[*SGML Version See Change Record*]
TECHNICAL MANUAL

INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS

SLIDING PADEYE RECEIVING UNITS, BULKHEAD-MOUNTED

THIS MANUAL SUPERSEDES S9585-AA-MMA-010 DATED 1 JUNE 1981, AND ALL CHANGES THERETO.

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RECORD OF CHANGES

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NOTE

THIS TECHNICAL MANUAL (TM) HAS BEEN DEVELOPED FROM AN INTELLIGENT ELECTRONIC SOURCE KNOWN AS STANDARD GENERALIZED MARKUP LANGUAGE (SGML). THERE IS NO LOEP. ALL CHANGES, IF APPLICABLE, ARE INCLUDED. THE PAGINATION IN THIS TM WILL NOT MATCH THE PAGINATION OF THE ORIGINAL PAPER TM; HOWEVER, THE CONTENT IS EXACTLY THE SAME. ANY CHANGES RECEIVED AFTER RECEIPT OF THIS TM WILL ONLY FIT IN THIS PAGINATED VERSION.

FOREWORD

This manual contains the information needed to operate and maintain the sliding padeye.

This manual consists of eight chapters and one appendix:

This manual was prepared by the Naval Surface Warfare Center, Port Hueneme Division for the Commander, Naval Sea Systems Command (NAVSEA).

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SAFETY SUMMARY

GENERAL SAFETY NOTICES. The following general safety notices supplement the general and specific warnings and cautions appearing throughout this manual. General and specific precautions must be understood and applied during operation and maintenance of the sliding block drive. The commanding officer or other authority will issue orders as deemed necessary for any situations not covered in the general and specific safety precautions.

DO NOT REPAIR OR ADJUST ALONE. Do not repair or adjust equipment alone under any circumstances. The immediate presense of someone capable of rendering aid is required.

FIRST AID. An injury, no matter how slight, should never go unattended. Always obtain first aid or medical attention immediately.

RESUSCITATION. Personnel working with or near high voltage shall be familiar with approved resuscitation methods. If someone is injured and stops breathing, initiate resuscitation immediately. A delay could cost the victim's life.

ENERGIZED EQUIPMENT. Before working on energized equipment, ensure against grounding. If possible, make repairs/adjustments with one hand, leaving the other hand clear of equipment.

MOVING EQUIPMENT. If equipment must be repaired/adjusted while in motion, a safety watch shall be posted. The safety watch must have a full view of the repair/adjustment operation, and immediate access to controls that can stop the equipment in motion.

DEENERGIZED EQUIPMENT. Even when power is removed from equipment circuit, dangerous potentials may still exist due to retention of charges by capacitors. Ground circuits and discharge capacitors prior to making repairs/adjustments.

INTERLOCKS. Interlocks are provided for personnel and equipment safety, and should be used only for the purpose intended. Interlocks should not be battle shortened or otherwise modified, except by authorized personnel. Do not depend solely upon interlocks for protection. Whenever possible, disconnect power at power distribution source.

TEST EQUIPMENT. Ensure that test equipment is in good condition. If a test meter must be held, ground the case of the meter before using. Do not touch live equipment or personnel working on live equipment while holding a test meter. Some types of measuring devices should not be grounded; do not hold such devices when taking measurements.

GENERAL PRECAUTIONS. The following general precautions must be understood prior to equipment operation and maintenance:

1. All maintenance operations shall comply with Navy Safety Precautions for Forces Afloat, OPNAVINST 5100 series.
2. All electrical components associated with the winch shall be installed and grounded in accordance with applicable Navy regulations and approved shipboard practices.
3. Precautions in Naval Ships' Technical Manual (NSTM), chapters 300, 302, 310, and 320, shall be observed with respect to electrical equipment and circuits.

SAFETY SUMMARY - Continued

4. Before operating equipment or performing any tests or measurements, ensure that frames of motors and control panels are grounded.

5. Proper installation and maintenance of protective guards and shutdown devices around rotating parts of machinery and high voltage sources shall be observed.

6. Do not wear loose clothing while working around rotating parts of machinery.

7. Special precautionary measures are essential to prevent applying power accidentally to the equipment when maintenance work is in progress.

8. All circuits not known to be dead must be considered live and dangerous at all times.

9. Deenergize all equipment before connecting or disconnecting meters or test leads.

10. Before working on electrical equipment, check with voltmeter to ensure that equipment is not energized.

11. When connecting a meter to terminals for measurement, use range higher than expected voltage.

12. When working near electricity, do not use metal rules, flashlights, metallic pencils, or any other objects having exposed conducting material.

13. Do not make any unauthorized alterations to equipment or components.

14. Ensure that area is well-ventilated when using cleaning solvent. Avoid prolonged breathing of fumes and solvent contact with skin or eyes. Avoid use near heat or open flame.

WARNINGS AND CAUTIONS. Specific warnings and cautions applying to the sliding padeye are summarized as follows. These warnings and cautions are repeated elsewhere in the manual following paragraph headings and immediately preceding the text to which they apply.

WARNING

Identifies an operating or maintenance procedure, practice, condition, or statement which, if not strictly followed, could result in death or injury to personnel. (Page 1-1)

WARNING

Prior to rigging highline, ensure that both motor access panels on retractable sliding padeyes are in place. Motor access panels are structural. Application of working loads with panels removed could damage kingpost and endanger personnel. (Page 2-7)

WARNING

To prevent death or injury, ensure that Model B-9A manual worm drive assembly is in disengaged position prior to sliding padeye emergency operation. (Page 2-8)

WARNING

To prevent death or injury, or equipment damage, ensure that electrical power to sliding padeye is turned off and that equipment is tagged out of service in accordance with ship's procedures. (Page 2-9)

WARNING

Ensure that ship's low pressure air valve is turned off to prevent inadvertent operation of emergency drive. (Page 2-9)

WARNING

Do not attempt normal operations until one of the following precautions has been observed and implemented. (Page 2-11)

WARNING

To prevent injury, do not apply hand-pressure to latches while kingpost is in motion. Engage latches only when kingpost is stationary. (Page 2-12)

WARNING

To prevent injury, do not apply hand-pressure to latches while kingpost is in motion. Operate latches only when kingpost is stationary. (Page 2-12)

WARNING

Prior to rigging highline ensure that both motor access panels are in place. These panels are structural; application of working load with panels removed could severely damage the kingpost and endanger personnel. (Page 2-13)

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing alignment. (Page 6-2)

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing adjustment. (Page 6-4, page 6-6, page 6-6)

WARNING

To prevent death or injury, always wear safety harness when working above the deck on kingpost. (Page 6-4)

WARNING

Brake dust may be a respiratory irritant. To prevent injury, ensure that appropriate breathing apparatus is worn when handling brake components. (Page 6-7, page 6-11)

WARNING

To prevent death or injury, use cleaning solvent in well-ventilated area. Wear appropriate covering and avoid prolonged breathing of fumes or solvent contact with skin. (Page 6-11)

WARNING

Pressurized air can drive particles into eyes and skin if handled improperly. To prevent injury, exercise extreme caution. (Page 6-12)

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures. (Page 6-15, page 6-19, page 6-25, page 6-26, page 6-28, page 6-38)

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving. (Page 6-15, page 6-15, page 6-19, page 6-29, page 6-45)

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear or block to prevent falling; use extreme caution when removing attaching hardware. (Page 6-17)

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear or block to prevent falling; use extreme caution when installing attaching hardware. (Page 6-18)

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when removing. (Page 6-19, page 6-40)

WARNING

Procedures contained in this section are for sliding padeye repair and overhaul on units that have been removed from the ship and are lying in a horizontal position. Using these procedures, unmodified, for mounted (vertical) units may result in personnel injury or equipment damage. (Page 6-28)

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury, use services of riggers to safely move assembly. (Page 6-28, page 6-39, page 6-46)

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving. (Page 6-29)

WARNING

Ball screw and carriage assemblies are heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving. (Page 6-30, page 6-40)

WARNING

Guides are heavy. To prevent death or injury attach suitable lifting gear and use extreme caution when moving. (Page 6-32)

WARNING

Ball screw and carriage assembly is heavy. To prevent death or injury attach suitable lifting gear and use extreme caution when installing. (Page 6-33, page 6-43)

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when installing. (Page 6-36)

WARNING

AC motor and electrical disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving. (Page 6-36)

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury use services of riggers to safely move assembly. (Page 6-37)

WARNING

To prevent injury, do not apply hand pressure to latches while kingpost is in motion. (Page 6-39, page 6-47)

WARNING

Guides are heavy. Attach suitable lifting gear and use extreme caution when removing. (Page 6-42)

WARNING

Hatch assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving. (Page 6-48, page 6-50, page 6-51, page 6-54)

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk. (Page 6-48, page 6-49, page 6-52)

WARNING

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall. (Page 6-49, page 6-49, page 6-52)

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk.

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall. (Page 6-53)

WARNING

Magnet mounting plate assembly (20) is under pressure from return spring (22). To prevent personnel death or injury, exercise care in removing lock nuts (17). (Page 6-55)

WARNING

To prevent death or injury, relieve spring pressure gradually and maintain control over spring-loaded components at all times during removal. (Page 6-56)

CAUTION

Identifies an operating or maintenance procedure, practice, condition, or statement which, if not strictly followed, could result in equipment damage or serious impairment of system operation. (Page 1-1)

CAUTION

To prevent damage to structural components, ensure that sliding padeye does not continue travel once carriage cams trip the limit switches. (Page 2-7)

CAUTION

To prevent serious damage to ac motor, do not operate sliding padeye in emergency condition longer than necessary. (Page 2-9)

CAUTION

During upward and downward movement of padeye no automatic stop provisions are provided. (Page 2-10)

CAUTION

Attempt the following procedure only after the kingpost has been fully erected. (Page 2-11)

CAUTION

In the following step, kingpost should stop with the two elongated latch slots or pawl pockets slightly below the latches or pawls. If kingpost tends to rise above this point, release PADEYE/KINGPOST UP/DN switch immediately to avoid damage to equipment. Check down stop limit switches. (Page 2-11)

CAUTION

Sliding padeye must be jogged into contact with lifting braces with care. Engagement at full motor speed will cause damage to equipment. (Page 2-12)

CAUTION

Use care when jogging carriage into contact with lifting braces; engagement at full motor speed will cause damage to equipment. (Page 2-13)

CAUTION

The floodlight assembly can be damaged if kingpost is fully lowered with floodlights installed. (Page 2-14)

CAUTION

To prevent damage to jog timing relay needle or orifice, turn adjusting screw only a fraction of a revolution before checking effect of adjustment. (Page 6-6)

CAUTION

To prevent damage, do not use harsh abrasives that might scratch, score, or otherwise mar surface finishes. (Page 6-11)

CAUTION

To prevent damage, do not ultrasonically clean parts longer than 5 minutes at any one time. (Page 6-12)

CAUTION

Leakage around loosely threaded parts, or movement between bolted parts, can cause failure and damage to equipment. Do not alter concentricity of any part. (Page 6-12)

CAUTION

To prevent damage to equipment, do not allow machined or lapped mating surfaces to contact any surface without protection against nicks, scratches, and burrs. (Page 6-13)

CAUTION

Removal of retaining collars from lower bearing housing assembly may allow lower bearing sleeve and roller bearing to fall. Restrain these components before removing retaining collars. (Page 6-22)

CAUTION

Lower and upper (port side) tie plates (3 and 8, figure 7-3) with tack welded setscrews (4) and port side motor cover (2) should not be removed unless required for replacement of kingpost structural elements. (Page 6-22)

CAUTION

Lower and upper (port side) tie plates (5 and 31, figure 7-2 or 3 and 8, figure 7-3) with tack welded setscrews (3 or 4, respectively) and port side motor cover (models CR-1, CR-12B and CR-12B-P) should not be removed for they are kingpost structural elements. (Page 6-22)

CAUTION

Upper and lower (back) tie plates (5 and 31, figure 7-2) with tack welded setscrews (3) should not be removed unless required for replacement of kingpost structural elements. (Page 6-31)

CAUTION

Upper and lower (back) tie plates (5 and 31, figure 7-2) should not be removed unless required for replacement of kingpost structural elements. (Page 6-32)

CAUTION

Exercise care when removing ball screw and carriage assembly to avoid damage to carriage. (Page 6-32, page 6-42)

CAUTION

Exercise care when installing ball screw and carriage assembly to avoid damage to carriage. (Page 6-33, page 6-43)

CAUTION

Operate sliding padeye with motor overload heater relays tripped only long enough to verify operation. Continued operation could damage motor. (Page 6-37, page 6-47)

CAUTION

Lower and upper port side tie plates (3 and 8, figure 7-3) with tack welded setscrews (4) and port side motor cover (2) should not be removed unless required for replacement of kingpost structural elements. (Page 6-41, page 6-41)

CAUTION

To prevent equipment damage, ensure kingpost base enters trunk from directly vertical. (Page 6-46)

CAUTION

Do not allow balls (22) to escape from ball nut. (Page 6-59)

CAUTION

Do not allow balls (24) to escape from ball nut. (Page 6-61)

CHAPTER 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1-1. SAFETY PRECAUTIONS.

1-1.1 WARNING/CAUTION/NOTE USAGE. Warnings and cautions appearing throughout this technical manual are of paramount importance to personnel and equipment safety. Prior to any attempt to operate, maintain, troubleshoot, or repair any part of this equipment, all warnings and cautions shall be thoroughly reviewed and understood. Refer to the Safety Summary which precedes this chapter. Definitions for warnings, cautions, and notes as they are used in this manual are listed below.

WARNING

Identifies an operating or maintenance procedure, practice, condition, or statement which, if not strictly followed, could result in death or injury to personnel.

CAUTION

Identifies an operating or maintenance procedure, practice, condition, or statement which, if not strictly followed, could result in equipment damage or serious impairment of system operation.

NOTE

Highlights certain operating or maintenance conditions or statements which are essential but not of known hazardous nature as indicated by a warning or caution.

1-1.2 ADDITIONAL PRECAUTIONS. Personnel responsible for the sliding padeye shall become thoroughly familiar with and frequently review the following specific safety precautions. These precautions apply to both personnel and equipment and supplement the general precautions and specific warnings and cautions listed in the Safety Summary.

1. Ensure that all safety devices, including limit switches and overload devices, are operational.
2. Ensure that sliding padeye load does not exceed rated capacity.
3. Ensure that arms, head, and other body parts are kept clear of sliding padeye unless power to ac magnetic motor controller is turned off.
4. For emergency stop, ensure that PADEYE UP/DN rotary switch is released and centers to off position.
5. Ensure that personnel always wear properly secured safety harness when working at heights on kingpost or near open trunk.

6. Only qualified personnel shall be allowed to operate sliding padeye and associated replenishment-at-sea (RAS) equipment.
7. Do not operate retractable padeye units equipped with latch pins unless a safety watch has been posted, or unless blocks have been inserted between the hatch coaming and latch pin housing (see paragraph 2-4.2).
8. All RAS personnel shall be thoroughly familiar with procedures presented in Replenishment At Sea, NWP-14.

1-2. INTRODUCTION.

1-2.1 PURPOSE. This manual provides the information required for the operation, maintenance, and repair of the following sliding padeye receiving units: bulkhead-mounted models B-9A and B-12, and retractable models CR-12, CR-12B and CR-12B-P . The receiving units are generally referred to herein as ″sliding padeyes″ except as necessary to distinguish specific models or characteristics.

1-2.2 SCOPE. This manual has been developed in accordance with the content requirements of MIL-M-15071 for a type I technical manual and with the style and format requirements of MIL-M-38784. Detailed physical and functional descriptions of the equipment are given. In addition, sufficient information is presented to enable personnel to operate, maintain, troubleshoot, or repair the sliding padeye. The Illustrated Parts Breakdown in chapter 7 has been developed in accordance with MIL-M-008910, and contains parts listings, and cross-reference information for the equipment. A list of abbreviations and acronyms appearing in this manual is also presented in chapter 7. Measurement conversion information for units of measure appearing throughout this manual is presented in table 1-1.

1-2.3 SUPERSEDURE DATA. This manual supersedes NAVSEA S9585-AA-MMA-010, dated 1 June 1981, and all changes thereto.

1-2.4 APPLICABILITY. The information contained in this manual is applicable to the bulkhead-mounted sliding padeye (figure 1-1) and the retractable sliding padeye (figure 1-2) for the models and ships listed below.

Models/Ship List

Bulkhead-Mounted		**Retractable**	
Model B-9A	**Model B-12**	**Model CR-12**	**Model CR-12B /CR-12B-P**
LHD 1 Class	CG 47 Class (port/stbd)	CG 47 Class (fore/aft)	DDG 51 Class

1-2.5 MAINTENANCE PHILOSOPHY. This manual provides complete coverage for the organizational, intermediate, and depot levels of maintenance. There are three levels at which maintenance is normally performed, depending upon the complexity of the work and availability of support equipment. The first is the organizational level, where the work is performed by the ship’s force with no outside assistance other than routine supply services. The second is the intermediate level, which refers to maintenance and repairs performed by a repair ship, tender, repair facility, or shore intermediate maintenance activity. The third is the depot level, such as a naval or private shipyard where the more difficult and complex maintenance and repairs are performed. This manual does not designate or determine at which maintenance level (organizational, intermediate, or depot) preventive and corrective maintenance should be performed, that being the prerogative of the forces afloat. All components designated as repairable items have been addressed in chapter 6. Sufficient coverage has been given to nonrepairable

items to provide an understanding of item purposes and functions and aid in obtaining replacement parts. Information available in other official publications has been referenced rather than duplicated in this manual.

Table 1-1. U.S-to-Metric Conversion Factors

When You Know	Multiply By	To Determine
	Length	
inches	2.540	centimeters
feet	30.480	centimeters
yards	0.914	meters
miles	1.609	kilometers
	Area	
square inches	6.452	square centimeters
square feet	0.093	square meters
square yards	0.836	square meters
square miles	2.590	square kilometers
	Volume	
fluid ounces	29.574	milliliters
pints	0.473	liters
quarts	0.946	liters
gallons	3.785	liters
cubic feet	0.028	cubic meters
cubic yards	0.765	cubic meters
	Weight	
ounces	28.350	grams
pounds	0.454	kilograms
tons-short	0.907	metric tons

1-3. MAJOR COMPONENTS AND ASSEMBLIES.

1-3.1 SLIDING PADEYE RECEIVING UNIT. The sliding padeye receiving unit kingpost structure (figure 1-1 and figure 1-2) is composed primarily of two box columns with hardened steel tracks to guide the carriage assembly. The bulkhead-mounted unit (figure 1-1) is secured to the ship's structure at four mounting points. The retractable unit (figure 1-2) is mounted in a vertical trunk which is welded to the ship's structure. The trunk descends three levels from the 01 level to the 2nd platform. A ladder on each kingpost provides access to top-mounted components. The receiving unit is used for transferring cargo between ships during Underway Replenishment (UNREP) operations, and is capable of handling nominal payloads up to 6000 pounds.

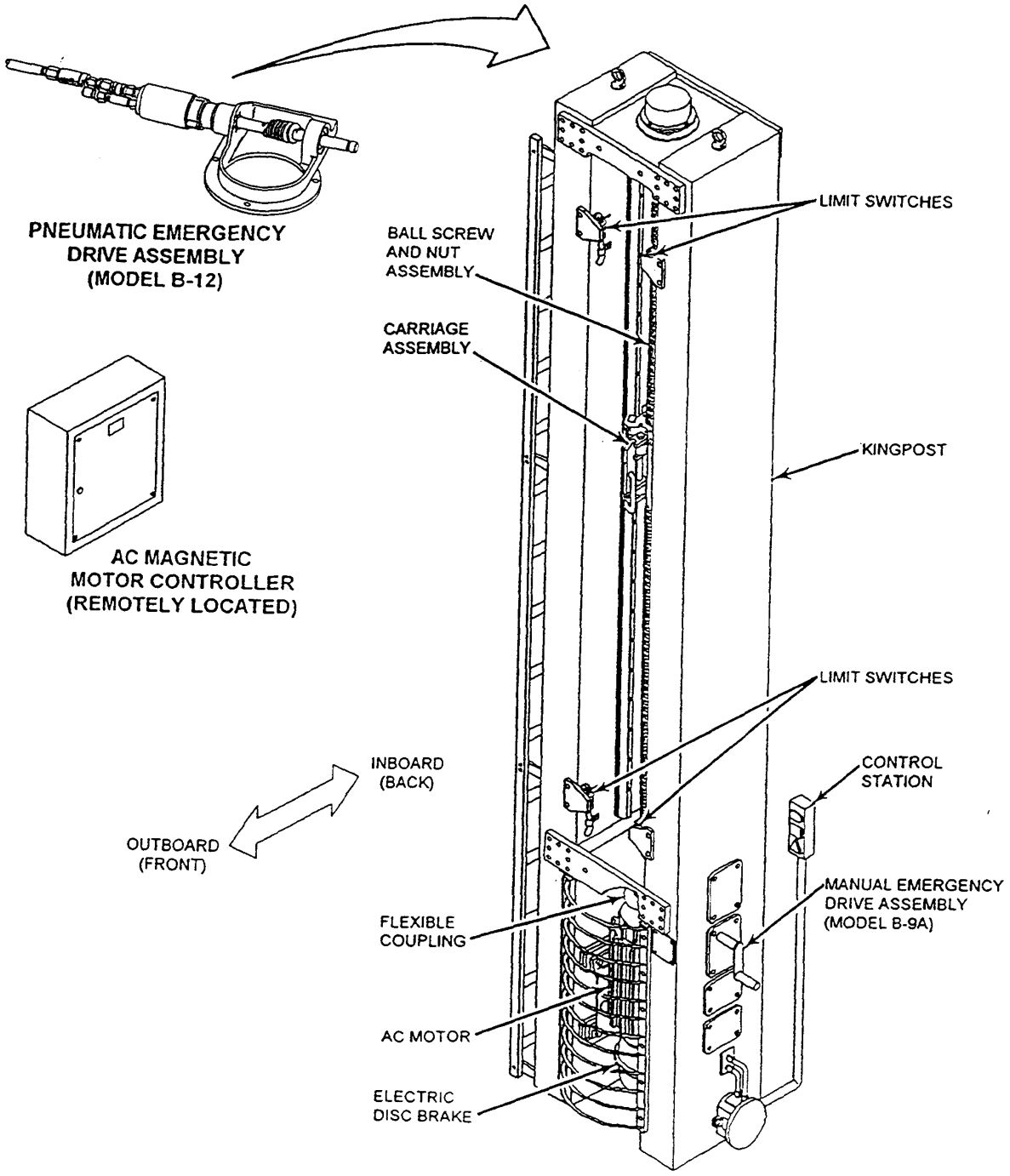


Figure 1-1. Bulkhead-Mounted Sliding Padeye

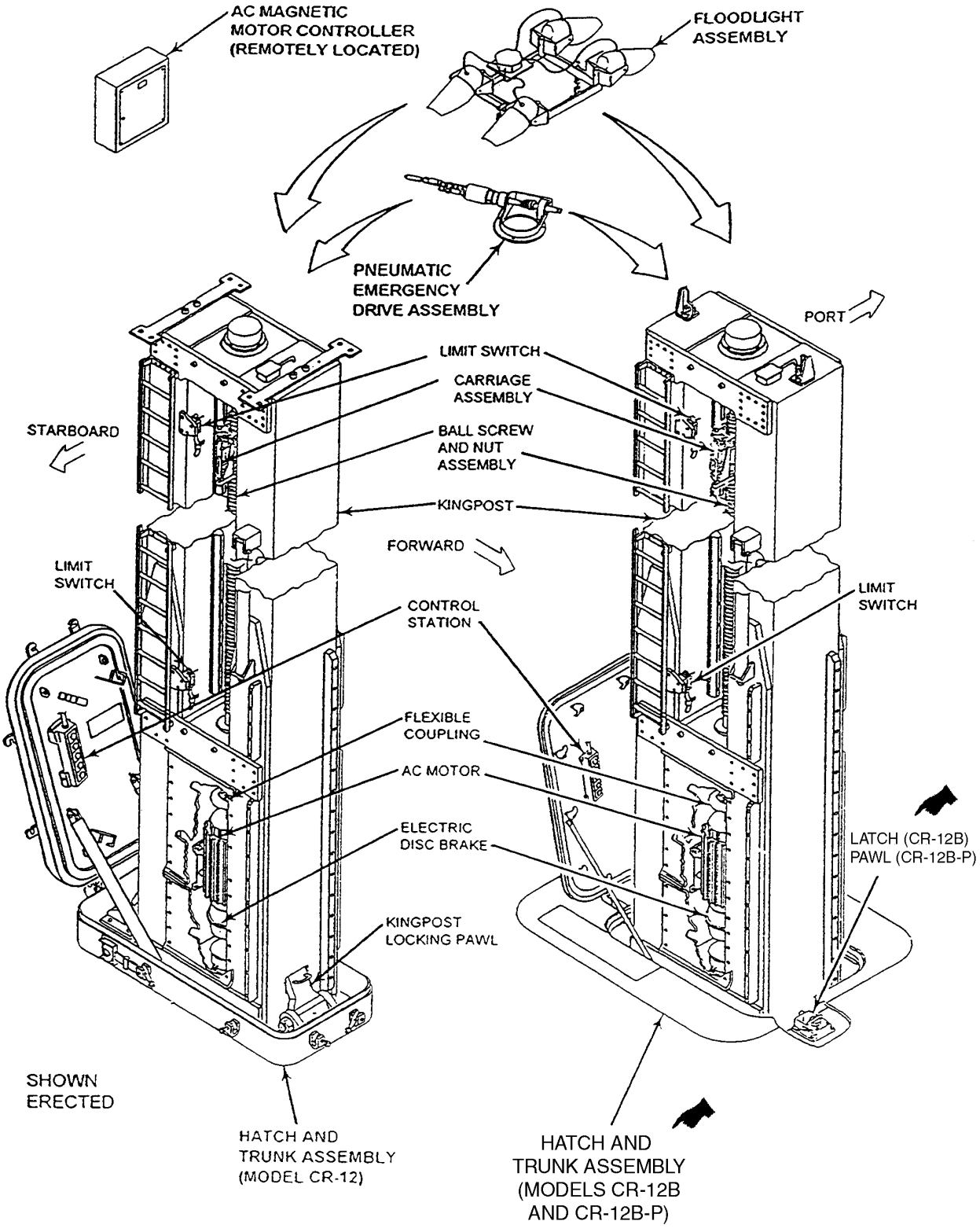


Figure 1-2. Retractable Sliding Padeye

1-3.2 AC MAGNETIC MOTOR CONTROLLER. The remotely located ac magnetic motor controller receives 440-Vac, 60-Hz, 3-phase power from ship's electrical power distribution system. The controller starts and stops the ac motor, releases the electric disc brake, and coordinates the functions of the control and safety circuits. The controller contains an interlocked contactor, control power transformer, overload relays, RESET pushbutton, fuses, and terminal blocks. The RESET pushbutton is mounted on the controller enclosure door. The controller for retractable padeye units contains jog timing relays.

1-3.3 AC MOTOR. The ac motor used to drive the sliding padeye is a 15-hp reversible motor. The motor is vertically mounted and is totally enclosed in a non-ventilated, watertight enclosure. The motor is an ac induction type with a squirrel cage rotor supported by two ball bearings. The motor's synchronous speed is 600 rpm while the full-load speed is approximately 820 rpm resulting in carriage assembly speed of 50 fpm. Coils in the stator slots are connected to form three phases; within each phase the coils are connected to form four poles. The motor operates on 440-Vac, 60-Hz, 3-phase power.

1-3.4 ELECTRIC DISC BRAKE. The electric disc brake is mounted on the lower end of the vertical motor by a splined hub keyed to the motor shaft. The brake is springset, and solenoid-released, with all operating components contained in a watertight housing. The major components of the brake are four internally-splined friction discs, (mounted between the stationary discs), a magnet mounted plate, a pressure plate, four torque springs, and levers and linkages. The pressure plate is connected to the levers and linkages to manually release the brake. A manual release lever is installed outside the housing.

1-3.5 FLEXIBLE COUPLING. The flexible coupling connects the motor shaft to the ball screw shaft.

1-3.6 CARRIAGE ASSEMBLY. The carriage assembly consists of upper and lower body plates separated by a tubular spacer, an upper and lower lug, two limit switch cams and eight guide rollers. A ball nut, which transforms ball screw rotation into vertical motion, is secured within the tubular spacer. The carriage assembly components are clamped together by six through bolts. The STREAM adapter is secured to the upper and lower lugs. The guide rollers, four on each body plate, ride on two kingpost mounted rails to guide the carriage assembly.

1-3.7 BALL SCREW AND NUT ASSEMBLY. The ball screw assembly consists of a hardened ball screw and a ball nut. The ball screw is supported at each end by spherical roller bearings. The ball nut provides a circulating path for a complement of ball bearings and converts the rotary motion of the ball screw to vertical thrust with high mechanical efficiency. The ball screw shall always be protected with a light coating of grease (see chapter 4 for lubrication requirements).

1-3.8 LIMIT SWITCHES. Four limit switches are connected electrically to the controller. Two limit switches are located at the top to control the upper travel limit and two are located at the bottom to establish lower travel limit. These limit switches are adjustable roller lever type which are actuated by cams on the carriage assembly. The model B-9 has a limit switch mounted in the manual drive assembly to prevent power operation when manual drive is engaged.

1-3.9 PORTABLE THREE- AND FIVE-ELEMENT CONTROL STATIONS. The three-element control station for the bulkhead-mounted units is enclosed in a watertight, portable console. The five-element portable control station for retractable units is stowed beneath the sliding padeye trunk hatch cover. The control stations are described in detail in chapter 2.

1-3.10 EMERGENCY DRIVE ASSEMBLY. The pneumatic emergency drive assembly is used on model B-12, CR-12, CR-12B , and CR-12B-P and uses ship's low pressure (LP) air to operate the sliding padeye in case of electrical power loss. Details of emergency drive assembly operation are discussed in chapter 2.

1-3.11 MANUAL DRIVE ASSEMBLY. Manual operation of model B-9A is provided through an integrally mounted worm reduction driving a worm gear keyed to the ball screw. This arrangement is located on the ball screw between the lower bearing housing and the motor coupling. The driving worm is mounted on a shaft which is pivoted at one end and is normally pinned in a position disengaged from the worm gear. When the gears are pinned in the engaged position for manual operation, an electrical limit switch is actuated to prevent powered operation.

1-3.12 FLOODLIGHT ASSEMBLY. (Retractable Sliding Padeye). The floodlight assembly (figure 3-5) consists of a cluster of four 150-watt, red-lens-equipped floodlights attached to a base which can be mounted atop the kingpost to facilitate nighttime operation. The electrical connector on the floodlight assembly is plugged into a kingpost-mounted receptacle which provides the required 120-volt power.

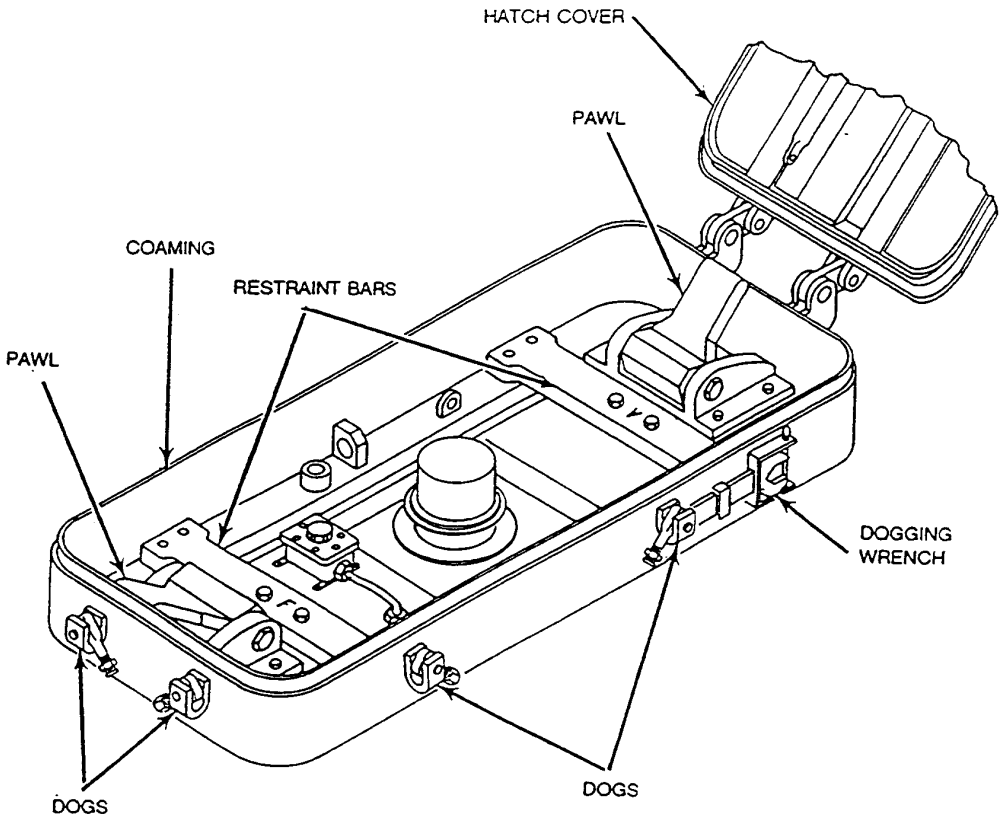
1-3.13 HATCH ARRANGEMENTS. Hatch arrangements for the retractable sliding padeye for models CR-12 CR-12B , and CR-12B-P are discussed in the following paragraphs.

1-3.13.1 Hatch and Trunk Assembly. (Retractable Sliding Padeye). When the CR-12 retractable sliding padeye (figure 1-2) is in the stowed position within the trunk, it is secured by two restraint bars (figure 1-3) which are secured across the top of the padeye and bolted to the deck structure (four bolts per restraint). A 9-inch high coaming and a manually-dogged hatch cover protect the trunk from flooding. SHIPALT CG47-00438 replaces original latch assemblies with pawls which engage pockets welded in the kingpost sides. There are two pawls secured to the deck inside the coaming. The pawls support the kingpost when it is fully erected and during erection and retraction cycles.

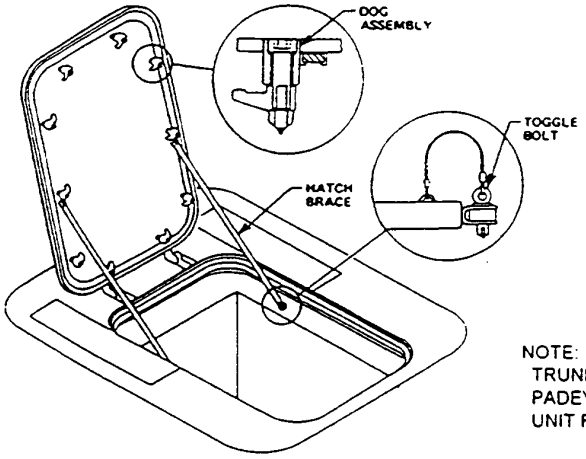
1-3.13.2 Model CR-12B , and CR-12B-P Hatch Arrangement. The hatch arrangement of these models is shown in figure 1-3. These models are similar to Model CR-12, but fit flush with the deck and there is no coaming or restraint bars. The stowed sliding padeye is held in place by the closed and secured hatch cover.

NOTE

Original units are equipped with latch assemblies (figure 1-4) which have been known to fail, causing free-fall of padeye kingpost into the stowage trunk. If sliding padeye unit is not yet equipped with pawl assemblies, do not erect or operate equipment without thoroughly reviewing procedures, cautions, and warnings in chapter 2 which relate to units equipped with latch assemblies.



MODEL CR-12



MODEL CR-12B AND CR-12B-P

Figure 1-3. Hatch Arrangements

1-3.14 LATCH ASSEMBLY. Each latch assembly consists of a base with a sliding latch pin. The latches support the kingpost when it is fully erected and support the kingpost temporarily during erection and retraction cycles. Latch assemblies are used on sliding padeye model CR-12B and are being replaced on CR-12 sliding padeyes with pawl assemblies.

1-3.15 PAWL ASSEMBLY. Pawl assemblies which replace latch assemblies on CG 47 class ships, (figure 1-5 and figure 1-6) consist of a pawl supported by a clevis base and secured by a nut at one end of the clevis bolt. The pawl is manually rotated about the bolt to engage or disengage the pawl at the detent recess (pocket) located on the forward and aft sides of the kingpost. Pawl assemblies are also used on model CR-12B-P

1-3.16 RETROFITS There are currently two retrofit kits available for the model CR-12B sliding padeyes used on DDG 51 Class ships.The first is driven by ECP DB-2154R1which replaces the latch assemblies with pawl assemblies. The model number is changed to CR-12B-P on the units that are retrofitted. The second retrofit kit is driven by ECP 51–1031R3. It replaces the current limit switch arm with a stainless steel arm. No model number change is required. For DDG 51 Class hulls not covered by the pawl assembly retrofit, SHIPALT 51–00320K, when accomplished, makes the hardware changes to add the pawl assemblies to the sliding padeyes.

1-4. REFERENCE INFORMATION.

1-4.1 REFERENCE DATA. Electrical and design characteristic data are provided in table 1-2.

1-4.2 REFERENCE PUBLICATIONS. Publications referenced throughout this technical manual are provided in table 1-3.

Table 1-2. Reference Data

Equipment/ Characteristic	Description		
	Model B-9A	Model B-12	Model CR-12/CR-12B/ CR-12B-P
General			
Height (overall)	193 in.	232-1/4 in.	301-1/2 in.
Width (overall)	36 in.	40-3/4 in.	36 in.
Depth (overall)	24 in.	27 in.	24 in.
Weight	5,245 lb	6,010 lb	9,074 lb (less trunk)
Rigging Load	31,000 lb	31,000 lb	31,000 lb
Transfer Load	6,000 lb (max)	6,000 lb (max)	6,000 lb (max)
Test Load	62,000 lb	62,000 lb	62,000 lb
Speed	40 fpm	40 fpm	40 fpm
Travel	9 ft	12 ft	12 ft
Manufacturer	The Entwistle Co.	The Entwistle Co.	The Entwistle Co.
Control Station	120 V, 60-Hz 3-element	120 V, 60-Hz 3-element	120 V, 60-Hz 5-element

Table 1-2. Reference Data - Continued

Equipment/Characteristic	Description
Sliding Padeye	NOTE The following descriptions and data apply to all models, unless otherwise noted

Table 1-2. Reference Data - Continued

Equipment/Characteristic	Description
AC Magnetic Motor Controller	
Manufacturer	General Electric Navy Controller Business (Sold to Ward Leonard Co.)
Dwg. No.	202B4494 and 202B4495
Type	Magnetic across-the-line, Single-Speed, Reversing
Enclosure	Drip-proof
Power Input	440-Vac, 60-Hz, 3-phase
Size	2
AC Motor	
Manufacturer	General Electric Co. Motor Business Group (Majority) (Sold to Tech Systems Division of Datron, Inc.)
Dwg. No.	198F131
Model	5KR286NN489
Frame	286TNZ
Type of Rotor	Squirrel Cage, Induction
Power Input	440-Vac, 60-Hz, 3-phase
Horsepower Rating	15 hp
Current, Full Load	22.5 Amps
Duty	Continuous
Speed, Synchronous	820 rpm
Enclosure	Watertight
Electric Disc Brake	
Manufacturer	Dings Co., Division of Venturedyne, Ltd.
Dwg. No.	J8001
Model	VU5-84135-27
Power Input	440-Vac, 60-Hz, single-phase
Specification	MIL-B-16392
Type	Disc
Enclosure	Watertight
Torque	135 lbs ft (max)
Limit Switch	
Manufacturer	Cutler-Hammer Products Division of Eaton Corp.
Dwg. No.	6984ED60
Cat. No.	6984H47A
Type	NL, Adj. Roller Lever
Specification	MIL-C-2212
Enclosure	Watertight
Rating	10 amps
Operation	Cam actuation, Single circuit - normally closed
Manual Drive Limit Switch	
Manufacturer	Cutler-Hammer Products Division of Eaton Corp., Industry Control Div.
Dwg. No.	6984ED60
Cat. No.	6984H42
Type	NL, Top Pushbutton
Specification	MIL-C-2212
Enclosure	Watertight

Table 1-2. Reference Data - Continued

Equipment/Characteristic	Description
Rating	10 amps
Operation	Single circuit - normally closed
Three-Element Control Station	
Manufacturer	Cutler-Hammer Products Division of Eaton Corp., Industry Control Div.
Dwg. No.	6981ED173
Specification	MIL-C-2212

Table 1-2. Reference Data - Continued

Equipment/Characteristic	Description
Enclosure	Watertight
Insulation Class	B
Power Input	120 Vac
Five-Element Control Station	
Manufacturer	Cutler-Hammer Products Division of Eaton Corp., Industry Control Div.
Dwg. No.	6981ED175
Specification	MIL-C-2212
Enclosure	Watertight
Insulation Class	B
Power Input	120 Vac

Table 1-3. Reference Publications

Title	Number
Standard Organization and Regulations of the U.S. Navy	OPNAVINST 3120.32A
Ships' Maintenance and Material Management (3-M) Manual	OPNAVINST 4790.4
Navy Safety Precautions	OPNAVINST 5100 (Series)
COSAL Use and Maintenance Manual	SPCCINST 4441.170
Naval Ships' Technical Manual Chapters	
244 (Bearings)	S9086-HN-STM-000
300 (Electric Plant General)	S9086-KC-STM-000
302 (Electric Motors and Controllers)	S9086-KE-STM-000
320 (Electric Power Distribution Systems)	S9086-KY-STM-000
635 (Thermal, Fire, and Acoustic Insulation)	S9086-VH-STM-010
Replenishment At Sea	NWP-14

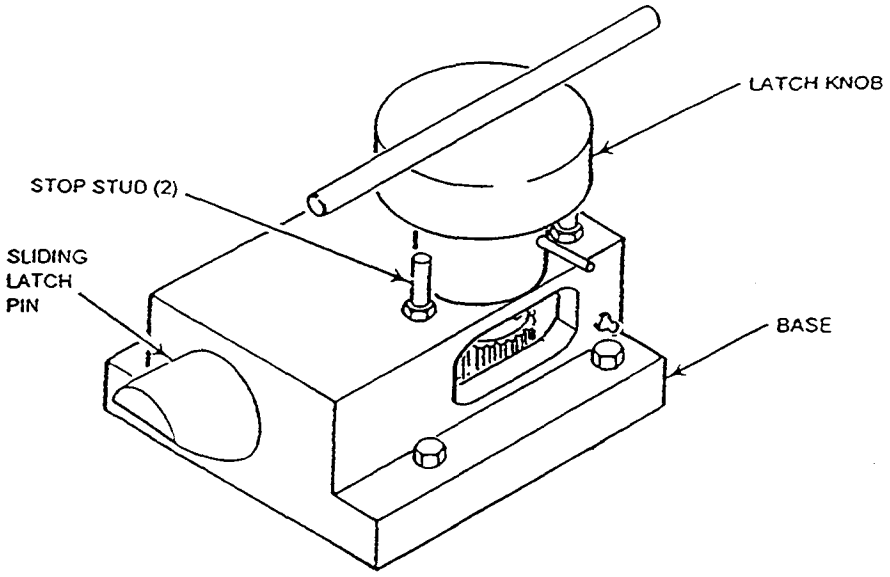


Figure 1-4. Retractable Sliding Padeye Latch Assembly

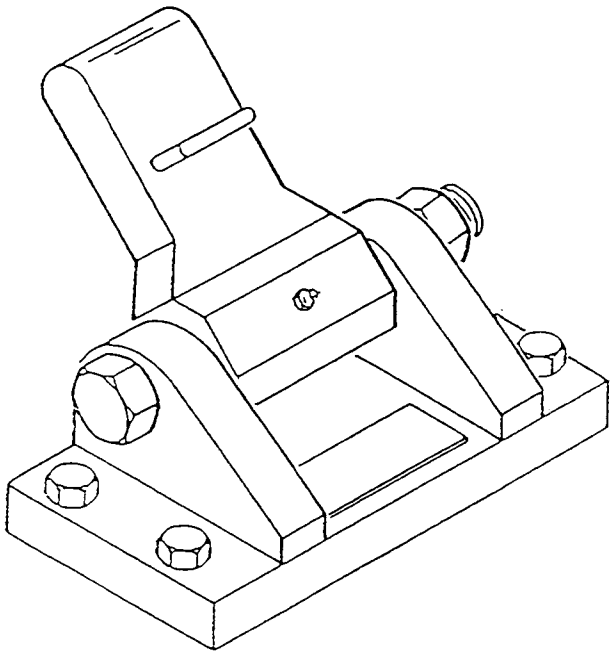


Figure 1-5. Pawl Assembly

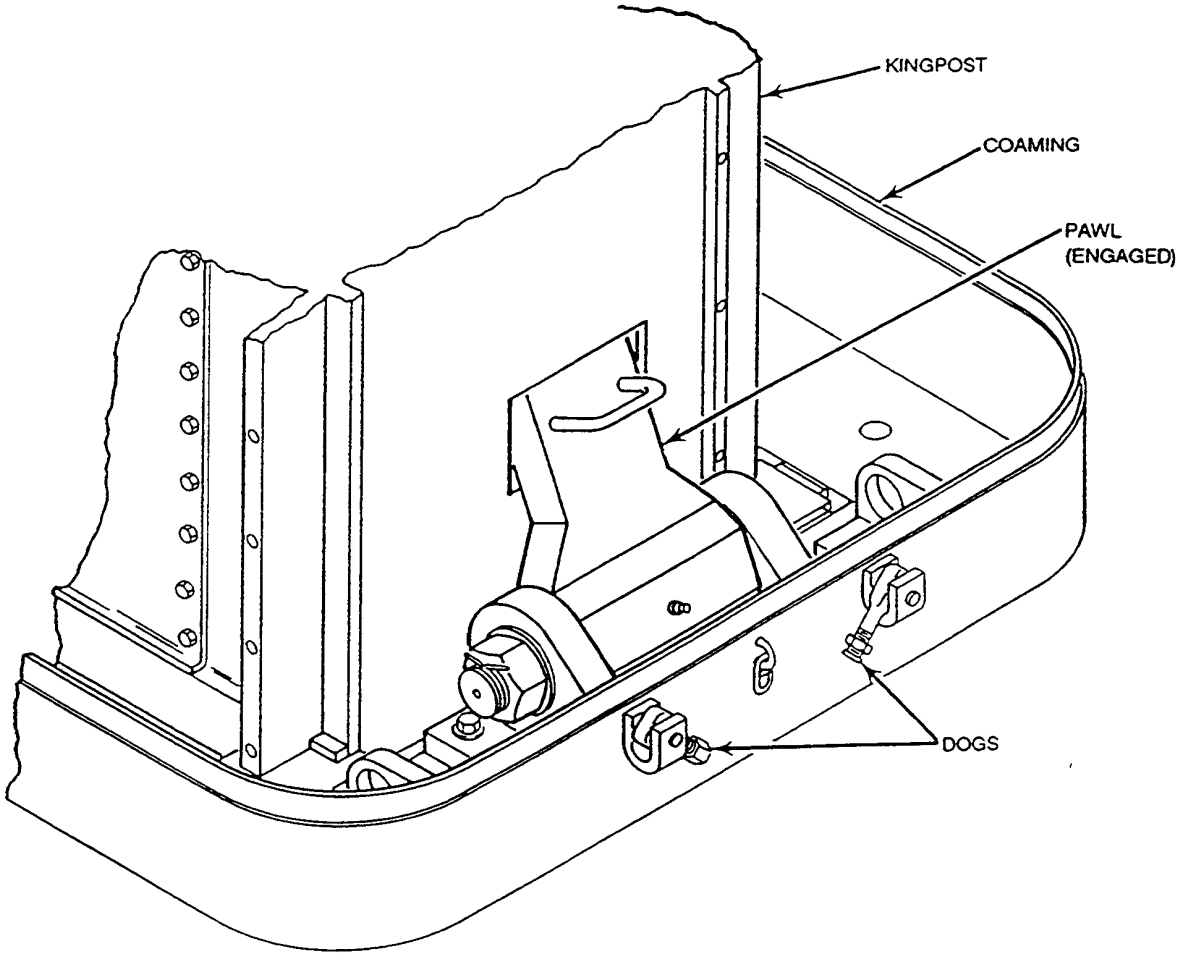


Figure 1-6. Pawl Assembly (Engaged, Kingpost Erect)

CHAPTER 2

OPERATION

2-1. INTRODUCTION.

2-1.1 SCOPE. Proper operation of the sliding padeye in conjunction with replenishment-at-sea (RAS) operations extends the service life of the equipment and reduces repair requirements. This chapter provides information on safety requirements, controls and indicators, operating procedures (including emergency operation), and shutdown procedures. It is assumed that all components are operating properly. If any malfunctions occur, refer to chapter 5. Measurement conversion information for units of measure appearing throughout this manual is presented in table 1-1. Applicable technical manual numbers and titles for Naval Ships' Technical Manual (NSTM) chapters and other referenced publications are presented in table 1-3.

2-1.2 SAFETY PRECAUTIONS. Before performing any operating procedures on the sliding padeye, personnel shall review and become thoroughly familiar with the general safety notices and precautions listed in the Safety Summary at the beginning of this manual and in NSTM chapters 300 and 302. In addition, all warnings and cautions provided in this chapter and throughout this manual shall be observed. Also refer to Replenishment At Sea (NWP-14) or applicable system technical manual for detailed information on RAS operations.

2-2. CONTROLS AND INDICATORS.

2-2.1 LOCATIONS AND FUNCTIONS. Controls and indicators for sliding padeye operation consist of the ac magnetic motor controller, control stations, brake release lever, emergency drive assembly, manual drive assembly (Model B-9A only) and limit switches. Controls and indicators are illustrated in figure 2-1 and their functions summarized in table 2-1.

2-2.2 DESCRIPTIONS.

2-2.2.1 AC Magnetic Motor Controller. The remotely located ac magnetic motor controller controls motor starting and stopping, brake releasing, and direction of movement in response to electrical signals from the control station and limit switches. Located on the controller is the RESET pushbutton which is used to reset the overload relay allowing the motor to be restarted after an overload has occurred. In retractable padeye units, the motor controller houses jog timing switches which are set to control jog movement.

2-2.2.2 Three-Element Control Station. The three-element control station (figure 2-2) is used with the bulkhead-mounted padeye units. The three elements are: a PADEYE EMER RUN pushbutton switch, a CONTROL PWR AVAIL indicator light and a PADEYE UP/DN rotary switch.

a. PADEYE EMER RUN Pushbutton Switch. When the PADEYE EMER RUN pushbutton is pressed, the motor overload cutout circuit in the controller is bypassed, and the motor starts without overload protection. To bypass the motor overload protection, the pushbutton switch must be pressed continuously with the PADEYE UP/DN rotary switch held in the desired direction. When the pushbutton switch or rotary switch is released, the motor starting circuit is opened, and the motor stops.

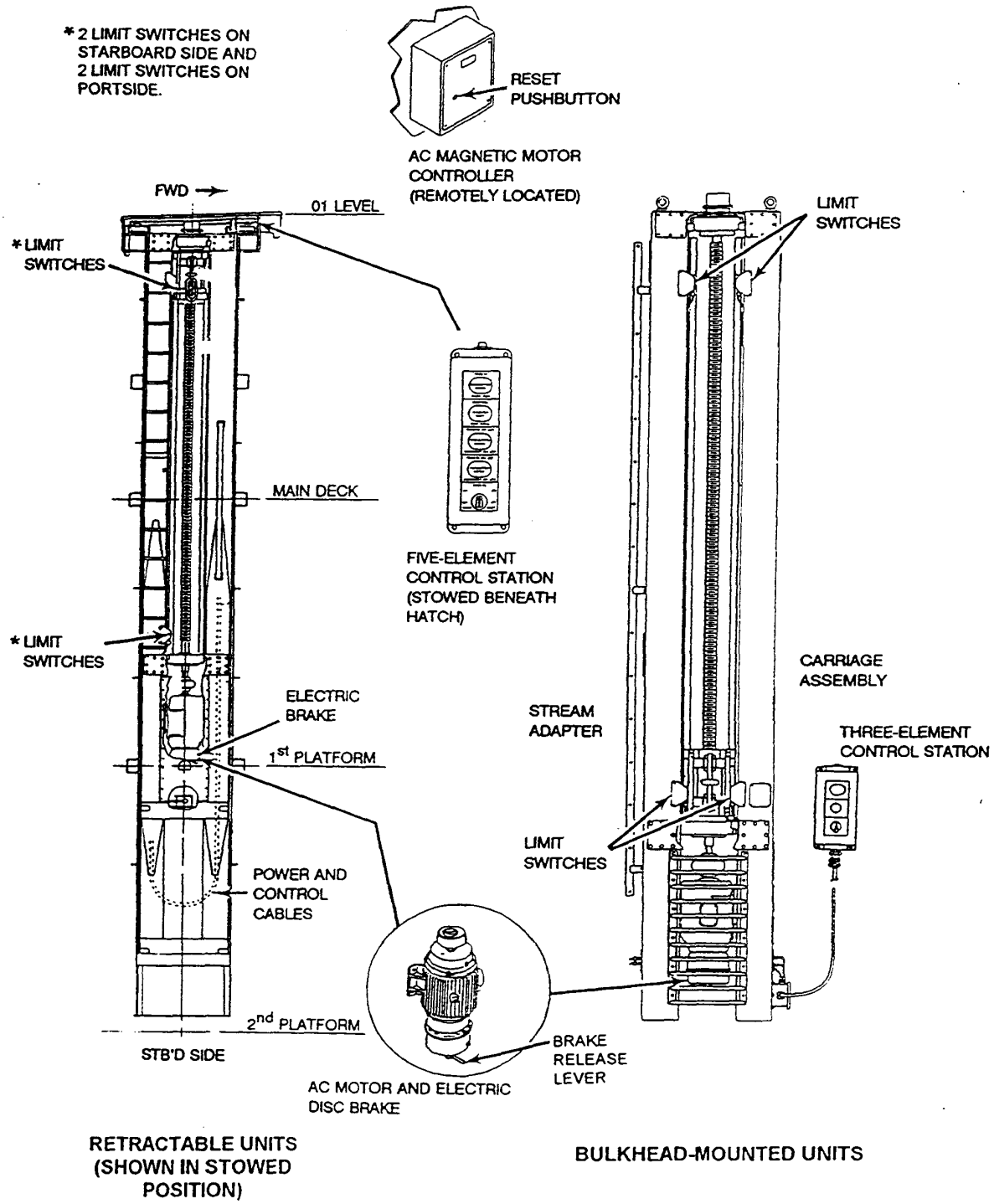


Figure 2-1. Control and Indicator Locations

Table 2-1. Controls and Indicators

Control/Indicator	Location	Function
AC Magnetic Motor controller	On bulkhead, remotely located	Controls motor starting, stopping, jogging and direction (para. 2-2.2.1).
RESET Pushbutton	On ac magnetic motor controller	Resets overload circuit after motor has tripped due to overload (para. 2-2.2.1).
PADEYE EMER RUN Pushbutton Switch	Both control stations	Bypasses motor overload circuit to permit emergency operation (para. 2-2.2.2.a).
CONTROL PWR AVAIL Indicator Light	Both control stations	Indicates power is available at control station (para. 2-2.2.2.b).
PADEYE UP/DN Rotary Switch	Both control stations	Moves the carriage assembly in the selected direction (para. 2-2.2.2.c).
PADEYE UP JOG/KINGPOST DN JOG Pushbutton Switch	Five-element control station (retractable sliding padeyes)	Jog carriage up during operation; Jog kingpost down during erection/retraction (para. 2-2.2.2.c).
PADEYE DN JOG/KINGPOST UP JOG Pushbutton Switch	Five-element control station (retractable sliding padyes)	Jog carriage down during operation; Jog kingpost up during erection/retraction (para. 2-2.2.2.d).
PADEYE UP DN/KINGPOST UP DN Rotary Switch	Five-element control station (retractable sliding padeyes)	Controls direction of vertical travel of the carriage during normal operation, and vertical travel of the kingpost during erection/retraction (para. 2-2.2.2.e).
Brake Release Lever	Electric disc brake housing	Releases electric disc brake to permit pneumatic or manual operation of carriage assembly (para. 2-2.2.4).
Emergency Drive Assembly (Pneumatic) (Models B-12, CR-12, CR-12B, CR-12B-P)	Stowed remotely	Raises or lowers carriage assembly pneumatically (para. 2-2.2.5).
Manual Drive (Model B-9A)	In kingpost between lower bearing housing and flexible coupling	Raises or lowers carriage assembly manually or pneumatically (para 2-2.2.6).

NOTE

The emergency run feature should be used only to the extent necessary to clear the emergency at hand. Prolonged use will result in damage to the electric motor.

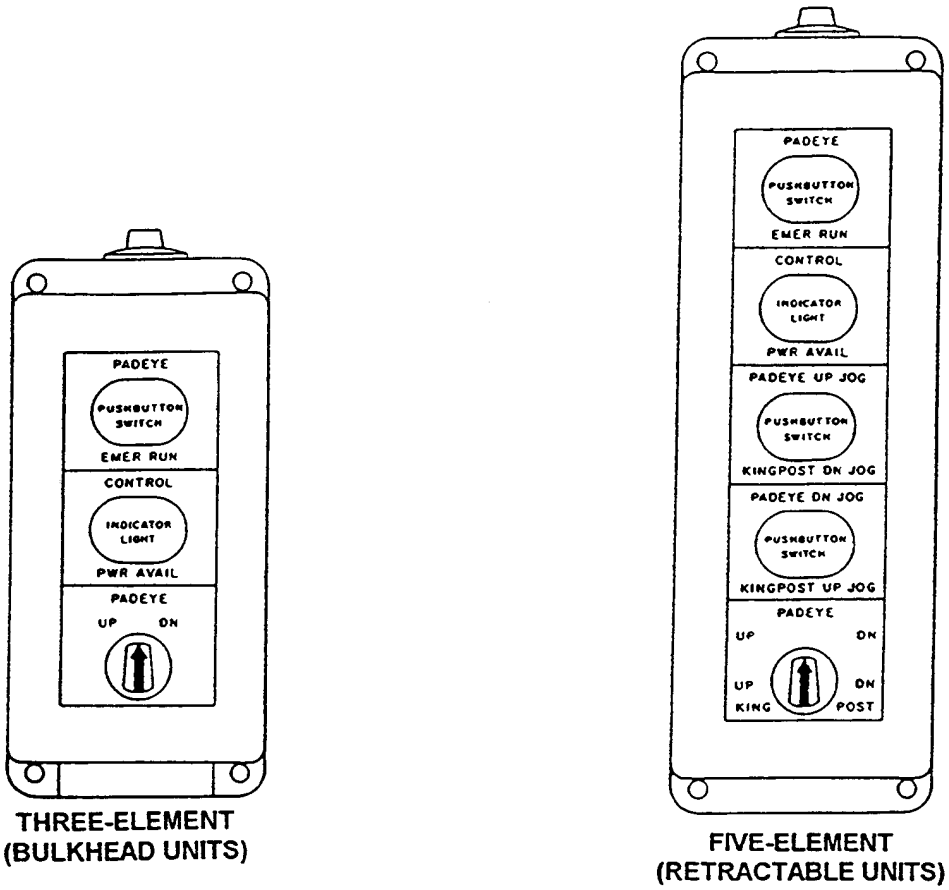


Figure 2-2. Control Station Controls and Indicators

b. CONTROL PWR AVAIL Indicator Light. The CONTROL PWR AVAIL indicator light is connected to the power distribution panel and, when illuminated, indicates that power is available to operate the sliding padeye. When power is secured at the distribution panel, the indicator light should go off.

c. PADEYE UP/DN Rotary Switch. The PADEYE UP/DN rotary switch has three positions: UP, off (center), and DN. Moving and holding the rotary switch either to the UP or DN position operates the sliding padeye in the selected direction. Releasing the rotary switch, centers the switch to the off position by means of a spring-return.

2-2.2.3 Five-Element Control Station. The five-element control station is used with the retractable padeye units. The five elements are: PADEYE EMER RUN pushbutton switch, CONTROL PWR AVAIL indicator light, PADEYE UP JOG/KINGPOST DN JOG pushbutton switch, PADEYE DN JOG/KINGPOST UP JOG pushbutton switch, and a PADEYE UP/DN - KINGPOST UP/DN three-position rotary switch.

a. PADEYE EMER RUN Pushbutton Switch. Same as operation described in paragraph 2-2.2.2.a for three-element control station.

b. CONTROL PWR AVAIL Indicator Light. Same as operation described in paragraph 2-2.2.2.b for three-element control station.

c. PADEYE UP JOG/KINGPOST DN JOG Pushbutton Switch. Pressing PADEYE UP JOG/KINGPOST DN JOG pushbutton permits fine control (jogging) of carriage in the up direction during normal operation and downward jogging of the kingpost during erection/retraction. Releasing the spring-loaded pushbutton breaks control contact and stops machinery movement.

d. PADEYE DN JOG/KINGPOST UP JOG Pushbutton Switch. Pressing PADEYE DN JOG/KINGPOST UP JOG pushbutton permits fine control (jogging) of carriage in the down direction during normal operation and upward jogging of the kingpost during erection/retraction. Releasing the spring-loaded pushbutton breaks control contact and stops machinery movement.

e. PADEYE UP DN/KINGPOST UP DN Rotary Switch. Turning PADEYE UP DN/KINGPOST UP DN rotary switch to desired setting controls vertical movement of the carriage during normal operation, or vertical movement of the kingpost during erection/retraction. Switch must be held at desired setting until operation is complete; when released, it will spring-return to centered neutral (off) position, and machinery movement will stop.

2-2.2.4 Brake Release Lever. A manually operated brake release lever (figure 2-1) is mounted on the bottom of the electric disc brake housing, which is coupled to the ac motor. Pulling the release lever releases the brake allowing the ball screw to be rotated to raise or lower the carriage. When the release lever is released, the brake is automatically reset. The release lever is used only when moving the sliding padeye carriage assembly when the power is turned off.

2-2.2.5 Emergency Drive Assembly, Pneumatic (Models B-12, CR-12, CR-12B CR-12B-P). In case of electrical power loss, the sliding padeye can still be operated pneumatically by bolting the air motor worm-drive assembly into place on top of the sliding padeye kingpost with the worm drive engaging the worm gear as shown in figure 2-3.

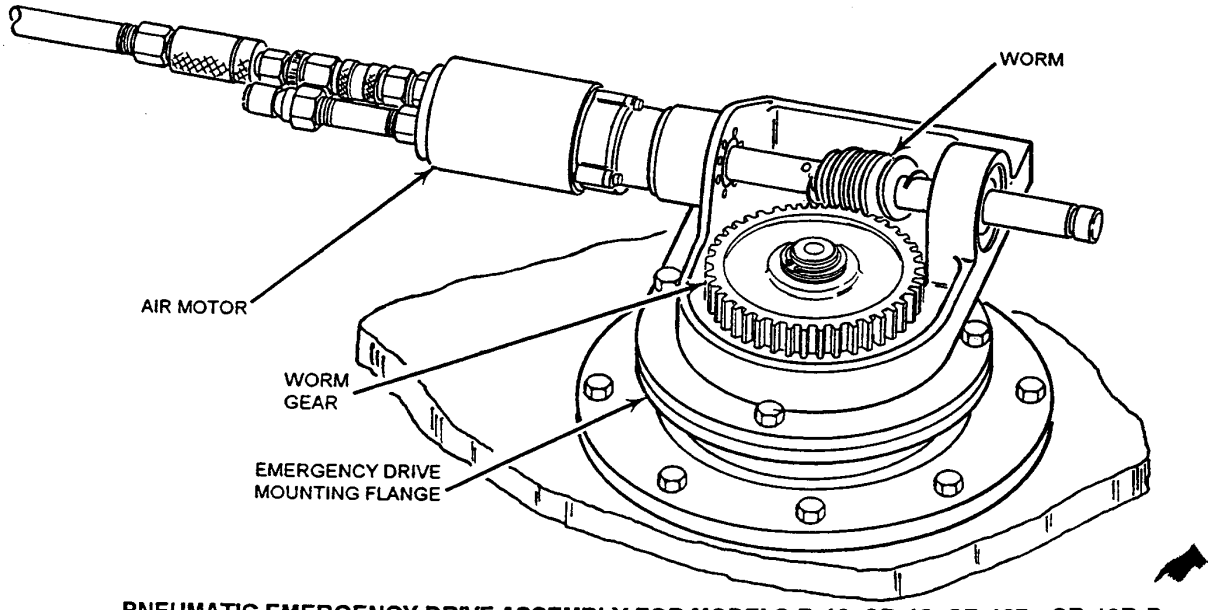
2-2.2.6 Manual Drive (Model B-9A Only). In case of electrical power loss the sliding padeye can still be operated manually by engaging and pinning the manual worm drive assembly against the worm gear mounted on the ball screw shaft as shown in figure 2-3. A separately stowed hand crank or air motor is engaged with the worm shaft to turn worm, worm gear and ball screw.

2-3. OPERATING PROCEDURES FOR BULKHEAD-MOUNTED UNITS (Models B-9A, B-12).

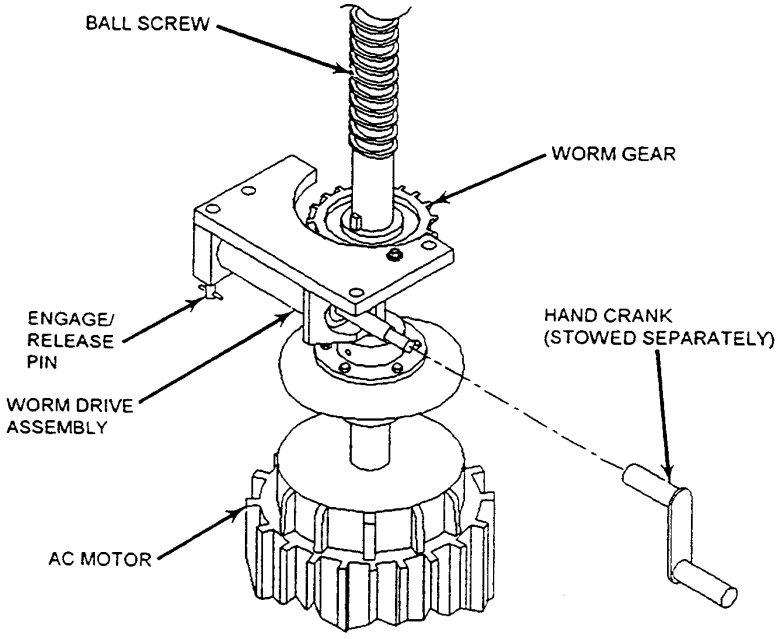
2-3.1 PREOPERATIONAL CHECKS. Perform the following procedures prior to putting the sliding padeye into operation.

1. Ensure that proper electrical connections are made at all terminals.

2. Inspect all wiring for fraying, cracks, broken, or burned insulation.



PNEUMATIC EMERGENCY DRIVE ASSEMBLY FOR MODELS B-12, CR-12, CR-12B , CR-12B-P (SHOWN MOUNTED ON EMERGENCY DRIVE HOUSING)



MANUAL EMERGENCY DRIVE ASSEMBLY FOR MODEL B-9A (SHOWN SEPARATE FROM KINGPOST)

Figure 2-3. Emergency Drive Assembly

3. Inspect carriage assembly for general condition.
4. Inspect long link and Standard Tensioned Replenishment Alongside Method (STREAM) adapter plate on carriage assembly for excessive wear.
5. Ensure that ball screw is lubricated and free of foreign objects.
6. Ensure that limit switch levers are operable.
7. Ensure that carriage assembly rails are free of obstructions.
8. Ensure that 440-Vac, 60-Hz, 3-phase power is turned on at power distribution panel which supplies sliding padeye.

CAUTION

To prevent damage to structural components, ensure that sliding padeye does not continue travel once carriage cams trip the limit switches.

9. Prior to rigging, check and adjust upper/lower limit switches for carriage travel as follows.
   - 9.1 Turn and hold PADEYE UP/DN switch to UP and position carriage assembly approximately 6 inches below upper limit switches: release switch.
   - 9.2 Hold PADEYE UP/DOWN switch momentarily in UP direction until upper limit switch is actuated; the carriage should stop; release PADEYE UP/DOWN switch. If further upward travel takes place, replace/adjust limit switches (paragraph 6-3.3).
   - 9.3 Turn and hold switch in DN position and position carriage assembly approximately 6 inches above lower limit switches; release switch.
   - 9.4 Hold PADEYE UP/DOWN switch momentarily in DN direction until lower limit switch is actuated; the carriage should stop; release PADEYE UP/DOWN switch. If further downward travel takes place, replace/adjust limit switches (paragraph 6-3.3).

2-3.2 RIGGING PROCEDURE. All transfer and rigging requirements should be in accordance with the publication, Replenishment At Sea (NWP-14). The rigging process requires the attachment of the highline pelican hook to the long link on the carriage assembly. Rigging should be done after the limit switches have been checked (step 9, paragraph 2-3.1). The following procedure shall be used to rig the sliding padeye.

WARNING

Prior to rigging highline, ensure that both motor access panels on retractable sliding padeyes are in place. Motor access panels are structural. Application of working loads with panels removed could damage kingpost and endanger personnel.

1. Delivery ship attaches highline to messenger line and receiving ship hauls across to sliding padeye.
2. STREAM pelican hook on highline is connected to long link on carriage assembly. Delivery ship tensions highline.

3. Receiving ship hauls across traveling Standard Underway Replenishment Fixture (SURF) fitting along with attached outhaul on tensioned highline.
4. Receiving ship connects traveling SURF hook to STREAM pelican hook bail. Delivery ship tensions outhaul line.

2-3.3 NORMAL OPERATION. Normally, the sliding padeye is lowered to a point 6 feet above the deck for attaching the highline, raised to the top travel limit for receiving a load, and then re-lowered far enough to land the load on deck. Perform normal operation as follows:

1. Ensure that all preoperational checks have been performed (paragraph 2-3.1).
2. Ensure manual drive assembly engage/release pin is in disengaged position (B-9A only).
3. Ensure that CONTROL PWR AVAIL indicator light is lit at three-element control station.
4. Check that carriage assembly travel area is free of obstructions over entire stroke.
5. Check that unnecessary personnel are clear of area.
6. Operate by holding PADEYE UP/DN switch in direction of desired carriage assembly movement to perform RAS operations.

2-3.4 SHUTDOWN AND STOWAGE. Shut down and stow the sliding padeye as follows:

1. Lower carriage assembly to full down position.
2. Disconnect and remove rigging.
3. Stow sliding padeye carriage assembly above lower limit switches.
4. Secure all electrical power to sliding padeye.

2-3.5 EMERGENCY OPERATION. During emergency conditions, the sliding padeye can be operated under power, or with the emergency drive assembly.

2-3.5.1 Under Power. When overload conditions shut down the motor, emergency electrical operation of the sliding padeye can be accomplished as follows.

1. Ensure that all preoperational checks have been performed (paragraph 2-3.1).

WARNING

To prevent death or injury, ensure that Model B-9A manual worm drive assembly is in disengaged position prior to sliding padeye emergency operation.

2. Ensure worm drive assembly is in disengaged position (B-9A only).
3. Ensure that CONTROL PWR AVAIL indicator light is lit at three-element control station.

CAUTION

To prevent serious damage to ac motor, do not operate sliding padeye in emergency condition longer than necessary.

4. Press and hold PADEYE EMER RUN pushbutton switch, and simultaneously hold PADEYE UP/DN switch in the direction of desired movement.

5. Release PADEYE EMER RUN pushbutton and PADEYE UP/DN switch when emergency operation is over.

6. Secure all electrical power to sliding padeye.

2-3.5.2 Emergency Pneumatic Drive Operation. The following procedures shall be used for operating the sliding padeye (Models B-12, CR-12, CR-12B, CR-12B-P) using the emergency drive assembly (figure 2-3).

WARNING

To prevent death or injury, or equipment damage, ensure that electrical power to sliding padeye is turned off and that equipment is tagged out of service in accordance with ship's procedures.

1. Turn off power to sliding padeye at three-element control station and tag equipment out of service in accordance with ship procedures.

2. Remove four screws and remove emergency drive cover.

NOTE

It may be necessary to rotate drive worm or emergency drive to mesh it with worm gear and to align emergency drive installation screw holes.

3. Mount emergency drive assembly on emergency drive housing using three of the screws removed in step 2.

NOTE

Ensure that the lubricator on the ship's low pressure air supply is filled with oil.

WARNING

Ensure that ship's low pressure air valve is turned off to prevent inadvertent operation of emergency drive.

4. Connect ship's low pressure (90-110 psi) air supply to emergency drive observing color coding of air connectors on air motor (green-up; red-down).

CAUTION

During upward and downward movement of padeye no automatic stop provisions are provided.

5. Turn on air supply to move padeye and manually release electric disc brake by pulling on handle.

NOTE

Carriage travel will be approximately 3/4 fpm.

6. To return to normal operation, release manual brake handle to set electric disc brake, turn off air supply and disconnect air line, remove emergency drive assembly, and reinstall emergency drive cover. Restore electrical power.

2-3.5.3 Manual Drive Operation. The following procedure shall be used for operating the sliding padeye (Model B-9A) using the manual drive assembly (figure 2-3).

1. Remove locking pin from worm assembly and engage gears. Reinsert pin.

NOTE

Engaging gears when shifting to manual mode actuates limit switch 1LS and deactivates electrical control circuits.

2. Engage operating crank with drive shaft through opening on side of kingpost and manually release electric disc brake. Rotate crank counterclockwise to raise carriage assembly and clockwise to lower carriage assembly.

NOTE

An air motor maybe used in place of the hand crank for faster operation.

3. When electrical power is restored or emergency operation is complete, release manual brake handle to set electric disc brake, remove locking pin from worm assembly, disengage gears, reinsert pin.

2-4. OPERATING PROCEDURES FOR RETRACTABLE UNITS.

2-4.1 PREOPERATIONAL CHECKS AND SETUP. Perform the following procedures prior to putting the sliding padeye into operation.

1. Check that unnecessary personnel are clear of area and that hatch and surrounding area are free from obstructions.
2. Undo and open hatch.
3. Remove four screws from each restraint bar (Model CR-12 only), and remove the two restraint bars (see figure 1-3).
4. Unship five-element portable control station from hatch-mounted stowage brackets.

NOTE

The control station cable for retractable sliding padeye models is 15 feet long to allow operation of the sliding padeye from a location remote from the cargo handling area.

5. Establish power and observe that CONTROL PWR AVAIL indicator lamp is lit.

2-4.2 SAFETY PRECAUTIONS FOR UNITS EQUIPPED WITH LATCH PINS. Latch pins may become unseated and disengaged during replenishment operations while underway. Select one of the following two methods to assure safe operation.

WARNING

Do not attempt normal operations until one of the following precautions has been observed and implemented.

1. Post an operations watch to observe that latch pins remain properly engaged (i.e., that both latch pins are fully extended into their slots in the kingpost) throughout entire operation cycle.

CAUTION

Attempt the following procedure only after the kingpost has been fully erected.

2. Fit a block between the hatch coaming (Model CR-12) or trunk (Model CR-12B) and the latch pin housing to prevent latch pins from releasing.

2-4.3 NORMAL OPERATION FOR RETRACTABLE UNITS. Assure that preoperational checks (para. 2-4.1) and applicable safety precautions (2-4.2) have been accomplished.

2-4.3.1 Erection and Operation.

NOTE

For nighttime operation raise the kingpost approximately 1 foot and secure the floodlight to the kingpost with the spring-loaded mounting clips. Plug the floodlights into the receptacle on top of kingpost.

CAUTION

In the following step, kingpost should stop with the two elongated latch slots or pawl pockets slightly below the latches or pawls. If kingpost tends to rise above this point, release PADEYE/KINGPOST UP/DN switch immediately to avoid damage to equipment. Check down stop limit switches.

1. Hold PADEYE/KINGPOST UP/DN switch at KINGPOST UP until kingpost stops automatically; release switch.

WARNING

To prevent injury, do not apply hand-pressure to latches while kingpost is in motion. Engage latches only when kingpost is stationary.

2. Jog kingpost upward, using KINGPOST UP JOG pushbutton switch, until latches or pawls can be engaged in the slots or pockets in the kingpost.
3. Jog kingpost downward, using KINGPOST DN JOG pushbutton switch, until kingpost rests on latch pins or pawls.
4. Hold PADEYE/KINGPOST UP/DN switch at PADEYE UP until carriage elevates approximately 5-1/2 feet above deck level.

CAUTION

Sliding padeye must be jogged into contact with lifting braces with care. Engagement at full motor speed will cause damage to equipment.

5. Insert two lifting braces in trunk sockets. Position lifting brace tips to engage 1-1/2 inch diameter holes in carriage lower body. Using PADEYE DN JOG switch, ease sliding padeye down until carriage holes engage lifting braces.
6. Jog kingpost until latches or pawls can be disengaged.
7. Hold PADEYE/KINGPOST UP/DN switch at KINGPOST UP until kingpost stops automatically.

WARNING

To prevent injury, do not apply hand-pressure to latches while kingpost is in motion. Operate latches only when kingpost is stationary.

8. Jog kingpost upward, using KINGPOST UP JOG pushbutton switch, until latches or pawls can be engaged. Turn latch knobs in LATCH direction to fully extend both latch pins. Pawls engage kingpost without hand pressure.
9. Jog kingpost down, using KINGPOST DN JOG pushbutton switch, until kingpost rests on latch pins or is engaged with pawls.
10. Jog carriage upward, using PADEYE UP JOG pushbutton switch, until lifting braces can be disengaged. Remove lifting braces.
11. For latch-equipped sliding padeyes, fit wood blocks between latch housing and hatch coaming (Model CR-12) or trunk (Model CR-12B) to prevent latches backing out and disengaging from kingpost.
12. Install STREAM adapter toward direction of intended replenishment.

WARNING

Prior to rigging highline ensure that both motor access panels are in place. These panels are structural; application of working load with panels removed could severely damage the kingpost and endanger personnel.

13. Rig working lines in accordance with paragraph 2-3.2.

14. Hold PADEYE/KINGPOST UP/DN rotary switch at PADEYE UP to position carriage approximately 6 inches below upper limit switches.

15. Continue upward carriage travel by momentarily actuating and releasing PADEYE/KINGPOST UP/DN rotary switch until carriage cam actuates limit switches. Additional upward travel is now impossible with rotary switch. KINGPOST UP JOG/DOWN JOG switches bypass limit switches.

16. Operate PADEYE/KINGPOST UP/DN switch as required to accomplish replenishment operation.

2-4.3.2 Retraction and Stowage.

1. Remove all rigging.

2. Using PADEYE/KINGPOST UP/DN switch, position carriage approximately 6 feet above deck level.

CAUTION

Use care when jogging carriage into contact with lifting braces; engagement at full motor speed will cause damage to equipment.

3. Insert two lifting braces in trunk sockets. Position lifting brace tips to engage 1-1/2 inch diameter holes in carriage lower body (figure 2-4). Using KINGPOST UP JOG switch, ease sliding padeye down until carriage holes engage lifting braces.

4. Retract latch pins or pawls.

5. Using PADEYE/KINGPOST UP/DN switch, lower kingpost until latches or pawls can be engaged in kingpost slots or pockets; jog kingpost down onto latch pins or pawls.

6. Using PADEYE UP JOG switch, raise padeye until lifting braces can be disengaged. Remove lifting braces and stow on kingpost.

7. Turn PADEYE/KINGPOST UP/DN switch to KINGPOST DN until carriage stops automatically.

8. Using KINGPOST UP JOG switch, elevate kingpost sufficiently to disengage latches or pawls.

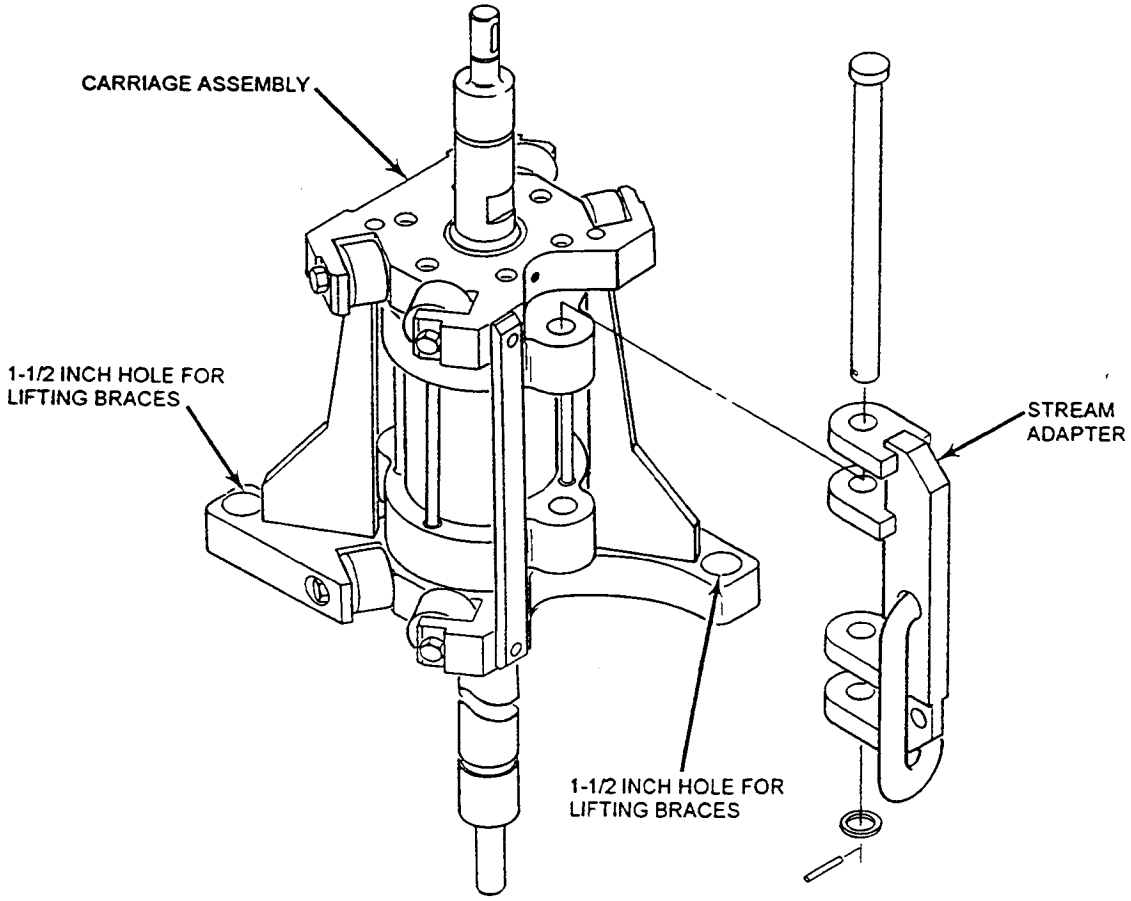


Figure 2-4. Carriage Assembly Stowage (Model CR-12 Shown)

CAUTION

The floodlight assembly can be damaged if kingpost is fully lowered with floodlights installed.

9. If the floodlight assembly is installed, stop kingpost movement when it is approximately 1-foot above the coaming (Model CR-12) or deck edge (Model CR-12B and CR-12B-P); then disconnect and remove floodlight assembly.
10. Turn PADEYE/KINGPOST UP/DN switch to KINGPOST DN until kingpost stops automatically. Jog kingpost down until it rests on bottom of trunk.
11. Secure ship's power to the sliding padeye.
12. Reinstall two restraint bars using four bolts for each (model CR-12 only).
13. Stow portable control station and attach cable on stowage brackets in hatch.
14. Secure hatch.

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. INTRODUCTION.

3-1.1 SCOPE. This chapter provides a general functional description of the sliding padeye together with detailed functional descriptions of all major components and assemblies.

3-1.2 REFERENCE PUBLICATIONS. Additional information and safety instructions are contained in Naval Ships' Technical Manual (NSTM), chapters 244, 300, and 302. Applicable technical manual numbers for NSTM chapters and titles for referenced technical manuals are presented in table 1-3. Replenishment At Sea (RAS) NWP-14 also contains additional information.

3-2. SLIDING PADEYE FUNCTIONAL DESCRIPTION.

3-2.1 FUNCTIONAL BLOCK DIAGRAM. Figure 3-1 is a functional block diagram which graphically illustrates the interrelationship between sliding padeye components. The following paragraphs identify the differences between bulkhead-mounted and retractable sliding padeye units.

3-2.2 BULKHEAD-MOUNTED UNIT. The bulkhead-mounted sliding padeye (figure 3-2) is an electrically powered assembly which provides a means of transferring cargo between ships while underway. The kingpost is secured to the ship's structure above deck by four mounting lugs. Ship 440-Vac power is supplied to a remotely mounted ac magnetic motor controller which is electrically connected to the ac motor. The controller and associated control stations apply ship power to, and remove ship power from, the motor stator windings to start or stop motor operation. The controller also protects the motor by means of suitable overload and undervoltage/low-voltage protective devices. The motor-driven shaft is coupled to a ball screw and provides power for vertical motion of the sliding padeye carriage. The vertical thrust is transmitted from the ball screw to the padeye carriage assembly through the ball nut which is housed in the carriage assembly. The ball screw is supported at each end by spherical roller bearings. A Standard Tensioned Replenishment Alongside Method (STREAM) adapter is mounted on the outboard face of the carriage assembly to interface with the STREAM delivery system and pivots to accommodate off-station angles. The carriage assembly is guided by several pairs of cam rollers on hardened steel tracks. When the carriage assembly reaches either the upper or lower extremes of travel, two of the four electrical limit switches (which are wired in series) are opened by contact with cams mounted on the carriage assembly, stopping the motor and setting the brake.

3-2.3 RETRACTABLE UNITS. The retractable sliding padeye (figure 3-2) functions in the same manner as the bulkhead-mounted unit except that it is stowed below the deck in a vertical trunk which is welded to the ship's structure. The retractable padeye kingpost must be unstowed and erected prior to rigging and operation. Retractable units have a number of features and components which differ from the bulkhead-mounted units. Functional descriptions for components and assemblies common to both units are provided in the following material under paragraph 3-3. Descriptions for components and assemblies specific to retractable units are noted accordingly. The shaft provides power for raising and lowering the retractable kingpost.

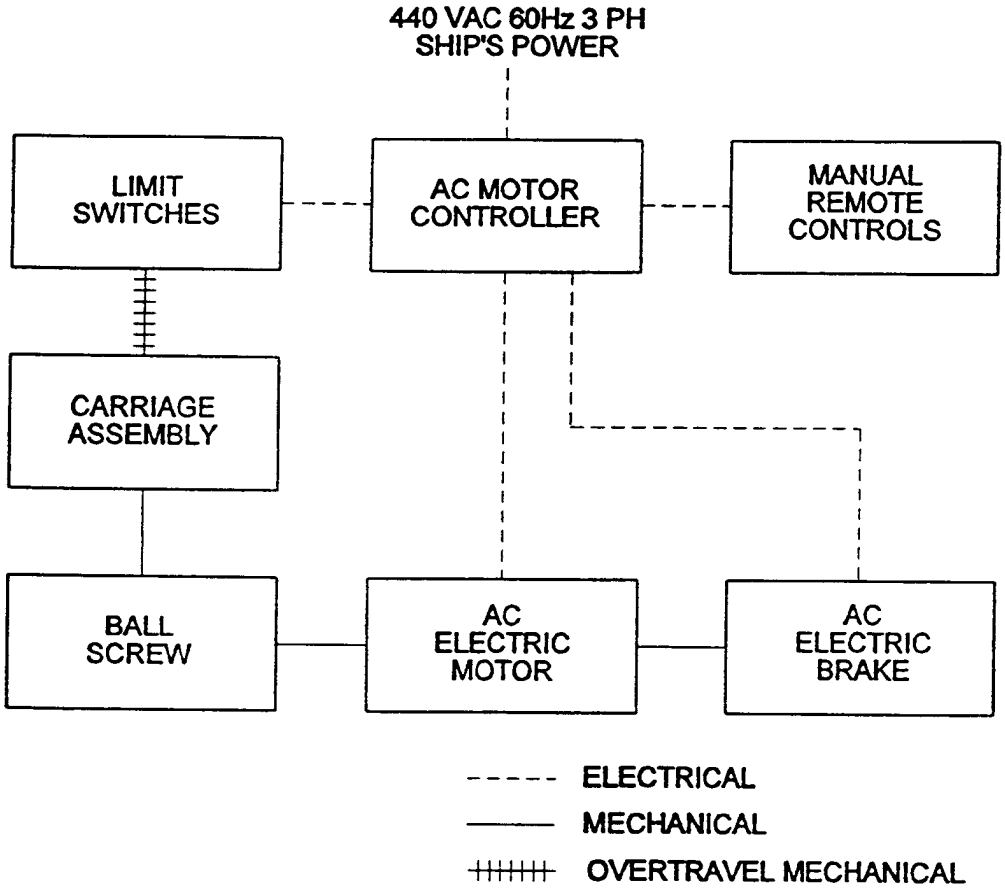
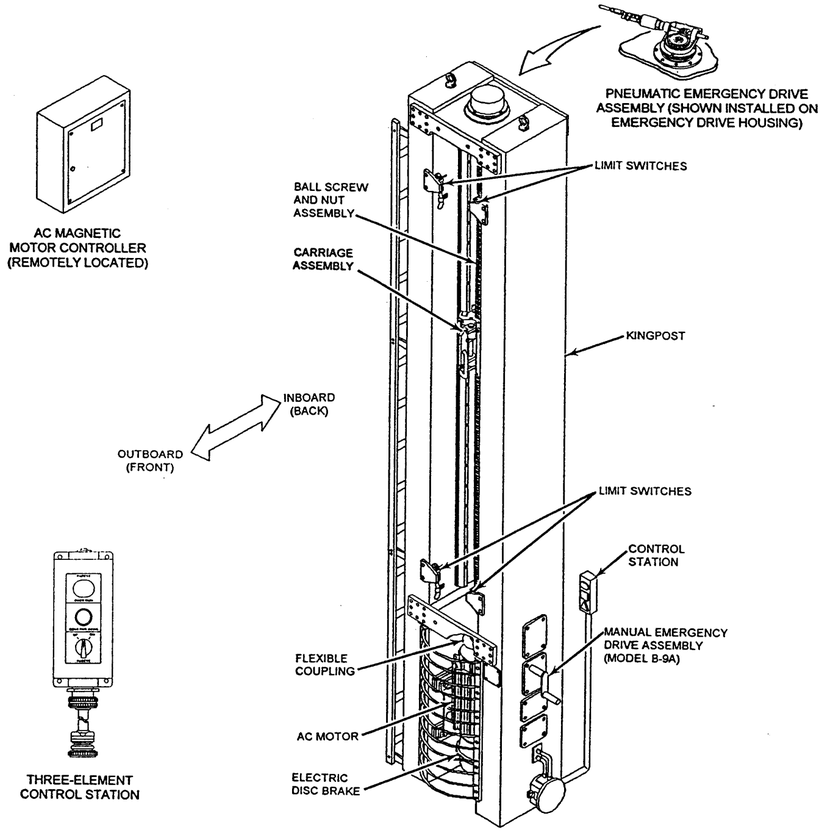


Figure 3-1. Functional Block Diagram



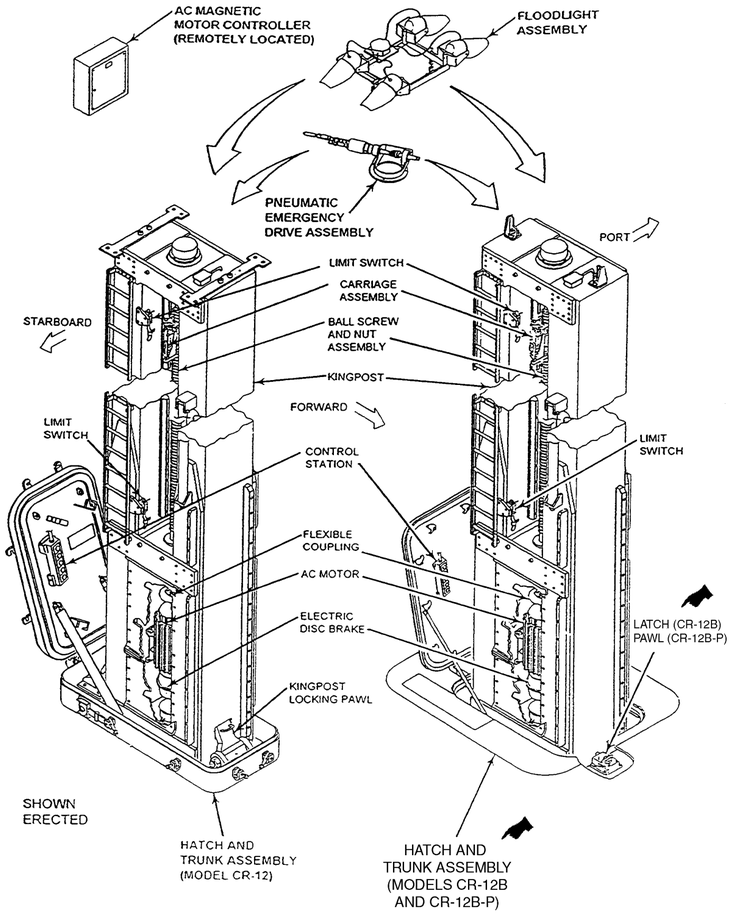


Figure 3-2. Sliding Padeye Configurations

3-3. MAJOR COMPONENTS AND ASSEMBLIES.

3-3.1 SLIDING PADEYE RECEIVING UNIT. The sliding padeye receiving unit consists of two main box columns (figure 3-2) which are connected by support weldments throughout. The columns have hardened steel surfaced tracks to guide the carriage assembly and also to serve as protection for the ball screw. The upper and lower bearing supports have identical spherical roller bearing arrangements to accommodate radial and thrust loads and provide end restraint for the ball screw. A motor guard or cover plates further stiffen the structure and provide protection for the motor and shaft coupling while safeguarding personnel from rotating components.

3-3.2 AC MAGNETIC MOTOR CONTROLLER. The remotely located ac magnetic motor controller is an across-the-line starter contained in a dripproof electrical enclosure that contains the control and safety devices used in the control of the sliding padeye. The function of the controller is to start, stop, and reverse the motor. The controller contains two jog timing switches that control the amount of movement that will occur when the kingpost is jogged up or down. In conjunction with the control station, emergency motor run can also be performed. The controller contains an interlocked contactor, control power transformer, overload relays, RESET pushbutton, fuses, and terminal blocks. The interlocked contactor allows it to be set in one of two positions: forward (F) or reverse (R), at any given instant. The control power transformer is a single-phase transformer that reduces 440-Vac to 115-Vac for the control circuit. The overload relays are used to protect the motor against damage from excessive running overloads or prolonged stalled motor currents. The RESET pushbutton resets the thermal overload relay, when tripped. Fuses, rated at 10 amperes, are also installed to protect the control circuit. The terminal blocks provide connection points inside the controller for internal and external wiring.

3-3.3 AC MOTOR. The ac motor drives the carriage assembly up and down the ball screw to raise and lower the carriage, as well as the kingpost for the retractable models. A flexible coupling connects the motor shaft to the ball screw shaft. The motor is a 440-Vac, 60-Hz, 3-phase, reversible, squirrel cage induction type. The motor is totally enclosed in a non-ventilated, watertight enclosure. The reversing feature is accomplished by reversing two of the three leads per winding, which reverses the phase sequence of the input current and causes the motor to turn in one direction or the other. When 440-Vac power is applied to the stator, the out-of-phase currents flowing through the stator windings produce a rotating magnetic field across the air gap between the rotor and stator. This field cuts across the rotor conductors, inducing a voltage which causes rotor current to flow. The interaction of the rotor current and rotating magnetic field develops a torque which causes the rotor to turn. The rotor is supported in the stator core by a ball bearing near each end of the motor shaft. The ball bearings are held in place by the drive- and opposite drive-end bearing caps. A seal and slinger at the drive end of the motor prevents leakage of lubricant along the shaft. The drive- and opposite drive-end end shields close up and seal the ends of the motor. An electric disc brake is secured to the end of the motor opposite from the flexible coupling. The motor shaft extends into the endplate of the brake. A splined hub is keyed, and secured with setscrews, to the end of the shaft, and rotates with the motor shaft. The splined hub contains the braking components which stop motor rotation when the brake is applied.

3-3.4 ELECTRIC DISC BRAKE. The electric disc brake (figure 3-3 and figure 3-4) mounted on the lower end of the motor, is a magnetically-operated, friction type which automatically sets and stops the motor whenever 440-Vac input power is interrupted or removed from the motor control circuit. The brake is released and set by the action of the electromagnet on the pressure plate. When 440-Vac power is applied to the motor, the coils are energized, pulling the pressure plate toward the magnet plate. The force of the torque springs is overcome and the pressure plate moves away from the stationary and rotating disk stack. As long as power is applied to the coils, the magnet plate will hold the pressure plate away from the disc stack. This removes all friction between the stationary and friction discs and releases the brake to allow starting of the motor. When 440-Vac input power is interrupted or removed from the motor control circuit, the coils are deenergized. This allows the force of the

torque springs to push the pressure plate, moving it against the discs. Movement of the pressure plate forces the stationary discs and the friction discs together. Friction between the pressure plate, stationary discs, endplate, and rotating friction discs slows down and stops the friction discs, thus stopping the motor. The brake remains set until the coils are energized. The brake can also be released manually by pulling the release lever on the outside of the housing. When the release lever is released, the brake resets under the force of the torque springs to the original (brake set) position.

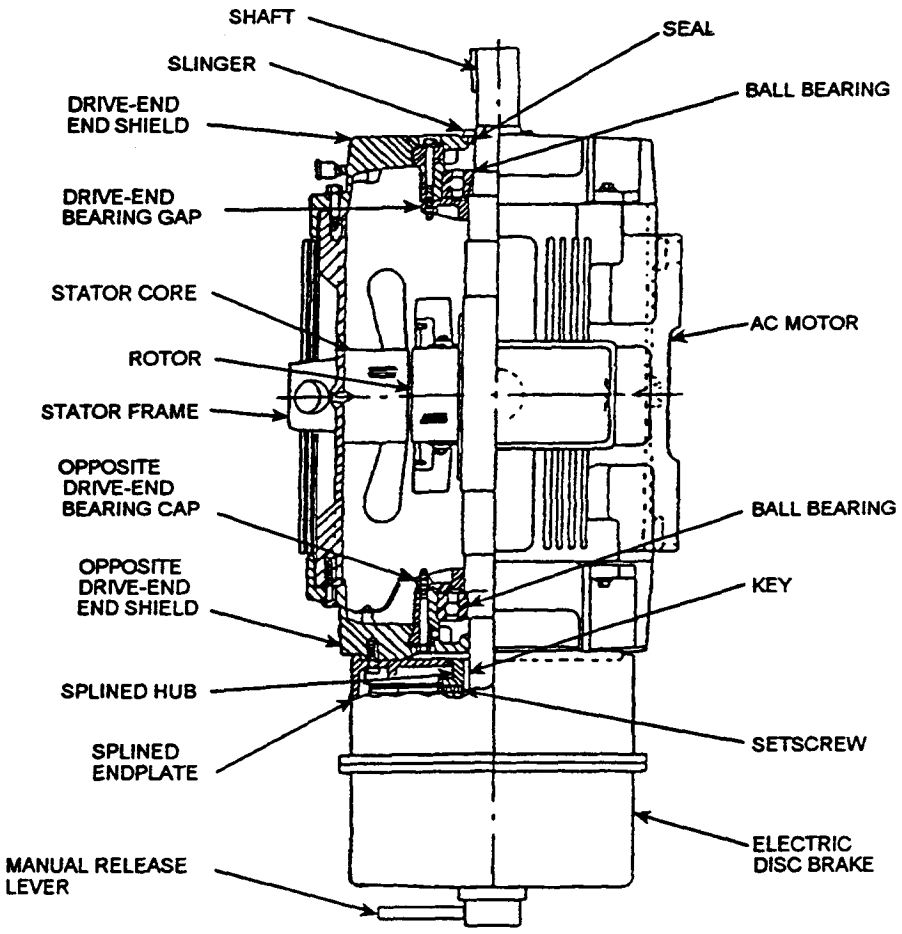


Figure 3-3. AC Motor and Electric Disc Brake

3-3.5 FLEXIBLE COUPLING. The lower flange of the flexible coupling (figure 3-2) is attached to the motor shaft and the upper flange is attached to the lower end of the ball screw shaft. The flexible coupling transmits rotary motion and the torque developed from the motor shaft to the ball screw. The coupling (and manual drive on Model B-9A) components are enclosed by front and rear motor guards or covers.

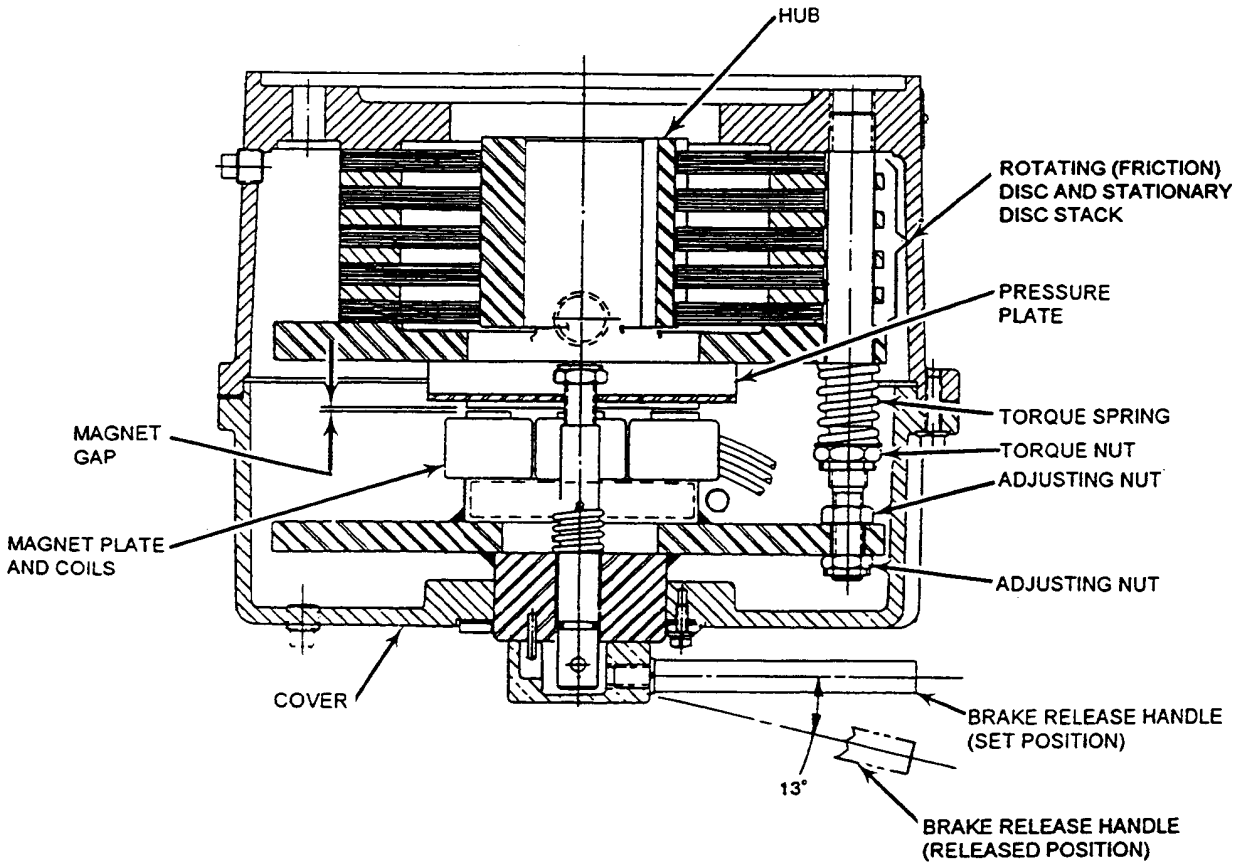


Figure 3-4. Electric Disc Brake Cross Section

3-3.6 CARRIAGE ASSEMBLY. The padeye carriage assembly (figure 3-2) contains a mounting arrangement for the ball nut of the ball screw assembly. It accepts the loads applied by the tensioned highline, inhaul, and outhaul lines, and transmits them through cam rollers to the tracks of the structural columns. A STREAM adapter plate is mounted to the outboard face of the bulkhead-mounted padeye unit carriage assembly. A long link, tested to 50,000 pounds, is fitted to the midpoint of this adapter for attachment of a 1-3/8 inch highline pelican hook. The drilled pad at the base of the adapter, below the long link is tested for 9,000 pounds and will accommodate a 3/4-inch shackle for attaching a messenger or inhaul line fairlead block. The STREAM adapter on the carriage will train forward or aft to accommodate 30 degrees off-station delivery angles. A cam is mounted on both left and right sides of the bulkhead-mounted padeye unit carriage assembly. These cams actuate electrical limit switches, which control upper and lower extremes of travel.

3-3.6.1 Carriage Assembly (Retractable Units). The carriage assembly is similar to that described in paragraph 3-3.6 except that the lower plate is larger and has two holes which fit into the carriage support pins in the trunk and also accommodate the upper ends of two lifting braces during kingpost erection and retraction (figure 2-4). The two braces, which fit between the upper and lower plates, strengthen the carriage assembly enabling it to support the kingpost during erection/retraction operations. The STREAM adapter can be mounted to receive from either port or starboard. There is a single cam on each side of the carriage assembly to actuate the two port side

and two starboard side upper and lower limit switches. Two bumpers, one located on the underside of the upper bearing housing, and one on the bottom of the carriage assembly, cushion the carriage at both extremes of travel.

3-3.7 BALL SCREW ASSEMBLY. The thrust required to impart vertical motion to the carriage assembly is transmitted by a motor driven ball screw assembly. The screw assembly is comprised of a surface-hardened steel rolled-thread screw (figure 3-2) and a ball nut. The ball screw is supported at each end by spherical roller bearings which are mounted in bearing housing assemblies. The end supports are designed so that the ball screw is always in tension. The ball nut provides a circulating path for a complement of bearing balls and converts the rotary motion of the ball screw to thrust with high mechanical efficiency.

3-3.8 LIMIT SWITCHES. Bulkhead-mounted units have four adjustable travel limit switches (figure 3-2) which are mounted on the front of the kingpost. Retractable units have two limit switches mounted on the starboard side and two mounted on the port side. Two are located at the top to control the upper travel limit and two are located near the bottom to control the lower travel limit. These limit switches are actuated by cams on the carriage assembly and are connected in series so that in the event of the failure of one limit switch, the other switch acts as a backup to limit travel to the maximum permissible. The switches, operated by a roller lever, are single pole double throw, and are actuated when the roller lever is rotated by the cam. The switch mechanism consists of a quick make-and-break device that actuates a movable electrical contact which will close the circuit between the two stationary contacts, when tripped. When the limit switch at the top of the kingpost is actuated, an electrical signal is sent to deenergize the raise contactor in the controller and stop further upward travel of the sliding padeye. The same function occurs if the limit switch at the bottom of the kingpost is actuated to deenergize the (lower) contactor and prevent further downward travel. Deenergizing either the raise or lower contactor will automatically set the brake on the motor.

NOTE

Bulkhead-mounted unit, model B-9A has an additional limit switch on the manual drive assembly. Refer to paragraph 1-3.11.

On retractable units, closing the control station JOG switches bypasses the limit switches allowing additional carriage movement (approximately 1/2 inch per jog) which is required during kingpost erection/ retraction procedures.

3-3.9 CONTROL STATIONS. Bulkhead-mounted units have a three-element control station, while the retractable units have a five-element control station.

3-3.9.1 Three-Element Control Station (Bulkhead-Mounted Units). The three-element control station for bulkhead-mounted units (figure 2-2) is a hand-held, watertight, portable enclosure containing three elements for the operation of the sliding padeye. It contains a pushbutton switch, an indicator light, and a three-position rotary switch. The PADEYE EMER RUN pushbutton switch is used along with the PADEYE UP/DN rotary switch for emergency run operations and should be used only for short periods. In this condition, the emergency run switch bypasses motor overload protection devices. The indicator light when lit, indicates power is available to the control unit. The three-position rotary switch is a spring-return-to-center type. When turned counterclockwise from center, it enables the up circuit and starts the up operation of the sliding padeye. When turned clockwise from center, it enables the down circuit and starts the down operation of the sliding padeye. When released, the spring returns to center off position.

3-3.9.2 Five-Element Control Station (Retractable Units). The five-element control station (figure 2-2) is a hand-held, watertight enclosure containing three pushbutton switches, an indicator light, and a three-position, spring-loaded, center-off, rotary switch. An electrical cable (approximately 15 feet long) connects the control station to a power outlet (inside the hatch coaming) to permit padeye operation from outside the cargo handling area. The control station and electrical cable are stowed in brackets mounted beneath the trunk hatch.

3-3.10 KINGPOST. The kingpost supports the transferred load burden until the load is lowered to the deck. It consists of two rectangular-section tubular steel columns which are fastened together, top and bottom, fore and aft, by four tie plates. A motor guard or cover plate further stiffens the structure and provides protection for the motor/brake assembly and flexible coupling while also shielding personnel from rotating components. Two guides, bolted to the kingpost, serve as tracks to guide vertical movement of the carriage assembly.

3-3.11 RETRACTABLE KINGPOST AND TRUNK ASSEMBLY. The vertical trunk assembly consists of kingpost guides which are welded to the ship's structure (figure 3-2). The guides form a socket for the erected kingpost. A watertight hatch precludes flooding of the trunk when the kingpost/sliding padeye is stowed. Below deck access to the trunk is provided by two manholes and one access panel. When erected, the kingpost functions as described in paragraph 3-3.10.

3-3.12 RETRACTABLE KINGPOST LATCHES AND PAWLS. The functions of the latch and pawl assemblies are described below.

3-3.12.1 Latch Assemblies. Refer to figure 1-4. Each latch assembly consists of a base which contains a sliding latch pin. Affixed to the latch pin is a rack, a latch knob, two stop studs, and a gear which is fastened to a shaft. The gear meshes with the rack to either extend or retract the latch pin according to the direction in which the latch knob is rotated. The stop studs limit latch pin extension or retraction. The latches support the kingpost base when it is fully erected, and also support the kingpost temporarily during erection and retraction cycles.

NOTE

Units equipped with latch assemblies shall not be erected without thorough review and understanding of paragraph 2-4.2, Safety Precautions for Units Equipped With Latch Pins.

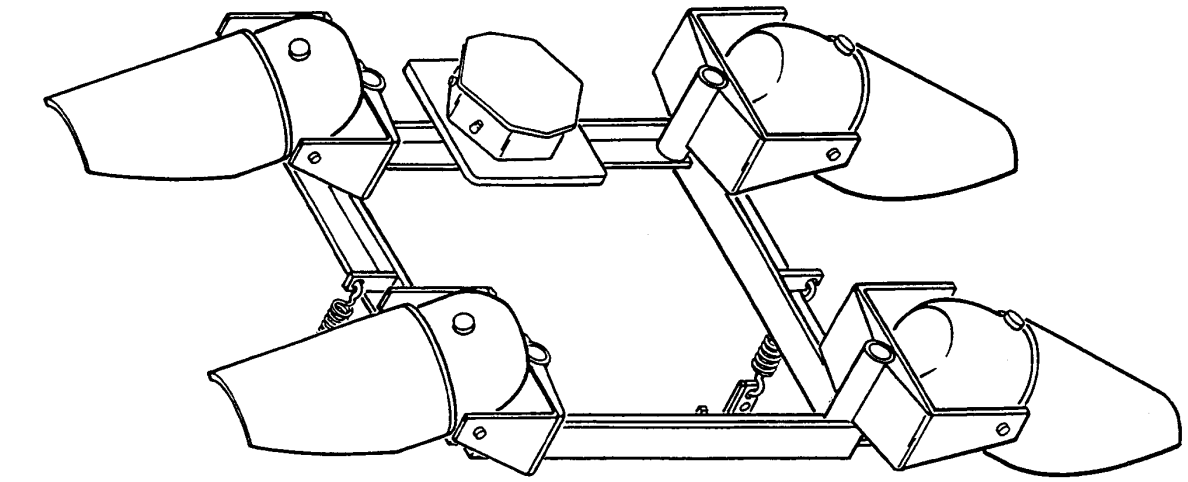


Figure 3-5. Floodlight Assembly (Retractable Units)

3-3.12.2 Pawl Assemblies. Refer to figure 1-5 and figure 1-6. The pawl assemblies have been developed to ultimately replace the latch assemblies described in paragraph 3-3.12.1. They serve to support the kingpost when it is fully erected, and during erection and retraction cycles. When so equipped, two pawls are secured to the deck inside the hatch coaming. Pawls are manually rotated to engage or disengage with the detent recess at the base of kingpost. When the kingpost is lowered into position with the pawl engaged, the weight of the kingpost and padeye assembly serves to create a positive restraint to secure the erect kingpost.

3-3.13 FLOODLIGHT ASSEMBLY (RETRACTABLE UNITS). The floodlight assembly (figure 3-5) is used for nighttime RAS operations. It consists of four 150-watt floodlights mounted on an open rectangular base. It is secured to the top of the kingpost by two spring-tensioned clips and plugged into an electrical receptacle installed atop the kingpost. When not in use, the floodlight assembly is stowed in the RAS equipment locker.

3-3.14 EMERGENCY DRIVE ASSEMBLY. In the event of electrical power loss, the sliding padeye (Models B-12, CR-12, CR-12B, CR-12B) can be operated pneumatically with the emergency drive assembly (figure 2-3). The assembly is bolted into position on the kingpost so that its worm drive meshes with the worm gear attached to the upper end of the ball screw assembly. An air motor is attached to the worm driveshaft and has quick-disconnect couplings which enable connection to ship’s low pressure air supply (green coupling for raise; red coupling for lower). Pneumatic emergency drive operation is accomplished at greatly reduced speed from normal operation. In the event that neither electrical nor pneumatic power is available, there is a 3/4-inch hex end on the

emergency drive shaft which will accommodate a socket wrench to permit manual operation of the unit. Sliding padeye model B-9A has manual emergency drive unit integral to the kingpost structure. The drive has a worm that can be turned using a hand crank or air motor. The worm is moved into engagement with a worm gear on the ball screw shaft and pinned in place for emergency operation. During normal operation the worm is pinned in a disengaged position.

3-4. ELECTRICAL SYSTEM FUNCTIONAL DISCUSSION.

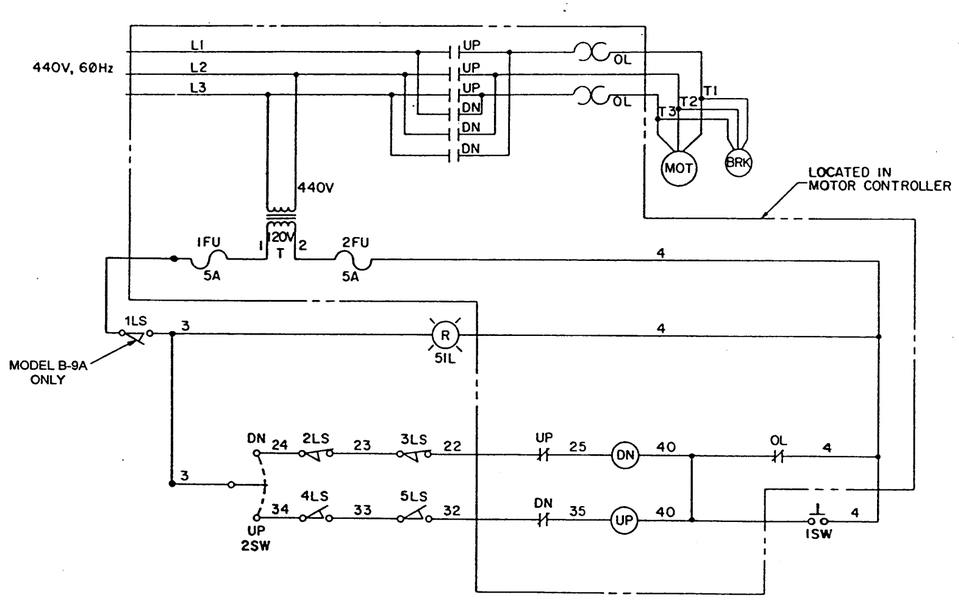
Refer to the electrical schematics (figure 3-6 and figure 3-7). Ship 440-Vac power is continuously supplied from line one (L1), line two (L2), and line three (L3) of the controller input terminals. The control power transformer (T) converts ship's power to 120-Vac control power, and its secondary winding is connected to 5 amp fuses 1FU and 2FU to provide circuit protection.

3-4.1 ELECTRICAL SCHEMATIC (BULKHEAD-MOUNTED UNIT). Figure 3-6 is a schematic diagram showing electrical power distribution for the bulkhead-mounted sliding padeye. Control circuitry is shown with padeye carriage at up position and power off.

3-4.2 ELECTRICAL SCHEMATIC (RETRACTABLE UNIT). Figure 3-7 is a schematic diagram showing electrical power distribution for the retractable sliding padeye unit. Control circuitry is shown with padeye carriage at up position (stowed in trunk) and power off.

3-4.3 MOTOR OVERLOAD. If a motor overload condition occurs, the motor can still be started by pressing the PADEYE EMER RUN pushbutton (1SW, between wires 4 and 40) and turning PADEYE UP/DN or PADEYE/KINGPOST UP/DN rotary switch (2SW) in the desired direction. To avoid motor damage, the emergency run function should not be used for prolonged periods.

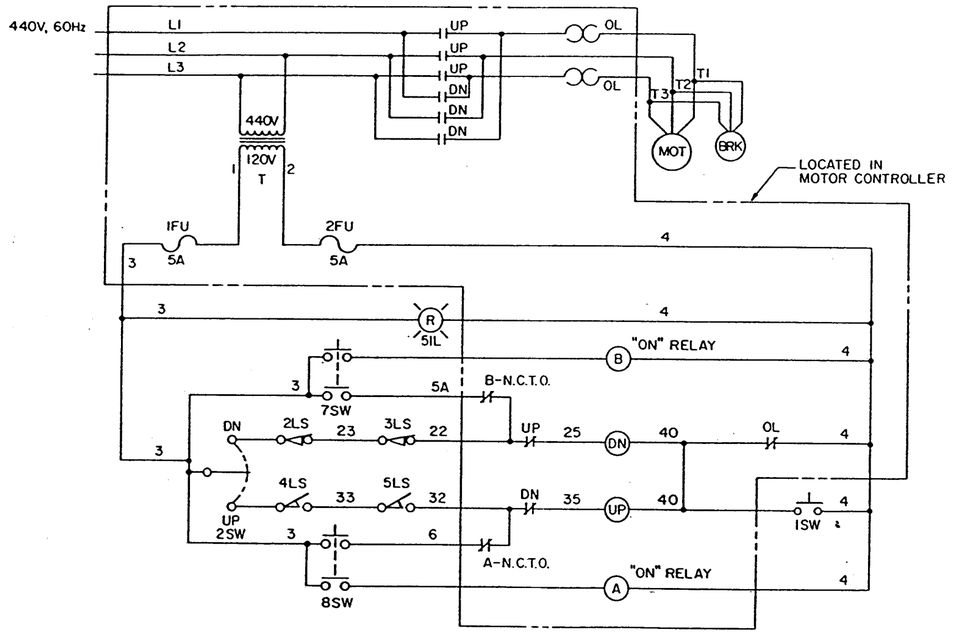
	N. C. LIMIT SWITCH
	N. C. LIMIT SWITCH HELD OPEN
	N. C. CONTACT
	N. O. CONTACT
OL	OVERLOAD
1LS	MANUAL DRIVE LIMIT SWITCH (MODEL B-9A ONLY)
2LS 3LS	PADEYE DOWN STOP LIMIT SWITCHES
4LS 5LS	PADEYE UP STOP LIMIT SWITCHES
1SW 2SW	EMERGENCY RUN SWITCH PADEYE UP/DOWN SWITCH
5IL	POWER AVAILABLE INDICATOR LIGHT
MOT	MOTOR
BRK	BRAKE
T	440/120V CONTROL CIRCUIT TRANSFORMER
FU	FUSE
T1, T2, T3	AC MOTOR TERMINALS
L1, L2, L3	POWER SUPPLY TERMINALS



NOTE
SHOWN WITH PADEYE AT UP POSITION AND POWER OFF.

Figure 3-6. Bulkhead-Mounted Sliding Padeye Electrical Schematic

	N. C. LIMIT SWITCH
	N. C. LIMIT SWITCH HELD OPEN
	N. C. CONTACT
	N. O. CONTACT
OL	OVERLOAD
2LS 3LS	PADEYE DOWN STOP LIMIT SWITCHES
4LS 5LS	PADEYE UP STOP LIMIT SWITCHES
1SW	EMERGENCY RUN SWITCH
2SW	PADEYE/KINGPOST UP/DOWN SWITCH
7SW	PADEYE DOWN JOG SWITCH KINGPOST UP JOG SWITCH
8SW	PADEYE UP JOG SWITCH KINGPOST DOWN JOG SWITCH
5IL	POWER AVAILABLE INDICATOR LIGHT
MOT	MOTOR
BRK	BRAKE
T	440/120V CONTROL CIRCUIT TRANSFORMER
FU	FUSE
A	DOWN JOG LIMIT TIME DELAY
B	UP JOG LIMIT TIME DELAY
N.C.T.O.	NORMALLY CLOSED TIMED OPEN
T1, T2, T3	AC MOTOR TERMINALS
L1, L2, L3	POWER SUPPLY TERMINALS



NOTE
SHOWN WITH PADEYE AT UP POSITION
(STOWED IN TRUNK) AND POWER OFF.

Figure 3-7. Retractable Sliding Padeye Electrical Schematic

CHAPTER 4

SCHEDULED MAINTENANCE

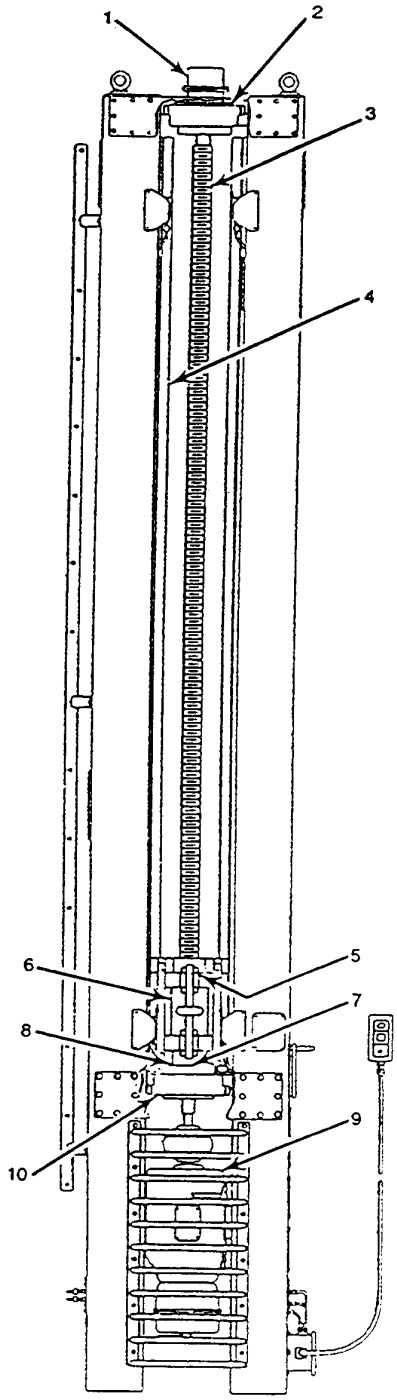
4-1. INTRODUCTION

4-1.1 PLANNED MAINTENANCE SYSTEM. Required preventive maintenance procedures to be performed on a scheduled basis are provided in Planned Maintenance System (PMS) documentation. OPNAVINST 4790.4 describes this system, which also covers departmental and work center recordkeeping, as well as the Maintenance Index Page (MIP) and Maintenance Requirement Cards (MRC's). Existing PMS for the sliding padeye takes precedence over the coverage presented herein.

4-1.2 PREVENTIVE MAINTENANCE PROCEDURES. Inspection and lubrication preventive maintenance should be performed periodically to prevent failure or damage to the equipment. The sliding padeye assembly should be lubricated in accordance with PMS at points shown in figure 4-1 (bulkhead-mounted units) and figure 4-2 (retractable units). Specific corrective maintenance (adjustment, alignment, repair) is covered in chapter 6 of this manual.

4-1.3 CHECK LIST. The following procedures should be performed before and after each operation and are intended as a general check list.

1. Ensure that sliding padeye is clean and free of all loose and unnecessary equipment.
2. Check and tighten all fastening devices as required.
3. Inspect all structural components for deformation, distortion, weld bead cracks, and general condition.
4. Ensure proper electrical connections at all terminals. Inspect all wiring for fraying, cracks, broken, or burned insulation.
5. Inspect all guide rails, slots, and bearing surfaces for indications of unusual wear or misalignment.
6. Check for any bending, cracking, or other distortion of backstays and side braces. Check associated positioning, locking pins, and pawls.
7. Inspect carriage assembly for general condition.
8. Inspect long link and Standard Tensioned Replenishment Alongside Method (STREAM) adapter plate on carriage assembly for excessive wear.
9. Ensure all lubrication points are sufficiently lubricated (figure 4-1 and figure 4-2).
10. During sliding padeye operation, observe functional and structural components for unusual noises, vibration, surging, distortion, electrical arcing, or smoking, and any other unusual condition.
11. During idle periods, sliding padeye should be cycled at least ten times every two weeks.

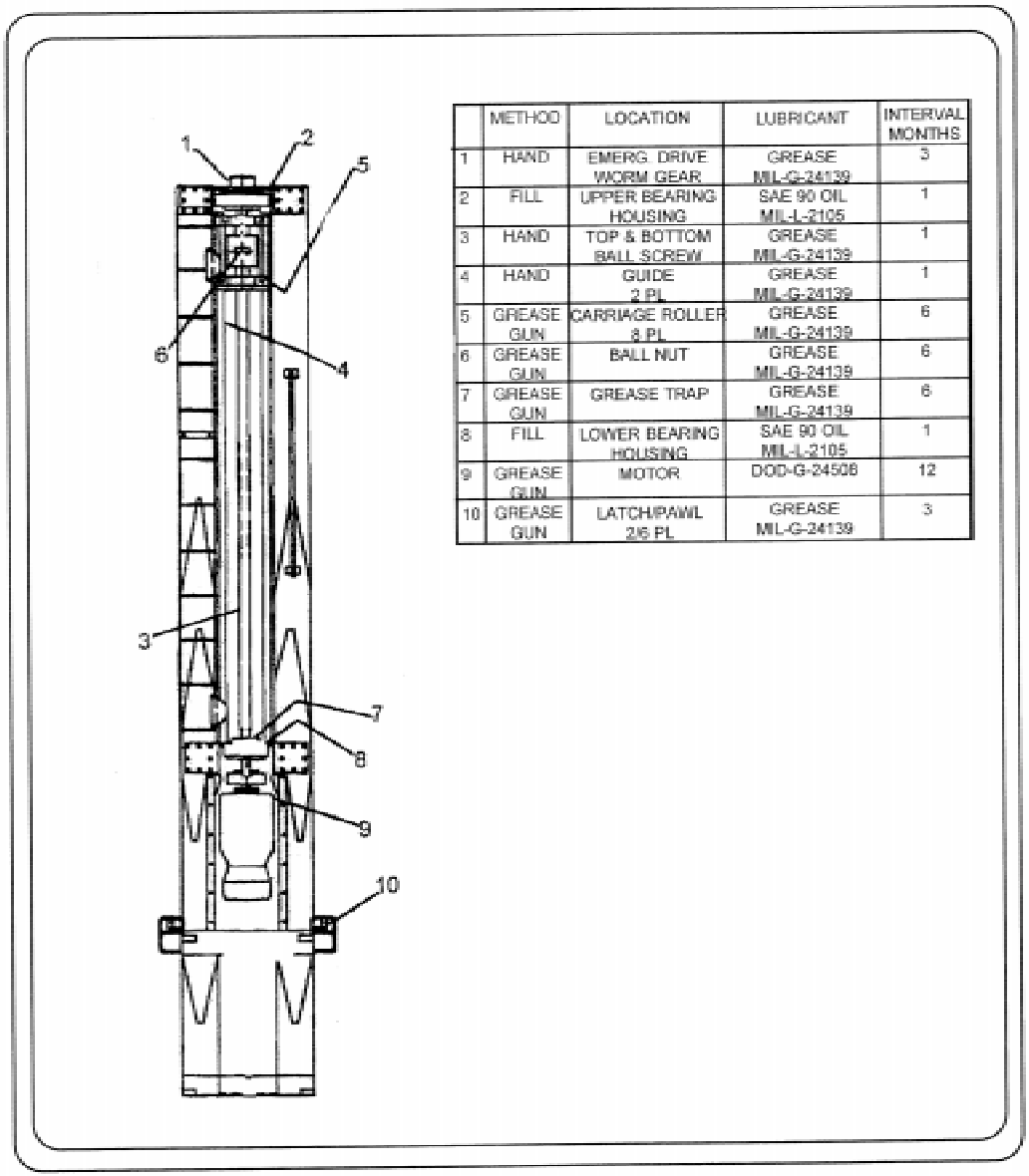


		METHOD	LOCATION	LUBRICANT	INTERVAL MONTHS
	1	HAND	EMERG. DRIVE WORM GEAR	GREASE MIL-G-23549	3
*	2	FILL	UPPER BEARING HOUSING	SAE90 OIL MIL-L-2105	1
	3	HAND	TOP & BOTTOM BALL SCREW	GREASE MIL-G-23549	1
	4	HAND	GUIDE 2 PL.	GREASE MIL-G-23549	1
	5	GREASE GUN	CARRIAGE ROLLER 8 PL.	GREASE MIL-G-23549	6
	6	GREASE GUN	BALL NUT	GREASE MIL-G-23549	6
	7	GREASE GUN	GREASE TRAP	GREASE MIL-G-23549	6
*	8	FILL	LOWER BEARING HOUSING	SAE90 OIL MIL-L-2105	1
	9	GREASE GUN	MOTOR	GREASE DOD-G-24508	12
**	10	HAND	MANUAL DRIVE ASSEMBLY WORM GEAR	GREASE MIL-G-23549	3

* USE GREASE MIL-G-24139 FOR UNITS WITH ECP SOS-P1711 "SLIDING PADEYE LUBE CHANGE" ACCOMPLISHED.

** MODEL B-9A ONLY

Figure 4-1. Lubrication Points, Models B-9A, B-12



	METHOD	LOCATION	LUBRICANT	INTERVAL MONTHS
1	HAND	EMERG. DRIVE WORM GEAR	GREASE MIL-G-24139	3
2	FILL	UPPER BEARING HOUSING	SAE 90 OIL MIL-L-2105	1
3	HAND	TOP & BOTTOM BALL SCREW	GREASE MIL-G-24139	1
4	HAND	GUIDE 2 PL	GREASE MIL-G-24139	1
5	GREASE GUN	CARRIAGE ROLLER 8 PL	GREASE MIL-G-24139	6
6	GREASE GUN	BALL NUT	GREASE MIL-G-24139	6
7	GREASE GUN	GREASE TRAP	GREASE MIL-G-24139	6
8	FILL	LOWER BEARING HOUSING	SAE 90 OIL MIL-L-2105	1
9	GREASE GUN	MOTOR	DOD-G-24508	12
10	GREASE GUN	LATCH/PAWL 2/6 PL	GREASE MIL-G-24139	3

Figure 4-2. Lubrication Points, Models CR-12, CR-12B and CR-12B-P

CHAPTER 5

TROUBLESHOOTING

5-1. INTRODUCTION.

5-1.1 PURPOSE AND SCOPE. This chapter provides information to aid maintenance personnel in troubleshooting the sliding padeye. The troubleshooting guide lists the most common malfunctions, their causes, and appropriate corrective actions. Maintenance personnel shall become thoroughly familiar with chapter 1, chapter 2, chapter 3, chapter 4, and chapter 6 of this manual prior to troubleshooting the sliding padeye. Measurement conversion information for units of measure appearing throughout this manual is presented in table 1-1. Applicable technical manual numbers and titles for Naval Ships' Technical Manual (NSTM) chapters and other referenced publications are presented in table 1-3.

5-1.2 SAFETY REQUIREMENTS. Prior to performing any troubleshooting on the sliding padeye, maintenance personnel shall review and become thoroughly familiar with the general safety notices and precautions listed in the Safety Summary. NSTM chapters 300 and 302 contain additional safety information. If it is necessary during troubleshooting to manually release the electric disc brake, personnel shall refer to paragraph 2-2.2.4. In addition, all warnings and cautions provided throughout the manual shall be observed.

5-2. TROUBLESHOOTING PROCEDURES.

5-2.1 PRELIMINARY TROUBLESHOOTING. Preliminary troubleshooting procedures often eliminate the need for detailed troubleshooting. It is assumed that, prior to the malfunction, all electrical wiring and connections were correct and all preoperational checks had been accomplished (paragraph 2-3.1). If the cause of the malfunction cannot be determined and corrected during preliminary troubleshooting, proceed to the troubleshooting guide.

1. Ensure that CONTROL PWR AVAIL indicator light at control station is illuminated.
2. Ensure that overload relay assembly (thermal overload relay) has not been tripped by pressing RESET button at the motor controller. If thermal overload relay continues to trip, determine cause of malfunction.
3. Visually ensure that no limit switches have been actuated.
4. If motor is humming, check phases, fuses, brake assembly, or for jammed carriage assembly.
5. If step 4 is satisfactory and motor is running, check motor coupling.
6. Monitor equipment for unusual noises or odors.

5-2.2 TROUBLESHOOTING GUIDE. The troubleshooting guide (table 5-1) shall be followed to isolate common malfunctions and to take the proper corrective action. Identify the malfunction in the left-hand column that best describes the problem. Once a malfunction has been identified, proceed to the probable causes listed in the center column and then take the corrective action listed in the right-hand column. Probable causes are listed in the approximate order in which they should be checked, but it is not mandatory that this order be maintained. Refer to electrical schematics, figures 3-6 and 3-7 to aid in fault isolation and in troubleshooting the electrical system.

Table 5-1. Sliding Padeye Troubleshooting Guide

Malfunction	Probable Cause	Corrective Action
Motor does not respond to any control switch	No electrical power to controller	Turn power on at distribution panel.
	No control circuit power Motor circuit overloaded	Check fuses in motor controller. Press RESET pushbutton on motor controller.
	Manual drive engaged (Model B-9A only)	Disengage manual drive and place manual engage/release pin in disengaged position.
	Manual drive limit switch defective (Model B-9A only)	Check manual drive limit switch to ensure contacts are closed when manual drive is disengaged. If not, replace switch (para 6-7.4).
	A travel limit switch is open in direction of travel	Free lever assembly and/or replace defective travel limit switch (para 6-3-3).
	Selector switch assembly defective	Replace selector switch assembly (figure 7-12 or figure 7-13).
	Motor controller defective	Check controller and replace defective parts.
	AC motor defective	Check motor and if defective, repair or replace (Para 6-7.2 or Para 6-7.5).
CONTROL PWR AVAIL light not lit	Defective lamp	Replace lamp (figure 7-12 or figure 7-13).
Carriage assembly does not stop automatically at upper and lower travel limits	Travel limit switch adjustable roller lever out of position	Readjust roller lever (Para 6-3.3).
	Travel limit switch adjustable roller lever broken	Replace adjustable roller lever (Para 6-3.3).
	Travel limit switch defective	Replace defective travel limit switch (Para 6-3.3).
Carriage assembly slips more than 3 inches when stopped	Disc brake's friction or stationary discs need adjustment for wear	Adjust disc brake (para 6-3.5).
	Disc brake's friction or stationary discs are worn out	Inspect and replace friction or stationary discs (para 6-7.5).
Ball screw vibrates excessively during sliding padeye operation	Carriage bearings defective	Replace carriage bearings (para 6-8.9).
	Bearing nut improperly torqued	Torque bearing nut to proper value (para 6-3.1).
	Ball screw defective	Replace ball screw and nut (para 6-8.2 or 6-8.3). Depot level repair.
	Upper or lower ball screw support bearings defective	Replace upper or lower ball screw support bearings (para 6-7.7).
	Clearance between carriage and guides excessive	Check kingpost for distortion.
		Install shims under guides to reduce clearance. (para 6-8.2 or 6-8.3).
		Check cam rollers for flat spots.

Table 5-1. Sliding Padeye Troubleshooting Guide - Continued

Malfunction	Probable Cause	Corrective Action
Excessive noises during sliding padeye operation	Lack of lubrication on tracks, ball screw or ball nut	Lubricate tracks and/or ball screw/ball nut (chapter 4).
	Spherical roller bearings damaged; inner or outer race cracked or broken	Replace defective bearings (para 6-7.7).
	Lower-and upper-ball screw bearings defective	Replace defective bearings (para 6-7.7).
	Ball screw threads damaged	Inspect and repair damaged ball screw threads (para 6-7.10).
	Steel balls in ball nut defective	Remove ball nut retainer and secure carriage assembly. Remove ball recirculation tubes one at a time and examine balls. Rotate ball screw manually to remove all balls (para 6-8.8 or para 6-8.9).
	Motor ball bearings worn out	Check ball bearings (NSTM chapter 244) and replace if necessary.
Motor overheats while running (usually accompanied by humming noise)	Voltage is low	Check ship's power supply and restore proper voltage.
	Open or shorted coil or phase in stator winding	Perform phase current test.
	Motor ball bearings worn out	Check ball bearings (NSTM chapter 244) and replace if necessary.
	Electric disc brake does not release	Inspect for defective solenoid coil; replace as required (para 6-7.2 or para 6-7.5).
Emergency drive operation fails to operate sliding padeye	Emergency drive assembly disengaged	Check that worm drive is fully meshed with worm gear.
	Air supply pressure low	Check and provide proper air supply pressure (90-110 psi).
	Air supply valve inoperative	Inspect and repair air supply valve.
Carriage fails to travel when manual drive is engaged. (Model B-9A only)	Worm gears not fully engaged	Engage worm gears completely by inserting pin through both holes.
	Defective limit switch	Replace limit switch (para 6.3.3).

CHAPTER 6

CORRECTIVE MAINTENANCE

6-1. INTRODUCTION

6-1.1 SCOPE. This chapter provides specific corrective action for organizational, intermediate and depot level maintenance. Corrective action consists of adjustment/ alignment and repair or replacement of components. This chapter is divided into three sections: Adjustment/alignment procedures are presented in section I, normal organizational and intermediate maintenance activity repairs are presented in section II, depot level repair and overhaul procedures are presented in section III.

6-1.2 SAFETY REQUIREMENTS. Prior to performing any corrective maintenance procedures, maintenance personnel shall review and become thoroughly familiar with the general safety notices and precautions listed in the Safety Summary. Specific adjustment/alignment and repair or replacement procedures, along with their individual warnings, cautions and notes shall be read in full prior to starting corrective maintenance.

SECTION I.

ADJUSTMENT AND ALIGNMENT

6-2. ADJUSTMENT AND ALIGNMENT INTRODUCTION

6-2.1 SCOPE. This section describes the steps and procedures required for equipment adjustment and alignment. The following equipment will require adjustment and/or alignment after repairs or replacements or when affected by previous adjustments and alignments or other causes.

6-3. ADJUSTMENT AND ALIGNMENT PROCEDURES

6-3.1 BEARING HOUSING ALIGNMENT/BALL SCREW NUT TORQUE ADJUSTMENT. Bearing housing alignment and ball screw nut torque adjustment should be performed whenever upper or lower bearing housings or their components have been replaced or removed and reinstalled. The following procedure is accomplished during reassembly when upper and lower bearing housings are in place, ball screw nut has been installed, and electric motor is not coupled to the ball screw.

1. Check clearance between upper and lower bearing housings and kingpost tie plates. Clearance should be 1/64 + 0.0 / - 1/64 inch.

NOTE

Setscrews are tack welded to kingpost tie plates. If adjustment is necessary, break tack welds and retack following adjustment.

2. If necessary, break tack welds and readjust clearances. Retack.
3. Check that bearing nut is snug.
4. Manually rotate ball screw, moving carriage through full stroke.
5. Use adjustable wrench on ball screw flats to prevent turning. Tighten ball screw nut using socket (Entwistle part number EJ-40089) to 310-375 ft lbs torque.
6. Using socket (EJ-40089) and torque wrench, rotate ball screw and note torque wrench reading. Running torque reading should be 60-75 ft lbs.
7. Tighten or loosen bearing nut as required to achieve running torque of 60-75 ft lbs and ball screw nut torque of 310-375 ft lbs.
8. Install spring pin to lock bearing nut in position.
9. Continue reassembly of sliding padeye components.

6-3.2 EMERGENCY DRIVE (PNEUMATIC) WORM GEAR ALIGNMENT. This procedure applies to sliding padeye models B-12, CR-12 and CR-12B CR-12B-P . Refer to figure 6-1. Following procedures apply to installed (vertical) kingpost but applicable steps may be used during reassembly of units in overhaul.

1. Move sliding padeye carriage assembly to approximately one foot above full down position.

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing alignment.

2. Deenergize sliding padeye electrical system by opening circuit breaker in power distribution panel and tagging out of service in accordance with ship's instructions.
3. Remove four cap screws, cover and gasket from emergency drive housing.
4. Measure distance between top surface of emergency drive housing and lower surface of worm gear. Dimension should be 2-3/16 +/- 1/64 inches.
5. Mount emergency drive unit on emergency drive housing using cap screws from cover.
6. Check that worm gear mates properly with emergency drive unit worm.
7. If adjustment is required, remove upper retaining ring and worm gear and change spacers or shim as necessary to achieve proper fit. Reinstall retaining ring.

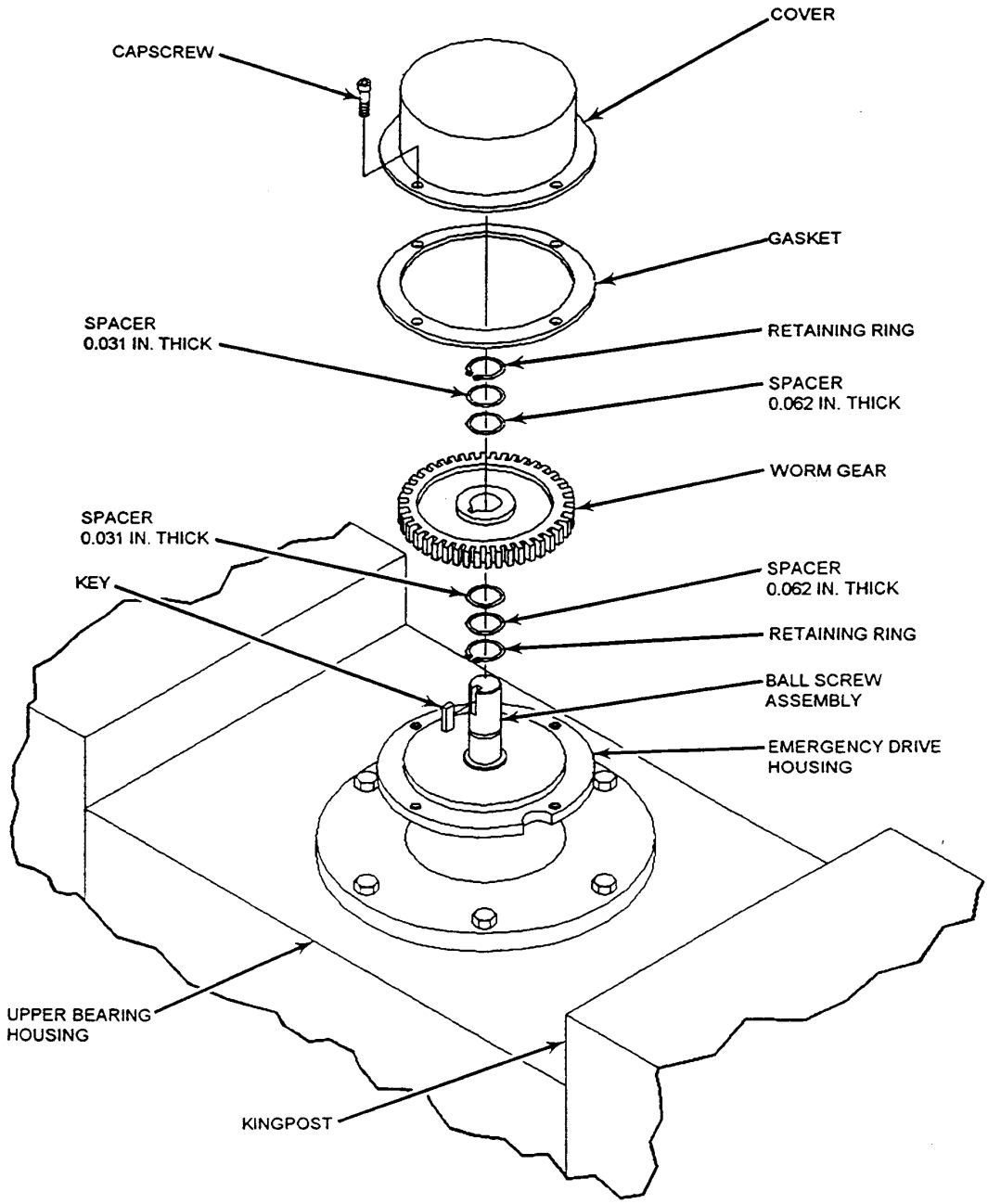


Figure 6-1. Emergency Drive Worm Gear Alignment

8. When adjustment is complete, connect ship's low pressure air to emergency drive unit and move carriage assembly up and down through several cycles to verify adjustment.

9. Remove emergency drive unit.

10. Reinstall gasket and cover using four cap screws.

11. Reenergize sliding padeye electrical system, remove out of service tag and return to normal operation in accordance with ship's instructions.

6-3.3 TRAVEL LIMIT SWITCH ADJUSTMENT. The limit switches must be positioned so that positive contact is made with the roller lever by the cams as the carriage assembly travels. Refer to figure 6-2.

1. Move carriage assembly to position where limit switch is normally tripped by carriage assembly cam.

2. If switch does not trip, adjust limit switch as follows.

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing adjustment.

3. Deenergize sliding padeye electrical system by opening circuit breaker in power distribution panel and tagging out of service in accordance with ship's instructions.

WARNING

To prevent death or injury, always wear safety harness when working above the deck on kingpost.

4. Verify limit switch function by performing continuity check.
   - 4.1 Remove limit switch cover.
   - 4.2 Attach voltohmmeter or other electrical continuity testing device to limit switch terminals.
   - 4.3. Operate roller lever by hand to open limit switch contacts and observe whether continuity is broken.
   - 4.4. Operate adjustable roller lever by hand to close limit switch contacts and observe if continuity is maintained.

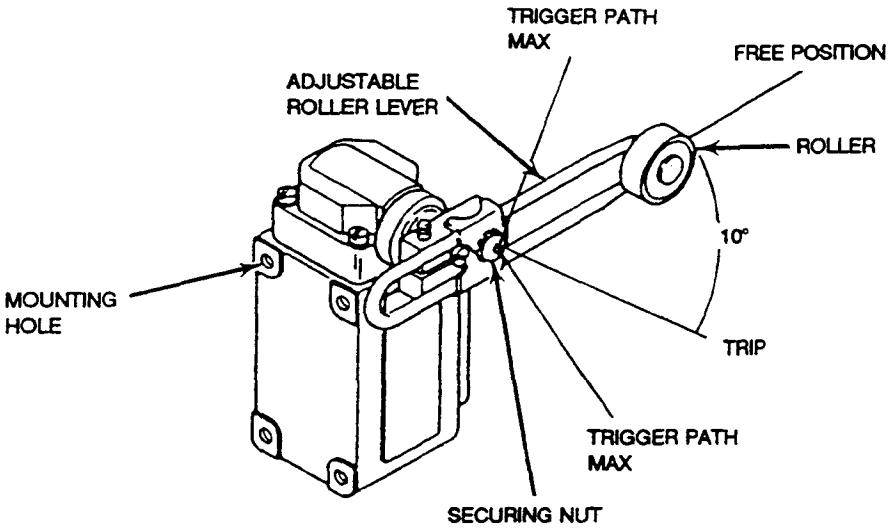


Figure 6-2. Travel Limit Switch Adjustment

4.5. If continuity check is unsatisfactory, repair or replace limit switch.

4.6. If continuity check is satisfactory, remove continuity testing device and replace limit switch cover.

5. Loosen roller lever securing nut.
6. Position roller lever so that when roller is at trip position, roller is about 10 degrees from free position with respect to limit switch trigger path.
7. Tighten roller lever securing nut.
8. Repeat step 4 through step 7 for remaining switches needing adjustment.
9. Reenergize sliding padeye electrical system and remove out of service tag and return to normal operation in accordance with ship's instructions.
10. Test travel limit switch adjustment by cycling carriage assembly to ends of travel. If readjustment is necessary secure power and tag out in accordance with step 3 and readjust.

6-3.4 JOG TIMING SWITCH ADJUSTMENT. This procedure applies to sliding padeye models CR-12 and CR-12B, CR-12B-P . Adjustment must be made as sliding padeye kingpost is being erected or retracted. Timing relays are located inside motor controller enclosures.

1. At a point during sliding padeye assembly erection or retraction, stop movement by releasing switch from KINGPOST UP or DN position.
2. Make reference mark on kingpost that can be compared to stationary item.
3. Jog kingpost upward by depressing KINGPOST UP JOG switch once and releasing.
4. Measure distance traveled up by kingpost. Kingpost travel should be approximately 1/2 inch.
5. Jog kingpost downward by depressing KINGPOST DN JOG switch once and releasing.

6. Measure distance traveled down by kingpost. Kingpost travel should be approximately 1/2 inch.
7. If necessary, adjust jog timing switches as follows.

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing adjustment.

8. Deenergize sliding padeye electrical system by opening circuit breaker in power distribution panel and tagging out of service in accordance with ship's instructions.
9. Open motor controller enclosure and locate appropriate jog timing relay(s).
10. Remove tamper-proof cover at top of relay to gain access to dial head.

CAUTION

To prevent damage to jog timing relay needle or orifice, turn adjusting screw only a fraction of a revolution before checking effect of adjustment.

11. Gently move adjusting screw(s) counterclockwise to decrease time delay and clockwise to increase time delay.
12. Reinstall relay(s) cover and close motor controller enclosure door.
13. Restore power to system and check upward and downward jog travel.
14. If further adjustments is necessary, secure power and repeat step 8 through step 13.
15. Reenergize sliding padeye electrical system, remove out of service tag and return to normal operation in accordance with ship's instructions.

6-3.5 ELECTRIC DISC BRAKE ADJUSTMENT. The electric disc brake magnet gap increases as a result of rotating (friction) disc wear. Check and adjust magnet gap and torque spring length as necessary. Refer to figure 6-3 and the following procedures for bulkhead-mounted and retractable sliding padeye models.

1. Move sliding padeye carriage assembly to secured and stowed full down position (retractable sliding padeye models must be fully erected with latches fully engaged in kingpost sockets and blocked to prevent backing out or kingpost resting completely on kingpost locking pawls).

WARNING

To prevent death or injury, secure power to sliding padeye electrical circuit and tag equipment out of service prior to performing adjustment.

2. Deenergize sliding padeye electrical system by opening circuit breaker in power distribution panel and tagging out of service in accordance with ship's instructions.
3. Remove motor/brake guards or cover plates to gain clear access to electric disc brake.

NOTE

Rotating (friction) discs used in brake do not contain asbestos. However, normal wearing of discs produces a fine dust which could be a respiratory irritant. Use a vacuum cleaner to remove dust from disc brake components as adjustment proceeds.

WARNING

Brake dust may be a respiratory irritant. To prevent injury, ensure that appropriate breathing apparatus is worn when handling brake components.

4. Remove cotter pin, clevis pin and release block and release handle assembly.
5. Remove screws, lock washers, flat washers, seal ring and seal.

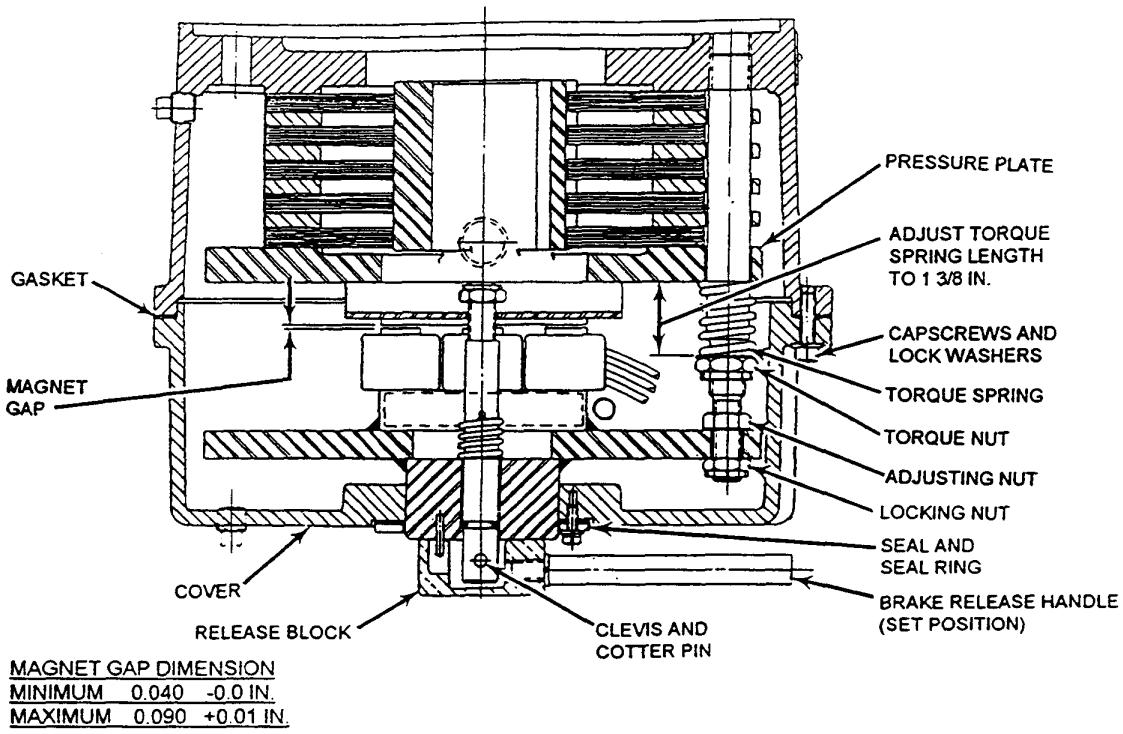


Figure 6-3. Electric Disc Brake Adjustment

6. Support cover to prevent it falling and remove cap screws, lock washers and gasket and cover.
7. Check compressed length of four torque springs. Measure between pressure plate and torque nut. Dimension should be 1-3/8 inch. Adjust torque nuts and verify all four springs have equal compressed length.
8. Check magnet gap. Gap should measure between 0.040 -0.0 inch and 0.090 + 0.01 inch.

9. Adjust magnet gap if required. Loosen, but do not remove, four locking nuts. Turn adjusting nuts clockwise to decrease magnet gap and counterclockwise to increase magnet gap. Tighten locking nuts.

NOTE

If magnet gap adjustment exceeds 0.090 + 0.01 inch, rotating (friction) discs require replacement. Refer to section II.

10. Reinstall gasket and cover using lock washers and cap screws.
11. Reinstall seal and seal ring using flat washers, lock washers and screws.
12. Reinstall release block and handle assembly using clevis pin and cotter pin.
13. Restore power and test operate electrical disc brake to verify adjustment.
14. Secure power.
15. Reinstall motor/brake guards or cover plates.
16. Reenergize sliding padeye electrical system, remove out of service tag and return to normal operation in accordance with ship's instructions.

SECTION II.

REPAIR

6-4. INTRODUCTION.

6-4.1 REPAIR PROCEDURES. This section provides general cleaning, inspection, and detailed repair/replacement procedures for selected sliding padeye assembly components. Procedures are intended for organizational (shipboard) and intermediate maintenance activities. Repair procedures for the following components are presented. Certain procedures are identical to those in section III, depot level repair/overhaul and are referenced in the following list.

	Section II Paragraph or Section III Reference
1. AC Motor and Electric Disc Brake Assembly (Models B-9A and B-12)	6-7.2
2. Flexible Coupling (Models B-9A and B-12)	6-7.3
3. Manual (Emergency) Drive Assembly (Model B-9A)	6-7.4
4. AC Motor and Electric Disc Brake Assembly (Models CR-12, CR-12B, CR-12B-P)	6-7.5
5. Flexible Coupling (Models CR-12, CR-12B, CR-12B-P)	6-7.6
6. Lower and Upper Bearing Housings (All Models)	6-7.7
7. Carriage Assembly (Models B-9A and B-12)	6-7.8
8. Carriage Assembly (Models CR-12, CR-12B, CR-12B-P)	6-7.9
9. Latch Assembly	6-8.10
10. Kingpost Locking Pawl Assembly	6-8.11
11. Floodlight Assembly	6-8.12

	Section II Paragraph or Section III Reference
12. Emergency Drive Assembly, Pneumatic	6-8.13

6-4.2 TOOLS, EQUIPMENT, AND MATERIALS. Repair procedures contained in this section and section III require the use of the standard and special tools equipment and materials listed in table 6-1.

Table 6-1. Tools, Equipment, and Materials

1. Abrasive Stick	Rubberized
2. Ammeter	Clamp-on type
3. Apron	TY-M-2
4. Bag	Parts, plastic
5. Bags	Red plastic (asbestos disposal)
6. Bearing Puller	GGG-P-781, type VII with type XII attachment
7. Blocks	Wooden
8. Bolts	Threaded, 5/16-18 UNC
9. Brush	Cleaning
10. Brush	Stiff-bristled
11. Caliper	Vernier, 0 to 12 in.
12. Cloth	Crocus, grit 400
13. Cloth	Lint-free
14. Compound	Antiseize
15. Container	Waste drain
16. Coveralls	Disposable
17. Covers	Footwear, toxicological, small, MIL-F-12224
18. Detergent	General purpose, MIL-D-16791, water soluble
19. Dial Indicator	---
20. Drain Pan	Shallow
21. Drift Punch, Brass	Assortment
22. Face Shield	Tilting, industrial, size 4
23. Flashlight	Explosion-proof
24. Foot Covering	Disposable
25. Funnel	Strainer, ridge spout, 1 qt
26. Fuse Puller	---
27. Gauge	Taper
28. Gloves	Disposable
29. Gloves	Rubber, elbow length
30. Goggles	Industrial, GG-G-531
31. Grease	DOD-G-24508
32. Grease	MIL-G-23549 , MIL-G-23827, MIL-G-24139
33. Grease Gun	Hand
34. Hammer	Ball peen
35. Hammer Puller, Slide	
36. Helmet	Safety
37. Hose	Low pressure air with shut-off valve

Table 6-1. Tools, Equipment, and Materials - Continued

38. India Stone	---
39. Jacking Bolts	3/4-10 NC
40. Lapping Plate	Cast iron
41. Light, Extension	50 ft
42. Lubricant	WD-40 (MIL-C-81309)
43. Magnet	Pencil type
44. Magnifier	Hand held
45. Mallet	Rawhide or plastic
46. Mask	Asbestos approved
47. Metal Polish	Liquid
48. Mirror	Inspection
49. Ohmmeter	---
50. Oil	SAE 90, MIL-2105
51. Oiler	Hand, 16 oz
52. Pail	Utility, 3 gal
53. Paintbrush	1 in.
54. Paintbrush	Flat, hog bristle, 2 x 2-1/2 in.
55. Pliers	Lineman
56. Pliers	Needlenose
57. Pliers	Slipjoint, 6 in.
58. Pliers	Snapring
59. Pocketknife	Electrician
60. Rags	Wiping
61. Respirator	Air filtering, type III Class, 1/2 filters
62. Rule	Machinist steel, 6 in.
63. Screwdriver	Flat tip, light duty, 6 in.
64. Screwdriver	Flat tip, heavy duty, 8 in.
65. Screwdriver	Flat tip, normal duty, 10 in.
66. Screwdriver	Cross tip, Phillips No. 2, 6 in.
67. RTV	Silastic RTV-22/RTV-731
68. Smock	General purpose, MIL-S-2124
69. Socket	Mfg. Part No. EJ-40089, for 3-3/4 in hex nut
70. Solvent	Dry cleaning, P-D-680, type II, 5 gal
71. Straightedge	Machinist, type I, 1.75 x 24 in.
72. Tag	Identification
73. Tag	Safety
74. Tag	Shipping, paper, string tie, 3.125 x 6.250 in.
75. Tape	Electrical, vinyl
76. Towel	Machinery wiping, twill weave, bleached and lint-free
77. Ultrasonic Cleaner	Parts cleaning
78. Vacuum Cleaner	Type I, MIL-C-24593 (for asbestos cleaning)
79. Vise	---
80. Voltohmmeter	---
81. Wrench	Adjustment, 8 in., heavy duty, 0.987 in., jaw open

Table 6-1. Tools, Equipment, and Materials - Continued

82. Wrench	Adjustable, 10 in., heavy duty, 1.135 in., jaw open
83. Wrench	Socket set, 1/2-in. drive
84. Wrench	Strap pipe
85. Wrench	Torque, in-lb
86. Wrench	Torque, min. 400 ft-lb
87. Wrench Set	Box, double head, double offset

Table 6-1. Tools, Equipment, and Materials - Continued

88. Wrench Set	Combination box and open end, nonsparking
89. Wrench Set	Hex key

6-5. CLEANING AND INSPECTION.

6-5.1 CLEANING. The following general cleaning procedures shall be used during repair. Specific cleaning procedures may be provided for a particular item, in addition to those presented here. Applicable warnings and cautions shall be carefully observed.

WARNING

To prevent death or injury, use cleaning solvent in well-ventilated area. Wear appropriate covering and avoid prolonged breathing of fumes or solvent contact with skin.

1. Remove grease, oil, or dirt from exterior surfaces with solution of approved water-soluble detergent and water.

CAUTION

To prevent damage, do not use harsh abrasives that might scratch, score, or otherwise mar surface finishes.

2. Wearing protective clothing in well-ventilated area, wash all nonelectrical metal parts with approved mineral-base solvent. Use stiff-bristled brush to remove hardened deposits of dirt or other contaminants.

WARNING

Brake dust may be a respiratory irritant. To prevent injury, ensure that appropriate breathing apparatus is worn when handling brake components.

3. Clean brake components with vacuum cleaner.

4. Refer to NSTM chapters 300 and 302 for cleaning procedures for electrical components.

5. Refer to NSTM chapter 244 for cleaning procedures for new and used bearings.

6. Allow bearings to air dry after cleaning.

7. After drying, rinse bearings in approved lubricant and place individually in protective wrap such as plastic bag or aluminum foil.

CAUTION

To prevent damage, do not ultrasonically clean parts longer than 5 minutes at any one time.

8. If available, ultrasonic cleaning may be used on some parts.

WARNING

Pressurized air can drive particles into eyes and skin if handled improperly. To prevent injury, exercise extreme caution.

9. After cleaning, dry parts other than bearings thoroughly, using filtered, dry, low-pressure air, or with clean, lint-free cloth.

6-5.2 INSPECTION. The following procedure shall be used for inspection of components during repair. Whenever possible all parts shall be visually inspected under strong light and magnification.

1. Inspect all parts for excessive wear, deformation, or deterioration that may render them unserviceable.
2. Check all parts for evidence of fractures, corrosion, and discoloration caused by overheating.
3. Examine for pitting, scoring, scratches, and nicks.
4. Inspect threaded areas for stripped threads and evidence of cross-threading.
5. Examine areas adjacent to threads and bends for cracks.
6. Inspect bearings for flat spots and corrosion.
7. Check all springs for cracks, bends, and uniform expansion/retraction ability.
8. Check drive shafts and couplings for flat spots and signs of uneven wear.

6-6. REPAIR AND REPLACEMENT.

6-6.1 REPAIR. Repair parts in accordance with standard shop procedures, using standard shop tools along with those listed in table 6-1, as required. Minor repair to precision-machined parts may be performed if fits and clearances are maintained and if the reliability of the part is not impaired. The following procedure shall be used to repair parts.

CAUTION

Leakage around loosely threaded parts, or movement between bolted parts, can cause failure and damage to equipment. Do not alter concentricity of any part.

1. Remove light surface discoloration from bare metal surfaces, using cloth saturated with liquid metal polish. Remove discoloration by rubbing briskly, then polish with clean, dry, lint-free cloth. Clean parts in accordance with paragraph 6-5.1.
2. Remove corrosion, minor nicks, and scratches from metal surfaces by polishing with crocus cloth. Blend out edges of reworked area, and polish in accordance with step 1.

CAUTION

To prevent damage to equipment, do not allow machined or lapped mating surfaces to contact any surface without protection against nicks, scratches, and burrs.

3. If rework is required on mating surfaces, finish lap, using lapping machine or block.
4. Break all sharp edges after lapping. Use rubberized abrasive stick on parts made from nonferrous metals or a fine India stone for parts made from ferrous metals.

6-6.2 REPLACEMENT. Parts not meeting inspection requirements, or not within allowable wear limits after repairs have been made, shall be replaced. Replace parts in accordance with standard shop practices using standard shop tools, along with those listed in table 6-1, as required.

1. Replace any parts that show severe discoloration from overheating.
2. If serviceability of any part is questionable, replace part.
3. Replace all O-rings, seals, gaskets and cotter pins during reassembly.
4. Do not discard used items until availability of replacement parts is determined.
5. If replacements are not available and equipment must be reassembled (due to ship's mission or other emergency), used O-rings, seals, and gaskets may be reused.
6. If old parts are reused, equipment/system shall be closely monitored for leaks.

6-6.3 PAINT TOUCHUP. Removal/replacement of sliding padeye components will, in most cases, cause chipped, and scratched painted surfaces. These areas should be touched up in accordance with standard painting procedures for underway replenishment (UNREP) equipment. Refer to NAVSEA drawing number 5210545 for procedures on touchup and overcoating. Briefly, the procedure for touchup and overcoating is to prepare the surface using a wire brush to clean the metal followed by sanding to roughen the surface and to feather edges. One coat of MIL-P-24441, Formula 150 Green Epoxy paint is applied to a minimum dry film thickness of 1-1/4 mils. The next coat applied is Haze Gray Silicone Alkyd Enamel Topcoat, MIL-E-24635. For the enamel to bond to the epoxy, it must be applied when the epoxy primer is between ″dry to recoat″ and tack-free.

6-6.4 ANTISEIZE AND RTV SEALANT COMPOUNDS. During reassembly, apply antiseize compound (Led Plate No. 250, NSN 8030-00-597-5367) to all threads, sliding or rolling surfaces, unpainted metal shafts or bores and wherever unpainted metal-to-metal contacts exist (except as noted in the reassembly procedures). Application of RTV adhesive/sealant compounds shall be in accordance with manufacturer's instructions. Apply a thin coat of adhesive/sealant RTV, where required, to the full circumference of the mating surfaces to be sealed. Exercise caution to avoid application of adhesive/sealant RTV to shaft bores, bearings or bearing surfaces.

6-6.5 FASTENERS. Most of the cap screws/bolts used in the sliding block drive are stainless steel, steel-Grade 5, or steel-Grade 8 fasteners. Stainless steel fasteners are used to prevent corrosion in the at-sea environment; Grades 5 and 8 steel fasteners are used to meet particular stress requirements. Care must be taken to ensure that the same fasteners, or suitable replacements, are used during reassembly. Fasteners are readily identified by the grade markings on the screw/bolt head (figure 6-4). Torque fasteners in diagonally opposite sequence (as applicable), and in accordance with table 6-2 (except as otherwise noted in this chapter).

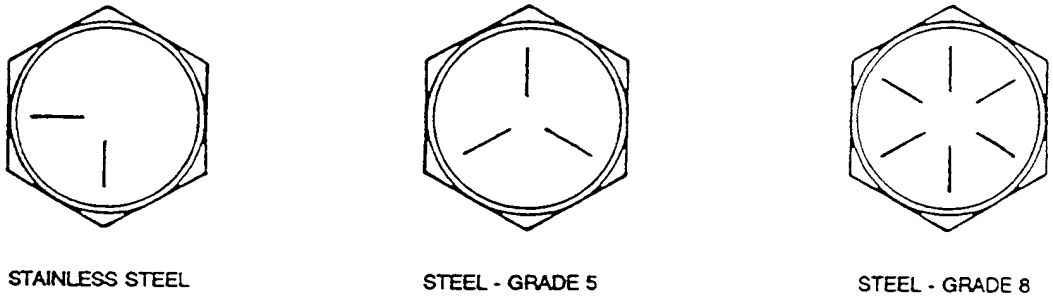


Figure 6-4. Society of Automotive Engineers (SAE) Screw/Bolt Markings

Table 6-2. Screw/Bolt Assembly Torques

Screw/Bolt Size	Torque (ft-lb) *
1/4-20UNC (SST)	2-4
5/16-18UNC (SST)	4-8
1/2-13UNC (SST)	30-35
1/2-13UNC (STL, Grade 5)	50-55
1/2-13UNC (STL, Grade 8)	55-60
9/16-12UNC (STL, Grade 5)	70-80
5/8-11UNC (SST)	50-70
5/8-11UNC (STL, Grade 5)	90-110
3/4-10UNC (SST)	100-120
3/4-10UNC (STL, Grade 5)	180-200
3/4-10UNC (STL, Grade 8)	260-280
7/8-9UNC (SST)	90-110
7/8-9UNC (STL, Grade 5)	260-300
1-8UNC (STL, Grade 5)	400-440

*Torque values shown are lubricated/wet values.

6-7. REPAIR PROCEDURES.

6-7.1 GENERAL. Disassemble only to the extent necessary to perform required repair or replacement. Procedures shall be read in full before starting repairs. Chapter 7 illustrations are referenced to identify parts for removal, disassembly, reassembly, reinstallation, and parts identification.

6-7.2 AC MOTOR AND ELECTRIC DISC BRAKE ASSEMBLY (MODELS B-9A AND B-12).

6-7.2.1 Removal.

1. Elevate carriage approximately one foot. Using wooden blocks between carriage and kingpost, securely block carriage in this position.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

2. Turn off power to sliding padeye assembly from all sources and tag out of service.
3. Disconnect and tag wiring and metal conduit at terminal box (49, figure 7-2).
4. Remove twelve hex head screws (1) and motor guard (2) from kingpost (64).
5. Disassemble flexible coupling in accordance with the following procedures. Refer to figure 7-6.
   - 5.1 Remove outer setscrew (1) from upper flange (6) and loosen inner setscrew (1).
   - 5.2 Loosen, but do not remove, six cap screws (2) each from upper and lower external clamp rings (3).
   - 5.3 Separate coupling by repositioning parts, removing upper (ball screw) flange (6) and pull flexible element (rubber boot) (5) from clamp rings.
6. Disconnect and tag ac motor and electric disc brake wiring at junction box.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

7. Attach appropriate lifting gear to ac motor and electric disc brake assembly (8, figure 7-2).
8. Match mark position of motor and note any installed shims for reassembly reference.
9. Take a strain on lifting gear and remove four aircraft bolts (7) from motor mounting plate.
10. Move ac motor and electric disc brake assembly to work area for disassembly, cleaning and inspection, repair and replacement and reassembly as required in accordance with paragraph 6-8.6.

6-7.2.2 Reinstallation.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

1. Attach appropriate lifting gear to ac motor and electric disc brake assembly. Move to kingpost and position motor and electric disc brake assembly (8, figure 7-2) with partial flexible coupling assembly (6) in kingpost.
2. Install shims (if any) as noted during removal. Refer to match marks to align motor within kingpost structure. Fasten in place with aircraft bolts (7).
3. Reconnect ac motor and electric disc brake assembly electrically.

NOTE

If original motor is not being reinstalled, verify that motor shaft and ball screw shaft align laterally within 1/32 inch and angular misalignment is within one degree.

4. Position upper flexible coupling flange (6, figure 7-6) on ball screw shaft. Position flexible element (rubber boot) (5) between flanges and external clamp rings (3). Secure upper and lower external clamp rings (3) to upper and lower internal clamp rings (4) using cap screws (2).
5. Lock upper flange in place using two setscrews (1).
6. Install motor guard (2, figure 7-2) using twelve hex head screws (1).
7. Reconnect sliding padeye assembly to power and control cables.
8. Restore power to sliding padeye assembly and remove out of service tags.
9. Observe that CONTROL PWR AVAIL indicator lamp illuminates.
10. Momentarily turn PADEYE UP/DN switch to PADEYE DN. Carriage assembly should move down. If carriage assembly moves up, secure power, tag equipment out of service then reverse motor leads at terminal box.
11. Restore power, remove out of service tag and retest carriage movement.

6-7.3 FLEXIBLE COUPLING (MODELS B-9A and B-12).

6-7.3.1 Removal.

1. Remove ac motor and electric disc brake in accordance with paragraph 6-7.2.1.

NOTE

When ac motor and disc brake is removed the flexible coupling components are separated, some parts remain attached to the ball screw shaft and some parts remain attached to the motor shaft.

2. Remove flexible coupling components from ball screw shaft and motor shaft.
3. Move flexible coupling to work area for disassembly, cleaning and inspection, repair and replacement and reassembly as required in accordance with paragraph 6-8.7.

6-7.3.2 Reinstallation.

1. Reinstall flexible coupling components on motor and ball screw shaft in same configuration as required for removal.

2. Reinstall ac motor and electric disc brake assembly in accordance with paragraph 6-7.2.2.

6-7.4 MANUAL (EMERGENCY) DRIVE ASSEMBLY (MODEL B-9A).

NOTE

Following procedure for manual (emergency) drive assembly removal and disassembly applies to model B-9A only.

6-7.4.1 Removal.

1. Remove ac motor and electric brake (paragraph 6-7.2.1) and portion of flexible coupling attached to ball screw shaft.

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear or block to prevent falling; use extreme caution when removing attaching hardware.

2. Attach appropriate lifting gear to manual drive assembly. Take a slight strain on lifting gear or position blocks to prevent drive assembly dropping when mounting hardware is removed.
3. Disconnect and tag electrical connections to limit switch (15, figure 7-2, bubble A).
4. Ensure pin assembly (18) locks worm housing (25) in disengaged position.
5. Remove four hex head cap screws (9) and three socket head cap screws (10).
6. Lift manual drive assembly away from kingpost and to work area.

6-7.4.2 Disassembly.

1. Remove nut (11), washer (12) and bolt (13) and separate worm housing (25) and attached parts from bracket (19).
2. Remove two round head screws (14) and limit switch (15).
3. Remove round head screw (16), lock washer (17) and pin assembly (18) from bracket (19).
4. If necessary, remove bushing (20) from worm housing (25).
5. Remove two round head screws (21) and angle (22) from worm housing (25).
6. Remove two retaining rings (23). Press bearings (24) and worm shaft (29) assembly from worm housing (25).
7. Remove two spacers (26), worm (27) and key (28) from shaft (29).

6-7.4.3 Cleaning and Inspection. Clean and inspect manual drive assembly parts in accordance with paragraph 6-5.

6-7.4.4 Repair and Replacement. Repair or replace manual drive assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-7.4.5 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5.

1. Assemble worm shaft (29), key (28), worm (27) and two spacers (26).
2. Position assembled worm shaft in worm housing and install bearings (24) and retaining rings (23).
3. Install angle (22) using two round head screws (21).
4. Install bushing (20) in worm housing (25).
5. Position assembled worm housing in bracket (19) and secure with bolt (13), washer (12) and nut (11).
6. Attach pin assembly (18) to bracket (19) using washer (17) and round head screw (16). Use pin assembly to lock worm housing in disengaged position to prevent movement of worm housing during reinstallation.
7. Install limit switch (15) using round head screws (14).

6-7.4.6 Reinstallation.

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear or block to prevent falling; use extreme caution when installing attaching hardware.

1. Attach appropriate lifting gear to manual drive assembly and move to kingpost. Position assembled manual drive in kingpost and secure in place using three socket head screws (10) and four hex head screws (9).
2. Check engagement of worm (27) with worm gear (2, figure 7-8).
3. Reinstall upper portion of flexible coupling previously attached to ball screw shaft and install ac motor and electric brake (paragraph 6-7.2.1).

6-7.5 AC MOTOR AND ELECTRIC DISC BRAKE ASSEMBLY (MODELS CR-12 AND CR-12B, CR-12B-P).

6-7.5.1 Removal.

1. Erect sliding padeye normally and engage latches or pawls to support kingpost.
2. Elevate carriage assembly approximately one foot. Using wooden blocks between carriage and kingpost, securely block carriage in this position.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

3. Turn off power to sliding padeye assembly from all sources and tag out of service.
4. Remove thirty-eight cap screws attaching starboard side upper and lower motor covers (2, figure 7-3) to kingpost.
5. Disassemble flexible coupling (5) in accordance with the following procedures. Refer to figure 7-6.
   5.1 Remove outer setscrew (1) from upper flange (6) and loosen inner setscrew (1).
   5.2 Loosen, but do not remove six cap screws (2) each from upper and lower external clamp rings (3).
   5.3 Separate coupling by repositioning parts, removing upper (ball screw) flange (6) and pull flexible element (rubber boot) (5) from clamp rings.
6. Disconnect and tag ac motor and electric disc brake wiring at junction box.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when removing.

7. Attach appropriate lifting gear to ac motor and electric disc brake assembly (7, figure 7-3).
8. Match mark position of motor and note any installed shims for reassembly reference.
9. Take a strain on lifting gear and remove four hex head screws (6) from motor mounting plate.
10. Move motor and brake assembly to work area for disassembly, cleaning and inspection, repair and replacement and reassembly as required in accordance with paragraph 6-8.6.

6-7.5.2 Reinstallation.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

1. Attach appropriate lifting gear to ac motor and electric disc brake assembly. Move to kingpost and position motor and disc brake assembly (7, figure 7-3) with partial flexible coupling assembly (5) in kingpost.
2. Install shims (if any) as noted during disassembly. Refer to match marks to align motor within kingpost structure. Fasten in place with hex head screws (6).
3. Reconnect ac motor and electric disc brake assembly electrically.

NOTE

If original motor is not being reinstalled, verify that motor shaft and ball screw shaft align laterally within 1/32 inch and angular misalignment is within one degree.

4. Position upper flexible coupling flange (6, figure 7-6) on ball screw shaft. Position flexible element (rubber boot) (5) between flanges (6) and external clamp rings (3). Secure upper and lower external clamp rings (3) to upper and lower internal clamp rings (4) using cap screws (2).
5. Lock upper flange in place using two setscrews (1).
6. Install starboard side upper and lower motor covers (2, figure 7-3) using thirty-eight cap screws.
7. Restore power to sliding padeye assembly and remove out of service tags. Remove wooden blocks from between carriage and kingpost.
8. Observe that CONTROL PWR AVAIL indicator lamp illuminates.
9. Momentarily turn PADEYE/KINGPOST UP/DN switch to PADEYE DN. Carriage assembly should move down. If carriage assembly moves up, secure power and tag equipment out of service then reverse motor leads at terminal box.
10. Restore power and remove out of service tag.

6-7.6 FLEXIBLE COUPLING (MODELS CR-12 AND CR-12B, CR-12B-P).

6-7.6.1 Removal.

1. Remove ac motor and electric disc brake in accordance with paragraph 6-7.5.1.

NOTE

When ac motor and electric disc brake is removed the flexible coupling components are separated, some parts remain attached to the ball screw shaft and some parts remain attached to the motor shaft.

2. Remove flexible coupling components from ball screw shaft and motor shaft.
3. Move flexible coupling to work area for disassembly, cleaning and inspection, repair and replacement and reassembly as required in accordance with paragraph 6-8.7.

6-7.6.2 Reinstallation.

1. Reinstall flexible coupling components on motor and ball screw shaft in same configuration as required for removal.
2. Reinstall ac motor and electric disc brake assembly in accordance with paragraph 6-7.5.2.

6-7.7 LOWER AND UPPER BEARING HOUSINGS (ALL MODELS).

6-7.7.1 Removal.

1. Raise carriage assembly approximately one foot and block securely in this position (models CR-12 , CR-12B and CR-12B-P must be fully erect with kingpost weight resting on latches or pawls).
2. Remove ac motor and electric disc brake assembly in accordance with paragraph 6-7.2.1 (models B-9A and B-12) or paragraph 6-7.5.1 (models CR-12, CR-12B and CR-12B-P).
3. Remove flexible coupling components from ball screw shaft.
4. Remove manual (emergency) drive assembly (model B-9A only) in accordance with paragraph 6-7.3.1.
5. From lower bearing housing, remove retaining ring (1, figure 7-8), manual drive worm gear (2) and key (3) from ball screw shaft (model B-9A only).

NOTE

Engineering Change Proposals (ECP) SOS-P1711 for CG 47 Class ships change bearing lubricant from SAE 90 oil to grease, MIL-G-24139. ECPs provide for lubrication and air vent fittings to be installed for adding grease.

6. Loosen six socket head cap screws (8) and allow lubricant, if present, to drain from lower bearing housing around seal housing (9).
7. Remove cap screws (8), seal housing (9) and gasket (10).
8. Press oil seal (11) out of seal housing (9).
9. Remove upper bearing housing components as follows. Refer to figure 7-9.

   9.1 Remove socket head screws (1), emergency drive cover or cap (2) and gasket (3).

NOTE

NAVSEA drawing 6665726 modifies upper bearing housing assembly bumper and carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt holes to allow removal and replacement of bumper without removal of the upper bearing housing or ball screw and carriage.

Step 9.2 through step 9.7 apply to models B-12, CR-12, CR-12B and CR-12B-P only.

   9.2 Remove retaining ring (4). Record number, thickness and positioning of spacers (5 and 6) located on both sides of worm gear (7) as spacers, worm gear and key (8) are removed from ball screw.

   9.3 Remove second retaining ring (4).

   9.4 Remove six socket head screws (9) and emergency drive housing (12).

   9.5 Remove lube fitting (10) and reducing bushing (11) if necessary.

   9.6 Remove emergency drive housing (12), gasket (13) and oil seal (14) from ball screw.

   9.7 Press oil seal from emergency drive housing.

NOTE

Step 9.8 and Step 9.9 apply to all models.

   9.8 Remove two bolts (19) and bumper (20).

   9.9 Loosen three bolts (19) and allow lubricant, if present, to drain.

10. Prevent rotation of ball screw by using adjustable wrench on ball screw flats. Drive out spring pin (15) and, using socket wrench (part number EJ-40089 or equivalent), loosen bearing nut (16) approximately 5/8 to 3/4 inch. Allow ball screw to rotate down.

CAUTION

Removal of retaining collars from lower bearing housing assembly may allow lower bearing sleeve and roller bearing to fall. Restrain these components before removing retaining collars.

11. At lower bearing housing assembly, lift lower bearing sleeve (13, figure 7-8) and remove retaining collars (12) and bearing sleeve (13) with bearing (14) inner race, cage and rollers. Remove key (20).

CAUTION

Lower and upper (port side) tie plates (3 and 8, figure 7-3) with tack welded setscrews (4) and port side motor cover (2) should not be removed unless required for replacement of kingpost structural elements.

12. Remove lower bearing housing (19, figure 7-8) with attached parts and grease trap (6) from ball screw and kingpost. Match mark and note thickness and position of shims between lower bearing housing (19) and lower bearing housing assembly bracket weldment.
13. Remove two pipe plugs (7).
14. Using a brass drift punch, drive out roller bearing (14) outer race.
15. Pull oil seal (15) from housing (19).
16. At upper bearing housing, remove bearing nut (16, figure 7-9) and bearing sleeve (17) containing roller bearing (18) inner race, cage and rollers.
17. Install three 5/16-18UNC bolts in jacking screw holes in bearing sleeve. Tighten screws evenly and alternately to remove bearing (18) parts from sleeve (17).
18. Using a brass drift punch through three holes in bearing housing (25), tap bearing (18) outer race from housing.

CAUTION

Lower and upper (port side) tie plates (5 and 31, figure 7-2 or 3 and 8, figure 7-3) with tack welded setscrews (3 or 4, respectively) and port side motor cover (models CR-1, CR-12B and CR-12B-P) should not be removed for they are kingpost structural elements.

19. Remove starboard side upper tie plate and upper bearing housing from kingpost and ball screw. Match mark and note position and thickness of shims between upper bearing housing and upper bearing housing assembly bracket weldment.

6-7.7.2 Cleaning and Inspection. Clean and inspect lower and upper bearing housing assembly parts in accordance with paragraph 6-5.

6-7.7.3 Repair and Replacement. Repair or replace lower and upper bearing housing assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-7.7.4 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5.

1. Partially assemble upper bearing housing assembly as follows. Refer to figure 7-9.
   1.1 Install roller bearing (18) outer race in housing (25). Ensure race seats in bore.
   1.2 Install pipe plugs (23 and 24).
   1.3 Hand pack bearing (18) outer race with grease, MIL-G-24139 (except model B-9A).
   1.4 Install gasket (22) and oil retaining sleeve (21) to underside of housing (25) using three bolts (19).
   1.5 Align bolt holes in bumper (20) with mating holes in housing and secure using two bolts (19).
2. Place shims, as noted during disassembly, between upper bearing housing assembly bracket weldment on kingpost and partially assembled upper bearing housing (25, figure 7-9) as housing is slipped over end of ball screw and into position against setscrews (3, figure 7-2 or 4, figure 7-3) in port side upper tie plate.
3. Install roller bearing (18, figure 7-9) inner race, cage and rollers on upper bearing sleeve (17).
4. Install upper bearing sleeve (17) on ball screw shaft.
5. Install bearing nut (16) allowing 5/8 to 3/4 inch play between nut and upper bearing sleeve (17).
6. Partially assemble lower bearing housing assembly as follows. Refer to figure 7-8.
   6.1 Press new oil seal (15), lip first, into lower bearing housing (19).
   6.2 Install roller bearing (14) outer race into lower bearing housing (19), Ensure race seats in bore.
   6.3 Hand pack bearing (14) outer race with grease, MIL-G-24139.
   6.4 Place grease trap (6) loosely over ball screw.
7. Place shims, as noted during disassembly, between lower bearing housing assembly bracket weldment on kingpost and partially assembled lower bearing housing (19) as housing is slipped over end of ball screw. Position lower bearing housing assembly against setscrews in port side lower tie plate and block in place.
8. Install roller bearing (14, figure 7-8) inner race, cage and rollers on lower bearing sleeve (13).
9. Install key (20) in ball screw shaft.
10. Install lower bearing sleeve (13) over ball screw with keyway aligned with key (20).
11. Install two retaining collars (12) in ball screw shaft groove.
12. At upper bearing housing assembly, prevent ball screw turning by using adjustable wrench on flats while tightening bearing nut (16, figure 7-9). Tighten bearing nut sufficiently to draw lower bearing housing assembly retaining collars (12, figure 7-8) snugly into recess in lower bearing sleeve (13).
13. Align screw holes in grease trap (6) with mating holes in lower bearing sleeve (13) and install three cap screws (5) and lube fitting (4).
14. Press new oil seal (11) into seal housing (9) with seal lip toward recessed side of housing.
15. Install gasket (10) and seal housing (9) on underside of bearing housing (19) using cap screws (8).
16. Apply a bead of Silastic RTV 731 to joining surfaces of ball screw and grease trap (6).

NOTE

If original bearing housings were reinstalled and shimmed in the same way, the upper and lower bearing housing adjustments will have been preserved. Alignment clearances need only to be verified. If alignment of old bearings is incorrect or new bearing housings are installed it will be necessary to break tack weld on setscrews (3, figure 7-2 or 4, figure 7-3) for adjustment.

17. Reinstall lower and upper starboard side tie plates (5 and 31, figure 7-2 or 3 and 8, figure 7-3) with installed (tack welded) setscrews using socket head cap screws, leaving ladder mounting screw holes (models CR-12, CR-12B, CR-12B-P) empty.

18. Verify gap between starboard side and port side lower and upper tie plates and their respective bearing housing assemblies is 1/64 + 0-1/64 inch. If necessary break tack weld on setscrews to make adjustment.

19. Align bearing housings, set bearing nut torque and ball screw running torque in accordance with paragraph 6-3.1.

20. Install upper bearing housing components as follows. Refer to figure 7-9.

NOTE

Step 20.1 through Step 20.4 apply to models B-12, CR-12, CR-12B and CR-12B-P only.

20.1 Press oil seal (14), lips first, into emergency drive housing (12).

20.2 Install reducing bushing (11) and lube fitting (10) in emergency drive housing (12).

20.3 Position gasket (13) and emergency drive housing (12) on upper bearing housing (25) and fasten in place using six socket head screws (9).

20.4 Refer to notes made during disassembly and install lower retaining ring (4), spacers (5 and 6), key (8) and worm gear (7) followed by spacers (5 and 6) and retaining ring (4).

NOTE

Step 21 applies to all sliding padeye models.

21. Install emergency drive gasket (3) cover or cap (2) and socket head screws (1).

22. At lower bearing housing, install key (3, figure 7-8), manual drive worm gear (2) and retaining ring (1) (model B-9A only).

23. Install manual (emergency) drive assembly (model B-9A only) in accordance with paragraph 6-7.3.5.

24. Install flexible coupling components on ball screw shaft in same configuration as when removed.

25. Install ac motor and electric disc brake assembly in accordance with paragraph 6-7.2.2 (models B-9A and B-12) or paragraph 6-7.5.2 (models CR-12, CR-12B and CR-12B-P).

6-7.8 CARRIAGE ASSEMBLY (MODELS B-9A AND B-12). The carriage assembly must be disassembled in place. Further disassembly of carriage assembly requires ball nut and ball screw removal. This is a depot level job accomplished with the kingpost placed in a horizontal position. The following procedure is for emergency use only should it become necessary to disassemble the carriage assembly aboard ship. Refer to figure 7-10.

NOTE

Disassemble carriage assembly only to the extent necessary to accomplish repairs or overhaul.

6-7.8.1 Disassembly.

1. Position carriage at convenient working height.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

2. Turn off power to sliding padeye assembly from all sources and tag out of service.
3. Remove pin (1), washer (2), STREAM adapter pin (3) and STREAM adapter assembly (4).
4. Remove socket head screws (5) and cams (6).
5. Remove two bolts (26) and bumper (27).
6. Remove six self-locking nuts (7).
7. Slide lower body (28) and lug (16) off bolts (8) and onto lower bearing housing.
8. Slide spacer tube (17) and upper lug (16) off bolts (8) and onto lower bearing housing.
9. Remove six bolts(8) from body (15).
10. Remove setscrews (13 and 14) from upper body (15) and remove ballnut assembly (18) from upper body.

6-7.8.2 Cleaning and Inspection. Clean and inspect carriage assembly parts in accordance with paragraph 6-5.

6-7.8.3 Repair and Replacement. Repair or replace carriage assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-7.8.4 Reassembly. Prior to reassembly, touch up damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-10.

1. Coat all mating parts with grease (MIL-G-23549).

NOTE

Ensure that upper and lower lug (16) eyes align with each other and are positioned over cut out in upper and lower bodies (15 and 28); upper body (15) setscrew holes align with hole in ball nut housing (24); ball nut housing (24) lube fitting (23) will face outboard when padeye is reassembled; and opening in tube spacer (17) is positioned to allow access to lube fitting (23) and mates with recesses in lugs (16).

2. Install setscrews (13 and 14) in upper body (15) and tighten against depression in ball nut housing.
3. Install six bolts (8) and nuts (7) to bind lower body (28), lower lug (16), tube spacer (17), upper lug (16) and upper body (15) together. Tighten nuts (7) to 280 ft lbs.
4. Using two bolts, (26) install bumper (27) on lower body (28).
5. Install cams (6) using screws (5).
6. Install STREAM adapter (4) on lugs (16) using pin (3), washer (2) and spring pin (1).
7. Fill bolt (8) head counter bores with Silastic RTV-22.
8. Lubricate ball nut and bearings in accordance with chapter 4 procedures.

6-7.9 CARRIAGE ASSEMBLY (MODELS CR-12, CR-12B and CR-12B-P). The carriage assembly must be disassembled in place. Further disassembly of carriage assembly requires ball nut and ball screw removal. This is a depot level job accomplished with the kingpost placed in a horizontal position. The following procedure is for emergency use only should it become necessary to disassemble the carriage assembly aboard ship. Refer to figure 7-11.

NOTE

Disassemble carriage assembly only to the extent necessary to accomplish repairs or overhaul.

6-7.9.1 Removal.

1. Position carriage at convenient working height.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

2. Turn off power to sliding padeye assembly from all sources and tag out of service.
3. Remove pin (1), washer (2), STREAM adapter pin (3) and STREAM adapter assembly (4).
4. Remove ten socket head screws (5) and two carriage braces (6).
5. Remove socket head screws (7) and cams (8).
6. Remove two bolts (28) and bumper (29).
7. Remove six self-locking nuts (9).
8. Slide lower body (30) and lug (18) off bolts (10) and onto lower bearing housing.
9. Slide spacer tube (19) and upper lug (18) off bolts (10) and onto lower bearing housing.
10. Remove 6 bolts (10) from upper body (17).
11. Remove setscrews (15 and 16) from upper body (17) and remove ballnut assembly (26) from upper body (17).

6-7.9.2 Cleaning and Inspection. Clean and inspect carriage assembly parts in accordance with paragraph 6-5.

6-7.9.3 Repair and Replacement. Repair or replace carriage assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-7.9.4 Reassembly. Prior to reassembly, touch up damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-10 and figure 7-11.

1. Coat all mating parts with grease (MIL-G-23549).

NOTE

Ensure that upper and lower lug (18) eyes align with each other and are positioned over cut out in upper and lower bodies (17 and 30); upper body (17) setscrew holes align with hole in ball nut housing (26); ball nut housing (26) lube fitting (25) will face athwartship; and opening in tube spacer (19) is positioned to allow access to lube fitting (25) and mates with recesses in lugs (18).

2. Install setscrews (15 and 16) in upper body (17) and tighten against depression in ball nut housing.
3. Install six bolts (10) and nuts (9) to bind lower body (30), lower lug (18), tube spacer (19), upper lug (18) and upper body (17) together. Tighten nuts (9) to 280 ft lbs.
4. Position carriage braces (6) between upper and lower bodies (17 and 30) and fasten using ten screws (5).
5. Using two bolts, (28) install bumper (29) on lower body (30).
6. Install cams (8) using screws (7).
7. Install STREAM adapter (4) on lugs (18) using pin (3), washer (2) and spring pin (1).
8. Fill bolt (10) head counter bores with Silastic RTV-22.
9. Lubricate ball nut and bearings in accordance with chapter 4 procedures.

SECTION III.

DEPOT LEVEL REPAIR/OVERHAUL

6-8. DEPOT LEVEL REPAIR/OVERHAUL INTRODUCTION.

6-8.1 SCOPE. This section contains depot level repair/overhaul information for the sliding padeye assembly, models B-9A, B-12, CR-12, CR-12B and CR-12B-P . The following paragraphs detail complete removal and disassembly of the four sliding block drive models. Wherever possible, component disassembly has been presented one time and referenced appropriately to avoid needless repetition of procedures. Table 6-1 and Table 6-2 contain information on screw/bolt assembly torques and tools, equipment and materials required. Section I of this chapter contains adjustment and alignment procedures referenced by this section.

WARNING

Procedures contained in this section are for sliding padeye repair and overhaul on units that have been removed from the ship and are lying in a horizontal position. Using these procedures, unmodified, for mounted (vertical) units may result in personnel injury or equipment damage.

6-8.2 SLIDING PADEYE ASSEMBLY (MODELS B-9A AND B-12). The repair procedures for both bulkhead mounted sliding padeye assemblies, models B-9A and B-12 are similar. The exceptions lie in differences in emergency drives and upper and lower bearing housing assemblies. Variations in procedures are noted. Refer to figure 7-2 and other figures noted in the procedures.

NOTE

Disassembly of the sliding padeye assembly is done with the kingpost in a horizontal position.

6-8.2.1 Removal.

1. Position carriage assembly at mid point of travel on ball screw.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

2. Turn off power to sliding padeye assembly from all sources and tag out of service.
3. Disconnect and tag wiring and metal conduit at terminal box (49).

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury, use services of riggers to safely move assembly.

4. Sliding padeye assembly weighs approximately 10,000 pounds. Remove bolt from top of each kingpost leg and install lifting eyes (63). Rig sling and appropriate lifting gear to lifting eyes and yard crane whip. Use multihook crane with second hook rigged to ensure lower end of sliding

padeye assembly can be controlled. Avoid striking other objects or pier when sliding padeye assembly is rotated from vertical to horizontal.

5. Tension whip attached to sling at top of kingpost.
6. Remove mounting hardware from kingpost mounting points and move sliding padeye assembly from mounted position to work area. Place kingpost horizontally on raised platform or blocks. Outboard (front side) of kingpost should face up. Ensure clear access to back side upper and lower tie plates (5 and 31).

6-8.2.2 Disassembly.

NOTE

Disassemble sliding padeye only to the extent necessary to accomplish repairs or overhaul.

1. Remove twelve hex head screws (1) and motor guard (2) from kingpost (64).
2. Remove sixteen socket head cap screws (4) and front lower tie plate (5) with installed setscrews (3).
3. Disassemble flexible coupling in accordance with the following procedures. Refer to figure 7-6.
   3.1 Remove outer setscrew (1) from upper flange (6) and loosen inner setscrew (1).
   3.2 Loosen, but do not remove, six cap screws (2) each from upper and lower external clamp rings (3).
   3.3 Separate coupling by repositioning parts, removing upper (ball screw) flange (6) and pull the flexible element (rubber boot) (5) from clamp rings.
4. Disconnect motor and brake wiring at junction box.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

5. Attach appropriate lifting gear to ac motor and electric disc brake assembly (8, figure 7-2).
6. Match mark position of motor and note any installed shims for reassembly reference.
7. Take a strain on lifting gear and remove four aircraft bolts (7) from motor mounting plate.
8. Move motor and brake assembly to work area for later disassembly (paragraph 6-8.6).

NOTE

Following procedure for manual (emergency) drive assembly removal and disassembly applies to model B-9A only.

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

9. Attach appropriate lifting gear to manual drive assembly. Take a slight strain on lifting gear to prevent drive assembly dropping when mounting hardware is removed.
10. Disconnect and tag electrical connections to limit switch (15, figure 7-2, bubble A).
11. Ensure pin assembly (18) locks worm housing (25) in disengaged position.
12. Remove four hex head cap screws (9) and three socket head cap screws (10).

13. Lift manual drive assembly away from kingpost and to work area. Disassemble as necessary.
    13.1 Remove nut (11), washer (12) and bolt (13) and separate worm housing (25) and attached parts from bracket (19).
    13.2 Remove two round head screws (14) and limit switch (15).
    13.3 Remove round head screw (16), lock washer (17) and pin assembly (18) from bracket (19).
    13.4 If necessary, remove bushing (20) from worm housing (25).
    13.5 Remove two round head screws (21) and angle (22) from worm housing (25).
    13.6 Remove two retaining rings (23). Press bearings (24) and worm shaft (29) assembly from worm housing (25).
    13.7 Remove spacers (26), worm (27) and key (28) from shaft (29).

NOTE

Following steps apply to both models B-9A and B-12.

14. Remove sixteen socket head cap screws (30, figure 7-2) and front upper tie plate (31) with installed setscrews (3).

NOTE

Model B-9A has a worm gear installed on ball screw beneath the lower bearing housing (32). Before ball screw and carriage assembly can be removed, worm gear must be removed. Following step applies to model B-9A only.

15. Remove retaining ring (1, figure 7-8), worm gear (2) and key (3) from ball screw.

NOTE

Following steps apply to both models B-9A and B-12.

WARNING

Ball screw and carriage assemblies are heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

16. Attach appropriate lifting gear to carriage assembly Standard Tensioned Replenishment Alongside Method (STREAM) adapter to support carriage and ball screw assemblies during disassembly of bearing housings. Carriage should be at mid stroke.
17. Remove lube fitting (4), if necessary, and three socket head cap screws (5) from grease trap (6).

NOTE

Engineering Change Proposal (ECP) SOS-P1711 for CG 47 Class ships changes bearing lubricant from SAE 90 oil to grease, MIL-G-24139 and provides lubrication and air vent fittings for adding grease. This ECP does not apply to model B-9A sliding padeyes installed on LHD 1 Class ships.

18. Remove fill and vent plugs (7), loosen six socket head cap screws (8) and allow lubricant, if present, to drain from bearing housing around seal housing (9). Reinstall fill and vent plugs,

19. Remove cap screws (8), seal housing (9) and gasket (10).
20. Press oil seal (11) out of seal housing (9).
21. Remove upper bearing housing components as follows for models B-9A and B-12. Refer to figure 7-9.
    21.1 Loosen socket head screws (1) and let oil drain (model B-9A only).
    21.2 Remove socket head screws (1), cap or cover (2) and gasket (3).

NOTE

Following steps apply to model B12 only.

    21.3 Remove retaining ring (4). Record number, thickness and positioning of spacers (5 and 6) located on both sides of worm gear (7) as spacers, worm gear and key (8) are removed from ball screw.
    21.4 Remove second retaining ring (4).
    21.5 Loosen six socket head screws (9), allow oil, if present, to drain. Remove screws.
    21.6 Remove lube fitting (10) and reducing bushing (11) if necessary.
    21.7 Remove emergency drive housing (12), gasket (13) and oil seal (14) from ball screw. Press oil seal from emergency drive housing.

NOTE

Following steps apply to both models B-9A and B-12.

22. Prevent rotation of ball screw by using adjustable wrench on ball screw flats. Drive out spring pin (15) and, using socket wrench (part number EJ-40089 or equivalent), loosen bearing nut (16) approximately 5/8 to 3/4 inch.
23. At lower bearing housing assembly, move lower bearing sleeve (13, figure 7-8) toward upper bearing housing assembly to allow access to retaining collars (12).
24. Remove retaining collars (12) and bearing sleeve (13) with bearing (14) inner race, cage and rollers. Remove key (20).

CAUTION

Upper and lower (back) tie plates (5 and 31, figure 7-2) with tack welded setscrews (3) should not be removed unless required for replacement of kingpost structural elements.

25. Remove lower bearing housing (19, figure 7-8) with attached parts and grease trap (6) from ball screw and kingpost. Match mark and note thickness and position of shims between lower bearing housing (19) and lower bearing housing assembly bracket weldment.
26. Remove two pipe plugs (7).
27. Using a brass drift punch, drive out roller bearing (14) outer race.
28. Pull oil seal (15) from lower bearing housing (19).

NOTE

NAVSEA drawing 6665726 modifies upper bearing housing assembly bumper and carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt

holes to allow removal and replacement of bumper without removal of the upper bearing housing or ball screw and carriage.

29. At upper bearing housing assembly, remove two bolts (19, figure 7-9) and bumper (20).
30. Remove bearing nut (16) and bearing sleeve (17) containing roller bearing (18) inner race, cage and rollers.
31. Install three 5/16-18UNC screws in bearing sleeve jacking screw holes. Tighten screws evenly and alternately to remove bearing parts (18) from sleeve (17).
32. Using a brass drift punch through three holes in bearing housing (25), tap bearing (18) outer race from housing.

CAUTION

Upper and lower (back) tie plates (5 and 31, figure 7-2) should not be removed unless required for replacement of kingpost structural elements.

33. Remove upper bearing housing from kingpost and ball screw. Match mark and note position and thickness of shims between upper bearing housing (25, figure 7-9) and lower bearing housing assembly bracket weldment.
34. Disconnect wiring from four limit switches (39, figure 7-2) located, two each, at top and bottom of carriage travel.
35. Note position of each limit switch for reinstallation reference. Remove screws (35) and limit switch and bracket assemblies (36 through 40) and shims (41) from lower two limit switch brackets.
36. Match mark limit switches (39) and brackets (40) for reassembly reference. Remove hex nuts (36) and screws (37 and 38) and switches from brackets.
37. If necessary, tag and remove limit switch cables (43), connectors (42), screws (44) and cable clamps (45).
38. If necessary, tag and remove cables (43), connector (46), screws (47), terminal box cap (48), terminal box (49) and terminal lugs (50).
39. If necessary, remove screws (56) and label plates (51 through 55).

WARNING

Guides are heavy. To prevent death or injury attach suitable lifting gear and use extreme caution when moving.

40. If removal of guides is necessary, attach appropriate lifting gear or block to prevent falling. Check distance between guides at upper and lower limits and mid point of carriage travel. Record dimensions for reinstallation reference. During removal, note thickness and position of shims, if present, for reinstallation reference. Remove socket head screws (57) and guides (58).

CAUTION

Exercise care when removing ball screw and carriage assembly to avoid damage to carriage.

41. If removal of ball screw and carriage assembly (34) is necessary, remove socket head cap screws (30 and 4) and lower and upper back tie plates (5 and 31). Separate kingpost assembly (64) columns. Move ball screw and carriage assembly to work area for later disassembly. Keep ball screw in horizontal position and support ends on raised wood platform or blocks.
42. If necessary, remove attaching hardware (59 through 61) and ladder (62) from kingpost (64).
43. If necessary, remove control station assembly (65) from ship's structure. Refer to figure 7-12 for parts information.

6-8.2.3 Cleaning and Inspection. Clean and inspect sliding padeye assembly parts in accordance with paragraph 6-5.

6-8.2.4 Repair and Replacement. Repair or replace sliding padeye assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.2.5 Reassembly. Prior to reassembly and reinstallation, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-2.

NOTE

All electrical connections must be watertight. Use Teflon tape on all threads and tighten connections sufficiently to ensure watertight integrity.

1. If removed during disassembly, reinstall control station assembly (65) on ship's structure.
2. If removed during disassembly, reinstall ladder (62) on kingpost assembly (64) using attaching hardware (59 through 61).

CAUTION

Exercise care when installing ball screw and carriage assembly to avoid damage to carriage.

WARNING

Ball screw and carriage assembly is heavy. To prevent death or injury attach suitable lifting gear and use extreme caution when installing.

3. If removed during disassembly, reposition ball screw and carriage assembly (34) between separated kingpost assembly (64) columns. Position columns and reinstall lower and upper back tie plates (5 and 31) and secure in place using socket head cap screws (4 and 30).
4. If removed during disassembly, reinstall guides (58) using socket head screws (57). Refer to notes taken during guide disassembly for guide positioning and shimming. Torque screws to 120-140 ft lbs.
5. If removed during disassembly, reinstall label plates (51 through 55) using RTV compound and screws (56).

6. If removed during disassembly, reinstall terminal lugs (50), terminal box (49) and cap (48) using screws (47). Reinstall cable (43) and connectors (46).
7. If removed during disassembly, reinstall limit switch wiring; cable (43) and connectors (42) using cable clamps (45) and screws (44).

NOTE

Apply electrical tape over entire mating surfaces of limit switch and mounting bracket to prevent rapid corrosion of the die-cast limit switch housing.

8. Reassemble four limit switches (39) and brackets (40) using screws (37 and 38) and hex nuts (36). Refer to match marks made during disassembly.
9. Partially assemble upper bearing housing assembly (33) as follows. Refer to figure 7-9.
   9.1 Install roller bearing (18) outer race in housing (25). Ensure race seats in bore.
   9.2 Install pipe plugs (23 and 24).
   9.3 Hand pack bearing (18) outer race with grease, MIL-C-24139. (Model B-12 only.)
   9.4 Install gasket (22) and oil retaining sleeve (21) to underside of housing (25) using three bolts (19).
   9.5 Align bolt holes in bumper (20) with mating holes in housing and secure using two bolts (19).
10. Place shims, as noted during disassembly, between upper bearing housing assembly bracket weldment on kingpost and partially assembled upper bearing housing (25) as housing is installed over end of ball screw and into position against setscrews (3, figure 7-2) in back upper tie plate (31).
11. Install roller bearing (18, figure 7-9) inner race, cage and rollers on upper bearing sleeve (17).
12. Install upper bearing sleeve (17) on ball screw shaft.
13. Install bearing nut (16) allowing 5/8 to 3/4 inch play between nut and upper bearing sleeve (17).
14. Partially assemble lower bearing housing assembly (32, figure 7-2) as follows. Refer to figure 7-8.
   14.1 Press new oil seal (15), lip first, into lower bearing housing (19).
   14.2 Install roller bearing (14) outer race into lower bearing housing (19). Ensure race seats in bore.
   14.3 Hand pack bearing (14) outer race with grease, MIL-G-24139. (Model B-12 only.)
   14.4 Place grease trap (6) loosely over ball screw.
15. Place shims, as noted during disassembly, between lower bearing housing assembly bracket weldment on kingpost and partially assembled lower bearing housing (19) as housing is slipped over end of ball screw and into position against setscrews (3, figure 7-2) in back lower tie plate (5).
16. Install roller bearing (14, figure 7-8) inner race, cage and rollers on lower bearing sleeve (13).
17. Install key (20) in ball screw shaft.
18. Install lower bearing sleeve (13) over ball screw with keyway aligned with key (20).
19. Install two retaining collars (12) in ball screw shaft groove.
20. At upper bearing housing assembly, prevent ball screw turning by using adjustable wrench on flats while tightening bearing nut (16, figure 7-9). Tighten bearing nut sufficiently to draw lower bearing housing assembly retaining collars (12, figure 7-8) snugly into recess in lower bearing sleeve (13).
21. Align screw holes in grease trap (6) with mating holes in lower bearing housing (19) and install three cap screws (5) and lube fitting (4).
22. Press new oil seal (11) into seal housing (9) with seal lip toward recessed side of housing.

23. Install gasket (10) and seal housing (9) on underside of bearing housing (19) using cap screws (8).
24. Apply a bead of Silastic RTV 731 to joining surfaces of ball screw and grease trap (6).

NOTE

If original bearing housings were reinstalled and shimmed in the same way, the upper and lower bearing housing adjustments will have been preserved. Alignment clearances need only to be verified. If alignment of old bearings is incorrect or new bearing housings are installed, it will be necessary to break tack weld on setscrews (3, figure 7-2) for adjustment.

25. Reinstall lower and upper front tie plates (5 and 31, figure 7-2) with installed (tack welded) setscrews (3) using sixteen socket head cap screws (4 and 30 respectively) in each.
26. Verify gap between front and back lower and upper tie plates (5 and 31) and their respective bearing housing assemblies (32 and 33) is 1/64 + 0/- 1/64 inch. If necessary, break tack weld on setscrews to make adjustment.
27. Align bearing housings, set bearing nut torque and ball screw running torque in accordance with paragraph 6-3.1.
28. Install upper bearing housing components as follows. Refer to figure 7-9.

NOTE

Step 28.1 through Step 28.4 applies to model B-12 only.

28.1 Press oil seal (14), lips first, into emergency drive housing (12).
28.2 Install reducing bushing (11) and lube fitting (10) in emergency drive housing (12).
28.3 Position gasket (13) and emergency drive housing (12) on upper bearing housing (25) and fasten in place using six socket head screws (9).
28.4 Refer to notes made during disassembly and install lower retaining ring (4), spacers (5 and 6), key (8) and worm gear (7) followed by spacers (5 and 6) and retaining ring (4).

NOTE

Step 29 applies to both sliding padeye models B-9A and B-12.

29. Install emergency drive gasket (3) cover or cap (2) and socket head screws (1).

NOTE

Following steps apply to model B-9A only.

30. Install key (3, figure 7-8), worm gear (2) and retaining ring (1).
31. Reassemble and reinstall manual (emergency) drive as follows. Refer to figure 7-2, bubble A.
    31.1 Assemble worm shaft (29), key (28), worm (27) and two spacers (26).
    31.2 Position assembled worm shaft in worm housing and install bearings (24) and retaining rings (23).
    31.3 Install angle (22) using two round head screws (21).
    31.4 Install bushing (20) in worm housing (25).
    31.5 Position assembled worm housing in bracket (19) and secure with bolt (13), washer (12) and nut (11).

31.6 Attach pin assembly (18) to bracket (19) using washer (17) and round head screw (16). Use pin assembly to lock worm housing in disengaged position to prevent movement of worm housing during reinstallation.

31.7 Install limit switch (15) using round head screws (14).

WARNING

Manual (emergency) drive assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when installing.

32. Attach appropriate lifting gear to manual drive assembly and move to kingpost. Position assembled manual drive in kingpost and secure in place using three socket head screws (10) and four hex head screws (9).

33. Check engagement of worm (27) with worm gear (2, figure 7-8).

NOTE

Following steps apply to both models B-9A and B-12.

34. Reinstall previously assembled limit switch and bracket assemblies (36 through 40, figure 7-2) in original positions as noted during disassembly using screws (35). Reinstall shims (41) with lower limit switches as noted during disassembly.

NOTE

Limit switch adjustment will follow reinstallation of sliding padeye assembly aboard ship and restoration of electrical power.

35. Position flexible coupling upper external clamp ring (3, figure 7-6) and key (7) on ball screw shaft.

36. Install upper flange (6) on ball screw shaft and slide up shaft over key to provide clearance for installation of coupling parts attached to ac motor shaft.

WARNING

AC motor and electrical disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

37. Attach appropriate lifting gear to ac motor and electric disc brake assembly. Move to kingpost and position motor and brake assembly (8, figure 7-2) with partial flexible coupling assembly (6) in kingpost.

38. Install shims (if any) as noted during disassembly. Refer to match marks to align motor within kingpost structure. Fasten in place with aircraft bolts (7).

NOTE

If original motor is not being reinstalled, verify that motor shaft and ball screw shaft align laterally within 1/32 inch and angular misalignment is within one degree.

39. Position upper flexible coupling flange (6, figure 7-6) on ball screw shaft. Position flexible element (rubber

boot) (5) between flanges and external clamp rings (3). Secure upper and lower external clamp rings (3) to upper and lower internal clamp rings (4) using cap screws (2).

40. Lock upper flange in place using two setscrews (1).
41. Install motor guard (2, figure 7-2) using twelve hex head screws (1).

6-8.2.6 Reinstallation.

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury use services of riggers to safely move assembly.

1. Sliding padeye assembly weighs approximately 10,000 pounds. Rig appropriate lifting gear to lifting eyes and yard crane. Use multihook crane with second hook rigged to ensure lower end of sliding padeye assembly can be controlled to avoid striking other objects or ship when padeye assembly is rotated from horizontal to vertical.
2. Tension whips attached to top and bottom of kingpost.
3. Move sliding padeye assembly to ship.
4. Slack off on whip attached to bottom of kingpost, raise kingpost to vertical, and position at mounting point.
5. Attach kingpost to ship's structure using mounting hardware.
6. Remove sling and second whip.
7. Remove lifting eyes (63) and install bolts in lifting eye screw holes at top of each kingpost leg.
8. Lubricate sliding padeye assembly in accordance with procedures in chapter 4.
9. Reconnect sliding padeye assembly to power and control cables.
10. Restore power to sliding padeye assembly and remove out of service tags.
11. Observe that CONTROL PWR AVAIL indicator lamp illuminates.
12. Momentarily turn PADEYE UP/DN switch to PADEYE DN. Carriage assembly should move down. If carriage assembly moves up, secure power, tag equipment out of service then reverse motor leads at terminal box.
13. Restore power and remove out of service tag.
14. Check upper and lower travel limit switch adjustments in accordance with paragraph 6-3.3.

CAUTION

Operate sliding padeye with motor overload heater relays tripped only long enough to verify operation. Continued operation could damage motor.

15. Check emergency motor overload operation as follows.

    15.1 Manually trip motor overload heater relays. Run sliding padeye as follows.

15.2 Depress and hold PADEYE EMER RUN pushbutton switch.

15.3 Operate PADEYE UP/DN switch briefly to verify movement.

15.4 Reset motor overload heater relays.

16. Cycle sliding padeye through normal operation to verify proper operation. Operate for thirty minutes at the rate of one complete cycle every 90 seconds.

17. Return sliding padeye to normal operation upon successful completion of checks.

6-8.3 SLIDING PADEYE ASSEMBLY (MODELS CR-12, CR-12B and CR-12B-P). The repair procedures for both retractable sliding padeye assemblies, models CR-12, CR-12B and CR-12B-P are similar. All models have different trunks, and the CR-12 hatch assembly is different from the CR-12B and CR12–B-P. . Refer to figure 7-3 and other figures as noted in the procedures.

NOTE

Sliding padeye model CR-12A production was limited to a few units which are not expected to be in service at date of publication of this manual. If, however, model CR-12A sliding padeyes are placed back in service, repair procedures and parts are similar to those for model CR-12B and CR-12B-P

Disassembly of the sliding padeye assembly is normally done with the kingpost in a horizontal position.

6-8.3.1 Removal.

NOTE

Retractable sliding padeyes are designed for installation on the ship's centerline and may be operated to port or starboard. For purposes of this procedure, the working side of the kingpost is the starboard side. The kingpost, when positioned horizontally, rests on its port side.

1. Erect sliding padeye normally and engage latches or pawls to support kingpost.

2. Position carriage assembly at mid point of travel on ball screw.

WARNING

To prevent death or injury, ensure electrical power to sliding padeye is secured and tagged out of service in accordance with ship's procedures.

3. Turn off power to sliding padeye assembly from all sources and tag out of service.

4. Disconnect and tag electrical connections at terminal box (13, figure 7-3) and remove cable clips attaching electrical cable to kingpost leg. Ensure cable is free of kingpost. Tie cable off near top of trunk for easy retrieval during reinstallation.

5. Install lifting fittings (38) on top of kingpost if not already installed (requires removal of restraint bars on model CR-12).

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury, use services of riggers to safely move assembly.

6. Sliding padeye assembly weighs approximately 10,000 pounds. Rig appropriate lifting gear to lifting fittings (38) and yard crane. Use multihook crane with second hook rigged to ensure lower end of sliding padeye assembly can be controlled to avoid striking other objects or pier when padeye assembly is rotated from vertical to horizontal.

7. Tension whip attached to top of kingpost.

WARNING

To prevent injury, do not apply hand pressure to latches while kingpost is in motion.

8. Retract latches for kingpost that is so equipped. Pawls will automatically disengage as kingpost rises.

9. Carefully hoist sliding padeye assembly out of the trunk and move to work area. Place in horizontal position on raised platform or blocks. Starboard side of kingpost should face up. Ensure clear access to port side lower and upper tie plates (3 and 8).

6-8.3.2 Disassembly.

NOTE

Disassemble sliding padeye only to the extent necessary to accomplish repairs or overhaul.

1. Remove nine hex head screws attaching ladder (1) to upper and lower tie plates (3 and 8) and kingpost (49).

2. Remove thirty-eight cap screws attaching starboard side upper and lower motor covers (2) to kingpost.

3. Remove remaining 13 cap screws and starboard side lower tie plate (3) with installed setscrews (4).

4. Disassemble flexible coupling (5) in accordance with the following procedures. Refer to figure 7-6.
   4.1 Remove outer setscrew (1) from upper flange (6) and loosen inner setscrew (1).
   4.2 Loosen, but do not remove six, cap screws (2) each from upper and lower external clamp rings (3).
   4.3 Separate coupling by repositioning parts, removing upper (ball screw) flange (6) and pull the flexible element (rubber boot) (5) from clamp rings.

5. Disconnect motor and brake wiring at junction box.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when removing.

6. Attach appropriate lifting gear to ac motor and electric disc brake assembly (7, figure 7-3).
7. Match mark position of motor and note any installed shims for reassembly reference.
8. Take a strain on lifting gear and remove four hex head screws (6) from motor mounting plate.
9. Move motor and brake assembly (7) to work area for later disassembly (paragraph 6-8.6).
10. Remove remaining twenty socket head cap screws and starboard side upper tie plate (8, figure 7-3) with installed setscrews.

WARNING

Ball screw and carriage assemblies are heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

11. Attach appropriate lifting gear to carriage assembly Standard Tensioned Replenishment Alongside Method (STREAM) adapter to support carriage and ball screw assemblies during disassembly of bearing housings.
12. Remove lube fitting (4, figure 7-8) if necessary and three socket head cap screws (5) from grease trap (6).

NOTE

Engineering Change Proposals (ECP) SOS-P1711 for CG 47 Class ships change bearing lubricant from SAE 90 oil to grease, MIL-G-24139. ECPs provide for lubrication and air vent fittings to be installed for adding grease.

13. Remove fill and vent plugs (7), loosen six socket head cap screws (8) and allow lubricant, if present, to drain from bearing housing around seal housing (9). Reinstall fill and vent plugs.
14. Remove cap screws (8), seal housing (9) and gasket (10).
15. Press oil seal (11) out of seal housing (9).
16. Remove upper bearing housing components as follows. Refer to figure 7-9.
    - 16.1 Remove socket head screws (1), emergency drive cover (2) and gasket (3).
    - 16.2 Remove retaining ring (4). Record number, thickness and positioning of spacers (5 and 6) located on both sides of worm gear (7) as spacers, worm gear and key (8) are removed from ball screw.
    - 16.3 Remove second retaining ring (4).
    - 16.4 Loosen six socket head screws (9), allow oil, if present, to drain. Remove screws.
    - 16.5 Remove lube fitting (10) and reducing bushing (11) if necessary.
    - 16.6 Remove emergency drive housing (12), gasket (13) and oil seal (14) from ball screw.
    - 16.7 Press oil seal from emergency drive housing.
17. Prevent rotation of ball screw by using adjustable wrench on ball screw flats. Drive out spring pin (15) and, using socket wrench (part number EJ-40089 or equivalent), loosen bearing nut (16) approximately 5/8 to 3/4 inch.

18. At lower bearing housing assembly, move lower bearing sleeve (13, figure 7-8) toward upper bearing housing assembly to allow access to retaining collars (12).
19. Remove retaining collars (12) and bearing sleeve (13) with bearing (14) inner race, cage and rollers. Remove key (20).

CAUTION

Lower and upper port side tie plates (3 and 8, figure 7-3) with tack welded setscrews (4) and port side motor cover (2) should not be removed unless required for replacement of kingpost structural elements.

20. Remove lower bearing housing (19, figure 7-8) with attached parts and grease trap (6) from ball screw and kingpost. Match mark and note thickness and position of shims between lower bearing housing (19) and lower bearing housing assembly bracket weldment.
21. Remove two pipe plugs (7).
22. Using a brass drift punch, drive out roller bearing (14) outer race.
23. Pull oil seal (15) from lower bearing housing (19).

NOTE

NAVSEA drawing 6665726 modifies upper bearing housing assembly bumper and carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt holes to allow removal and replacement of bumper without removal of the upper bearing housing or ball screw and carriage.

24. At upper bearing housing assembly, remove two bolts (19, figure 7-9) and bumper (20).
25. Remove bearing nut (16) and bearing sleeve (17) containing roller bearing (18) inner race, cage and rollers.
26. Install three 5/16-18UNC bolts in jacking screw holes in bearing sleeve. Tighten screws evenly and alternately to remove bearing (18) parts from sleeve (17).
27. Using a brass drift punch through three holes in bearing housing (25), tap bearing (18) outer race from housing.

CAUTION

Lower and upper port side tie plates (3 and 8, figure 7-3) with tack welded setscrews (4) and port side motor cover (2) should not be removed unless required for replacement of kingpost structural elements.

28. Remove upper bearing housing from kingpost and ball screw. Match mark and note position and thickness of shims between upper bearing housing (25, figure 7-9) and lower bearing housing assembly bracket weldment.
29. Disconnect wiring from four limit switches (24, figure 7-3) located, two each (one on port side and one on starboard side), at top and bottom of carriage travel.
30. Note position of each limit switch for reinstallation reference. Remove screws (20) and limit switch and bracket assemblies (21 through 25) and shims (26) from lower two limit switch brackets.

31. If necessary, remove screws (12), terminal box (13) and terminal lugs (14).

32. If necessary, tag wires and remove screws (15), receptacle (16), connectors (17 and 19) and electrical cable (18).

33. Match mark limit switches (24) and brackets (25) for reassembly reference. Remove hex nuts (21) and screws (22 and 23) and switches from brackets.

34. If necessary, tag and remove limit switch cables (18), connectors (27), screws (28) and cable clamps (29).

35. If necessary, remove screws (30), upper and lower athwartship guides (31 and 33), and shims (32 and 34). Note thickness and positioning of shims for reassembly reference.

36. If necessary, remove screws (35) and fore and aft guides (36). Note thickness and positioning of shims, if installed, for reassembly reference.

37. If necessary, remove screws (37) and restraint bars (if still attached) or lifting fittings (38).

WARNING

Guides are heavy. Attach suitable lifting gear and use extreme caution when removing.

38. If removal of guides is necessary, attach appropriate lifting gear or block to prevent falling. Check distance between guides at upper and lower limits and mid point of carriage travel and record dimensions for reinstallation reference. During removal, note thickness and position of shims, if present, for reinstallation reference. Remove socket head screws (39) and guides (40).

CAUTION

Exercise care when removing ball screw and carriage assembly to avoid damage to carriage.

39. If removal of ball screw and carriage assembly (11) is necessary, remove attaching socket head cap screws and lower and upper back tie plates (3 and 8). Separate kingpost assembly (49) columns. Move ball

screw and carriage assembly to work area for later disassembly. Keep ball screw in horizontal position and support ends on raised wood platform or blocks.

40. If necessary, remove pan head screws and label plates (42 through 46).

41. Remove screws (41), vari pin and chain (47) and lifting brace (48) from kingpost (49).

6-8.3.3 Cleaning and Inspection. Clean and inspect sliding padeye assembly parts in accordance with paragraph 6-5.

6-8.3.4 Repair and Replacement. Repair or replace sliding padeye assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.3.5 Reassembly. Prior to reassembly and reinstallation, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-3.

NOTE

All electrical connections must be watertight. Use Teflon tape on all threads and tighten connections sufficiently to ensure watertight integrity.

1. If removed during disassembly, reinstall lifting brace (48), vari pin and chain (47) on kingpost (49) using screws (41).
2. If removed during disassembly, reinstall label plates (42 through 46) using pan head screws (41) and RTV compound.

CAUTION

Exercise care when installing ball screw and carriage assembly to avoid damage to carriage.

WARNING

Ball screw and carriage assembly is heavy. To prevent death or injury attach suitable lifting gear and use extreme caution when installing.

3. If removed during disassembly, reposition ball screw and carriage assembly (11) between separated kingpost assembly (49) columns. Position columns and reinstall lower and upper back tie plates (3 and 8) and secure in place using attaching socket head cap screws.
4. If removed during disassembly, reinstall guides (40) using socket head screws (39). Refer to notes taken during disassembly for guide positioning and shimming. Torque screws to 120-140 ft lbs.
5. If removed during disassembly, reinstall lift fittings (38) using screws (37).
6. If removed during disassembly, reinstall fore and aft guides (36) using screws (35). Refer to notes taken during disassembly for guide positioning and shimming.
7. If removed during disassembly, reinstall athwartship guides (31 and 33) and shims (32 and 34) using screws (30).
8. If removed during disassembly, reinstall limit switch cables (18), connectors (27), screws (28) and cable clamps (29).

NOTE

Apply electrical tape over entire mating surfaces of limit switch and mounting bracket to prevent rapid corrosion of the die-cast limit switch housing.

9. Reassemble four limit switches (24) and brackets (25) using hex nuts (21) and screws (22 and 23). Refer to notes taken during disassembly.

10. If removed during disassembly, reinstall connectors (19), cables (18), connector (17), and receptacle (16) using screws (15).

11. If removed during disassembly, reinstall terminal lugs (14) and terminal box (13) using screws (12).

12. Partially assemble upper bearing housing assembly (10) as follows. Refer to figure 7-9.
    12.1 Install roller bearing (18) outer race in housing (25). Ensure race seats in bore.
    12.2 Install pipe plugs (23 and 24).
    12.3 Hand pack bearing (18) outer race with grease, MIL-G-24139.
    12.4 Install gasket (22) and oil retaining sleeve (21) to underside of housing (25) using three bolts (19).
    12.5 Align bolt holes in bumper (20) with mating holes in housing and secure using two bolts (19).

13. Place shims, as noted during disassembly, between upper bearing housing assembly bracket weldment on kingpost and partially assembled upper bearing housing (25) as housing is installed over end of ball screw and

    into position against setscrews (4, figure 7-3) in port side upper tie plate (8).

14. Install roller bearing (18, figure 7-9) inner race, cage and rollers on upper bearing sleeve (17).

15. Install upper bearing sleeve (17) on ball screw shaft.

16. Install bearing nut (16) allowing 5/8 to 3/4 inch play between nut and upper bearing sleeve (17).

17. Partially assemble lower bearing housing assembly (9, figure 7-3) as follows. Refer to figure 7-8.
    17.1 Press new oil seal (15), lip first, into lower bearing housing (19).
    17.2 Install roller bearing (14) outer race into lower bearing housing (19), ensure race seats in bore.
    17.3. Hand pack bearing (14) outer race with grease, MIL-G-24139.
    17.4. Place grease trap (6) loosely over ball screw.

18. Place shims, as noted during disassembly, between lower bearing housing assembly bracket weldment on kingpost and partially assembled lower bearing housing (19) as housing is installed over end of ball screw and into position against setscrews (4, figure 7-3) in port side lower tie plate (3).

19. Install roller bearing (14, figure 7-8) inner race, cage and rollers on lower bearing sleeve (13).

20. Install key (20) in ball screw shaft.

21. Install lower bearing sleeve (13) over ball screw with keyway aligned with key (20).

22. Install two retaining collars (12) in ball screw shaft groove.

23. At upper bearing housing assembly, prevent ball screw turning by using adjustable wrench on flats while tightening bearing nut (16, figure 7-9). Tighten bearing nut sufficiently to draw lower bearing housing assembly retaining collars (12, figure 7-8) snugly into recess in lower bearing sleeve (13).

24. Align screw holes in grease trap (6) with mating holes in lower bearing housing (19) and install three cap screws (5) and lube fitting (4).

25. Press new oil seal (11) into seal housing (9) with seal lip toward recessed side of housing.

26. Install gasket (10) and seal housing (9) on underside of bearing housing (19) using cap screws (8).

27 Apply a bead of Silastic RTV 731 to joining surfaces of ball screw and grease trap (6).

NOTE

If original bearing housings were reinstalled and shimmed in the same way, the upper and lower bearing housing adjustments will have been preserved. Alignment clearances need only to be verified. If alignment of old bearings is incorrect or new bearing housings are installed it will be necessary to break tack weld on setscrews (4, figure 7-3) for adjustment.

28. Reinstall lower and upper starboard side tie plates (3 and 8, figure 7-3) with installed (tack welded) setscrews (4) using socket head cap screws, leaving ladder mounting screw holes empty.

29. Verify gap between starboard side and port side lower and upper tie plates (3 and 8) and their respective bearing housing assemblies (9 and 10) is 1/64 + 0/- 1/64 inch. If necessary, break tack weld on setscrews to make adjustment.

30. Align bearing housings, set bearing nut torque and ball screw running torque in accordance with paragraph 6-3.1.

31. Install upper bearing housing components as follows. Refer to figure 7-9.
    - 31.1 Press oil seal (14), lips first, into emergency drive housing (12).
    - 31.2 Install reducing bushing (11) and lube fitting (10) in emergency drive housing (12).
    - 31.3 Position gasket (13) and emergency drive housing (12) on upper bearing housing (25) and fasten in place using six socket head screws (9).
    - 31.4 Refer to notes made during disassembly and install lower retaining ring (4), spacers (5 and 6), key (8) and worm gear (7) followed by spacers (5 and 6) and retaining ring (4).

32. Install gasket (3) emergency drive cover (2) and socket head screws (1).

33. Reinstall previously assembled limit switch and bracket assemblies (21 through 25, figure 7-3) in original positions as noted during disassembly using screws (20). Reinstall shims (26) with lower limit switches as noted during disassembly.

NOTE

Limit switch adjustment will follow reinstallation of sliding padeye assembly aboard ship and restoration of electrical power.

34. Position flexible coupling upper external clamp ring (3, figure 7-6) and key (7) on ball screw shaft.

35. Install upper flange (6) on ball screw shaft and slide up shaft over key to provide clearance for installation of coupling parts attached to ac motor shaft.

WARNING

AC motor and electric disc brake assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

36. Attach appropriate lifting gear to ac motor and electric disc brake assembly. Move to kingpost and position motor and disc brake assembly (7, figure 7-3) with partial flexible coupling assembly (5) in kingpost.

37. Install shims (if any) as noted during disassembly. Refer to match marks to align motor within kingpost structure. Fasten in place with hex head screws (6).

NOTE

If original motor is not being reinstalled, verify that motor shaft and ball screw shaft align laterally within 1/32 inch and angular misalignment is within one degree.

38. Position upper flexible coupling flange (6, figure 7-6) on ball screw shaft. Position flexible element (rubber boot) (5) between flanges and external clamp rings (3). Secure upper and lower external clamp rings (3) to upper and lower internal clamp rings (4) using cap screws (2).
39. Lock upper flange in place using two setscrews (1).
40. Install starboard side motor covers (2, figure 7-3) using thirty-eight hex head screws.
41. Install ladder (1) using attaching hardware.

6-8.3.6 Reinstallation.

WARNING

Sliding padeye assembly is extremely heavy. To prevent death or injury, use services of riggers to safely move assembly.

1. Sliding padeye assembly weighs approximately 10,000 pounds. Rig appropriate lifting gear to lifting fittings (38) and yard crane. Use multihook crane with second hook rigged to ensure lower end of sliding padeye assembly can be controlled to avoid striking other objects or ship when padeye assembly is rotated from horizontal to vertical.
2. Tension whips attached to top and bottom of kingpost.
3. Move sliding padeye assembly to ship and position near trunk.
4. Reconnect power and control cables to terminal box. Refer to tags placed during removal.
5. Apply a coating of grease (MIL-G-23827) to trunk guides.
6. Tension whip attached to top of kingpost and raise kingpost to vertical position taking care that cables are not strained. Position kingpost vertically over trunk.
7. Remove lower whip.

CAUTION

To prevent equipment damage, ensure kingpost base enters trunk from directly vertical.

8. Carefully lower kingpost into trunk. Ensure power and control cables are not damaged. Observe sling continually for evidence of slack. If slack appears, hoist kingpost from trunk, realign and lower.

WARNING

To prevent injury, do not apply hand pressure to latches while kingpost is in motion.

9. When kingpost latch holes align with latches, stop lowering and engage latches. If pawls are installed, stop lowering when kingpost pockets are just above pawls. Tip pawls to touch kingpost sides and slowly lower until pawls are fully engaged and supporting kingpost.
10. Remove sling, whip and lifting fittings (Model CR-12 only) from top of kingpost.
11. Lubricate sliding padeye assembly in accordance with procedures in chapter 4.
12. Unship portable control station and electrical cable from hatch-mounted stowage brackets and connect normally.
13. Restore power to sliding padeye assembly and remove out of service tags.
14. Observe that CONTROL PWR AVAIL indicator lamp illuminates.
15. Momentarily turn PADEYE/KINGPOST UP/DN switch to PADEYE DN. Carriage assembly should move down. If carriage assembly moves up, secure power and tag equipment out of service then reverse motor leads at terminal box.
16. Restore power and remove out of service tag.
17. Check upper and lower travel limit switch adjustments in accordance with paragraph 6-3.3.
18. Check jog timing switch adjustment in accordance with paragraph 6-3.4.

CAUTION

Operate sliding padeye with motor overload heater relays tripped only long enough to verify operation. Continued operation could damage motor.

19. Check emergency motor overload operation as follows.
    - 19.1 Manually trip motor overload heater relays. Run sliding padeye as follows.
    - 19.2 Depress and hold PADEYE EMER RUN pushbutton switch.
    - 19.3 Operate PADEYE/KINGPOST UP/DN switch to verify movement.
    - 19.4 Reset motor overload heater relays.
20. Cycle sliding padeye through normal operation to verify proper operation. Operate for thirty minutes at the rate of one complete cycle every 90 seconds.
21. Return sliding padeye to normal operation upon successful completion of checks.

6-8.4 TRUNK AND HATCH ASSEMBLY (MODEL CR-12). Sliding padeye model CR-12 trunk and hatch assembly is identified by its raised coaming and external dogs. The trunk

assembly is integral to the ship's structure and is therefore not normally removed. Refer to figure 7-4 and the following procedures.

6-8.4.1 Removal.

1. Undog hatch and remove sliding padeye assembly in accordance with paragraph 6-8.3.1.

WARNING

Hatch assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

2. Attach appropriate lifting gear to hatch. Remove four cotter pins (1), four flat washers (2), and hinge pins (3). Move hatch to work area.

6-8.4.2 Disassembly.

NOTE

Disassemble trunk and hatch assembly only to the extent necessary to accomplish repairs or overhaul.

1. Unship and remove control station assembly (4) and cable. Refer to figure 7-13 for parts information.
2. Remove parts as necessary from control station assembly stowage bracket weldment in accordance with the following procedures. Refer to figure 7-4, bubble A.
   2.1 Remove flat head screws (5) and base stud (6).
   2.2 Remove hex nut (7), lock washer (8), flat washer (9) and pan head screw (10).
   2.3 Disassemble clinch plate (11), socket (12) and nylon webbing (13).
3. If necessary, remove instruction plate (14).
4. Remove two screws (15) and retainer (16) from each of two grab handles (17).
5. Remove two hatch supports (18).
6. Remove gasket (19) from hatch assembly (20).

NOTE

Kingpost latch assembly or kingpost locking pawl assembly may be installed.

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk.

7. Remove nuts (1, figure 7-14), washers (2), cap screws (3), shims (4) and kingpost latch assembly (21, figure 7-4) or bolts (1, figure 7-15), lock washers (2), shims (3) and kingpost locking pawl assembly from trunk. Note size and positions of shims for reassembly reference. For latch assembly repair procedures refer to paragraph 6-8.10 and figure 7-14. For locking pawl assembly repair procedures refer to paragraph 6-8.11 and figure 7-15.
8. If necessary, drive out spring pin (22, figure 7-4) and remove carriage support pin (23).

WARNING

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall.

9. If necessary, remove guides as follows.
   9.1 For each guide section (upper, 25 and lower, 28) remove two button head screws (24) near each end. Replace with 5/16-18UNC studs that extend a few inches beyond the guide face.
   9.2 Remove remaining button head screws (24) and slide guide away from trunk mating surface on studs.
   9.3 Attach suitable lifting gear by rigging through guide screw holes and remove guide from trunk.
   9.4 Note position and thickness of shims (26, 27 and 29) and others that may be present before removing.

NOTE

Leave studs in place for reinstallation of guides.

10. Remove cap screws (30), access panel (31) and gasket (32) from trunk weldment (33).

6-8.4.3 Cleaning and Inspection. Clean and inspect trunk and hatch assembly parts in accordance with paragraph 6-5.

6-8.4.4 Repair and Replacement. Repair or replace trunk and hatch assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.4.5 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-4.

1. Install access panel (31) and gasket (32) on trunk weldment (33) and secure with cap screws (30).

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk.

WARNING

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall.

2. Using studs installed for guide removal, position shims (26, 27 and 29) and any other shims noted during disassembly and install guides (upper, 25 and lower 28) as follows.
   2.1 Install shims over studs.

2.2 Using appropriate lifting gear, install guides in original positions over studs.

2.3 Unrig lifting gear from guide screw holes and press guide and shims into contact with trunk.

2.4 Fasten guides to trunk using button head screws (24).

3. Install carriage support pins (23) and secure using spring pins (22).

4. Refer to shimming notes taken during disassembly. Install two latch assemblies (21) in trunk using shims (4, figure 7-14), cap screws (3), washers (2) and nuts (1); or install two kingpost locking pawl assemblies in trunk using shims (3), lock washers (2) and bolts (1).

   Refer to figure 7-14 and figure 7-15, respectively for attaching hardware information.

5. Reassemble hatch as follows:

   5.1 Install gasket (19, figure 7-4) on hatch assembly (20).

   5.2 Install two hatch supports (18).

   5.3 Install two grab handles (17) using one retainer (16) and two screws (15) in each.

6. If previously removed, reinstall instruction plate (14) using RTV compound.

7. Reinstall parts on stowage bracket weldment as follows. Refer to bubble A.

   7.1 Assemble nylon webbing (13), socket (12) and clinch plate (11).

   7.2 Attach webbing assembly to bracket using pan head screw (10), flat washer (9), lock washer (8) and hex nut (7).

   7.3 Reinstall stud plate (6) using two flat head screws (5).

6-8.4.6 Reinstallation.

WARNING

Hatch assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

1. Attach appropriate lifting gear to hatch and move to trunk.

2. Install hinge pins (3), four flat washers (2) and four cotter pins (1).

3. Reinstall sliding padeye assembly in accordance with applicable portions of paragraph 6-8.3.6.

6-8.5 TRUNK AND HATCH ASSEMBLY (MODEL CR-12B and CR-12B-P). Sliding padeyes , models CR-12B and CR-12B-P, trunk and hatch assembly is flush with the deck. The trunk assembly is integral to the ship's structure and is therefore not normally removed. Refer to figure 7-5 and following procedures.

6-8.5.1 Removal.

1. Undog hatch and remove sliding padeye assembly in accordance with paragraph 6-8.3.1. Close hatch.

2. Remove socket head screws (1) from forward and aft covers (2 through 5).

3. Open hatch fully allowing spring pressure on spring cranks (41 and 42) to relax.

WARNING

Hatch assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

4. Attach appropriate lifting gear to hatch.
5. Unship and remove control station assembly (6) and cable. Refer to figure 7-13 for parts information.
6. Remove spring pins (7, figure 7-5) from hatch and spring cranks (41 and 42). Remove socket head screws (8) from hinge retainers (23) and move hatch assembly to work area.

6-8.5.2 Disassembly.

NOTE

Disassemble trunk and hatch assembly only to the extent necessary to accomplish repairs or overhaul.

1. Remove dog assembly self-locking nut (9, figure 7-5), dog (10), thrust washers (11), bushings (12), grease fitting (13) and spindle (14).
2. Repeat step 1 for remaining dog assemblies.
3. Remove gasket (15).
4. Remove two screws (16) and retainer (17) from each of two grab handles (18).
5. Remove two hatch braces (19).
6. If necessary, remove label plates (20 and 21) and if present label plate (75) on model CR-12B-P retrofit version only. .
7. Remove hinge pins (22) and retainers (23).
8. Remove parts as necessary from control station assembly stowage bracket weldment in accordance with the following procedures. Refer to bubble A.
   - 8.1 Remove flat head screws (24) and base stud (25).
   - 8.2 Remove hex nut (26), lock washer (27), flat washer (28) and pan head screw (29).
   - 8.3 Disassemble clinch plate (30), socket (31) and nylon webbing (32).
9. Remove right hand spring crank (41) assembly as follows.
   - 9.1 Remove nut (33) and cap screw (34).
   - 9.2 Remove cap screws (35) and lift shims (36) and spring crank assembly (37 through 41, 43 through 47) and cartridge spring assembly (bubble B) from deck cavity.
10. Disassemble spring crank (41) assembly as follows. Match mark shaft and components for reassembly reference.
    - 10.1 Remove roller disconnect roller chain (37) from actuator (39) and cartridge spring assembly.
    - 10.2 Remove setscrews (38) from actuator (39). Remove actuator and key
    - (43) from shaft (44).
    - 10.3 Remove setscrew (38) from spring crank (41). Remove spring crank and a key (40) from shaft (44).

10.4 Remove shaft (44) and bushings (45) from pivot block (47).

10.5 Remove two bushings (45) from shaft (44).

10.6 Remove lube fitting (46) from pivot block (47).

11. Repeat step 9 and step 10 for left hand spring crank (42) assembly.

12. Disassemble right and left cartridge spring assemblies as follows. Refer to bubble B.

12.1 Remove rod end fitting (48), jam nut (49), spring pins (50), nut (51) and bushing (52) from spring container (57).

12.2 Remove screws (53) and end plug (54) from spring container (57) and remove plunger (55) and spring (56).

NOTE

Kingpost latch assembly or kingpost locking pawl assembly may be installed.

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk.

13. Remove nuts (1, figure 7-14), washers (2), socket head screws (3), shims (4) and kingpost latch assembly (58, figure 7-5) or bolts (1, figure 7-15), lock washers (2), shims (3) and kingpost locking pawl

assembly from trunk. Note size and positions of shims for reassembly reference. For latch assembly repair procedures refer to paragraph 6-8.10 and figure 7-14. For locking pawl assembly repair procedures refer to paragraph 6-8.11 and figure 7-15.

14. If necessary, drive out spring pin (59, figure 7-5) and remove carriage support pin (60).

WARNING

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall.

15. If necessary, remove guides as follows.

15.1 For each guide section (upper, 63 and lower, 66) remove two cap screws (61), one near each end. Replace with 5/16-18UNC studs that extend a few inches beyond the guide face.

15.2 Remove remaining socket head screws (61) and spring pins (62) and slide guide away from trunk mating surface on studs.

15.3 Attach suitable lifting gear by rigging through guide screw holes and remove guide from trunk.

15.4 Note position and thickness of shims (64 and 65 or 67 and 68) and others that may be present before removing.

NOTE

Leave studs in place for reinstallation of guides.

16. If necessary, remove rivets (69) and dog wedges (70) at one or more locations around hatch opening.
17. Remove hex head screws (71), access panel (72) and gasket (73) from trunk (74).

6-8.5.3 Cleaning and Inspection. Clean and inspect trunk and hatch assembly parts in accordance with paragraph 6-5.

6-8.5.4 Repair and Replacement. Repair or replace trunk and hatch assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.5.5 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-5.

1. Install access panel (72) and gasket (73) on trunk (74) and secure using hex head screws (71).

WARNING

To prevent death or injury, ensure personnel working near open trunk use restraining gear to avoid falling into trunk.

Guides are heavy, greasy, and awkwardly placed. To prevent death or injury or equipment damage ensure guides are not allowed to fall.

2. If removed during disassembly, reinstall dog wedges (70) using new rivets (69).
3. Using studs installed for guide removal, position shims (67 and 68 or and 65) and any other shims noted during disassembly and guides (upper, 63 and lower 66) as follows.
   3.1 Install shims over studs.
   3.2 Using appropriate lifting gear, install guides in original positions over studs.
   3.3 Unrig lifting gear from guide screw holes and press guide and shims into contact with trunk.
   3.4 Fasten guides to trunk using spring pins (62) and socket head screws (61).
4. Install carriage support pins (60) and secure using spring pins (59).
5. Refer to shimming notes taken during disassembly. Install two latch assemblies (58) in trunk using shims (4, figure 7-14), socket head screws (3), lock washers (2) and self-locking nut (1); or install two kingpost locking pawl assemblies in trunk using shims (3), lock washers (2) and cap screws (1). Refer to figure 7-14 and figure 7-15, respectively for attaching hardware information.
6. Reassemble right- and left-hand cartridge springs as follows. Refer to figure 7-5, bubble B.
   6.1 Insert spring (56) into spring container (57).
   6.2 Insert plunger (55) through center of spring (56) and through small opening in spring container (57).
   6.3 Install end plug (54) in spring container large opening and secure using screws (53).
   6.4 Install bushing (52) followed by nut (51) and spring pins (50).
   6.5 Install jam nut (49) and rod end fitting (48).

7 Reassemble right-hand spring crank (41) assembly as follows. Refer to match marks made during disassembly.

7.1 Install lube fitting (46) in pivot block (47).

7.2 Assemble shaft (44) and bushings (45) and install in pivot block (47).

7.3 Install key (43) on shaft (44) followed by right-hand spring crank (41). Secure spring crank in place using setscrew (38).

7.4 Install key (40) on shaft (44) followed by actuator (39). Secure actuator in place using setscrews (38).

7.5 Connect roller chain (37) to actuator (39).

8. Reinstall right-hand spring crank (41) assembly as follows.

8.1 Position shims (36) as noted during removal; lower spring crank assembly onto deck cavity and secure in place with hex head screws (35).

8.2 Lower cartridge spring assembly into deck cavity. Connect roller chain (37) to cartridge spring assembly rod end fitting (48, bubble B).

8.3 Connect cartridge spring assembly to mounting point using cap screw (34) and nut (33).

9. Repeat step 7 and step 8 for left-hand spring crank (42) assembly.

10. Reinstall parts on stowage bracket weldment as follows. Refer to bubble A.

10.1 Assemble nylon webbing (32), socket (31) and clinch plate (30).

10.2 Attach webbing assembly to bracket using pan head screw (29), flat washer (28), lock washer (27) and hex nut (26).

10.3 Reinstall stud plate (25) using two flat head screws (24).

11. Install retainers (23) on hatch hinge clevises using hinge pins (22).

12. Reinstall label plates (20 and 21)using RTV compound and (75) on model CR-12B-P retrofit version only using screws (76).

13. Reassemble hatch as follows:

13.1 Install two hatch supports (19).

13.2 Install two grab handles (18) using one retainer (17) and two screws (16) in each.

13.3 Install hatch gasket (15).

13.4 Assemble spindle (14) and grease fitting (13).

13.5 Slip thrust washer (11) and bushing (12) over spindle (14), pass spindle through hole in hatch assembly from weather side.

13.6 Install bushing (12), thrust washer (11), dog (10), and self-locking nut (9).

13.7 Repeat step 13.4 through step 13.6 as necessary for remaining hatch dogs.

WARNING

Hatch assembly is heavy. To prevent death or injury, attach suitable lifting gear and use extreme caution when moving.

6-8.5.6 Reinstallation.

1. Attach appropriate lifting gear to hatch and position over trunk.

2. Fasten retainers (23) to deck using socket head screws (8).

3. Connect spring cranks (41 and 42) to hatch assembly using spring pins (7).

4. Mount control station assembly (6) on bracket and strap in place. Stow control cable on hatch brackets.
5. Close hatch.
6. Reinstall right- and left-hand forward and aft covers (2 through 5) using screws (1).
7. Lubricate hatch hinges and dogs.
8. Reinstall sliding padeye assembly in accordance with applicable portions of paragraph 6-8.3.6.

6-8.6 AC MOTOR AND ELECTRIC DISC BRAKE ASSEMBLY. The ac motor and electric disc brake assembly with partial flexible coupling attached were removed during sliding padeye disassembly. The following procedures address electric disc brake disassembly and repair only. Motors needing overhaul shall be sent to nearest authorized motor rewind facility for rebuilding. Refer to figure 7-6 and figure 7-7.

6-8.6.1 Disassembly.

NOTE

Disassemble ac motor and electric disc brake only to the extent necessary to accomplish repairs or overhaul.

NOTE

Rotating (friction) discs used in brake do not contain asbestos. However, normal wearing of discs produces fine dust which could be a respiratory irritant. Use appropriate filter mask for personnel protection and use vacuum cleaner to remove dust from disc brake components as disassembly proceeds.

1. Remove release handle (1, figure 7-7), lock washer (2), cotter pin (3), clevis pin (4) and release block (5).
2. Remove screws (6), lock washers (7), flat washers (8), seal ring (9) and seal (10).
3. If necessary, remove pin (11).
4. Support cover to prevent it falling and remove socket head cap screws (12), lock washers (13) and gasket (14).
5. Remove pipe plug (15) from cover (16).
6. Check magnet gap in accordance with paragraph 6-3.5 (disc brake adjustment). If proper magnet gap cannot be set, rotating (friction) discs require replacement.

WARNING

Magnet mounting plate assembly (20) is under pressure from return spring (22). To prevent personnel death or injury, exercise care in removing lock nuts (17).

7. Remove four lock nuts (17) incrementally and evenly to relieve spring pressure on magnet plate assembly (20).

8. Tag wires and remove connectors (18).

9. If necessary, remove coils (19) from magnet mounting plate assembly.

10. Remove O-ring (21) from magnet mounting plate assembly (20).

11. Remove spring (22) and, if necessary, pin (23) from release rod (24).

12. Remove release rod (24) and lock nut (25) from pressure plate (30). Do not remove pressure plate, it will be removed later.

WARNING

To prevent death or injury, relieve spring pressure gradually and maintain control over spring-loaded components at all times during removal.

13. Remove jam nuts (26) and back off lock nuts (27) to relieve pressure of springs (29). Remove lock nuts (27), washers (28) and springs (29).

14. Note colors and positions of springs (black, 33; blue, 35; silver, 36; and green, 37) for reassembly reference. Note relative positions of stationary discs (34) for reassembly reference. Springs and stationary discs must be reinstalled in same positions.

15. Remove pressure plate (30), and stacked rotating (friction) discs (31), stationary discs (34), springs (33, 35, 36, 37) and washers (32).

16. Remove studs (38 and 39).

17. Remove hub (40) and key (49) from motor (50) shaft.

18. Support brake bracket (48) to prevent it falling. Remove hardware attaching bracket (48) to motor (50). Remove bracket while withdrawing lead wires (41), tags (42 and 43) and fiberglass sleeve (44).

19. If necessary, remove drive screws (45) and nameplate (46) and pipe plug (47) from bracket (48).

20. Match mark and remove flexible coupling from motor as follows. Refer to figure 7-6.

    20.1 Match mark to preserve position of flange (6) on motor shaft.

    20.2 Remove outer setscrew (1) from flange (6) loosen inner setscrew (1).

    20.3 Remove partially assembled flexible coupling from motor shaft.

    20.4 Remove key (7) from motor shaft.

21. Disassemble and repair flexible coupling, if necessary. Refer to paragraph 6-8.7 for repair procedures.

6-8.6.2 Cleaning and Inspection. Clean and inspect ac motor and disc brake assembly parts in accordance with paragraph 6-5.

6-8.6.3 Repair and Replacement. Repair or replace ac motor and disc brake assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2. Replace rotating discs (31, figure 7-7) if magnet gap cannot be set to between 0.040 -0.0 and 0.090 +0.01 inch.

6-8.6.4 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-6 and figure 7-7.

1. Refer to match marks made during disassembly and mount partial flexible coupling on motor shaft.

NOTE

Reassemble flexible coupling loosely to the same degree found when removed from ac motor. Assembling too much will make reinstallation of ac motor and disc brake assembly in sliding padeye kingpost difficult.

1.1 Install key (7, figure 7-6) on motor shaft.

1.2 Install flange (6) and attached parts over key (7) and lock in place using two setscrews (1) to secure coupling to motor. Flange may later have to be moved during reconnection to upper coupling flange.

2. If removed during disassembly, reinstall pipe plug (47, figure 7-7) and nameplate (46) using new drive screws (45) on bracket (48).
3. Route assembly of lead wires (41), tags (42 and 43) and fiberglass sleeve (44) through bracket (48).
4. Secure assembled bracket (48) to motor (50) using attaching hardware.
5. Install key (49) and hub (40) on motor shaft.
6. Install studs (38) and (39).

NOTE

Stationary discs (34) and springs (33, 35, 36, 37) must be installed in same positions as before disassembly. Refer to notes made during disassembly procedures.

7. Install friction discs (31), washers (32), springs (33, 35, 36, 37) and stationary discs (34).
8. Install pressure plate (30), springs (29), washers (28) and lock nuts (27) on studs (38).
9. Tighten lock nuts (27) alternately and evenly until compressed spring (29) length (dimension between lock nut (27) and pressure plate (30) is 1-3/8 inch at all four springs.
10. Hold lock nuts (27) to prevent turning and secure in place with four jam nuts (26).
11. If removed during disassembly, install pin (23) in release rod (24) and screw into captive lock nut (25).
12. Install spring (22) on release rod (24).
13. If removed during disassembly, reinstall coils (19) and O-ring (21) in magnet mounting plate assembly (20).
14. Reconnect lead wires using connectors (18) and install assembled magnet mounting plate assembly (20) over release rod (24) on studs and secure using lock nuts (17).
15. Check and adjust magnet gap as may be required in accordance with paragraph 6-3.5.
16. Install pipe plug (15) in cover (16).
17. Position gasket (14) between bracket (48) and cover (16) and fasten bracket to cover using lock washers (13) and socket head cap screws (12).
18. Install pin (11) in end of magnet mounting plate.

19. Install seal (10) and seal ring (9) and fasten in place using washer (8), lock washer (7) and screws (6).
20. Install release block (5) on release rod (24) and secure in place with clevis pin (4) and cotter pin (3).
21. Install lock washer (2) and release handle (1) on release block.

NOTE

AC motor, electric disc brake and partial flexible coupling is ready for reinstallation in sliding padeye kingpost.

6-8.7 FLEXIBLE COUPLING. The flexible coupling is partially disassembled during sliding padeye disassembly and ac motor and electric disc brake disassembly. Since a given flexible coupling may be in different stages of disassembly, the following procedures cover entire disassembly sequence without regard to actual level of disassembly. Refer to figure 7-6.

6-8.7.1 Disassembly.

NOTE

Disassemble flexible coupling only to the extent necessary to accomplish repairs or overhaul.

1. Remove two setscrews (1) from each coupling flange (6) and remove flanges from ball screw and motor shafts.
2. Remove six screws (2) each from upper and lower external clamp rings (3), internal clamp rings (4), flexible element (5) and flanges (6).
3. Remove keys (7) from shafts.

6-8.7.2 Cleaning and Inspection. Clean and inspect flexible coupling assembly parts in accordance with paragraph 6-5.

6-8.7.3 Repair and Replacement. Repair or replace flexible coupling assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.7.4 Reassembly. Prior to reassembly and reinstallation, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-6.

1. Install keys (7) on motor and ball screw shafts.
2. Install flanges on ball screw and motor shafts and fasten in place using two setscrews (1) in each.
3. Assemble upper and lower flanges (6), upper and lower internal clamp rings (4) and upper and lower external clamp rings (3). Fasten loosely with six screws (2) in each upper and lower assembly.
4. Install flexible element (5) between internal and external clamp rings and tighten screws (2) to clamp flexible in place.

6-8.8 CARRIAGE ASSEMBLY (MODELS B-9A AND B-12). The carriage assembly and ball screw was removed during sliding padeye disassembly and placed on blocks in a horizontal position. Disassemble carriage assembly in accordance with following procedures. Refer to figure 7-10.

6-8.8.1 Disassembly.

NOTE

Disassemble carriage assembly only to the extent necessary to accomplish repairs or overhaul.

1. Remove pin (1), washer (2), STREAM adapter pin (3) and STREAM adapter assembly (4).
2. Remove socket head screws (5) and cams (6).
3. Remove six self-locking nuts (7) and bolts (8).
4. Remove four each, bearing shaft bolts (9), bearing shafts (10), bearings (11) and lube fittings (12) from upper and lower bodies (15 and 28).

NOTE

If difficulty is encountered in removing a bearing shaft (10) from body (15 or 28), install a 1/2-13 bolt with a flat washer in bearing shaft and, using a slide hammer puller, extract bearing shaft from body.

5. Remove setscrews (13 and 14) from upper body (15) and remove upper body, lug (16), tube spacer (17) and lower body lug (16) from ball screw (25) shaft.
6. Disassemble ball nut assembly (18) as follows.

CAUTION

Do not allow balls (22) to escape from ball nut.

6.1 Place container beneath ball screw to capture balls that may fall from ball nut. Remove four nuts (19), ball tube retainer (20), three ball tubes (21) and sixty balls (22).

6.2 When all balls have been removed, ball nut housing (24) will slide off ball screw (25).

6.3 Remove lube fitting (23) from ball nut housing (24).

7. Slide lower body (28) off ball screw (25).

NOTE

NAVSEA drawing 6665726 modifies upper bearing housing assembly bumper and carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt holes to allow removal and replacement of bumper without removal of the upper bearing housing or ball screw and carriage.

8. Remove two bolts (26) and bumper (27) from lower body (28).

6-8.8.2 Cleaning and Inspection. Clean and inspect carriage assembly parts in accordance with paragraph 6-5.

6-8.8.3 Repair and Replacement. Repair or replace carriage assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.8.4 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-10.

1. Coat all mating parts with grease (MIL-G-23549). Ensure layer of grease covers entire inside grooves of ball nut housing (24) to prevent installed balls (22) from dropping out.
2. Install on upper and lower bodies (15 and 28), four each, lube fittings (12), bearings (11), bearing shafts (10) and bearing shaft bolts (9).

NOTE

NAVSEA drawing 6665726 modifies carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt holes to allow removal and replacement of bumper without removal of the ball screw and carriage.

3. Using two bolts (26) install bumper (27) on lower body (28) and assembled lower body on ball screw (25).

NOTE

Ensure bumper (27) is installed toward lower end of ball screw (25). Top of ball screw can be identified by presence of wrench flats machined in shaft.

4. Install lube fitting (23) in ball nut housing (24) and slide ball nut housing over ball screw for assembly at approximate middle of ball screw.
5. Install balls (22) through three holes in ball nut housing keeping in place with three ball tubes (21). Secure ball tubes (21) to ball nut housing using ball tube retainer (20) and four nuts (19).
6. Install lower lug (16), tube spacer (17), upper lug (16) and upper body (15) to surround ball nut.

NOTE

Ensure that upper and lower lug (16) eyes align with each other and are positioned over cut out in upper and lower bodies (15 and 28); upper body (15) setscrew holes align with hole in ball nut housing (24); ball nut housing (24) lube fitting (23) will face outboard when padeye is reassembled; and opening in tube spacer (17) is positioned to allow access to lube fitting (23) and mates with recesses in lugs (16).

7. Install setscrews (13 and 14) in upper body (15) and tighten against depression in ball nut housing.
8. Install eight bolts (8) and nuts (7) to bind lower body (28), lower lug (16), tube spacer (17), upper lug (16) and upper body (15) together. Tighten nuts (7) to 280 ft lbs.
9. Install cams (6) using screws (5).
10. Install STREAM adapter (4) on lugs (16) using pin (3), washer (2) and spring pin (1).
11. Fill bolt (8) head counter bores with Silastic RTV-22.
12. Lubricate ball nut and bearings in accordance with chapter 4 procedures.

13. Carriage and ball screw assembly is ready for installation during sliding padeye reassembly.

6-8.9 CARRIAGE ASSEMBLY (MODELS CR-12, CR-12B, CR-12B-P). The carriage assembly and ball screw was removed during sliding padeye disassembly and placed on blocks in a horizontal position. Disassemble carriage assembly in accordance with following procedures. Refer to figure 7-11.

6-8.9.1 Disassembly.

NOTE

Disassemble carriage assembly only to the extent necessary to accomplish repairs or overhaul.

1. Remove pin (1), washer (2), STREAM adapter pin (3) and STREAM adapter assembly (4).
2. Remove ten socket head screws (5) and two carriage braces (6).
3. Remove socket head screws (7) and cams (8).
4. Remove six self-locking nuts (9) and bolts (10).
5. Remove four each, bearing shaft bolts (11, bearing shafts (12), bearings (13) and lube fittings (14) from upper and lower bodies (17 and 30).

NOTE

If difficulty is encountered in removing a bearing shaft (12) from body (17 or 30), install a 1/2-13 bolt with a flat washer in bearing shaft and, using a slide hammer puller, extract bearing shaft from body.

6. Remove setscrews (15 and 16) from upper body (17) and remove upper body, lug (18), tube spacer (19) and lower body lug (18) from ball screw (27) shaft.
7. Disassemble ball nut assembly (20) as follows.

CAUTION

Do not allow balls (24) to escape from ball nut.

7.1 Place container beneath ball nut (26) to capture balls that may fall from ball nut. Remove four nuts (21), ball tube retainer (22), three ball tubes (23) and sixty balls (24).

7.2 When all balls have been removed, ball nut housing (26) will slide off ball screw (27).

7.3 Remove lube fitting (25) from ball nut housing (26).

8. Slide lower body (30) off ball screw (27).
9. Remove two bolts (28) and bumper (29) from lower body (30).

6-8.9.2 Cleaning and Inspection. Clean and inspect carriage assembly parts in accordance with paragraph 6-5.

6-8.9.3 Repair and Replacement. Repair or replace carriage assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.9.4 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-11.

NOTE

NAVSEA drawing 6665726 modifies carriage assembly bumper by cutting a slot 90 degrees to the mounting bolt holes to allow removal and replacement of bumper without removal of the ball screw and carriage.

1. Coat all mating parts with grease (MIL-G-23549). Ensure layer of grease covers entire inside grooves of ball nut housing (26) to prevent installed balls (24) from dropping out.
2. Install on upper and lower bodies (17 and 30), four each, lube fittings (14), bearings (13), bearing shafts (12) and bearing shaft bolts (11).
3. Using two bolts (28) install bumper (29) on lower body (30) and install assembled lower body on ball screw (27).

NOTE

Ensure bumper (29) is installed toward lower end of ball screw (27). Top of ball screw can be identified by presence of wrench flats machined in shaft.

4. Install lube fitting (25) in ball nut housing (26) and slide ball nut housing over ball screw for assembly at approximate middle of ball screw.
5. Install balls (24) through three holes in ball nut housing keeping in place with three ball tubes (23). Secure ball tubes (23) to ball nut housing using ball tube retainer (22) and four nuts (21).
6. Install lower lug (18), tube spacer (19), upper lug (18) and upper body (17) to surround ball nut.

NOTE

Ensure that upper and lower lug (18) eyes align with each other and are positioned over cut out in upper and lower bodies (17 and 30); upper body (17) setscrew holes align with hole in ball nut housing (26); ball nut housing (26) lube fitting (25) will face athwartship when padeye is reassembled; and opening in tube spacer (19) is positioned to allow access to lube fitting (25) and mates with recesses in lugs (18).

7. Install setscrews (15 and 16) in upper body (17) and tighten against depression in ball nut housing.
8. Install six bolts (10) and nuts (9) to bind lower body (30), lower lug (18), tube spacer (19), upper lug (18) and upper body (17) together. Tighten nuts (9) to 280 ft lbs.
9. Install cams (8) using screws (7).
10. Position carriage braces (6) between upper and lower bodies (17 and 30) and fasten using screws (5).
11. Install STREAM adapter (4) on lugs (18) using pin (3), washer (2) and spring pin (1).

12. Fill bolt (10) head counter bores with Silastic RTV-22.
13. Lubricate ball nut and bearings in accordance with chapter 4 procedures.
14. Carriage and ball screw assembly is ready for installation during sliding padeye reassembly.

6-8.10 LATCH ASSEMBLY. The latch assembly was removed during trunk and hatch repair procedures. Disassemble latch assembly in accordance with the following procedures. Refer to figure 7-14.

6-8.10.1 Disassembly.

NOTE

Disassemble latch assembly only to the extent necessary to accomplish repairs or overhaul.

Nuts (1), lock washers (2) socket head cap screws (3) and shims (4) were removed as part of trunk disassembly.

1. Drive out spring pin (5) and remove latch knob (6).
2. Remove two studs (7).
3. Drive out pin (8). Remove gear shaft (9) and remove gear (10).
4. Remove latch pin (13) from latch base. Remove two screws (11) and rack (12).
5. Remove two lube fittings (14) and two flanged bushings (15) from latch base (16).
6. Repeat disassembly steps for second latch assembly.

6-8.10.2 Cleaning and Inspection. Clean and inspect latch assembly parts in accordance with paragraph 6-6.

6-8.10.3 Repair and Replacement. Repair or replace latch assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.10.4 Reassembly. Prior to reassembly, touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-14.

1. Install two flanged bearings (15) in latch base (16).
2. Install two lube fittings (14) in latch base (16).
3. Install rack (12 on latch pin (13) using two screws (11). Slide assembled latch pin (13) into latch base (16).
4. Position gear (10) inside latch base (16). Install gear shaft (9), align gear and gear shaft holes and drive pin (8) through gear and gear shaft.
5. Install studs (7).

6. Position latch knob (6) on gear shaft (9), align latch knob and gear shaft holes and drive pin (5) through gear shaft and latch knob.
7. Lubricate in accordance with chapter 4 procedures.
8. Repeat reassembly steps for second latch assembly.
9. Latch assemblies are now ready for installation in trunk using shims (4), cap screws (3), lock washers (2) and nuts (1).

6-8.11 KINGPOST LOCKING PAWL ASSEMBLY. The kingpost locking pawl assembly was removed during trunk and hatch repair procedures. Disassemble kingpost locking pawl assembly in accordance with the following procedures. Refer to figure 7-15.

6-8.11.1 Disassembly.

NOTE

Disassemble kingpost locking pawl assembly only to the extent necessary to accomplish repairs or overhaul.

Hex head bolts (1), lock washers (2) and shims (3) were removed as part of trunk disassembly.

1. Remove cotter pin (4).
2. Remove nut (5) and bolt (6) releasing pawl (8).
3. Remove lube fitting (7) from pawl (8).
4. If necessary, remove label plate (9) from base plate (10) on model CR-12 only .
5. Repeat disassembly steps for second latch assembly.

6-8.11.2 Cleaning and Inspection. Clean and inspect latch assembly parts in accordance with paragraph 6-5.

6-8.11.3 Repair and Replacement. Repair or replace latch assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.11.4 Reassembly. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-15.

1. If removed during disassembly, install label plate (9) on base plate (10) using RTV.
2. Install lube fitting (7) in pawl (8).
3. Position pawl (8) in base plate (10) and secure using bolt (6), nut (5) and cotter pin (4).
4. Lubricate in accordance with chapter 4 procedures.
5. Repeat reassembly steps for second kingpost locking pawl assembly.

6. Kingpost locking pawl assemblies are now ready for installation in trunk using shims (3), lock washers (2) and bolts (1).

6-8.12 FLOODLIGHT ASSEMBLY. Disassemble floodlight assembly in accordance with the following procedures. Refer to figure 7-16.

6-8.12.1 Disassembly.

NOTE

Disassemble floodlight assembly only to the extent necessary to accomplish repairs or overhaul.

1. Disconnect four floodlight cable connectors (9) from terminal box.
2. Remove setscrew (1) and floodlight (2). Repeat for remaining three floodlights.
3. Remove springs (3) from base (13) and two strap clips (8).
4. Remove nut (4), washer (5), screw (6) and strap (7) from strap clip (8).
5. Repeat step 4 for second strap clip assembly.
6. Remove connector (9) and cable (10) from four flood light assemblies.
7. Remove cap screws (11) and terminal box (12) from base (13).

6-8.12.2 Cleaning and Inspection. Clean and inspect floodlight assembly parts in accordance with paragraph 6-5.

6-8.12.3 Repair and Replacement. Repair or replace floodlight assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.12.4 Reassembly. Prior to reassembly touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-16.

1. Install terminal box (12) on base (13) using cap screws (11).
2. Install electrical cables (10) and connectors (9) on floodlight assemblies (2).
3. Install strap (7) on strap clip (8) using screw (6), washer (5) and nut (4).
4. Repeat step 3 for second strap clip assembly.
5. Attach springs (3) to strap clips (8) and base (13).
6. Install four floodlight assemblies (2) on base (13) and secure using setscrews (1).
7. Reconnect floodlight assemblies to terminal box (2) using connectors (9).

6-8.13 EMERGENCY DRIVE ASSEMBLY, PNEUMATIC. Disassemble emergency drive unit in accordance with the following procedures. Refer to figure 7-17.

6-8.13.1 Disassembly.

NOTE

Disassemble emergency drive assembly only to the extent necessary to accomplish repairs or overhaul.

1. Remove two screws (1) and air motor assembly (8) with attached parts (2 through 7).
2. If necessary remove couplers (2 and 3), and nipples (4 through 7) from air motor (8).
3. Remove two retaining rings (9) and remove shaft (15) assembly from base (17).
4. Remove two retaining rings (12), worm (13) and key (14) from shaft (15).
5. Remove retaining ring (10) and bearing (11) from shaft (15).
6. If necessary remove warning label (16) from base (17).

6-8.13.2 Cleaning and Inspection. Clean and inspect emergency drive assembly parts in accordance with paragraph 6-5.

6-8.13.3 Repair and Replacement. Repair or replace emergency drive assembly parts in accordance with paragraph 6-6.1 and paragraph 6-6.2.

6-8.13.4 Reassembly. Prior to reassembly touch up surfaces with damaged paint in accordance with paragraph 6-6.3. During reassembly use antiseize and RTV sealant compounds in accordance with paragraph 6-6.4 or as directed in procedures. Unless otherwise specified, torque fasteners in accordance with paragraph 6-6.5. Refer to figure 7-17.

1. If removed during disassembly, install warning label (16) on base (17).
2. Install bearing (11) and retaining ring (10) on shaft (15).
3. Install key (14) on shaft (15) followed by worm (13) and two retaining rings (12).
4. Position shaft (15) assembly in base (17) and secure using two retaining rings (9).
5. If removed during disassembly, reinstall nipples (4 through 7) and couplers (2 and 3) on air motor (8).
6. Install air motor (8) on base (17) and secure using screws (1).

CHAPTER 7

ILLUSTRATED PARTS BREAKDOWN

SECTION I

INTRODUCTION

7-1. HOW THIS CHAPTER IS ORGANIZED.

7-1.1 This chapter consists of three sections and provides the Illustrated Parts Breakdown (IPB) for the sliding padeye receiving unit, bulkhead-mounted models B-9A and B-12, and retractable models CR-12, CR-12B, CR-12B-P . Section I describes the scope and content of this chapter. Section II, Group Assembly Parts List (GAPL), consists of illustrations and parts lists. Section III, Numerical Index, provides a cross-reference between part numbers and figure and index numbers.

7-1.2 The GAPL includes exploded-view illustrations and parts lists for assemblies and major components of the sliding padeye installation. Each part of an assembly or major component shown on an exploded-view or assembled-view illustration is assigned an index number; the index numbers generally indicate the complete disassembly sequence for the assembly or component.

7-1.3 GROUP ASSEMBLY PARTS LIST FEATURES. Index numbers on the illustrations correspond to numbers in the parts lists. Parts lists with components or subassemblies shown assembled in one illustration and disassembled in another, cross-reference each other. The following paragraphs further discuss features of the parts lists.

7-1.4 FIGURE AND INDEX NUMBER COLUMN. The figure and index number column lists in numerical order the figure and index number of each item shown on the corresponding illustration. The index number zero is assigned to the installation, assembly, or component shown in the exploded-view illustration.

7-1.5 REFERENCE DESIGNATION COLUMN. The reference designation column is blank. Reference designations for electrical components can be found on the motor controller drawings in the appendix.

7-1.6 PART NUMBER COLUMN. The part number column lists the manufacturer or government part number of each item shown on the illustration. A NO NUMBER entry indicates that an item is a general arrangement or grouping/installation of equipment assemblies, or that the assembly/part has no identified applicable part number. The entry COML indicates the item is a common hardware item and may be procured from consumable stocks or commercial sources using the data in the description column.

7-1.7 INDENT COLUMN. The numbers 1 through 4 in the indent column indicate subordination of one item to another. For any given illustration, a number 1 indent is assigned to the item with index number zero in the parts list. Indent numbers 2 through 4 indicate subsequent levels of disassembly for that item. For example, subassemblies of an indent level 1 assembly are indent level 2; components of the subassemblies are indent level 3, and parts of the components are indent level 4.

7-1.8 DESCRIPTION COLUMN. The description column names and briefly describes (as necessary) each indexed item in the applicable disassembly drawing. Cross-references to other figures are included, as applicable, in the description column. This column may also contain the entry AP, meaning that the item is an attaching part used on the previously listed item having the same figure and index number. Abbreviations and acronyms are generally in accordance with MIL-STD-12, except for certain shipboard placard data or manufacturer usage.

7-1.9 QUANTITY PER ASSEMBLY COLUMN. The quantity per assembly column contains one of the following entries: a number, indicating the quantity of the item at the indicated location(s) only; the entry REF, indicating that the quantity is listed with the figure and index number referenced in the description column; or the entry AR, indicating that the item is used in quantity as required.

7-1.10 MANUFACTURER'S CODE COLUMN. The manufacturer's code column identifies the supplier of each item by code number. Table 7-1 lists all the code numbers used in this column and the corresponding suppliers and addresses. Suppliers and codes are also listed in the Cataloging Handbook H4/H8, Commercial and Government Entity (CAGE).

7-1.11 USED ON CODE COLUMN. The used on code column indicates variations in equipment/parts used in the installations, assemblies, etc., described in the parts lists. No entry in this column indicates that the part number is applicable to all units.

Sliding Padeye Model

Used On Code	Sliding Padeye Model	Ship Application
A	B-9A (Bulkhead Mount)	LHD 1 Class
B	B-12 (Bulkhead Mount)	CG 47 Class
C	CR-12 (Retractable)	CG 47 Class
D	CR-12B (Retractable)	DDG 51 Class
D1	CR-12B (Retractable)	DDG 51 through DDG 58
D2	CR-12B (Retractable)	DDG 59 and later
E	CR-12B-P (Retractable)	DDG 51 Class
E1	CR-12B-P (Pawl retrofit)	DDG 73 through DDG 76
E2	CR-12B-P (Pawl and Switch retrofit)	DDG 77 through DDG 85
E3	CR-12B-P (Manufactured)	DDG 86 and follow

7-1.12 NUMERICAL INDEX.

7-1.12.1 Numerical Index Features. The numerical index lists in alphanumerical order all the parts numbers included in the GAPL. The index cross-references figure and index numbers and reference designations in the GAPL. The following paragraphs further discuss features of the numerical index.

7-1.12.2 Part Number Column. The part number column lists part numbers in alphanumerical order. Alphanumerical arrangement starts with the extreme left letter or numeral of the part number and continues from left to right, one character at a time. Order of precedence is as follows:

First Position (Extreme Left)	Second (and Succeeding) Position
Letter A through Z	Space (blank)
Numerals 0 through 9	Diagonal (/)

First Position (Extreme Left)	Second (and Succeeding) Position
	Point (.)
	Dash (-)
	Letters A through Z
	Numerals 0 through 9

Table 7-1. Manufacturers' Codes, Names, and Addresses

Code	Name and Address
00293	Beaver Precision Products Inc. 1970 Big Beaver Rd P.O. Box 1199 Troy, MI 48099
02989	General Electric Co. G.E. Drive Systems 215 Maple Street Salem VA 24153-6422 (See 63743 for spare parts)
08094	Boston Gear Works 14 Hayward St Quincy, MA 02171-2416
12532	General Electric Co. Motor Business Group 3301 Old Hartford Rd. Owensboro, KY 42301-5650 (See 20019 for spare parts)
15235	Crouse-Hinds Co. Wolf and 7th N Sts. P.O. Box 4999 Syracuse, NY 13221
15605	Cutler-Hammer Products Division of Eaton Corp. 4201 N. 27th Street Milwaukee, WI 53216-1807
17904	Dings Co. Div. of Venturedyne Ltd 4740 West Electric Avenue Milwaukee, WI 53219-1626
20019	Tech Systems Div. Datron Inc. 401 Watertown Rd Thomaston, CT 06787-1922
20722	The Entwistle Co. Bigelow St. Hudson, MA 01749-2697
26124	Garlock Bearings Inc. Sub. of Colt Industries Inc. 700 Mid-Atlantic Pkwy. Glassboro, NJ 08028
27192	Cutler-Hammer Products Div. of Eaton Corp. 4265 N. 30th Street Milwaukee, WI 53216-1894
32377	SKF Industries Inc. 2421 N. Mayfair Rd. Milwaukee, WI 53226
4P412	Ingersol RAND Co. Power Tool Div. 510 Hester Drive White House, TN 37188

Table 7-1. Manufacturers' Codes, Names, and Addresses - Continued

Code	Name and Address
50619	Keyon Engineering and Mfg Corp. Cable Connector Div. 1146 E. Ash Ave. Fullerton, CA 92631-5049
52676	SKF Industries Inc. 1100 1st Ave. King of Prussia, PA 19406-1312
52788	General Motors Corp. Saginaw Div. 3900 Holland Rd. Saginaw, MI 48605
53711	Naval Sea Systems Command Washington, D.C. 20362
63743	Ward Leonard Electric Co.Inc. 31 South St. Mount Vernon, NY 10550-1714
65131	Ingersol Rand Co. Small Compression Div. Beatty St. P.O. Box 867 Davidson, NC 28036
65456	Deck Mfg Corp. 51477 Bittersweet Rd. P.O. Box 173 Granger, IN 46530-0173
71041	Boston Gear Div. Incom INTL Inc. 14 Hayward St. Quincy, MA 02171-2416
71956	Dodge Div of Reliance Electric Co. 6045 Ponders Ct. P.O. Box 499 Greensville, SC 29602
73680	Garlock Inc. Mechanical Packing Div. 1666 Division St. Palmyra, NY 14522-9343
77820	Amphenol Corp. Bendix Connector Opns. 40-60 Delaware St. Sidney, NY 13838-1395
78310	Simplex Technologies Inc. 2073 Woodbury Ave. P.O. Box 479 Portsmouth, NH 03801-0429

Table 7-1. Manufacturers' Codes, Names, and Addresses - Continued

Code	Name and Address
79136	Waldes Truarc, Inc. Div. of Seeger Inc. 500 Memorial Dr. P.O. Box 6723 Somerset, NJ 08875-6723
80064	Naval Ship Systems Command Washington, D.C.
80201	CR Industries Chicago Rawhide Mfg Co. 900 N. State St. Elgin, IL 60123-3293
81349	Military Specifications Promulgated by Military Departments/Agencies Under Authority of Defense Standardization Manual 4120-3M
82241	T.H. Smith Mfg Co. 114 Pearl St. P.O. Box 789 Laman, SC 29069-0789
84830	Lee Spring Co. A UNIMAX Sub. 1462 62nd St. Brooklyn, NY 11219-5413
84971	TA Mfg Inc., Sub of Criton Technologies 375 W. Arden Ave. P.O. Box 2500 Glendale, CA 91209-2500
86855	National Seal Div of Federal & Mogul & Bower & Bearings Inc. United States
88044	Aeronautical Standards Group Dept. of Navy and Air Force United States
88174	Aeronautical Standards Group Ingersol Rand Co. Athens Plant 101 N. Main St. Athens, PA 18810-1707
89020	Amerace Corp. (Formerly AGASTAT) Industrial Electrical Products 7474 Utilities Rd. Punta Gorda, FL 33982
92563	McGill Mfg. Co. Inc. Bearings Division 909 N. Lafayette St. Valparaiso, IN 46383-4210
95879	Stewart-Warner Alemite Corp. 1826 Diversey Pky Chicago, IL 60614-1540

Table 7-1. Manufacturers' Codes, Names, and Addresses - Continued

Code	Name and Address
96906	Military Specification Promulgated by Military Departments/Agencies Under Authority of Defense Standardization Manual 4120-3M
97111	Parker Hannifin Corp. Fluid Connector Group 8145 Lewis Rd. Minneapolis, MN 55427-4416

7-1.12.3 Figure and Index Number Column. The figure and index number column lists the figure and index number of each item in the numerical index.

7-1.12.4 Reference Designation Column. The reference designation column is blank. Reference designations for electrical components can be found on the motor controller drawings in the appendix.

7-1.13 ABBREVIATIONS AND ACRONYMS

7-1.13.1 Abbreviations and acronyms in table 7-2 appear in the GAPL and text of this manual. They are generally in accordance with MIL-STD-12C, except for certain shipboard placard data or manufacturer usage. Abbreviations in the text may be in lowercase letters, initial capitals with lowercase letters, or all capitals. Acronyms in the text and GAPL are in all capitals. Abbreviations and acronyms in table 7-2 are in all capitals for consistency.

7-1.14 CROSS-REFERENCE.

7-1.14.1 The IPB is arranged for maximum cross-referencing of the table of contents, GAPL and numerical index to facilitate part number location. The procedures for locating a part number when the part number is known and when the part number is not known are explained and illustrated in figure 7-A1 and figure 7-A2.

Table 7-2. Abbreviations and Acronyms

Abbreviation/Acronym	Definition
AC	Alternating Current
ACTL	Actual
ALY	Alloy
AMB	Ambient
AP	Attaching Part
APVD	Approved
APPROX	Approximate
AR	As required
ASSY	Assembly
AUX	Auxiliary
BRG	Bearing(s)
BRTHR	Breather
BRZ	Bronze
BSHG	Bushing(s)

Table 7-2. Abbreviations and Acronyms - Continued

Abbreviation/Acronym	Definition
C	Centigrade
CAT.	Catalog
COML	Commercial
COMP	Compound
CONT	Continuous, Control, Controller
CON.	Connector
CRES	Corrosion-Resistant Steel
CSCK	Countersunk
CW	Clockwise
CCW	Counterclockwise
DE	Drive End
DET	Details
DIA	Diameter
DWG	Dwg
EA	Each
ELECT.	Electric(al)
EMERG	Emergency
ENCL	Enclosure
EST	Estimated
ETC.	Etcetera
F	Fahrenheit
FIG.	Figure
FILH	Fillister Head
FLH	Flat Head
FLTD	Fluted
FPM	Feet Per Minute
FSTNR	Fastener
FT	Foot, Feet
FT-LB	Foot-Pound(s)
GAL	Gallon(s)
GAPL	Group Assembly Parts List
GR	Grade
HD	Head
HDLS	Headless
HI	High
HLS	Hoist Limit Switch
HP	Horsepower
HR	Hoist Relay
HS	High-Speed
HSLS	Hoist Speed Limit Switch
HT.	Height
HZ	Hertz (Cycles Per Second)
IAW	In Accordance With
ID	Inside Diameter
IDENT	Identification
IN.	Inch(es)

Table 7-2. Abbreviations and Acronyms - Continued

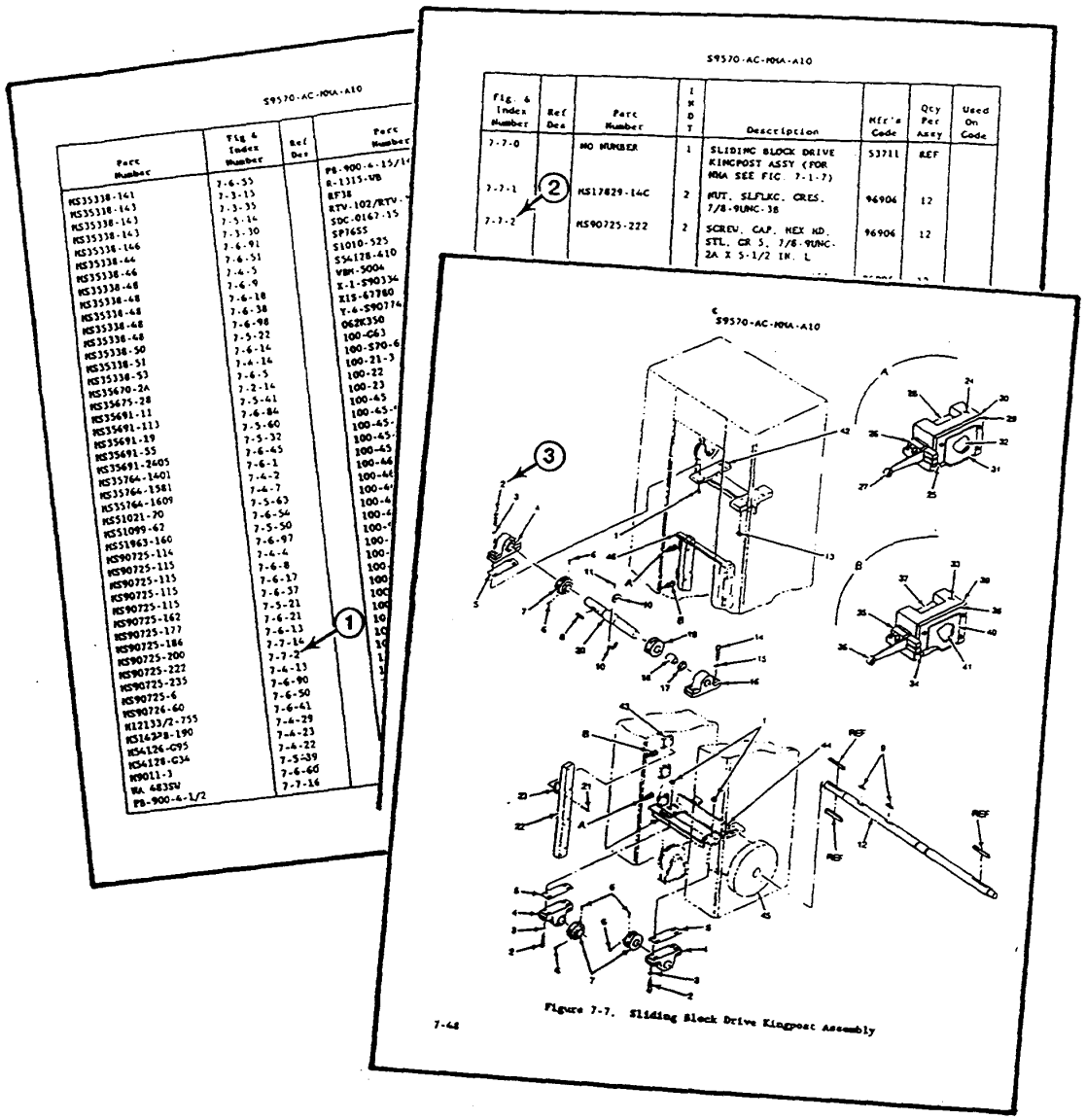
Abbreviation/Acronym	Definition
INSTL	Installation
INT	Interior
INTLK	Interlock
INTMD	Intermediate
IPB	Illustrated Parts Breakdown
IPS	International Pipe Standard
JCT	Junction
L	Long
LH	Left-Hand
LO	Low
LLS	Lower Limit Switch
LSLS	Lower Speed Limit Switch
MACH	Machine
MAJ	Major
MATL	Material
MAX	Maximum
MFD	Manufactured
MFR	Manufacturer
MIP	Maintenance Index Page
MOD	Model
MRC	Maintenance Requirement Card
MSC	Military Sealift Command
MSGR	Messenger
MTG	Mounting
MTR	Motor
MVBL	Movable
NA	Nonapplicable
NAVSEA	Naval Sea Systems Command
N.C.	Normally Closed
NHA	Next Higher Assembly
NICOP	Nickel-Copper
NOM	Nominal
NO.	Number
NOD.	Nodular
NPFC	Naval Publications and Forms Center
NPT	National Taper Pipe (Thread)
NPTF	National Taper Pipe (Dry Seal)
NSDSA	Naval Sea Data Support Activity
NSTM	Naval Ships' Technical Manual
NWP	Naval Warfare Publication
OD	Outside Diameter

Table 7-2. Abbreviations and Acronyms - Continued

Abbreviation/Acronym	Definition
ODE	Opposite Drive End
OZ	Ounce
PC	Piece
PH	Phase
PMS	Planned Maintenance System
P/N	Part Number
PRESS.	Pressure
PSI	Pounds Per Square Inch
PT	Point(s)
PUSHBTN	Pushbutton
PWR	Power
QA	Quality Assurance
QTY	Quantity
R	Red, Situation Requirement
RAD	Radius
RAS	Replenishment-at-Sea
RBR	Rubber
RDCR	Reducer
RDH	Roundhead
RECT	Rectifier
REF	Reference(d)
REG.	Regular
REPL	Replenishing
REQD	Required
REV	Revision
RH	Right-Hand
RPM	Revolutions Per Minute
RTN	Return
RTNG	Retaining
SAE	Society of Automotive Engineer
SCH	Socket Head
SHK	Shock
SLFLKG	Self-Locking
SOL	Solenoid
SOT	System Operability Test
SPEC	Specification
SPR.	Spring
SQ	Square
SQH	Squarehead
SST	Stainless Steel
STBD	Starboard
STL	Steel
STD	Standard
STR	Straight
STREAM	Standard Tensioned Replenishment Alongside Method

Table 7-2. Abbreviations and Acronyms - Continued

Abbreviation/Acronym	Definition
STWG	Stowing
SUPPR	Suppressor
SW	Switch
TDO	Time Delay Opening
TEMP	Temperature
TERM(S)	Terminal(s)
THD	Thread
THK	Thick
TPG	Tapping
TPI	Threads Per Inch
TR	Trouble Relay
UNC	Unified Coarse Thread
UNF	Unified Fine Thread
UNIV	Universal
UNREP	Underway Replenishment
UV	Undervoltage
V	Volt(s), Voltage
VAC	Volts, Alternating Current
Vdc	Volts, Direct Current
Vert	Vertical
W	With
WR	Wire Rope
WT	Weight
x	By (Dimension)



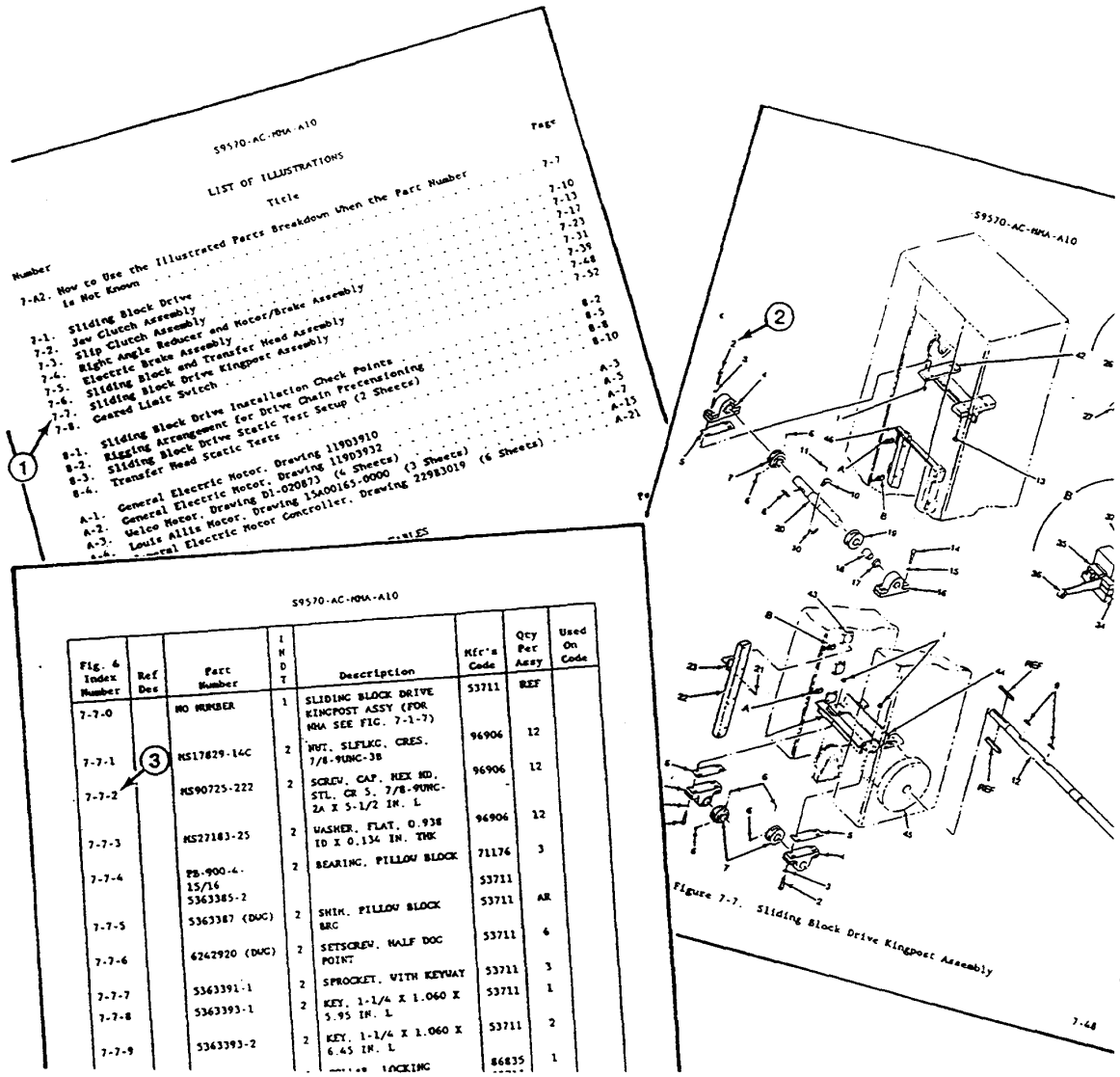
WHEN THE PART NUMBER IS KNOWN

1. **REFER TO SECTION III. NUMERICAL INDEX. LOCATE THE PART NUMBER AND NOTE THE FIGURE AND INDEX NUMBER ASSIGNED TO THE PART NUMBER.**

2. **TURN TO THE FIGURE NUMBER INDICATED AND LOCATE THE INDEX NUMBER REFERENCED IN THE NUMERICAL INDEX.**

3. **IF A PICTORIAL REPRESENTATION OF THE PART OR ITS LOCATION IS DESIRED, REFER TO THE ACCOMPANYING ILLUSTRATION.**

Figure 7-A1. How to Use the Illustrated Parts Breakdown When the Part Number is Known.



WHEN THE PART NUMBER IS NOT KNOWN

1. **DETERMINE THE FUNCTION AND APPLICATION OF THE PART REQUIRED. TURN TO THE LIST OF ILLUSTRATIONS AND SELECT THE MOST APPROPRIATE TITLE. NOTE THE ILLUSTRATION PAGE NUMBER.**

2. **TURN TO THE PAGE INDICATED AND LOCATE THE DESIRED PART ON THE ILLUSTRATION.**

3. **FROM THE ILLUSTRATION, OBTAIN THE INDEX NUMBER ASSIGNED TO THE PART DESIRED. REFER TO THE ACCOMPANYING DESCRIPTION FOR SPECIFIC INFORMATION REGARDING THE PART.**

Figure 7-A2. How to Use the Illustrated Parts Breakdown When Part Number is Not Known

SECTION II.

GROUP ASSEMBLY PARTS LIST

7-2. SCOPE AND APPLICABILITY

7-2.1 ILLUSTRATIONS AND PARTS LISTS. This section contains illustrations and lists of all major assemblies, components, and parts which comprise the sliding padeye. Discussion and explanation of the contents and format of this section are presented in section I. Table 7-3 lists the illustrations used in the IPB. Top-down breakdown is shown in figure 7-A3. This breakdown shows how the major equipment/installation and related assemblies/subassemblies are broken down in disassembly sequence.

Table 7-3 Illustrated Parts Breakdown Illustrations

Figure	Title
7-1	Sliding Padeye Assembly Installation (2 Sheets)
7-2	Sliding Padeye Assembly, Models B-9A, B-12 (2 Sheets)
7-3	Sliding Padeye Assembly, Models CR-12, CR-12B, and CR-12B-P
7-4	Trunk Assembly, Model CR-12
7-5	Trunk Assembly, Model CR-12B and CR-12B-P (2 Sheets)
7-6	Flexible Coupling
7-7	AC Motor and Electric Disc Brake Assembly
7-8	Lower Bearing Housing Assembly
7-9	Upper Bearing Housing Assembly
7-10	Carriage Assembly, Models B-9A, B-12
7-11	Carriage Assembly, Models CR-12, CR-12B and CR-12B-P
7-12	Control Station Assembly, Models B-9A, B-12
7-13	Control Station Assembly, Models CR-12, CR-12B and CR-12B-P
7-14	Latch Assembly
7-15	Kingpost Locking Pawl Assembly
7-16	Floodlight Assembly
7-17	Emergency Drive Assembly, Pneumatic, Models B-12, CR-12, CR-12B

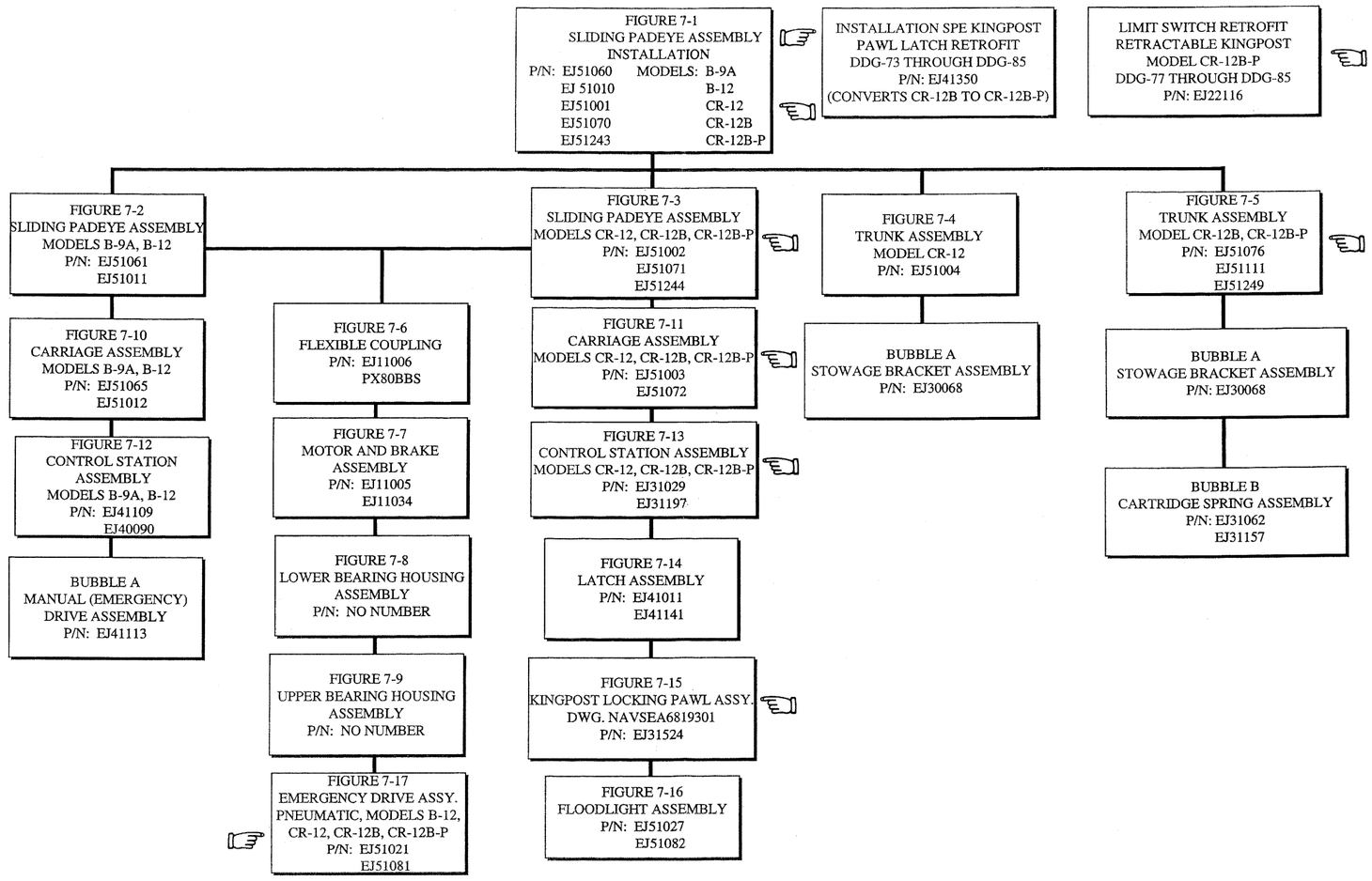


Figure 7-A3. Top-Down Breakdown

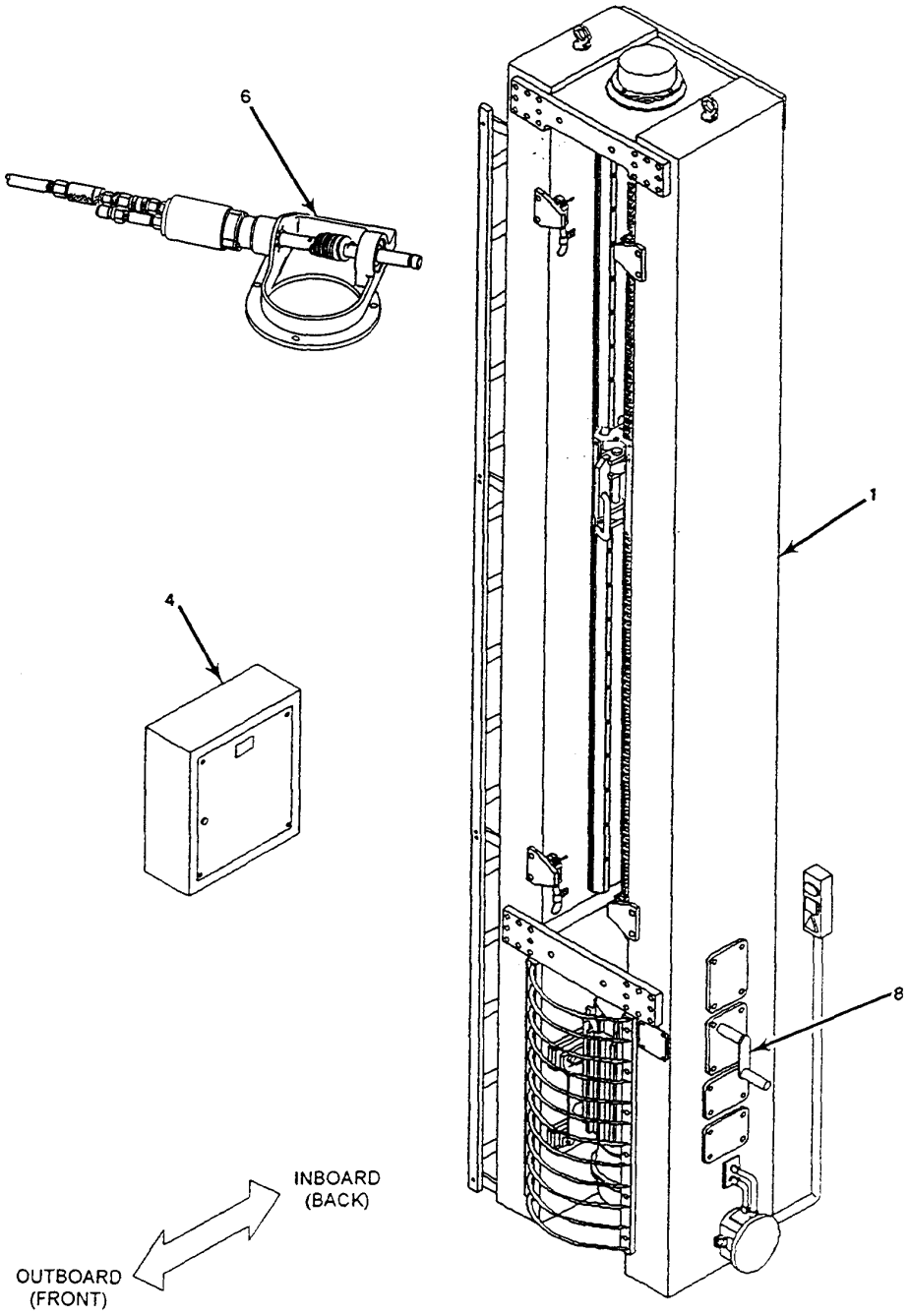


Figure 7-1. Sliding Padeye Assembly Installation (Sheet 1 of 2)

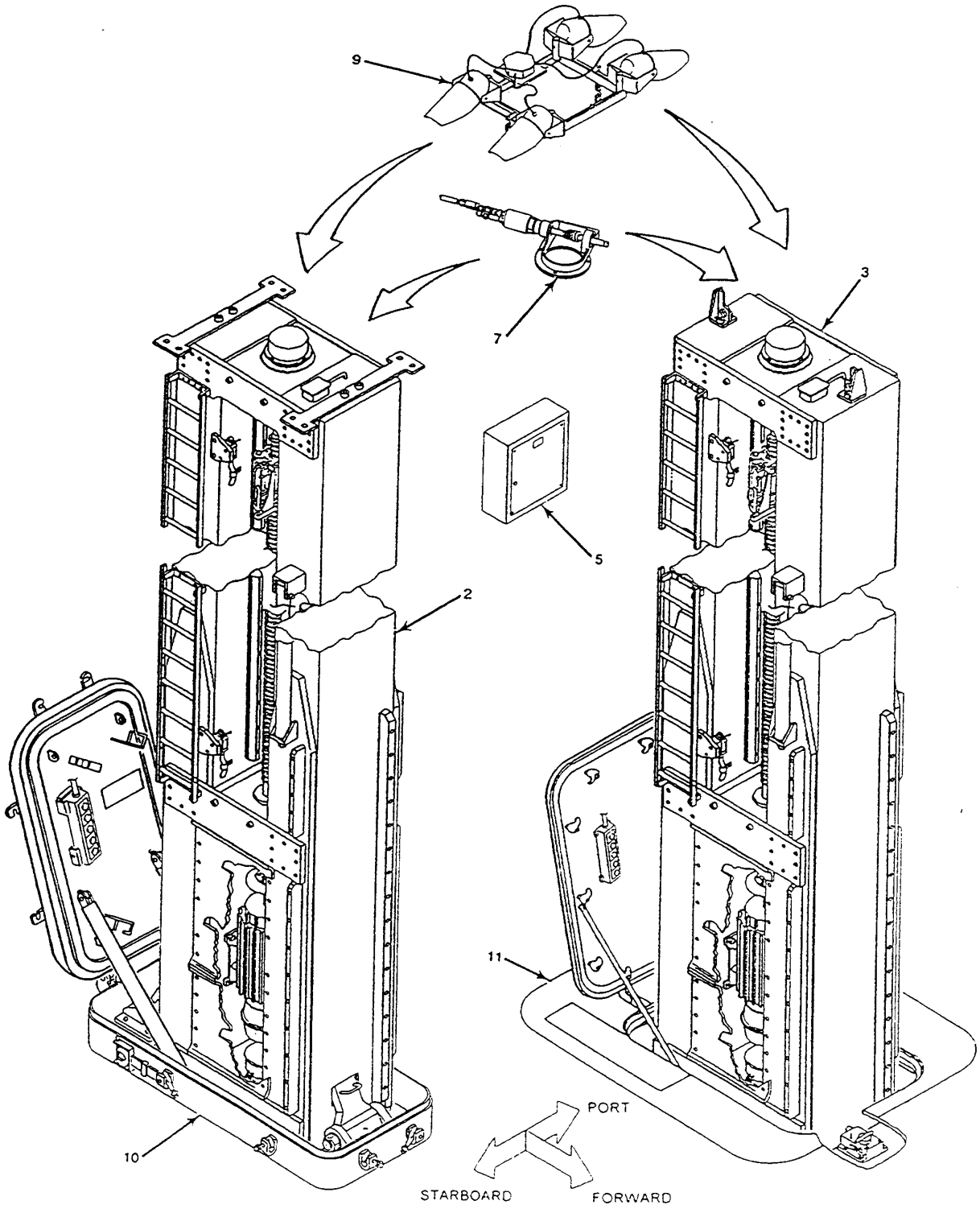


Figure 7-1. Sliding Padeye Assembly Installation (Sheet 2 of 2)

Sliding Padeye Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-1-0		EJ51060	1	SLIDING PADEYE ASSY INSTL, MODEL B-9A (BULK-HEAD MOUNTED)	20722	REF	A
		EJ51010		SLIDING PADEYE ASSY INSTL, MODEL B-12 (BULK-HEAD MOUNTED)	20722		B
		EJ51001		SLIDING PADEYE ASSY INSTL, MODEL CR-12 (RETRACTABLE)	20722		C
		EJ51071		SLIDING PADEYE ASSY INSTL, MODEL CR-12B (RETRACTABLE)	20722		D
		EJ51243		SLIDING PADEYE ASSY INSTL, MODEL CR-12B-P (RETRACTABLE)	20722		E
7-1-1		EJ51061	2	SLIDING PADEYE ASSY, MODEL B-9A (BULKHEAD MOUNTED) FOR DET SEE FIG. 7-2)	20722	1	A
		EJ51011		SLIDING PADEYE ASSY, MODEL B-12 (BULKHEAD MOUNTED) (FOR DET SEE FIG. 7-2)	20722		B
7-1-2		EJ51002	2	SLIDING PADEYE ASSY, MODEL CR-12 (RETRACT-ABLE) (FOR DET SEE FIG. 7-3)	20722	1	C
7-1-3		EJ51071	2	SLIDING PADEYE ASSY, MODEL CR-12B (RETRACT-ABLE) (FOR DET SEE FIG. 7-3)	20722	1	D
		EJ51243		SLIDING PADEYE ASSY INSTL, MODEL CR-12B-P (RETRACTABLE)(FOR DET SEE FIG. 7–3)	20722		E
7-1-4		EJ21204	2	MOTOR CONTROLLER (FOR DET SEE APPENDIX A)	20722	1	A
		229B3054		ALTERNATE PART NO.	63743	1	A
		EJ21005		MOTOR CONTROLLER (FOR DET SEE APPENDIX A)	20722		B
		202B4494 (DWG)		ALTERNATE PART NO.	63743		
7-1-5		EJ21006	2	MOTOR CONTROLLER (FOR DET SEE APPENDIX A)	20722	1	C, D, E
		202B4495 (DWG)		ALTERNATE PART NO.	63743		

Sliding Padeye Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-1-6		EJ51021	2	EMERGENCY DRIVE ASSY, PNEUMATIC (FOR DET SEE FIG. 7-17)	20722	1	B
7-1-7		EJ51021	2	EMERGENCY DRIVE ASSY, PNEUMATIC (FOR DET SEE FIG. 7-17)	20722	1	C
		EJ51081	2	EMERGENCY DRIVE ASSY, PNEUMATIC (FOR DET SEE FIG. 7-17)	20722		D, E
7-1-8		4524704	2	EMERGENCY DRIVE CRANK	20722	1	A
7-1-9		EJ51027	2	FLOODLIGHT ASSY (FOR DET SEE FIG. 7-16)	20722	1	C
		EJ51082		FLOODLIGHT ASSY (FOR DET SEE FIG. 7-16)	20722		C, D, E
7-1-10		EJ51004	2	TRUNK ASSY MODEL CR-12 (FOR DET SEE FIG. 7-4)	20722	1	C
7-1-11		EJ51076		TRUNK ASSY MODEL	20722	1	D1
		EJ51111		CR-12B and CR-12B-P (FOR DET SEE FIG. 7-5)	20722		D2
		EJ51248					E
7-1-12		EJ40089	2	SOCKET WRENCH NOTE QTY REQD 1 PER SHIP. USED ON UPPER BEARING NUT FOR ADJUSTMENT OR REPAIR ONLY (NOT SHOWN)	20722	1	
7-1-13		EJ2466	2	SHIM, PAWL BASE (NOT SHOWN)	20722	AR	E
7-1-14		EJ2465	2	SHIM, HOLD DOWN BAR (NOT SHOWN)	20722	AR	E

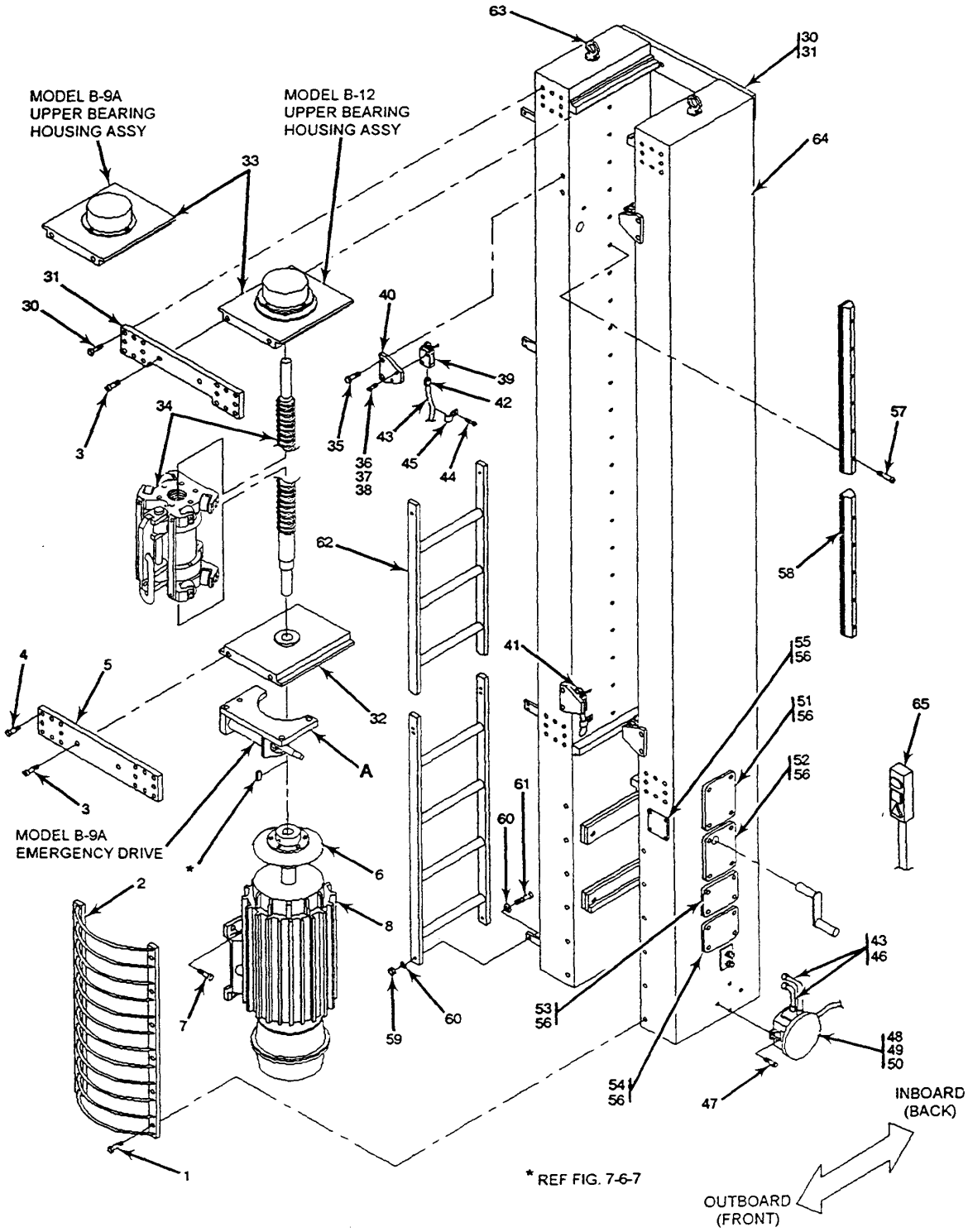


Figure 7-2. Sliding Padeye Assembly, Models B-9A, B-12 (Sheet 1 of 2)

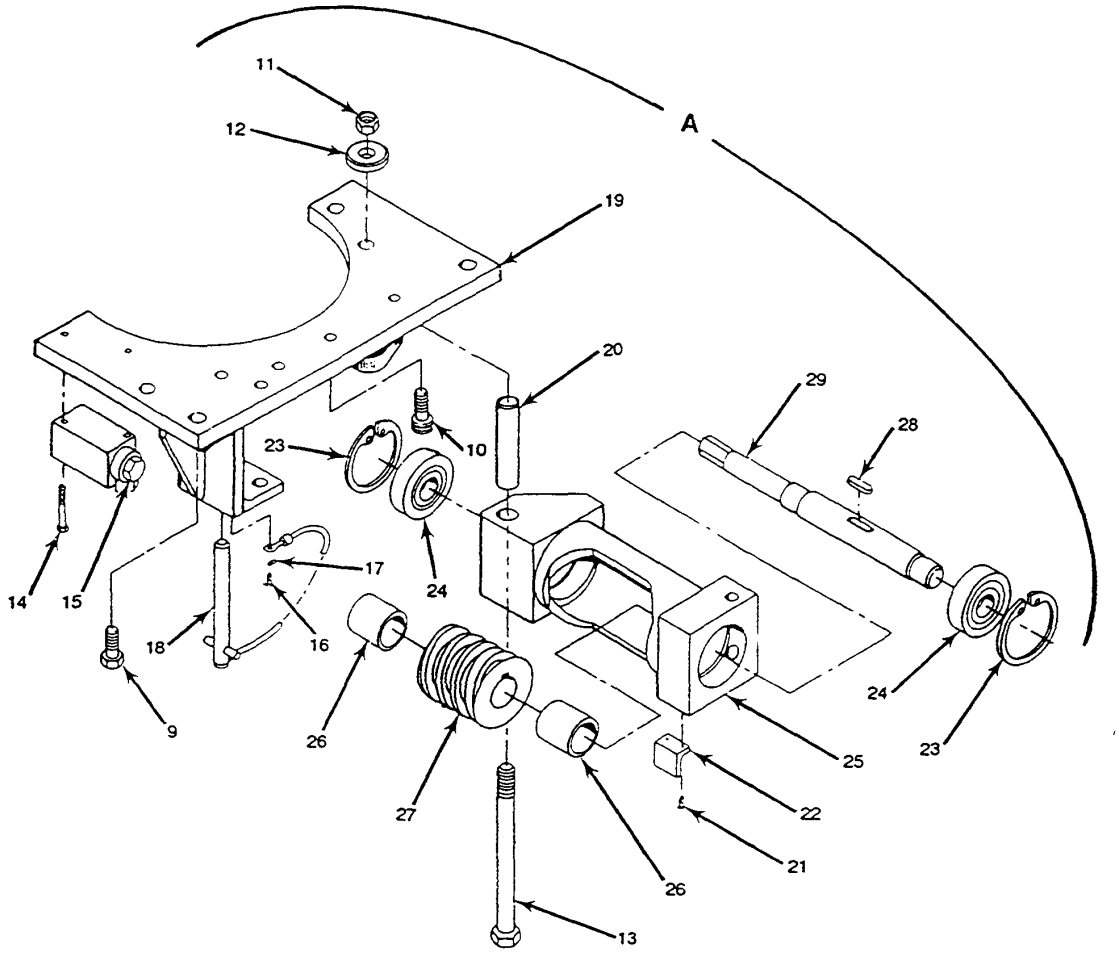


Figure 7-2. Sliding Padeye Assembly, Models B-9A, B-12 (Sheet 2 of 2)

Sliding Padeye Description (Model B-9A, B-12)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-2-0		EJ51061	1	SLIDING PADEYE ASSY, MODEL B-9A (BULKHEAD MOUNTED) (FOR NHA SEE FIG. 7-1-1)	20722	REF	A
		EJ51011	1	SLIDING PADEYE ASSY, MODEL B-12 (BULKHEAD MOUNTED) (FOR NHA SEE FIG. 7-1-1)	20722	REF	B
7-2-1		EJ11502	2	SCREW, HEX HD, 1/2-13UNC X 1 IN. L, CRES STL, NYLOCK	20722	12	
7-2-2		4563545	2	MOTOR GUARD (SHIELD)	80064	1	
7-2-3		EJ11514	2	SETSCREW, SCH, FLT PT, 3/4-10UNC X 2 1/4 IN. L, ZINC PL, STL	20722	8	
7-2-4		EJ10516	2	SCREW, CAP, SCH, 5/8-18 UNC X 1 1/2 IN. L, GR 8, CD PL, STL	20722	32	
7-2-5		EJ31001	2	TIE PLATE (LOWER)	20722	2	
7-2-6		EJ11006	2	FLEXIBLE COUPLING (1-3/8 IN. BORE, BOTH FLANGES)	20722	1	
		PX80BBS		ALTERNATE PART NO. (FOR DET SEE FIG. 7-6) APL 780350021	65456		
7-2-7		AN-12-14A	2	BOLT, AIRCRAFT, 3/4-16UNF X 1-21/32 IN. L, CD PL, STL	88044	4	
7-2-8		EJ11034	2	MOTOR AND BRAKE ASSY	20722	1	A
		EJ11005	2	MOTOR AND BRAKE ASSY APL 175506273 (FOR DET SEE FIG. 7-7)	20722		
		226F136 (DWG)	3	MOTOR, AC	20019	1	
		04-0024 (DWG)	3	MOTOR, AC	20019		
		5KR286NS401H	3	BRAKE, ELECTRIC	17904	1	
		EJ11005	2	MOTOR AND BRAKE ASSY APL 175505370 (FOR DET SEE FIG. 7-7)	20722		B
		198F131 (DWG)	3	MOTOR, AC	20019	1	
		5KR286NN489	3	BRAKE, ELECTRIC	17904	1	
			2	MOTOR AND BRAKE ASSY APL 175506273	20722	1	
		226F136 (DWG)	3	MOTOR, AC	20019	1	
		5KR286NS401H	3	BRAKE, ELECTRIC	17904		

Sliding Padeye Description (Model B-9A, B-12) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ41113	2	MANUAL (EMERGENCY) DRIVE ASSY (BUBBLE A)	20722	1	A
7-2-9		EJ10625	3	SCREW, HEX HD, 1/2-13UNC X 1 1/4 IN. L, CRES NYLOCK	20722	4	
7-2-10		EJ11518	3	SCREW, SCH, 3/8-16UNC X 1 IN. L, CRES, NYLOCK	20722	3	
7-2-11		EJ10558	3	NUT, HEX, SLFLKG, 1/213UNC	20722	1	
		MS51922-33		ALTERNATE PART NO.	96906		
7-2-12		4524728	3	WASHER	80064	1	
7-2-13		EJ10557	3	SCREW, HEX HD, 1/2-13UNC X 8 IN. L, ZN PL, STL	20722	1	
7-2-14		EJ11539	3	SCREW, RDH, 10-24 X 2 IN. L, CRES NYLOCK	20722	2	
7-2-15		EJ10031	3	SWITCH, LIMIT, LEVER TYPE	20722	1	
		6984H53A		ALTERNATE PART NO. APL 212102377	27192		
7-2-16		EJ10561	3	SCREW, RDH, NO. 5-40UNC X 5/16 IN. L, CRES	20722	1	
		AN515C-5-6		ALTERNATE PART NO.	88044		
7-2-17		EJ10562	3	WASHER, LOCK, NO. 5, CRES	20722	1	
7-2-18		4524726	3	PIN ASSY	80064	1	
7-2-19		4524717	3	BRACKET	80064	1	
7-2-20		4524727	3	BUSHING	80064	1	
7-2-21		EJ10544	3	SCREW, RHD, NO. 10-32 X 1/2 IN. L, CRES	20722	2	
		AN515C-10-8		ALTERNATE PART NO.	88044		
7-2-22		4524729	3	ANGLE	80064	1	
7-2-23		EJ10060	3	RING, RETAINING	20722	2	
		5000-244		ALTERNATE PART NO.	79136		
7-2-24		EJ10036	3	BEARING, BALL	20722	2	
		6305-2RS		ALTERNATE PART NO.	52676		
7-2-25		4524720	3	HOUSING, WORM	80064	1	
7-2-26		4524725	3	SPACER	80064	2	
7-2-27		EJ10034	3	WORM	20722	1	
		H1096		ALTERNATE PART NO.	71041		
7-2-28		EJ10035	3	KEY, ROUND END, 1/4 SQUARE X 1 1/2 IN. L, CRES	20722	1	
7-2-29		4524724	3	SHAFT, WORM	80064	1	
7-2-30		EJ11501	2	SCREW, SCH, 5/8-18UNF X 2 IN. L, CD PL STL, GR 8	20722	32	
7-2-31		EJ31002	2	TIE PLATE, UPPER	20722	2	
7-2-32		NO NUMBER	2	LOWER BEARING HOUSING ASSY (FOR DET SEE FIG. 7-8)	20722	1	
7-2-33		NO NUMBER	2	UPPER BEARING HOUSING ASSY (FOR DET SEE FIG. 7-9)	20722	1	

Sliding Padeye Description (Model B-9A, B-12) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-2-34		EJ51065	2	CARRIAGE ASSY MODEL B-9A (FOR DET SEE FIG. 7-10)	20722	1	A
		EJ51012		CARRIAGE ASSY MODEL B-12 (FOR DET SEE FIG. 7-10)	20722		B
7-2-35		EJ11515	2	SCREW, HEX HD, 5/16-18UNC X 1 IN. L, CRES	20722	8	
7-2-36		EJ10506	2	NUT, HEX, SLFLKG, 10-32, CRES	20722	8	
7-2-37		EJ11519	2	SCREW, RDH, 10-32 X 21/2 IN. L, CRES (FOR 4LS AND 5LS)	20722	8	
7-2-38		EJ11521	2	SCREW, RDH, 10-32 X 3 IN. L, CRES (FOR 2LS AND 31, S)	20722	4	
7-2-39		EJ10031	2	SWITCH, LIMIT, ROLLER	20722	4	B
				LEVER		5	A
		6984H53A		ALTERNATE PART NO. APL 212102377	27192		
7-2-40		4524752	2	BRACKET	80064	4	
7-2-41		EJ21022	2	SHIM, LIMIT SWITCH BRACKET (USED ON LOWER LIMIT SWITCHES ONLY)	20722	2	
7-2-42		EJ11030	2	CONNECTOR ELECT., STR	20722	5	A
		CT01501		ALTERNATE PART NO.	50619		
		EJ10006		CONNECTOR, ELECT., STR	20722		B
		CGB-294		ALTERNATE PART NO.	15235		
7-2-43		EJ11029	2	CABLE, ELECT., MIL-C-915	20722	AR	A
		TSS-3		ALTERNATE PART NO.	78310		
		EJ10088		CABLE, ELECT., MIL-C-915	20722		B
		THOF-3		ALTERNATE PART NO.	78310		
7-2-44		EJ10505	2	SCREW, RHD, 10-32 X 3/4 IN. L, CRES	20722	5 9	A B
		AN515C-10-12		ALTERNATE PART NO.	88044		
7-2-45		EJ10009	2	CLAMP, LOOP TYPE, CUSHIONED, FOR 1/2 IN. CABLE	20722	5 8	A B
		TA716		ALTERNATE PART NO.	84971		
7-2-46		EJ11031	2	CONNECTOR, PLUG, ELECT.	20722	5	A
		CT01499		ALTERNATE PART NO.	50619		
		EJ10012		CONNECTOR, PLUG, ELECT.	20722	4	B
		CGB-194		ALTERNATE PART NO.	15235		
7-2-47		EJ10584	2	SCREW, CAP, HEX HD, 3/816UNC X 1 IN. L, CRES, NYLOCK	20722	3	
7-2-48		EJ10022	2	CAP, TERMINAL BOX	20722	1	
		MS25043-240		ALTERNATE PART NO.	96906		
7-2-49		EJ41107	2	TERMINAL BOX ASSY	20722	1	A
		EJ41015		TERMINAL BOX ASSY	20722		B
7-2-50		EJ10007	2	LUG, TERMINAL	20722	24	

Sliding Padeye Description (Model B-9A, B-12) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		16-8-10		ALTERNATE PART NO.	89020		
7-2-51		EJ31127	2	PLATE, LUBE CHART	20722	1	A
		EJ31015		PLATE, LUBE CHART	20722		B
7-2-52		EJ31126	2	PLATE, INSTRUCTION	20722	1	A
		EJ31014		PLATE, INSTRUCTION	20722		B
7-2-53		EJ31129	2	PLATE, ELECT. SCHEMATIC	20722	1	A
		EJ31019		PLATE, ELECT. SCHEMATIC	20722		B
7-2-54		EJ31128	2	PLATE, WIRING DIAGRAM	20722	1	A
		EJ31017		PLATE, WIRING DIAGRAM	20722		B
7-2-55		EJ21026	2	PLATE, IDENT	20722	1	A
		EJ21023		PLATE, IDENT	20722		B
7-2-56		EJ10623	2	SCREW, PAN HD, 8-32 X 3/8 IN. L, CRES (FOR PLATES, INDEX NOS 51-55) (AP)	20722	28 32	A B
		MS35233-43		ALTERNATE PART NO.	96906		
7-2-57		EJ10536	2	SCREW, SCH, 5/8-11UNC X 2 1/4 IN. L, CD PL STL, NYLOCK	20722	44 56	A B
7-2-58		4524734-1	2	GUIDE	80064	2	A
		4524734-2		GUIDE	80064	2	B
7-2-59		EJ11536	2	NUT, HEX, SLFLKG, 3/816UNC, CRES	20722	12	
7-2-60		EJ11537	2	WASHER, FLAT, 3/8 IN., CRES	20722	24	
		MS15795-314		ALTERNATE PART NO.	96906		
7-2-61		EJ11535	2	SCREW, CAP, HEX HD, 3/816UNC X 1 1/4 IN. L, CRES	20722	12	
		MS35307-362		ALTERNATE PART NO.	96906		
7-2-62		EJ41106	2	LADDER	20722	1	A
		EJ31013		LADDER	20722		B
7-2-63		EJ21034	2	LIFTING EYE	20722	2	
		EJ11538	2	BOLT, HEX HD, 1-8UNC X 1 1/4 IN. L, GR 3, ZN PL (AP)	20722	2	
7-2-64		EJ51062	2	KINGPOST ASSY	20722	1	A
		EJ51020		KINGPOST ASSY	20722		B
7-2-65		EJ41109	2	CONTROL STATION ASSY MODEL B-9A (FOR DET SEE FIG. 7-12)	20722	1	A
		EJ40090		CONTROL STATION ASSY MODEL B-12 (FOR DET SEE FIG. 7-12)	20722	1	B

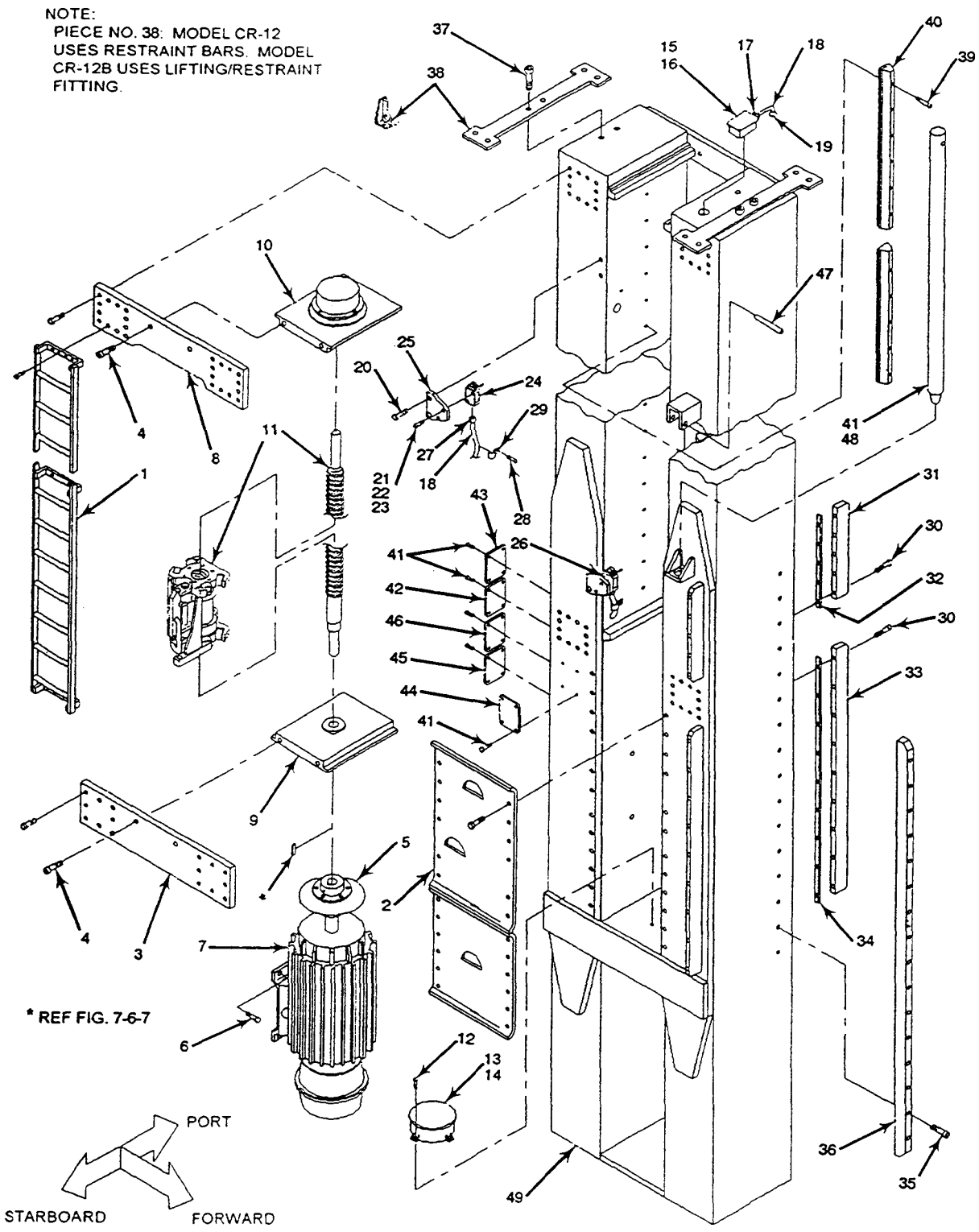


Figure 7-3. Sliding Padeye Assembly, Models CR-12, CR-12B CR-12B-P

Sliding Padeye Description (Models CR-12, CR-12B , CR-12B-P)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-3-0		EJ51002	1	SLIDING PADEYE ASSY, MODEL CR-12 (RETRACT-ABLE) (FOR NHA SEE FIG. 7-1-2)	20722	REF	C
		EJ51071	1	SLIDING PADEYE ASSY MODEL CR-12B (RETRACT-ABLE) (FOR NHA SEE FIG. 7-1-2)	20722	REF	D
		EJ51244				E	
7-3-1		EJ31003	2	LADDER	20722	1	C
		EJ31142′				D, E	
		EJ10570	2	SCREW, HEX HD, CRES, 5/16-18 X 3/4 IN. L, NYLOCK (AP)	20722	9	C
7-3-2		EJ41002	2	COVER, MOTOR, STBD SIDE, W/WARNING PLATE (EJ20088)	20722	1	C
		EJ41124	COVER, MOTOR, STBD SIDE, W/WARNING PLATE (EJ21234)		20722	D, E	
		EJ11502	2	SCREW, CAP, HEX HD, CRES, 1/2-13 X 1 IN. L, NYLOCK (AP)	20722	38	C
		EJ11610				26	D, E
		EJ41005	2	COVER, MOTOR, PORT SIDE, LOWER, W/WARNING PLATE (EJ20088)	20722	1	C
		EJ41125	2	COVER, MOTOR, PORT SIDE, LOWER, W/WARNING PLATE (EJ21234)	20722	1	D, E
		EJ11502	2	SCREW, CAP, HEX HD, CRES, 1/2-13 X 1 IN. L, NYLOCK (AP)	20722	12	C
		EJ11610					D, E
		EJ41001	2	COVER, MOTOR, PORT SIDE, UPPER W/WARNING PLATE (EJ20088)	20722	1	C
		EJ41123	2	COVER, MOTOR, PORT SIDE, UPPER W/WARNING PLATE (EJ21234)	20722	1	D, E
		EJ11502	2	SCREW, CAP, HEX HD, CRES 1/2-13 X 1 IN. L, NYLOCK (AP)	20722	14	C
		EJ11610					D, E
7-3-3		EJ31001	2	TIE PLATE, LOWER	20722	2	C

Sliding Padeye Description (Models CR-12, CR-12B , CR-12B-P) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ31140					D, E
		EJ10516	2	SCREW, SCH, 5/8-18 X 1 1/2 IN. L, CAD PL, GR 8 OR 9, NYLOCK(AP)	20722	32	C
		EJ11612	2	SCREW, ALLEN SOCKET HD, 5/8–18 X 1–1/2 IN. L, NYLOCK	20722	32	D, E
7-3-4		EJ11514	2	SCREW, SET SCH, 3/4-10 X 2-1/4 IN. L, FLAT POINT, GR 8, NYLOCK	20722	8	C
		EJ11553	2	SCREW, SET SCH, 3/4-10 X 2-1/4 IN. L, FLAT POINT, GR 8, NYLOCK	20722	8	D, E
7-3-5		EJ11006	2	COUPLING, FLEXIBLE, 1 3/8 IN. BORE BOTH FLANGES	20722	1	
		PX80BBS		ALTERNATE PART NO. (FOR DET SEE FIG. 7-6) APL 780350021	65456		
7-3-6		EJ11516	2	SCREW, HEX HD, 3/4-10 X	20722	4	C
		EJ11557		1 1/2 IN. L, NYLOCK			D, E
		EJ11517	2	WASHER, LOCK, CD PL (AP)	20722	4	C
7-3-7		EJ11005	2	MOTOR AND BRAKE ASSY	20722	1	C
		EJ11034		(FOR DET SEE FIG. 7-7)	20722		D, E
7-3-8		EJ31027	2	TIE PLATE, UPPER	20722	2	C
		EJ31141					D, E
		EJ11501	2	SCREW, SCH, 5/8-18 X 2 IN. L, CAD PL, GR 8 OR 9, NYLOCK (AP)	20722	48	C
		EJ11609	2	SCREW, ALLEN SOCKET HD, 5/8-18 X 2 IN. LG, GR 8 OR 9, NYLOCK	20722	48	D, E
7-3-9		NO NUMBER	2	LOWER BEARING HOUSING ASSY (FOR DET SEE FIG. 7-8)	20722	1	
7-3-10		NO NUMBER	2	UPPER BEARING HOUSING ASSY (FOR DET SEE FIG. 7-9)	20722	1	
7-3-11		EJ51003	2	CARRIAGE ASSY (FOR DET SEE FIG. 7-11)	20722	1	C
		EJ51072		CARRIAGE ASSY (FOR DET SEE FIG. 7-11)	20722		D , E
7-3-12		EJ11584	2	SCREW, HEX HD, 316 CRES, 3/8-16 X 1 IN. L, NYLOCK	20722	3	C
		EJ11558		SCREW, HEX HD, 316 CRES, 3/8-16 X 1 IN. L, NYLOCK	20722		D , E
7-3-13		EJ41017	2	TERMINAL BOX	20722	1	
7-3-14		EJ10007	3	LUG, TERMINAL	20722	24	
		16-8-10		ALTERNATE PART NO.	89020		

Sliding Padeye Description (Models CR-12, CR-12B , CR-12B-P) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-3-15		EJ10526	2	SCREW, HEX HD, 316 CRES, 1/4-20 X 1/2 IN. L, NYLOCK	20722	4	C
		EJ11562		SCREW, HEX HD, 316 CRES, 1/4-20 X 1/2 IN. L, NYLOCK	20722	4	D , E
7-3-16		EJ11018	2	RECEPTACLE, SYM 1099.1, MIL-R-2726137	20722	1	
7-3-17		EJ11019	2	CONNECTOR ELECT.	20722	1	
		CGB194-	36	ALTERNATE PART NO.	15235		
7-3-18		EJ10088	2	CABLE, ELECTRIC, MIL-C-915	20722	120 FT	C
		FHOF-9		ALTERNATE PART NO.	81349		C
		EJ11029		CABLE, ELECT., MIL-C-915	20722		D, E
		TSS-3		ALTERNATE PART NO.	81349		C
7-3-19		EJ10012	2	CONNECTOR, ELECT., STR	20722	9	
		CGB-194		ALTERNATE PART NO.	15235		
7-3-20		EJ11515	2	SCREW, HEX HD, 316 CRES, 5/16-18 X 1 IN. L, NYLOCK	20722	8	C
		EJ11554		SCREW, HEX HD, 316 CRES, 5/16-18 X 1 IN. L, NYLOCK	20722		D, E
7-3-21		EJ10506	2	NUT, HEX, 316 CRES, 1032 SLFLKG	20722	8	C
		EJ11556		NUT, HEX, 316 CRES, 1032 SLFLKG	20722		D , E
7-3-22		EJ11515	2	SCREW, RDH, 316 CRES, 10-32 X 2 1/2 IN. L (4LS AND 5LS)	20722	4	C
		EJ11555		SCREW, RDH, 316 CRES, 10-32 X 2 1/2 IN. L (4LS AND 5LS)	20722		D , E
7-3-23		EJ11521	2	SCREW, RDH, 316 CRES, 10-32 X 3 IN. L (FOR 2LS AND 3LS)	20722	4	C
		EJ11547		SCREW, RDH, 316 CRES, 10-32 X 3 IN. L (FOR 2LS AND 3LS)	20722		D , E
7-3-24		EJ10031	2	SWITCH, LIMIT, ROLLER LEVER APL 212102377	20722	4	C, D, E1
		6984H53A		ALTERNATE PART NO.	27192		C, D, E1
		EJ22114		SWITCH, LIMIT, ROLLER LEVER			E2, E3
7-3-25		4524752	2	BRACKET, LIMIT SWITCH	20722	4	C
		EJ21233		BRACKET, LIMIT SWITCH	20722		D , E
7-3-26		EJ21022	2	SHIM, LIMIT SWITCH (USED ON LOWER LIMIT SWITCHES ONLY)	20722	2	C
		EJ21242		SHIM, LIMIT SWITCH (USED ON LOWER LIMIT SWITCHES ONLY)	20722		D
7-3-27		EJ10006	2	CONNECTOR, ELECT., STR	20722	4	

Sliding Padeye Description (Models CR-12, CR-12B , CR-12B-P) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		CGB-294		ALTERNATE PART NO.	15235		
7-3-28		EJ10505	2	SCREW, RDH, 316 CRES, 10-32 X 3/4 IN. L, NYLOCK	20722	6	C
		EJ11559		SCREW, RDH, 316 CRES, 10-32 X 3/4 IN. L, NYLOCK	20722		D , E
7-3-29		EJ10009	2	CLAMP, LOOP TYPE, CUSHIONED FOR 1/2 IN. CABLE	20722	6	
		TA716		ALTERNATE PART NO.	84971		
7-3-30		EJ11520	2	SCREW, SCH, 316 CRES, 3/8-16 X 3 1/2 IN. L, NYLOCK	20722	28	C
		EJ11548		SCREW, SCH, 316 CRES, 3/8-16 X 3 1/4 IN. L, NYLOCK	20722		D , E
7-3-31		EJ31030	2	GUIDE, UPPER, ATHWARTSHIP	20722	2	C
		EJ21244		GUIDE, UPPER, ATHWARTSHIP	20722		D , E
7-3-32		EJ21039	2	SHIM, UPPER	20722	8	
7-3-33		EJ21243	2	GUIDE, LOWER, ATHWARTSHIP	20722	2	D, E
7-3-34		EJ21040	2	SHIM, LOWER	20722	8	
7-3-35		EJ11531	2	SCREW, SCH, 316 CRES, 5/16-18 X 3/4 IN. L,	20722	42	C
		EJ11552		NYLOCK	20722		D , E
7-3-36		EJ31031	2	GUIDE, FORE AND AFT	20722	2	C
		EJ31152		GUIDE, FORE AND AFT	20722		D , E
7-3-37		EJ11546	2	SCREW, SCH, 1-8 UNC X 2 IN. L, GR 8, NYLOCK	20722	4	C
7-3-38		EJ31012	2	BAR, RESTRAINT	20722	2	C
		EJ20097	3	PLATE, INST	20722	2	C
				NOTE: FOR LIFTING SLIDING PADEYE (KINGPOST) ASSY DURING REMOVAL/INSTALLATION, RESTRAINT BARS ARE REPLACED WITH:			
		EJ31025	2	LIFTING FITTING	20722	2	C
		EJ31151	2	LIFTING FITTING, FWD	20722	1	D
		EJ31526	2	LIFTING FITTING, FWD	20722	1	E
		EJ31150	2	LIFTING FITTING, AFT	20722	1	D1, D2
		EJ31525	2	LIFTING FITTING, AFT	20722	1	D3, D4
7-3-39		EJ10536	2	SCREW, SCH, 5/8-11 X 2–1/4 IN. L, GR 8, NYLOCK	20722	56	C

Sliding Padeye Description (Models CR-12, CR-12B , CR-12B-P) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ11549-2	SCREW, SCH, 5/8-11 X 2–1/4 IN. L, GR 8, NYLOCK		20722	56	D , E
7-3-40		4524734-2	2	GUIDE	20722	2	
7-3-41		EJ10623	2	SCREW, PAN HD, 316 CRES,8-32 X 3/8 IN. L	20722	30	C
		EJ11608	2	SCREW, PAN HD, 316 CRES,8-32 X 3/8 IN. L		18	D , E
7-3-42		EJ31014	2	PLATE, OPERATING, INST	20722	1	C ,D, E
		EJ31148		PLATE, OPERATING, INST	20722		C,D, E
7-3-43		EJ31016	2	PLATE, LUBRICATION CHART	20722	1	C
		EJ31434		PLATE, LUBRICATION CHART	20722		D , E
7-3-44		EJ21024	2	PLATE, IDENT	20722	1	C
		EJ21241		PLATE, IDENT	20722		D
		EJ21469		PLATE, IDENT	20722		E
7-3-45		EJ31018	2	PLATE, WIRING DIAGRAM	20722	1	C
7-3-46		EJ31020		PLATE, ELECT. SCHEMATIC	20722	1	C
7-3-47		EJ11007	2	VARI-PIN AND CHAIN	20722	2	
7-3-48	*	EJ41026	2	BRACE, LIFTING	20722	2	C
		EJ41130	2	BRACE, LIFTING	20722	2	D
		EJ41348	2	BRACE, LIFTING	20722	2	E
7-3-49		EJ51006	2	KINGPOST ASSEMBLY	20722	1	C
		EJ51073		KINGPOST ASSEMBLY	20722		D
		EJ51245		KINGPOST ASSEMBLY	20722		E

*Part No. EJ41026 modified by NAVSEA dwg no. 6887433 when SHIPALT CG47-438 installs new kingpost locking pawls (figure 7-15).

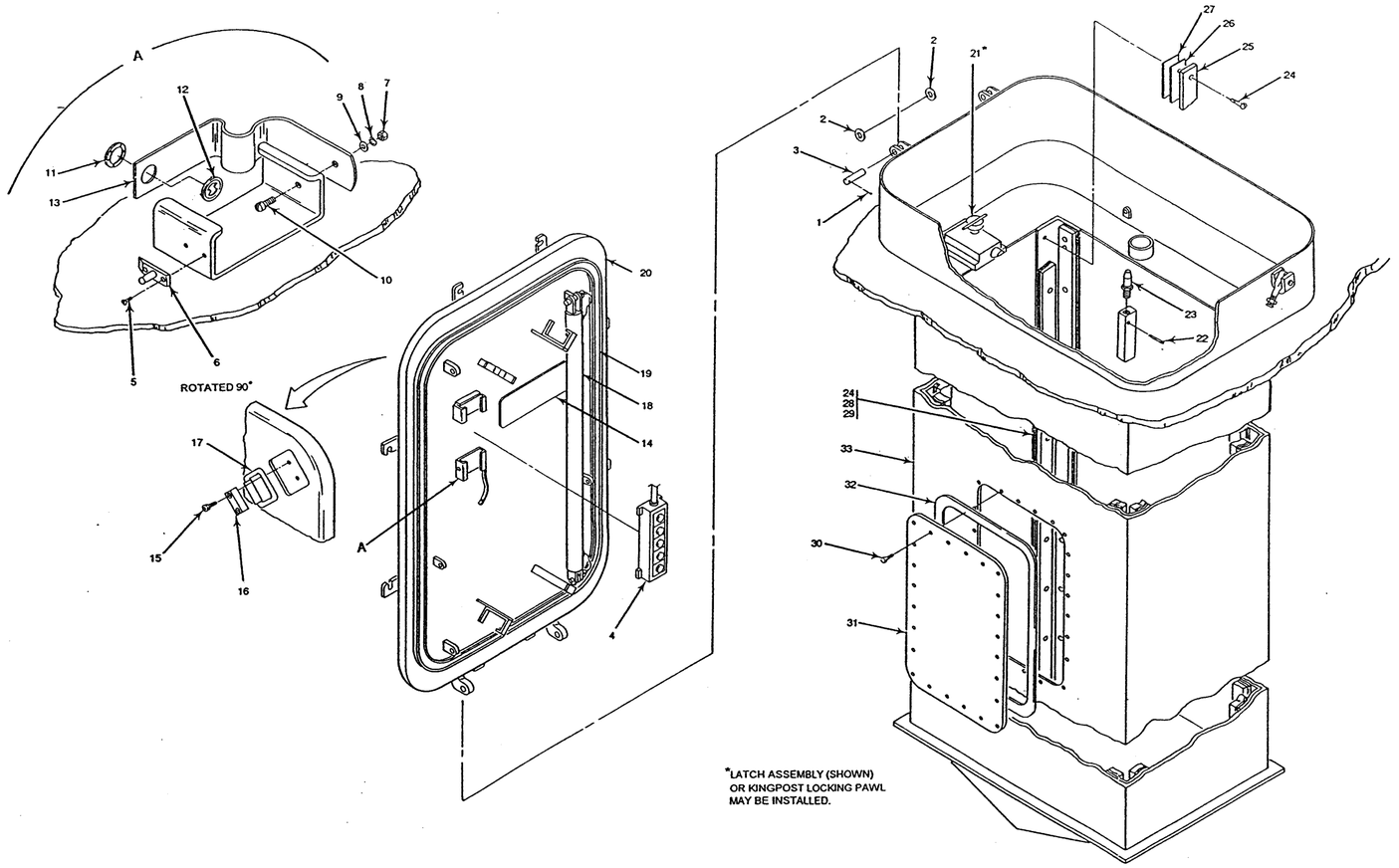


Figure 7-4. Trunk Assembly, Model CR-12

Trunk Description (Model CR-12)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-4-0		EJ51004	1	TRUNK ASSY, MODEL CR12 (FOR NHA SEE FIG. 7-1-10)	20722	REF	C
7-4-1		EJ10095	2	COTTER PIN, HINGE PIN	20722	2	
		805-1624071-64		ALTERNATE PART NO.	80064		
		MS9245-65		ALTERNATE PART NO.	96906		
7-4-2		EJ10094	2	WASHER, FLAT	20722	AR	
		MS27183-20		ALTERNATE PART NO.	96906		
7-4-3		EJ10093	2	PIN, HINGE, 3/16 DIA X 1-9/16 IN. L	20722	2	
		805-1624071-62		ALTERNATE PART NO.	80064		
7-4-4		EJ31029	2	CONTROL STATION ASSY (SEE FIG. 7-13 FOR DET)	20722	1	
		EJ30068	2	STOWAGE BRACKET ASSY (BUBBLE A)	20722	1	
7-4-5		EJ10099	3	SCREW, FLT HD, NO. 832 UNC X 1/4 IN. L, CRES	20722	2	
7-4-6		EJ10100	3	STUD, TWO-SCREW BASE	20722	1	
		MS27977-6B		ALTERNATE PART NO.	96906		
7-4-7		EJ10101	3	NUT, HEX	20722	1	
		MS35650-354		ALTERNATE PART NO.	96906		
7-4-8		EJ10103	3	WASHER, LOCK	20722	1	
		MS35338-156		ALTERNATE PART NO.	96906		
7-4-9		EJ10102	3	WASHER, FLAT, WOOD	20722	1	
		AN970-3		ALTERNATE PART NO.	88044		
7-4-10		EJ10104	3	SCREW, PAN HEAD	20722	1	
		MS51958-45		ALTERNATE PART NO.	96906		
7-4-11		EJ10106	3	PLATE, CLINCH	20722	1	
		MS27977-3B		ALTERNATE PART NO.	96906		
7-4-12		EJ10105	3	SOCKET	20722	1	
		MS27977-2B		ALTERNATE PART NO.	96906		
7-4-13		EJ10107	3	WEBBING, NYLON, MIL-W27657, TYPE 1, 0.0800.090 THK X 3/4 WIDE X 9 IN. L	20722	1	
7-4-14		EJ41030	2	PLATE, INSTRUCTION, ERECT/RETRACT (FOR SLIDING PADEYES WITH LATCH, P/N EJ41011 INSTALLED)	20722	1	
		6902185		PLATE, INSTR, ERECT/RETRACT (FOR SLIDING PADEYES WITH KINGPOST LOCKING PAWL, P/N 6819301 INSTALLED)	53711	1	

Trunk Description (Model CR-12) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-4-15		NO NUMBER	2	SCREW (AP)	20722	4	
7-4-16		NO NUMBER	2	RETAINER (AP)	20722	2	
7-4-17		NO NUMBER	2	HANDLE, GRAB	20722	2	
7-4-18		NO NUMBER	2	SUPPORT, HATCH	20722	2	
7-4-19		NO NUMBER	2	GASKET, NEOPRENE 40-50 DUR, PER MIL-R-900	20722	1	
7-4-20		EJ41021	2	HATCH ASSY	20722	1	
7-4-21		EJ41011	2	LATCH ASSY (FOR DET SEE FIG. 7-14)	20722	2	
		6819301 (DWG)	2	KINGPOST LOCKING PAWL ASSY REPLACES LATCH ASSY, PART NO. EJ41011 (ECP 47-4814 AND SHIPALT CG 47-438) (FOR DET SEE FIG. 7-15)	53711	2	
		EJ51004	2	TRUNK ASSY, MODEL CR-12	20722	1	
7-4-22		EJ11504	3	PIN, SPRING, 3/16 X 2-3/4 IN. L, CRES	20722	2	
7-4-23		EJ21016	3	PIN, CARRIAGE SUPPORT	20722	2	
7-4-24		EJ10641	3	SCREW, BUTTON HD, 5/1618UNC-3A X 3/4 IN. L, CRES, NYLOCK	20722	216	
7-4-25		EJ31057	3	GUIDE, UPPER	20722	8	
7-4-26		EJ21086	3	SHIM, UPPER	20722	24	
7-4-27		EJ21087	3	SHIM, UPPER	20722	8	
7-4-28		EJ31058	3	GUIDE, LOWER	20722	32	
7-4-29		EJ21084	3	SHIM, LOWER	20722	96	
		EJ21085		SHIM, LOWER	20722	32	
7-4-30		EJ10584	3	SCREW, CAP, HEX RD 3/816UNC X 1 IN. L, CRES, NYLOCK	20722	40	
7-4-31		EJ41019	3	PANEL, ACCESS	20722	1	
7-4-32		EJ41020	3	GASKET, ACCESS PANEL	20722	1	
7-4-33		EJ51005	3	TRUNK WELDMENT	20722	1	

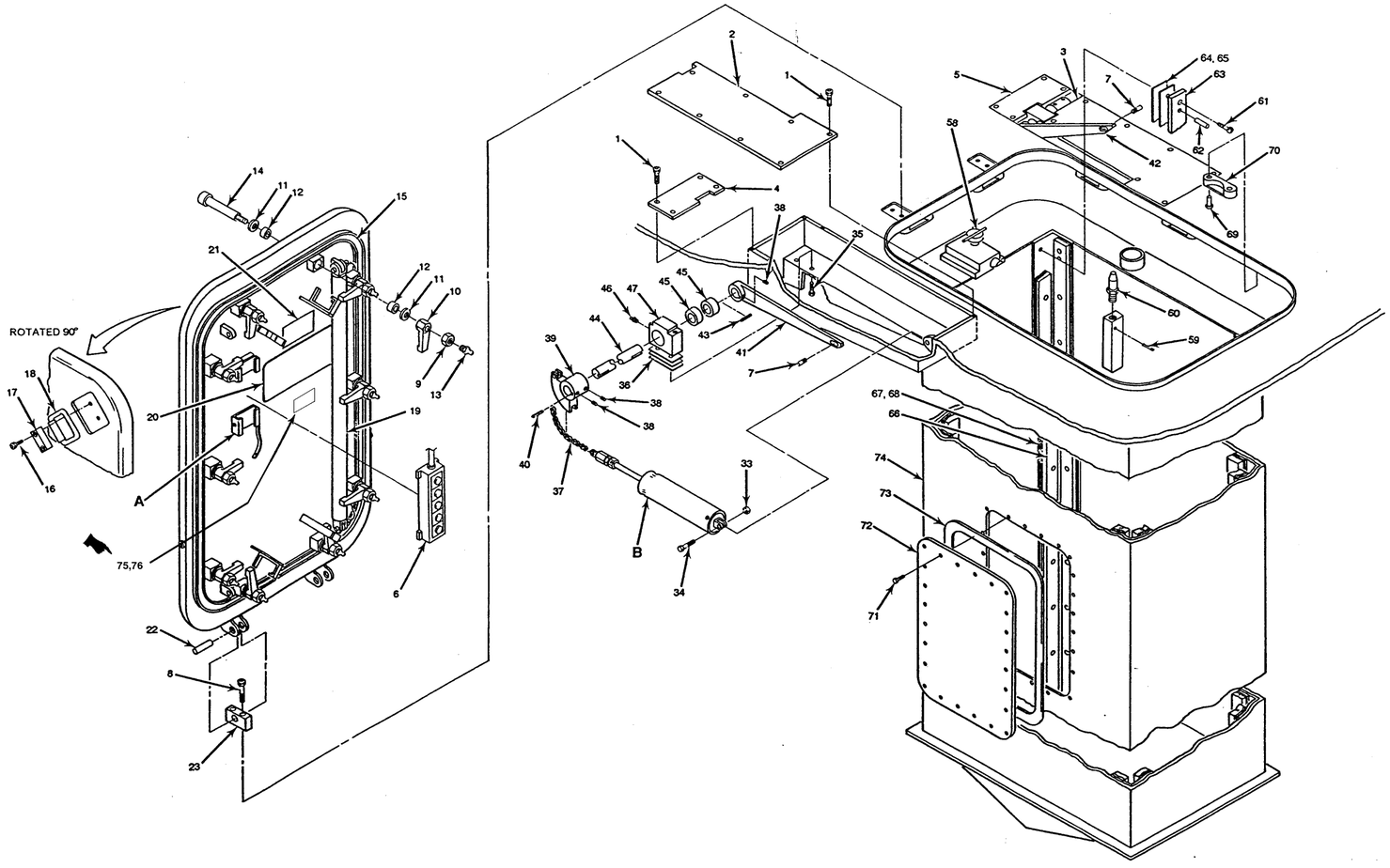


Figure 7-5. Trunk Assembly, Model CR-12B and CR-12B-P (Sheet 1 of 2)

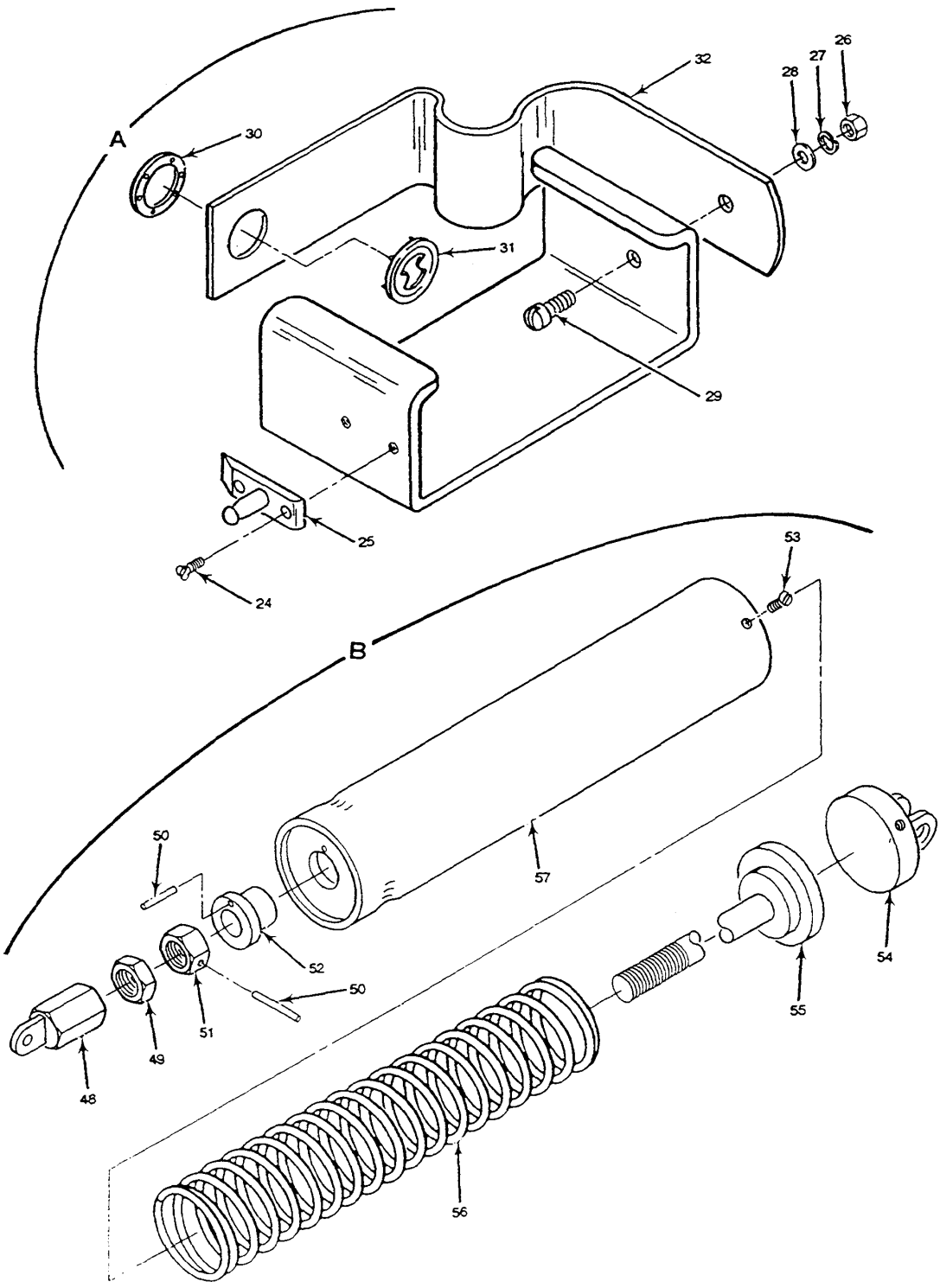


Figure 7-5. Trunk Assembly, Model CR-12B and CR-12B-P (Sheet 2 of 2)

Trunk Description (Model CR-12B)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-5-0		EJ51076	1	TRUNK ASSY, MODEL CR12B, (FOR NHA FIG. 7-1-11)	20722	REF	D1
		EJ51111		TRUNK ASSY, MODEL CR12B, (FOR NHA FIG. 7-1-11)	20722	REF	D2
		EJ51248		TRUNK ASSY, MODEL CR12B, (FOR NHA FIG. 7-1-11)	20722	REF	D2
7-5-1		EJ11392	2	SCREW, 82 DEG, CSCK, SCH CRES 3/8-16 X 1, NYLOCK	20722	24	
7-5-2		EJ21270-2	2	COVER, FWD, RH	20722	1	
7-5-3		EJ21270-1	2	COVER, FWD, LH	20722	1	
7-5-4		EJ31161-2	2	COVER, AFT, RH	20722	1	
7-5-5		EJ31161-1	2	COVER, AFT, LH	20722	1	
7-5-6		EJ31197	2	CONTROL STATION ASSY (SEE FIG. 7-13 FOR DET)	20722	1	
7-5-7		EJ11586	2	PIN, SPRING, CRES	20722	2	
		MS171777		ALTERNATE PART NO.	96906		
7-5-8		EJ11591	2	SCREW, 82 DEG, CSCK, GR 8, 1/2-13 X 1 IN.	20722	4	
		EJ51079	2	HATCH ASSY	20722	1	D
		EJ51251	2	HATCH ASSY	20722	1	E
7-5-9		EJ11584	3	NUT, SLFLKG, 316 CRES, 3/4-10UNC, REG. HT. HEX	20722	10	
7-5-10		EJ31160		DOG	20722	10	
7-5-11		EJ11583		THRUST WASHER, BRONZE	20722	20	
		TB1624		ALTERNATE PART NO.	08094		
7-5-12		EJ11582		BUSHING, BRONZE	20722	20	
		M1620-6		ALTERNATE PART NO.	08094		
7-5-13		EJ10565	3	GREASE FITTING, CRES, 1/8 NPT	20722	10	D1
		EJ11635	3	GREASE FITTING, CRES, 1/8 NPT	20722	10	D2, E
7-5-14		EJ21266		SPINDLE	20722	10	
7-5-15		EJ11581		GASKET, NEOPRENE, 40-50 DUR, PER MIL-R-900	20722	1	
7-5-16		EJ11585	3	SCREW, 82 DEG, CSCK, SCH, 316 CRES, 3/8-16 X 1/2 IN. L NYLOCK	20722	4	
7-5-17		EJ21268		RETAINER	20722	2	
7-5-18		EJ21267		HANDLE, GRAB	20722	2	
7-5-19		EJ21101	3	BRACE 2	20722		
7-5-20		EJ41143	3	PLATE, INSTRUCTION	20722	1	D1
		EJ41030		PLATE, INSTRUCTION	20722		D2
		EJ41349		PLATE, INSTRUCTION	20722		E
7-5-21		EJ31165	3	PLATE, WARNING	20722	1	
7-5-22		EJ21105	2	PIN, HINGE	20722	2	
7-5-23		EJ21106	2	RETAINER	20722	2	D1
		EJ21271		RETAINER	20722		D2, E

Trunk Description (Model CR-12B) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ30068	2	STOWAGE BRACKET ASSY (FOR FIVE ELEMENT CONTROL STATION) (BUBBLE A)	20722	1	
7-5-24		COML	3	SCREW, FLH, 8-32UNC X 11/4 IN. L, CRES		2	
7-5-25		MS27977-6B	3	STUD	96906	1	
7-5-26		MS35650-354	3	NUT, HEX	96906	1	
7-5-27		MS35338-156	3	WASHER, LOCK	96906	1	
7-5-28		AN970-3	3	WASHER, FLAT	88044	1	
7-5-29		MS51958-45	3	SCREW, PAN HD	96906	1	
7-5-30		MS27977-3B	3	PLATE, CLINCH	96906	1	
7-5-31		MS27977-2B	3	SOCKET	96906	1	
7-5-32		EJ10107	3	WEBBING, NYLON, MIL-W27657, TYPE I, 0.0800.090 THK X 3/4 WIDE X 9 IN. L	20722	1	
7-5-33		EJ11596	2	NUT, SLFLKG, CRES, 3/816UNC	20722	2	
7-5-34		EJ11595	2	SCREW, CAP, HEX HD, CRES, 3/8-16UNC X 1-1/4 IN. L	20722	2	
7-5-35		EJ11597	2	SCREW, HEX HD, CRES, 1/2-13 X 1-1/4 IN. L,	20722	4	
7-5-36		EJ21096	2	SHIM, PIVOT BLOCK	20722	AR	
7-5-37		EJ11590	2	CHAIN, ROLLER, NO. 50, CRES, 13 PITCHES W/CON. LINK EA END	20722	2	
7-5-38		EJ11594	2	SETSCREW, SCH, CRES 5/16-18 X 3/8 IN. L, NYLOCK	20722	6	
7-5-39		EJ31162	2	ACTUATOR	20722	2	
7-5-40		EJ21108-2	2	KEY, 3/8 SQ X 3 1/4 IN. L, ONE END ROUND	20722	2	
7-5-41		EJ31064-1	2	CRANK, SPRING, RH	20722	1	
7-5-42		EJ31064-2	2	CRANK, SPRING, LH	20722	1	
7-5-43		EJ21108-1	2	KEY, 3/8 SQ X 1 5/8 IN. L, ONE END ROUND	20722	2	
7-5-44		EJ21272	2	SHAFT	20722	2	
7-5-45		EJ11035	2	BUSHING, BRONZE 1-1/2 X 1-3/4 X 1 IN.	20722	4	
		B2428-8		ALTERNATE PART NO.	08094		
7-5-46		EJ10565	2	FITTING, LUBE	20722	2	
		EJ11636	2	FITTING, LUBE	20722	2	D2, E
7-5-47		EJ31163	2	PIVOT BLOCK	20722		
		EJ31157	2	SPRING, CARTRIDGE ASSY (BUBBLE B)	20722		
7-5-48		EJ21262	3	FITTING, ROD END	20722	1	
7-5-49		EJ11577	3	NUT, JAM, 1/2-20UNF, CRES	20722	1	

Trunk Description (Model CR-12B) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-5-50		EJ11579	3	PIN, SPRING, CRES, 1/8 X 3/4 IN. L	20722	2	
7-5-51		EJ11576	3	NUT, HEX, 1/2-20UNF, CRES	20722	1	
7-5-52		EJ21093	3	BUSHING	20722	1	
7-5-53		EJ11578	3	SCREW, BUTTON HD, CRES, 5/16-18UNC X 3/8 IN. L, NYLOCK	20722	4	
7-5-54		EJ21261	3	END PLUG, CARTRIDGE	20722	1	
7-5-55		EJ21092	3	PLUNGER	20722	1	
7-5-56		EJ21260	3	SPRING	20722	1	
7-5-57		EJ31158	3	CONTAINER, SPRING	20722	1	
7-5-58		EJ41141	2	LATCH ASSY (SEE FIG. 7-14 FOR DET)	20722	2	D
		EJ31524	2	PAWL ASSY (SEE FIG. 7–15 FOR DET)	20722	2	E
7-5-59		EJ11504	2	PIN, SPRING, CRES, 3/16 X 2 1/4 IN. L	20722	2	
7-5-60		EJ21254	2	PIN, CARRIAGE SUPPORT	20722	2	
7-5-61		EJ11589	2	SCREW, SCH, 5/16-18 X 3/4 IN. L, NYLOCK	20722	216	
7-5-62		EJ11530	2	PIN, SPRING, CRES, 3/8 DIA X 1 IN. L, NYLOCK	20722	16	
		MS171714		ALTERNATE PART NO.			
7-5-63		EJ31154	2	GUIDE, UPPER	20722	8	
7-5-64		EJ21250	2	SHIM, UPPER, 0.06 IN. THK	20722	24	
7-5-65		EJ21251	2	SHIM, UPPER, 0.03 IN. THK	20722	8	
7-5-66		EJ31155	2	GUIDE, LOWER	20722	32	
7-5-67		EJ21252	2	SHIM, LOWER, 0.06 IN. THK	20722	64	
7-5-68		EJ21253	2	SHIM, LOWER, 0.03 IN. THK	20722	32	
7-5-69		EJ11593	2	RIVET, CSCK, BRASS, 5/16 DIA X 7/8 IN. L	20722	20	
7-5-70		EJ21098	2	WEDGE, DOG	20722	10	
7-5-71		EJ11558	2	SCREW, HEX RD, CRES, 3/8-16 X 1 IN. L, NYLOCK	20722	36	D1
		EJ11634		SCREW, HEX HD, CRES, 3/8-16 X 3/4 IN. L	20722	36,	D2, E
7-5-72		EJ41160	2	PANEL, ACCESS	20722	1	
7-5-73		EJ41161	2	GASKET, PANEL	20722	2	
7-5-74		EJ51077	2	TRUNK	20722	1	D1
		EJ51112		TRUNK	20722		D2
		EJ51249					E
7-5-75		EJ31529	2	LABEL PLATE	20722	1	E1, E2
7-5-76		EJ11608	2	SCREW, PAN HEAD, CRES 8–32 X 3/8 IN L (AP)	20722	4	E1, E2

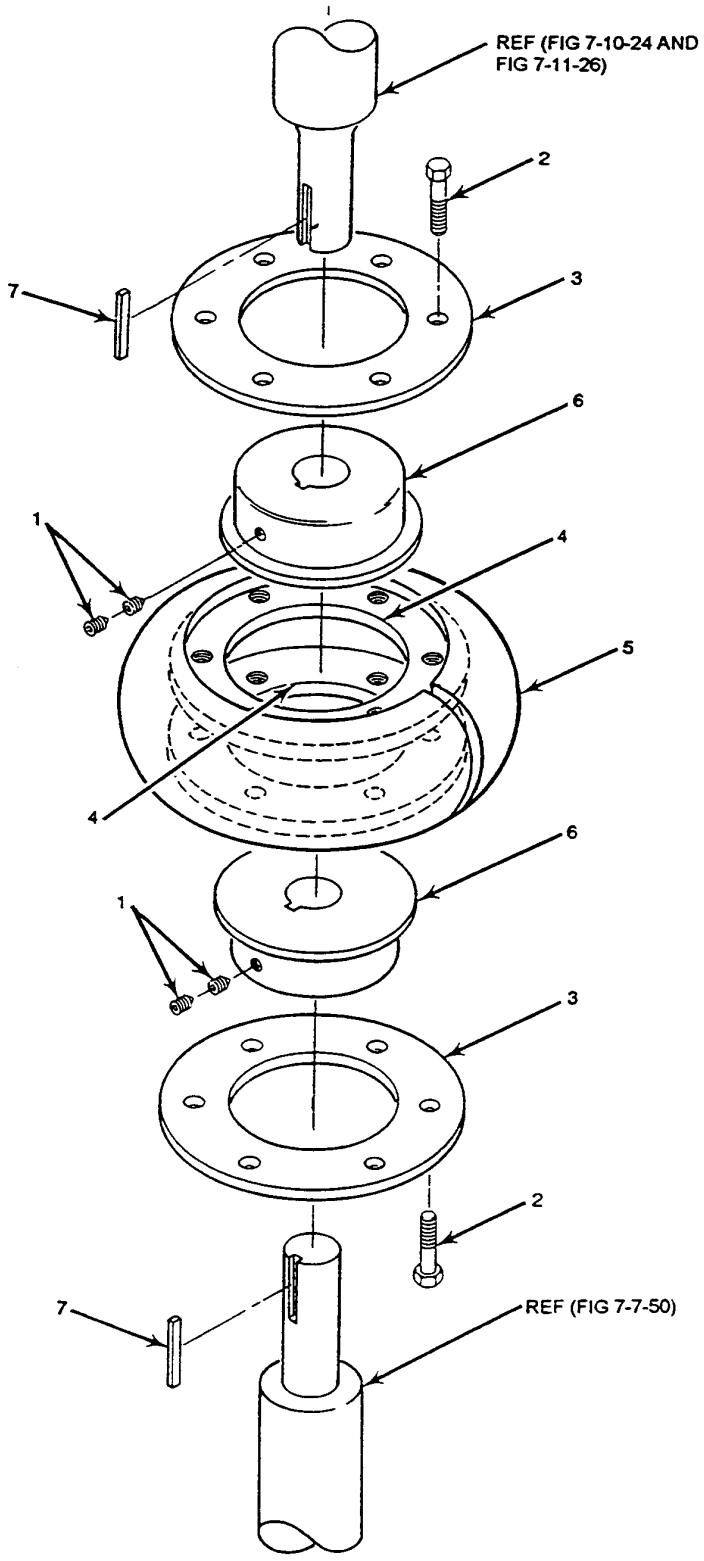


Figure 7-6. Flexible Coupling

Flexible Coupling Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-6-0		EJ11006	1	FLEXIBLE COUPLING, 1-3/8 IN. BORE BOTH FLANGES (FOR NHA SEE FIG. 7-2-6 FOR MODELS B-9A AND B-12 OR FIG. 7-3-5 FOR MODELS CR-12, CR-12B)	20722	REF	A, B, C, D E
		PX80BBS		ALTERNATE PART NO.	71956		
		010302		ALTERNATE PART NO. APL 780350021	71956		
7-6-1		NO NUMBER	2	SETSCREW, CUP PT, SLFLKG, 5/16-24 X 3/8 IN. L (MODIFIED PER NAVSEA DWG 6665728)	71956	4	
7-6-2		411375	2	CAPSCREW, HEX HD, 5/1618 X 1-1/2 IN. L SAE, GR 8	71956	12	
		MS90728-38		ALTERNATE PART NO.	96906		
7-6-3		010624	2	EXTERNAL CLAMP RING	71956	2	
7-6-4		011048	2	INTERNAL CLAMP RING	71956	2	
7-6-5		011108	2	FLEXIBLE ELEMENT (BOOT)	71956	1	
7-6-6		010311	2	FLANGE	71956	2	
7-6-7		EJ11512	2	KEY, 5/16 SQ X 1-1/2 IN. L, CD PL STL, ROUND ENDS	20722	2	A, D , E
		NO NUMBER	2	KEY, 5/16 SQ X 1-9/16 IN. L, ONE END RD, CD PL STL (MODIFIED PER NAVSEA DWG 6665728, ALTERATION EQUIVALENT TO REPAIR 534 FOR CG 47 THROUGH CG 53, BALL SCREW SHAFT (UPPER KEY)	20722	1	B, C

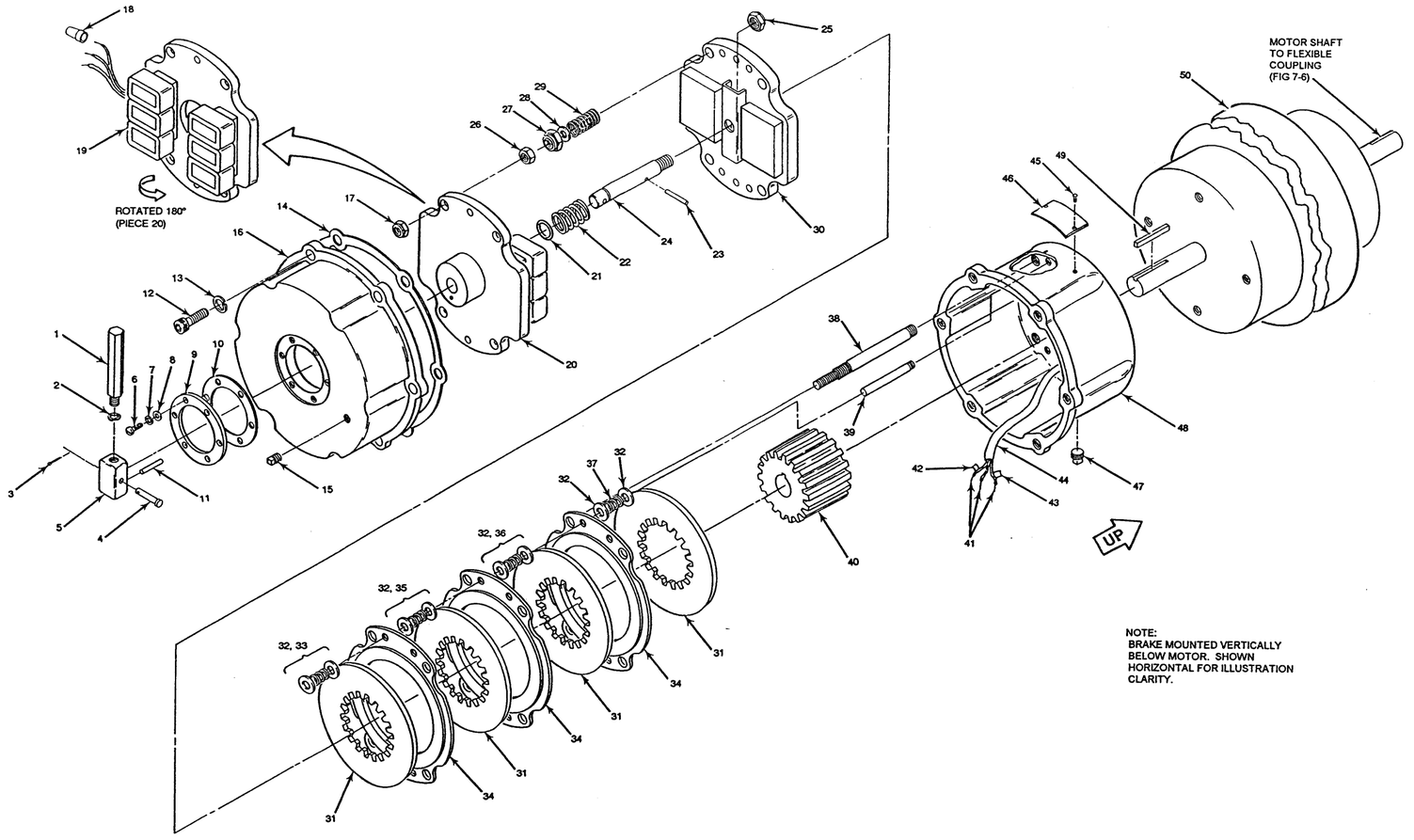


Figure 7-7. AG Motor and Electric Disc Brake Assembly

AG Motor and Electric Disc Brake Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-7-0		EJ11005	1	AC MOTOR AND ELECTRIC DISC BRAKE ASSY (FOR NHA SEE FIG. 7-2-8 AND FIG. 7-3-7)	20722	REF	B, C
		EJ11034		MOTOR AND BRAKE ASSY (FOR NHA SEE FIG. 7-3-7)	20722	REF	A, D , E
		MODEL NO. 84135-27	2	ELECTRIC DISC BRAKE	17904	1	
		J80001 (DWG)		(MIL-B-16392)	17904		
7-7-1		G80188	3	HANDLE, RELEASE, STL 1215	17904	1	
7-7-2		4-6-8D	3	LOCK WASHER, 3/8 IN., STL FF-W-84	17904	1	
7-7-3		5-1-1A	3	PIN, COTTER, 1/16 X 1/2 IN., SSTL	17904	1	
7-7-4		G80144-2	3	PIN, CLEVIS, SSTL	17904	1	
7-7-5		G80187	3	BLOCK, RELEASE, BRASS, SAE 40	17904	1	
7-7-6		1-9-3E	3	SCREW, FILH, #10-32 X 1/2 IN. STL, FF-S-92	17904	6	
7-7-7		4-6-4D	3	LOCK WASHER, #10, STL, FF-W-84	17904	6	
7-7-8		4-2-4D	3	WASHER, 1/2 OD X 7/32 ID X.046 IN. THK, STL	17904	6	
7-7-9		G80185	3	RING, SEAL, STL	17904	1	
7-7-10		G80184	3	SEAL, BUNA-N	17904	1	
7-7-11		5-3-104D	3	ROLL PIN, 5/32 X 3/4 IN. L, SSTL, MIL-P-10971	17904	1	
7-7-12		1-13-28D	3	SCREW, CAP, SCH, 1/4-20 X 7/8 IN. L, STL, FF-S86	17904	6	
7-7-13		4-6-6D	3	LOCK WASHER, 1/4 IN. STL, FF-W-84	17904	6	
7-7-14		K80061-2	3	GASKET, COVER, ASBESTOS FREE	17904	1	
7-7-15		10-1-2A	3	PLUG, PIPE, SQ HD, 1/4 NPT, STL	17904	1	
7-7-16		L80134	3	COVER, NOD. IRON, MIL-I24137	17904	1	
7-7-17		3-6-2A	3	NUT, LOCKING, 1/2-20 JAM, STL, MS20364	17904	5	
7-7-18		G80193	3	CONNECTOR, WIRE, COPPER/ NYLON	17904	AR	
7-7-19		K80137	3	COIL, COPPER, MIL-W-583	17904	6	
7-7-20		K80082-5	3	PLATE ASSY, MAGNET MTG, STL	17904	1	
7-7-21		6-1-3	3	O-RING, BUNA-N, SAE 12 OR CL 1	17904	1	

AG Motor and Electric Disc Brake Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-7-22		G80147	3	SPRING, RETURN, SPR STL, QQ-W-470	17904	1	
7-7-23		5-3-77D	3	ROLL PIN, 1/8 IN. L, SSTL, MIL-P-10971	17904	1	
7-7-24		G80146-3	3	ROD, RELEASE, SSTL, MILS-7720	17904	1	
7-7-25		3-6-2A	3	NUT, LOCKING, 1/2-20 JAM, STL, MS20364	17904	1	
7-7-26		3-3-23E	3	NUT, JAM, 1/2-20, STL, MIL-B-857	17904	4	
7-7-27		3-6-3A	3	NUT, LOCKING, 5/8-18, JAM, STL, MS20364	17904	4	
7-7-28		4-4-1D	3	WASHER, 1 1/8 OD X 21/32 ID X.048 IN. THK, STL	17904	4	
7-7-29		G70019	3	SPRING, TORQUE, MUSIC WIRE, QQ-W-470	17904	4	
7-7-30		K80081-2	3	PRESSURE PLATE, STL	17904	1	
7-7-31		H80002-2	3	DISC, ROTATING, ASBESTOS FREE	17904	4	
7-7-32		4-4-13D	3	WASHER, 1/2 OD X.346.352 ID X.028 IN. THK STL	17904	32	
7-7-33		G80171	3	SPRING, VERT MTG, BLACK, MUSIC WIRE, QQ-W-470	17904	4	
7-7-34		K80139-6	3	DISC, STATIONARY, VERT, AL. BRONZE, MIL-B-16033	17904	3	
7-7-35		G80172	3	SPRING, VERT MTG, BLUE, MUSIC WIRE, QQ-W-470	17904	4	
7-7-36		G80173	3	SPRING, VERT MTG, SILVER, MUSIC WIRE, QQ-W-470	17904	4	
7-7-37		G80174	3	SPRING, VERT MTG, GREEN, MUSIC WIRE, QQ-W-470	17904	4	
7-7-38		G70219-4	3	STUD, HI TENSILE, STL, RYCUT 50	17904	4	
7-7-39		G80189-3	3	STUD, VERT MTG, SSTL, MIL-S-7720	17904	4	
7-7-40		H80033	3	HUB, STL, B1113	17904	1	
7-7-41		G80195	3	LEADWIRE, #18 X 36 IN. L, COPPER, TEFLON INSUL.	17904	3	
7-7-42		G70349-1	3	TAG, WIRE, IDENT, AL.	17904	1	
7-7-43		G70349-2	3	TAG, WIRE, IDENT, AL.	17904	1	
7-7-44		G80194-1	3	SLEEVE, FIBERGLASS	17904	AR	
7-7-45		1-12-48A	3	DRIVE SCREW, #4 X 1/4 IN. L SSTL	17904	2	
7-7-46		H80116	3	NAMEPLATE, SSTL	17904	1	
7-7-47		10-1-4A	3	PLUG, PIPE, SQ HD, 1/2 NPT, STL	17904	1	

AG Motor and Electric Disc Brake Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-7-48		L80065-34	3	BRACKET, NOD. IRON, MIL-I-24137	17904	1	
7-7-49		COML	2	KEY, 0.375 SQ X 2 1/2 IN, L. STL (MIL-S-16782)		1	
7-7-50		226F136 (DWG)	2	AC MOTOR (FOR DET SEE APPENDIX A)	20019	1	A, D , E
		226F136 (DWG)		AC MOTOR (CG 60 AND LATER) (FOR DET SEE APPENDIX A)	20019		B
		198F131 (DWG)		AC MOTOR (CG 47 THROUGH CG 59) (FOR DET SEE APPENDIX A)	20019		B
		198F131 (DWG)		AC MOTOR (FOR DET SEE APPENDIX A)	20019		C
		04-0024 (DWG)		AC MOTOR (FOR DET SEE APPENDIX A)	20019		A, D , E

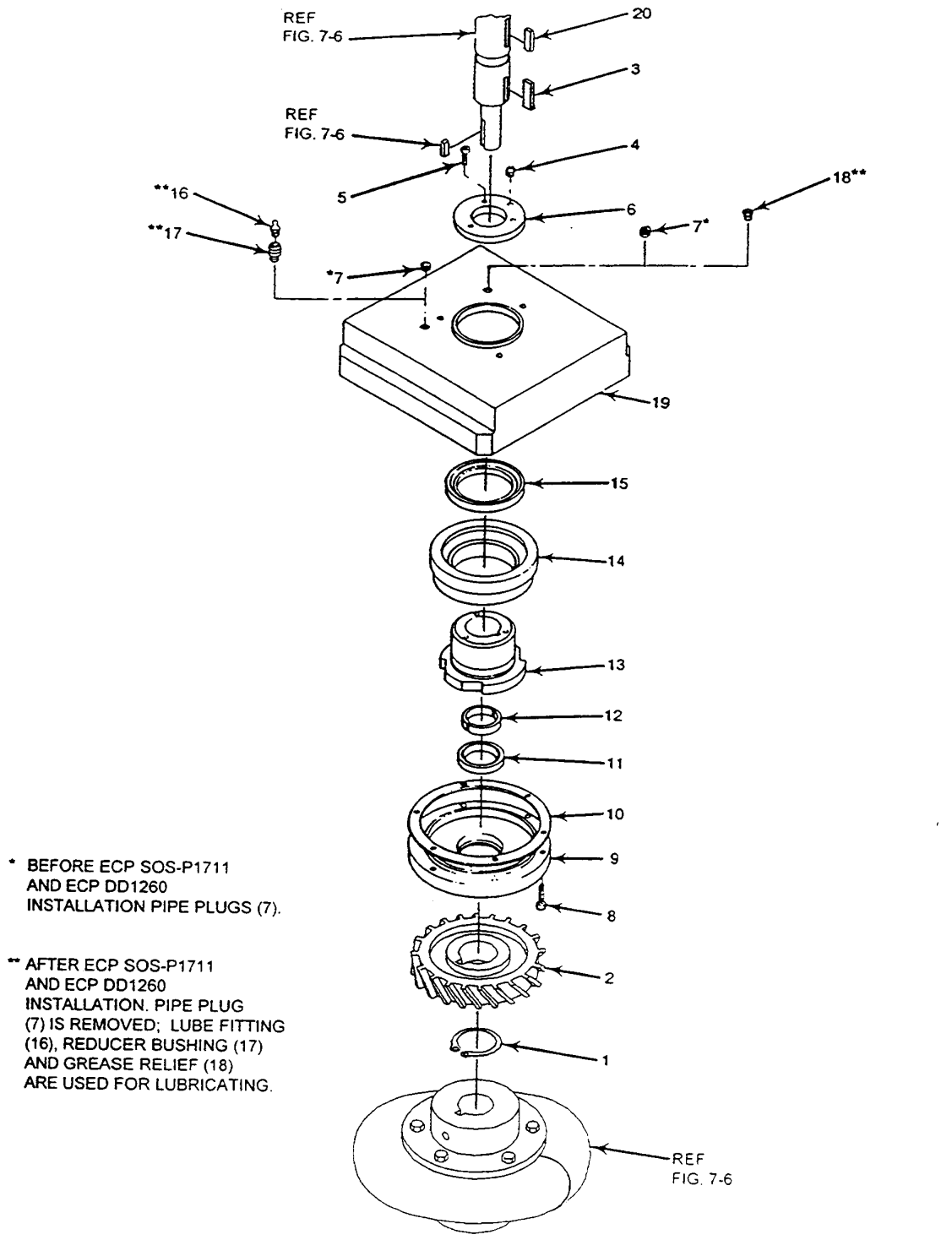


Figure 7-8. Lower Bearing Housing Assembly

Lower Bearing Housing Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-8-0		NO NUMBER	1	LOWER BEARING HOUSING ASSY (FOR NHA SEE FIG. 7-2-32)	20722	REF	A, B
		NO NUMBER		LOWER BEARING HOUSING ASSY (FOR NHA SEE FIG. 7-3-9)	20722		C, D , E
7-8-1		EJ10030	2	RING, RETAINING	20722	1	A
		5100-162		ALTERNATE PART NO.	79136		
7-8-2		EJ31125	2	WORM GEAR	20722	1	A
7-8-3		EJ10535	2	KEY, ROUND END, 3/8 SQ X 1 1/2 IN. L, ZN PL STL	20722	1	A
7-8-4		EJ10565	2	FITTING, LUBE, 1/8 NPT X 3/4 IN. L, CRES	20722	1	
7-8-5		EJ10576	2	SCREW, CAP, SCH, 1/420UNC X 1 IN. L, CRES, NYLOCK	20722	3	A, B, C
		EJ11561		SCREW, CAP, SCH, 1/420UNC X 1 IN. L, CRES, NYLOCK	20722		D , E
7-8-6		EJ30032	2	TRAP, GREASE	20722	1	A, B, C
		EJ31147		TRAP, GREASE	20722		D , E
7-8-7		EJ10512	2	PIPE PLUG, SCH, 3/8 NPT, CRES	20722	2	
		EJ11630		PIPE BUSHING	20722	2	D2, E
7-8-8		EJ11518	2	SCREW, CAP, SCH, 3/8-16UNC X 1 IN. L, CRES,	20722	6	A, B, C
		EJ11541		NYLOCK	20722		D , E
7-8-9		EJ31009	2	HOUSING, SEAL	20722	1	A, B, C
		EJ31146		HOUSING, SEAL	20722		D , E
7-8-10		4563566	2	GASKET	80064	1	
7-8-11		EJ10011	2	SEAL, OIL	20722	1	
		63x1735		ALTERNATE PART NO. CG 69 AND LATER	73680		
		412040		ALTERNATE PART NO. CG 69 AND LATER	86855		
		24263		ALTERNATE PART NO. CG 69 AND LATER	80201		
7-8-12		4524740	2	COLLAR, RETAINING	80064	2	A, B, C
		EJ20006		COLLAR, RETAINING	20722		D , E
7-8-13		EJ31006	2	SLEEVE, BEARING, LOWER	20722	1	
7-8-14		EJ10003	2	BEARING, SPHERICAL ROLLER	20722	1	
		29322		ALTERNATE PART NO.	52676		
7-8-15		EJ10005	2	SEAL, OIL	20722	1	
		53-2636		ALTERNATE PART NO.	73680		
7-8-16		EJ11629	2	FITTING, LUBE, 1/8 PTF,	20722	1	B, C,

Lower Bearing Housing Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
				SST			D
		MS15721-1		ALTERNATE PART NO.	96906		
		1961B		ALTERNATE PART NO.	95879		
7-8-17		EJ11630	2	REDUCER, PIPE, 3/8 MALE TO 1/8 IN. FEMALE	20722	1	B, C, D , E
		AN912-3J		ALTERNATE PART NO.	95879		
		A-112		ALTERNATE PART NO.	95879		
7-8-18		EJ11627	2	FITTING, RELIEF	20722	1	B, C, D , E
		47200		ALTERNATE PART NO.	95879		
		MS35670-2		ALTERNATE PART NO.	96906		
7-8-19		EJ41114	2	HOUSING, BEARING, LOWER	20722	1	A
		EJ41007		HOUSING, BEARING, LOWER	20722		B, C
		EJ41134		HOUSING, BEARING, LOWER	20722		D , E
7-8-20		EJ11522	2	KEY, ROUND END, 1/2 SQUARE X 2 IN. L	20722	1	

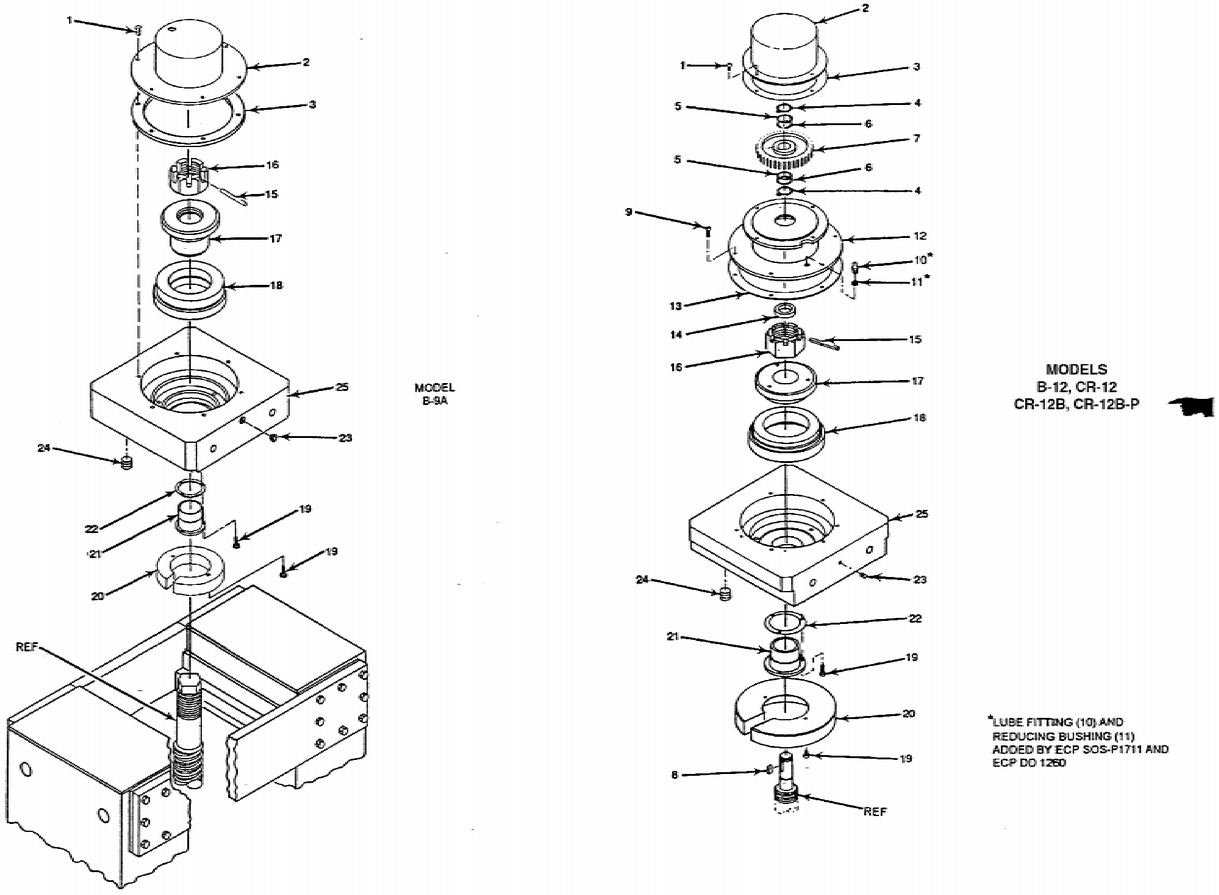


Figure 7-9. Upper Bearing Housing Assembly

Upper Bearing Housing Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-9-0		NO NUMBER	1	UPPER BEARING HOUSING ASSY (FOR NHA SEE FIG. 7-2-33)	20722	REF	A
		NO NUMBER	1	UPPER BEARING HOUSING ASSY (FOR NHA SEE FIG. 7-2-33)	20722	REF	B
		NO NUMBER	1	UPPER BEARING HOUSING ASSY (FOR NHA SEE FIG. 7-3-10)	20722	REF	C, D , E
7-9-1		EJ10570	2	SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	6	A
		EJ10570	2	SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	4	B
		EJ11531		SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	4	C
		EJ11552		SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	4	D , E
7-9-2		EJ41108	2	CAP, BEARING HOUSING	20722	1	A
		EJ40058	2	COVER, EMERGENCY DRIVE	20722		B, C
		EJ41131	2	COVER, EMERGENCY DRIVE	20722		D , E
7-9-3		EJ30055	2	GASKET	20722	1	A
		EJ21025	2	GASKET	20722		B, C, D , E
7-9-4		EJ10083	2	RING, RETAINING	20722	2	B, C, D , E
		5100-125-MD		ALTERNATE PART NO.	79136		
7-9-5		EJ10063	2	SPACER, WORM GEAR, 1-3/4 OD X 1-1/4 ID X 0.031 IN. THK	20722	AR	B, C, D , E
7-9-6		EJ10064	2	SPACER, WORM GEAR, 1-3/4 OD X 1-1/4 ID X 0.062 IN. THK	20722	AR	B, C, D
7-9-7		EJ31004	2	WORM GEAR	20722	1	B, C, D
7-9-8		EJ11513	2	KEY, ROUND ENDS, 1/4 SQ X 1-5/8 IN. L, CD PL STL	20722	1	B, C, D , E
7-9-9		EJ10570		SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	6	B
		EJ11531		SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	6	C
		EJ11552		SCREW, SCH, 5/16-18UNC X 3/4 IN. L, CRES, NYLOCK	20722	6	D , E
7-9-10		MS15721-1	2	FITTING, LUBE, 1/8 PTF	96906	1	B, C, D
7-9-11		EJ11630	2	BUSHING, REDUCING, 1/8 NPT X 3/8 IN.	20722	1	B, C, D , E

Upper Bearing Housing Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-9-12		EJ40057	2	HOUSING, EMERGENCY DRIVE	20722	1	B, C
		EJ41132		HOUSING, EMERGENCY DRIVE	20722		D , E
7-9-13		EJ30055	2	GASKET	20722	1	
7-9-14		EJ10085	2	SEAL, OIL	20722	1	B, C, D
		63427		ALTERNATE PART NO.	73680		
7-9-15		EJ10520	2	PIN, SPRING, 1/4 DIA X 3-1/2 IN. L	96906	1	
7-9-16		4524737	2	NUT, BEARING	80064	1	A, B, C
		EJ21231		NUT, BEARING	20722		D , E
7-9-17		EJ30039	2	SLEEVE, BEARING UPPER	20722	1	
7-9-18		EJ10003	2	BEARING, SPHERICAL ROLLER	20722	1	
		29322		ALTERNATE PART NO.	52676		
7-9-19		EJ10594	2	BOLT, SCH, 1/4-20UNC-2A X 5/8 IN. L, CRES, NYLOCK	20722	5	A, B, C
		EJ11540		BOLT, SCH, 1/4-20UNC-2A X 5/8 IN. L, CRES, NYLOCK	20722		D , E
7-9-20		EJ31010	2	BUMPER	20722	1	
7-9-21		EJ30056	2	SLEEVE, OIL RETAINING	20722	1	A, B, C
		EJ31145		SLEEVE, OIL RETAINING	20722		D , E
7-9-22		EJ20046	2	GASKET	20722	1	
7-9-23		EJ10512	2	PIPE PLUG, SCH, 3/8 NPT	20722	AR	A, B, C
		EJ11630		PIPE PLUG, SCH, 3/8 NPT	20722		D , E
7-9-24		EJ10513	2	PIPE PLUG	20722	1	
7-9-25		EJ41006	2	HOUSING, BEARING, UPPER	20722	1	A, B, C
		EJ41133		HOUSING, BEARING, UPPER	20722		D , E

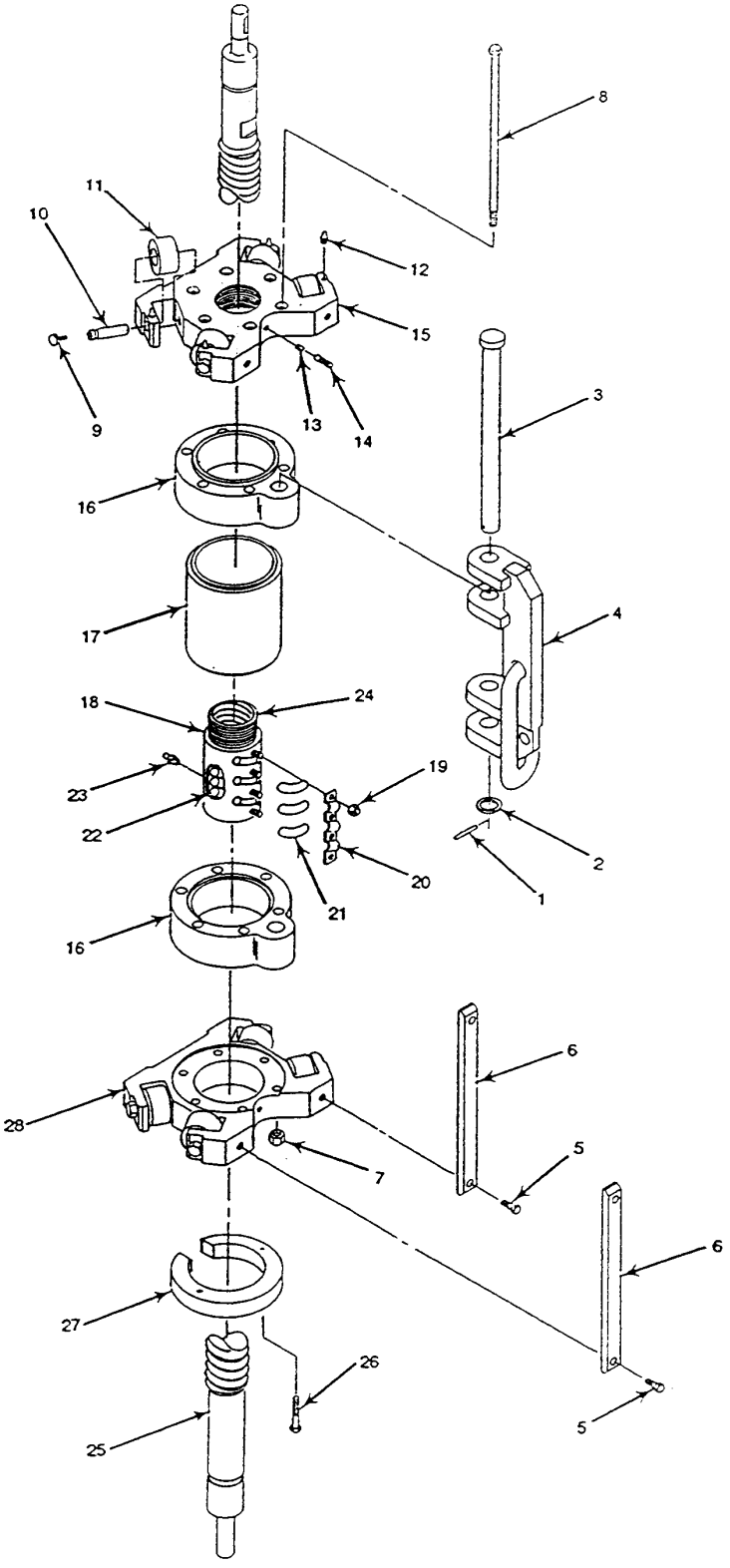


Figure 7-10. Carriage Assembly, Models B-9A, B-12

Carriage Assembly Description (Models B-9A, B-12)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-10-0		EJ51065	1	CARRIAGE ASSEMBLY, MODEL B-9A (FOR NHA SEE FIG. 7-2-34)	20722	REF	A
		EJ51012	1	CARRIAGE ASSEMBLY, MODEL B-12 (FOR NHA SEE FIG. 7-2-34)	20722	REF	B
7-10-1		MS17692	2	PIN, SPRING, CRES, 5/16 X 2 IN.	96906	1	
7-10-2		EJ20048	2	WASHER, STREAM ADAPTER	20722	1	
7-10-3		EJ20041	2	PIN, STREAM ADAPTER	20722	1	
7-10-4		EJ40075	2	STREAM ADAPTER ASSY	20722	1	
7-10-5		EJ10517	2	SCREW, SCH, CRES, 3/816UNC X 1 IN. L, NYLOCK	20722	4	
7-10-6		4524748	2	CAM	80064	2	
7-10-7		EJ10564	2	NUT, SLFLKG	20722	6	
		MS17829-1	2F	ALTERNATE PART NO.	96906		
7-10-8		EJ20025	2	BOLT, HEX HD, 3/4-16UNF 2A X 18 IN. L, CD PL, STL	20722	6	
7-10-9		EJ21021	2	SCREW, HEX HD, BEARING SHAFT	20722	8	
7-10-10		EJ21020	2	SHAFT, BEARING	20722	8	
7-10-11		EJ10052	2	BEARING	20722	8	
		CYR-3-S		ALTERNATE PART NO.	92563		
7-10-12		EJ10565	2	FITTING, LUBE, CRES, 1/8 NPT X 11/16 IN. L	20722	8	
7-10-13		EJ10614	2	SETSCREW, SCH, FIAT POINT CRES, 1/2-13UNC-3A X 1/4 IN. L, NYLOCK	20722	1	
7-10-14		EJ10613	2	SETSCREW, SCH, FULL DOG POINT, CRES, 1/2-13UNC3A X 3/4 IN. L, NYLOCK	20722	1	
7-10-15		EJ41027	2	BODY, UPPER	20722	1	
7-10-16		4524744	2	LUG	80064	2	
7-10-17		4524746	2	TUBE, SPACER	80064	1	
			2	BALL SCREW AND NUT ASSY	20722	1	
7-10-18		5707519	3	BALL NUT ASSY	52788	1	
		5703891	4	SEAL KIT	52788	AR	B
		B-14076-ZR		BALL NUT ASSY	00293		
		B-14076-6	4	SEAL KIT	00293		
7-10-19		NO NUMBER	4	NUT	52788	4	
7-10-20		NO NUMBER	4	RETAINER, BALL TUBE	52788	1	
7-10-21		NO NUMBER	4	TUBE, BALL	52788	3	
7-10-22		NO NUMBER	4	BALLS	52788	177	
7-10-23		EJ10572	4	FITTING, LUBE	96906	1	
		MS15003-2		ALTERNATE PART NO.	96906		
7-10-24		NO NUMBER	4	HOUSING, BALL NUT	20722	1	

Carriage Assembly Description (Models B-9A, B-12) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-10-25		EJ41112-1	3	BALL SCREW	52788	1	A
		EJ41008-1		BALL SCREW	52788		B
7-10-26		EJ10594	2	SCREW, HEX HD, CRES, 1/4-20UNC-2A X 5/8 IN. L, NYLOCK	20722	2	
7-10-27		EJ31010	2	BUMPER	20722	1	
7-10-28		EJ41028	2	BODY, LOWER	20722	1	

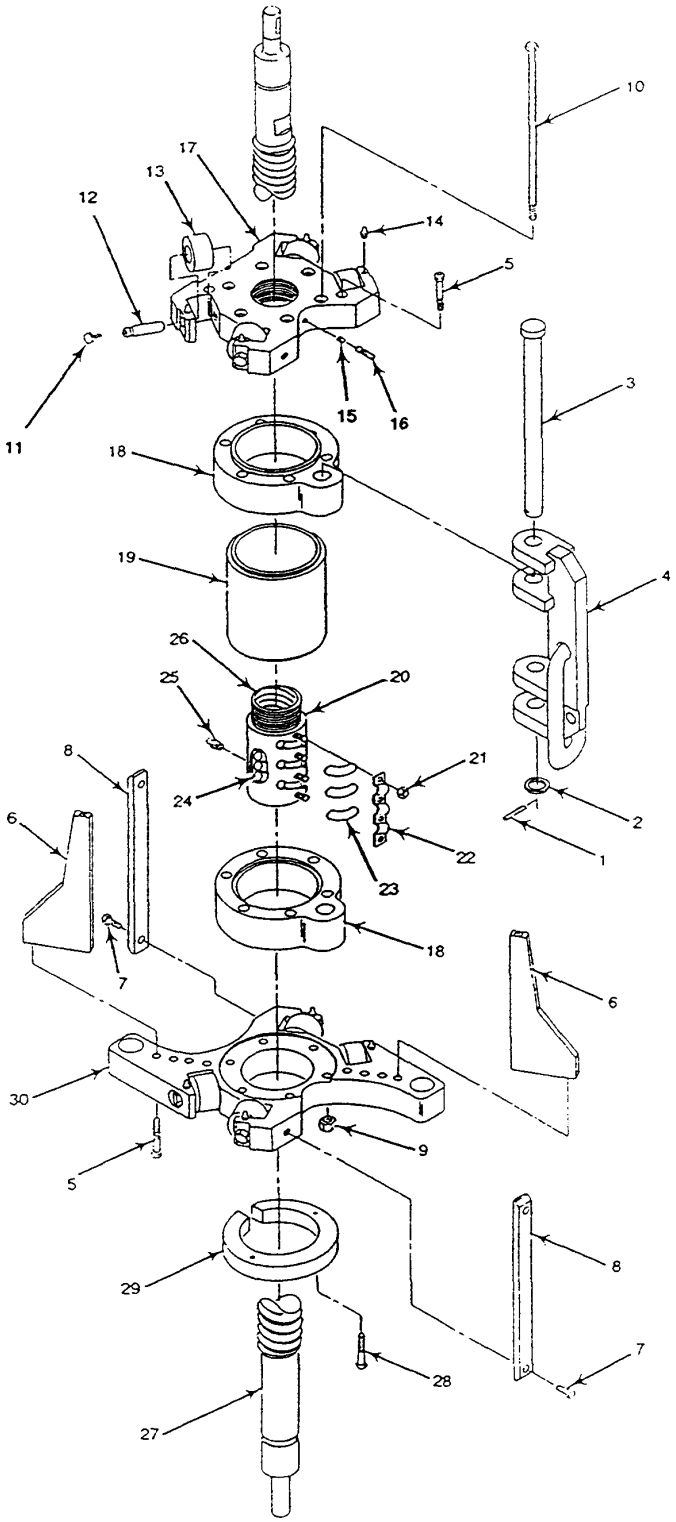


Figure 7-11. Carriage Assembly, Models CR-12, CR-12B and CR-12B-P

Carriage Description (Models CR-12, CR-12B and CR-12B-P)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-11-0		EJ51003	1	CARRIAGE ASSY, MODEL CR12 (FOR NHA SEE FIG. 7-3-11)	20722	REF	C
		EJ51072	1	CARRIAGE ASSY, MODEL CR12B (FOR NHA SEE FIG. 7-3-11)	20722	REF	D , E
7-11-1		MS17692	2	PIN, SPRING, CRES, 5/16 X 2 IN.	96906	1	
7-11-2		EJ20048	2	WASHER, STREAM ADAPTER	20722	1	
7-11-3		EJ20041	2	PIN, STREAM ADAPTER	20722	1	
7-11-4		EJ40075	2	STREAM ADAPTER ASSY	20722	1	C
		EJ41129		STREAM ADAPTER ASSY	20722		D , E
7-11-5		EJ11509	2	SCREW, SCH, CRES, 1/213UNC X 2-3/4 IN. L, NYLOCK	20722	10	C
		EJ11542	2	SCREW, SCH, CRES, 1/213UNC X 2-3/4 IN. L, NYLOCK	20722		D , E
7-11-6		EJ31011	2	BRACE, CARRIAGE	20722	2	C
		EJ31144		BRACE, CARRIAGE	20722		D , E
7-11-7		EJ10517	2	SCREW, CAP, SCH, 3/816UNC X 1 IN. L, NYLOCK	20722	4	C
		EJ11541		SCREW, CAP, SCH, 3/816UNC X 1 IN. L, NYLOCK	20722		D , E
7-11-8		4524748	2	CAM	80064	2	C
		EJ21232		CAM	20722		D , E
7-11-9		EJ10564	2	NUT, SLFLKG, CERAMIC COAT, 3/4-16UNF 3B 12F	20722	6	C
		EJ11543		NUT, SLFLKG, CERAMIC COAT, 3/4-16UNF 3B 12F	20722		D , E
		MS17829-12F		ALTERNATE PART NO.	96906		
7-11-10		EJ21236	2	BOLT, HEX HD, 3/4-16UNF 2A X 18 IN. L, CD PL, STL	20722	6	D , E
		EJ20025		BOLT, HEX HD, 3/4-16 UNY 2A X 18 IN. L, CD PL, STL	20722	6	C
7-11-11		EJ21021	2	BOLT, BEARING SHAFT	20722	8	C
		EJ21238		BOLT, BEARING SHAFT	20722		D , E
7-11-12		EJ21020	2	SHAFT, BEARING	20722	8	C
		EJ21237		SHAFT, BEARING	20722		D , E
7-11-13		EJ10052	2	BEARING	20722	8	
		CYR-3-S		ALTERNATE PART NO.	92563		
7-11-14		EJ10565	2	FITTING, LUBE, CRES, 1/8 NPT X 11/16 IN. L	20722	8	
7-11-15		EJ10614	2	SETSCREW, SCH, FLAT POINT, CRES, 1/2-13UNC3A X 3/8 IN. L, NYLOCK	20722		C

Carriage Description (Models CR-12, CR-12B and CR-12B-P) - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ11545		SETSCREW, SCH, FLAT POINT, CRES, 1/2-13UNC3A X 3/8 IN. L, NYLOCK	20722	1	D , E
7-11-16		EJ10613	2	SETSCREW, SCH, FULL DOG POINT, CRES, 1/2-13UNC3A X 3/4 IN. L, NYLOCK	20722	1	C
		EJ11544		SETSCREW, SCH, FULL DOG POINT, CRES, 1/2-13UNC3A X 3/4 IN. L, NYLOCK	20722		D , E
7-11-17		EJ41022	2	BODY, UPPER	20722	1	C
		EJ41126		BODY, UPPER	20722		D , E
7-11-18		EJ40041	2	LUG	20722	2	C
		EJ41127		LUG	20722		D , E
7-11-19		4524746	2	SPACER, TUBE	80064	1	C,
		EJ31143		SPACER, TUBE	20722		D , E
			2	BALL SCREW AND NUT ASSY	20722	1	
7-11-20		5707519	3	BALL NUT ASSY	52788	1	
7-11-21		NO NUMBER	4	NUT	52788	4	
7-11-22		NO NUMBER	4	RETAINER, BALL TUBE	52788	1	
7-11-23		NO NUMBER	4	TUBE, BALL	52788	3	
7-11-24		NO NUMBER	4	BALLS	52788	177	
7-11-25		EJ10572	4	FITTING, LUBE	20722	1	C
		EJ10565		FITTING, LUBE	20722	1	D , E
		MS15003-2		ALTERNATE PART NO.	96906		
7-11-26		NO NUMBER	4	HOUSING, BALL NUT	20722	1	
7-11-27		EJ41008-1	3	BALL SCREW	52788	1	
7-11-28		EJ10594	2	BOLT, HEX HD, CRES, 1/420UNC-2A X 5/8 IN. L, NYLOCK	20722	2	C
		EJ11540		BOLT, HEX HD, CRES, 1/420UNC-2A X 5/8 IN. L, NYLOCK	20722		D , E
7-11-29		EJ31010	2	BUMPER	20722	1	
7-11-30		EJ41023	2	BODY, LOWER	20722	1	C
		EJ41128		BODY, LOWER	20722		D , E

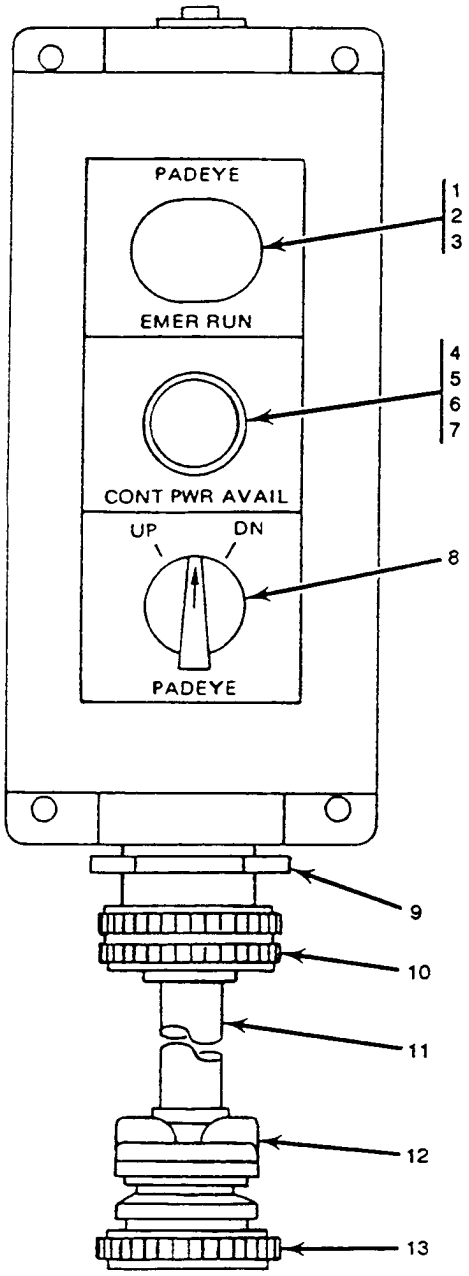


Figure 7-12. Control Station Assembly, Models B-9A, B-12

Control Station Description (Models B-9A, B-12)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-12-0		EJ41109	1	CONTROL STATION ASSY, MODEL B-9A (FOR NHA SEE FIG. 7-2-66)	20722	REF	A
		EJ40090	1	CONTROL STATION ASSY, MODEL B-12 (FOR NHA SEE FIG. 7-2-66)	20722	REF	B
		EJ30057	2	THREE ELEMENT CONTROL	20722		
		6981ED173-286 (DWG)		ALTERNATE PART NO. APL 212104464	27192		
7-12-1		86-2427-3	3	PUSHBUTTON ASSY (PADEYE EMER RUN)	27192	1	
7-12-2		86-2369-3	4	CONTACT BLOCK	27192	1	
7-12-3		32-576	4	DIAPHRAGM, PUSHBUTTON	27192	1	
7-12-4		86-2425	3	INDICATOR LIGHT ASSY (CONTROL PWR AVAIL)	27192	1	
7-12-5		28-822	4	LENS (RED)	27192	1	
7-12-6		28-651	4	LAMP, TYPE TS159	27192	2	
7-12-7		42-1091	4	TRANSFORMER	27192	1	
7-12-8		6981ED190-6P	3	SELECTOR SWITCH ASSY (PADEYE UP/DOWN)	27192	1	
7-12-9		EJ10007	2	TERMINAL, LUG	20722	1	
		16-8-10		ALTERNATE PART NO.	89020		
7-12-10		EJ10018	2	CONNECTOR	20722	1	
		CGB-397 FORM C		ALTERNATE PART NO.	15235		
7-12-11		EJ10097	2	CABLE, ELECT. 16 FT L, MIL-C-915	20722	1	
		MHOF-10		ALTERNATE PART NO.	81349		
7-12-12		EJ10096	2	SLEEVE, CABLE	20722	1	
		AN3420-16A		ALTERNATE PART NO.	88044		
7-12-13		EJ10015	2	CONNECTOR, PLUG, STR ELECT.	20722	1	
		10-72624-24-21P		ALTERNATE PART NO.	77820		

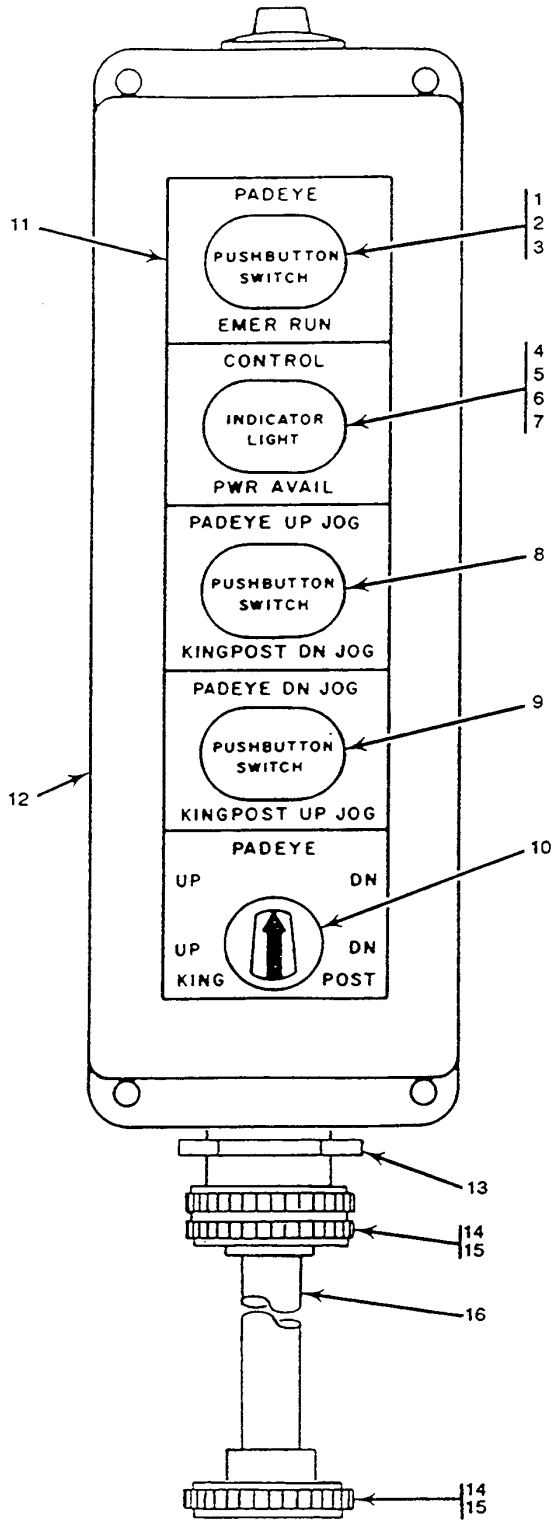


Figure 7-13. Control Station Assembly, Models CR-12, CR-12B and CR-12B-P

Control Station Assembly Description (Models CR-12, CR-12B and CR-12B-P)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-13-0		EJ31029	1	CONTROL STATION ASSY, MODEL CR-12 (FOR NHA SEE FIG. 7-4-4)	20722	REF	C
		EJ31197		CONTROL STATION ASSY, MODEL CR-12B (FOR NHA SEE FIG. 7-5-6)	20722		D , E
		EJ41042	2	FIVE ELEMENT CONTROL	20722		
		6981ED175-214		ALTERNATE PART NO. APL 212104060	27192		
7-13-1		86-2427-3	3	PUSHBUTTON ASSY (PADEYE EMER RUN)	27192	1	
7-13-2		86-2369-3	4	CONTACT BLOCK	27192	1	
7-13-3		32-576	4	DIAPHRAGM, PUSHBUTTON	27192	1	
7-13-4		86-2425	3	INDICATOR LIGHT ASSY (CONTROL PWR AVAIL)	27192	1	
7-13-5		28-822	4	LENS (RED)	27192	1	
7-13-6		28-651	4	LAMP, TYPE TS159	27192	2	
7-13-7		42-1091	4	TRANSFORMER	27192	1	
7-13-8		86-2498	3	PUSHBUTTON ASSY (PADEYE UP/JOG; KINGPOST DN/JOG)	27192	1	
7-13-9		86-2498-2	3	PUSHBUTTON ASSY (PADEYE DN/JOG; KINGPOST UP/JOG)	27192	1	
7-13-10		2498-3	3	SELECTOR SWITCH ASSY (PADEYE UP/DN; KINGPOST UP/DN)	27192	1	
7-13-11		49-3365	3	COVER	27192	1	
7-13-12		49-3362	3	CASE	27192	1	
7-13-13		EJ10007	3	TERMINAL, LUG	20722	1	
		16-8-10		ALTERNATE PART NO.	89020		
7-13-14		EJ10018	2	CONNECTOR	20722	2	
		CGB-397 FORM C		ALTERNATE PART NO.	15235		
7-13-15		EJ10096	2	SLEEVE, CABLE	88044	2	
		AN3420-16A		ALTERNATE PART NO.	88044		
7-13-16		EJ10097	2	CABLE, ELECT., MIL-C-915	20722	36 FT	C
		MHOF-10		ALTERNATE PART NO.	78310		
		EJ11041	2	CABLE, SHIELDED	20722	30 FT	D , E
		A28910		ALTERNATE PART NO.	78310		

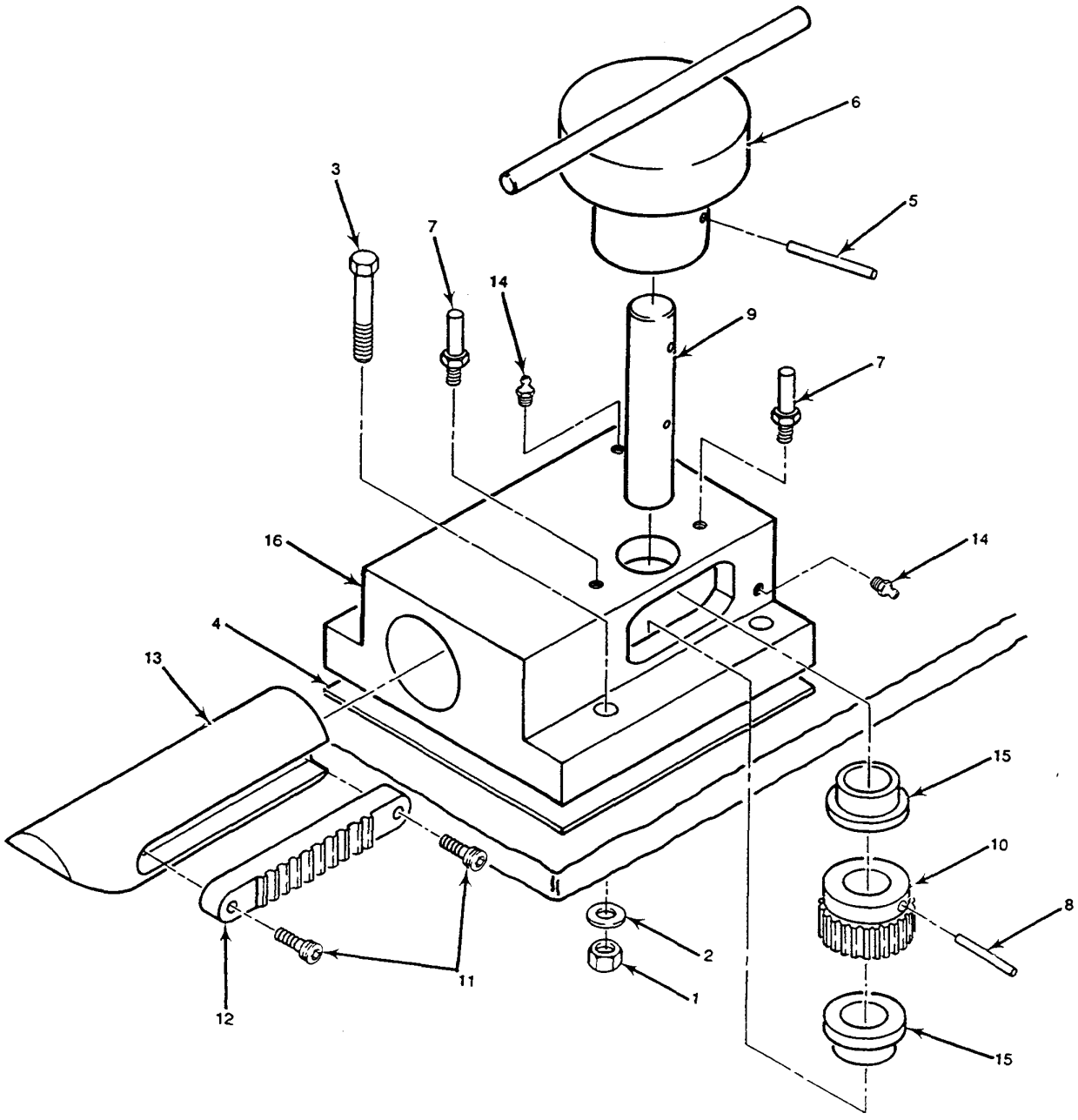


Figure 7-14. Latch Assembly

Latch Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-14-0		EJ41011	0	LATCH ASSY (FOR NHA SEE FIG. 7-4-21)	20722	REF	C
		EJ41141		LATCH ASSY (FOR NHA SEE FIG. 7-5-58)	20722		D 1, D2
7-14-1		EJ11511	2	NUT SLFLKG, CAD FL, 1/213 (FOR GR 8 BOLT)	20722	4	C
		EJ11588		NUT SLFLKG, CAD PL, 1/213 (FOR GR 8 BOLT)	20722		D 1, D2
7-14-2		EJ21017	2	WASHER	20722	4	C
		EJ21273		WASHER	20722		D 1, D2
7-14-3		EJ11505		SCREW, SCH, GR 8, CAD PL, 1/2-13 X 2-1/2 IN. L	20722	4	C
		EJ11587		SCREW, SCH, GR 8, CAD PL, 1/2-13 X 2-1/2 IN. L	20722		D 1, D2
7-14-4		EJ21011	2	SHIM, LATCH	20722	4	C
		EJ21269		SHIM, LATCH	20722		D 1, D2
7-14-5		EJ10511	2	PIN, SPRING	20722	1	
		MS9048-240		ALTERNATE PART NO.	96906		
7-14-6		EJ21008	2	KNOB, LATCH	20722	1	C
		EJ21257		KNOB, LATCH	20722		D 1, D2
7-14-7		EJ20026	2	STUD, LATCH	20722	2	C
		EJ21256		STUD, LATCH	20722		D 1, D2
7-14-8		EJ10587	2	PIN, SPRING, 1/4 DIA X 1-3/8 IN. L	20722	1	
		MS9048-235		ALTERNATE PART NO.	96906		
7-14-9		EJ21010	2	SHAFT, GEAR	20722	1	C
		EJ21259		SHAFT, GEAR	20722		D 1, D2
7-14-10		EJ21007	2	GEAR, LATCH (ALTERED FROM PIN YA30, CAGE 71041)	20722	1	C
		EJ21258		GEAR, LATCH (ALTERED FROM PIN YA30, CAGE 71041)	20722		D 1, D2
7-14-11		EJ10588	2	SCREW, SCH, CRES, NYLOCK, 10-32 X 1/2 IN. L	20722	2	C
		EJ11575		SCREW, SCH, CRES, NYLOCK, 10-32 X 1/2 IN. L	20722		D 1, D2
7-14-12		EJ20028	2	RACK, LATCH (ALTERED FROM P/N L-2020-4, CAGE 71041	20722	1	C
		EJ21255		RACK, LATCH (ALTERED FROM P/N L-2020-4, CAGE 71041	20722		D 1, D2
7-14-13		EJ31007	2	PIN, LATCH	20722	1	C

Latch Description - Continued

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
		EJ31156		PIN, LATCH	20722		D 1, D2
7-14-14		EJ10565		FITTING, LUBE, 1/8 NPT	20722	2	
		MS15003-2		ALTERNATE PART NO.	96906		
7-14-15		EJ11002	2	BUSHING, FLANGED, OIL-IMPREGNATED, BRONZE	20722	2	
		FB-1012-4		ALTERNATE PART NO.	71041		
7-14-16		EJ41012	2	BASE, LATCH	20722	1	C
		EJ41142		BASE, LATCH	20722		D 1, D2

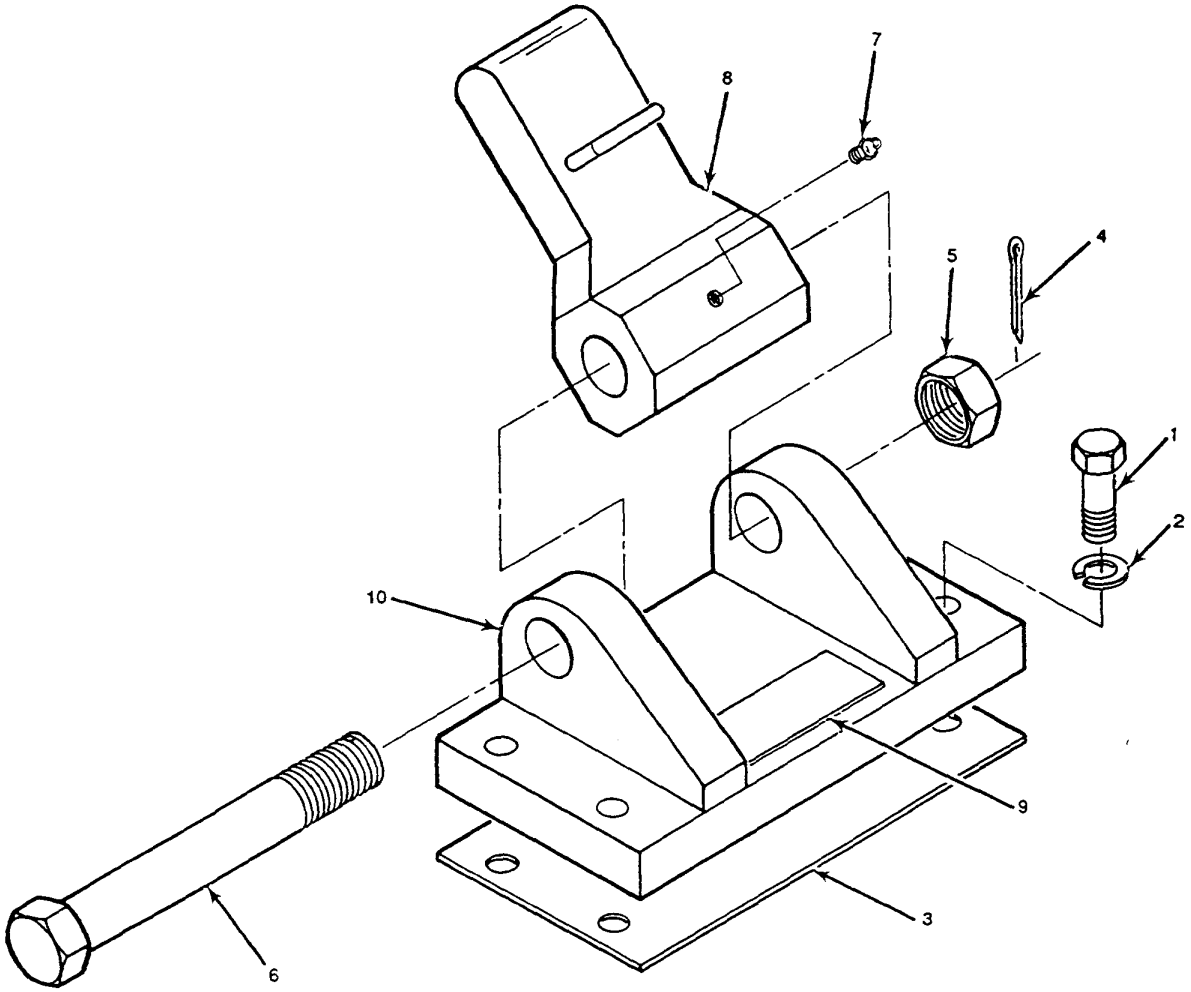


Figure 7-15. Kingpost Locking Pawl Assembly

Kingpost Locking Pawl Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-15-0		6819301 (DWG)	1	KINGPOST LOCKING PAWL ASSY (FOR NHA SEE FIG. 7-4-21)	53711	REF	C , E
7-15-1		MIL-S-1222	2	BOLT, HEX HD (MIL-S1222) 5/8-11UNC X 2 IN. L		4	C, E
7-15-2		MS35338-145	2	LOCK WASHER, 5/8 IN. ID	96906	4	C, E
7-15-3		6819314	2	SHIM, BASE PLATE	53711	AR	
7-15-4		MS24665-517	2	PIN, COTTER, 3/16 X 21/4 IN. L	96906	1	C C, E
7-15-5		6819303	2	NUT, HEX	53711	1	C, E
7-15-6		6819304	2	BOLT, CLEVIS	53711	1	C, E
7-15-7		MS15721-1	2	FITTING, LUBE, 1/8 PTF	96906	1	C, E
7-15-8		6819307	2	PAWL, WELDMENT	53711	1	C, E
7-15-9		6902171	2	PLATE, LABEL	53711	1	C
7-15-10		6819305	2	BASE PLATE (CLEVIS WELDMENT)	53711	1	C, E

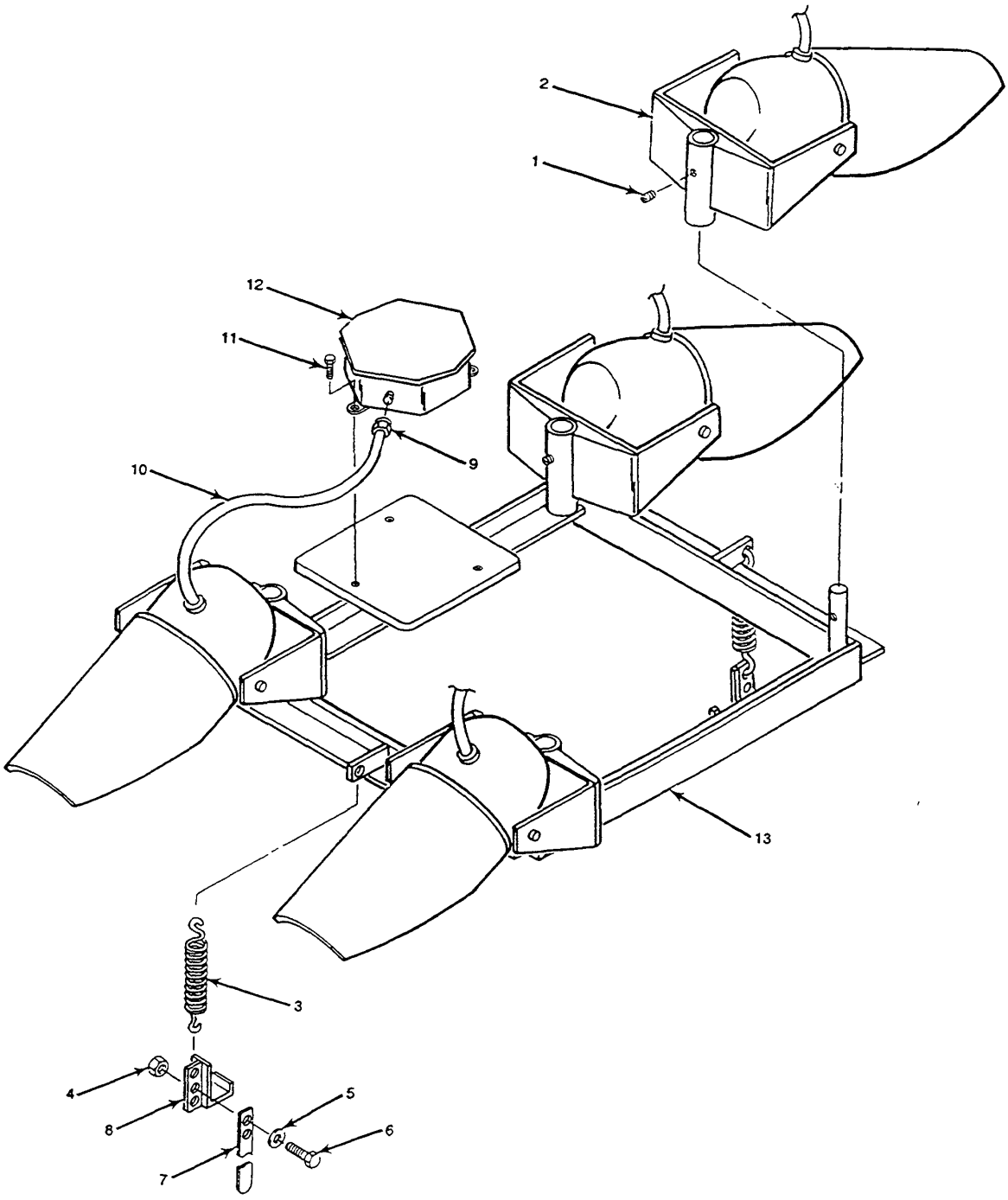


Figure 7-16. Floodlight Assembly

Floodlight Description

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-16-0		EJ51027	1	FLOODLIGHT ASSY (REMOVABLE, REMOTELY STOWED) (FOR NHA SEE FIG. 7-1-9)	20722	REF	C
		EJ51082		FLOODLIGHT ASSY (REMOVABLE, REMOTELY STOWED) (FOR NHA SEE FIG. 7-1-9)	20722		D , E
		EJ41159		FLOODLIGHT ASSY	20722		C, D , E
7-16-1		EJ10521	2	SETSCREW, SCH, CUP PT, 3/8-16UNC X 3/4 IN. L, CRES	20722	4	
		EJ11565		ALTERNATE PART NO.	20722		
7-16-2		EJ41204	2	FLOODLIGHT, RED LENS, 120V, 150 W, MIL-F16377/60	20722	4	
		EJ11021		ALTERNATE PART NO.	20722		
		EJ11042		ALTERNATE PART NO.	20722		
7-16-3		EJ11023	2	SPRING	20722	2	
		LE085HS		ALTERNATE PART NO.	84830		
7-16-4		EJ11556	2	NUT, HEX, SLFLKG, NO. 10-32, CRES	20722	4	
		EJ11506		ALTERNATE PART NO.	20722		
7-16-5		EJ10523	2	WASHER, FLAT, NO. 10, CRES	20722	4	
7-16-6		EJ11564	2	SCREW, RDH, NO. 10-32 UNF X 1/2 IN. L, CRES	20722	4	
		EJ10554		ALTERNATE PART NO.	20722		
7-16-7		EJ21032	2	STRAP	20722	2	
7-16-8		EJ21246	2	CLIP, STRAP	20722	2	
		EJ21033		ALTERNATE PART NO.	20722		
7-16-9		EJ11019	2	CONNECTOR, PLUG ELECT.	20722	5	
		CGB-194-SG		ALTERNATE PART NO.	15235		
7-16-10		EJ11029	2	CABLE, ELECT., MIL-C-915	20722	3- 1/2 FT	
		TSS-3		ALTERNATE PART NO.	78310		
		EJ10088		ALTERNATE PART NO.	20722		
		THOF-3		ALTERNATE PART NO.	78310		
7-16-11		EJ11562	2	SCREW, CAP, HEX HD, 1/420UNC X 1/2 IN. L, CRES	20722	3	
		EJ10526		ALTERNATE PART NO.	20722		
7-16-12		EJ11022	2	TERMINAL BOX	20722	1	
		S6202-74027		ALTERNATE PART NO.	80064		
7-16-13		EJ41140	2	BASE, FLOODLIGHT	20722	1	
		EJ41038		ALTERNATE PART NO.	20722		

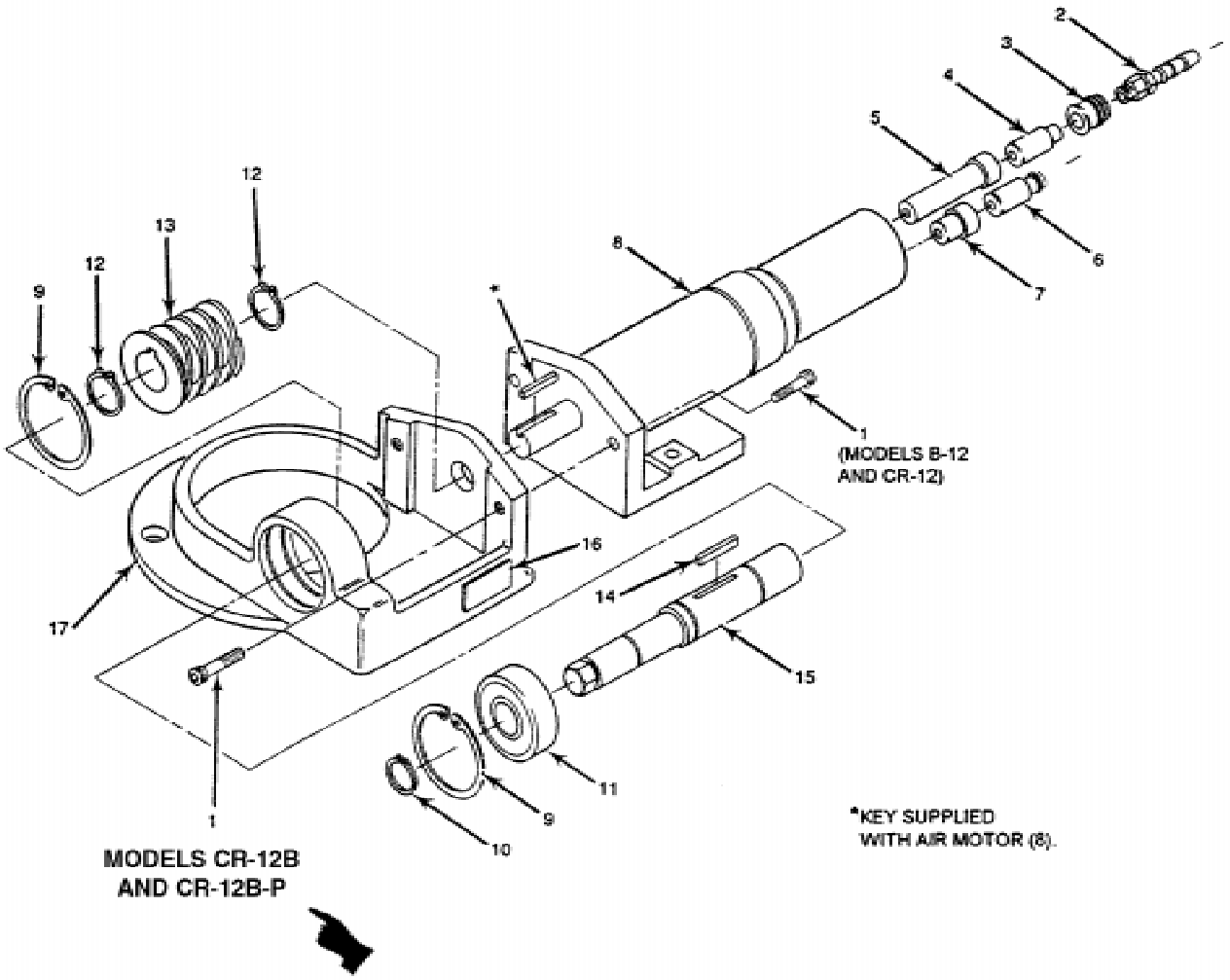


Figure 7-17. Emergency Drive Assembly, Pneumatic, Models B-12, CR-12, CR-12B and CR-12B-P

Emegency Drive Assembly, Pneumatic Description (Models B-12, CR-12, CR-12B)

Fig. & Index Number	Ref Des	Part Number	INDT	Description	Mfr's Code	Qty Per Assy	Used On Code
7-17-0		EJ51021	1	EMERGENCY DRIVE ASSY, PNEUMATIC (FOR NHA SEE FIG. 7-1-6 AND FIG. 7-1-7)	20722	REF	B, C
		EJ51081		EMERGENCY DRIVE ASSY, PNEUMATIC (FOR NHA SEE FIG. 7-1-7)	20722		D , E
7-17-1		EJ11563	2	SCREW, SCH, CRES, 5/16 18UNC X 3/4 IN. L, CRES, NYLOCK	20722	6	B
		EJ10641		SCREW, BUTTON HD, 5/1618 X 3/4 IN. L, CRES, NYLOCK	20722		C, D , E
7-17-2		EJ11028	2	COUPLER, PUSH-LOC, MALE PIPE	20722	1	
		30182-6-88		ALTERNATE PART NO.	97111		
7-17-3		EJ11027	2	COUPLER, STR THROUGH	20722	1	
		BST-4		ALTERNATE PART NO.	97111		
7-17-4		EJ11026	2	NIPPLE, STR THROUGH	20722	1	
		BST-N4		ALTERNATE PART NO.	97111		
7-17-5		EJ11534	2	NIPPLE, PIPE, 1/2 X 3 IN. L, BRASS	20722	1	
7-17-6		EJ11026	2	NIPPLE, STR THROUGH	20722	1	
		BST-N4		ALTERNATE PART NO.	97111		
7-17-7		EJ11533	2	NIPPLE, PIPE, 1/2 IN. CLOSE BRASS	20722	1	
7-17-8		EJ11003	2	AIR MOTOR W/PILOT RING	20722	1	
		3840 Q		ALTERNATE PART NO.	4P412		
7-17-9		EJ10081	2	RING, RETAINING	20722	2	
		5100-98-MD		ALTERNATE PART NO.	79136		
7-17-10		EJ10060	2	RING RETAINING	20722	1	
		5000-244-MD		ALTERNATE PART NO.	79136		
7-17-11		EJ10036	2	BEARING BALL	20722	1	
		6305-2RS		ALTERNATE PART NO.	32377		
7-17-12		EJ10083	2	RING, RETAINING	20722	2	
		5100-125-MD		ALTERNATE PART NO.	79136		
7-17-13		EJ21018	2	WORM, RH	20722	1	
		H1086		ALTERNATE PART NO.	71041		
7-17-14		EJ10605	2	KEY, SQ END, 1/4 SQ X 1 3/4 IN. L, CD PL STL	20722	1	
7-17-15		EJ31005	2	SHAFT	20722	1	B, C
		EJ31153		SHAFT	20722		D , E
7-17-16		EJ20096	2	LABEL, WARNING	20722	1	B, C
		EJ21245		LABEL, WARNING	20722		D , E
7-17-17		EJ41010	2	BASE, EMERGENCY DRIVE	20722	1	

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EJ11531	7-3-35	
EJ11531	7-9-1	
EJ11531	7-9-9	
EJ11533	7-17-7	
EJ11534	7-17-5	
EJ11535	7-2-61	
EJ11536	7-2-59	
EJ11537	7-2-60	
EJ11538	7-2-63	
EJ11539	7-2-14	
EJ11540	7-9-19	
EJ11540	7-11-28	
EJ11541	7-8-8	
EJ11541	7-11-7	
EJ11542	7-11-5	
EJ11543	7-11-9	
EJ11544	7-11-16	
EJ11545	7-11-15	
EJ11546	7-3-37	
EJ11547	7-3-23	
EJ11548	7-3-30	
EJ11549	7-3-39	
EJ11552	7-3-35	
EJ11552	7-9-1	
EJ11552	7-9-9	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
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EJ11554	7-3-20	
EJ11555	7-3-22	
EJ11556	7-3-21	
EJ11556	7-16-4	
EJ11557	7-3-6	
EJ11558	7-3-12	
EJ11558	7-5-71	
EJ11559	7-3-28	
EJ11561	7-8-5	
EJ11562	7-3-15	
EJ11562	7-16-11	
EJ11564	7-16-6	
EJ11563	7-17-1	
EJ11565	7-5-71	
EJ11565	7-16-1	
EJ11575	7-14-11	
EJ11576	7-5-51	
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EJ11579	7-5-50	
EJ11581	7-5-15	
EJ11582	7-5-12	
EJ11583	7-5-11	
EJ11584	7-3-12	
EJ11584	7-5-9	
EJ11585	7-5-16	
EJ11586	7-5-7	
EJ11587	7-14-3	
EJ11588	7-14-1	
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EJ11627	7-8-18	
EJ11629	7-8-16	
EJ11630	7-8-17	
EJ11630	7-9-11	
EJ11630	7-9-23	
EJ20006	7-8-12	
EJ20025	7-10-8	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
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EJ20026	7-14-7	
EJ20028	7-14-12	
EJ20041	7-10-3	
EJ20041	7-11-3	
EJ20046	7-9-22	
EJ20048	7-10-2	
EJ20048	7-11-2	
EJ20096	7-17-16	
EJ20097	7-3-38	
EJ21005	7-1-4	
EJ21006	7-1-5	
EJ21007	7-14-10	
EJ21008	7-14-6	
EJ21010	7-14-9	
EJ21011	7-14-4	
EJ21016	7-4-23	
EJ21017	7-14-2	
EJ21018	7-17-13	
EJ21020	7-10-10	
EJ21020	7-11-12	
EJ21021	7-10-9	
EJ21021	7-11-11	
EJ21022	7-2-41	
EJ21022	7-3-26	
EJ21023	7-2-55	
EJ21024	7-3-44	
EJ21025	7-9-3	
EJ21026	7-2-55	
EJ21032	7-16-7	
EJ21033	7-16-8	
EJ21034	7-2-63	
EJ21039	7-3-32	
EJ21040	7-3-34	
EJ21084	7-4-29	
EJ21085	7-4-29	
EJ21086	7-4-26	
EJ21087	7-4-27	
EJ21092	7-5-55	
EJ21093	7-5-52	
EJ21096	7-5-36	
EJ21098	7-5-70	
EJ21101	7-5-19	
EJ21105	7-5-22	
EJ21106	7-5-23	
EJ21108-1	7-5-43	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
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EJ21204	7-1-4	
EJ21231	7-9-16	
EJ21232	7-11-8	
EJ21233	7-3-25	
EJ21236	7-11-10	
EJ21237	7-11-12	
EJ21238	7-11-11	
EJ21241	7-3-44	
EJ21242	7-3-26	
EJ21243	7-3-33	
EJ21244	7-3-31	
EJ21245	7-17-16	
EJ21246	7-16-8	
EJ21250	7-5-64	
EJ21251	7-5-65	
EJ21252	7-5-67	
EJ21253	7-5-68	
EJ21254	7-5-60	
EJ21255	7-14-12	
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EJ21257	7-14-6	
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EJ21259	7-14-9	
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EJ21266	7-5-14	
EJ21267	7-5-18	
EJ21268	7-5-17	
EJ21269	7-14-4	
EJ21270-1	7-5-3	
EJ21270-2	7-5-2	
EJ21271	7-5-23	
EJ21272	7-5-44	
EJ21273	7-14-2	
EJ30032	7-8-6	
EJ30039	7-9-17	
EJ30055	7-9-3	
EJ30055	7-9-13	
EJ30056	7-9-21	
EJ30057	7-12-0	
EJ30068	7-4-4	
EJ30068	7-5-23	
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EJ31001	7-3-3	

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EJ31004	7-9-7	
EJ31005	7-17-15	
EJ31006	7-8-13	
EJ31007	7-14-13	
EJ31009	7-8-9	
EJ31010	7-9-20	
EJ31010	7-10-27	
EJ31010	7-11-29	
EJ31011	7-11-6	
EJ31012	7-3-38	
EJ31013	7-2-62	
EJ31014	7-2-52	
EJ31014	7-3-42	
EJ31015	7-2-51	
EJ31016	7-3-43	
EJ31017	7-2-54	
EJ31018	7-3-45	
EJ31019	7-2-53	
EJ31020	7-3-46	
EJ31025	7-3-38	
EJ31027	7-3-7	
EJ31029	7-4-4	
EJ31029	7-13-0	
EJ31030	7-3-31	
EJ31031	7-3-36	
EJ31057	7-4-25	
EJ31058	7-4-28	
EJ31064-1	7-5-41	
EJ31064-2	7-5-42	
EJ31125	7-8-2	
EJ31126	7-2-52	
EJ31127	7-2-51	
EJ31128	7-2-54	
EJ31129	7-2-53	
EJ31143	7-11-19	
EJ31144	7-11-6	
EJ31145	7-9-21	
EJ31146	7-8-9	
EJ31147	7-8-6	
EJ31148	7-3-42	
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EJ31152	7-3-36	
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EJ31156	7-14-13	
EJ31157	7-5-47	
EJ31158	7-5-57	
EJ31160	7-5-10	
EJ31161-1	7-5-5	
EJ31161-2	7-5-4	
EJ31162	7-5-39	
EJ31163	7-5-47	
EJ31165	7-5-21	
EJ31197	7-5-6	
EJ31197	7-13-0	
EJ31434	7-3-43	
EJ40041	7-11-18	
EJ40057	7-9-12	
EJ40058	7-9-2	
EJ40075	7-10-4	
EJ40075	7-11-4	
EJ40089	7-1-12	
EJ40090	7-2-65	
EJ40090	7-12-0	
EJ41001	7-3-2	
EJ41002	7-3-2	
EJ41005	7-3-2	
EJ41006	7-9-25	
EJ41007	7-8-19	
EJ41008	7-10-25	
EJ41008-1	7-11-27	
EJ41010	7-17-17	
EJ41011	7-4-21	
EJ41011	7-14-0	
EJ41012	7-14-16	
EJ41015	7-2-49	
EJ41017	7-3-13	
EJ41019	7-4-31	
EJ41020	7-4-32	
EJ41021	7-4-20	
EJ41022	7-11-17	
EJ41023	7-11-30	
EJ41026	7-3-48	
EJ41027	7-10-15	
EJ41028	7-10-28	
EJ41030	7-4-14	
EJ41030	7-5-20	
EJ41038	7-16-13	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
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EJ41106	7-2-62	
EJ41107	7-2-49	
EJ41108	7-9-2	
EJ41109	7-2-65	
EJ41109	7-12-0	
EJ41112	7-10-25	
EJ41113	7-2-8	
EJ41114	7-8-19	
EJ41126	7-11-17	
EJ41127	7-11-18	
EJ41128	7-11-30	
EJ41129	7-11-4	
EJ41131	7-9-2	
EJ41132	7-9-12	
EJ41133	7-9-25	
EJ41134	7-8-19	
EJ41140	7-16-13	
EJ41141	7-5-58	
EJ41141	7-14-0	
EJ41142	7-14-16	
EJ41143	7-5-20	
EJ41159	7-16-0	
EJ41160	7-5-72	
EJ41161	7-5-73	
EJ41204	7-16-2	
EJ51001	7-1-0	
EJ51002	7-1-2	
EJ51002	7-3-0	
EJ51003	7-3-11	
EJ51003	7-11-0	
EJ51004	7-1-10	
EJ51004	7-4-0	
EJ51004	7-4-21	
EJ51005	7-4-33	
EJ51006	7-3-49	
EJ51010	7-1-0	
EJ51011	7-1-1	
EJ51011	7-2-0	
EJ51012	7-2-34	
EJ51012	7-10-0	
EJ51020	7-2-64	
EJ51021	7-1-6	
EJ51021	7-1-7	
EJ51021	7-17-0	
EJ51027	7-1-9	

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EJ51061	7-1-1	
EJ51061	7-2-0	
EJ51062	7-2-64	
EJ51065	7-2-34	
EJ51065	7-10-0	
EJ51070	7-1-0	
EJ51071	7-1-3	
EJ51071	7-3-0	
EJ51072	7-3-11	
EJ51072	7-11-0	
EJ51073	7-3-49	
EJ51076	7-1-11	
EJ51076	7-5-0	
EJ51077	7-5-74	
EJ51079	7-5-8	
EJ51081	7-1-7	
EJ51081	7-17-0	
EJ51082	7-1-9	
EJ51082	7-16-0	
EJ51111	7-1-11	
EJ51111	7-5-0	
EJ51112	7-5-74	
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FHOF-9	7-3-18	
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G70219-4	7-7-38	
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G70349-2	7-7-43	
G80144-2	7-7-4	
G80146-3	7-7-24	
G80147	7-7-22	
G80171	7-7-33	
G80172	7-7-35	
G80173	7-7-36	
G80174	7-7-37	
G80184	7-7-10	
G80185	7-7-9	
G80187	7-7-5	
G80188	7-7-1	
G80189-3	7-7-39	
G80193	7-7-18	
G80194-1	7-7-44	
G80195	7-7-41	
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H80116	7-7-46	
J80001 (DWG)	7-7-0	
K80061-2	7-7-14	
K80081-2	7-7-30	
K80082-5	7-7-20	
K80137	7-7-19	
K80139-6	7-7-34	
LE085HS	7-16-3	
L80065-34	7-7-48	
L80134	7-7-16	
MHOF-10	7-12-11	
MHOF-10	7-13-16	
MIL-S-1222	7-15-1	
MODEL NO. 84135-27	7-7-0	
MS15003-2	7-10-23	
MS15003-2	7-11-25	
MS15003-2	7-14-14	
MS15721-1	7-8-16	
MS15721-1	7-9-10	
MS15721-1	7-15-7	
MS15795-314	7-2-60	
MS171714	7-5-62	
MS171777	7-5-7	
MS17692	7-10-1	
MS17692	7-11-1	
MS17829-12F	7-10-7	
MS17829-12F	7-11-9	
MS24665-517	7-15-4	
MS25043-240	7-2-48	
MS27183-20	7-4-2	
MS27977-2B	7-4-12	
MS27977-2B	7-5-31	
MS27977-3B	7-4-11	
MS27977-3B	7-5-30	
MS27977-6B	7-4-6	
MS27977-6B	7-5-25	
MS35233-43	7-2-56	
MS35307-362	7-2-61	
MS35338-145	7-15-2	
MS35338-156	7-4-8	
MS35338-156	7-5-27	
MS35650-354	7-4-7	
MS35650-354	7-5-26	

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MS51922-33	7-2-11	
MS51958-45	7-4-10	
MS51958-45	7-5-29	
MS9048-235	7-14-8	
MS9048-240	7-14-5	
MS90728-38	7-6-2	
MS9245-65	7-4-1	
M1620-6	7-5-12	
PX80BBS	7-2-6	
PX80BBS	7-3-5	
PX80BBS	7-6-0	
S6202-74027	7-16-12	
TA716	7-2-45	
TA716	7-3-29	
TB1624	7-5-11	
THOF-3	7-2-43	
THOF-3	7-16-10	
TSS-3	7-2-43	
TSS-3	7-3-18	
TSS-3	7-16-10	
010302	7-6-0	
010311	7-6-6	
010624	7-6-3	
011048	7-6-4	
011108	7-6-5	
04-0024 (DWG)	7-2-8	
04-0024 (DWG)	7-7-50	
1-12-48A	7-7-45	
1-13-28D	7-7-12	
1-9-3E	7-7-6	
10-1-2A	7-7-15	
10-1-4A	7-7-47	
10-72624-24-21P	7-12-13	
16-8-10	7-2-50	
16-8-10	7-3-14	
16-8-10	7-12-9	
16-8-10	7-13-13	
1961B	7-8-16	
198F131 (DWG)	7-2-8	
198F131 (DWG)	7-7-50	
202B4494 (DWG)	7-1-4	
202B4495 (DWG)	7-1-5	
226F136 (DWG)	7-2-8	
226F136 (DWG)	7-7-50	
229B3054	7-1-4	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
24263	7-8-11	
2498-3	7-13-10	
28-651	7-12-6	
28-651	7-13-6	
28-822	7-12-5	
28-822	7-13-5	
29322	7-8-14	
29322	7-9-18	
3-3-23E	7-7-26	
3-6-2A	7-7-17	
3-6-2A	7-7-25	
3-6-3A	7-7-27	
30182-6-88	7-17-2	
32-576	7-12-3	
32-576	7-13-3	
3840 Q	7-17-8	
4-2-4D	7-7-8	
4-4-1D	7-7-28	
4-4-13D	7-7-32	
4-6-4D	7-7-7	
4-6-6D	7-7-13	
4-6-8D	7-7-2	
411375	7-6-2	
412040	7-8-11	
42-1091	7-12-7	
42-1091	7-13-7	
4524704	7-1-8	
4524717	7-2-19	
4524720	7-2-25	
4524724	7-2-29	
4524725	7-2-26	
4524726	7-2-18	
4524727	7-2-20	
4524728	7-2-12	
4524729	7-2-22	
4524734-1	7-2-58	
4524734-2	7-2-58	
4524734-2	7-3-40	
4524737	7-9-16	
4524740	7-8-12	
4524744	7-10-16	
4524746	7-10-17	
4524746	7-11-19	
4524748	7-10-6	
4524748	7-11-8	
4524752	7-2-40	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
4524752	7-3-25	
4563545	7-2-2	
4563566	7-8-10	
47200	7-8-18	
49-3362	7-13-12	
49-3365	7-13-11	
5-1-1A	7-7-3	
5-3-104D	7-7-11	
5-3-77D	7-7-23	
5KR286NN489	7-2-8	
5KR286NS401H	7-2-8	
5000-244	7-2-23	
5000-244-MD	7-17-10	
5100-125-MD	7-9-4	
5100-125-MD	7-17-12	
5100-162	7-8-1	
5100-98-MD	7-17-9	
53-2636	7-8-15	
5703891	7-10-18	
5707519	7-10-18	
5707519	7-11-20	
6-1-3	7-7-21	
63x1735	7-8-11	
63427	7-9-14	
6305-2RS	7-2-24	
6305-2RS	7-17-11	
6819301 (DWG)	7-4-21	
6819301 (DWG)	7-15-0	
6891303	7-15-5	
6891304	7-15-6	
6891305	7-15-10	
6891307	7-15-8	
6819314	7-15-3	
6902171	7-15-9	
6902185	7-4-14	
6981ED173-286 (DWG)	7-12-0	
6981ED175-214	7-13-0	
6981ED190-6P	7-12-8	
6984H53A	7-2-15	
6984H53A	7-2-39	
6984H53A	7-3-24	
805-1624071-62	7-4-3	
805-1624071-64	7-4-1	
86-2369-3	7-12-2	
86-2369-3	7-13-2	
86-2425	7-12-4	

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PART NUMBER	FIG & INDEX NUMBER	REF DES
86-2425	7-13-4	
86-2427-3	7-12-1	
86-2427-3	7-13-1	
86-2498	7-13-8	
86-2498-2	7-13-9	

APPENDIX A

MANUFACTURERS' DRAWINGS

A-1. INTRODUCTION.

A-1.1 SCOPE. This appendix contains preservation (painting) data for the sliding padeye drive and master drawings for the electric motor and motor controller.

A-2. PAINTING.

A-2.1 Removal and replacement of sliding padeye components in most cases causes chipped or scratched painted surfaces. These areas should be touched up in accordance with the standard painting procedures for Underway Replenishment (UNREP) equipment. Refer to the touchup and overcoating procedures on NAVSEA drawing 53711-5210545.

A-3. MASTER DRAWINGS.

A-3.1 MOTOR CONTROLLER. Table A-1 contains a listing of motor controllers that were specified for the four sliding padeye models covered by this technical manual. The drawings are included in this appendix as figure A-1 through figure A-3. Refer to chapter 7, illustrated parts breakdown (IPB) and group assembly parts list (GAPL) figure 7-1 for applicability.

A-3.2 ELECTRIC MOTOR. Table A-1 contains a listing of electric motors that were specified for the four sliding padeye models covered by this technical manual. The drawings are included in this appendix as figure A-4 through figure A-7. Refer to chapter 7 IPB/GAPL figure 7-7 for applicability.

Table A-1. Manufacturers' Drawings

Figure No.	Drawing Number	Equipment	Manufacturer
A-1	202B4494 (2 sheets)	Motor Controller	* General Electric
A-2	202B4495 (2 sheets)	Motor Controller	* General Electric
A-3	229B3054 (2 sheets)	Motor Controller	Ward Leonard
A-4	04-0024 (3 sheets)	AC Motor	Tech Systems
A-5	198F131 (1 sheet)	AC Motor	* General Electric
A-6	226F136 (2 sheets)	AC Motor	* General Electric

*Motor controller and AG motor manufactured by General Electric. General Electric Motor Business has been taken over by Tech Systems and General Electric Motor Controller Business by Ward Leonard. Sources for General Electric motor and motor controller repair parts are Tech Systems and Ward Leonard, respectively.

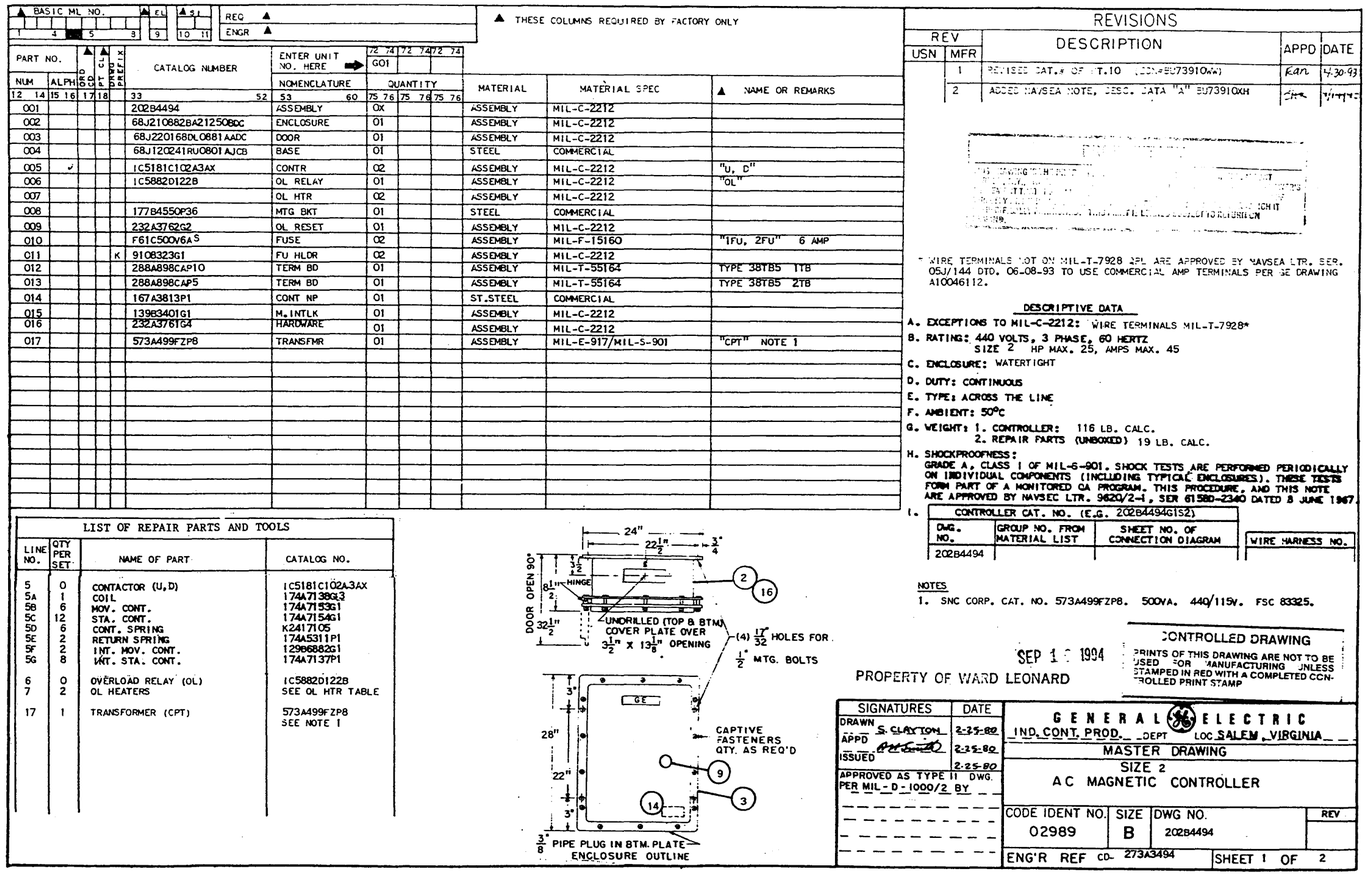


Figure A-1. Motor Controller, Dwg. No. 202B4494 (Sheet 1 of 2)

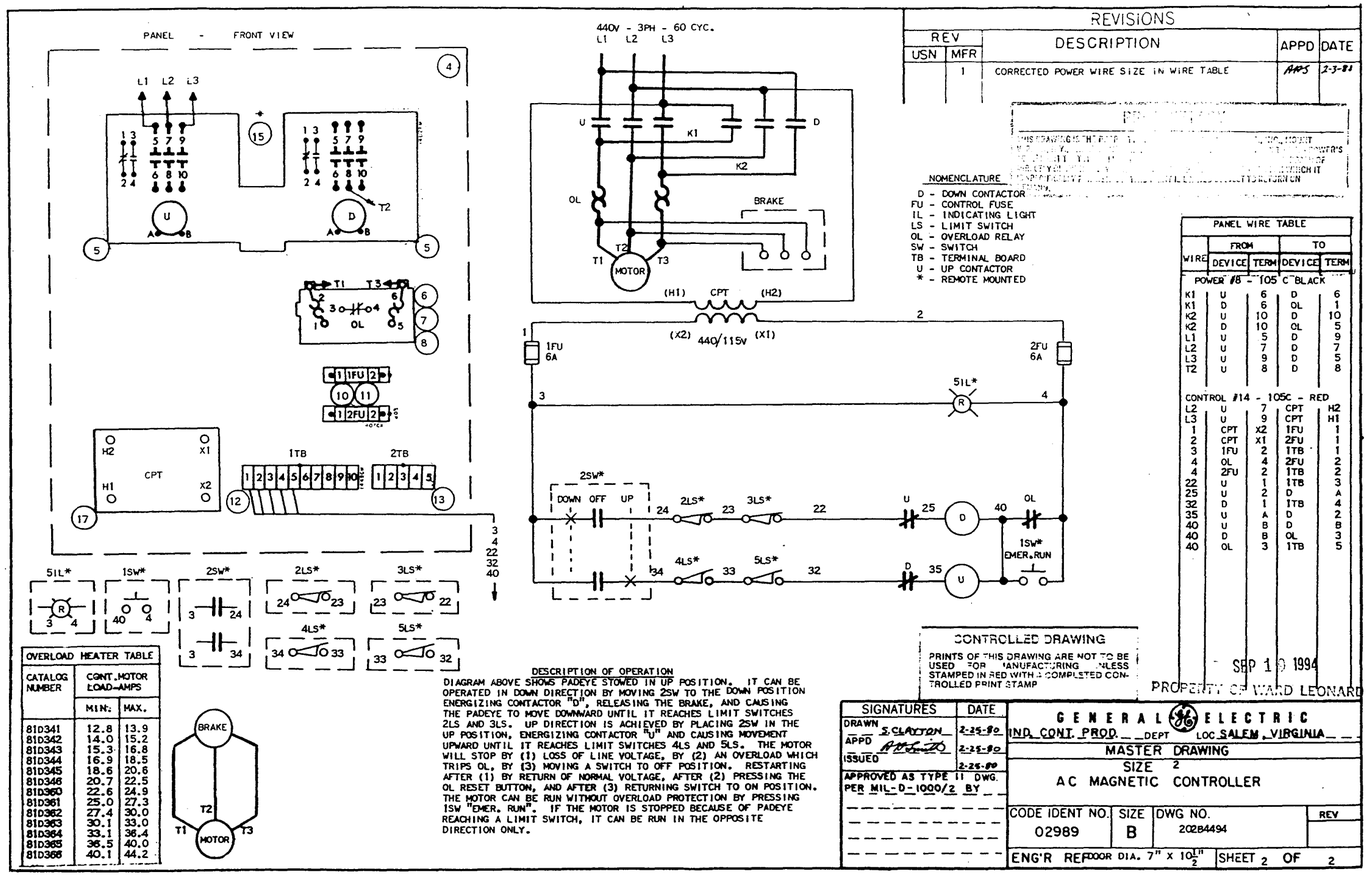


Figure A-1. Motor Controller, Dwg. No. 202B4494 (Sheet 2 of 2)

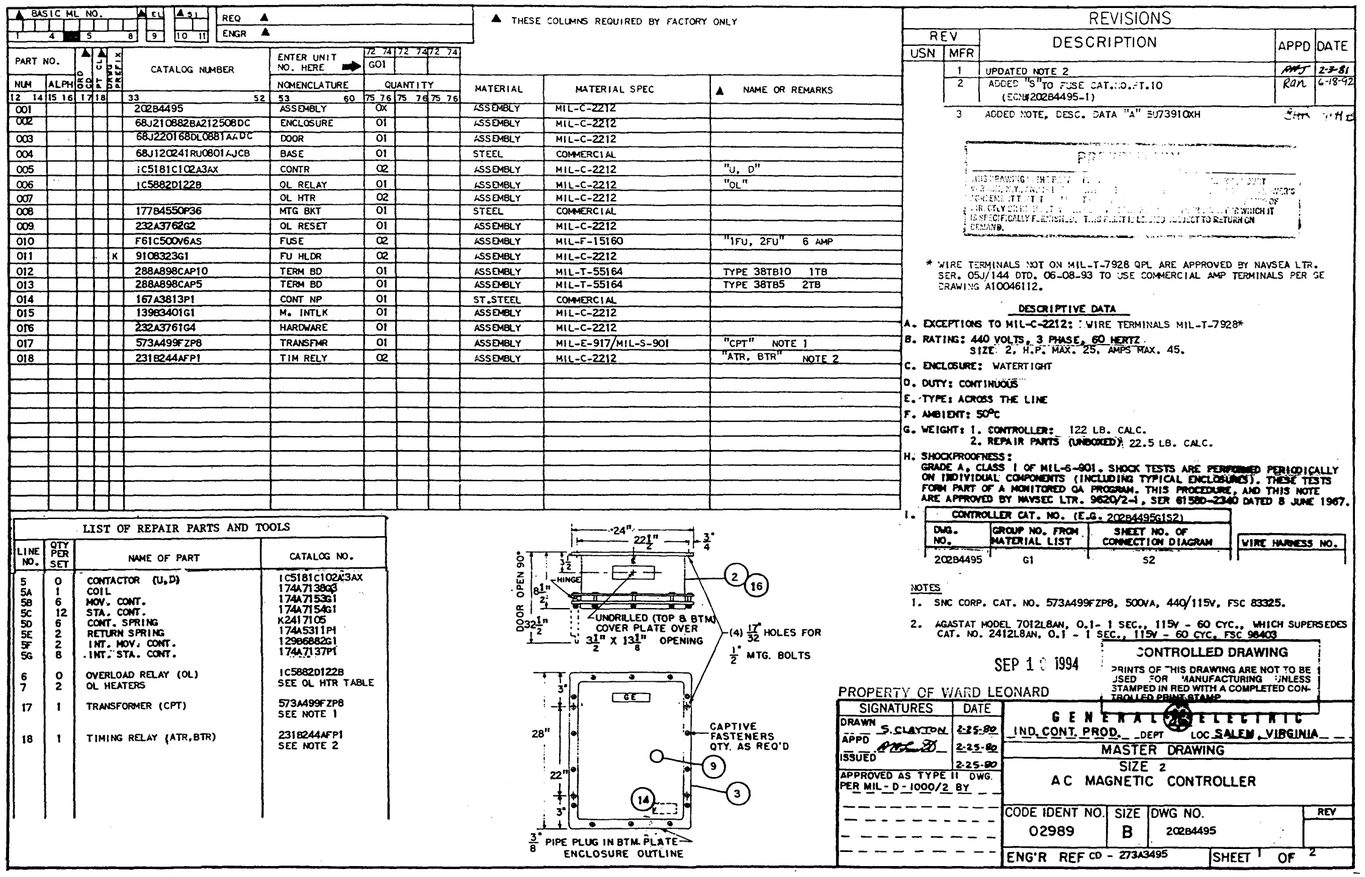


Figure A-2. Motor Controller, Dwg. No. 202B4495 (Sheet 1 of 2)

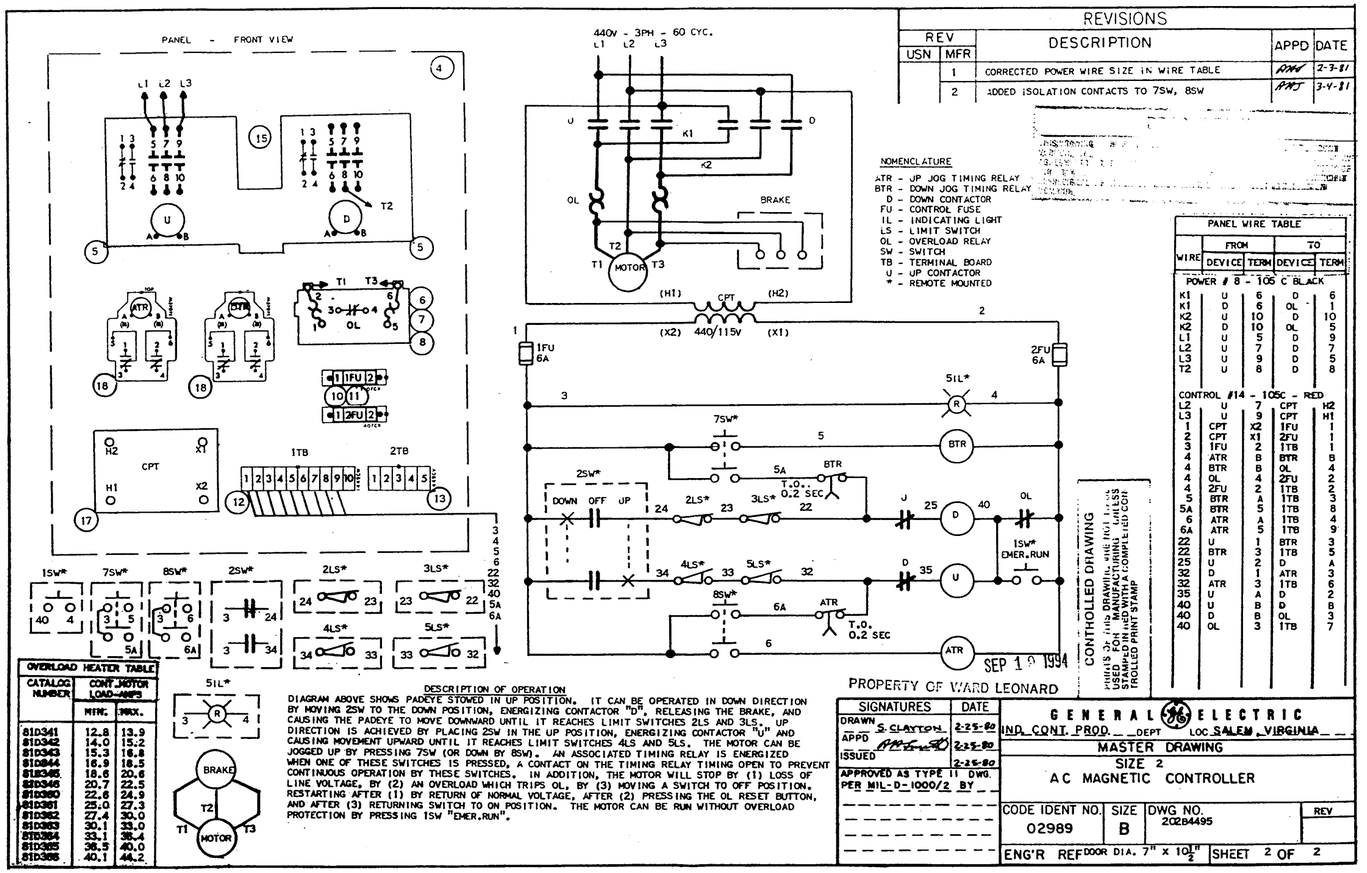


Figure A-2. Motor Controller, Dwg. No. 202B4495 (Sheet 2 of 2)

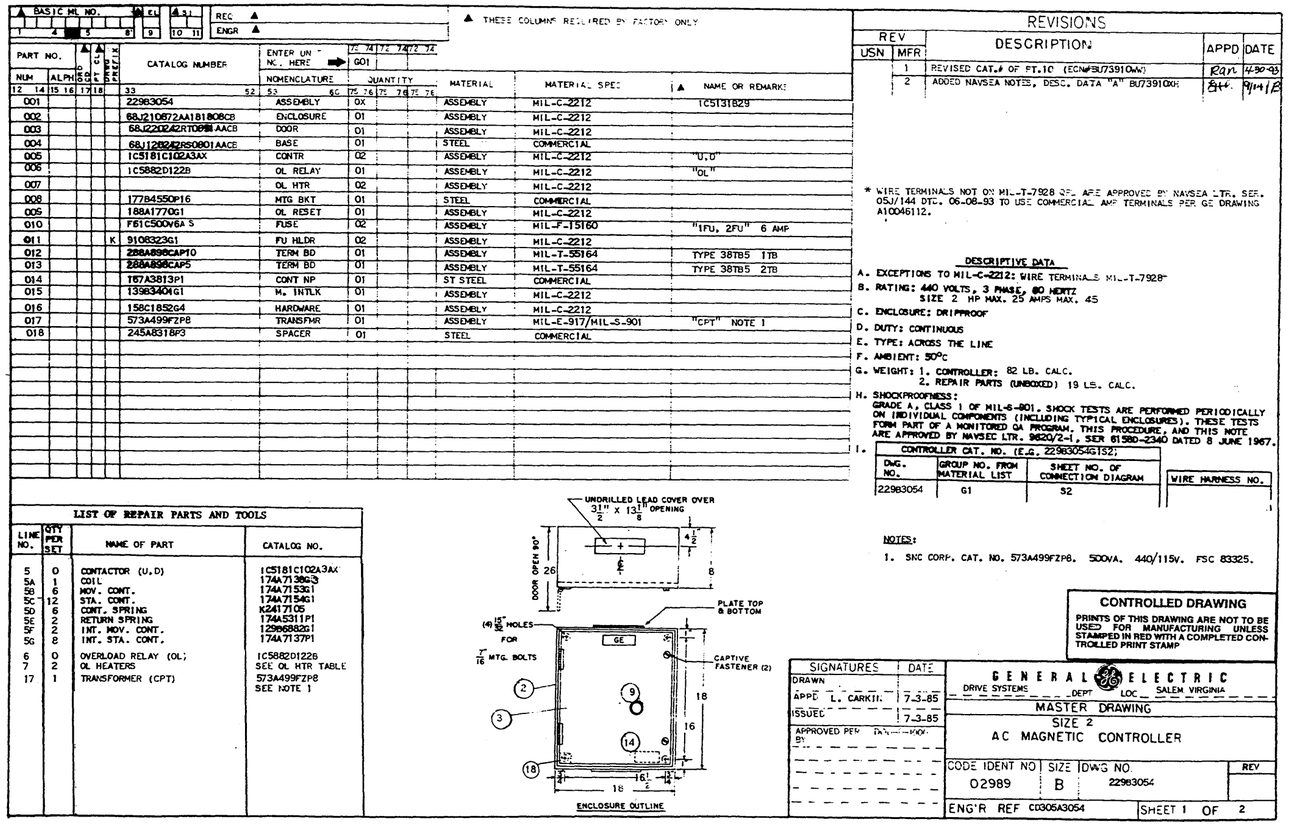


Figure A-3. Motor Controller, Dwg. No. 229B3054 (Sheet 1 of 2)

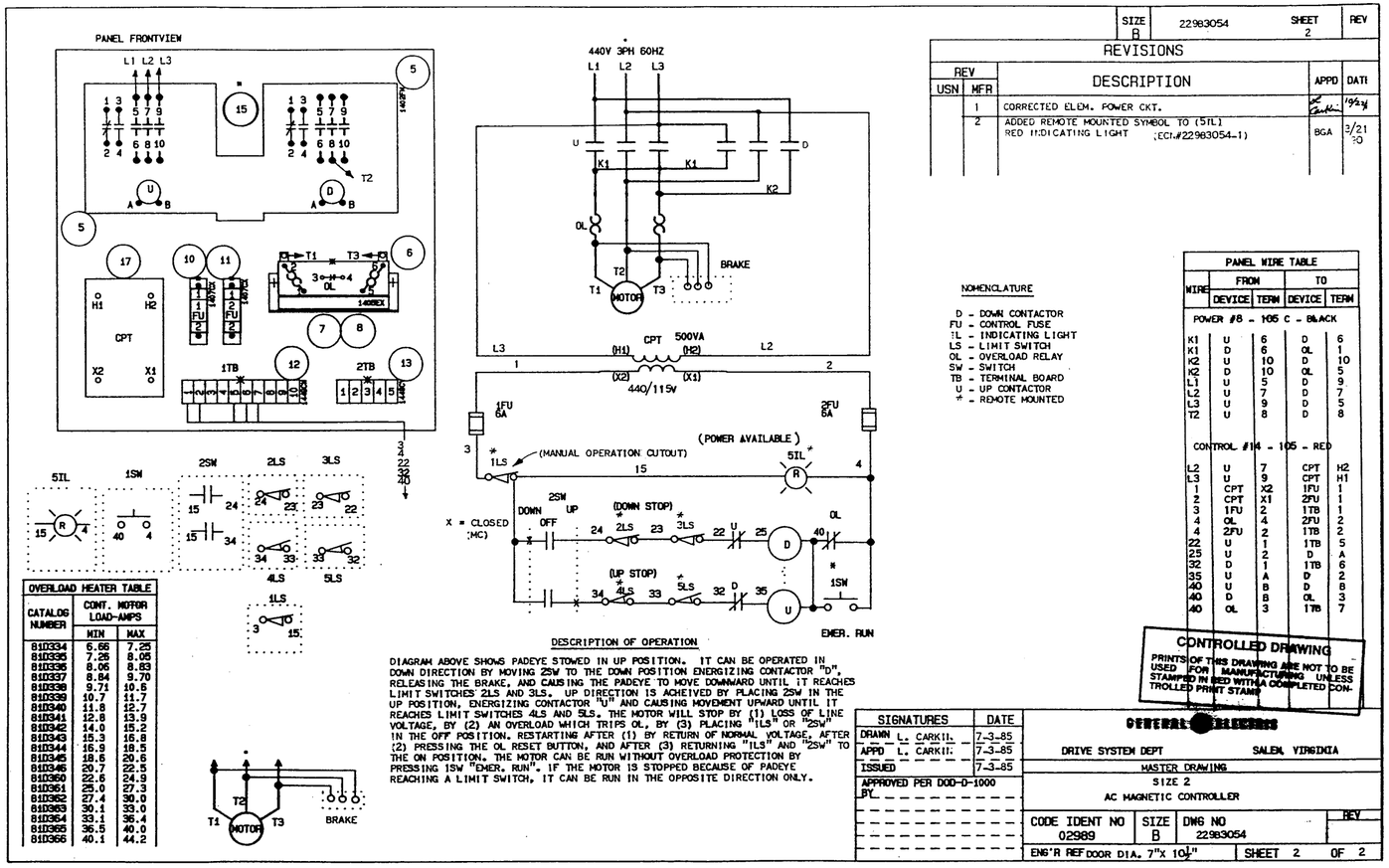


Figure A-3. Motor Controller, Dwg. No. 229B3054 (Sheet 2 of 2)

PARTS LIST	TECH SYSTEMS PRECISE POWER SYSTEMS Thomaston,Connecticut 06787	CONTRACT NO.	FSCM NO. 20019	PL04-0024	REV. LTR. F DATE 3/8/93
AC MOTOR, FRAME SIZE 286TNZ, 835 RPM, 440 V.A.C., 60 HZ, 3 PHASE 15 HP, 22.4 AMPS, 8 POLES, VERTICAL FOOT MTG, CLASS "F" SEALED INSULATION MIL-M-17060	O R G A.L. 12-2-91	C H K 12/12/91	A P P 91/12/12	C7389	SHEET 1 OF 1 SHTS

ITEM NO.	QTY.	PART NO.	DESCRIPTION	MANUFACTURER FSCM NO.	MANUFACTURER PART NO.	MATERIAL	SPECIFICATION	WT.
1	1	128D7251AC1	FRAME	20019		NOD IRON	MIL-I-24137,GR.A	
2	1	128D6262AM1	BRACKET, BEARING B.E.	20019		NOD IRON	MIL-I-24137,GR.A	
3	1	128D6266AM1	BRACKET, BEARING F.E.	20019		NOD IRON	MIL-I-24137,GR.A	
4	2	241A5616AB1	BEARING CAP	20019		NOD IRON	MIL-I-24137,GR.A	
5	1	149C4130AA2	TERMINAL BOX	20019		NOD IRON	MIL-I-24137,GR.A	
6	1	149C4131AA1	COVER, TERMINAL BOX	20019		NOD IRON	MIL-I-24137,GR.A	
*7	2	K55-0047	BALL BEARING	76062	310Z	ASSY	FF-B-171	
8	1	25000359-731	KEY, SQ 5/16 x 1-1/2	20019		STEEL	ASTM-A108,1018	
9	1	28WC301300G401A	WOUND STATOR ASSY	20019		ASSY	MIL-M-17060	
10	1 SET	MC6123-A1-S	COILS	20019		COPPER	J-W-1177, TY.K2	
*11	1	28RA305300AA01	ROTOR & SHAFT ASSY	20019		ASSY	MIL-M-17060	
12	1	28SH1102G505A	SHAFT	20019		STEEL	ASTM-A108,1144	
13	1	28RC305300AAAF	ROTOR ASSY	20019		ASSY	MIL-M-17060	
14	1	235A2300ENG08	SLINGER	20019		BRASS	ASTM-B16,360	
15	1	M19-0032	BRAKE	17904	VU5-84135-27	ASSY	MIL-B-16392	
16	1	235A4560GG1	GASKET, BRAKE	20019		CK NPRN	MIL-G-6183	
17	2	MS35674-58	GROOVE PIN, 3/8 DIA x 1" LG	81349		STEEL	MIL-P-20700	
18	1	235A4560FB2	GASKET, TERMINAL BOX	20019		NPRN	MIL-R-6130	
19	1	235A4766AY1	BRACKET, LEAD CLAMP	20019		STEEL	ASTM-A366	
20	2	235A4591AS2	CLAMP, LEAD	20019		STEEL	ASTM-A366	
21	2	K84-0045	BUSHING, REDUCER 3/8 x 1/8 NPT	95829	A112	STEEL	ANSI-B16-3	
*22	1	K87-0065	SEAL	73680		ASSY	MIL-R-83248	
*23	1	11700003-8	SPRING WASHER, CAPTIVE	20019		STEEL	ASTM-A682,1075	
24	1	235A4560AF1	GASKET, TERMINAL BOX	20019		CK NPRN	MIL-G-6183	
25	1	25000359-821	KEY, SQ 3/8 x 2-1/2	20019		STEEL	ASTM-A108,1018	
26	2	K70-0013-22	WASHER, SEALING 5/16	03818	NAS1523-5R	ASSY	COMMERCIAL	
27	1	235A4592KA2	ADAPTOR, TERMINAL BOX TO FRAME	20019		STEEL	QQ-S-635	
28	1	235A4560FN1	GASKET, SADDLE	20019		CK NPRN	MIL-G-6183	
29	1	10100162	INSTRUCTION PLATE	20019		SST	MIL-P-15024	
30	1	10100168	NAMEPLATE	20019		SST	MIL-P-15024	
31	6	SPP70-0001	DRIVE SCREW, #4 x 1/4 RD HD	20019		SST C.P.	FF-S-107	
32	4	SPP72-0101	PLUG, PIPE 1/8 NPT SOC HD	20019		STEEL Z.P.	MIL-F-5509	
33	2	SPP72-0103	PLUG, PIPE 3/8 NPT SOC HD	20019		STEEL Z.P.	MIL-F-5509	
34	2	SPP56-0402	SET SCREW, 6-32 x 1/4 SOC HD	20019		STEEL Z.P.	FF-S-200	
35	1	SPP70-0002	DRIVE SCREW, #0 x 1/4 RD HD	20019		SST C.P.	FF-S-107	
36	3	#4 x 12" LG	SLEEVING, #4	81851	#4 x 12" LG	ACRYLIC FBGS	MIL-E-917,GR.A	
37	3	MS25036-118	TERMINAL LUG, #8 WIRE, 3/8 SCREW	81349		ASSY	MIL-T-7928	
38	2	SPP59-0006	SCREW, #10-32 x 1/2 PAN HD	20019		STEEL Z.P.	FF-S-92	
39	4	SPP60-0155	SCREW, 1/4-20 x 3/4 HEX HD	20019		STEEL Z.P.	FF-S-85	
40	4	SPP61-0166	SCREW, 5/16-18 x 2-3/4 HEX HD	20019		STEEL Z.P.	FF-S-85	
41	4	SPP62-0052	SCREW, 3/8-16 x 3/4 FLAT HD	20019		STEEL Z.P.	FF-S-85	
42	4	SPP62-0157	SCREW, 3/8-16 x 1" HEX HD	20019		STEEL Z.P.	FF-S-85	
43	8	SPP62-0955	SCREW, 3/8-16 x 1-1/4 SOC HD	20019		STEEL Z.P.	FF-S-86	
44	2	SPP51-0005	WASHER, LOCK #10	20019		STEEL Z.P.	FF-W-84	
45	8	SPP51-0006	WASHER, LOCK 1/4	20019		STEEL Z.P.	FF-W-84	
46	2	SPP51-0007	WASHER, LOCK 5/16	20019		STEEL Z.P.	FF-W-84	
47	8	SPP51-0356	WASHER, LOCK 3/8	20019		STEEL Z.P.	FF-W-84	
48	2	SPP52-0010	NUT, HEX #10-32	20019		STEEL Z.P.	FF-N-836	
49	2	MS35758-8	GREASE CUP (REPAIR PART ONLY)	20019		BRASS	MIL-C-1213	
50	4	SPP51-0008	WASHER, LOCK 3/8	20019		STEEL Z.P.	FF-W-84	
51	1	10100164	INSTRUCTION PLATE	20019		SST	MIL-P-15024	

Figure A-4. A.C. Motor, Dwg. No. 04-0024 (Sheet 1 of 3)

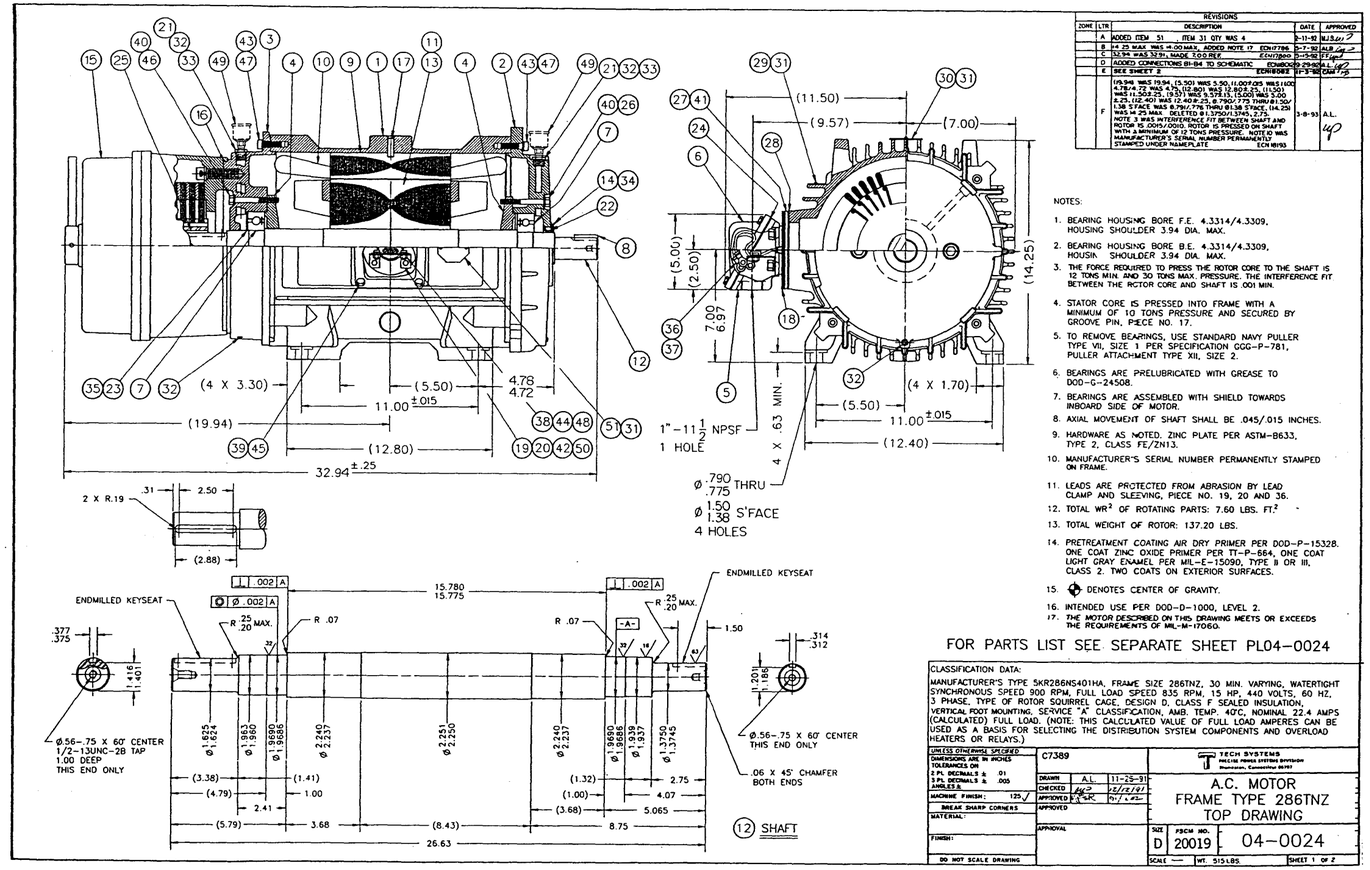


Figure A-4. A.C. Motor, Dwg. 04-0024 (Sheet 2 of 3)

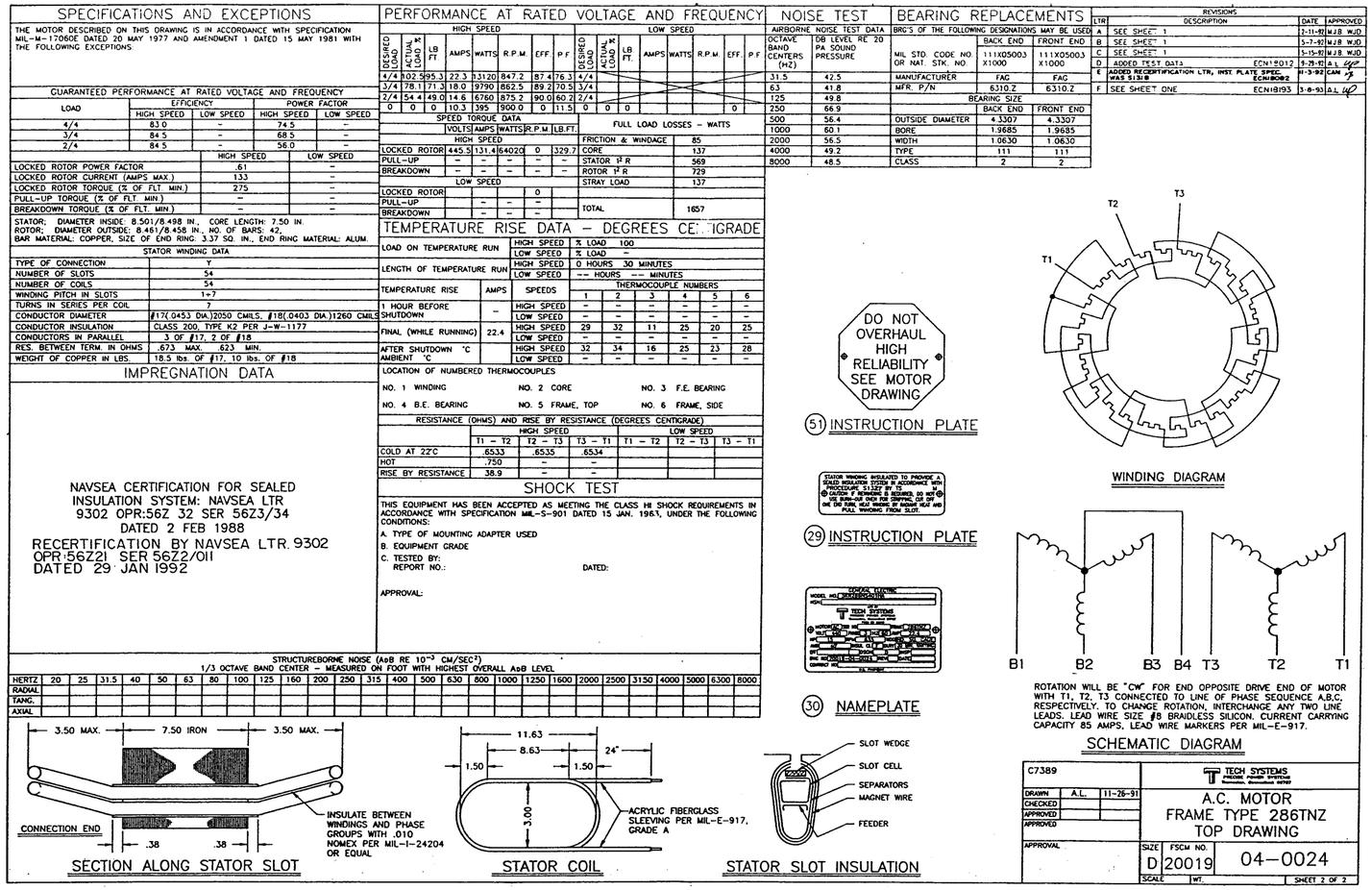


Figure A-4. A.C. Motor, Dwg. No. 04-0024 (Sheet 3 of 3)

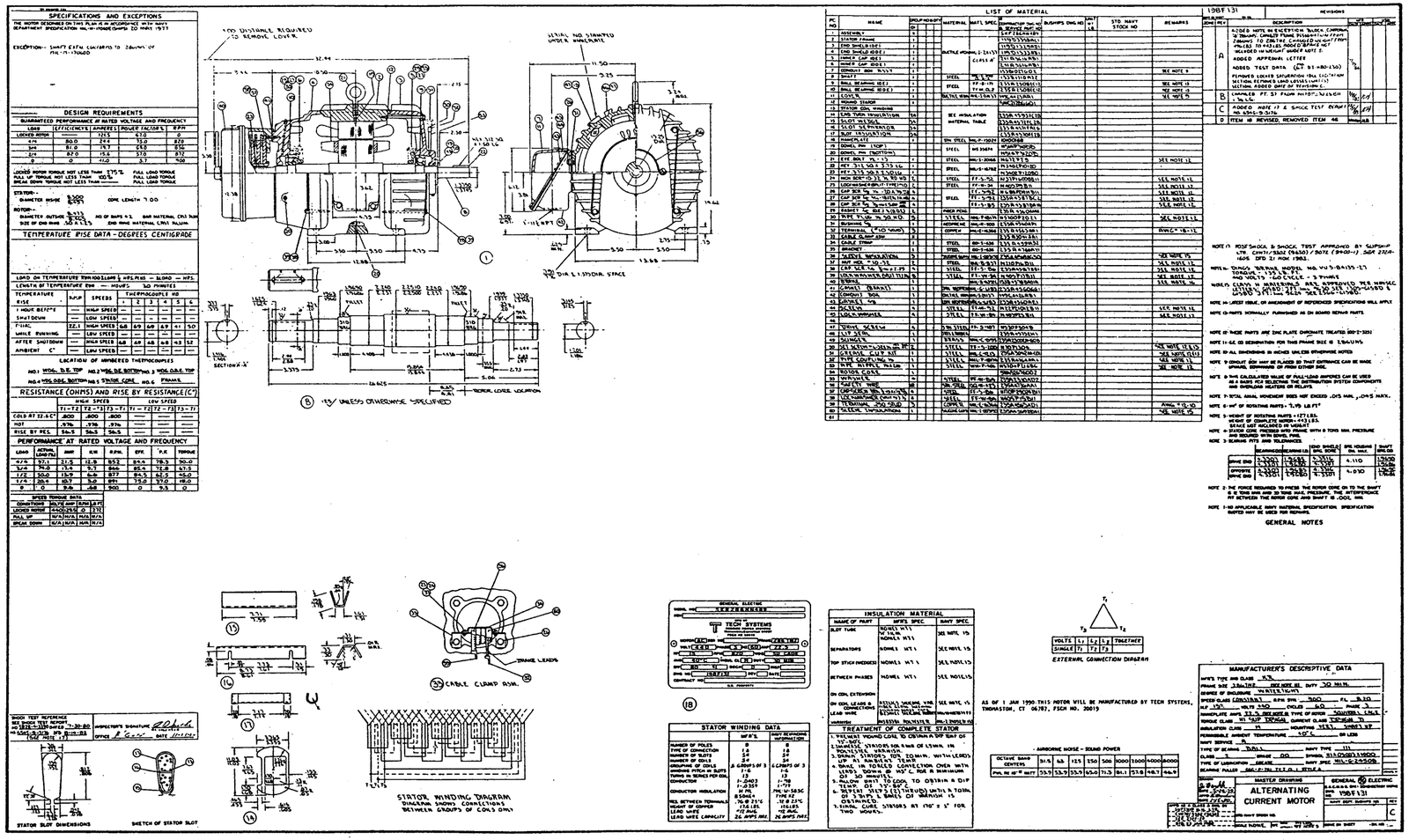
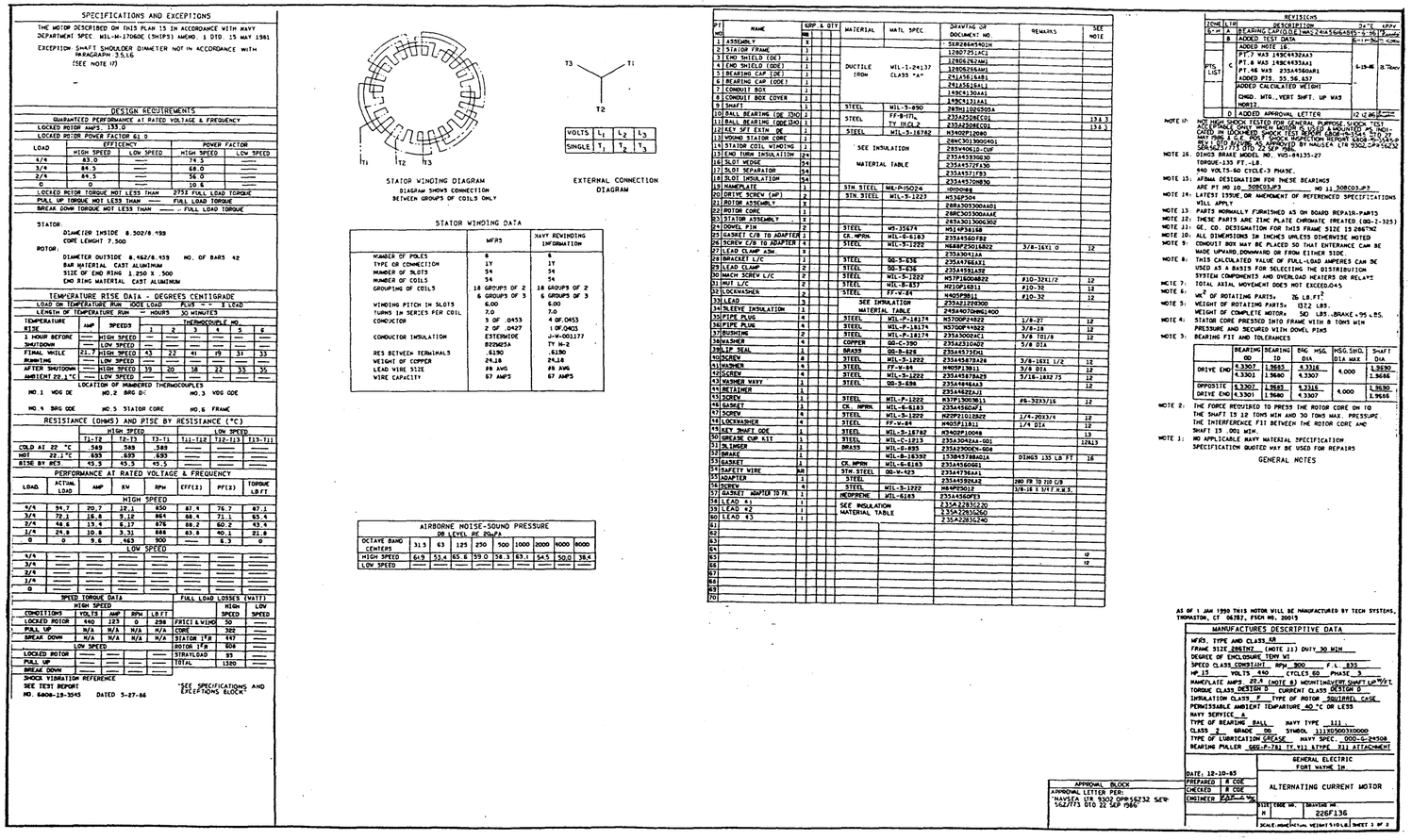


Figure A-5. A.C. Motor, Dwg. No. 198F131



SPECIFICATIONS AND EXCEPTIONS

THE MOTOR DESCRIBED ON THIS PLAN IS IN ACCORDANCE WITH NAVY DEPARTMENT SPEC MIL-W-17060E (SHIPS) AMEND. 1 DTD. 15 MAY 1981

EXCEPTION: SHAFT SHOULDER DIAMETER NOT IN ACCORDANCE WITH PARAGRAPH 3.5.1.6 (SEE NOTE 17)

DESIGN REQUIREMENTS

GUARANTEED PERFORMANCE AT RATED VOLTAGE & FREQUENCY

LOCKED ROTOR AMPS 133.0

LOCKED ROTOR POWER FACTOR 61.0

LOAD	EFFICENCY		POWER FACTOR	
	HIGH SPEED	LOW SPEED	HIGH SPEED	LOW SPEED
1/4	83.0	—	74.5	—
1/2	84.5	—	68.0	—
2/4	84.5	—	56.0	—
0	0	0	10.6	

LOCKED ROTOR TORQUE NOT LESS THAN 2752 FULL LOAD TORQUE

PULL UP TORQUE NOT LESS THAN —— FULL LOAD TORQUE

BREAK DOWN TORQUE NOT LESS THAN —— FULL LOAD TORQUE

STATOR

DIAMETER INSIDE 8.502/8.488
CORE LENGHT 7.500

ROTOR

DIAMETER OUTSIDE 8.462/8.459 NO. OF BARS 42
BAR MATERIAL CAST ALUMINUM
SIZE OF END RING 1.250 X .500
END RING MATERIAL CAST ALUMINUM

TEMPERATURE RISE DATA - DEGREES CENTIGRADE

LOAD ON TEMPERATURE RUN 100% LOAD PUF — % LEAD

LENGTH OF TEMPERATURE RUN — HOURS 30 MINUTES

TEMPERATURE RISE	AMP	SPEED	THERMOCOUPLE NO. 1	2	3	4	5	6
1 HOUR BEFORE SHUTDOWN	—	HIGH SPEED	—	—	—	—	—	—
	—	LOW SPEED	—	—	—	—	—	—
FINAL WHILE RUNNING	23.7	HIGH SPEED	43	22	41	19	37	33
	—	LOW SPEED	—	—	—	—	—	—
AFTER SHUTDOWN	—	HIGH SPEED	39	20	38	22	35	35
AMBIENT 22.1°C	—	LOW SPEED	—	—	—	—	—	—

LOCATION OF NUMBERED THERMOCOUPLES

NO.1 VOS DE NO.2 BRG DE NO.3 VOS ODE

NO.4 BRG ODE NO.5 STATOR CORE NO.6 FRAME

RESISTANCE (OHMS) AND RISE BY RESISTANCE (°C)

	HIGH SPEED T1-T2	T2-T3	T3-T1	LOW SPEED T11-T12	T12-T13	T13-T11
COLD AT 22 °C	.589	.588	.588	——	——	——
HOT 22.1°C	.693	.693	.693	——	——	——
RISE BY RES	45.3	45.5	45.5	——	——	——

PERFORMANCE AT RATED VOLTAGE & FREQUENCY

LOAD	ACTUAL LOAD	AMP	KW	RPM	EFF(%)	PF(%)	TORQUE LB FT
HIGH SPEED							
4/4	94.7	20.7	18.1	850	87.4	76.7	87.1
3/4	72.1	16.8	9.12	864	88.9	71.1	65.4
2/4	46.6	13.9	6.17	876	86.2	60.2	43.4
1/4	24.8	10.8	3.31	888	83.8	40.1	21.8
0	0	9.6	.463	900	——	6.3	0
LOW SPEED							
4/4	——	——	——	——	——	——	——
3/4	——	——	——	——	——	——	——
2/4	——	——	——	——	——	——	——
1/4	——	——	——	——	——	——	——
0	——	——	——	——	——	——	——

SPEED TORQUE DATA

CONDITIONS	HIGH SPEED VOLTS	AMP	RPM	LB FT
LOCKED ROTOR	440	123	0	298
PULL UP	N/A	N/A	N/A	N/A
BREAK DOWN	N/A	N/A	N/A	N/A
	LOW SPEED			
LOCKED ROTOR	——	——	——	——
PULL UP	——	——	——	——
BREAK DOWN	——	——	——	——

SHOCK VIBRATION REFERENCE
SEE TEST REPORT
NO. 6606-19-3545 DATED 5-27-86

FULL LOAD LOSSES (WATT)

	HIGH SPEED	LOW SPEED
FRICT & WIND	50	——
CORE	302	——
STATOR I²R	447	——
ROTOR I²R	608	——
STRAYLOAD	93	——
TOTAL	1320	——

SEE SPECIFICATIONS AND EXCEPTIONS BLOCK

STATOR WINDING DIAGRAM
DIAGRAM SHOWS CONNECTION BETWEEN GROUPS OF COILS ONLY

EXTERNAL CONNECTION DIAGRAM

STATOR WINDING DATA

	MFR'S	NAVY REWINDING INFORMATION
NUMBER OF POLES	8	8
TYPE OR CONNECTION	1Y	1Y
NUMBER OF SLOTS	54	54
NUMBER OF COILS	54	54
GROUPING OF COILS	18 GROUPS OF 2 6 GROUPS OF 3	18 GROUPS OF 2 6 GROUPS OF 3
WINDING PITCH IN SLOTS	6.00	6.00
TURNS IN SERIES PER COIL	7.0	7.0
CONDUCTOR	3 OF .0453 2 OF .0427	4 OF.0453 1 OF.0403
CONDUCTOR INSULATION	ESTERWIDE	J-W-001177 TY N-2
RES BETWEEN TERMINALS	.6190	.6190
WEIGHT OF COPPER	24.18	24.18
LEAD WIRE SIZE	#8 AWG	#8 AWG
WIRE CAPACITY	67 AMPS	67 AMPS

AIRBORNE NOISE-SOUND PRESSURE
DB LEVEL RE 20μPA

OCTAVE BAND CENTERS	31.5	63	125	250	500	1000	2000	4000	8000
HIGH SPEED	61.9	53.4	65.8	59.0	58.3	63.1	54.5	50.0	38.4
LOW SPEED	——	——	——	——	——	——	——	——	——

PT NO	NAME	QTY	MATERIAL	MATL SPEC	DRAWING OR DOCUMENT NO.	REMARKS	SEE NOTE
1	ASSEMBLY	X			5182686#5401H		
2	STATOR FRAME	1			12807251AC1		
3	END SHIELD (DE)	1			12806767AA1		
4	END SHIELD (ODE)	1	DUCTILE IRON	MIL-I-24137 CLASS "A"	12806766AH1		
5	BEARING CAP (DE)	1			241456164B1		
6	BEARING CAP (ODE)	1			241456164L1		
7	CONDUIT BOX	1			[illegible]30AA1		
8	CONDUIT BOX COVER	1			[illegible]31AA1		
9	SHAFT	1	STEEL	MIL-S-890	283W1102G505A		
10	BALL BEARING (DE ONLY)	1	STEEL	FF-B-171, TY IH CL 2	235A250EC01		13 & 3
11	BALL BEARING (ODE ONLY)	1			235A250EC01		13 & 3
12	KEY SFI EXTN DE	1	STEEL	MIL-S-16792	N340DP12080		
13	WOUND STATOR CORE	1	SEE INSULATION MATERIAL TABLE		28WC301300401		
14	STATOR COIL WINDING	1			283W4061D-CWF		
15	END TURN INSULATION	24			235A4593G30		
16	SLOT WEDGE	54			235A4572F430		
17	SLOT SEPARATOR	54			235A4572F31		
18	SLOT INSULATION	54			235A4572NB30		
19	NAMEPLATE	1	STN STEEL	MIL-P-15024	10100B6		
20	DRIVE SCREW (NP)	2	STN STEEL	MIL-S-1223	#536P304		
21	ROTOR ASSEMBLY	X			28RA3053004A01		
22	ROTOR CORE	1			28RC3053004AAE		
23	STATOR ASSEMBLY	X			283A3013006302		
24	DOWEL PIN	2	STEEL	MS-35674	#514P38168		
25	GASKET C/B TO ADAPTER	1	CK. NPRN	MIL-G-6183	235A4560F82		
26	SCREW C/B TO ADAPTER	4	STEEL	MIL-S-12202	H6A8P250188202	3/8-16X1.0	12
27	LEAD CLAMP ASM	X			235A3041AA		
28	BRACKET L/C	1	STEEL	QQ-S-636	235A4788AA1		
29	LEAD CLAMP	2	STEEL	QQ-S-636	235A4591AT2		
30	MATCH SCREW L/C	2	STEEL	MIL-S-1222	MS7P1600AB22	#10-32X1/2	12
31	NUT L/C	2	STEEL	MIL-B-157	#210P1681J	#10-32	12
32	LOCKWASHER	2	STEEL	FF-W-84	N405P3811	#10-32	12
33	LEAD	3	SEE INSULATION MATERIAL TABLE		235A2129B300		
34	SLEEVE INSULATION	1			2454407WHG400		
35	PIPE PLUG	4	STEEL	MIL-P-18174	N570DP24B22	1/8-27	12
36	PIPE PLUG	4	STEEL	MIL-P-18174	N370DP19B22	3/8-18	12
37	BUSHING	2	STEEL	MIL-P-18174	235A3002AC1	3/8 TO1/8	12
38	WASHER	4	COPPER	QQ-C-390	235A2310A02	5/8 DIA	
39	LIP SEAL	1	BRASS	QQ-B-626	235A4573EH1		
40	SCREW	8	STEEL	MIL-S-1222	235A4587BA28	3/8-16X1 1/2	12
41	WASHER	4	STEEL	FF-W-84	N405P13811	3/8 DIA	12
42	SCREW	4	STEEL	MIL-S-1222	235A4587BA29	3/16-18X2.75	12
43	WASHER WAVY	1	STEEL	QQ-S-698	235A4848AA3		12
44	RETAINER	1			235A4827AJ1		
45	SCREW	1	STEEL	MIL-P-1222	N37P13003611	#8-32X3/16	12
46	GASKET	1	CK. NPRN	MIL-G-6183	235A4560AF2		
47	SCREW	6	STEEL	MIL-S-1222	N27P12112B22	1/4-20X3/4	12
48	LOCKWASHER	4	STEEL	FF-W-84	N405P11811	1/4 DIA	12
49	KEY SHAFT ODE	1	STEEL	MIL-S-16792	N340DP10H8		13
50	GREASE CUP KIT	1	STEEL	MIL-C-1213	235A3042AA-001		12&13
51	SLINGER	1	BRASS	MIL-G-835	235A2300EN-606		
52	BRAKE	1		MIL-B-18392	153B4578AA02A	DINGS .135 LB FT	16
53	GASKET	1	CK. NPRN	MIL-G-6183	235A4560G61		
54	SAFETY WIRE	AR	STN STEEL	QQ-W-423	235A4736A1		
55	ADAPTER	1	STEEL		235A4592AA2	280 FR TO 210 C/B	
56	SCREW	4	STEEL	MIL-S-1222	M6MP250J2	3/8-16 X 1 3/4 H.H.S.	
57	GASKET ADAPTER TO FR	1	NEOPRENE	MIL-6183	235A4560F83		
58	LEAD #1	1	SEE INSULATION MATERIAL TABLE		235A2283Z20		
59	LEAD #2	1			235A2283Z40		
60	LEAD #3	1			235A2283Z60		
61							
62							
63							
64							
65							12
66							12
67							
68							
69							
70							

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPV
	A	BEARING CAP (10 & 11) WAS 236A5640E01 & 02	5-26-87	[illegible]
	B	ADDED TEST DATA	6-11-87	[illegible]
		ADDED NOTE 16		
STA LIST	C	PT.7 WAS 249C4432AA3 PT.8 WAS 249C4433AA1 PT.46 WAS 235A4560AR1 ADDED PTS. 55, 56, & 57	6-19-88	[illegible]
		ADDED CALCULATED WEIGHT		
		CHGD. MTG. VERT SHFT. UP WAS N0812		
	D	ADDED APPROVAL LETTER	12-12-88	[illegible]

NOTE 17: NOT HIGH SHOCK TESTED FOR GENERAL PURPOSE SHOCK TEST ACCEPTANCE ONLY WHEN MOTOR IS USED & MOUNTED AS INDICATED IN LOCKHEED SHOCK TEST REPORT GROB-LW-1364 5-10-77 NAVY PURCHASE ORDER SHOCK INSPECTION REPORT 6606-19-3545 & 6606-19-3546 DATED 5-27-86 PREPARED BY NAUSEA LTR 9302 OP0156232 SEP 5627F3 DTD 22 SEP 1986

NOTE 16: DINGS BRAKE MODEL NO. WUS-84135-27 TORQUE-135 FT.-LB. 440 VOLTS-60 CYCLE-3 PHASE.

NOTE 15: AFBMA DESIGNATION FOR THESE BEARINGS ARE PT NO 10 - 30BC03JP3 NO 11 - 30BC03JP3

NOTE 14: LATEST 1990E, OR AMENDMENT OF REFERENCED SPECIFICATIONS WILL APPLY.

NOTE 13: PARTS NORMALLY FURNISHED AS ON BOARD REPAIR-PARTS

NOTE 12: THESE PARTS ARE ZINC PLATE CHROMATE TREATED (QQ-Z-325)

NOTE 11: GE. CO. DESIGNATION FOR THIS FRAME SIZE IS 286TMZ

NOTE 10: ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

NOTE 9: CONDUIT BOX MAY BE PLACED SO THAT ENTRANCE CAN BE MADE UPWARD, DOWNWARD OR FROM EITHER SIDE.

NOTE 8: THIS CALCULATED VALUE OF FULL-LOAD AMPERES CAN BE USED AS A BASIS FOR SELECTING THE DISTRIBUTION SYSTEM COMPONENTS AND OVERLOAD HEATERS OR RELAYS

NOTE 7: TOTAL AXIAL MOVEMENT DOES NOT EXCEED.045

NOTE 6: WK^2 OF ROTATING PARTS. 26 LB.FT^2

NOTE 5: WEIGHT OF ROTATING PARTS- 1372 LBS.
WEIGHT OF COMPLETE MOTOR- 1620 LBS. -BRAKE-295 LBS.

NOTE 4: STATOR CORE PRESSED INTO FRAME WITH 8 TONS MIN PRESSURE AND SECURED WITH DOWEL PINS

NOTE 3: BEARING FIT AND TOLERANCES

	BEARING ID	BRG MSG. OD	MSG. SHLD. DIA	SHAFT DIA
DRIVE END	4.3307 / 4.3301	1.9685 / 1.9680	4.3316 / 4.3307	1.9690 / 1.9686
OPPOSITE DRIVE END	4.3307 / 4.3301	1.9685 / 1.9680	4.3316 / 4.3307	1.9530 / 1.9666

NOTE 2: THE FORCE REQUIRED TO PRESS THE ROTOR CORE ON TO THE SHAFT IS 12 TONS MIN AND 30 TONS MAX. PRESSURE THE INTERFERENCE FIT BETWEEN THE ROTOR CORE AND SHAFT IS .001 MIN.

NOTE 1: NO APPLICABLE NAVY MATERIAL SPECIFICATION. SPECIFICATION QUOTED MAY BE USED FOR REPAIRS

GENERAL NOTES

AS OF 1 JAN 1990 THIS MOTOR WILL BE MANUFACTURED BY TECH SYSTEMS, THOMASTON, CT 06787, FSCM NO. 20019

MANUFACTURES DESCRIPTIVE DATA

MFRS. TYPE AND CLASS KR
FRAME SIZE 286TMZ (NOTE 11) DUTY 30 MIN
DEGREE OF ENCLOSURE TEFC WI
SPEED CLASS CONSTANT RPM 900 F.L. 833
HP 15 VOLTS 440 CYCLES 60 PHASE 3
NAMEPLATE AMPS 20.4 (NOTE 8) MOUNTING VERT SHAFT UP
TORQUE CLASS DESIGN D CURRENT CLASS DESIGN D
INSULATION CLASS F TYPE OF MOTOR SQUIRREL CAGE
PERMISSABLE AMBIENT TEMPARTURE 40 °C OR LESS
NAVY SERVICE A
TYPE OF BEARING BALL NAVY TYPE 111
CLASS 2 GRADE 00 SYMBOL 111205003X0000
TYPE OF LUBRICATION GREASE NAVY SPEC. 0D0-G-24508
BEARING PULLER GGG-P-781 TY 111 STYLE 111 ATTACHMENT

APPROVAL BLOCK
APPROVAL LETTER PER:
"NAVSEA LTR 9302 OP0156232 SEP 5627F3 DTD 22 SEP 1986"

DATE: 12-10-85		GENERAL ELECTRIC FORT WAYNE IN.
PREPARED	R COE	ALTERNATING CURRENT MOTOR
CHECKED	R COE	
ENGINEER	[illegible]	SIZE: H CODE NO. — DRAWING NO. 226F136
		SCALE: NONE WEIGHT 5101LB SHEET 1 OF 2

Figure A-6. A.C. Motor, Dwg. No. 226F136 (Sheet 1 of 2)

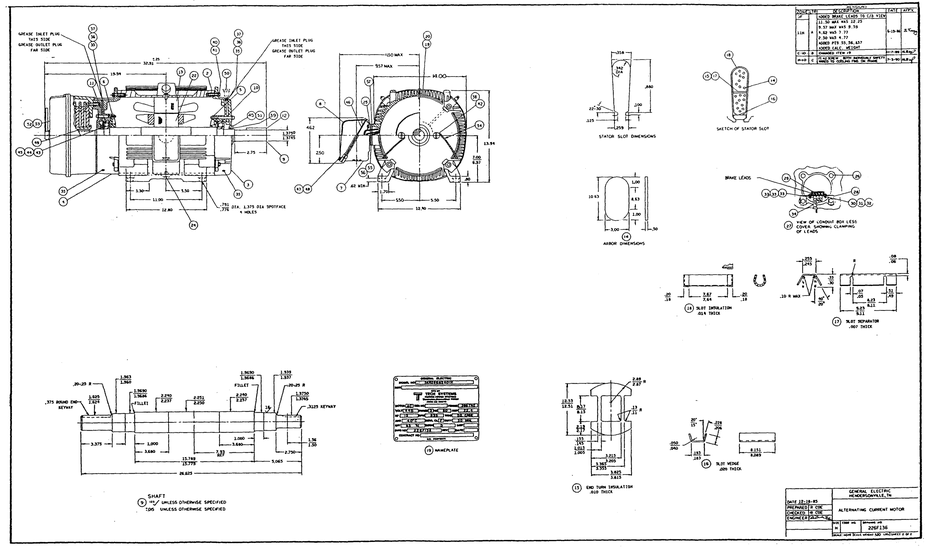


Figure A-6. A.C. Motor, Dwg. No. 226F136 (Sheet 2 of 2)

REAR SECTION

Ref: NAVSEAINST 4160-3A
NAVSEA S005-AA-GYD-030/TMMP

(Insert Classification of TMDER Here) CLASSIFICATION:

NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER)

INSTRUCTION: Continue on 8 1/2" x 11" paper if additional space is needed.

1. USE THIS REPORT TO INDICATE DEFICIENCIES, PROBLEMS, AND RECOMMENDATIONS RELATING TO PUBLICATION.
2. FOR CLASSIFIED TMDERS, FILL IN YOUR RETURN ADDRESS IN SPACE PROVIDED ON THE BACK, FOLD AND TAPE WHERE INDICATED, AND MAIL (SEE OPNAVINST 5510H FOR MAILING CLASSIFIED TMDERS.)

1. PUB NO.	2. VOL/PART	3. REV. NO./DATE OR TM CH. NO./DATE	4. SYSTEM/EQUIPMENT IDENTIFICATION
S9585-AA-MMA-010			

5. TITLE	6. REPORT CONTROL NUMBER
Sliding Padeye Receiving Units Bulkhead-Mounted Models B-12 and B-9A, and Retractable Models CR-12 and CR-12B	

7. RECOMMENDED CHANGES TO PUBLICATION

PAGE NO. A.	PARA-GRAPH B.	C. RECOMMENDED CHANGES AND REASONS

8. ORIGINATOR'S NAME AND WORK CENTER (Please Print)	9. DATE	10. DSN/COMM NO.	11. TRANSMITTED TO

12. SHIP HULL NO. AND/OR STATION ADDRESS (Do Not Abbreviate)

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