time to unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce unloading time.

l. Move joystick to the LOAD position and engage LHS hook arm (5) into cradle hook bar (6).

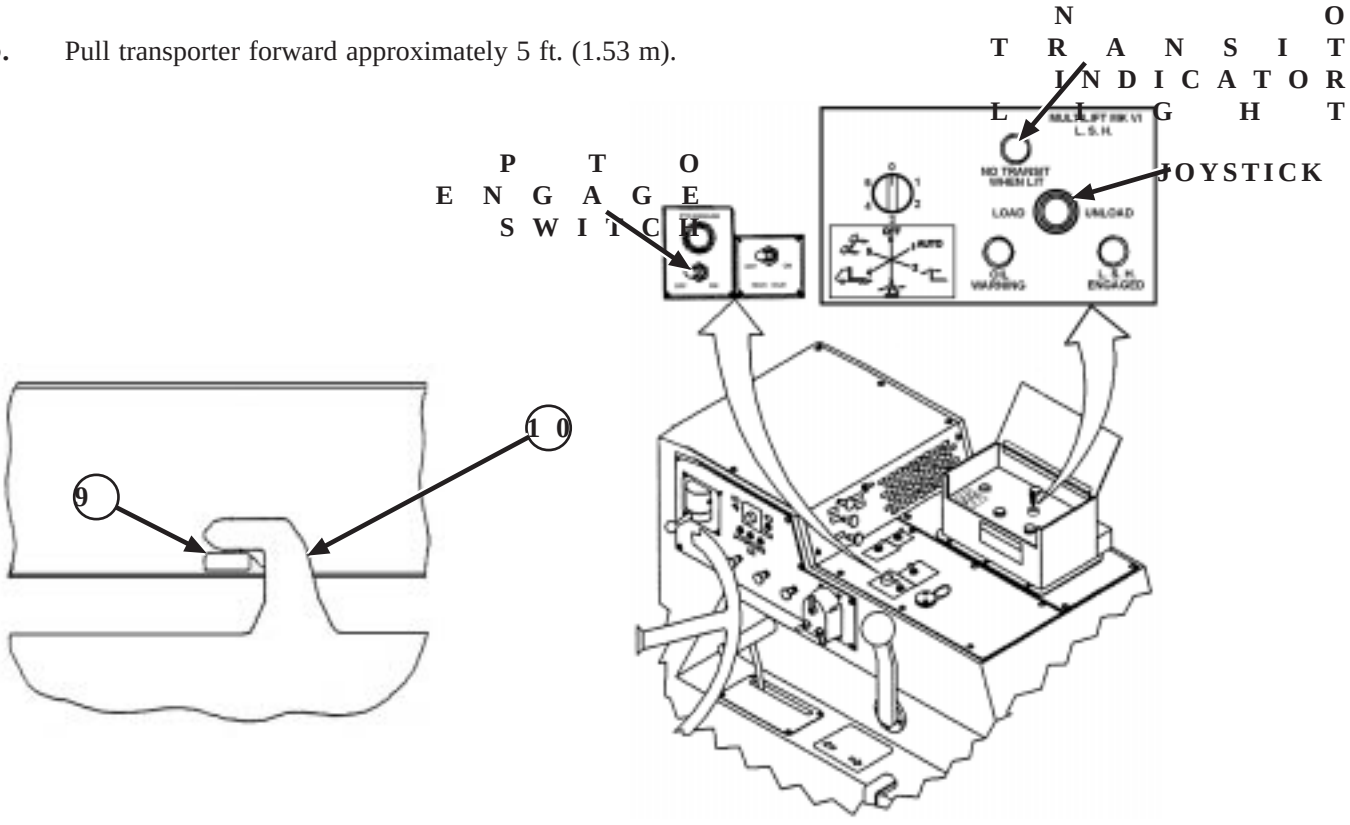
m. Continue loading cradle from trailer until the LHS NO TRANSIT light is extinguished indicating LHS is in transportation position.

NOTE

If locks do not engage, raise cradle slightly and lower again. Cradle should seat completely.

n. Turn PTO ENGAGE to OFF.

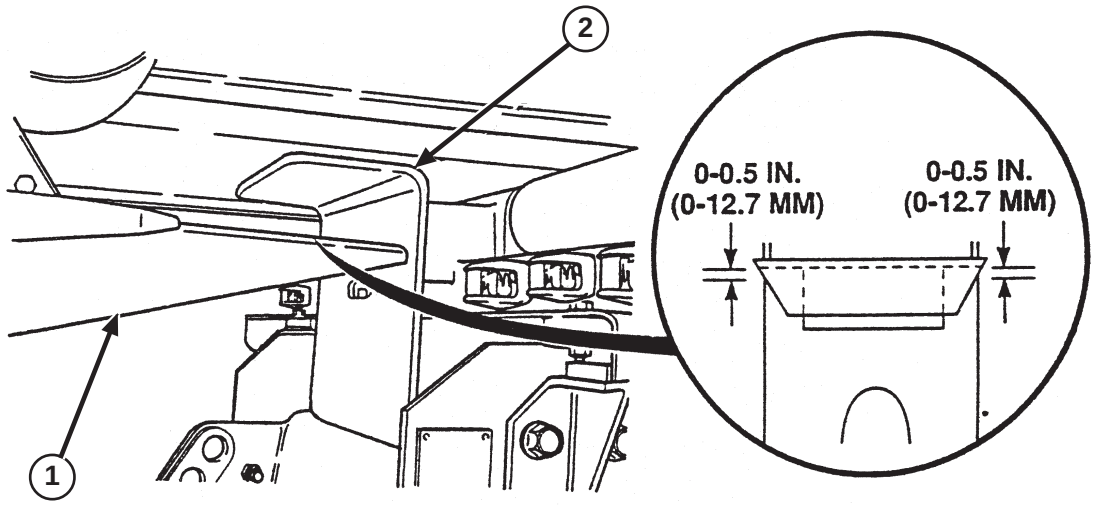
o. Pull transporter forward approximately 5 ft. (1.53 m).



p. Inspect cradle frame to ensure two cradle locking tabs (9) are engaged in transport frame (10).

q. Transporter is ready to be moved.

2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE.



WARNING

Trailer wheels must be chocked during transfer operation or serious injury or death could result.

CAUTION

- **Removable skid plate must be installed in stowage position (Ref para 3-2) or damage to equipment may result.**
- **Ensure that drawbar is down against the ground during transfer operation or damage to equipment may result (Ref TM 9-2330-385-14).**
- **Ensure air lines and cables are properly stowed to prevent damage to equipment (Ref TM 9-2330-385-14).**
- **Both of the trailer bumper points must be under the truck bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the truck bumper stop cannot exceed 1/2 inch (12.7 mm) or cradle will miss main rail guides and equipment damage may result.**

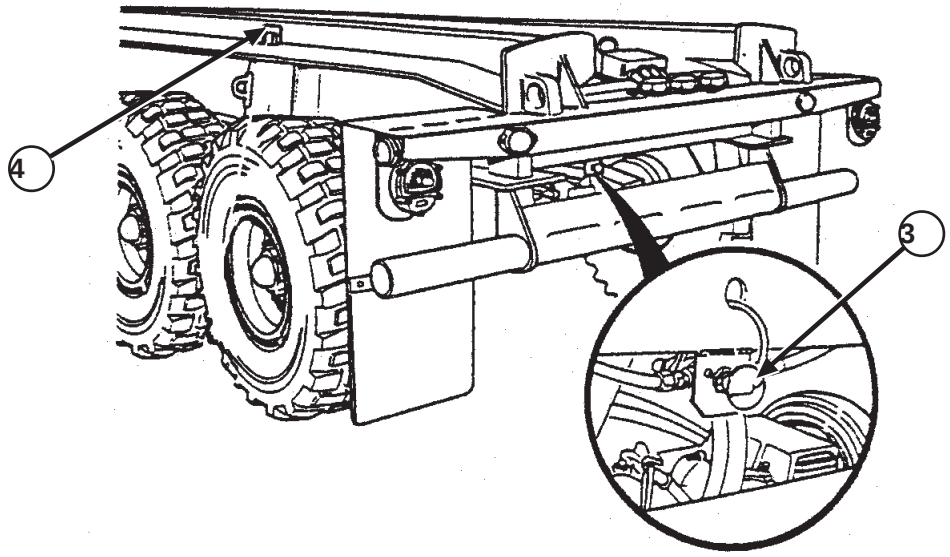
a. Back up the transporter (Ref TM 9-2320-279-10) so that bumper (1) is under flange and contacts transporter bumper stop (2).

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

b. Apply parking brakes and place transmission range selector to Neutral (N).

2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).



WARNING

- **When operating the CBT with PLS trailer, the heaviest load must always be placed on the transporter, otherwise adverse handling and/or braking may result, causing injury or death to personnel.**

- **Ensure trailer air system is charged before beginning transfer or cradle locking tabs may not properly engage, causing injury or death to personnel.**

CAUTION

- **There must be sufficient air pressure in trailer air system to retract locks or damage to cradle locking tabs can occur while attempting to load cradle on trailer. If air pressure is not sufficient, use transporter to charge trailer air system using trailer charging hose. If air system cannot retract locks, use manual lock retract procedure (Ref TM 9-2330-385-14).**

- **Ensure both locks are fully retracted or damage to equipment may result.**

c. Push in knob (3) and retract locks (4) on trailer.

CAUTION

Engine speed must be at idle before activating MODE SELECTION switch or damage to equipment may result.

2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

NOTE

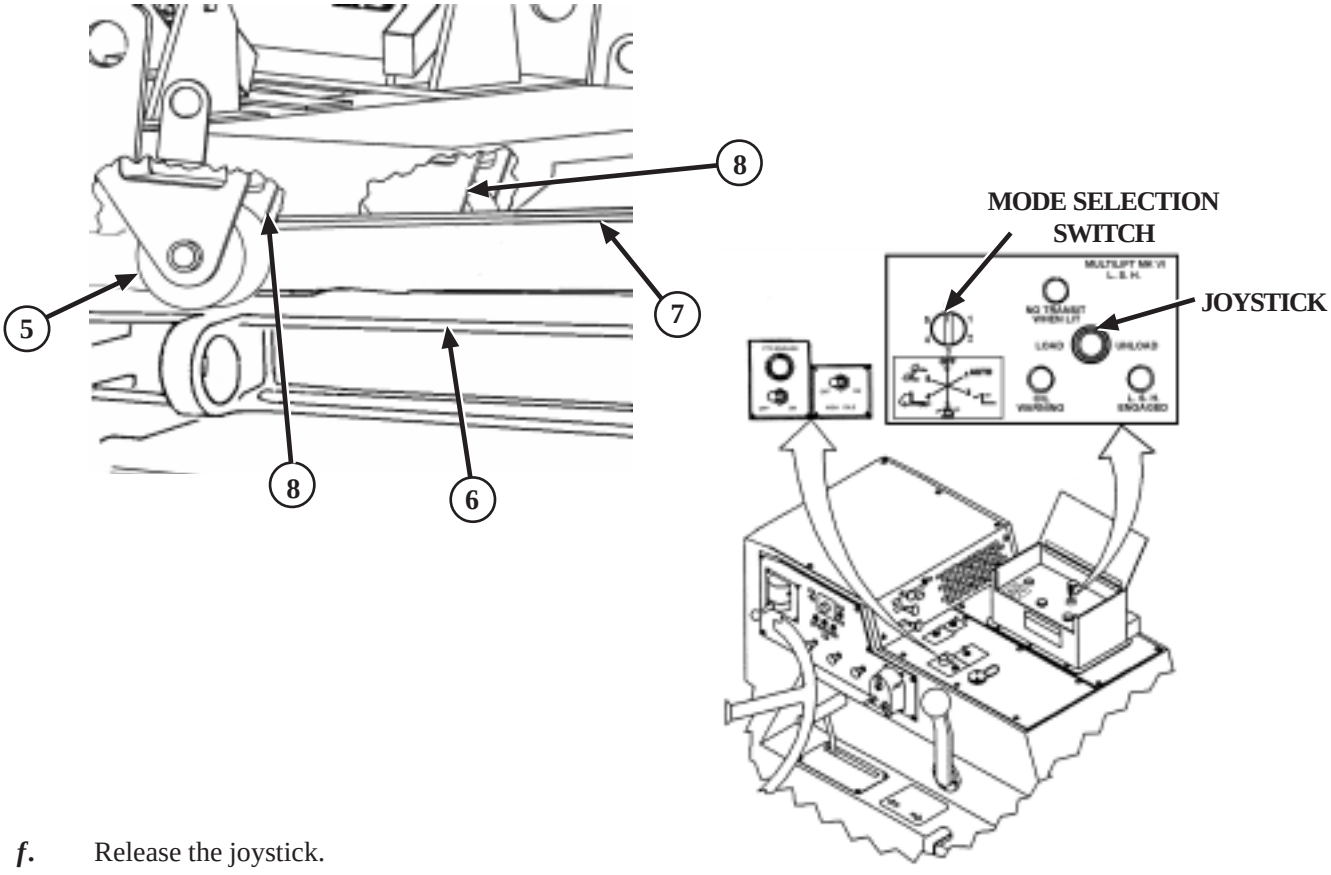
The time to load and unload is controlled by engine speed. Engine speed can be increased to approximately 1500 rpm to reduce loading and unloading times.

d. Turn the MODE SELECTION switch to MAN H.A.

WARNING

- **When loading or unloading cradle on uneven ground (side slopes or downgrades up to 10 deg.), it may be necessary to apply transporter service brakes to prevent transporter from rolling away or sever injury or death could result.**
- **Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 20 feet (6.1 m) with cradle. Serious injury or death could result from contact with electrical power lines.**

e. Move the joystick to UNLOAD position until cradle rollers (5) contact trailer (6).



f. Release the joystick.

g. Inspect and verify that trailer guides (7) are lined up between inboard surfaces of cradle roller brackets (8).

2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

NOTE

If not aligned, perform step ***h.*** If aligned, go to step ***i.***

h. If not aligned, move joystick to the LOAD position. When cradle is fully reloaded, release joystick. Repeat steps ***a*** through ***g***.

CAUTION

- **To avoid equipment damage, visually check that hook arm cylinders have fully extended.**
- **To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speeds above idle.**

NOTE

Overload warning light will come on when hook arm cylinders are fully extended and joystick is activated.

i. Move the joystick to the UNLOAD position and hold until hook arm cylinders are fully extended.

j. Release the joystick.

CAUTION

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

k. Turn the MODE SELECTION switch to MAN M.F.

l. Move the joystick to the UNLOAD position until cradle frame is completely seated on trailer.

m. Release the joystick.

CAUTION

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

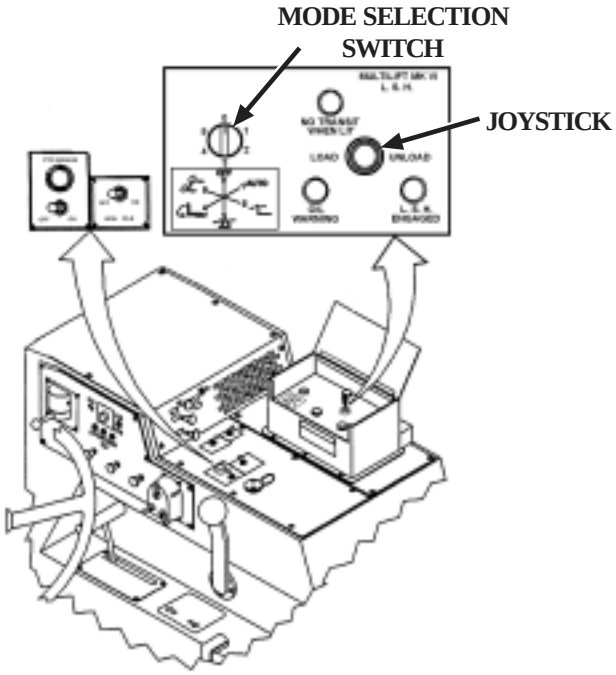
2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

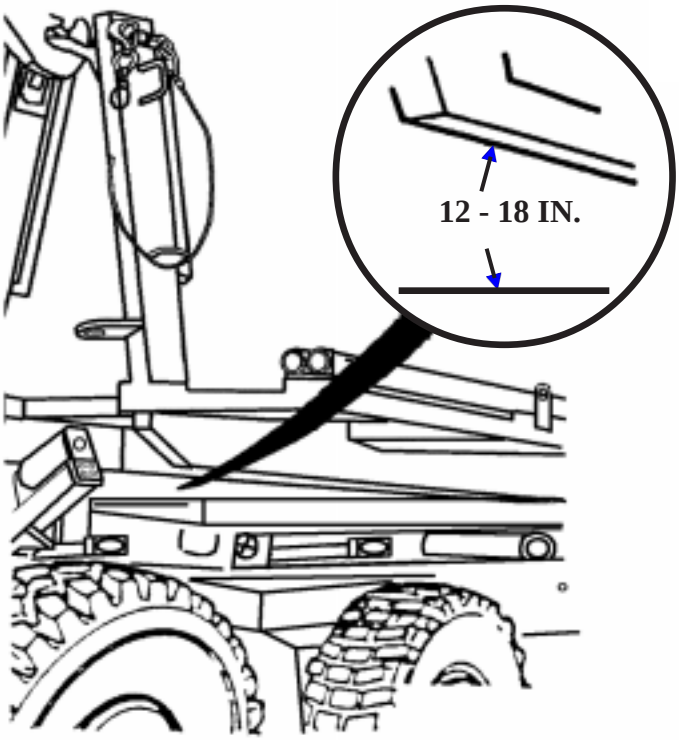
NOTE

If cradle rollers do not make contact with trailer stop, perform steps ***n*** through ***q.*** If rollers make contact with stop, go to step ***r.***

n. Turn the MODE SELECTION switch to MAN H.A.

o. Move joystick to the LOAD position until front of cradle is raised approximately 12 to 18 inches (30.48-45.72 cm) above trailer deck height.





2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

p. Turn the MODE SELECTION switch to MAN M.F.

q. Move the joystick to the UNLOAD position until cradle rollers (5) contact rear trailer stops (9) and front of cradle frame is seated on trailer. trailer.trailer.

r. Release the joystick.

s. Ensure cradle rollers (5) have contacted trailer stops (9).

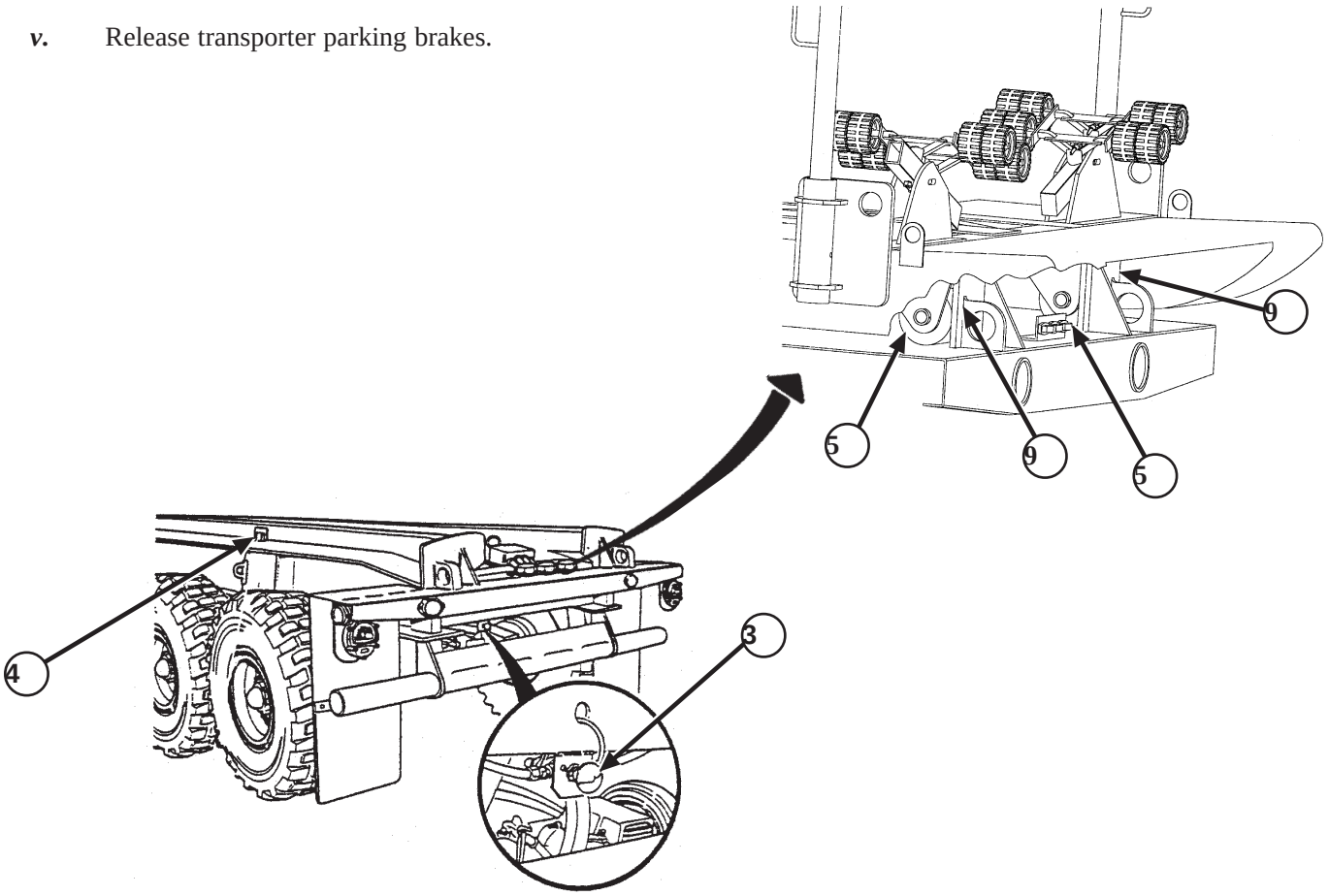
t. Pull knob (3) and engage locks (4).

NOTE

If locks do not engage, raise cradle slightly and lower again. Cradle should seat completely.

u. Apply the service brakes pedal.

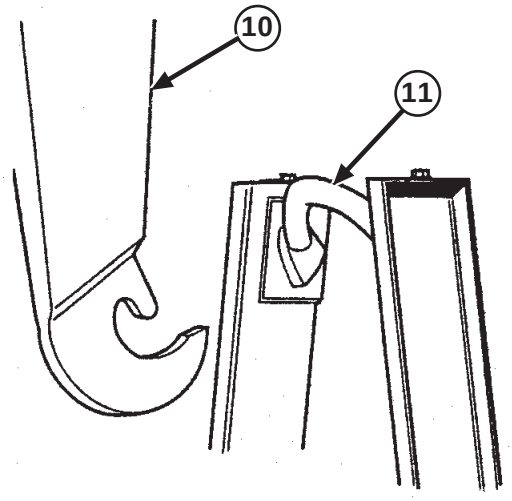
v. Release transporter parking brakes.



2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

NOTE

It may be necessary to repeat the following steps several times to clear lift-hook from hook bar.



w. Place transmission in Neutral (N), release the service brake pedal, and place transmission range selector in Drive (D). Move transporter forward approximately 3 inches (76.2 cm), and apply service brake pedal.

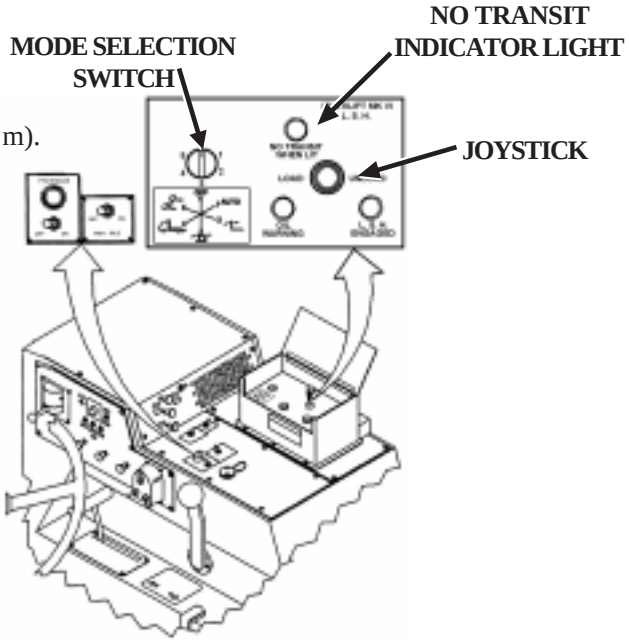
x. Move the joystick to the UNLOAD position to allow top of LHS hook arm (10) to clear cradle hook bar (11).

NOTE

Do not move transporter forward more than 3 inches (76.2 cm) to prevent cradle from pulling away from trailer stops.

y. Set the transmission range selector to Drive (D).

z. Move the transporter forward approximately 5 feet (1.52 m).



2-11. LOADING CRADLE ON PLS TRAILER IN MANUAL MODE (Continued).

aa. Apply the transporter parking brakes and set the transmission range selector to Neutral (N).

WARNING

Never drive with NO TRANSIT light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose causing injury or death to personnel.

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

NOTE

Overload warning light will come on when main frame cylinders are fully extended or fully retracted and joystick is being activated.

bb. Move the joystick to the LOAD position and hold in this position until main frame cylinders are fully retracted.

cc. Turn the MODE SELECTION switch to MAN H.A.

NOTE

Overload warning light will come on when hook arm cylinders are fully extended or retracted and joystick is being activated.

dd. Hold the joystick in the LOAD position until the LHS hook arm cylinder is fully retracted.

CAUTION

- **MODE SELECTION switch must remain in MAN TRANS while transporter is traveling or hydraulic system will overheat causing damage to transporter.**
- **Engine speed must be at idle before using mode selector switch or damage to equipment may result.**

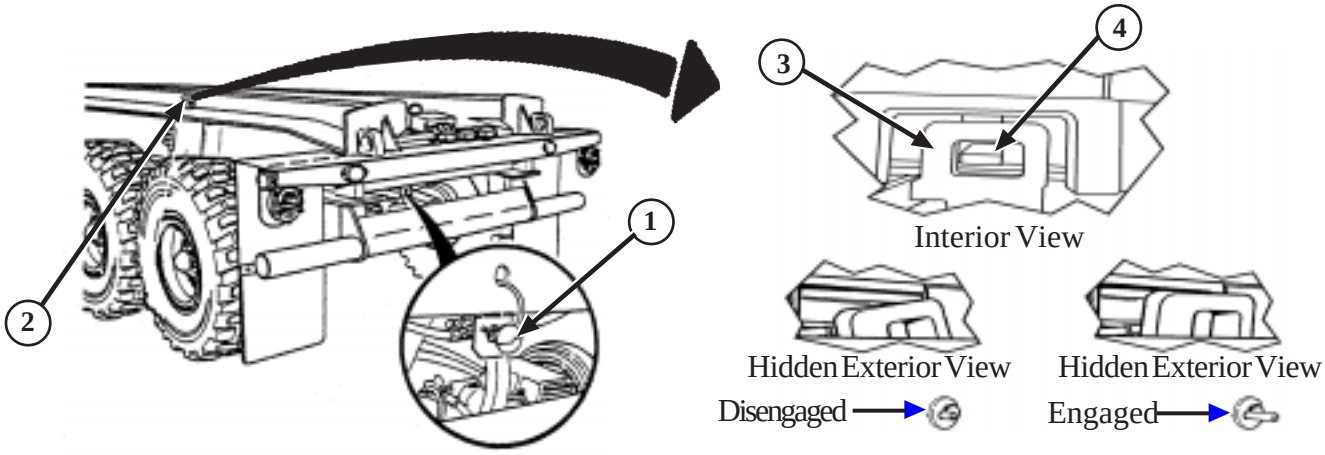
ee. Turn the MODE SELECTION switch to MAN TRANS.

2-12. UNLOADING CRADLE FROM PLS TRAILER IN MANUAL MODE.

CAUTION

- **There must be sufficient air pressure in trailer air system to retract locks or damage to cradle locking tabs can occur while attempting to remove cradle from trailer. If air pressure is not sufficient, use transporter to charge trailer air system using trailer air charging hose. If air system cannot retract locks, use manual lock retract procedure (Ref TM 9-2330-385-14).**
- **Ensure air lines and cables are properly stowed to prevent damage to equipment (Ref TM 9-2330-385-14).**
- **Ensure that trailer drawbar is down against the ground during transfer operation or damage to equipment may result.**

a. Push the knob (1) on trailer to retract locks (2) on trailer.



b. Inspect that both locks (3) are fully retracted from cradle locking tabs (4).

c. Back transporter up in line with trailer and stop approximately 5 feet (1.53 m) from trailer (Ref TM 9-2320-279-10).

d. Apply the service brake pedal and set transmission range selector to Neutral (N).

WARNING

- **Check for overhead power lines or other obstructions before attempting LHS operation. LHS reaches a height of 20 feet (6.1m). Serious injury or death could result from contact with electrical power lines.**
- **Prior to and during any load or unloading cycle, all personnel should stay clear of LHS and cradle or serious injury or death could result to personnel.**

2-12. UNLOADING CRADLE FROM PLS TRAILER IN MANUAL MODE (Continued).

e. Turn PTO ENGAGE to ON.

f. Turn the MODE SELECTION switch to MAN H.A.

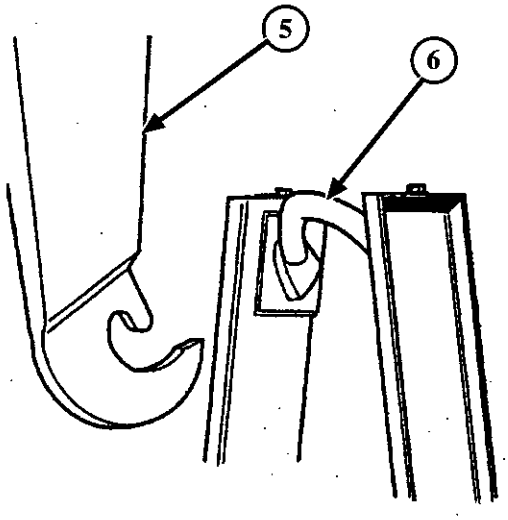
CAUTION

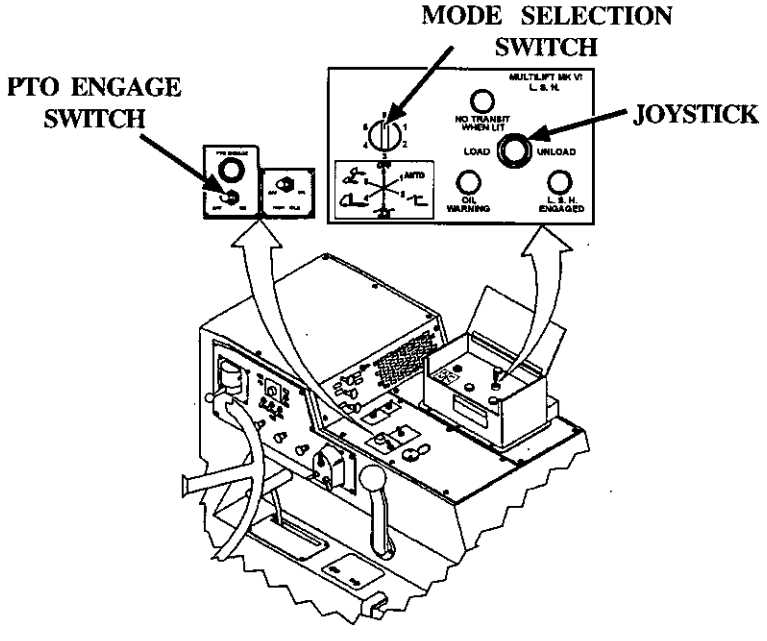
- **To avoid equipment damage, visually check that hook arm cylinders have completed full extension.**
- **To avoid equipment damage, ensure that hook arm cylinders do not complete full extension while operating at engine speed above idle.**

NOTE

Overload warning light will come on when arm cylinders are fully extended and joystick is activated.

g. Move the joystick to UNLOAD position and hold until LHS hook arm cylinders are fully extended.





CAUTION

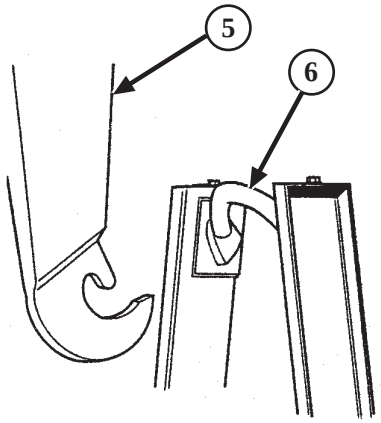
Engine speed must be at idle before using MODE SELECTION switch, or damage to equipment may result.

h. Release the joystick and turn MODE SELECTION switch to MAN M.F.

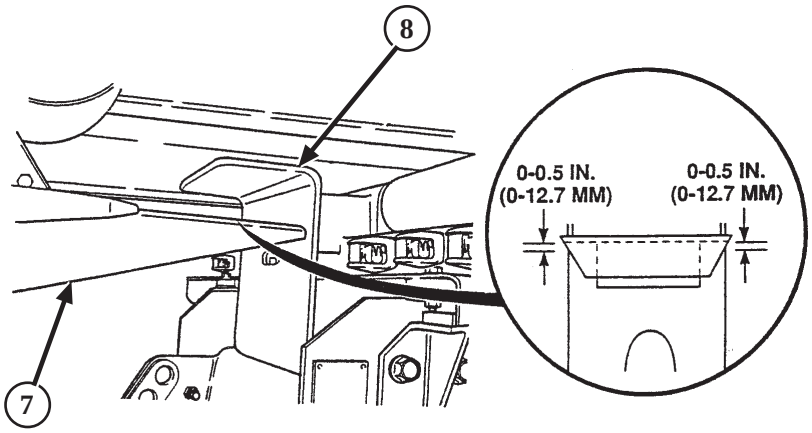
i. Move the joystick to the UNLOAD position and hold until hook arm (5) has moved below level at cradle hook bar (6).

2-12. UNLOADING CRADLE FROM PLS TRAILER IN MANUAL MODE (Continued).

j. Set transmission range selector to Reverse (R) and release service brake pedal. Back transporter up until hook arm (5) contact cradle hook bar (6).



k. Apply the parking brake, and put transmission range selector in Neutral (N).



CAUTION

- **Ensure that trailer drawbar is down against the ground or damage to equipment may result (Ref TM 9-2330-385-14).**
- **Both of the trailer bumper points must be under the truck bumper stop flange and at least one of the bumper points must contact the bumper stop. The trailer bumper point not contacting the transporter bumper stop cannot exceed 1/2 inch (12.7cm) or cradle will miss main rail guides and equipment damage may result.**

l. Check that trailer bumper (7) is under flange of transporter bumper stop (8).

2-12. UNLOADING CRADLE FROM PLS TRAILER IN MANUAL MODE (Continued).

m. Move joystick to the LOAD position and LHS engage hook arm (5) into cradle hook bar (6).

CAUTION

- **To avoid equipment damage, visually check that hook arm cylinder have completed full movement.**
- **To avoid equipment damage, ensure that hook arm cylinders do not complete full movement while operating at engine speed above idle.**

NOTE

Overload warning light will come on when main frame cylinders are fully extended and joystick is being activated.

n. Continue to load in MAN M.F. mode until the main frame cylinders are fully retracted.

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

o. Turn the MODE SELECTION switch to MAN H.A.

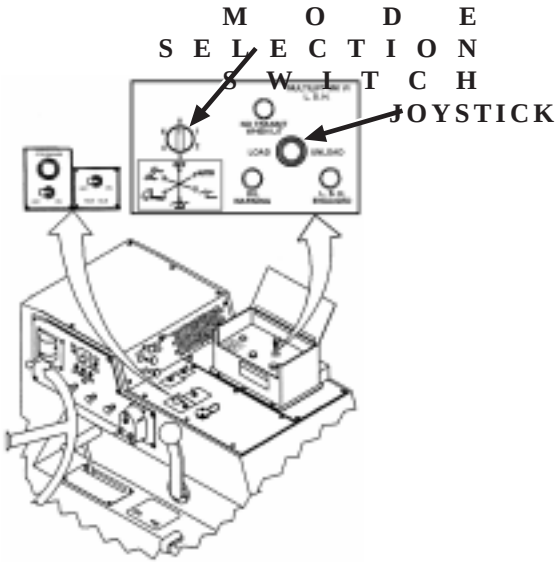
WARNING

Never drive with NO TRANS light illuminated. An illuminated light means LHS is not fully stowed. The load could break loose causing injury or death to personnel.

NOTE

Overload warning light will come on when hook arm cylinder are fully retracted.

p. Hold the joystick in LOAD position until hook bar cylinders are fully retracted.



2-12. UNLOADING CRADLE FROM PLS TRAILER IN MANUAL MODE (Continued.

CAUTION

Engine speed must be at idle before using MODE SELECTION switch or damage to equipment may result.

NOTE

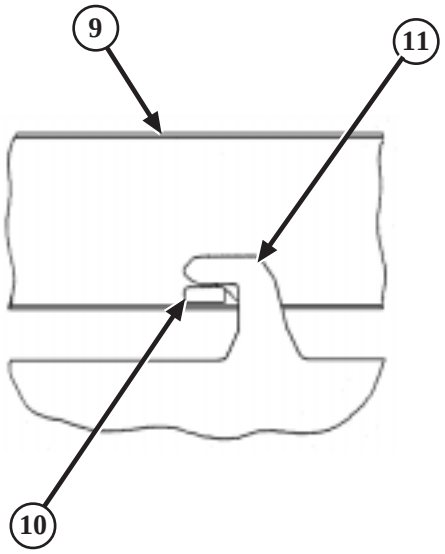
MODE SELECTION switch must remain in MAN TRANS while transporter is traveling. Turn MODE SELECTION switch to MAN TRANS .

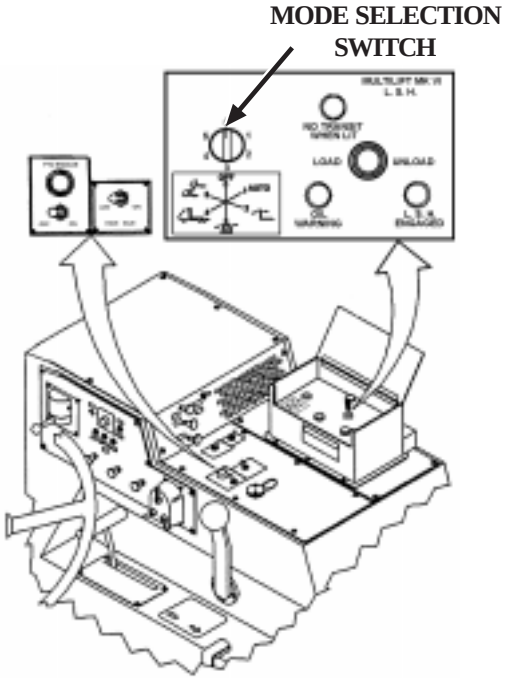
q. Turn MODE SELECTION switch to MAN TRANS.

NOTE

If locks do not engage, raise cradle slightly and lower again. Cradle should seat completely.

r. Inspect cradle frame (9) to ensure two cradle locking tabs (10) are engaged in transporter frame (11).





s. Transporter is now ready for movement.

2-13. PREPARATION FOR STORAGE OR SHIPMENT.

a. Preparation for Storage.

(1) Refer to AR750-1 for administrative storage procedures. If short-term storage is indicated, go on to Step (2).

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(2) Use drycleaning compound (Item 2, Appendix E) to clean or wash grease or oil from all metal parts. All surfaces must be clean to ensure removal of corrosion, soil, grease, or residues.

(3) Dry all parts thoroughly with a rag (Item 8, Appendix E).

(4) Perform the Preventive Maintenance Checks and Services in Tables 2-1 and 4-1.

(5) Schedule the next Preventive Maintenance Checks and Services on DD Form 314, Preventive Maintenance Schedule and Record.

(6) Report all deficiencies on DA Form 2407 if the deficiencies appear to involve unsatisfactory design.

(7) Spot paint all surfaces as necessary (TB 43-0209).

b. Preparation for Shipment.

(1) Complete storage instructions.

(2) Refer to AR 746-1, Packaging of Army Materiel for Shipment and Storage and AR 746-2, Marking, Packaging and Shipment of Supplies and Equipment.

(3) Refer to AR 725-50 and prepare all shipping documents to accompany cradle.

(4) Refer to TB 9-2300-281-35, Standard for Overseas Shipment or Domestic Issue of Special Purpose Vehicles, if cradle is to be shipped overseas.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-14. GENERAL.

a. This section contains special instructions for operating and servicing the cradle under unusual conditions.

b. In addition to performing all normal Preventive Maintenance Checks and Services (PMCS), special care must be taken in regard to cleaning and lubrication when extremes in temperature, humidity, and terrain conditions are present or anticipated. Proper cleaning, lubrication, storage, and handling ensures proper operation and function and also guards against excessive wear.

2-15. OPERATION IN COLD WEATHER.

CAUTION

To ensure that the cradle is not damaged, approved practices and precautions must be followed. FM 9-207 contains general cold weather information.

a. Extensive preparation of materiel scheduled for operation in extreme is necessary. Refer to FM 9-207 and FM 21-305.

b. Refer to Appendix I for proper lubrication during cold weather conditions.

2-16. OPERATION IN HOT WEATHER.

a. Refer to Appendix I for proper lubrication during extreme heat conditions. Adequate lubrication is essential. Heat will cause oil films to evaporate, resulting in inadequate lubrication.

b. Provide adequate protection for exposed rubber surfaces.

2-17. OPERATION IN HIGH HUMIDITY AND SALTWATER AREAS.

a. Moist and salty areas can destroy the rust preventative qualities of oils and greases. Exposed surfaces should be cleaned and lubricated daily. Refer to Appendix I for proper lubrication in high humidity and saltwater areas.

b. When equipment is inactive, unpainted parts should be coated with lubricating oil (Item 6, Appendix E).

2-18. OPERATION IN MUD AND SNOW.

a. Immediately after operation in mud or snow, thoroughly clean, inspect, and lubricate if tactical situation permits. Refer to Appendix I for proper lubrication instructions.

b. Inspect, clean, and lubricate frequently when operating in mud. Refer to Appendix I proper lubrication instructions.

2-19. OPERATION IN DUSTY OR SANDY AREAS.

a. Inspect, clean, and lubricate frequently when operating in dusty or sandy areas. Refer to Appendix I for proper lubrication instructions.

b. Make sure no dust or sand enters exposed mechanisms during inspections and repair operations. Cover exposed parts with tarpaulins or other suitable cover during disassembly and assembly.

c. When beginning operations in dusty or sandy areas, remove lubricants from exposed components if tactical situation permits. Grease and oil will cause dust and sand to accumulate and act as an abrasive, which will cause rapid wear.

CHAPTER 3
OPERATOR'S MAINTENANCE INSTRUCTIONS

Para Contents Page

Section I. Operator Maintenance Instructions

3-1. INTRODUCTION.

This chapter covers maintenance tasks authorized at the Operator Level of Maintenance. Inspect IBC using the PMCS Table 2-1. Report all damaged or missing parts on DA Form 2404 (Equipment Inspection and Maintenance Worksheet). Turn in DA Form 2404 to Unit Level Maintenance.

3-2. REMOVABLE SKID PLATE INSTALLATION.

This Task Covers:

a. Removal

b. Installation

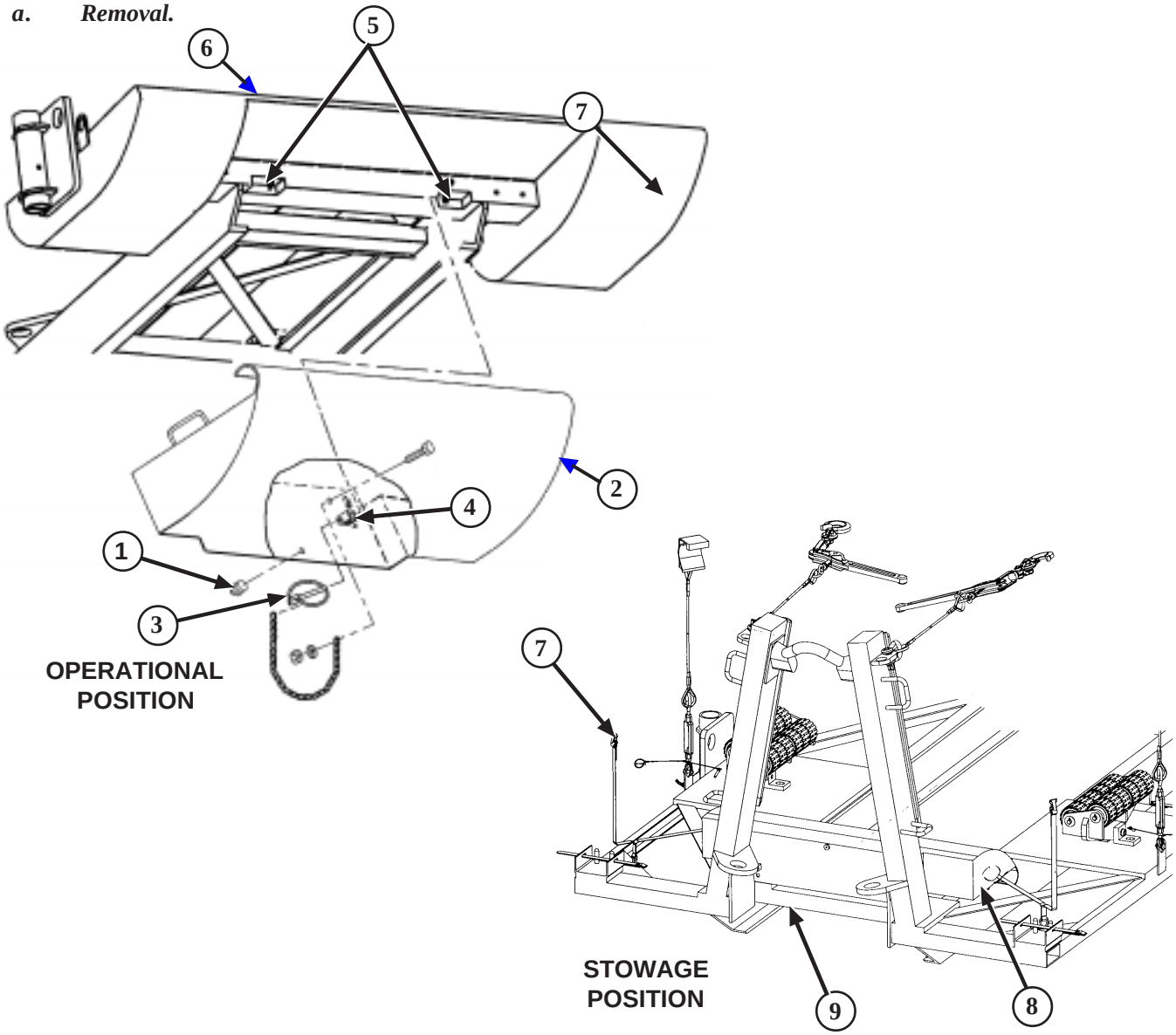
INITIAL SETUP

Tools and Test Equipment:
Wrench: 8 Inch Adjustable (Item 4, Appendix B)

Equipment Conditions:
Cradle on Transporter (para 2-5),
Cradle on PLS Trailer (2-9),
or Cradle on Level Ground (para 2-6)

Personnel Required: 3

a. Removal.



3-2. REMOVABLE SKID PLATE INSTALLATION (Continued).

WARNING

Removable skid plate weighs 100 lbs. (45.4 kg). Remove and replace pipe plug to ensure all water is drained from removable skid plate. It must be supported while removing ring pins, and requires three personnel to remove and replace. Failure to follow this warning may result in injury to personnel or damage to equipment.

NOTE

Perform step ***1*** through ***3*** if removable skid plate is installed in operational position. Perform step ***4*** if installed in stowage position.

(1) Using an 8 inch adjustable wrench, remove pipe plug (1) and drain any accumulated water from removable skid plate (2). Install (1) pipe plug in removable skid plate (2).

(2) With help of two assistants, remove two ring pins (3) from two rear ring pin brackets (4) and frame (5).

(3) Slide removable skid plate (2) rearward and remove from cradle (6).

(4) Remove two tie-down straps (7) from removable skid plate handles (8). With help of two assistants, lift removable skid plate (2) and remove from cradle frame (6).

b. Installation.

WARNING

Removable skid plate weighs 100 lbs. (45.4 kg). Remove and replace pipe plug to ensure all water is drained from removable skid plate. It must be supported while installing ring pins, and requires three personnel to remove and replace. Failure to follow this warning may result in injury to personnel or damage to equipment.

NOTE

Perform step ***1*** if removable skid plate is to be installed in operational position. Perform step ***2*** through ***4*** if being installed in stowage position.

(1) With help of two assistants, position removable skid plate (2) right side up on rear cradle (6). Slide removable skid plate (2) forward until ring pin brackets (4) are aligned with frame (5). Secure with two ring pins (3).

(2) With help of two assistants, position removable skid plate (2) wrong side up on forward cradle frame (9).

(3) Slide removable skid plate (2) forward and lower onto forward cradle frame (9).

(4) Secure removable skid plate handles (8) to cradle frame (9) with two tie-down straps (7).

FOLLOW-ON TASKS:
None

3-3. LOAD BINDER CABLE ASSEMBLY REPLACEMENT.

This Task Covers:

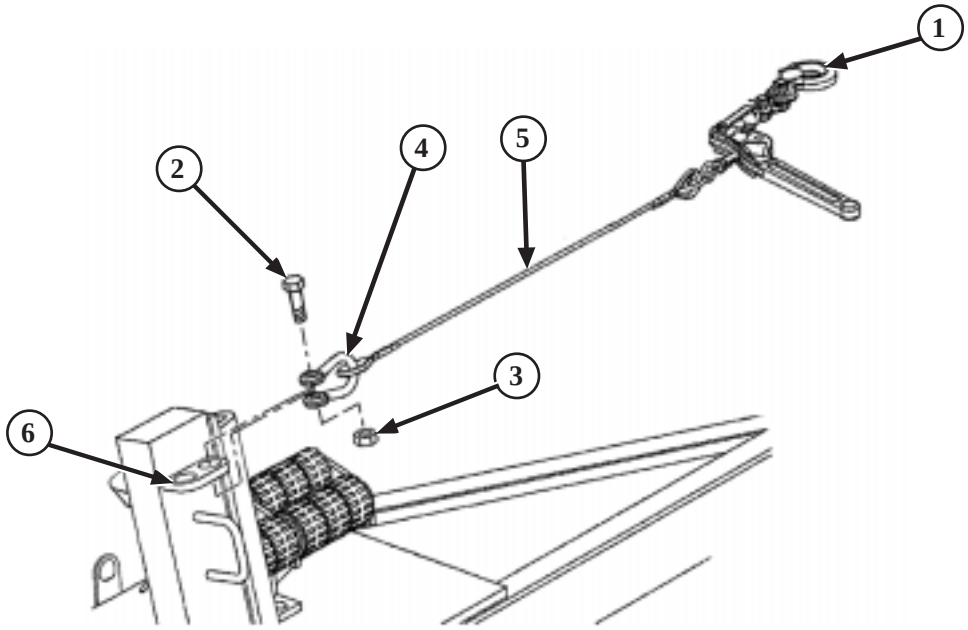
a. Removal

b. Replacement

INITIAL SETUP

Tools/Test Equipment:
Wrench: 8 inch Adjustable (Item 4, Appendix B)
Wrench: 12 inch Adjustable (Item 5, Appendix B)

Equipment Conditions:
Bridge Erection Boat Installed on Cradle (para 2-8)



a. Removal.

NOTE

Both left and right load binder cable assemblies are removed the same way. Left side is shown.

(1) Disengage eye hook (1) from bridge erection boat.

(2) Using two adjustable wrenches, remove bolt (2) and nut (3) from chain shackle (4).

(3) Remove load binder (5) and chain shackle (4) from cradle frame (6).

3-3. LOAD BINDER CABLE ASSEMBLY REPLACEMENT (Continued).

b. Replacement.

NOTE

Both left and right load binder cable assemblies are replaced the same way. Left side is shown.

(1) Using two adjustable wrenches, install bolt (2) in chain shackle (4) and secure with nut (3).

(2) Install chain shackle (4) in loop of load binder (5) and cradle frame (6).

(3) Install eye hook (1) on bridge erection boat.

FOLLOW-ON TASKS:
None

3-4. FRONT AND REAR TIE-DOWN CABLE REPLACEMENT.

This Task Covers:

a. Removal

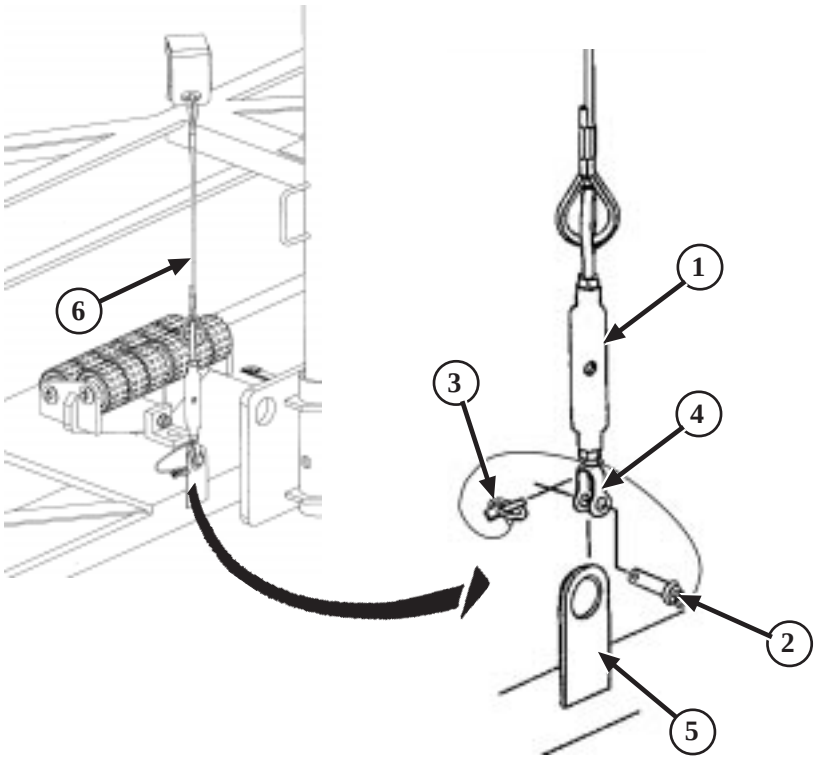
b. Replacement

INITIAL SETUP

Tools/Test Equipment:
Screwdriver, Hand (Item 2, Appendix B)

Equipment Conditions:
Bridge Erection Boat Installed on Cradle (para 2-10)

a. Removal.



NOTE

Both the Front (shortest) and Rear (longest) tie-down cables are removed the same way. Front tie-down cable is shown.

(1) Using a screwdriver, loosen turnbuckle (1) enough to remove headed straight pin (2).

(2) Remove ring pin (3) from headed straight pin (2).

(3) Remove headed straight pin (2) from turnbuckle jaw (4) and cradle frame (5).

(4) Remove front tie-down cable assembly (6) from bridge erection boat.

(5) Store front and rear tie-down cable assembly (6) in bridge erection boat.

3-4. FRONT AND REAR TIE-DOWN CABLE REPLACEMENT (Continued).

b. Replacement.

NOTE

Both the Front (shortest) and Rear (longest) tie-down cables are replaced the same way. Front tie-down cable is shown.

(1) Retrieve front tie-down cable assembly (6) from bridge erection boat.

(2) Position front tie-down cable assembly (6) on bridge erection boat.

(3) Using a screw driver, loosen turnbuckle (1) enough to align turnbuckle jaw (4) and cradle frame (5).

(4) Install headed straight pin (2) and secure with ring pin (3).

(5) Using a screwdriver, tighten turnbuckle (1) until there is no longer any slack in front tie-down cable assembly (6).

FOLLOW-ON TASKS:
None

CHAPTER 4
UNIT MAINTENANCE INSTRUCTIONS

Para Contents Page

Section I. REPAIR PARTS; SPECIAL TOOLS; COMMON TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); SUPPORT EQUIPMENT

4-1. GENERAL.

This section describes the maintenance tasks to be performed on the IBC.

4-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-3. SPECIAL TOOLS LIST, TMDE, AND SUPPORT EQUIPMENT.

There are no special tools or equipment necessary for support of this item.

4-4. REPAIR PARTS.

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (Appendix F).

Section II. SERVICE UPON RECEIPT

4-5. GENERAL.

When a new, used, or reconditioned IBC is received, determine whether it has been properly prepared for service and is capable of performing its mission. Follow the inspection instructions in Paragraph 4-6 and servicing instructions in Paragraph 4-7.

4-6. INSPECTION INSTRUCTIONS.

a. Refer to DD Form 1397 for procedures on unpacking the IBC.

b. Remove all straps, plywood, tape, seals, and wrappings.

c. Remove rust preventive compound from coated exterior parts of the IBC using cleaning compound (Item 1, Appendix E).

4-6. INSPECTION INSTRUCTIONS (Continued).

d. Inspect the IBC for any damage incurred during shipment. Check also to see if the equipment has been modified.

e. Check the equipment against the packing list to ensure that the shipment is complete. Report any discrepancies in accordance with instructions in DA Pam 738-750.

4-7. SERVICING INSTRUCTIONS.

a. Perform the preventive maintenance checks and services contained in the PMCS Table.

b. Schedule the next preventive maintenance checks and services on DD Form 314, Preventive Maintenance Schedule and Record.

c. Report all deficiencies on DA Form 2407 if the deficiencies appear to involve unsatisfactory design.

Section III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-8. GENERAL.

To ensure that the IBC is ready for operation at all times, it must be inspected systematically so that defects can be detected and corrected before they result in serious damage or failure. Table 4-1 contains a listing of PMCS to be performed by Unit maintenance personnel.

4-9. SERVICE INTERVALS.

Perform the PMCS procedures listed in Table 4-1 at the following intervals:

(1) Perform *Semiannual* PMCS procedure once every six months.

4-10. REPORTING REPAIRS.

Report all defects and corrective actions on SF Form 368. If a serious problem is found, report it to your supervisor immediately.

4-11. GENERAL PMCS PROCEDURES.

a. Keep equipment clean. Dirt, oil, and debris may cover up a serious problem. Clean as you work and as needed. Use cleaning compound (Item 1, Appendix E) on all metal surfaces. Use dishwashing compound (Item 2, Appendix E) and water on rubber, plastic, and painted surfaces.

b. While performing PMCS, inspect the following components:

(1) BOLTS, NUTS, AND SCREWS. Make sure they are not loose, missing, bent, or broken. Tighten any that are loose.

(2) WELDS. Inspect for gaps where parts are welded together. Report bad welds to unit maintenance.

4-12. SPECIFIC PMCS PROCEDURE.

a. Unit PMCS procedure is listed in Table 4-1. If any component or system is not serviceable or if given service does not correct the problem, notify your supervisor.

b. Before performing preventive maintenance, read the check required and prepare tools needed to make the check. Have several clean rags (Item 8, Appendix E) handy.

c. Explanations of the column headings in Table 4-1 are as follows:

(1) ITEM NO. The item number column of your PMCS table is to be used for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

(2) INTERVAL. This column of your PMCS table tells you when and how often to do a certain check or service.

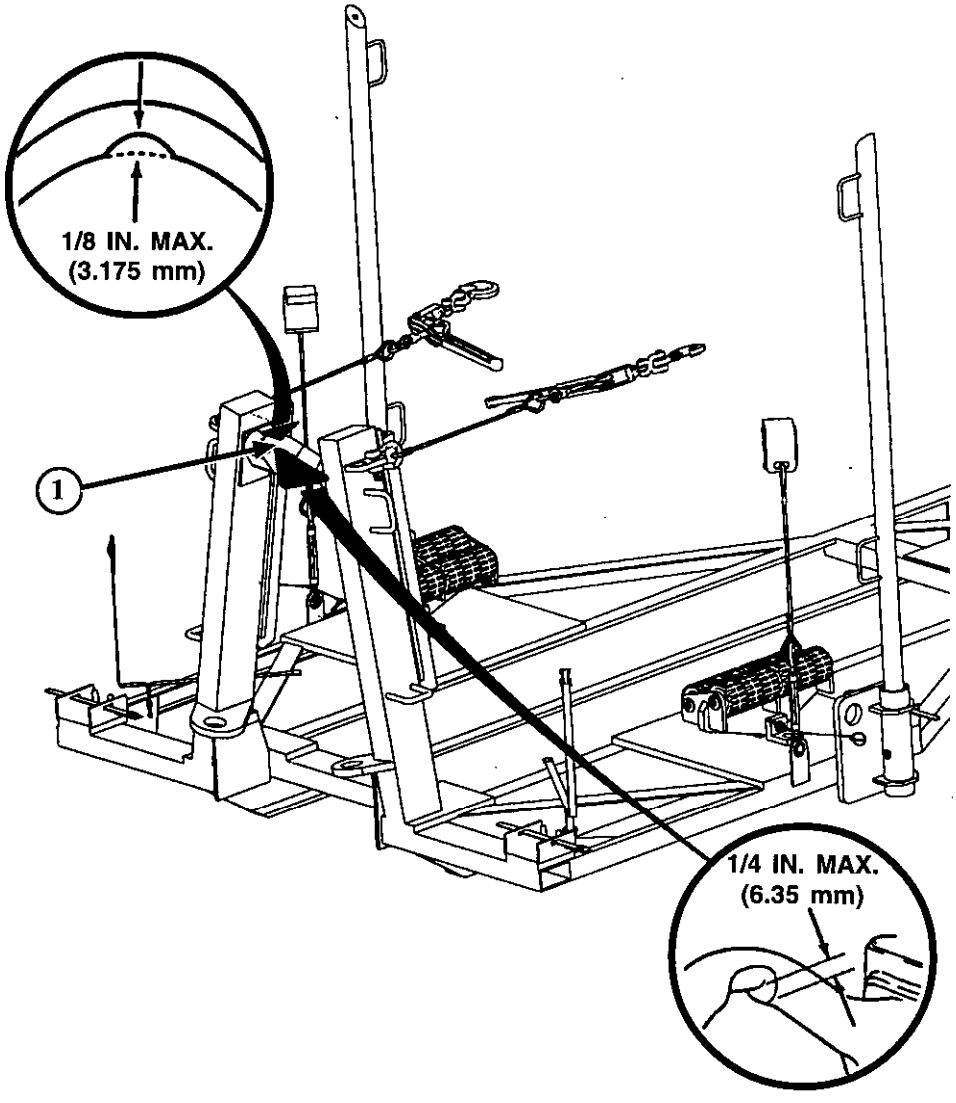
(3) LOCATION, ITEM TO CHECKS/SERVICES. This column of your PMCS table provides the location and the item to be checked or serviced.

(4) PROCEDURE. This column of your PMCS table tells you how to do the required checks and services. Carefully follow these instructions.

(5) NOT FULLY MISSION CAPABLE IF. Information in this column tells you what faults will keep the equipment from being capable of performing its mission. If PMCS reveals faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failures.

TABLE 4-1. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) FOR THE IBC

Item No.	Interval	Location: Item to Check/Service	Procedure	Not Fully Mission Capable if:
1	Semi-Annually	Hook Bar	Check hook bar (1) for wear. If wear at lower back side of hook bar is greater than 1/4 in. (6.35 mm) or greater than 1/8 in. (3.175 mm) at bottom of hook bar, notify supervisor.	Wear at lower back side of hook bar is greater than 1/4 in. (6.35 mm) or greater than 1/8 in. (3.175 mm) at bottom of hook bar.



Section IV. UNIT MAINTENANCE PROCEDURES

4-13. GENERAL.

This chapter contains information on the removal, inspection, cleaning, repair, or replacement and installation (where authorized by the MAC Chart in Appendix B), of the following items at the unit level:

4-14. BUMPER GUARD REPLACEMENT.

This task covers:

a. Removal
b. Cleaning/Inspection
c. Installation

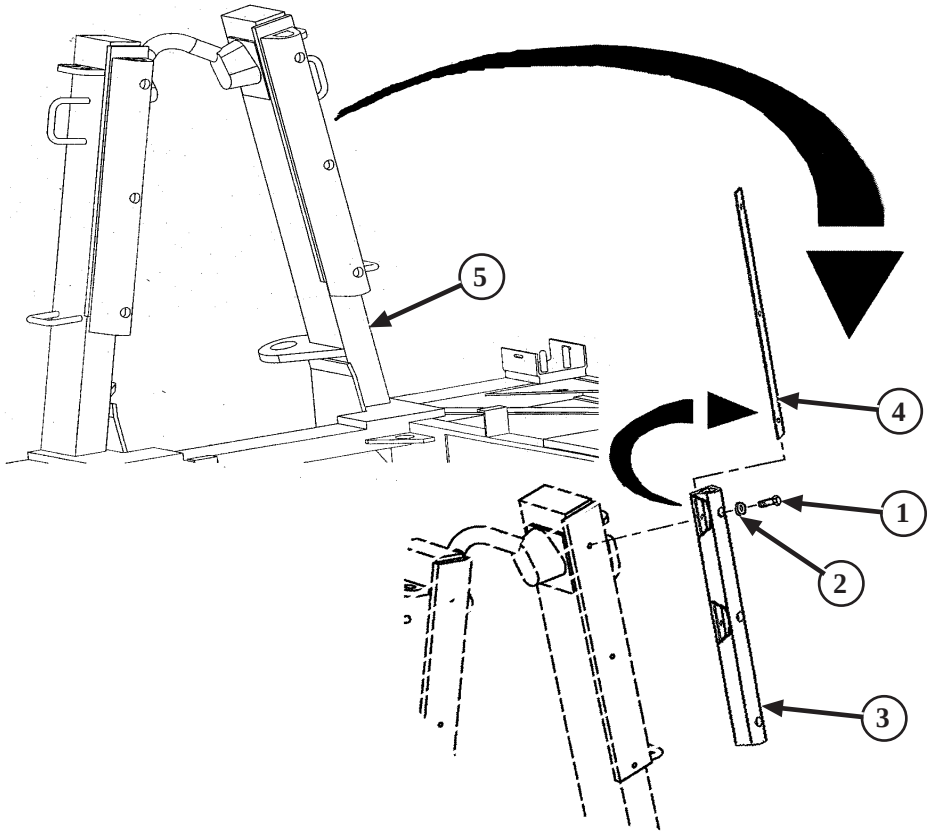
INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Took Kit (Item 1, Appendix B)

Equipment Conditions:
Bridge Erection Boat Removed (Para 2-7)

Materials/Parts:
Cleaning Compound (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Washer, Lock (3) MS35338-48 (Item 11, Appendix H)
Dishwashing Soap (Item 2, Appendix E)
Retaining plate (Para G-5, Appendix G)

a. Removal.



4-14. BUMPER GUARD REPLACEMENT (Continued).

NOTE

Both the left and right rubber bumpers are removed the same way. Right side is shown.

(1) Remove three capscrews (1) and lockwashers (2), rubber bumper (3), and retaining plate (4) from cradle frame (5). Discard lockwashers (2) and retaining plate (4), if damaged.

b. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**

- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**

- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**

- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean rubber bumper with dishwashing soap and a rag, clean all other components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

c. Installation.

NOTE

Both the left and right rubber bumpers are removed the same way. Right side is shown.

(1) Manufacture retaining plate (4) per Appendix G, if damaged.

(2) Position rubber bumper (3) and retaining plate (4) on cradle frame (5) and secure with three capscrews (1) and new lockwashers (2).

FOLLOW-ON TASKS:
None

4-15. STANCHION PIN REPLACEMENT AND REPAIR.

This task covers:

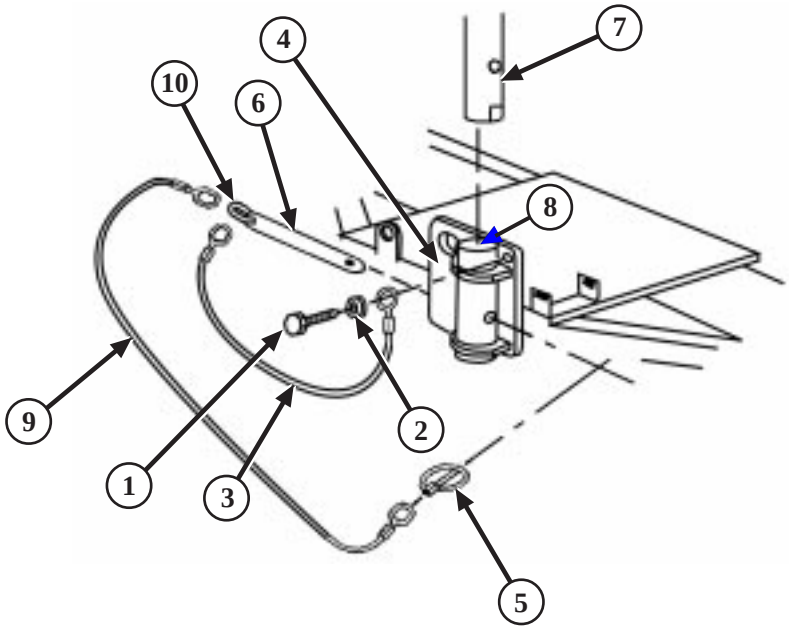
a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Replacement

INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)
Common #1 Tool Set (Item 3, Appendix B)

Equipment Conditions:
Cradle on Transporter (Para 2-5), PLS Trailer (Para 2-9), or Blocking on Level Ground (Para 2-6)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Wire Rope, 12463607-12 (Para G-2, Appendix G)
Wire Rope, 12463607-16 (Para G-2, Appendix G)



a. Removal.

NOTE

All four stanchion pins are removed the same way. Left side is shown.

(1) Remove self-tapping screw (1), flat washer (2), and wire rope (3) from cradle frame (4).

(2) Remove ring pin (5) from headless straight pin (6).

(3) Holding stanchion (7) in place, remove headless straight pin (6) from stanchion pocket (8).

4-15. STANCHION PIN REPLACEMENT AND REPAIR (Continued).

b. Disassembly.

NOTE

All four stanchion pins are disassembled the same way. Left side is shown.

(1) Spread ring pin (5) apart and remove from wire rope (9).

(2) Remove wire rope (9) from retaining ring (10). Discard wire rope (9).

(3) Remove wire rope (3) from retaining ring (10). Discard wire rope (3).

c. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean all components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

d. Assembly.

NOTE

All four stanchion pins are assembled the same way. Left side is shown.

(1) Manufacture wire rope (9) and install on retaining ring (10) per Appendix G (Para G-2). Finished length is 16 inches (40.64 cm).

(2) Manufacture wire rope (3) and install on retaining ring (10) per Appendix G (Para G-2). Finished length is 12 inches (30.48 cm).

(3) Spread ring pin (5) on wire rope (9).

4-15. STANCHION PIN REPLACEMENT AND REPAIR (Continued).

e. Replacement.

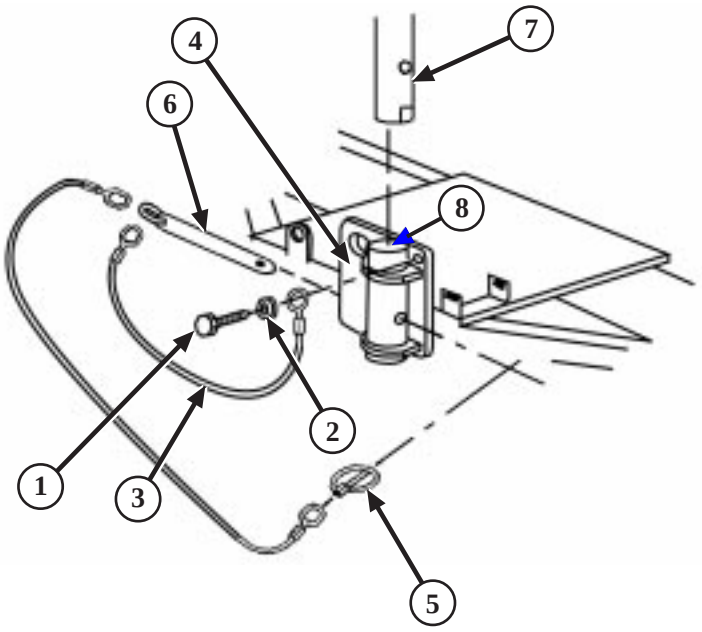
NOTE

All four stanchion pins are replaced the same way. Left side is shown.

(1) Position stanchion (7) in stanchion pocket (8) and align holes.

(2) Install headless straight pin (6) and secure with ring pin (5).

(3) Position wire rope (3) on cradle frame (4) and secure with flat washer (2) and self-tapping screw (1).



FOLLOW-ON TASKS:
None

4-16. REMOVABLE SKID PLATE PIN AND PLUG REPAIR.

This Task Covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly

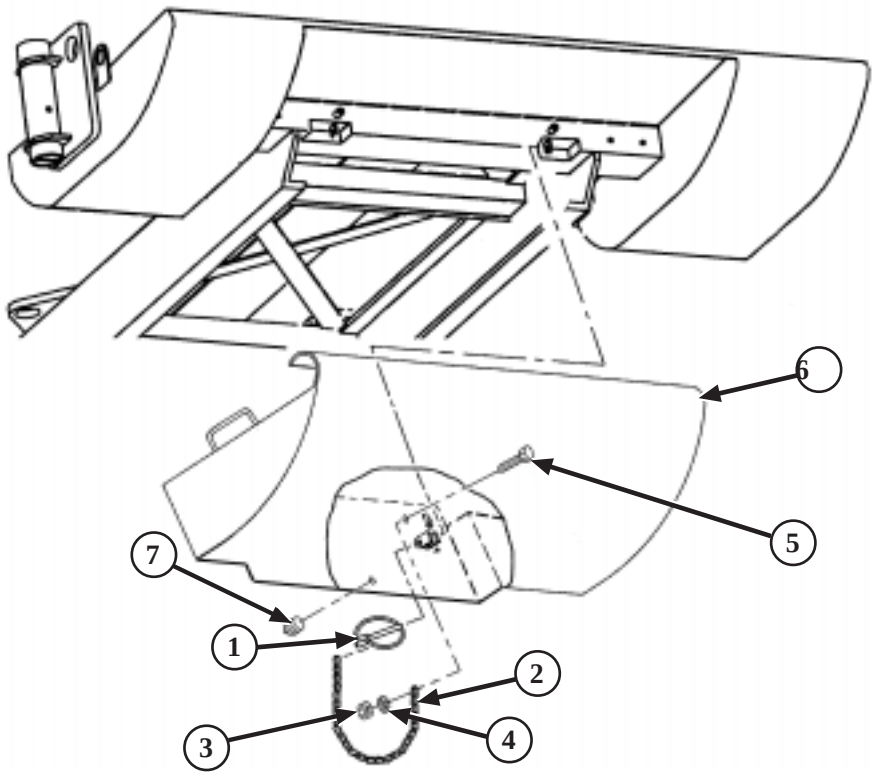
INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)
Common No. 1 Tool Set, (Item 3, Appendix B)

Equipment Conditions:
Removable Skid Plate Removed (Para 3-2)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Chain, 12463633-8 (Para G-6, Appendix G)
Nut, Self-Locking, MS21044C06 (Item 1, Appendix H)

a. Disassembly.



NOTE

Both removable skid plate chains are replaced the same way. Right side is shown.

(1) Spread ring pin (1) apart and remove from chain (2).

(2) Remove self-locking nut (3), flat washer (4), machine screw (5), and chain (2) from removable skid plate (6). Discard chain (2).

(3) If damaged, remove pipe plug (7). Discard pipe plug.

4-16. REMOVABLE SKID PLATE PIN AND PLUG REPAIR (Continued).

b. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**

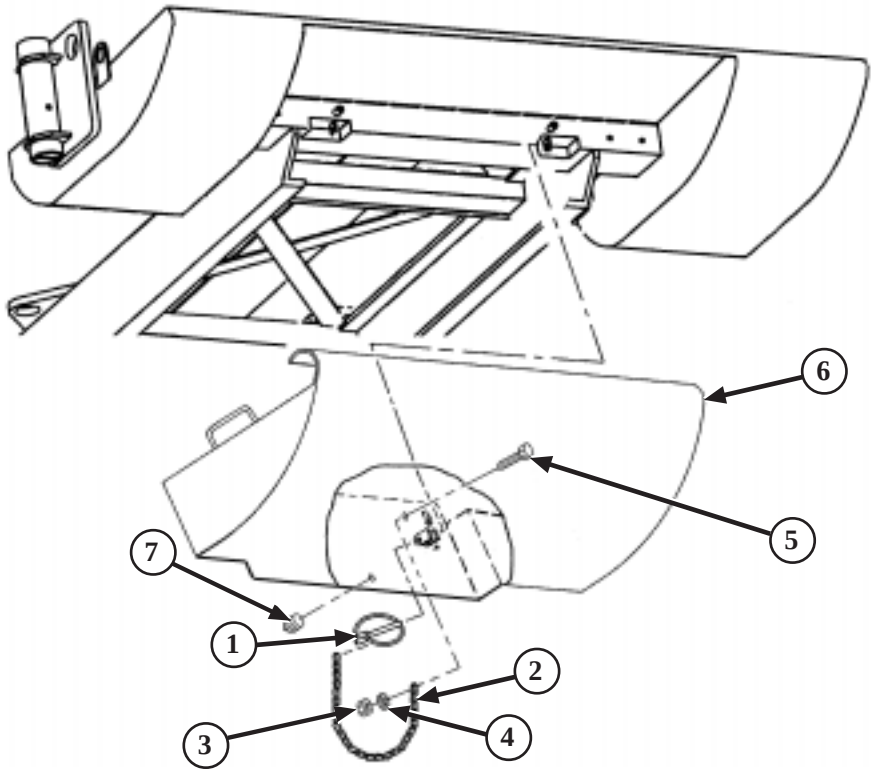
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**

- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**

- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean all components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.



4-16. REMOVABLE SKID PLATE PIN AND PLUG REPAIR (Continued).

c. Assembly.

NOTE

Both removable skid plate chains are assembled the same way. Right side is shown.

(1) Manufacture chain (2) per Appendix G (Para G-6). Finished length is 8 inches (20.32 cm).

(2) Position chain (2) on removable skid plate (6) and secure with machine screw (5), flat washer (4), and new self-locking nut (3).

(3) Spread ring pin (1) apart and install on chain (2).

(4) If removed, install new pipe plug (7).

FOLLOW-ON TASKS:
Install removable skid plate (Para 3-2).

4-17. LOAD BINDER CABLE ASSEMBLY REPAIR

This task covers:

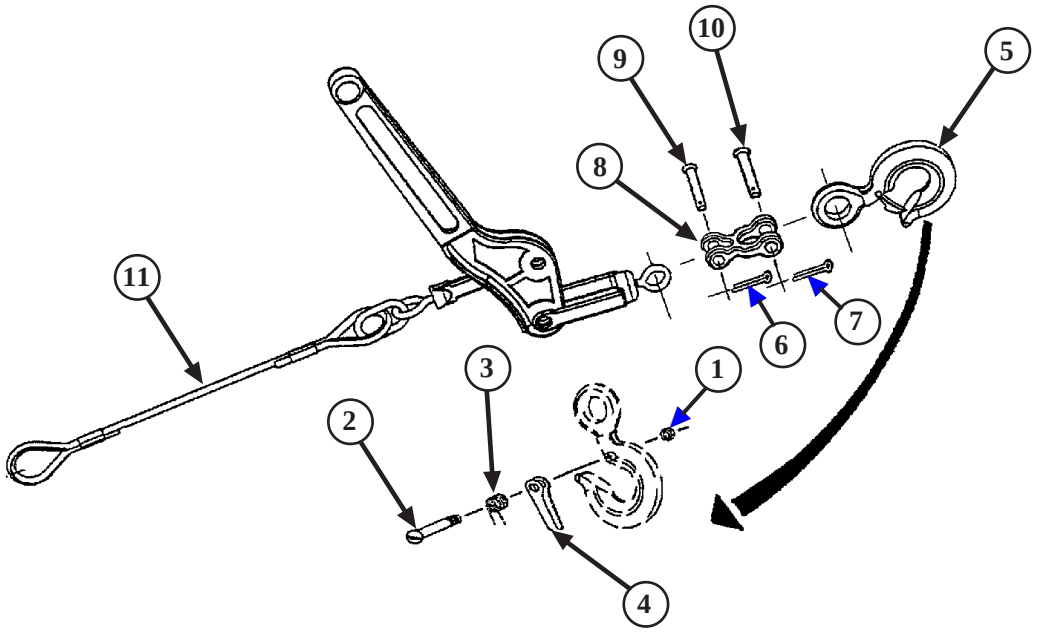
a. Disassembly
b. Cleaning/Inspection
c. Assembly

INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)

Equipment Conditions:
Load Binder Cable Assembly Removed (Para 3-3)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Cotter Pin, MS24665-370 (Item 4, Appendix H)
Cotter Pin, MS24665-511 (Item 5, Appendix H)



a. Disassembly.

NOTE

Perform step 1 if only eye hook latch is damaged.

(1) Remove nut (1) from latch bolt (2). Remove latch bolt (2), spring (3), and latch (4) from eye hook (5).

4-17. LOAD BINDER CABLE ASSEMBLY REPAIR (Continued).

(2) Remove two cotter pins (6 and 7) from double clevis (8). Discard cotter pins (6 and 7).

(3) Remove two double clevis pins (9 and 10) from double clevis (8). Remove double clevis (8) from load binder (11) and eye hook (5).

b. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under**

(1) Clean all components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

c. Assembly.

NOTE

Perform step 1 if only eye hook latch was damaged.

(1) Position spring (3) in latch (4), install latch bolt (2) and secure with nut (1) on eye hook (5). Ensure latch works freely.

(2) Position large end of double clevis (8) around eye hook (5), install large double clevis pin (10) and secure with new cotter pin (7).

(3) Position small end of double clevis (8) around load binder (11), install small double clevis pin (9) and secure with new cotter pin (6).

FOLLOW-ON TASKS:
Install load binder cable assembly (Para 3-3).

4-18. FRONT AND REAR TIE-DOWN CABLE REPAIR.

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly

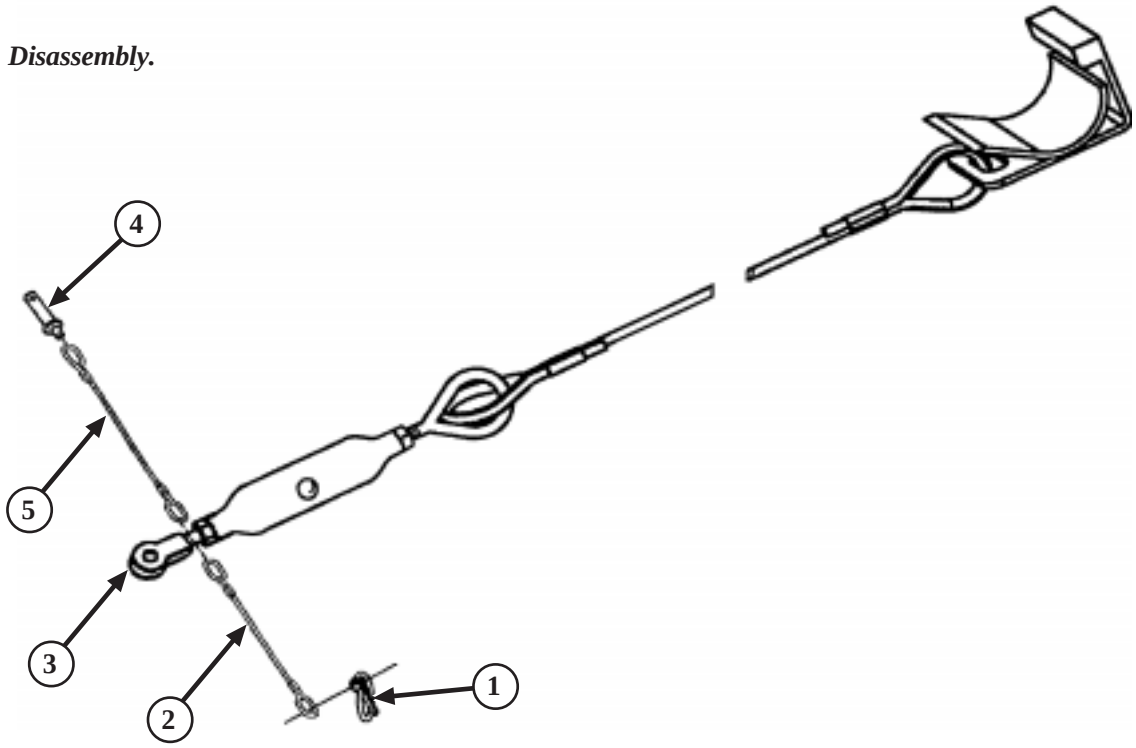
INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)
Common No. 1 Tool Set (Item 3, Appendix B)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Wire Rope, 12463627-8 (Para G-3, Appendix G)
Wire Rope, 12463627-9 (Para G-3, Appendix G)

Equipment Conditions:
Front or Rear Tie-Down Cable Removed (Para 3-4)

a. Disassembly.



NOTE

Both the front (shortest) and rear (longest) tie-down cables are disassembled the same way. Front tie-down cable is shown.

(1) Spread ring pin (1) apart and remove from shortest wire rope (2).

(2) Remove wire rope (2) from turnbuckle jaw (3). Discard wire rope (2).

4-18. FRONT AND REAR TIE-DOWN CABLE REPAIR (Continued).

(3) Using a suitable cutting device, remove straight pin (4) from longest wire rope (5).

(4) Using a suitable cutting device, remove longest wire rope (5) from turnbuckle jaw (3). Discard wire rope (5).

b. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean all components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

c. Assembly.

NOTE

Both the front (shortest) and rear (longest) tie-down cables are assembled the same way. Front tie-down cable is shown.

(1) Manufacture longest wire rope (5) and install on straight pin (4) and turnbuckle jaw (3) per Appendix G (Para G-3). Finished wire rope length is 6 inches (15.24 cm).

(2) Manufacture shortest wire rope (2) and install on turnbuckle jaw (3) per Appendix G (Para G-3). Finished wire rope length is 5 inches (12.7 cm).

(3) Spread ring pin (1) apart and install on shortest wire rope (2).

FOLLOW-ON TASKS:
Install front or rear tie-down cable (Para 3-4).

4-19. REAR ROLLER ASSEMBLY REPAIR.

This task covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Replacement

INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)
Common No. 1 Tool Set (Item 3, Appendix B)

Equipment Conditions:
Bridge Erection Boat Removed (Para 2-7).

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Dishwashing Soap (Item 2, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Grease, Automotive Artillery (GAA) (Item 5, Appendix E)
Cotter Pin (2), MS24665-513 (Item 6, Appendix H)
Lockwasher, MS35338-50 (Item 12, Appendix H)
Lockwasher, (4), MS35338-46 (Item 10, Appendix H)
Self-Locking Nut, MS21044C10 (Item 2, Appendix H)

a. Removal.

NOTE

Both left and right rear roller assemblies are removed the same way. Left side is shown.

(1) Remove capscrew (1), two washers (2), lockwasher (3), self-locking nut (4), two thrust washers (5) and roller holder (6) from cradle frame (7). Discard lockwasher (3) and self-locking nut (4).

b. Disassembly.

NOTE

Both left and right rear roller assemblies are disassembled the same way. Left side is shown.

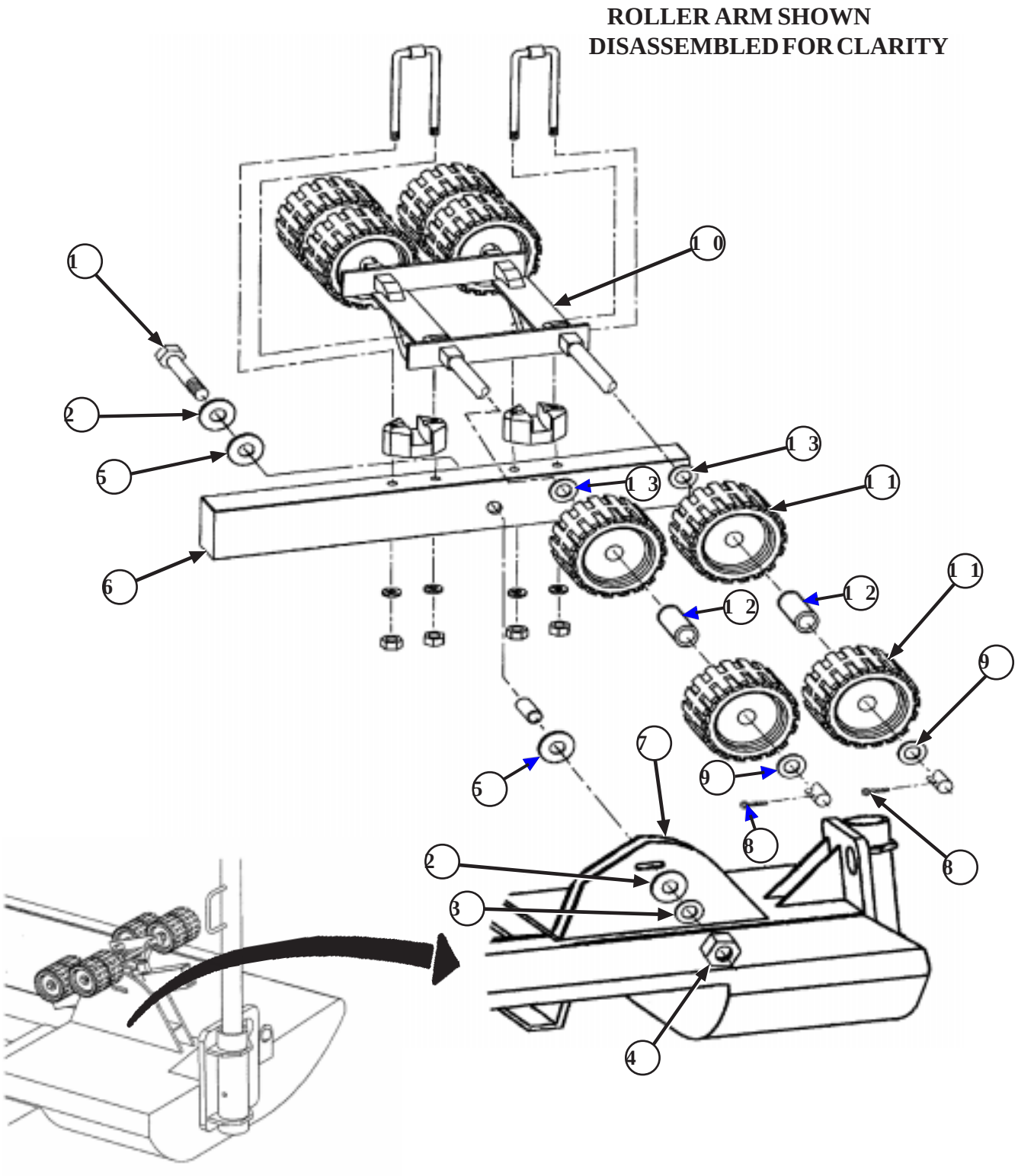
Perform steps 1 through 4 if only rollers are damaged.

(1) Remove cotter pin (8) and washer (9) from roller arm (10). Discard cotter pin (8).

(2) Remove two rollers (11) and plastic pipe (12) from roller arm (10).

(3) Remove washer (13) from roller arm (10).

4-19. REAR ROLLER ASSEMBLY REPAIR (Continued).



4-19. REAR ROLLER ASSEMBLY REPAIR (Continued).

NOTE

Perform step 4 only if rollers are damaged.

(4) Repeat steps 1 through 3 if remaining sets of rollers are damaged.

(5) Remove two nuts (14) and lockwashers (15) from loop clamp (16). Discard lockwashers (15).

(6) Remove loop clamp (16), saddle block (17), and roller arm (10) from roller holder (6).

(7) Repeat step 5 and 6 for remaining loop clamp. If damaged, remove bearing sleeve (18) from roller holder (6). Discard bearing sleeve (18).

c. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean rollers and saddle block with dishwashing soap and a rag. Clean all other components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

d. Assembly.

NOTE

Both left and right roller assemblies are assembled the same way. Left side is shown.

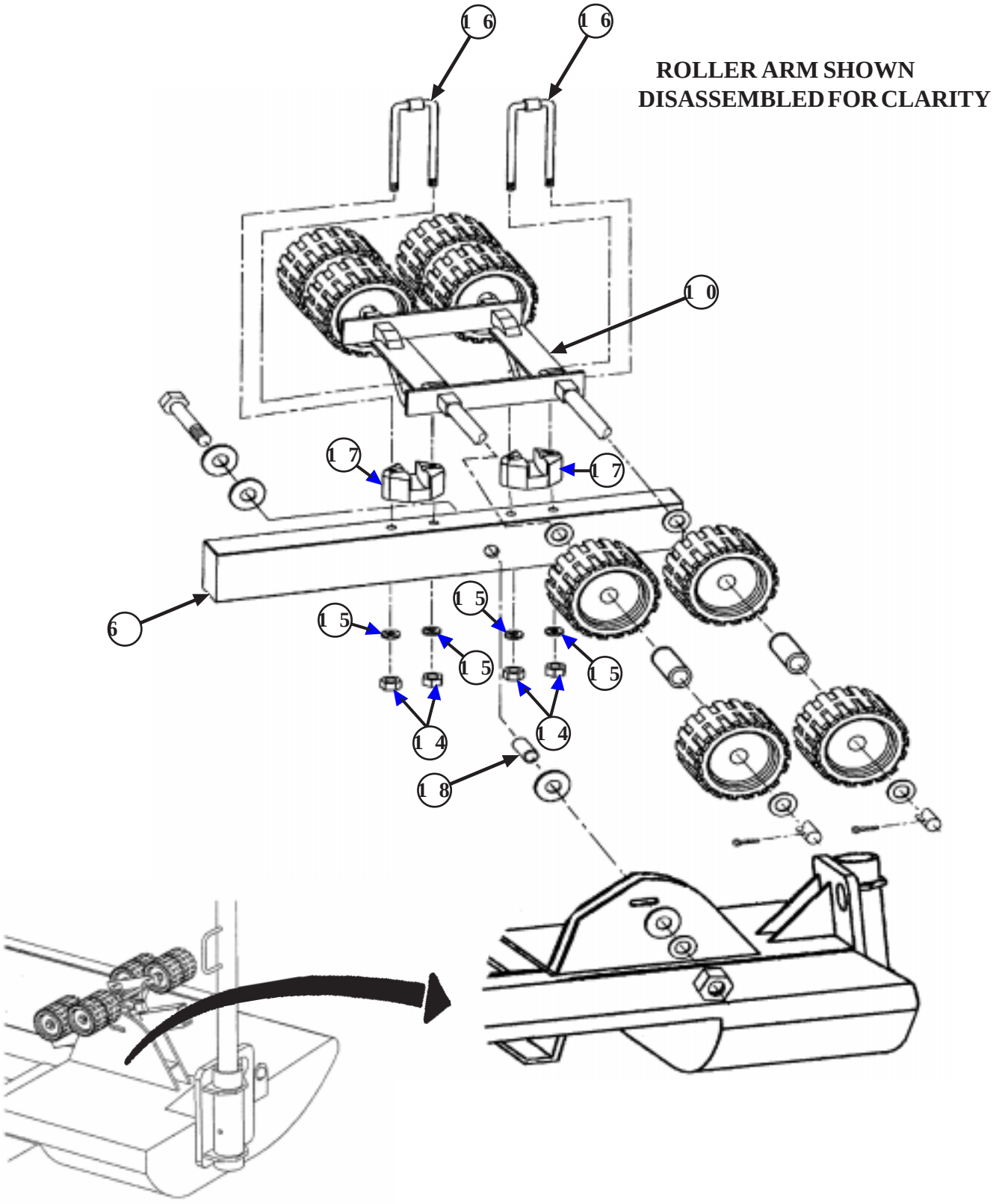
Lightly coat bearing sleeve with GAA grease to help ease installation.

(1) Position new bearing sleeve (18) in roller holder (6). Install new bearing sleeve (18) in roller holder (6). Install bearing sleeve (18) until it is even with outer surface of roller holder (6).

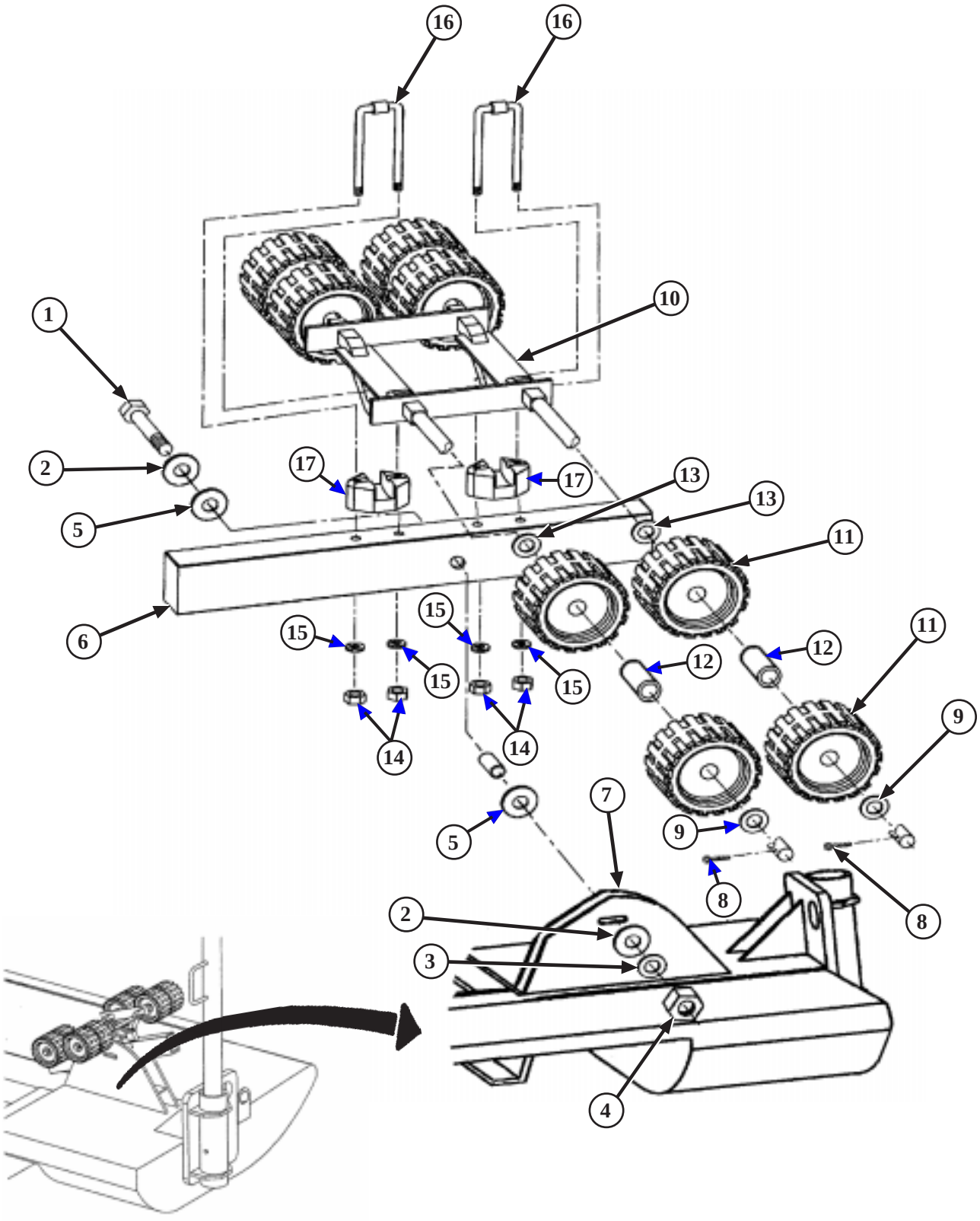
NOTE

Drain hole in roller holder faces down.

4-19. REAR ROLLER ASSEMBLY REPAIR (Continued).



4-19. REAR ROLLER ASSEMBLY REPAIR (Continued).



4-19. REAR ROLLER ASSEMBLY REPAIR (Continued).

(2) Install two loop clamps (16) and roller arm (10) in two saddle blocks (17).

(3) Install roller arm (10) on roller holder (6) and secure with four new lockwashers (15) and four nuts (14).

e. Replacement.

NOTE

- Both left and right rear roller assemblies are replaced the same way. Left side is shown.
- Heavy end of roller holder faces inboard.
- Perform steps 2 through 5 if only rollers were damaged.

(1) Position roller holder (6) on cradle frame (7) and secure with capscrew (1), two washers (2), two thrust washers (5), new lockwasher (3) and new self-locking nut (4).

(2) Install washer (13) on roller arm (10).

(3) Install two rollers (11) and plastic pipe (12) on roller arm (10).

(4) Install washer (9) on roller arm (10) and secure with new cotter pin (8).

(5) Repeat steps 2 through 4 if remaining sets of rollers are damaged.

FOLLOW-ON TASKS:
None

4-20. FRONT ROLLER ASSEMBLY REPAIR.

This task covers:

a. Disassembly
b. Cleaning/Inspection
c. Assembly

INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Tool Kit (Item 1, Appendix B)
Common No. 1 Tool Set (Item 3, Appendix B)

Equipment Conditions:
Bridge Erection Boat Removed (Para 2-7)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Dishwashing Soap (Item 2, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Automotive Artillery Grease (Item 5, Appendix E)
Cotter Pin (2), MS24665-513 (Item 6, Appendix H)
Lockwasher, MS35338-53 (Item 13, Appendix H)
Self-Locking Nut (2), MS21044C16 (Item 6, Appendix H)

a. Disassembly.

NOTE

- Both the left and right front roller assemblies are disassembled the same way. Left side is shown.
- Perform steps 1 through 4 only if rollers are damaged.

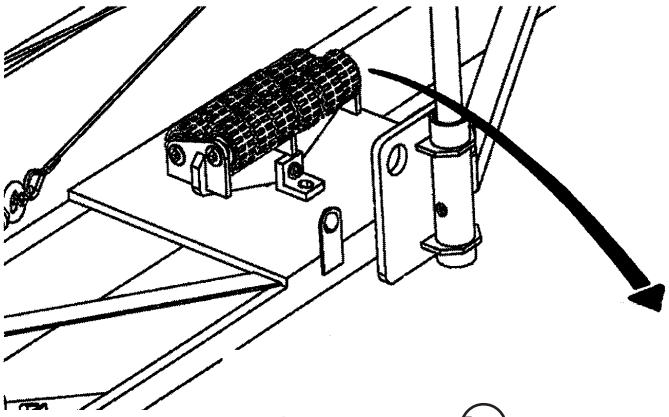
(1) Remove cotter pin (1) and washer (2) from shaft (3). Discard cotter pin (1).

(2) Holding rollers (4) and plastic pipes (5), remove shaft (3) from roller bracket (6). Remove six rollers (4) and four plastic pipes (5) from roller bracket (6).

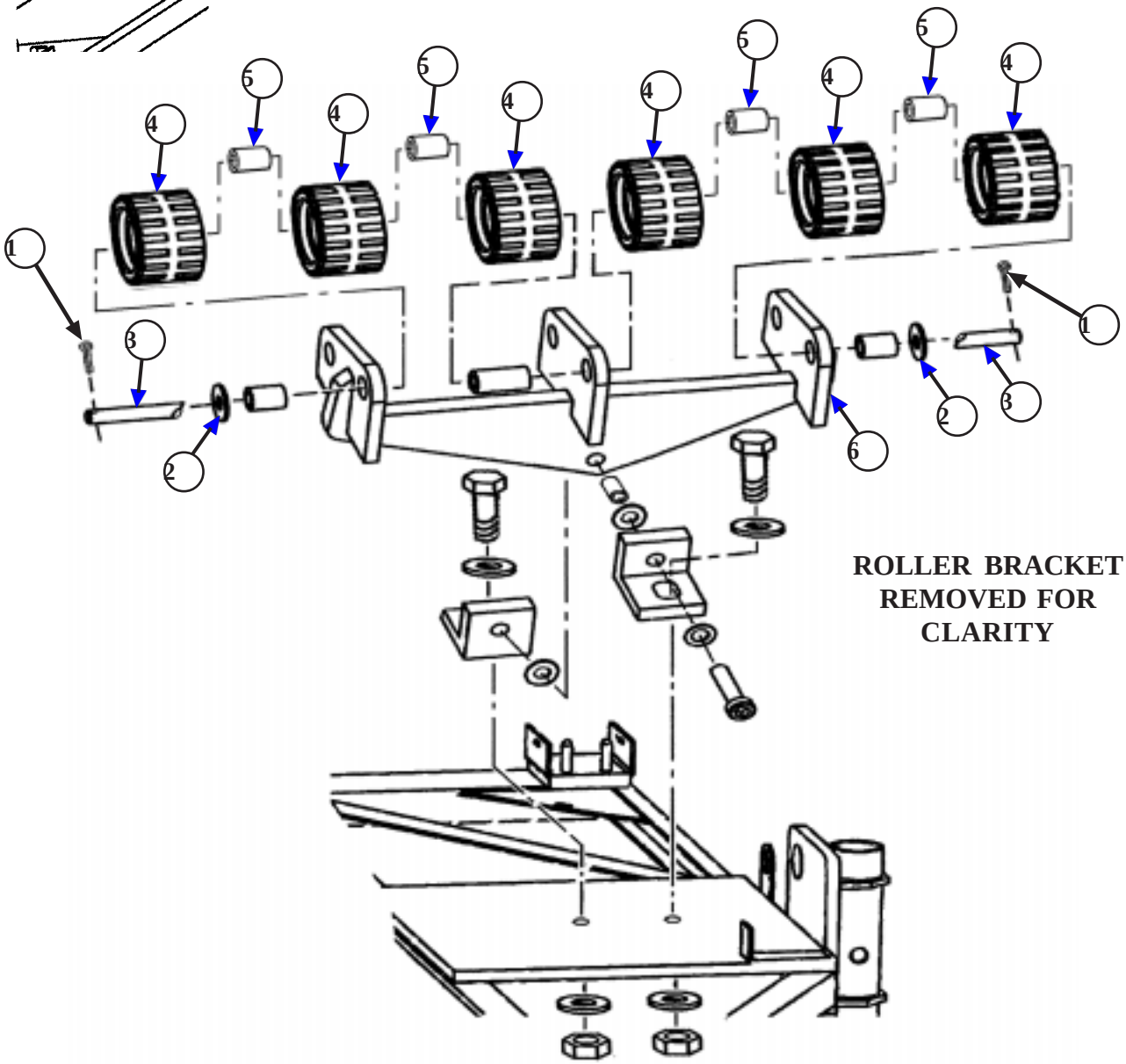
(3) Remove remaining washer (2) and cotter pin (1) from shaft (3). Discard cotter pin (1).

(4) If damaged, repeat steps 1 through 3 for remaining set of six rollers.

4-20. FRONT ROLLER ASSEMBLY REPAIR (Continued).



ONE SET REMOVED FOR CLARITY



ROLLER BRACKET REMOVED FOR CLARITY

4-20. FRONT ROLLER ASSEMBLY REPAIR (Continued).

WARNING

Roller bracket must be supported while removing shoulder screw or roller bracket may fall, causing injury to personnel.

(5) Remove capscrew (7), two washers (8), and self-locking nut (9) from outboard non-threaded angle bracket (10). Remove bracket (10) from cradle (15). Discard self-locking nut (9).

(6) Holding roller bracket (6) in place. Remove shoulder screw (11), lockwasher (12), two thrust washers (13), and roller bracket (6) from inboard threaded angle bracket (14).

(7) Remove capscrew (7), two washers (8), and self-locking nut (9) from inboard threaded angle bracket (14). Remove bracket (14) from cradle (15). Discard self-locking nut (9).

(8) If damaged, remove outer bearing sleeve (16) from roller bracket (6). Discard bearing sleeve (16).

(9) If damaged, repeat step 8 for remaining outer bearing sleeve (16), inner bearing sleeve (17) or lower bearing sleeve (18). Discard bearing sleeves (16, 17, or 18).

b. Cleaning and Inspection.

WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean rollers with dishwashing soap and a rag. Clean all other components with cleaning compound and rag.

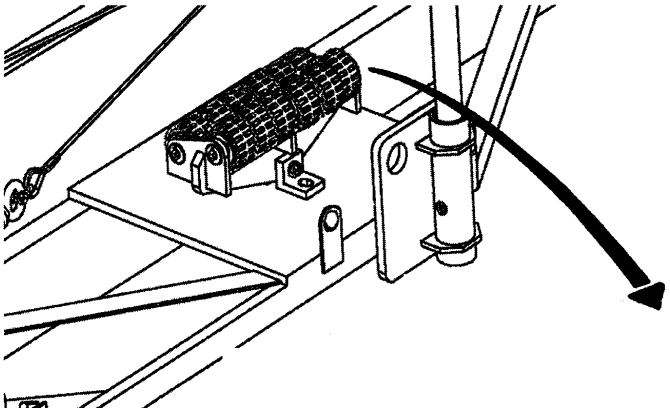
(2) Inspect parts and replace if damaged.

c. Assembly.

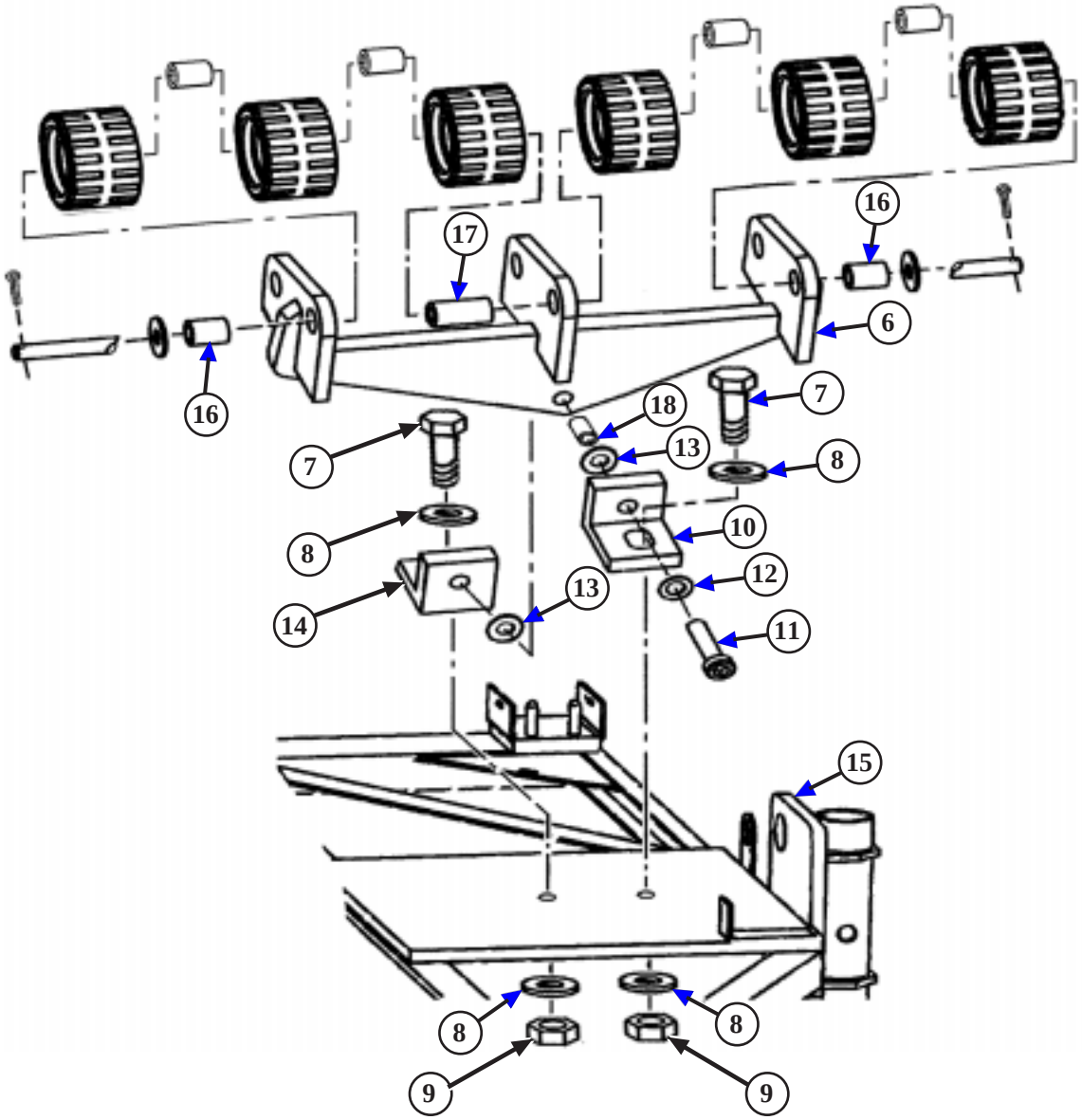
NOTE

- Both left and right front roller assemblies are assembled in the same way. Left side is shown.
- Lightly coat inner, outer, or lower bearing sleeves with GAA grease to help ease installation.
- Perform steps 7 through 9 only if only rollers were removed.

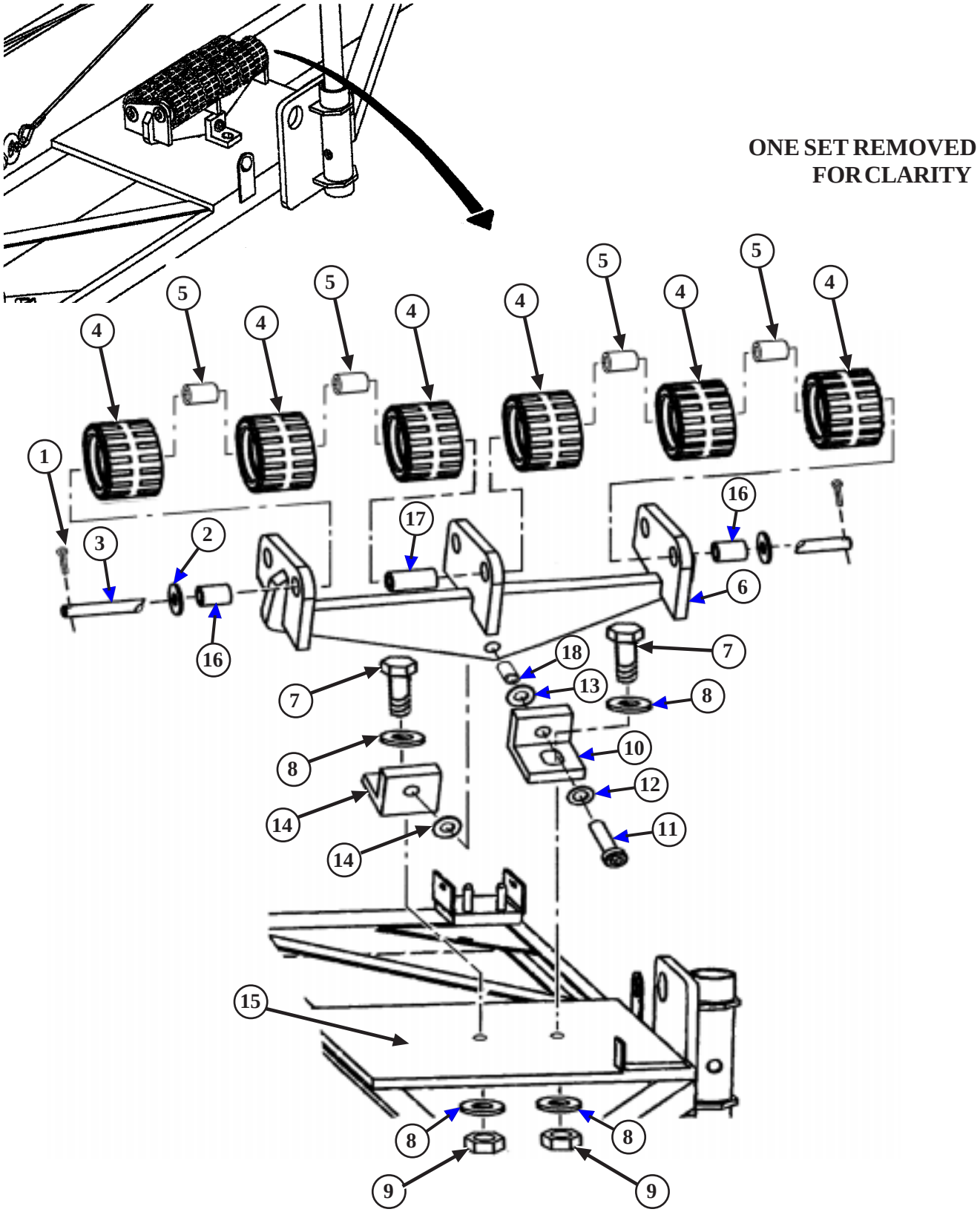
4-20. FRONT ROLLER ASSEMBLY REPAIR (Continued).



ONE SET REMOVED FOR CLARITY



4-20. FRONT ROLLER ASSEMBLY REPAIR (Continued).



4-20. FRONT ROLLER ASSEMBLY REPAIR (Continued).

(1) Position new outer bearing sleeve (16) in roller bracket (6). Install new outer bearing sleeve (16) until it is even with outer surface of roller bracket (6)

(2) If removed, repeat step 1 for other outer bearing sleeve (16).

(3) If removed, position inner bearing sleeve (17) in roller bracket (6). Install drive new inner bearing sleeve (17) into roller bracket (6) until it is exposed 7/8 inch (2.22 cm) on each side of roller bracket (6).

(4) If removed, position new lower bearing sleeve (18) in roller bracket (6). Drive new lower bearing sleeve (18) into roller bracket (6). Continue driving bearing sleeve (18) until it is even with outer surface of roller bracket (6).

(5) Position inboard threaded angle bracket (14) and outboard non-threaded angle bracket (10) on roller bracket (6). Install shoulder screw (11), new lockwasher (12), and two thrust washers (13).

(6) Position roller bracket assembly (6) on boat cradle (15) and secure with two capscrews (7), washers (8), and new self-locking nuts (9).

(7) Install washer (2) and new cotter pin (1) on shaft (3).

(8) Position shaft (3) on roller bracket (6). Install six rollers (4) and four pipes plastic (5) on shaft (3). Install washer (2) and new cotter pin (1).

(9) If removed, repeat steps 7 and 8 for remaining six rollers.

FOLLOW-ON TASKS:
None

4-21. CRADLE ROLLER ASSEMBLY REPAIR.

This Task Covers:

a. Removal
b. Disassembly
c. Cleaning/Inspection
d. Assembly
e. Installation

INITIAL SETUP

Tools/Test Equipment:
General Mechanic's Took Kit, Item 1, Appendix B
Common No. 1 Tool Set (Item 3, Appendix B)

Materials/Parts:
Cleaning Compound, (Item 1, Appendix E)
Rag, Wiping (Item 8, Appendix E)
Spring Pin, MS17602 (Item 9, Appendix G)
Wire Rope, 12463607-20, (Para G-4, Appendix G)

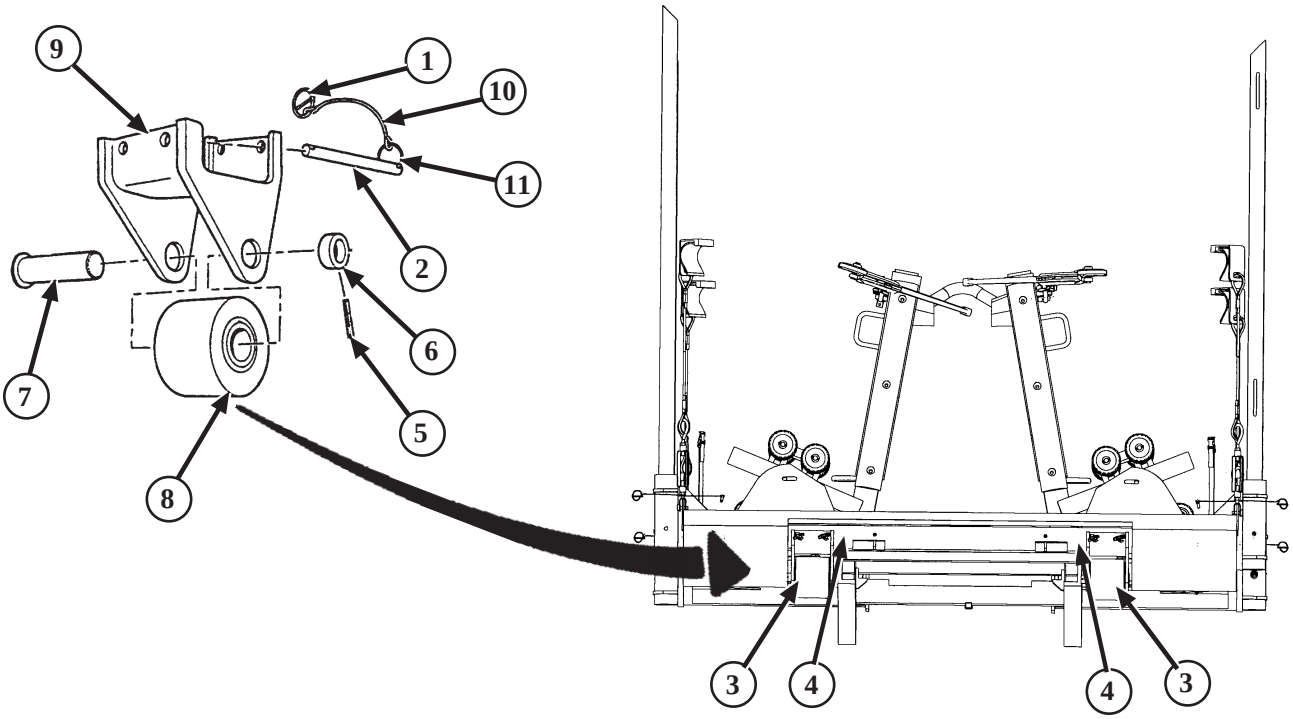
Equipment Conditions:
Cradle on Transporter (Para 2-5), Cradle on PLS Trailer (Para 2-9), or Cradle on level ground (Para 2-6).

a. Removal.

NOTE

Both the left and right cradle rollers assemblies are removed the same way. Right side is shown.

(1) Remove two ring pins (1) from two straight pin assemblies (2).



4-21. CRADLE ROLLER ASSEMBLY REPAIR (Continued).

WARNING

Cradle roller assembly must be supported while removing straight pin assemblies or roller assembly may fall, causing injury to personnel.

(2) Holding roller assembly (3) in place, remove two straight pin assemblies (2) from roller assembly (3) and cradle frame (4).

b. Disassembly.

NOTE

Both left and right cradle roller assemblies are disassembled the same way. Right side is shown.

(1) Remove spring pin (5) from collar (6). Discard spring pin (5).

(2) Remove collar (6), headed straight pin (7), and solid wheel (8) from bracket (9).

NOTE

Perform steps 3 and 4 if straight pin assemblies (2) are damaged.

(3) Spread ring pin (1) apart and remove from wire rope (10).

(4) Remove wire rope (10) from retaining ring (11). Discard wire rope (10).

c. Cleaning and Inspection.

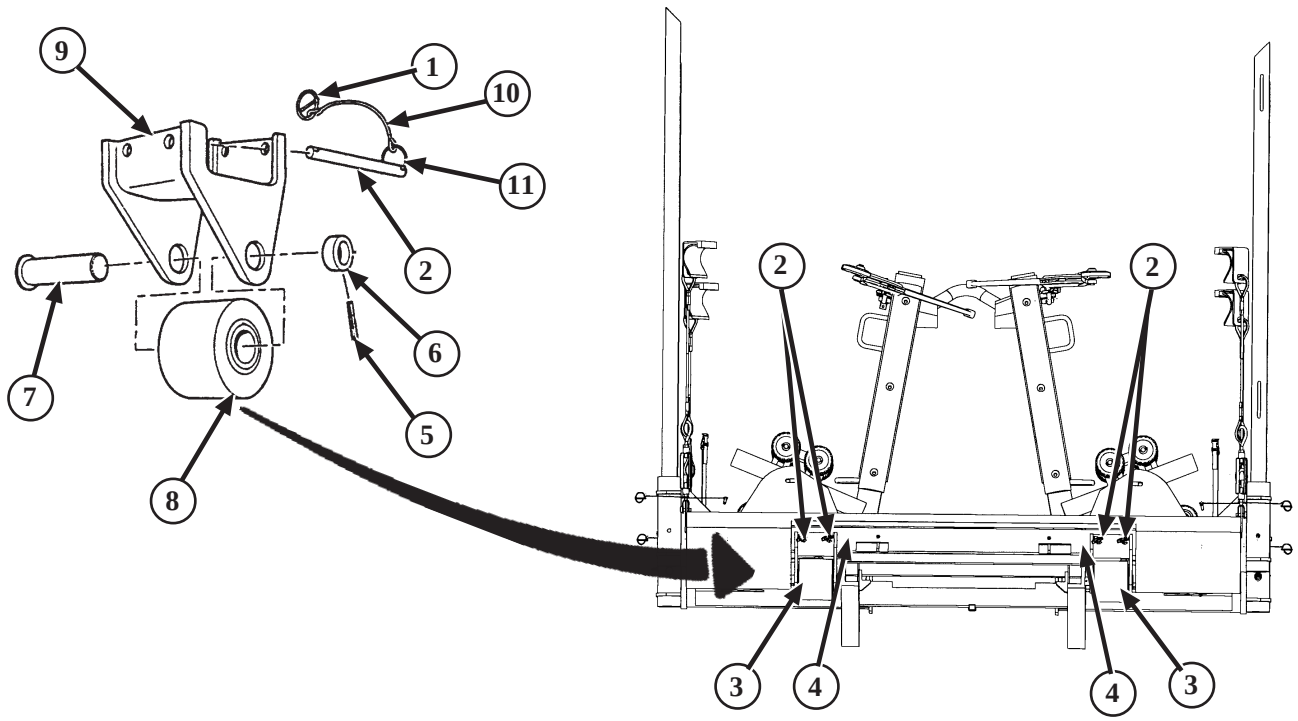
WARNING

- **Drycleaning compound is TOXIC and flammable. Wear protective goggles and gloves; use only in a well-ventilated area; avoid contact with skin, eyes, and clothes; and DO NOT breathe vapors. Keep away from heat or flame. Never smoke when using drycleaning compound; the flashpoint for Type II is 140 degrees F (60 degrees C), and for Type III it is 200 degrees F (93 degrees C). Failure to follow this warning may result in death or injury to personnel.**
- **If personnel become dizzy while using drycleaning compound, immediately get fresh air and medical help. If compound contacts skin or clothes, flush with cold water. If compound contacts eyes, immediately flush them with water and get immediate medical attention.**
- **When drycleaning compound is used, notify the local medical authority (preventive medicine and environmental coordinator concerning medical surveillance, respiratory protection, and disposal requirements.**
- **Do not use drycleaning compound on winch rope (cable). Compound will soak into rope strands and rust, causing rope to deteriorate. This may result in the rope breaking under normal loads and could cause death or injury to personnel.**

(1) Clean all components with cleaning compound and rag.

(2) Inspect parts and replace if damaged.

4-21. CRADLE ROLLER ASSEMBLY REPAIR (Continued).



d. Assembly.

NOTE

Both left and right cradle roller assemblies are assembled the same way. Right side is shown.

(1) Install solid wheel (8) in bracket (9) and secure with headed straight pin (7).

(2) Install collar (6) on headed straight pin (7).

(3) Secure collar (6) on headed straight pin (7) with new spring pin (5).

4-21. CRADLE ROLLER ASSEMBLY REPAIR (Continued).

NOTE

Perform steps 4 and 5 if straight pin assemblies are damaged.

(4) Manufacture wire rope (10) and install on retaining ring (11) per Appendix G (Para G-4). Finished length is 16 inches (40.64 cm).

(5) Spread ring pin (1) apart and install on wire rope (10).

e. Installation

WARNING

Cradle roller assembly must be supported while installing straight pin assemblies or roller assembly may fall, causing injury to personnel.

NOTE

Both the left and right cradle rollers assemblies are installed the same way. Right side is shown.

(1) Holding roller assembly in place, install two straight pin assemblies (2) in roller assembly (3) and cradle frame (4).

(2) Install two ring pins (1) on two straight pin assemblies (2).

FOLLOW-ON TASKS:
None

4-22. DATA PLATE REPLACEMENT.

This task covers:

a. Removal

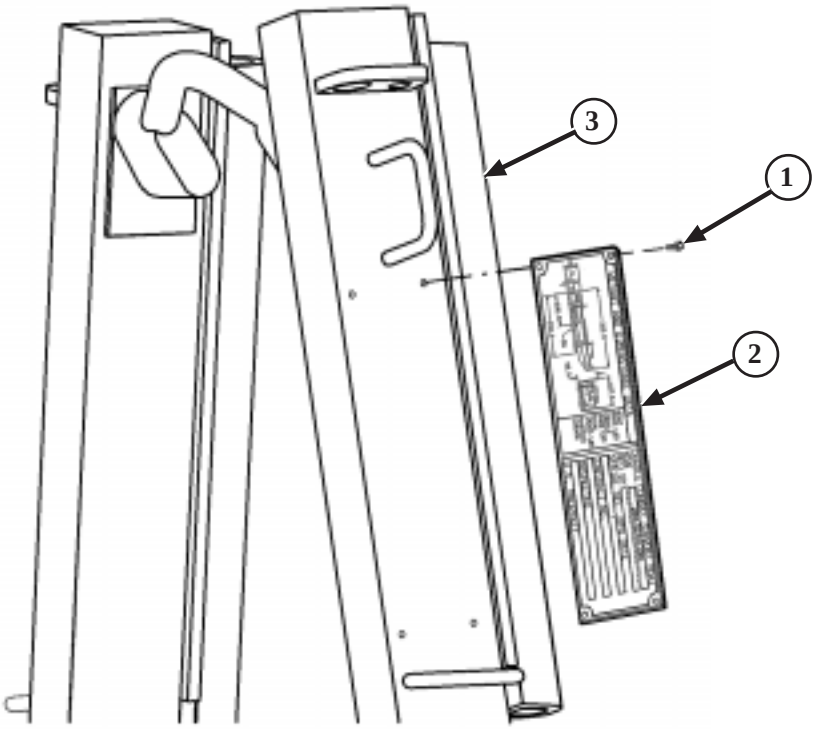
b. Installation

INITIAL SETUP

Tools/Test Equipment:
Common No. 1 Tool Set (Item 1, Appendix B)

Equipment Condition:
Cradle on Transporter (Para 2-5),Cradle on PLS Trailer (Para 2-9), or Cradle on Level Ground (Para 2-6).

a. Removal.



(1) Remove four tapping screws (1) and data plate (2) from cradle frame (3).

b. Installation.

(1) Transfer information from old data plate to new data plate.

(2) Position data plate (2) on cradle frame (3) and secure with four tapping screws (1).

Section V. PREPARATION FOR STORAGE OR SHIPMENT

4-23. GENERAL.

a. This section contains requirements and procedures for administrative storage of equipment that is issued to and in use by Army activities worldwide.

b. The requirements specified herein are necessary to maintain equipment in administrative storage in such a way as to achieve maximum readiness condition.

c. Equipment that is placed in administrative storage should be capable of being readied to perform its mission within a 24-hour period or as otherwise may be prescribed by the approving authority. Before equipment is placed in administrative storage, current PMCS procedures should be completed and deficiencies corrected.

d. Report equipment in administrative storage as prescribed for all reportable equipment.

e. Perform inspections, maintenance services, and lubrication as specified herein.

f. Records and reports to be maintained for equipment in administrative storage are those prescribed by DA Pam 738-750 for equipment in use.

g. A 10 percent variance is acceptable on time, running hours, or mileage used to determine maintenance actions.

h. Accomplishment of applicable PMCS procedures, as mentioned throughout this section, will be done annually.

4-24. DEFINITION OF ADMINISTRATIVE STORAGE.

Equipment placement in administrative storage can be for short periods when:

a. Units lack operating funds, personnel, other resources, or normal usage of its organic materiel.

b. Materiel exceeding the owning unit's capability for operation and maintenance must be retained by that unit for contingency or other reasons.

Installation or unit commanders may authorize the administrative storage of their materiel through guidance furnished in AR 750-1. IBCs should be ready to use within time factors determined by the directing authority. During the storage period appropriate maintenance records will be kept.

4-25. PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE.

a. Storage Site.

(1) Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area "Administrative Storage."

(2) Covered space is preferred.

(3) Open site should be improved hardstand, if available. IBCs should be placed on blocking. Unimproved sites should be firm, well drained and free of excessive vegetation.

4-25. PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE (Continued).

b. Storage Plan.

(1) Store equipment so as to provide maximum protection from the elements and access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.

(2) Take into consideration environmental conditions such as extreme heat or cold, high humidity, soft ground, mud, heavy snows, and blowing sand, dust, or loose debris, or any combination thereof, and take adequate precautions.

(3) Establish a fire plan and provide for adequate fire-fighting equipment and personnel.

c. Maintenance Service and Inspection.

(1) Prior to storage, perform the next scheduled Operator/Crew and Unit PMCS procedures.

(2) Inspect and approve the equipment prior to storage. Do not place equipment that is not mission capable in storage.

d. Auxiliary Equipment and Basic Issue Items.

(1) Process auxiliary equipment and basic issue items (BII) simultaneously with the major item to which they are assigned.

(2) If possible, store auxiliary equipment and BII with the major item.

(3) If stored apart from the major item, mark auxiliary equipment and BII with tags indicating the major item and its registration or serial number and location, and store in protective-type closures. In addition, place a tag or list indicating the location of the removed items in a conspicuous place on the major item.

e. Correction of Shortcomings and Deficiencies. Correct all shortcomings and deficiencies prior to storage, or obtain a deferment from the approving authority.

f. Lubrication. Lubricate equipment in accordance with instructions in Appendix I.

g. General Cleaning, Painting, and Preservation.

CAUTION

Do not direct water or steam under pressure against unsealed electrical systems or any exterior opening. Failure to follow this caution may result in damage to equipment.

4-25. PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE (Continued).

(1) Clean dirt, grease, and other contaminants from the equipment, but do not use vapor degreasing.

(2) Remove rust and damaged paint by scraping, wire brushing, sanding, or buffing. Sand to a smooth finish and spot-paint as necessary (refer to TB 43-0209).

(3) After cleaning and drying, immediately coat unpainted metal surfaces with oil or grease, as appropriate.

4-26. CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE.

a. ***Maintenance Services.*** After equipment had been placed in administrative storage, inspect, service, and exercise as specified herein.

b. ***Inspection.*** Inspection will usually be visual and must consist of at least a walk around examination of all equipment to detect any deficiencies. Inspect equipment in open storage weekly, and inspect equipment in covered storage monthly. Inspect all equipment immediately after any severe storm or environmental change. The following are examples of things to look for during a visual inspection:

(1) Condition of preservatives, seals, and wraps.

(2) Corrosion or other deterioration.

(3) Missing or damaged parts.

(4) Water in compartments.

(5) Any other readily recognizable shortcomings or deficiencies.

c. ***Repair During Administrative Storage.*** Keep equipment in an optimum state of readiness. Accomplish the required services and repairs as expeditiously as possible. Whenever possible, perform all maintenance on-site.

4-26. CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE (Continued).

d. ***Exercising.*** Exercise equipment in accordance with Table 4-2 and the following instructions:

(1) SCHEDULED SERVICE. Scheduled services will include inspection per Paragraph the "Inspection" above and will be conducted in accordance with Table 4-2. Lubricate in accordance with instructions in Appendix I.

(2) CORRECTIVE ACTION. Immediately take action to correct shortcomings and deficiencies noted. Record inspection and exercise results on DA Form 2404. Record and report all maintenance actions on DA Form 2407. After exercising, restore the preservation to the original condition.

Table 4-2. Exercise Schedule

Weeks	2	4	6	8	10	12	14	16	18	20	22	24
PMCS						X						X
Scheduled Services						X						X

e. ***Rotation.*** Rotate items in accordance with any rational plan that will keep equipment in an operational condition and reduce the maintenance effort.

4-27. REMOVAL OF EQUIPMENT FROM ADMINISTRATIVE STORAGE.

a. ***Activation.*** Restore the equipment to normal operating condition in accordance with the instructions contained in Chapter 4, Section II.

b. ***Servicing.*** Resume the maintenance service schedule in effect at the commencement of storage or service the equipment before the scheduled dates in order to produce a staggered maintenance workload.

4-28. PREPARATION OF EQUIPMENT FOR SHIPMENT.

a. Refer to TM 55-200, TM 55-601, and TM 743-200-1 for additional instructions on processing, storage, and shipment of materiel.

b. IBCs that have been removed from storage for shipment do not have to be reprocessed if they will reach their destination within the administrative storage period. Reprocess only if inspection reveals any corrosion or if anticipated in-transit weather conditions make it necessary.

c. When an IBC is received and has already been processed for domestic shipment, as indicated on DD Form 1397, the IBC does not have to be reprocessed for storage unless corrosion and deterioration are found during the inspection upon receipt. List on SF Form 364 all discrepancies found because of poor preservation, packaging, packing, marking, handling, loading, storage, or excessive preservation. Repairs that cannot be handled by the receiving unit must have tags attached listing the needed repairs. A report of these conditions will be submitted by the unit commander for action by an engineering maintenance unit.

CHAPTER 5
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

Para Contents Page

Section I. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT AND DIAGNOSTIC (TMDE) AND SUPPORT EQUIPMENT

5-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-2. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT.

Refer to Appendix B, the Maintenance Allocation Chart (MAC) and Appendix (F), RPSTL to determine special tools, Test, Measurement and Diagnostic Equipment (TMDE) and support equipment for the cradle. No fabricated tools are needed.

5-3. REPAIR PARTS.

Repair parts are listed and illustrated in Appendix F, Repair Parts and Special Tools List (RPSTL), covering Unit, Direct Support and General Support Maintenance for the cradle.

Section II. SERVICE UPON RECEIPT

5-4. SERVICE UPON RECEIPT.

Section 4 contains service upon receipt instructions. Specific paragraphs are referenced for different instructions.

Section III. DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE PROCEDURES

5-5. INTRODUCTION.

This paragraph will cover Direct Support and General Support Maintenance procedures for the cradle. All direct Support Maintenance procedures are listed first followed by all General Support Maintenance procedures. The following are general maintenance procedures to keep in mind:

a. ***Removal and Disassembly.***

(1) Precision matched or mated components, assemblies, subassemblies, or parts (other than common hardware) should be marked, handled and stored to preclude damage and to ensure reassembly and installation in their matched positions.

(2) Do not separate bonded, press-fitted, soldered, welded, or riveted parts unless such removal is necessary to clean, inspect, or test that part separately.

b. ***Inspection.***

(1) Inspect for loose, missing or damaged parts.

(2) Check for cracks, rust or pits, especially at weld points.

(3) Inspect all parts to determine if they conform to the wear limits, fits and tolerances established.

c. ***Lubrication.*** General lubrication needed before assembly or installation is called out in the maintenance procedures.

d. ***Assembly.***

(1) Refer to notes or diagram made during disassembly to install precision matched or mated parts.

(2) Torque bolts and nuts as required by Appendix J.

e. ***Testing.*** If needed, test procedures to verify proper operation will be called out in the maintenance procedure.

5-5. INTRODUCTION (Continued).

f. ***Installation.***

(1) Perform alignment and adjustment procedures as listed in the maintenance procedure. Complete any testing required before the cradle is returned to operation.

(2) Pay special attention to requirements for installing cotter pins and similar operations.

g. ***Adjustments.*** Refer to Section 4 for cradle adjustments. No adjustments to the cradle are authorized at the Direct Support/General Support level.

5-6. GENERAL WELDING MAINTENANCE.

WARNING

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

- **ALWAYS use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards**
- **DO NOT use CARC paint without adequate ventilation.**
- **NEVER weld or cut CARC-coated materials.**
- **DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.**
- **BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.**

NOTE

- When weldment cracks are discovered, it is recommended that they be repaired at the next service interval to prevent the length of the crack from increasing and to minimize repair. The following inspection procedures are to be considered as guidelines only. Any cracks discovered during inspections considered more significant, especially from a safety standpoint, should be referred to the supervisor for weld repair decisions. This would include cracks identified in any main structural areas (A-Frame and main rail flanges) and cracks that have opened and could lengthen rapidly during loading/unloading operations.
- Refer to TM 9-237 for welding theory and application.

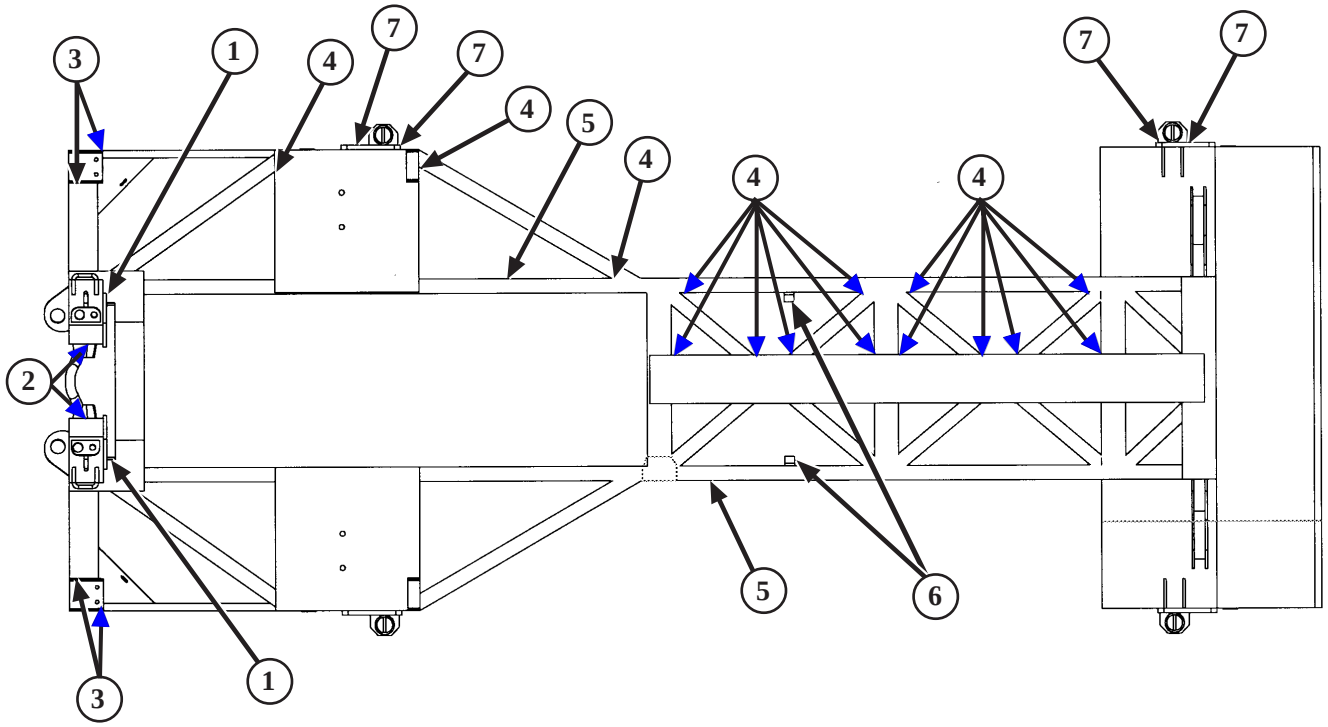
a. ***Weldment Points.*** Thoroughly inspect all weldments for cracks, chips or other damage. Areas include the left and right locking tabs, stanchion pockets, A-Frame interface, cross members, main rails, corner fittings, and the hook bar. Inspect welds for acceptable crack length limits using the following guidelines.

5-6. GENERAL WELDING MAINTENANCE (Continued).

(1) A-FRAME INTERFACE (1). This area includes the A-Frame channel to main rail interface, the inboard and outboard wrapper plates, and the front angle plates. Solid welds in this area are necessary to ensure safe loading and unloading of the cradle. A crack should be repaired before it has reached 2 inches (5.08 cm). The combined length of multiple cracks at any one location should not exceed 4 inches (10.16 cm).

(2) HOOK BAR (2). These welds are located at the base of the hook bar casting on the A-Frame of the cradle. These welds secure the hook bar to the structure and are subjected to a significant portion of the total load during loading and unloading operations. Cracks should be repaired prior to reaching 1 inch (2.54 cm) in length. The combined length of multiple cracks at this location should not exceed 1 1/2 inches (3.81 cm).

(3) CORNER FITTING AND ADJACENT STRUCTURE (3). Due to the high loads that these fittings can see in a transport mode, the crack should be repaired before reaching 1/2 inch (1 cm) in length. The combined length of multiple cracks at any one location should not exceed 1/2 inch (1 cm). This applies to cracks present in the adjoining structure also.



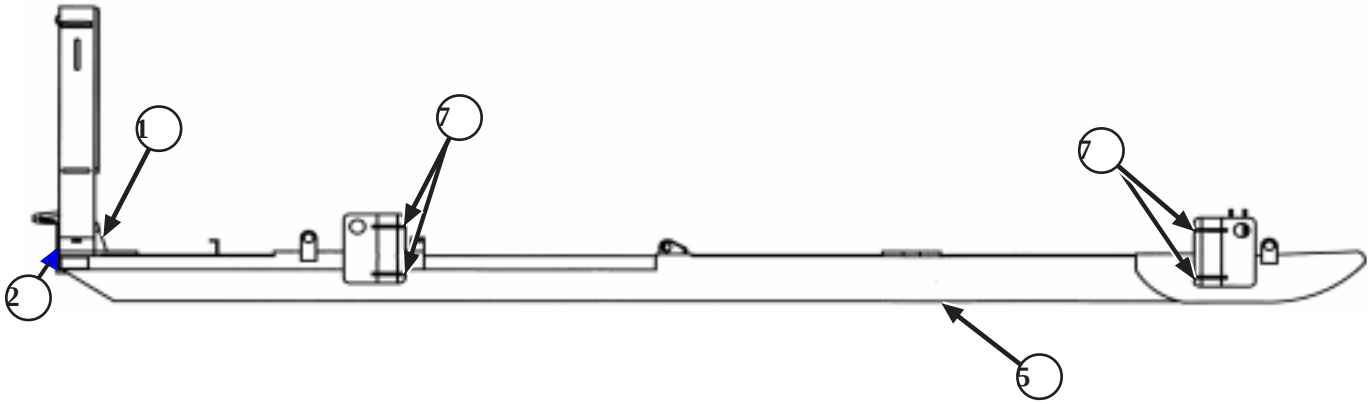
(4) CROSSMEMBERS (4). These welds are located at the junction of the crossmember and the main rails. A crack should be repaired before it has reached 2 inches (5.08 cm) at one location. The total length of all cracks on a single crossmember should not exceed 2 inches (5.08 cm). When cracks are present on several crossmembers, action should be taken to repair it at the next service. If a crossmember is completely missing, repairs should be made prior to use.

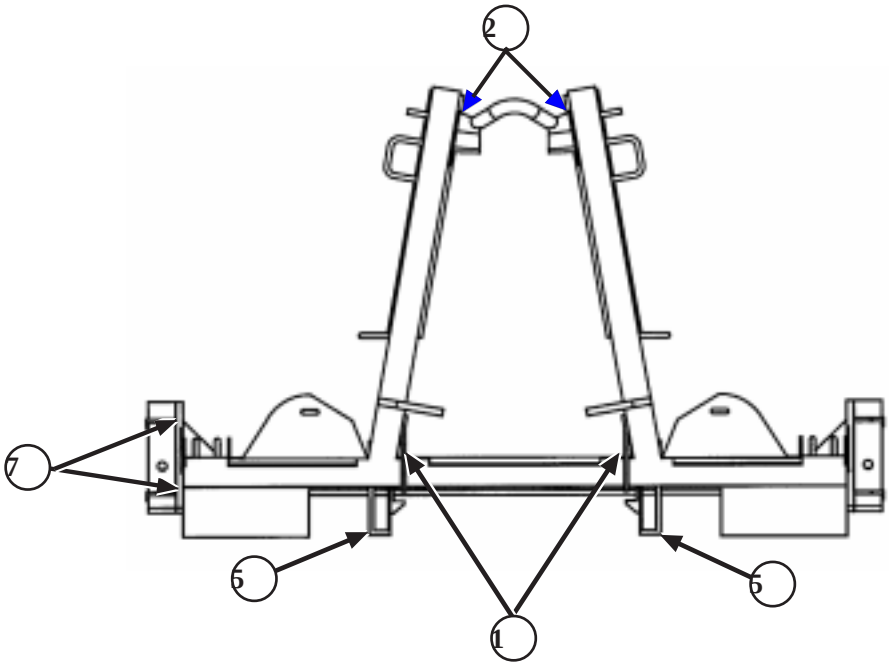
(5) MAIN RAILS (5). The main rails provide a major portion of the load carrying capacity of the cradle. They support a portion of the load while loaded on the transporter and PLS trailer. Cracks in the main rail should be repaired before reaching 1 inch (2.54 cm).

5-6. GENERAL WELDING MAINTENANCE (Continued).

(6) LOCKING TABS (6). The locking tabs are used to secure the cradle to the transporter and PLS trailer. Due to the high loads that these tabs can see in the transport mode, a crack should be repaired before reaching 1/2 inch (1.27 cm) in length.

(7) STANCHION POCKETS (7) The stanchion pockets are used to secure stanchion poles to cradle during bridge erection boat retrieval. A crack should be repaired before it has reached 2 inches (5.08 cm). The combined length of multiple cracks at any one location should not exceed 4 inches (10.16 cm).





5-6. GENERAL WELDING MAINTENANCE (Continued)

CAUTION

Do not weld the cradle while on trailer or truck or damage to equipment may result.

b. ***Cradle Welding.*** Welding on the cradle must be performed off the PLS trailer or transporter. Different areas of the cradle require different weld electrodes. Use the following guidelines to determine the correct weld.

(1) HOOK BAR. Two different welding methods can be used to repair the hook bar.

NOTE

Use minimum preheat and maintain the interpass temperature of 300 degrees F (136 degrees C).

(a) *ERll0S-1 Gas Metal Arc Welding (GMAW).* This method requires the use of a wire feed welder with argon and oxygen shielding gas and ER110S-1 welding wire.

(b) *E11018-M Submerged Metal Arc Welding (SMAW).* This process utilizes a E11018-M stick electrode and an arc welder.

(2) CRADLE LOCKING TABS. Repairing welds on this locking tab requires the use of an arc welder and an ER308 stainless steel stick electrode.

(3) REMAINING CRADLE WELDS. Welding wire ER80S-D2 is used to repair welds on the majority of the cradle with the exception of the hook bar. Welding with ER80S-D2 weld wire requires a wire feed welder and carbon dioxide shielding gas.

APPENDIX A
REFERENCES

A-1. GENERAL.

This appendix lists all forms, manuals, bulletins, and other publications that are referenced in this chapter. DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, should be consulted frequently for the latest changes or revisions and for new publications relevant to the material covered in this technical manual.

A-2. FORMS.

Refer to DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms.

Equipment Inspection and Maintenance Worksheet ..... DA Form 2404
Maintenance Request ..... DA Form 2407
Material Data Safety Sheets ..... OSHA Form 20
Preventive Maintenance Schedule and Record ..... DA Form 2407
Preventive Maintenance Schedule and Record ..... DD Form 314
Processing and Deprocessing Record for Shipment Storage and Issue of Vehicles and Space Engines ..... DD Form 1397
Product Quality Deficiency Report ..... SF Form 368
Recommended Changes to Equipment Technical Publications ..... DA Form 2028-2
Recommended Changes to Publications and Blank Forms ..... DA Form 2028
Report of Discrepancy (ROD) ..... SF Form 364

A-3. FIELD MANUALS.

Field Behavior of NBC Agents (Including Smoke and Incendiaries) ..... FM 3-6
Manual for the Wheeled Vehicle Driver ..... FM 21-305
NBC Contamination Avoidance ..... FM 3-3
NBC Decontamination ..... FM 3-5
NBC Protection ..... FM 3-4
NBC Handbook ..... FM 3-7
Operation and Maintenance of Ordnance Material in Cold Weather (0 Degrees F to Minus 65 Degrees F) ..... FM 9-207

A-4. TECHNICAL MANUALS.

Lubrication Order; Operator's Manual; Organizational Maintenance Manual; and Direct Support and General Support Maintenance Manual: M977 Series, 8x8 Heavy Expanded Mobility Tactical Trucks (HEMTT).

A-4. TECHNICAL MANUALS (Continued).

Operator's Manual for Boat, Bridge Erection, Twin Jet, Aluminum Hull,
Model USCSBMK1 (NSN 1940-01-105-5728) and USCS BMK2
(NSN 1940-01-218-9165) ..... TM 5-1940-279-10
Truck, Cargo, with Winch, M985E1 (2320-01-194-7032); ..... TM 9-2320-279-20
Truck, Cargo, Without Winch, M985E1 (2320-01-194-7031) ..... TM 9-2320-279-34
Operator's Unit, Direct Support and General Support Maintenance
Manual for Palletized Load System Trailer (PLST),
Model M1076 (NSN 2330-01-303-5197) ..... TM 9-2330-385-14
Operator's Manual for Welding Theory and Application ..... TM 9-237
Procedures for Destruction of Equipment to Prevent Enemy Use
Mobility Equipment Command ..... TM 750-244-3
Railcar Loading Procedures ..... TM 55-601
Storage of Materials Handling ..... TM 743-200-1

A-5. OTHER PUBLICATIONS.

Color, Marking, and Camouflage Painting of Military Vehicles, Construction
Equipment and Materials, Handling Equipment ..... TB 43-0209
The Army Maintenance Management System (TAMMS) ..... DA Pam 738-750
Marking, Packaging, and Shipment of Supplies and Equipment ..... AR 746-2
Modification of Material and Issuing Safety -of-Use Messages and
Commercial Vehicle Safety Recall Campaign Directive ..... AR 750-10

Packaging of Army Material for Shipment and Storage ..... AR 746-1
Requisition and Issue of Supplies and Equipment ..... AR 725-50
Standard for Overseas Shipment or Domestic Issue of Special Purpose Vehicles ..... TB 9-2300-281-35

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions are limited to and defined as follows.

a. ***Inspect.*** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. ***Test.*** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. ***Service.*** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), preserve, drain, paint, or replenish fuel, lubricants, chemical fluids, or gases.

d. ***Adjust.*** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. ***Align.*** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. ***Calibrate.*** To determine and cause corrections to be made or to be adjusted on instruments or TMDE used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

B-2. MAINTENANCE FUNCTIONS (continued).

g. ***Remove/Install.*** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. ***Replace.*** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and assigned the maintenance level is shown as the 3rd position code of the source, maintenance, and recoverability (SMR) code.

i. ***Repair.*** The application of maintenance services including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures and maintenance actions to correct specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), and item or system.

j. ***Overhaul.*** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (e.g., depot maintenance work requirements). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. ***Rebuild.*** Consists of those services/actions necessary for the restoration of an unserviceable equipment to a like-new condition in accordance with the original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN SECTION II, MAINTENANCE ALLOCATION CHART FOR THE IBC.

a. ***Column 1, Group Number.*** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance-significant components, assemblies, subassemblies, and modules to the next higher assembly.

b. ***Column 2, Component/Assembly.*** Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. ***Column 3, Maintenance Function.*** Column 3 lists the functions to be performed on the item listed in Column 2. (For a detailed explanation of these functions, see para B-2).

B-3. EXPLANATION OF COLUMNS IN SECTION II, MAINTENANCE ALLOCATION CHART FOR THE IBC (Continued).

d. ***Column 4, Maintenance Level.*** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3 by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

C	Operator or Crew
O	Unit
F	Direct Support
H	General Support
D	Depot

e. ***Column 5, Tools and Test Equipment Reference Code.*** Column 5 specifies, by code, those common tools sets (not individual tools), common TMDE, special tools, special TMDE, and special support equipment required to perform the designated maintenance function, Codes are keyed to tools and test equipment in Section III.

f. ***Column 6, Remarks.*** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV. If there is nothing in the Remarks column, there is no Section IV.

B-4. EXPLANATION OF COLUMNS IN SECTION III, TOOL AND TEST EQUIPMENT REQUIREMENTS.

a. ***Column 1, Tool or Test Equipment Reference Code.*** This code correlates with a code used in Section II, Column 5.

b. ***Column 2, Maintenance Level.*** The lowest level of maintenance authorized to use the tool or test equipment.

c. ***Column 3, Nomenclature.*** Name or identification of the tool or test equipment.

d. ***Column 4, National Stock Number.*** The national stock number of the tool or test equipment.

e. ***Column 5, Tool Number.*** The manufacturer's part number, model number, or type number.

Section II. MAINTENANCE ALLOCATION CHART FOR IMPROVED BOAT CRADLE

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
Group Number	Component/ Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref. Code	Remarks
33	**IBC**	Inspect	.2	.2					
		Repair			.5				A
3301	Bumper Guards	Remove and Replace		.4				1	
3301	Stanchion Pins	Remove and Replace		.1				1	
		Repair		.5				1, 3	
3301	Removable Skid Plate Pin and Plug	Remove and Replace	.1					4	
		Repair		.2				3	
3301	Load Binder Cable Assembly	Remove and Replace	.1					4, 5	
		Repair		.2				1	
3301	Front and Rear Tie Down Cables	Remove and Replace	.1					2	
		Repair		.5				1, 3	
3301	Rear Roller Assemblies	Remove and Replace		.2				1	
		Repair		.6				1, 3	
3301	Front Roller Assemblies	Repair		.8				1, 3	
3301	Cradle Roller Assemblies	Remove and Replace		.1					
		Repair		.4				1, 3	
3301	Data Plate	Remove and Replace		.2				1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Tool or Test Equipment Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National Stock Number	(5) Tool Number
1	O	Tool Kit, General Mechanics, Automotive	5180-00-177-7033	SC5180-95-CL- N26
2	C	Screwdriver, Phillips (CBT Basic Issue Item)	5120-00-227-7356	32746AX
3	O	Shop Equipment, Automotive Maintenance and Repair Organizational Maintenance, Common No. 1, Less Power	4910-00-754-0654	SC4910-95-CL-A74
4	C	Wrench, 8 Inch Adjustable (CBT Basic Issue Item)	5120-00-240-5328	1350180
5	C	Wrench, 12 Inch Adjustable (CBT Basic Issue Item)	5120-00-264-3796	120405A

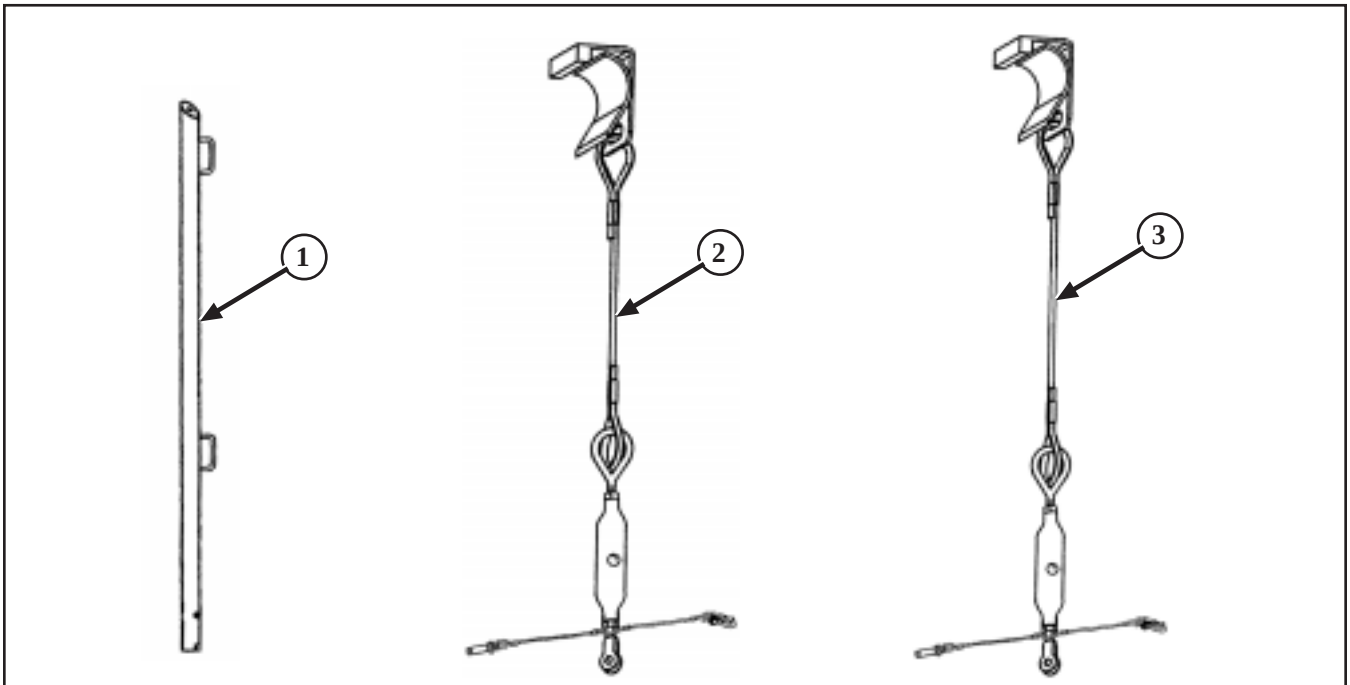
Section IV. REMARKS

Reference Code	Remarks
A	Time dependent on extent of repair required.

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

The improved boat cradle currently does not have any assigned BII. The following is a list of Components of End Item (COEI) for the improved boat cradle.

Table C-1. Basic Issue Items (BII)



(1) Illus Number	(2) National Stock Number	(3) Description Cage and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
1		Stanchion, Boat (19207), 12463628		ea	4
2		Binder, Load, Front Tie-down Cable (19207), 12463627-1, 22 Inches Long		ea	2
3		Binder, Load, Rear Tie-down Cable (19207), 12463627-2, 27 Inches Long		ea	2

APPENDIX D
ADDITIONAL AUTHORIZATION LIST

The improved boat cradle currently does not have any assigned additional authorization list.

APPENDIX E
EXPENDABLE AND DURABLE ITEMS LIST

Section I. INTRODUCTION

E-1. SCOPE.

This appendix lists expendable and durable items that you will need to operate and maintain the IBC. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790 or CTA 8-100.

E-2. 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 item (e.g., "Use cleaning compound, item 1, Appendix E").

b. ***Column (2), Level.*** This column identifies the lowest level of maintenance that requires the item: Operator/Crew (c) or Unit (o).

c. ***Column (3), National Stock Number.*** This is the national stock number assigned to the item, which you can use to requisition it.

d. ***Column (4), Nomenclature, Description, Commercial and Government Entity (CAGE) Code Part Number.*** This provides the other information you need to identify the item.

e. ***Column (5), U/M [Unit of Measure].*** This code shows the physical measurement or count of an item, such as GL (gallon) and TU (tube).

Section II. EXPENDABLE AND DURABLE ITEMS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Nomenclature, Description (CAGE) Code, Part Number	(5) U/M
1	O	6850-01-277-0595	Cleaning Compound, Solvent (59557) 134-HI-SOLV	GL
2	O	7930-00-899-9534	Dishwashing Compound, Hand, 5-Gallon Can (81348) P-D-410	GL
3	O	8010-00-118-2456	Epoxy Coating Kits, 2 Gallon Kit Epoxy Enamel (13178) R100G	GL
4	O	8010-00-118-2455	Epoxy Coating Thinner, 1-Gallon Can (13178) AT333	GL
5	O		Grease, Automotive, Artillery	
		9150-00-065-0029	2-1/4 oz tube	OZ
		9150-00-935-1017	14 oz cartridge	OZ
		9150-00-190-0904	1 lb can	LB
		9150-00-190-0905	5 lb can	LB
		9150-00-190-0907	35 lb can (81349) MIL-G-10924	LB
6	O		Lubricating Oil, Engine, OE/HDO 10	
		9150-00-189-6727	1 qt can	QT
		9150-00-186-6668	5 gal can	GL
		9150-00-191-2772	55 gal drum (81349) MIL-L-2104	GL
7	O		Lubricating Oil, Engine, OE/HDO-30	
		9150-00-186-6681	1-quart can	QT
		9150-00-188-9858	5 lb can	LB
		9150-00-189-6729	55 gal drum (81349) MIL-L-2104	GL
8	O	7920-00-205-1711	Rag, Wiping, 50 lb bale (58536) A-A-531	BL

APPENDIX F
REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

F-1. SCOPE.

This RPSTL lists and authorizes spares and repair parts, special tools, special Test, Measurement and Diagnostic Equipment (TMDE), and other special support equipment required for performance of Unit and Direct support maintenance of the IBC. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

F-2. GENERAL.

In addition to the Introduction work package, this RPSTL is divided into the following work packages:

a. ***Repair Parts List Work Package.*** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts shall be listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

b. ***Special Tools List Work Package.*** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

c. ***Cross Reference Indexes Work Package.*** There are two cross-reference indexes work packages in this RPSTL: The National Stock (NSN) Index work package and the Part Number (P/N) Index work package. The NSN Index work package refers you to the figure and item number. The P/N Index work package refers you to the figure and item number.

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE.

a. ***Item No. [Column (1)].*** Indicates the number used to identify items called out in the illustration.

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE (Continued).

b. ***SMR Code [Column (2)].*** The SMR code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:

Source Code	**Maintenance Code**		**Recoverability Code**
xx	**xx**		**xx**
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.	5th position: Who determines disposition action on unserviceable items.

* complete repair: Maintenance capacity, capability, and authority to perfom all corrective maintenance tasks of the "repair" function in a use/user environment in order to restore serviceability to a failed item.

c. ***Source Code.*** The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Source Code	**Application/Explanation**
PA PB PC PD PE PF PG	Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code. **NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at unit level MF-Made at DS level MH-Made at GS level ML-Made at SRA MD-Made at depot	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND UOC column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE (Continued).

AO-Assembled by unit/AVUM level AF-Assembled by DS/AVIM level AH-Assembled by GS level AL-Assembled by SRA AD-Assembled by depot	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

Source Code	Application/Explanation
XA	Do not requisition an "XA" coded item. Order the next higher assembly (refer to NOTE below).
XB	If an item is not available from salvage, order it using the CAGE Code and P/N.
XC	Installation drawings, diagrams, instruction sheets, field services drawings; identified by manufacturer's P/N.
XD	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGE Code and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA".

d. ***Maintenance Code.*** Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(1) THIRD POSITION. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE (Continued).

Maintenance Code	Application/Explanation
C	Crew or operator maintenance done within unit maintenance.
O	Unit level maintenance can remove, replace, and use the item.
F	Direct support maintenance can remove, replace, and use the item.
H	General support maintenance can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot can remove, replace, and use the item.

(2) FOURTH POSITION. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
O	Unit is the lowest level that can do complete repair of the item.
F	Direct support is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

e. ***Recoverability Code.*** Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE (Continued).

Recoverability Code	Application/Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at the unit level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.

Recoverability Code	Application/Explanation
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

f. ***NSN [Column (3)].*** The NSN for the item is listed in this column.

g. ***CAGEC [Column (4)].*** The Commercial and Government Entity (CAGE) Code is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

h. ***Part Number [Column (5)].*** Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different P/N from the number listed.

i. ***Description and Usable on Code (UOC) [Column (6)].*** This column includes the following information:

(1) The federal item name, and when required, a minimum description to identify the item.

F-3. EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGE (Continued).

(2) P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.

(3) Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.

(4) The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

j. ***QTY [Column (7)].*** The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

F-4. EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS.

a. ***National Stock Number (NSN)Index Work Package.***

(1) STOCK NUMBER COLUMN. This column lists the NSN in National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN.

NSN
(e.g., 5385-01-574-1476)
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(3) FIG. COLUMN. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

(4) ITEM COLUMN. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. ***Part Number (P/N) Index Work Package.*** P/Ns in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

(1) PART NUMBER COLUMN. Indicates the P/N assigned to the item.

(2) FIG. COLUMN. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

(3) ITEM COLUMN. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

F-5. SPECIAL INFORMATION.

a. ***Usable on Code.*** Not applicable.

b. ***Fabrication Instructions.*** Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in Appendix G.

c. ***Index Numbers.*** Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index work packages and the bulk material list in the repair parts list work package.

F-6. HOW TO LOCATE REPAIR PARTS.

a. ***When NSNs or P/Ns Are Not Known:***

(1) Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

(2) Find the figure covering the functional group or the subfunctional group to which the item belongs.

(3) Identify the item on the figure and note the number(s).

(4) Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

b. ***When NSN Is Known:***

(1) If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

(2) Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

c. ***When P/N Is Known.***

(1) If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

(2) Look up the item on the figure in the applicable repair parts list work package. Verify that the item is the one you are looking for.

6

7 thru 11

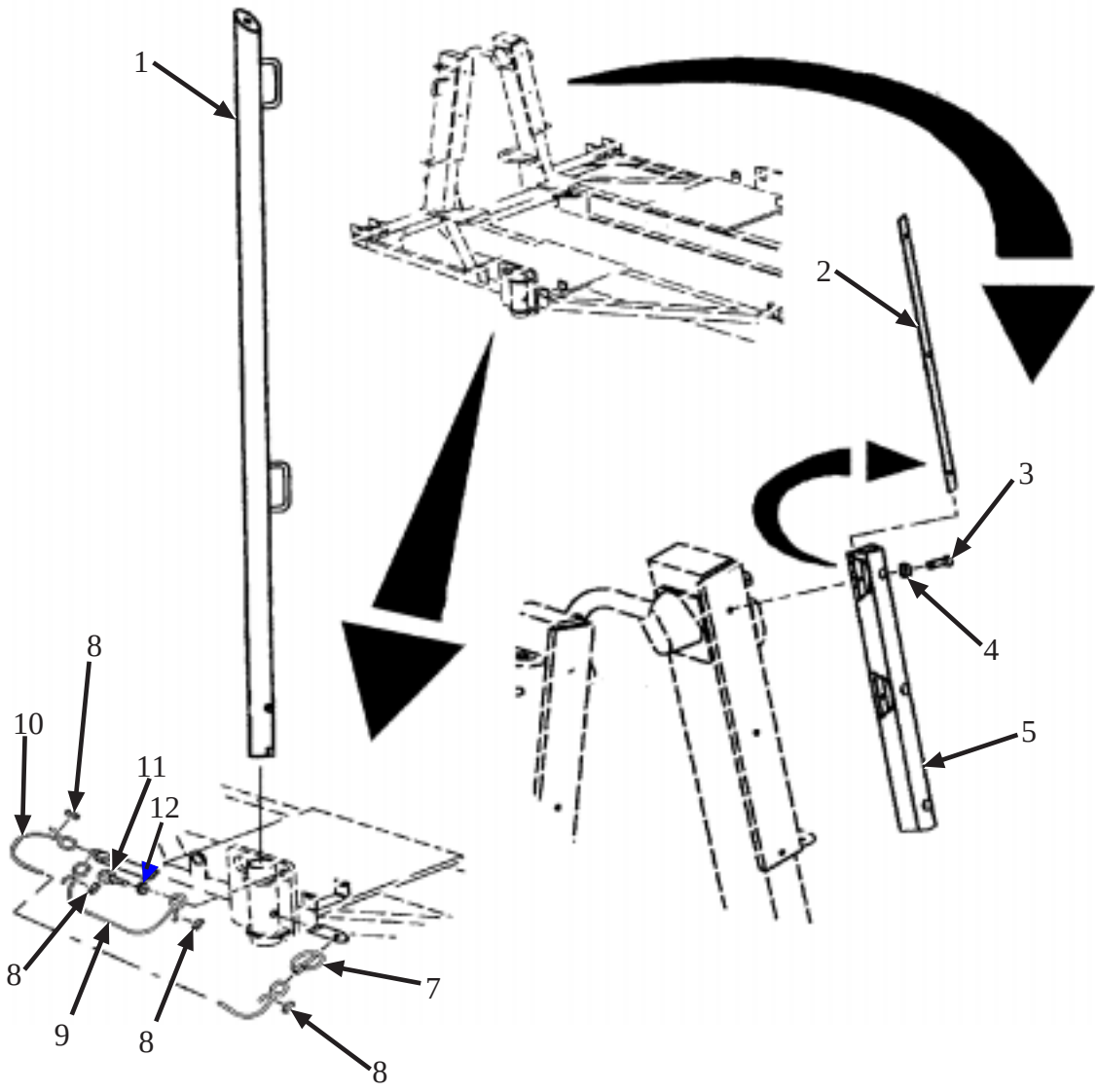


Figure 1. Stanchion and Bumper Guards

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 33 SPECIAL PURPOSE KITS GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 1 STANCHION AND BUMPER GUARD	
1	PAOZZ		19207	12463628	STANCHION,BOAT.....	4
2	MOOZZ		19207	12463603	PLATE,RETAINER,FEND MAKE FROM BAR,METAL, P/N ASTM A36, SEE APPENDIX G.....	2
3	PAOZZ	5305-00-071-2069	80204	B1821BH050C150N	SCREW,CAP,HEXAGON H 3/4 HEX, 1/2-13 UNC, 2A RH, 1 1/2 INCHES LONG.....	6
4	PAOZZ	5310-00-584-5272	96906	MS35338-48	WASHER,LOCK 1/2 I.D. X 7/8 O.D. X 1/8 THK.....	6
5	PAOZZ		19207	12463602	FENDER,MARINE BUMPER GUARD.....	2
6	PFOZZ		19207	12463607-2	PIN ASSEMBLY,STANCH.....	4
7	PAOZZ	5315-01-096-0203	99984	7637	.PIN,STRAIGHT,HEADLE RING PIN.....	1
8	PAOZZ	4030-00-431-5536	86831	RS290-1	.SWAGING SLEEVE,WIRE.....	4
9	MOOZZ		19207	12463607-12	.WIRE ROPE PART OF 12463607-2, MAKE FROM STRAND,WIRE, P/N RRW410, 12 INCHES LONG, SEE APPENDIX G.....	1
10	MOOZZ		19207	12463607-16	.WIRE ROPE PART OF 12463607-2, MAKE FROM STRAND,WIRE, P/N RRW410, 16 INCHES LONG, SEE APPENDIX G.....	1
11	PAOZZ	5305-01-136-5330	96906	MS51851-53	SCREW,TAPPING.....	4
12	PAOZZ	5310-01-253-1618	96906	MS51412-18	WASHER,FLAT.....	4
					END OF FIGURE	

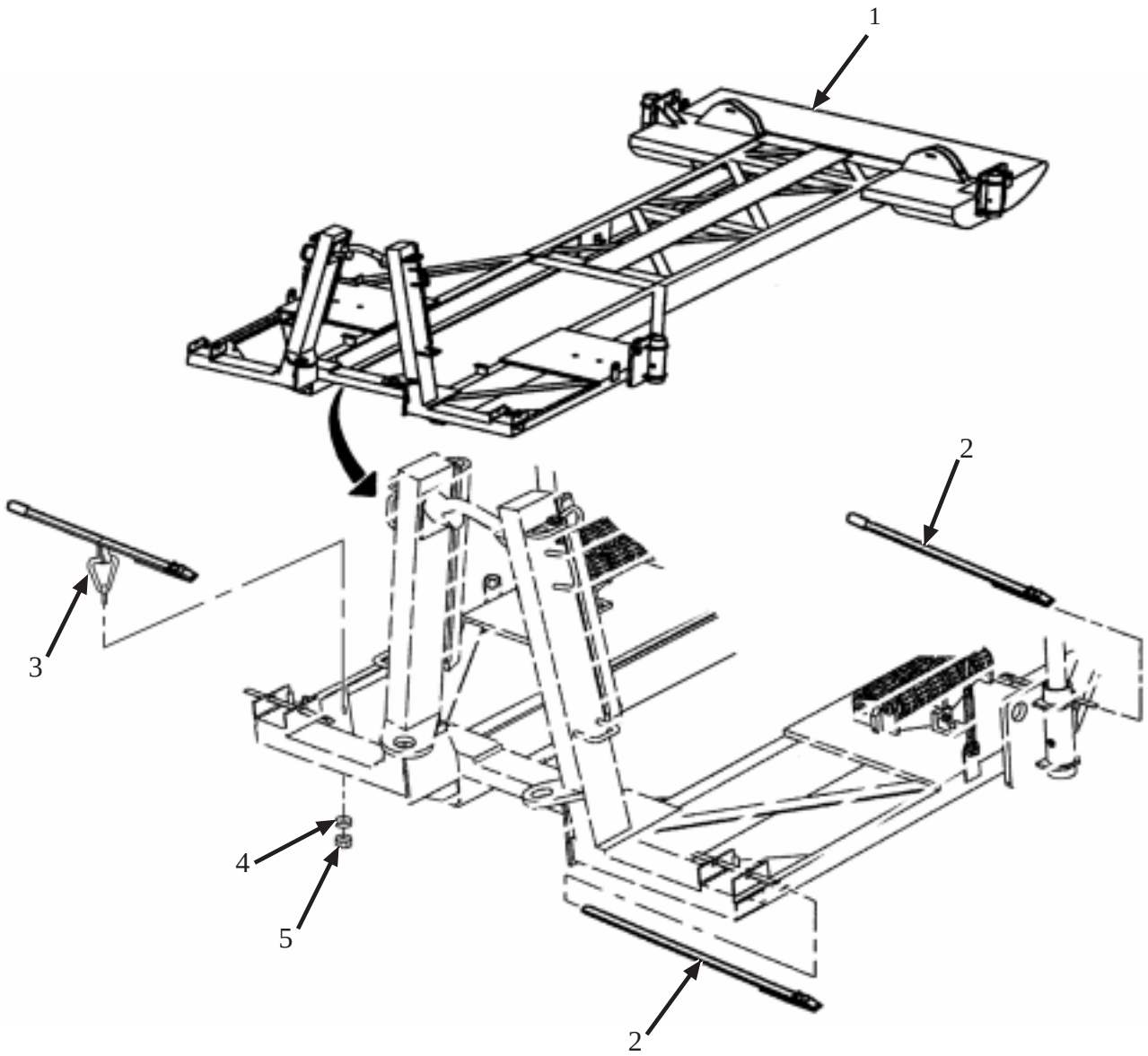


Figure 2. Frame and Straps

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 2 FRAME AND STRAPS		
1	XAOZZ		19207	12463601	FRAME SECTION,STRUC.....	1
2	PAOZZ		19207	12463606-1	.STRAP,TIEDOWN 16 INCHES LONG.....	4
3	PAOZZ		19207	12463612	.STRAP,TIEDOWN WITH RING.....	2
4	PAOZZ		80204	B18.22.1 1/4	.WASHER,PLAIN 1/4 SIZE, 9/32 I.D. X 5/8 O.D.....	2
5	PAOZZ	5310-00-889-2589	96906	MS21044C4	.NUT,SELF-LOCKING,HE.....	2
				END OF FIGURE		

1

2 thru 8

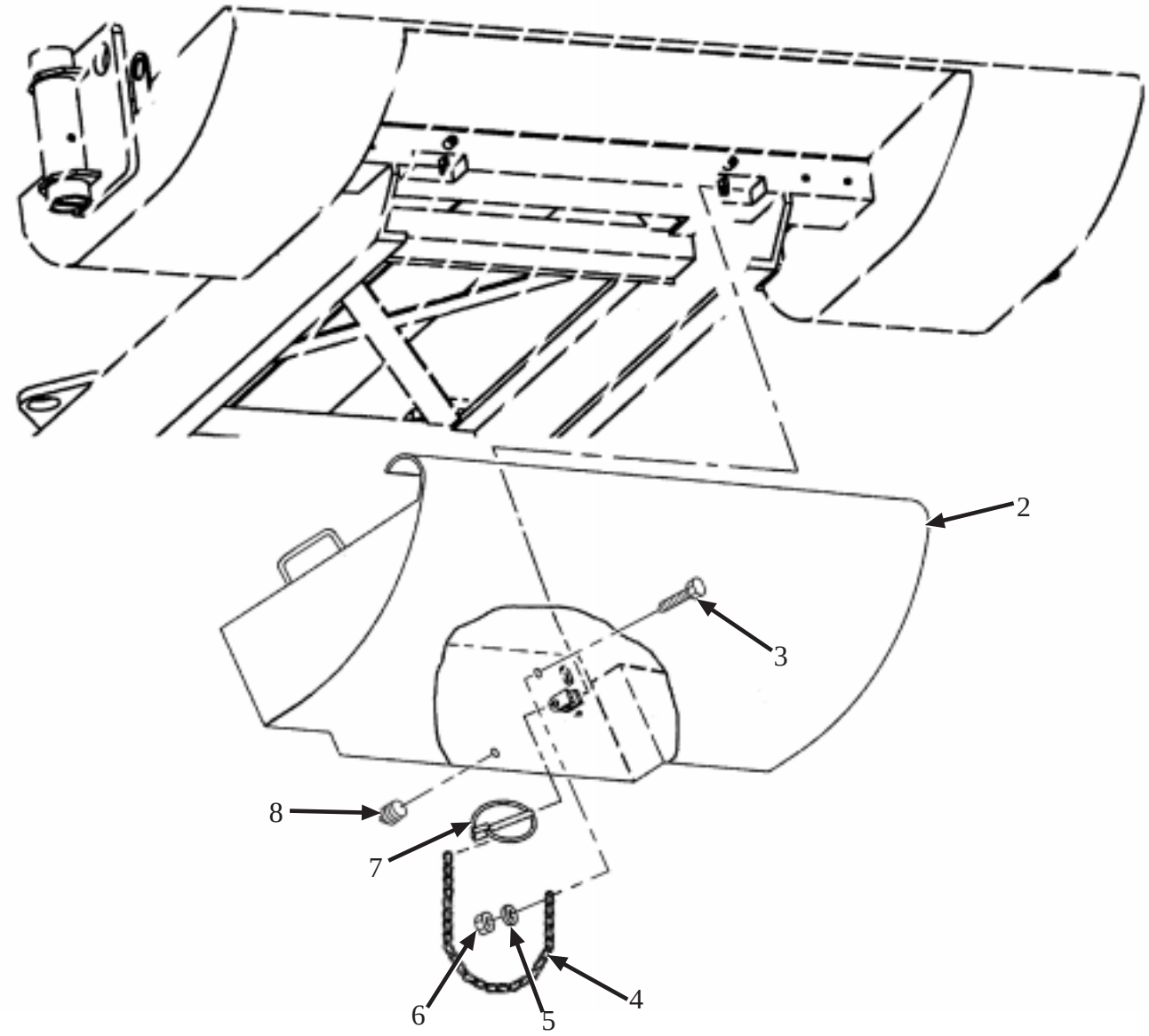


Figure 3. Removable Skid Plate

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 3 REMOVABLE SKID PLATE	
1	PFOZZ		19207	12463613	SKID PLATE ASSEMBLY REMOVABLE.....	1
2	XAOZZ		19207	12463633	.PLATE,SKID.....	1
3	PAOZZ	5305-00-054-6655	96906	MS51957-31	.SCREW,MACHINE.....	2
4	MOOZZ		19207	12463633-8	.CHAIN,WELDLESS MAKE FROM CHAIN,WELDLESS, P/N RRC271, 8 INCHES LONG SEE APPENDIX G.....	2
5	PAOZZ	5310-01-352-9588	80205	NAS1149CN632R	.WASHER,FLAT SIZE 6, .149 I.D. X 3/8 O.D.....	2
6	PAOZZ	5310-00-982-6813	96906	MS21044C06	.NUT,SELF-LOCKING,HE 5/16 HEX, 32 UNJC, 3B RH.....	2
7	PAOZZ	3930-00-759-9738	99984	7618	.PIN ASSEMBLY.....	2
8	PAOZZ		81348	WWP471	.PIPE,PLUG TYPE A, CL A, STYLE S, SIZE B, 1/4 NPT.....	1
					END OF FIGURE	

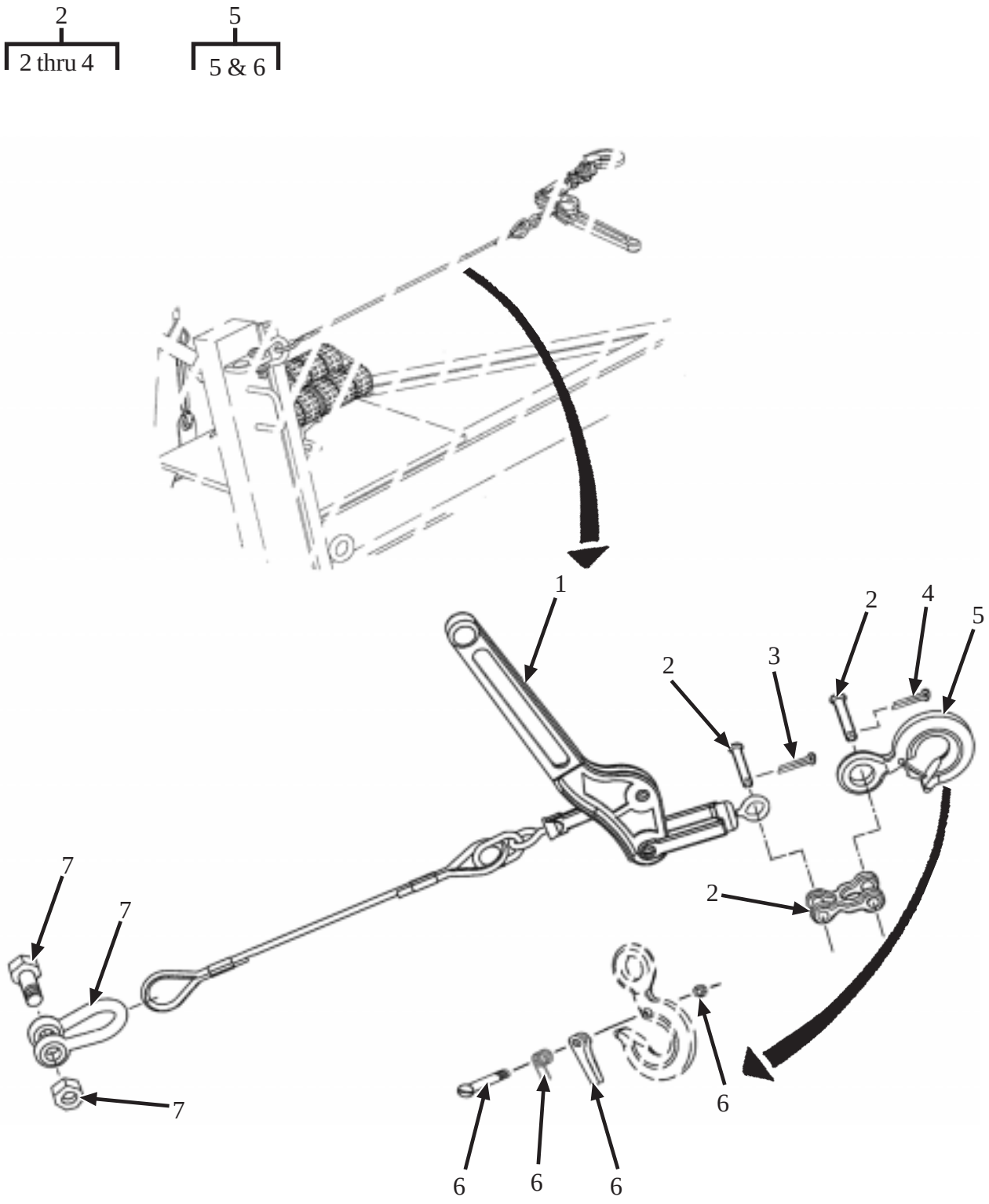


Figure 4. Load Binder Cable Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 4 LOAD BINDER CABLE ASSEMBLIES		
1	PAOZZ		19207	12463625	BINDER ASSEMBLY,LOA.....	1
2	PAOZZ		75535	1013085	CLEVIS,DOUBLE.....	1
3	PAOZZ	5315-00-236-8359	96906	MS24665-370	PIN,COTTER PART OF 1013085.....	1
4	PAOZZ	5315-00-576-0421	96906	MS24665-511	PIN,COTTER PART OF 1013085.....	1
5	PAOZZ		75535	1022424	EYE HOOK.....	1
6	PAOZZ		75535	1096515	LATCH KIT, HOOK PART OF 1022424....	1
7	PAOZZ	4030-00-278-0699	81349	MILS24214	CHAIN SHACKLE.....	1
				END OF FIGURE		

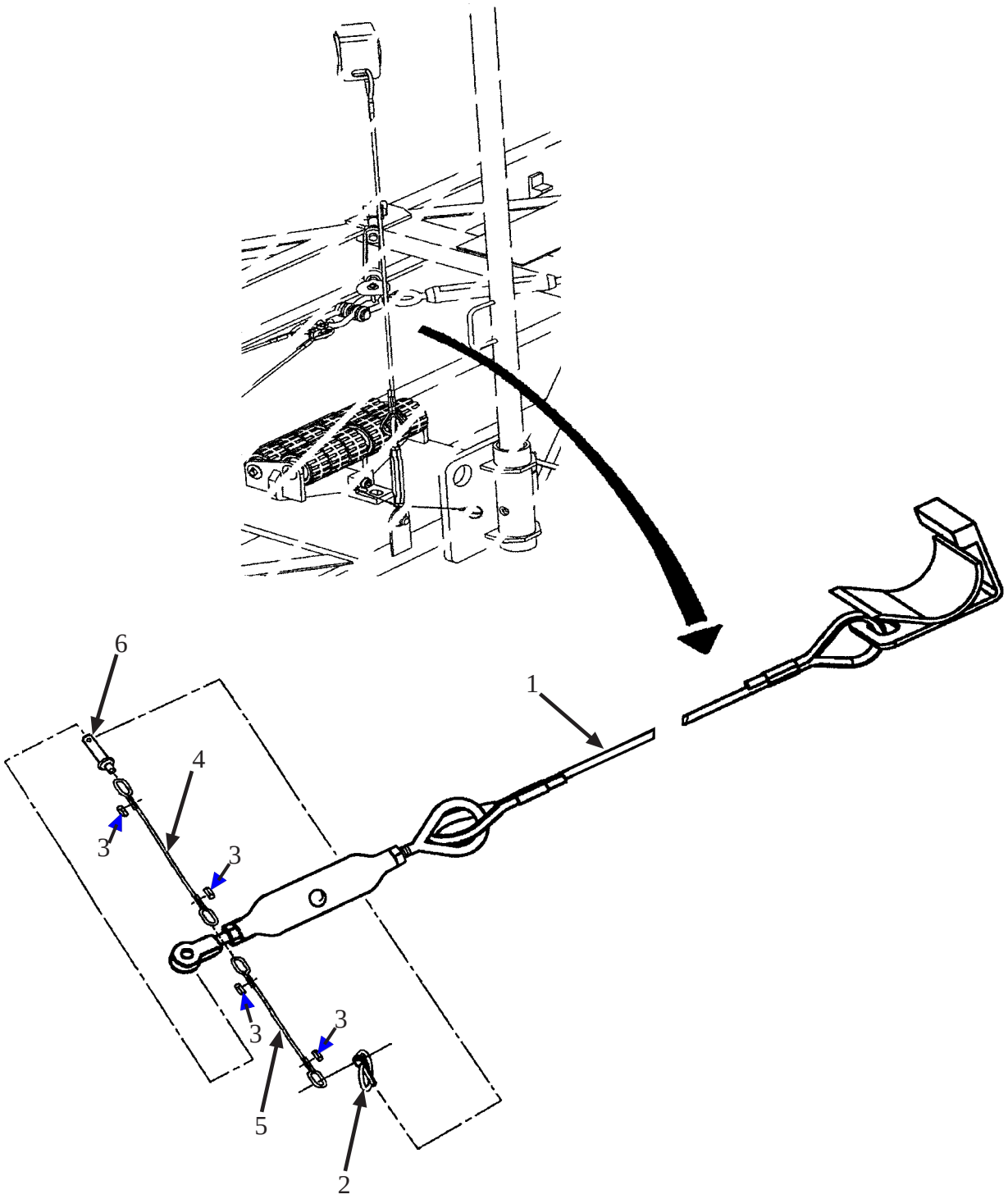


Figure 5. Front and Rear Tie-Down Cable Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 5 FRONT AND REAR TIE-DOWN CABLE ASSEMBLIES	
1	PAOZZ		19207	12463627-1	BINDER,LOAD FRONT TIE-DOWN CABLE, 22 INCHES LONG.....	2
1	PAOZZ		19207	12463627-2	BINDER,LOAD REAR TIE-DOWN CABLE, 27 INCHES LONG.....	2
2	PAOZZ	5315-01-096-0203	99984	7637	PIN,STRAIGHT,HEADLE RING PIN, PART OF 12463627-1 AND 12463627-2...	1
3	PAOZZ	4030-00-431-5536	86831	RS290-1	SWAGING SLEEVE,WIRE PART OF 12463627-1 AND 12463627-2.....	4
4	MOOZZ		19207	12463627-6.5	WIRE ROPE PART OF 12463627-1 AND 12463627-2, MAKE FROM STRAND,WIRE, P/N RRW410, 6 1/2 INCHES LONG.....	2
5	MOOZZ		19207	12463627-5.5	WIRE ROPE PART OF 12463627-1 AND 12463627-2, MAKE FROM STRAND,WIRE, P/N RRW410, 5 1/2 INCHES LONG.....	1
6	PAOZZ		19207	12463611	PIN,STRAIGHT,HEADED PART OF 12463627-1 AND 12463627-2.....	1

END OF FIGURE

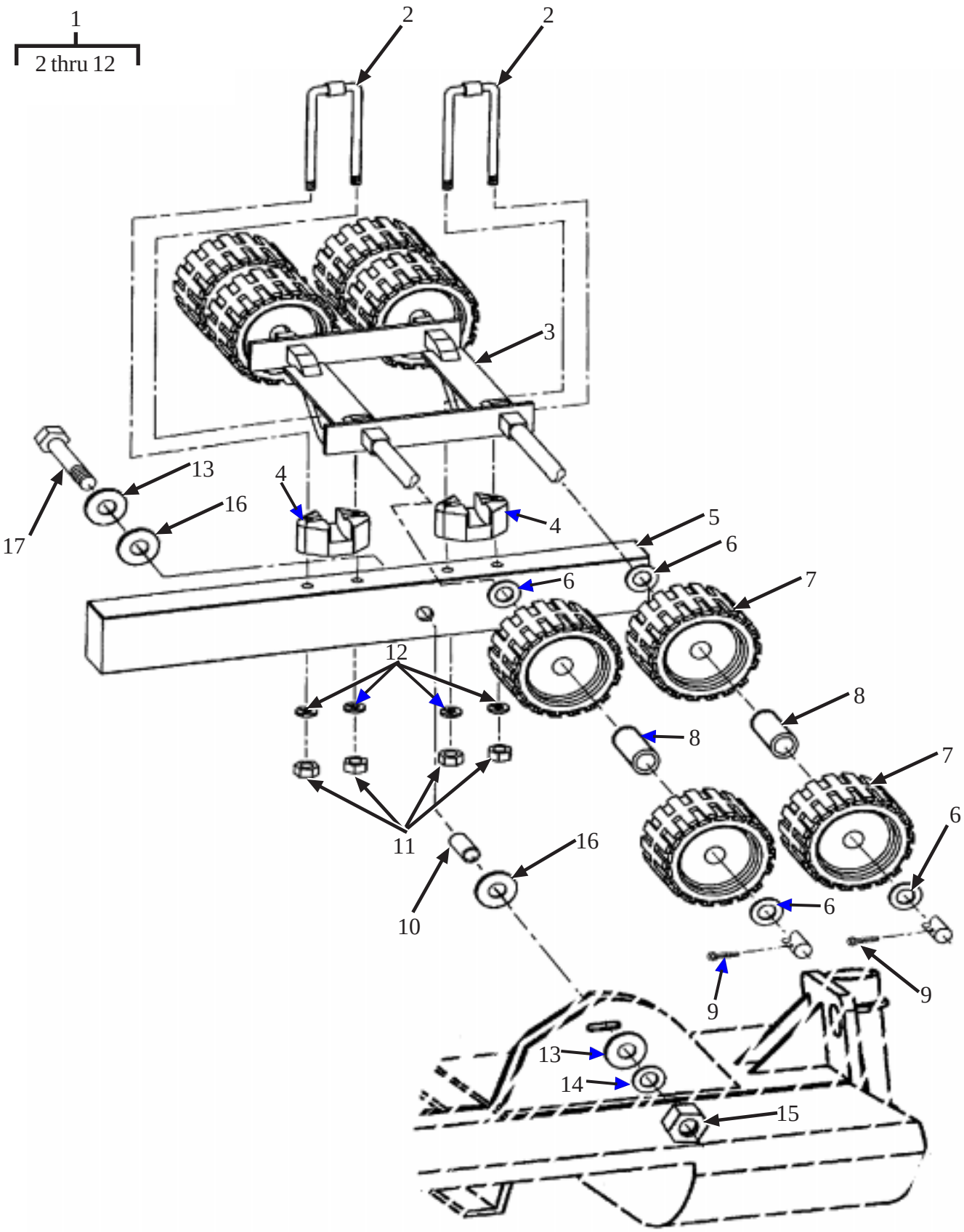


Figure 6. Rear Roller Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 3301 REUSABLE SHIPPING CONTAINERS		
				FIG. 6 REAR ROLLER ASSEMBLY		
1	AOOOO		19207	12463629	ROLLER ASSEMBLY REAR BOAT ROLLER...	2
2	PAOZZ		19207	12463616	.U-BOLT,PIVOT.....	2
3	PAOZZ		19207	12463635	.HOLDER,ROLLER ROLLER ARM.....	1
4	PAOZZ		19207	12463617	.BLOCK,SADDLE.....	2
5	PAOZZ		19207	12463614	.HOLDER,ROLLER.....	1
6	PAOZZ		80204	B18.22.1 3/4	.WASHER,PLAIN 3/4 SIZE, 13/16 I.D. X 2 O.D.....	8
7	PAOZZ		19207	12463615	.ROLLER.....	8
8	MOOZZ		19207	12463629-1.5	.PIPE,PLASTIC MAKE FROM PIPE,PLASTIC, P/N ASTM D1785, 1 7/16 INCHES LONG.....	2
9	PAOZZ	5315-00-239-8032	96906	MS24665-513	.PIN,COTTER.....	4
10	PAOZZ		19207	12463618-1	.BEARING,SLEEVE.....	1
11	PAOZZ		81346	ASTM A563 3/8	.NUT,PLAIN,HEXAGON 3/8-16 UNC, 2B RH.....	4
12	PAOZZ	5310-00-637-9541	96906	MS35338-46	.WASHER,LOCK 3/8 I.D. X 11/16 O.D. X 3/32 THK.....	4
13	PAOZZ	5310-01-421-7071	96906	MS51412-30A	WASHER,FLAT.....	4
14	PAOZZ	5310-00-820-6653	96906	MS35338-50	WASHER,LOCK 5/8 I.D. X 1 O.D. X 5/32 THK.....	8
15	PAOZZ	5310-00-079-6474	96906	MS21044C10	NUT,SELF-LOCKING,HE 15/16 HEX, 5/8-18 UNF, 3B RH.....	2
16	PAOZZ	3120-00-661-5932	96906	MS21783-16A282	BEARING,WASHER,THR BRASS.....	4
17	PAOZZ	5305-00-726-2562	96906	MS90727-175	SCREW,CAP,HEXAGON H 15/16 HEX, 5/8-18 UNF, 2A RH, 4 3/4 INCHES LONG.....	2

END OF FIGURE

1
2 thru 15

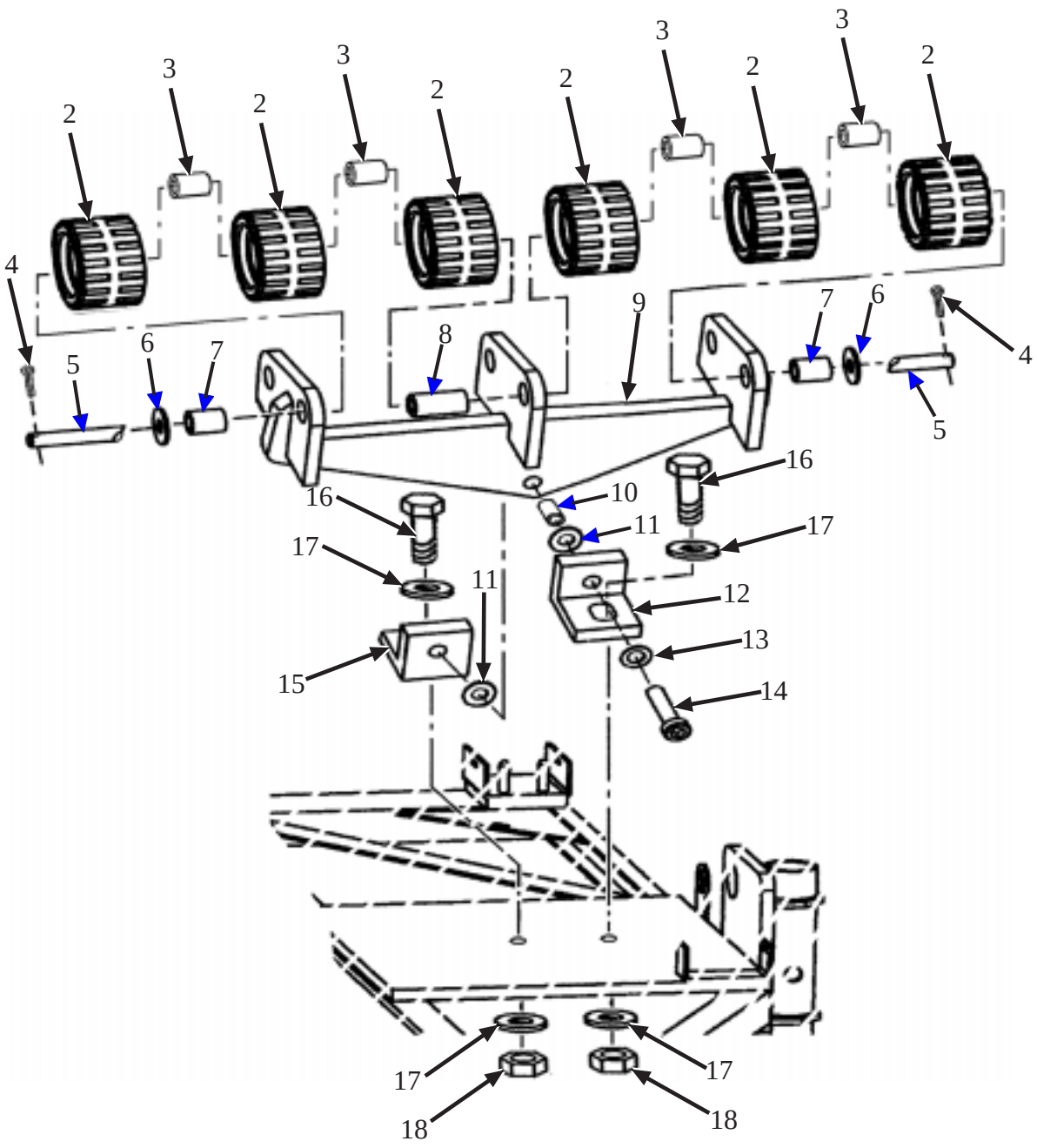


Figure 7. Front Roller Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 7 FRONT ROLLER ASSEMBLIES		
1	AOOOO		19207	12463630-1	ROLLER ASSEMBLY FRONT ROLLER ASSEMBLY, LEFT.....	1
1	AOOOO		19207	12463630-2	ROLLER ASSEMBLY FRONT ROLLER ASSEMBLY, RIGHT.....	1
2	PAOZZ		19207	12463615	.ROLLER.....	12
3	MOOZZ		19207	12463630-1.5	.PIPE,PLASTIC MAKE FROM, PIPE,PLASTIC, P/N ASTM D1785, 1 7/16 INCHES LONG.....	4
4	PAOZZ	5315-00-239-8032	96906	MS24665-513	.PIN,COTTER.....	4
5	PAOZZ		19207	12463619	.SHAFT.....	2
6	PAOZZ		80205	NAS1149F1290P	.WASHER,FLAT 3/4 I.D. X 1 5/16 O.D.	4
7	PAOZZ		19207	12463618-4	.BEARING,SLEEVE 2 3/8 INCHES LONG..	2
8	PAOZZ		19207	12463618-3	.BEARING,SLEEVE 1 1/2 INCHES LONG..	4
9	PFOZZ		19207	12463636-1	.BRACKET,ROLLER LEFT.....	1
9	PFOZZ		19207	12463636-2	.BRACKET,ROLLER RIGHT.....	1
10	PAOZZ		19207	12463618-2	.BEARING,SLEEVE.....	1
11	PAOZZ	3120-00-661-5932	96906	MS21783-16A282	.BEARING,WASHER,THR BRASS.....	2
12	PAOZZ		19207	12463621	.BRACKET,ANGLE OUTBOARD NON-THREADED.....	1
13	PAOZZ	5310-00-584-7889	96906	MS35338-53	.WASHER,LOCK 1 I.D. X 1 5/8 O.D. X 1/4 THK.....	1
14	PAOZZ	5305-01-203-9347	96906	MS51975-64	.SCREW,SHOULDER 3/4-10 UNC, 3A RH, 3 1/4 INCHES LONG.....	1
15	PAOZZ		19207	12463620	.BRACKET,ANGLE INBOARD THREADED....	1
16	PAOZZ	5303-00-935-2931	96906	MS90727-236	SCREW,CAP,HEXAGON H 1 1/2 HEX, 1-12 UNF, 2A RH, 3 1/2 INCHES LONG..	4
17	PAOZZ	5310-01-266-8265	96906	MS51412-15	WASHER,FLAT 1 I.D. X 1 3/4 O.D. X 3/32 THK.....	4
18	PAOZZ	5310-00-079-6477	96906	MS21044C16	NUT,SELF-LOCKING,HE 1 7/16 HEX, 1-12 UNJF, 3B RH.....	4
				END OF FIGURE		

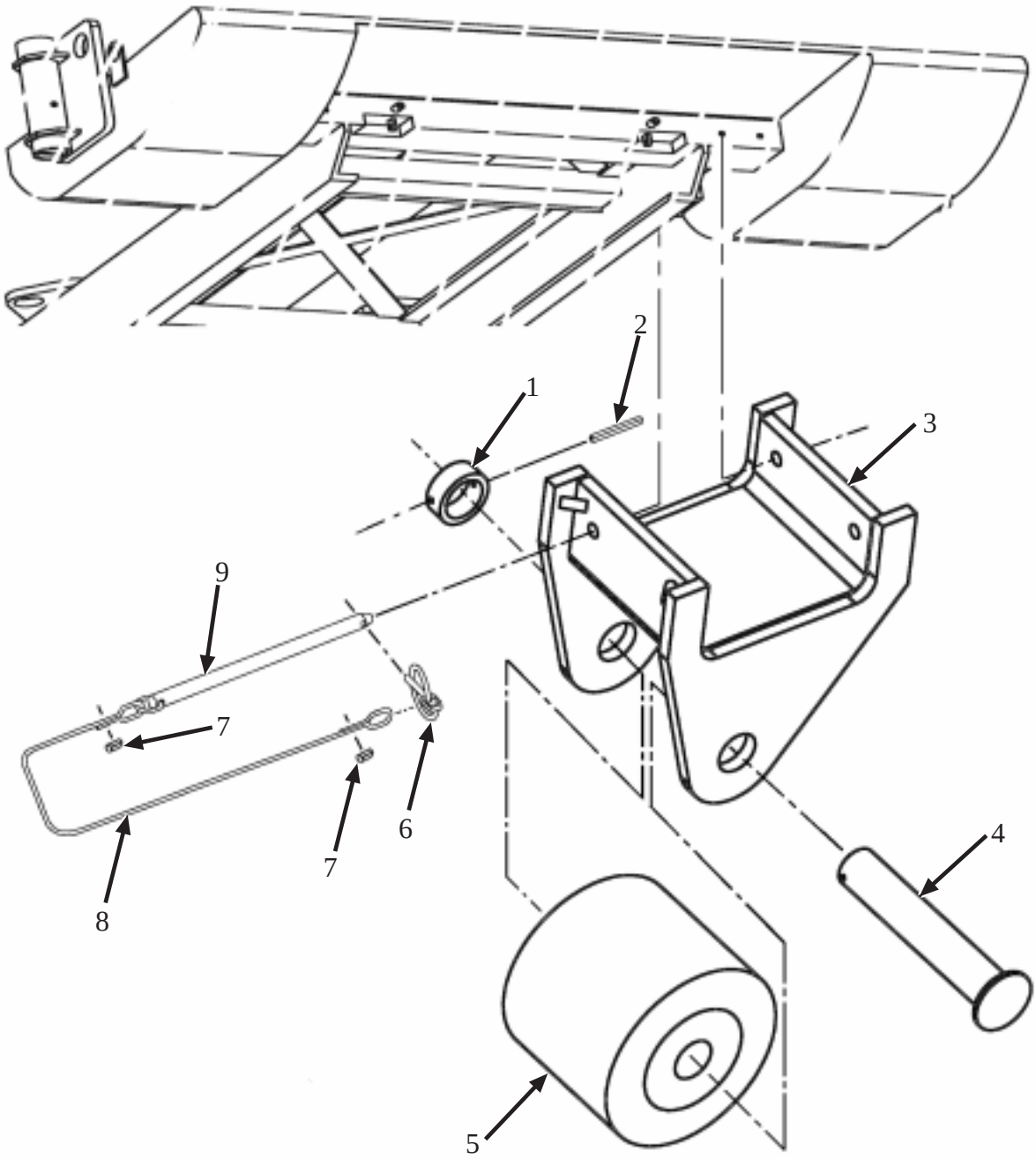


Figure 8. Cradle Roller Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 3301 REUSABLE SHIPPING CONTAINERS		
				FIG. 8 CRADLE ROLLER ASSEMBLY		
1	PAOZZ		19207	12463610	COLLAR,SHAFT.....	2
2	PAOZZ	5315-00-664-8063	96906	171602	PIN,SPRING.....	2
3	PAOZZ		19207	12463634	BRACKET,ROLLER.....	2
4	PAOZZ		19207	12463609	PIN,STRAIGHT,HEADED.....	2
5	PAOZZ	5340-01-421-6471	0PZP2	124405330	WHEEL,SOLID,NONMETA STEEL.....	2
6	PAOZZ	5315-01-096-0203	99984	7637	PIN,STRAIGHT,HEADLE RING PIN.....	4
7	PAOZZ	4030-00-431-5536	86831	RS290-1	SWAGING SLEEVE,WIRE.....	8
8	MOOZZ		19207	12463607-20	WIRE ROPE PART OF 12463607-1, MAKE FROM STRAND,WIRE, P/N RRW410, 20 INCHES LONG.....	4
9	PAOZZ		19207	12463607-1	PIN,STRAIGHT,HEADLE.....	4
				END OF FIGURE		

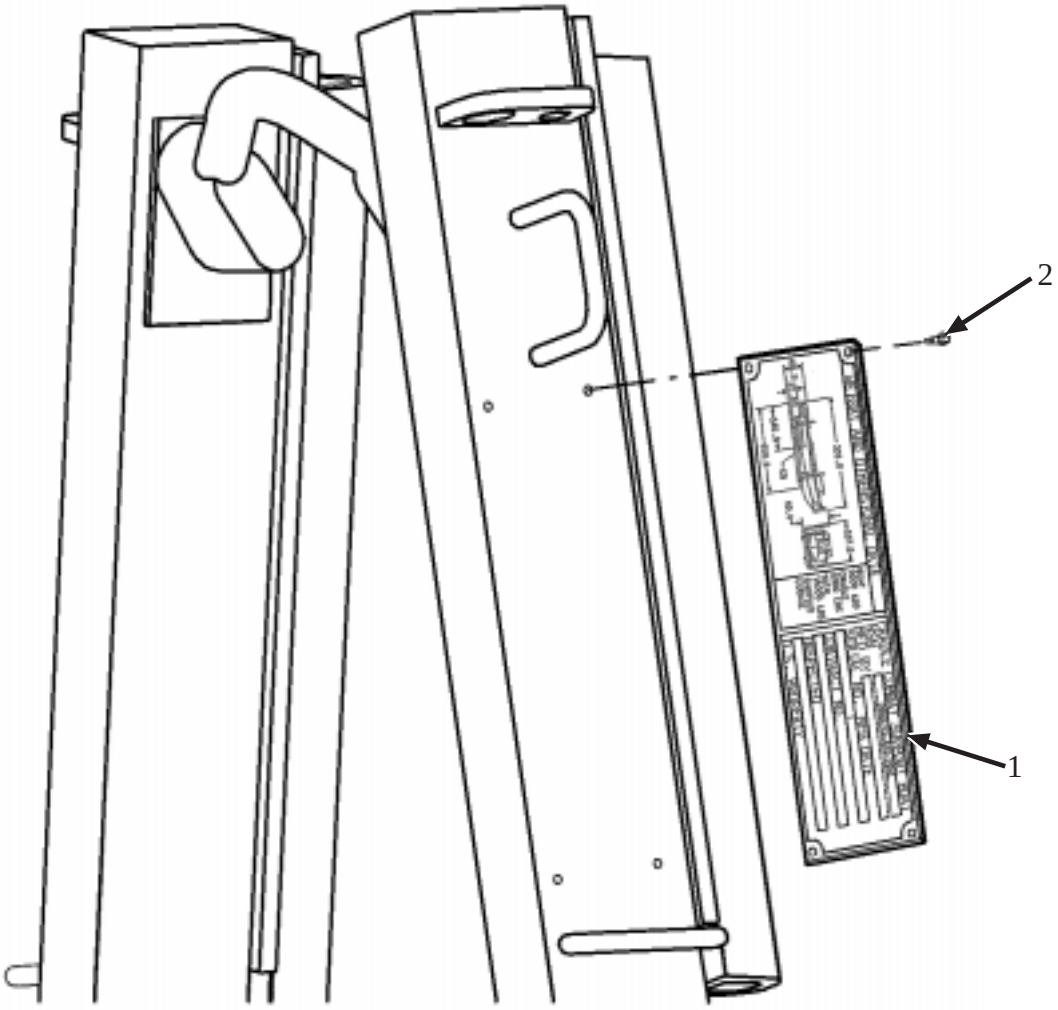


Figure 9. Data Plate Plate

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 3301 REUSABLE SHIPPING CONTAINERS FIG. 9 DATA PLATE	
1	XDOZZ		19207	12463638	PLATE,IDENTIFICATIO AND TRANSPORTABILITY.....	1
2	PAOZZ	5305-01-136-5330	96906	MS51851-53	SCREW,TAPPING 1/4 HEX, 5/32, 3/8 INCHES LONG.....	4

END OF FIGURE

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
				GROUP 95 GENERAL USE STANDARDIZED PARTS GROUP 9501 HARDWARE SUPPLIES AND BULK MATERIAL, COMMON FIG. BULK		
1	PAOZZ	9510-00-189-1556	81346	ASTM A36	BAR,METAL.....	1
2	PAOZZ	4010-00-720-4467	81348	RRC271	CHAIN,WELDLESS.....	1
3	PAOZZ	4010-00-641-6185	81348	RRW410	STRAND,WIRE.....	1
4	PAOZZ	4710-00-225-4778	81346	ASTM D1785	PIPE,PLASTIC SCHEDULE 40, 3/4 SIZE.	1
				END OF FIGURE		

PART NUMBER INDEX

PART NUMBER	FIG	ITEM
1022424	4	5
1096515	4	6
124405330	8	5
12463601	2	1
12463602	1	5
12463603	1	2
12463606-1	2	2
12463607-2	1	6
12463607-1	8	9
12463607-12	1	9
12463607-16	1	10
12463607-20	8	8
12463609	8	4
12463610	8	1
12463611	5	6
12463612	2	3
12463613	3	1
12463614	6	5
12463615	6	7
	7	2
12463616	6	2
12463617	6	4
12463618-1	6	10
12463618-2	7	10
12463618-3	7	8
12463618-4	7	7
12463619	7	5
12463620	7	15
12463621	7	12
12463625	4	1
12463627-1	5	1
12463627-2	5	1
12463627-5.5	5	5
12463627-6.5	5	4
12463628	1	1
12463629	6	1
12463629-1.5	6	8
12463630-1	7	1
12463630-1.5	7	3
12463630-2	7	1
12463633	3	2
12463633-8	3	4
12463634	8	3
12463635	6	3
12463636-1	7	9
12463636-2	7	9
12463638	9	1
7618	3	7
7637	1	7
	5	2
ASTM D1785	BULK	4
B18.22.1 1/4	2	4
B18.22.1 3/4	6	6
B1821BH050C150N	1	3
MILS24214	4	7
MS17602	8	2
MS21044C06	3	6
MS21044C10	6	15
MS21044C16	7	18
MS21044C4	2	5
MS21783-16A282	6	16
	7	11
MS24665-370	4	3
MS24665-511	4	4
MS24665-513	6	9
	7	4
MS35338-46	6	12
MS35338-48	1	4
MS35338-50	6	14
MS35338-53	7	13
MS51412-15	7	17
MS51412-18	1	12
MS51412-30A	6	13
MS51851-53	1	11
	9	2
MS51957-31	3	3
MS51975-64	7	14
MS90727-175	6	17
MS90727-236	7	16
NAS1149CN632R	3	5
NAS1149F1290P	7	6
RRC271	BULK	2
RRW410	BULK	3
RS290-1	1	8
	5	3
	8	7
WWP471	3	8

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
5305-00-054-6655	3	3
5305-00-071-2069	1	3
5310-00-079-6474	6	15
5310-00-079-6477	7	18
9510-00-189-1556	BULK	1
4710-00-225-4778	BULK	4
5315-00-236-8359	4	3
5315-00-239-8032	6	9
5315-00-239-8032	7	4
4030-00-278-0699	4	7
4030-00-431-5536	1	8
4030-00-431-5536	5	3
4030-00-431-5536	8	7
5315-00-576-0421	4	4
5310-00-584-5272	1	4
5310-00-584-7889	7	13
5310-00-637-9541	6	12
4010-00-641-6185	BULK	3
3120-00-661-5932	6	16
3120-00-661-5932	7	11
5315-00-664-8063	8	2
4010-00-720-4467	BULK	2
5305-00-726-2562	6	17
3930-00-759-9738	3	7
5310-00-820-6653	6	14
5310-00-889-2589	2	5
5303-00-935-2931	7	16
5310-00-982-6813	3	6
5315-01-096-0203	1	7
5315-01-096-0203	5	2
5315-01-096-0203	8	6
5305-01-136-5330	1	11
5305-01-136-5330	9	2
5305-01-203-9347	7	14
5310-01-253-1618	1	12
5310-01-266-8265	7	17
5310-01-352-9588	3	5
5340-01-421-6471	8	5
5310-01-421-7071	6	13

APPENDIX G
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

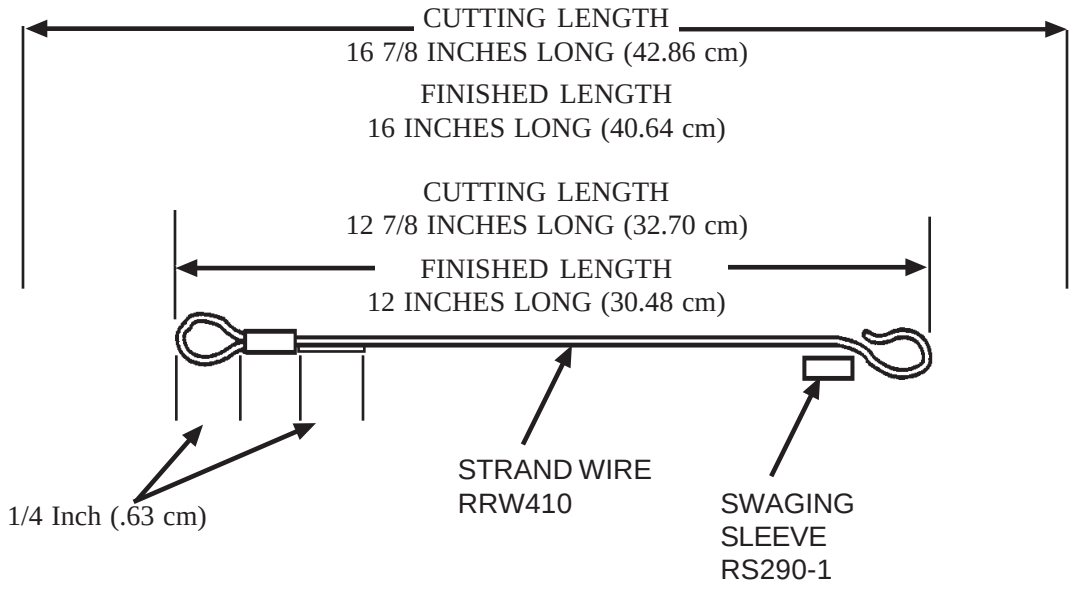
G-1. INTRODUCTION.

This appendix includes complete instructions for manufacturing or fabricating items needed for maintenance. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria. All bulk materials needed for manufacture of an item are listed by part number or specification number.

Section II. MANUFACTURING INSTRUCTIONS

G-2. STANCHION PIN ASSEMBLY WIRE ROPES.

The stanchion pin assembly is used in 4 places. One strandwire is 4 inches (10.16 cm) longer than the other on each pin assembly. Crimped swaging sleeves are used to attach the strand wire to other components. Each application requires two swaging sleeves.



Notes.

(1) Obtain all components required to fabricate stanchion pin assemblies.

(2) Use a fine toothed hacksaw or suitable cutting device, cut strand wire 16 7/8 inches (42.86 cm) long or 12 7/8 inches (32.70 cm) long, depending on which wire is replaced.

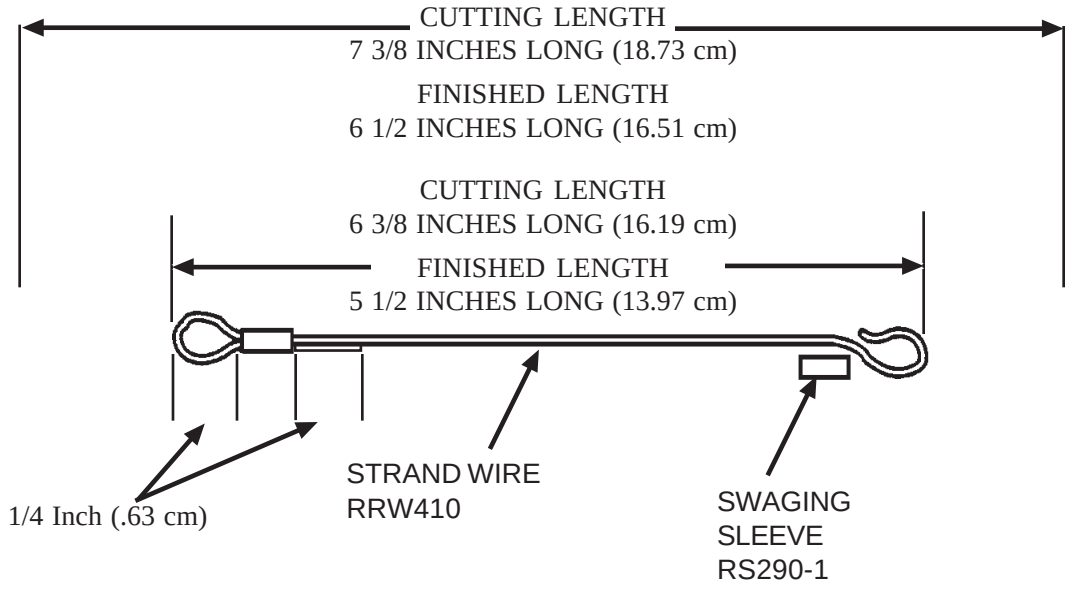
(3) Slide strand wire through hole in component, until strand wire comes through other side.

(4) Slide swaging sleeve onto strand wire until swaging sleeve bottoms against component and strand wire comes through swaging sleeve.

(5) Crimp swaging sleeves to strand wire.

G-3. FRONT AND REAR TIE-DOWN CABLE ASSEMBLY WIRE ROPES.

The front and rear tie-down cable assembly is used in 4 places. One strand wire is 1 inch (2.5cm) longer than the other on each cable assembly. Crimped swaging sleeves are used to attach the strandwire to other components. Each application requires two swaging sleeves.



Notes:

(1) Obtain all components required to fabricate front and rear tie-down cable assemblies.

(2) Use a fine toothed hacksaw or suitable cutting device, cut strand wire 7 3/8 inches (18.73 cm) long or 6 3/8 inches (16.19 cm) long, depending on which wire is replaced.

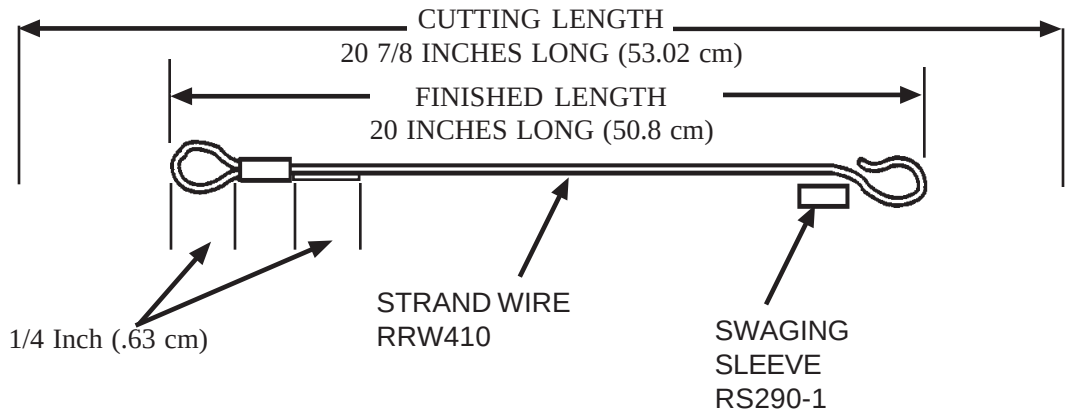
(3) Slide strand wire through hole in component until strand wire comes through other side.

(4) Slide swaging sleeve onto strand wire until swaging sleeve bottoms against component and strand wire comes through swaging sleeve.

(5) Crimp swaging sleeves to strand wire.

G-4. CRADLE ROLLER PIN ASSEMBLY WIRE ROPE.

The cradle roller pin assembly is used in 2 places. The strand wire length is the same for each application. Crimped swaging sleeves are used to attach the strand wire to other components. Each application requires two swaging sleeves.



Notes.

(1) Obtain all components required to fabricate stanchion pin assemblies.

(2) Using a fine toothed hacksaw or suitable cutting device, cut strandwire 20 7/8 inches (53.02 cm) long.

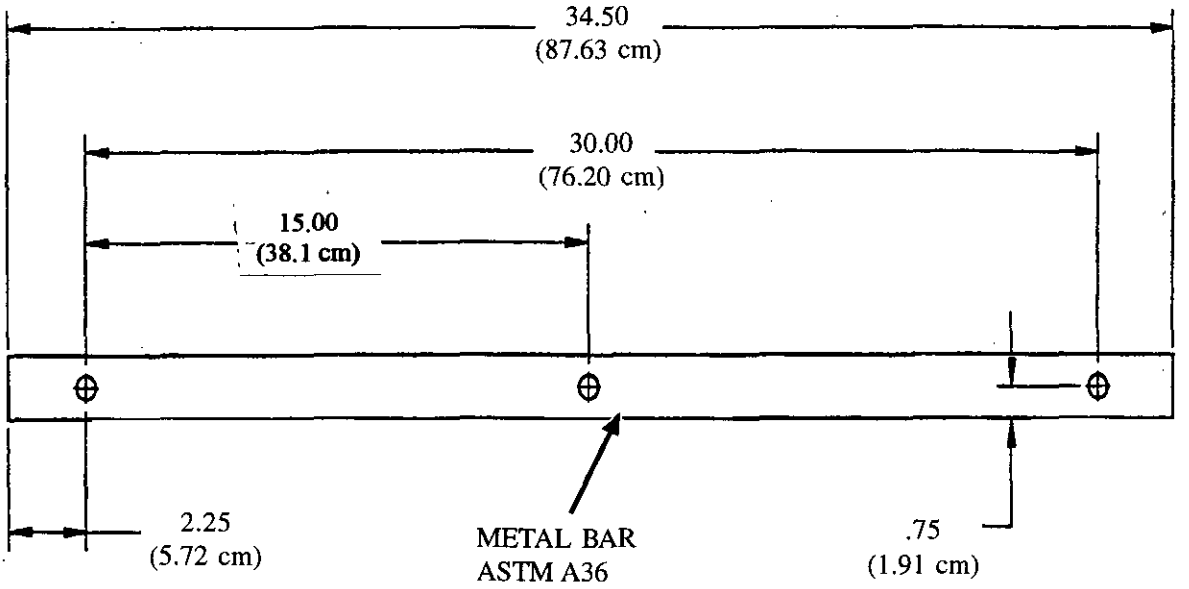
(3) Slide strand wire through hole in component until strandwire comes through other side.

(4) Slide swaging sleeve onto strand wire until swaging sleeve bottoms against component and strand wire comes through swaging sleeve.

(5) Crimp swaging sleeves to strandwire.

G-5. BUMPER GUARD RETAINER PLATE.

The bumper guard retainer plate is used in 2 places. Dimensions are the same for each application. Retainer plate is used to attach bumper guard to cradle frame.



Notes.

(1) Obtain all components required to fabricate the retainer plate.

(2) Use a hacksaw or suitable cutting device, cut bulk metal bar 34 1/2 inches (87.63 cm) long.

(3) Using a ruler and a scribe, measure 2 1/4 inches (5.72 cm) from one end of metal bar and 3/4 inch (1.91cm) from edge and mark intersection. Using a punch and hammer, make drill starter hole on metal bar.

(4) Using a ruler and a scribe, measure 15 inches (38.1 cm) from mark in step 3 and 3/4 inch (1.91 cm) from edge and mark intersection. Using a punch and hammer, make drill starter hole on metal bar.

(5) Using a ruler and a scribe, measure 30 inches (76.2 cm) from mark in step 3 and 3/4 inch (1.91 cm) from edge and mark intersection. Using a punch and hammer, make drill starter hole on metal bar.

(6) Using a portable drill and 9/16 inch (1.42 cm) drill bit, drill three holes in metal bar at drill starter holes made in steps 3, 4, and 5.

(7) Remove all burs and sharp edges.

G-5. BUMPER GUARD RETAINER PLATE (Continued).

WARNING

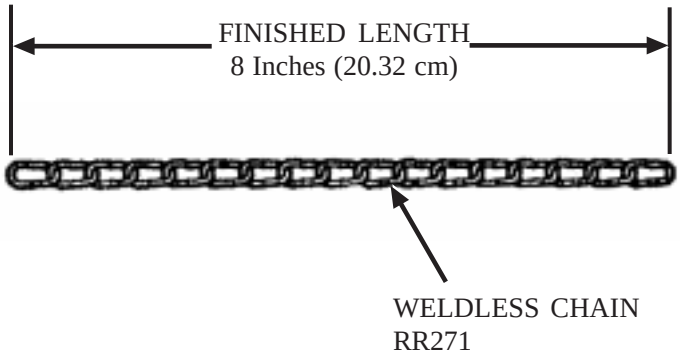
CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness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

- **ALWAYS use airline respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.**
- **DO NOT use CARC paint without adequate ventilation.**
- **NEVER weld or cut CARC-coated materials.**
- **DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.**
- **BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.**

(8) Finish using epoxy paint (Item 3, Appendix E) and epoxy thinner (Item 4, Appendix E).

G-6. REMOVABLE SKID PLATE RING PIN RETAINING CHAIN.

The ring pin retaining chain is used in 2 places on the removable skid plate. Dimensions are the same for each application. The chain is used to retain the ring pin on the removable skid plate.



Notes.

(1) Obtain all components required to fabricate ring pin retaining chain.

(2) Using a fine-toothed hacksaw or suitable cutting device, cut weldless chain 8 inches (20.32 cm) long.

(3) Remove all burs and sharp edges.

G-6. REMOVABLE SKID PLATE RING PIN RETAINING CHAIN (Continued).

WARNING

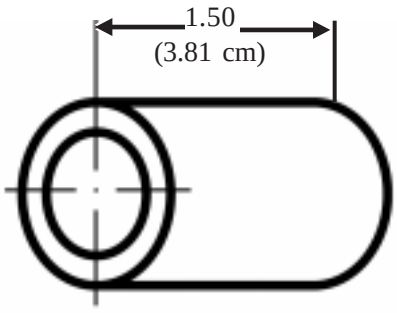
CARC paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness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

- **ALWAYS use airline respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.**
- **DO NOT use CARC paint without adequate ventilation.**
- **NEVER weld or cut CARC-coated materials.**
- **DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.**
- **BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.**

(4) Finish, using epoxy paint (Item 3, Appendix E) and epoxy thinner (Item 4, Appendix E), 383 CARC green.

G-7. FRONT AND REAR ROLLER ASSEMBLIES PLASTIC PIPE.

The plastic pipe is used on the front roller assemblies in eight places and the rear roller assemblies in sixteen places. Dimensions are the same for all applications. Plastic pipes are used to provide spacing between the rollers.



Notes.

(1) Obtain all components required to fabricate the plastic pipe.

(2) Use a hacksaw or suitable cutting device, cut bulk plastic pipe 1 1/2 inches (3.81 cm).

(3) Remove all burs and sharp edges.

APPENDIX H
MANDATORY REPLACEMENT PARTS LIST

H-1. SCOPE.

This appendix lists mandatory replacement parts you will need to perform maintenance on the IBC. Mandatory replacement parts are defined as parts that are replaced each time they are removed from the IBC, such as locking fasteners, cotter pins, etc. Refer to your Unit Commander if you are unsure whether a part is a consumable item. Table H-1 lists mandatory replacement parts for the IBC.

H-2. EXPLANATION OF COLUMNS.

a. ***Column (1) - Replacement Part Reference Code.*** This number is assigned to the entry in the listing and is referenced in the narrative task box to identify the material, e.g., Locknut (Item 6, Appendix H).

b. ***Column (2) - Maintenance Level.*** This column identifies the lowest level of maintenance that requires the listed items.

C - Operator/Crew
O - Unit Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. ***Column (3) - Nomenclature.*** Indicates the Federal item name and, if required, a description to identify the item.

d. ***Column (4) - National Stock Number.*** This is the vendor number assigned to the item.

e. ***Column (5) - Part Number.*** This is the vendor number assigned to the item.

Table H-1. MANDATORY REPLACEMENT PARTS LIST

(1) REPLACEMENT PART REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER
1	O	Nut, Self-Locking	5310-00-982-6813	MS21044C06
2	O	Nut, Self-Locking	5310-00-079-6474	MS21044C10
3	O	Nut, Self-Locking	5310-00-079-6477	MS241044C16
4	O	Pin, Cotter	5315-00-236-8359	MS24665-370
5	O	Pin, Cotter	5315-00-576-0421	MS24665-511
6	O	Pin, Cotter	5315-00-239-8032	MS24665-513
7	O	Pin, Cotter	5315-00-059-0543	MS24665-638
8	O	Pin, Cotter	5315-00-060-2411	MS24665-642
9	O	Pin, Spring	5315-00-664-8063	MS17602
10	O	Washer, Lock	5310-00-637-9541	MS35338-46
11	O	Washer, Lock	5310-00-584-5272	MS35338-48
12	O	Washer, Lock	5310-00-820-6653	MS35338-50
13	O	Washer, Lock	5310-00-584-7889	MS35338-53

APPENDIX I
LUBRICATION INSTRUCTIONS

I-1. GENERAL.

NOTE

These lubrication instructions to be performed on the IBC are MANDATORY.

a. The cradle must receive lubrication with approved lubricants at recommended intervals in order to be mission-ready at all times.

b. The KEY (I-3) lists lubricants to be used in all temperature ranges and shows the intervals.

c. The Lubrication Chart (I-2) shows lubrication points, names to be lubricated, the required lubricant, and recommended intervals for lubrication. Any special lubricating instructions required for specific components are contained in the NOTES section of the chart.

d. Recommended intervals are based on normal conditions of operation, temperature, and humidity. When operating under extreme conditions, lubricants should always be changed more frequently. When in doubt, notify your supervisor.

I-2. SPECIFIC LUBRICATION INSTRUCTIONS.

a. Keep all lubricants in a closed container and store in a clean, dry place away from extreme heat. Keep container covers clean and do not allow dust, dirt, or other foreign material to mix with lubricants. Keep all lubrication equipment clean and ready for use.

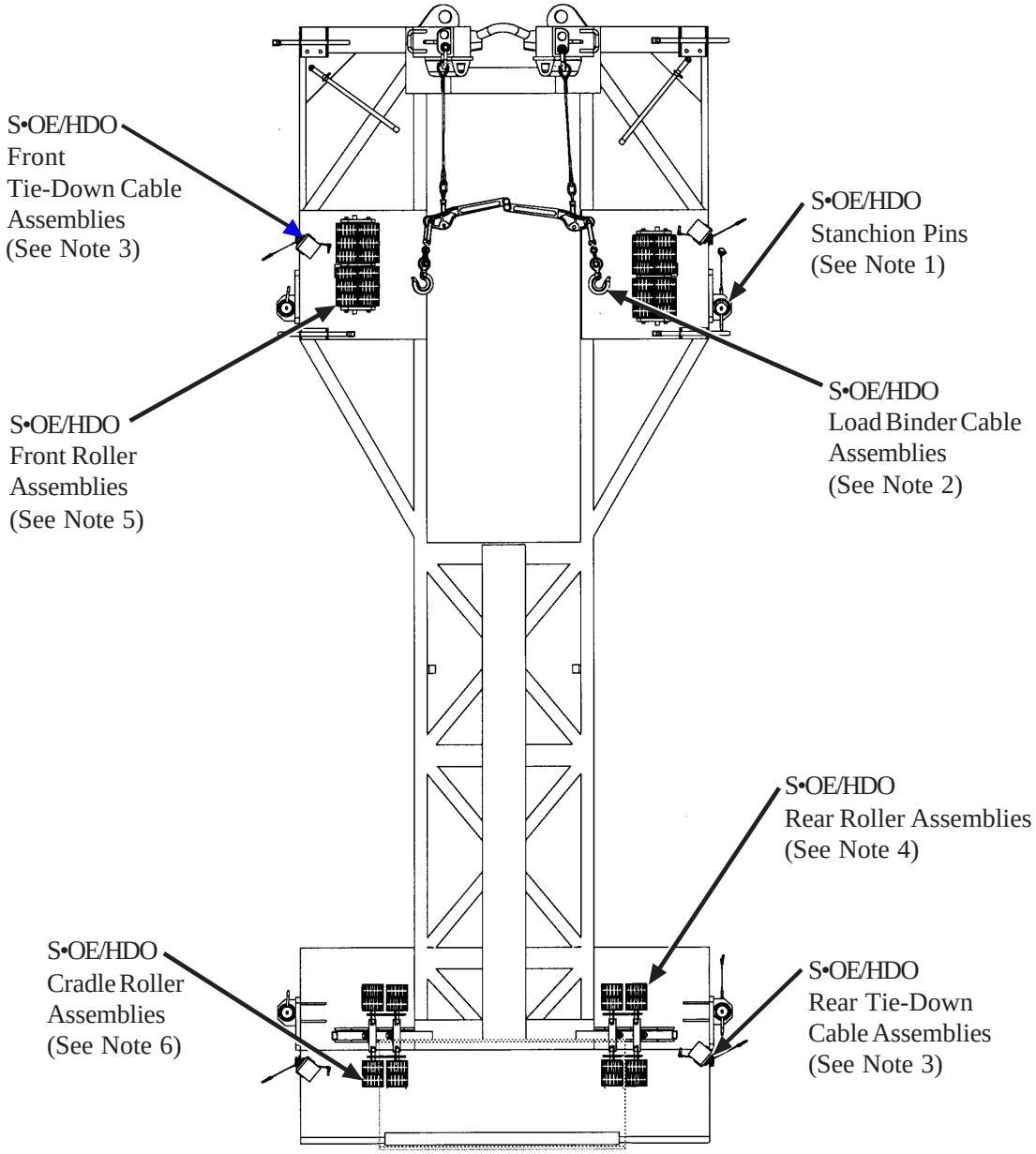
b. Maintain a record of lubrication performed and report any problems noted during lubrication. Refer to DA Pam, 738-750 for maintenance forms and maintenance forms and procedures to record and report any findings.

c. Refer to FM 9-207 for lubrication instructions in cold weather.

d. After operation in mud or in sandy or dusty conditions, clean and inspect all points of lubrication for fouled lubricants. Change lubricants as required.

Clean all fittings and areas around lubrication points with drycleaning solvent (Item 2, Appendix E) before lubricating equipment. After lubrication, wipe off excess oil to prevent an accumulation of foreign matter.

LUBRICANT • INTERVAL



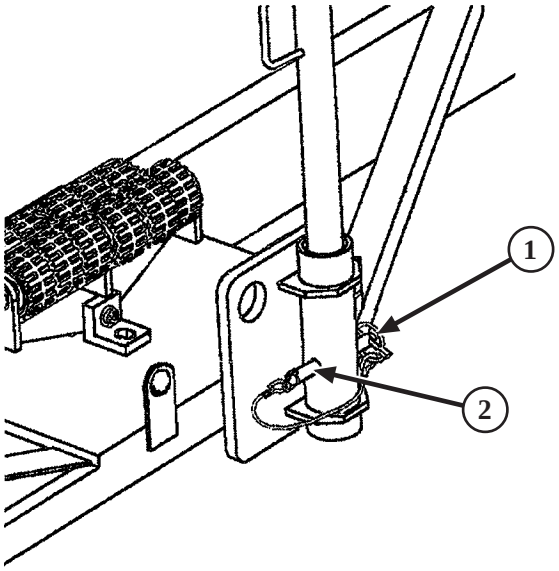
INTERVAL	MAN-HOURS*
S	0.5

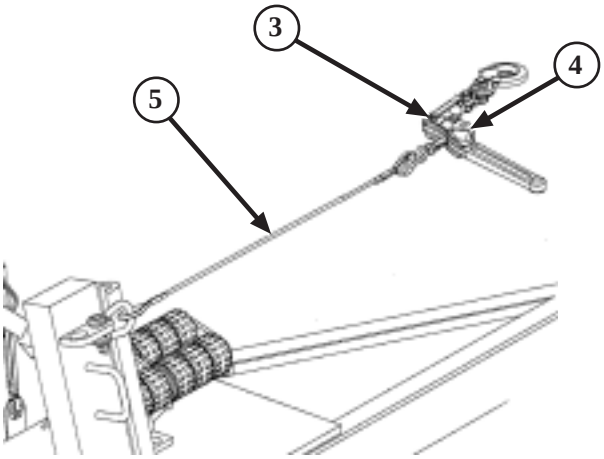
* The man-hour time specified is the time you need to do all the services prescribed.

– KEY –

LUBRICANTS	EXPECTED TEMPERATURE *				
	Above +32°F (Above 0°C)	+40°F to -10°F (+4°C to -23°C)	0°F to -65°F (-18°C to -54°C)		
Lubricating Oil, Internal Combustion Engine, Tactical Service * For arctic operation refer to FM 9-207.	OE/HDO-30	OE/HDO-10			S – Semiannual

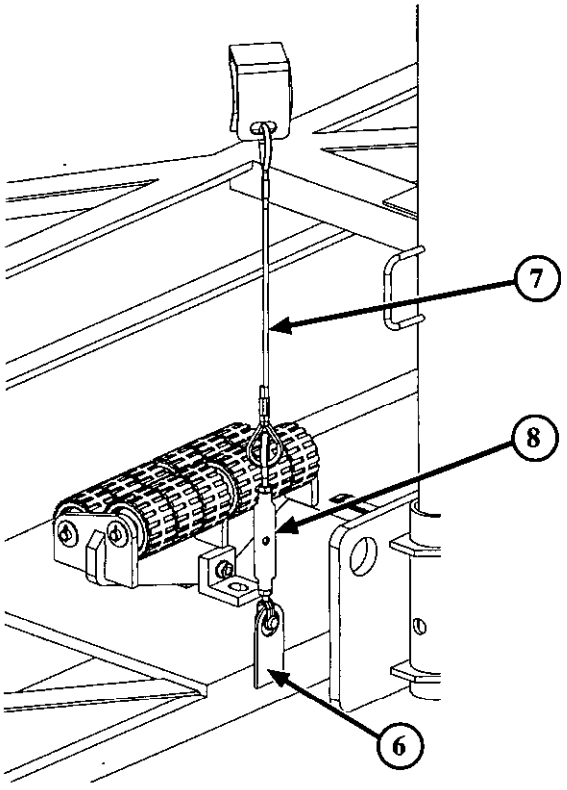
Notes.



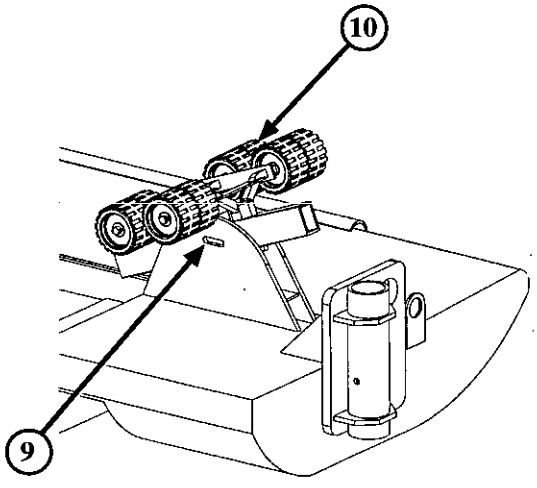


(1) STANCHION PIN ASSEMBLIES. Lubricate straight pin (1) on four stanchion pin assemblies (2) sparingly with lubrication oil (Item 7 or 8, Appendix E).

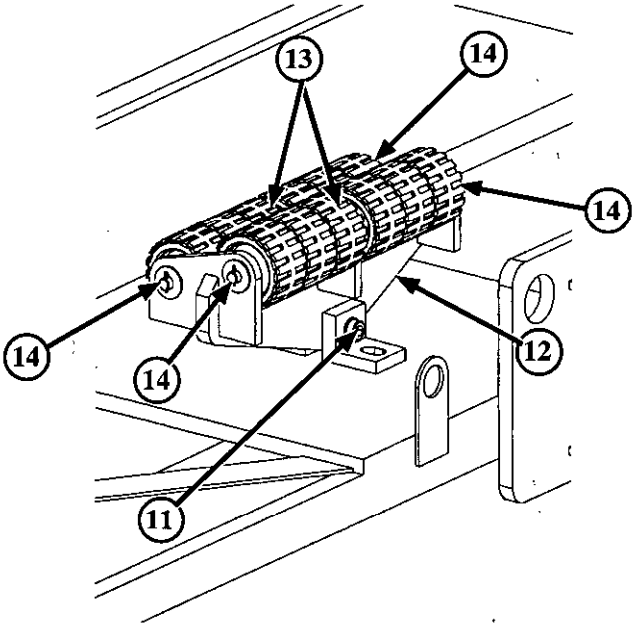
(2) LOAD BINDER CABLE ASSEMBLIES. Lubricate two load binder pivot points (3 and 4) on two load assemblies (5) sparingly with lubrication oil (Item 7 or 8, Appendix E).



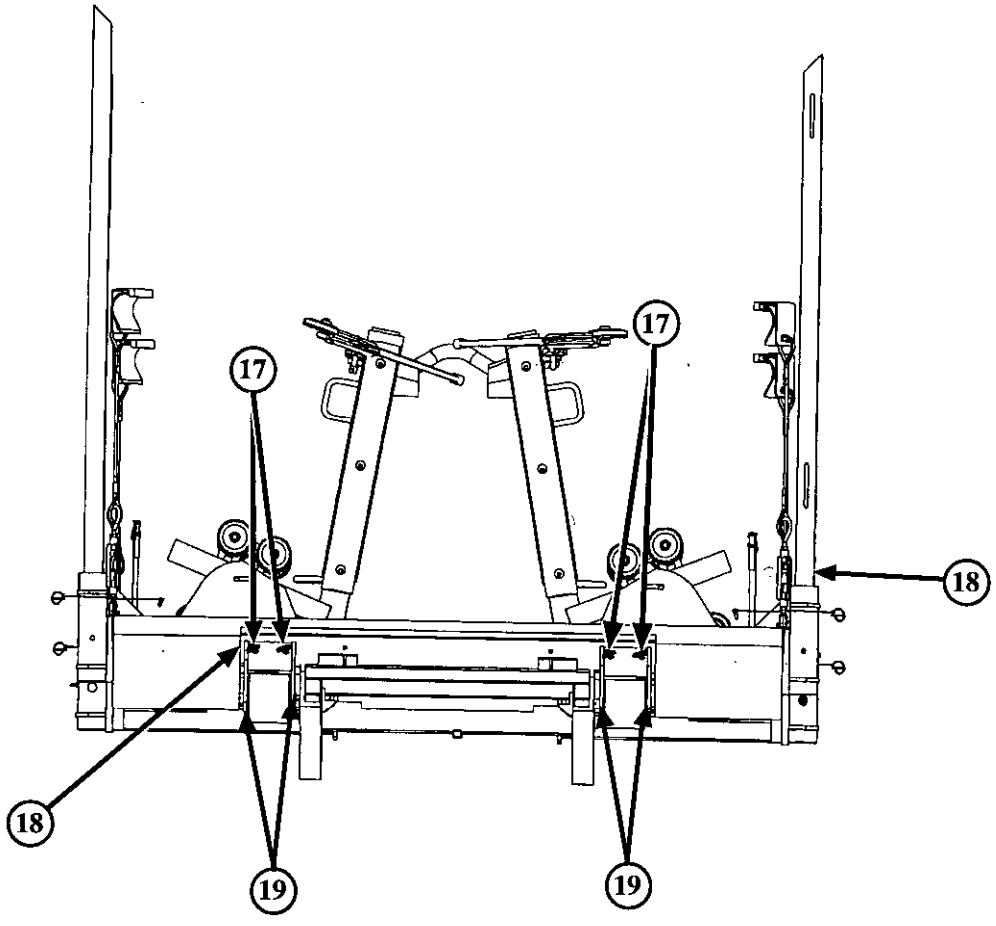
(3) FRONT AND REAR TIE-DOWN CABLE ASSEMBLIES. Lubricate headed straight pin (6) on two front and two rear tie-down cable assemblies (7) sparingly with lubrication oil (Item 7 or 8, Appendix E). Lubricate turnbuckle (8) on two front and rear tie-down cable assemblies (7) sparingly with lubrication oil (Item 7 or 8, Appendix E).



(4) REAR ROLLER ASSEMBLIES. Lubricate pivot sleeve bearing (9) on two rear roller assemblies (10) sparingly with lubrication oil (Item 7 or 8, Appendix E).



(5) FRONT ROLLER ASSEMBLIES. Lubricate pivot sleeve bearing (11) on two front roller assemblies (12) sparingly with lubrication oil (Item 7 or 8, Appendix E). Lubricate six roller bearing sleeves (13 and 14) on two front roller assemblies (12) sparingly with lubrication oil (Item 7 or 8, Appendix E).



(6) CRADLE ROLLER ASSEMBLIES. Lubricate two headless straight pins (17) on two cradle roller assemblies (18) sparingly with lubrication oil (Item 7 or 8, Appendix E). Lubricate straight pin (19) on two cradle roller assemblies (19) sparingly with lubrication oil (Item 7 or 8, Appendix E).

APPENDIX J
TORQUE LIMITS

J-1. SCOPE.

This appendix provides general torque limits for the screws used on the IBC. The general torque limits given in this appendix shall be used when specific torque limits are not indicated in the maintenance procedure. These general torque limits cannot be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions, tighten the screw or nut until it touches the metal bracket then tighten it one more turn.

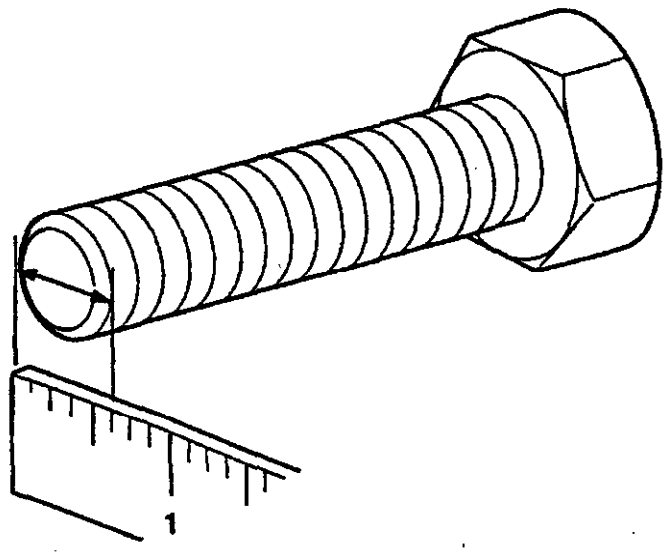
J-2. TORQUE LIMITS.

Table J-1 lists the torque limits for wet flange nuts. Table J-2 lists the torque limits for wet socket head capscrews. Table J-3 lists dry torque limits for capscrews. Dry torque limits are used on screws that do not have high pressure lubricants applied to the threads. Table J-4 lists wet torque limits for capscrews. Wet torque limits are used on screws that have high pressure lubricants applied to the threads.

J-3. HOW TO USE TORQUE TABLE.

a. Screws and Nuts.

(1) Measure the diameter of the screw you are installing with a ruler.



J-3. HOW TO USE TORQUE TABLE (Continued)..

(2) Measure out one inch with a ruler and count the number of threads per inch.

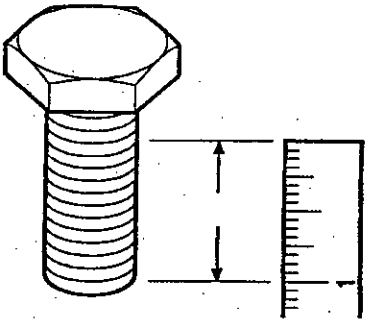
(3) Under the heading SIZE, look down the left hand column until you find the diameter of the screw you are installing (there will usually be two lines beginning with the same size).

(4) In the second column under SIZE, find the number of threads per inch that matches the number of threads per inch you counted in Step 2 (Not required for metric screws).

(5) To find the grade screw you are installing, match the markings on the head to the correct picture of CAPSCREW HEAD MARKINGS on the torque table.

(6) Look down the column under the picture you found in Step 5 until you find the torque limit (lb-ft or Nm) for the diameter and threads per inch of the screw you are installing.

(7) Use wet torque values.



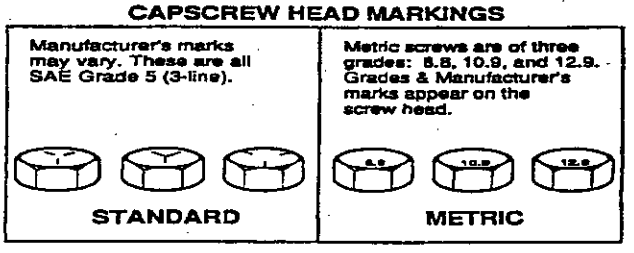


Table J-1. Torque Limits for Wet Flange Nuts

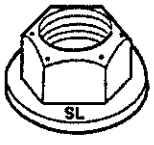
SPIRALOCK FLANGE NUT MARKINGS GRADE 8	DIAMETER IN.	DIAMETER MM	THREADS PER INCH	TORQUE LB-FT	TORQUE N·m
	1/4	6.35	20	15	20
	5/16	7.94	18	25	34
	3/8	9.65	16	45	61
	1/2	12.70	13	110	149
	5/8	15.87	11	210	285
	3/4	19.05	10	375	508

Table J-2. Torque Limits for Wet Socket Head Cap Screws

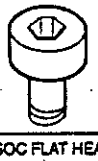
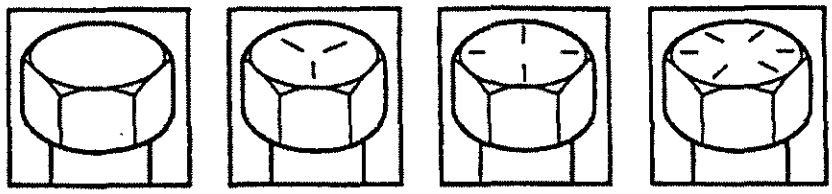
SOC HEAD/12 PT.	SOC FLAT HEAD	TORQUE IN FT. LBS. (CAP SCREWS) LUBED		
		SIZE	SOC HD OR 12 PT	SOC FLAT HD
		.10-24	5	2.5
		.25-20	12	6
		.31-18	25	12
		.38-16	44	22
		.50-13	70	36
		.56-12	106	53
		.62-11	212	106
		.75-10	375	187
		1.00-8	781	

Table J-3. TORQUE LIMITS FOR DRY FASTENERS

CAPSCREW HEAD MARKINGS

Manufacturer's marks may vary.
These are all SAE Grade 5 (3-line).

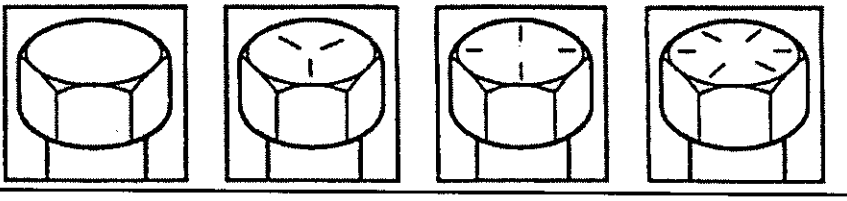


SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
Dia Inches	Threads Per Inch	Millimeters	Pound Feet	Newton Meters	Pound Feet	Newton Meters	Pound Feet	Newton Meters	Pound Feet	Newton Meters
1/4	20	6.35	5.5	7.5	8.0	10.8	10.0	13.6	12.0	16.3
1/4	28	6.35	6.33	8.6	10.0	13.6	12.0	16.3	14.0	19.0
5/16	18	7.94	11.0	14.9	17.0	23.0	21.0	28.5	25.0	33.9
5/16	24	7.94	12.0	16.3	19.0	25.8	24.0	32.5	25.0	33.9
3/8	16	9.52	20.0	27.1	30.0	40.7	40.0	54.2	45.0	61.0
3/8	24	9.52	23.0	31.2	35.0	47.5	45.0	61.0	50.0	67.8
7/16	14	11.11	32.0	43.4	50.0	67.8	60.0	81.4	70.0	94.9
7/16	20	11.11	36.0	48.8	55.0	74.6	70.0	94.9	80.0	108.5
1/2	13	12.70	50.0	67.8	75.0	101.7	95.0	128.8	110.0	149.1
1/2	20	12.70	55.0	74.6	90.0	122.0	100.0	135.6	120.0	162.7
9/16	12	14.29	70.0	94.9	110.0	149.1	135.0	183.0	150.0	203.4
9/16	19	14.29	80.0	108.5	120.0	162.7	150.0	203.4	170.0	230.5
5/8	11	15.88	100.0	135.6	150.0	203.4	190.0	257.6	220.0	298.3
5/8	18	15.88	110.0	149.1	180.0	244.0	210.0	284.7	240.0	325.4
3/4	10	19.05	175.0	237.3	260.0	352.5	320.0	433.9	380.0	515.2
3/4	16	19.05	200.0	271.2	300.0	406.7	360.0	488.1	420.0	569.4
7/8	9	22.23	170.0	230.5	430.0	583.0	520.0	705.0	600.0	813.5
7/8	14	22.23	180.0	244.0	470.0	637.2	580.0	786.4	660.0	894.8
1	8	25.40	250.0	339.0	640.0	867.7	800.0	1085.0	900.0	1220.0
1	12	25.40	270.0	366.1	710.0	962.6	860.0	1166.0	1000.0	1336.0
1	14	25.40	280.0	379.6	730.0	989.7	900.0	1220.0	1020.0	1383.0
1-1/8	7	28.58	350.0	474.5	800.0	1085.0	1120.0	1518.0	1280.0	1735.0
1-1/8	12	28.58	400.0	542.3	880.0	1193.0	1260.0	1708.0	1440.0	1952.0
1-1/4	7	31.75	500.0	677.9	1120.0	1518.0	1580.0	2142.0	1820.0	2468.0
1-1/4	12	31.75	550.0	745.7	1240.0	1681.0	1760.0	2386.0	2000.0	2712.0
1-3/8	6	34.93	670.0	908.4	1460.0	1979.0	2080.0	2820.0	2380.0	3227.0
1-3/8	23	34.93	750.0	1017.0	1680.0	2278.0	2380.0	3227.0	2720.0	3688.0
1-1/2	6	38.10	870.0	1180.0	1940.0	2630.0	2780.0	3769.0	3160.0	4284.0
1-1/2	12	38.10	980.0	1329.0	2200.0	2983.0	3100.0	4203.0	3560.0	4827.0

Table J-4. TORQUE LIMITS FOR WET FASTENERS

CAPSCREW HEAD MARKINGS

Manufacturer's marks may vary.
These are all SAE Grade 5 (3-line).



SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 or 7		SAE GRADE NO. 8	
Dia Inches	Threads Per Inch	Millimeters	Pound Feet	Newton Meters	Pound Feet	Newton Meters	Pound Feet	Newton Meters	Pound Feet	Newton Meters
1/4	20	6.35	4.2	5.6	6.25	8.47	8.0	10.8	9.0	12.2
1/4	28	6.35	4.67	6.33	7.17	9.72	9.0	12.2	10.0	13.6
5/16	18	7.94	8.0	10.8	13.0	17.6	16.0	21.7	18.0	24.4
5/16	24	7.94	9.0	12.2	14.0	19.0	18.0	24.4	20.0	27.1
3/8	16	9.52	15.0	20.3	23.0	31.2	30.0	40.7	35.0	47.5
3/8	24	9.52	17.0	23.0	25.0	33.9	30.0	40.7	35.0	47.5
7/16	14	11.11	24.0	32.5	35.0	47.5	45.0	61.0	55.0	74.6
7/16	20	11.11	27.0	36.6	40.0	54.2	50.0	67.8	60.0	81.3
1/2	13	12.70	35.0	47.5	55.0	74.6	70.0	94.9	80.0	108.5
1/2	20	12.70	40.0	54.2	65.0	88.1	80.0	108.5	90.0	122.0
9/16	12	14.29	55.0	74.6	80.0	108.5	100.0	135.6	110.0	149.1
9/16	19	14.29	60.0	81.3	90.0	122.0	110.0	149.1	130.0	176.3
5/8	11	15.88	75.0	101.7	110.0	149.1	140.0	189.8	170.0	230.5
5/8	18	15.88	85.0	115.2	130.0	176.3	160.0	216.9	180.0	244.0
3/4	10	19.05	130.0	176.3	200.0	271.2	240.0	325.4	280.0	379.6
3/4	16	19.05	150.0	203.4	220.0	298.3	280.0	379.6	320.0	433.9
7/8	9	22.23	125.0	169.5	320.0	433.9	400.0	542.3	460.0	623.7
7/8	14	22.23	140.0	189.8	360.0	488.0	440.0	596.6	500.0	677.9
1	8	25.40	190.0	257.6	480.0	650.8	600.0	813.5	680.0	921.9
1	12	25.40	210.0	284.7	530.0	718.6	660.0	894.8	740.0	1003.0
1	14	25.40	210.0	284.7	540.0	732.1	670.0	908.4	760.0	1030.0
1-1/8	7	28.58	270.0	366.1	600.0	813.5	810.0	1098.0	960.0	1302.0
1-1/8	12	28.58	300.0	406.7	660.0	894.8	940.0	1274.0	1080.0	1464.0
1-1/4	7	31.75	380.0	515.2	840.0	1139.0	1100.0	1491.0	1360.0	1844.0
1-1/4	12	31.75	420.0	569.4	920.0	1247.0	1320.0	1790.0	1500.0	2034.0
1-3/8	6	34.93	490.0	664.3	1100.0	1491.0	1560.0	2115.0	1780.0	2413.0
1-3/8	23	34.93	560.0	759.2	1260.0	1708.0	1780.0	2413.0	2040.0	2766.0
1-1/2	6	38.10	650.0	881.3	1460.0	1979.0	2080.0	2820.0	2360.0	3200.0
1-1/2	12	38.10	730.0	989.7	1640.0	2224.0	2320.0	3145.0	2660.0	3606.0

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1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches
1 Kilometer = 1,000 Meters = 0.621 Miles

WEIGHTS
1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces
1 Kilogram = 1,000 Grams = 2.2 Lb
1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Lilter = 1,000 Millimeters = 33.82 Fluid Ounces

SQUARE MEASURE
1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

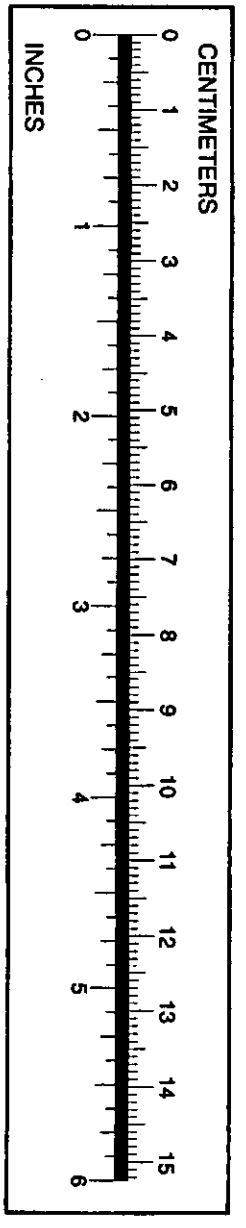
CUBIC MEASURE
1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE
5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 °C + 32 = °F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton•Meters	1.356
Pounds Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton•Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621



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